Capital Projects	2018 Actuals ($000's)	2018 CarryForward ($000's)	2019 Budget ($000's)	2019 Forecast ($000's)	2020 Budget ($000's)	2021 Budget ($000's)	2022 Budget ($000's)	Note
50 St Revitalization/DT Multi-Purpose Building St	-	75	-	-	**-**	-	-	
Accessibility Audit/Implementation	22	12	584	596	**584**	581	567	
Additional Firefighter Outfitting Costs	64	-	-	-	**-**	-	-	
Aquatic Centre	78	-	1,750	1,500	**4,805**	33,635	9,610	
Art & Culture Master Plan	-	-	-	-		75	-	
Asset Management	-	-	-	-	**409**	255	280	
Backup Power Liftstation Generator Installation	-	90	350	250	**100**	350	-	
Baling Facility- Mechanical Upgrades	3	44	-	44	**-**	-	-	
Ban Commercial Cardboard	-	25	-	25	**-**	-	-	
Bike Park	25	-	45	45	**-**	-	-	
Bristol Freighter Repainting	-	55	-	-	**-**	-	-	
Budget Management	2	25	-	25	**-**	-	-	
Bunker Gear	3	7	-	7	**-**	-	-	
Centralized Composting Program	221	-	-	2	**-**	-	-	
CEP City Hall Boiler Design	-	130	250	75	**-**	-	-	
CEP Community Outreach	-	40	-	20	**-**	-	-	
CEP Interior LED Lighting	12	-	-	-	**-**	-	-	
CEP Transportation Initiatives	70	-	-	-	**-**	-	-	
CEP Waste Strategic Plan	-	50	-	25	**-**	-	-	
City Hall Upgrades	27	183	175	175	**367**	-	-	
Class 1 - Mowers, Pumps, Snowmobiles, etc)	52	-	-	-	**-**	-	-	
Class Replacement	27	108	-	108	**-**	-	-	
Client Hardware Renewals	-	-	220	140	**-**	-	-	
CMP/W&S Federal Funded	1,439	1,724	200	1,924	**-**	-	-	
CMP/W&S Federal Funded - PAVING	3,299	-	-	-	**-**	-	-	
Cold Storage Shelter	147	-	-	-	**-**	-	-	
Columbarium Park	-	-	-	-	**100**	150	-	
Commercial Christmas Tree Replacement	30	-	-	-	**-**	-	-	
Community Energy Plan Projects	848	666	-	350	**120**	2,620	120	
Computer Aided Dispatch	23	-	-	-	**-**	-	-	
Council Chambers Audio Visual Equipment & Webcasting	-	-	-	-	**185**		-	
CS Land Fund Capital Projects	62	-	-	-	**-**	-	-	
Data Collection & Verification	17	-	-	-	**-**	-	-	
Design and Construction Standards	-	-	75	-	**-**	-	-	
Disk Expansion	35	-	-	-	**-**	-	-	
Dispatch Console	-	-	130	130	**-**	-	-	

CAPITAL FUND - 2020 Capital Projects

Capital Projects	2018 Actuals ($000's)	2018 CarryForward ($000's)	2019 Budget ($000's)	2019 Forecast ($000's)	2020 Budget ($000's)	2021 Budget ($000's)	2022 Budget ($000's)	Note
Dispatch Services	-	313	-	-	-	-	-	
Drainage Improvements	9	41	-	41	-	-	-	
ED&S Destination Marketing Organization	163	-	-	-	-	-	-	
Electronic Tendering	20	-	-	-	-	-	-	
Email Management Solution	-	-	-	-	90		-	
Emergency Equipment & Vehicles (Class 8)	248	-	-	-	-	-	-	
Exterior Wall Siding	96	-	-	-	-	-	-	
FDM Software	3	34	-	34	65	23	-	
Fieldhouse Climbing Wall	102	-	-	-	-	-	-	
Fire Hall Backup Power Generator	-	-	-	-	120	-	-	
Fire Hall Emergency Generator	13	187	-	7	-	-	-	
Fire Hall Improvement/Study	24	15	50	65	-	-	-	
Fire Safety Helmets	9	-	-	-	-	-	-	
Firehall Bathroom Expansion	-	-	-	-	-	185		
Fleet Management	-	-	1,207	-	1,326	1,335	1,300	
Flooring Replacement Project (Library, Arenas, Curling Club)	-	-	-	-	150	-	-	
Folk on the Rocks Rehabilitation	-	-	200	200	-	-	-	
General Plan Review	50	100	-	100	-	-	-	
GIS Enhancements	28	18	-	18	-	-	-	
Heavy Duty Vehicles (Class 4)	-	666	-	1,190	-	-	-	
Heavy Equipment (Class 5)	409	-	-	360	-	-	-	
Implementation of 50/50 Recommendations	-	-	25	25	-	-	-	
Information Technology Infrastructure Renewal	-	-	-	-	337	336	350	
Intersections Widening & New Traffic Lights	174	325	200	50	-	-	-	
Lagoon Control Structure Replacement	-	-	50	50	250	-	-	
Lagoon Sludge Removal	-	-	500	50	-	2,000	2,000	
Land Fund Capital Projects	-	-	2,860	200	-	2,000	2,000	
Landfill Fire Control & Risk Reduction Plan	-	25	-	25	-	-	-	
Light Duty Vehicles (Class 2)	112	-	-	241	-	-	-	
McMeekan Causeway Abutment Stabilization	-	450	-	50	-	-	-	
Medium Duty Fleet (Class 3)	-	85	-	85	-	-	-	
Mobile Tractors (Class 6)	-	425	-	425	-	-	-	
Monitoring Well Installation	26	174	-	174	-	-	-	
Multiplex Iceplant Upgrade	-	-	-	-	595	170	-	
Multiplex Upgrade	21	139	-	139	-	-	-	
Multi-Purpose Asphalt Surface - Hall Crescent Park	-	-	-	-	52		-	
Municipal Enforcement Vehicles (Class 7)	54	-	-	63	-	-	-	

Capital Projects	2018 Actuals ($000's)	2018 CarryForward ($000's)	2019 Budget ($000's)	2019 Forecast ($000's)	2020 Budget ($000's)	2021 Budget ($000's)	2022 Budget ($000's)	Note
Network Infrastructure	47	-	93	93	-	-	-	
New Landfill Cell Design	-	-	-	-	-	350	-	
New Landfill/ Landfill Expansion	16	45	-	45	-	-	-	
One-Stop Shopping	50	-	-	-	-	-	-	
Park Development	94	-	-	-	-	-	-	
Parker Park Field Outfield	-	-	-	-	**87**		-	
Parking Structure Feasibility Study	-	-	-	-	**75**	-	-	
Paving & Foundation Repairs	-	97	-	97	-	-	-	
Paving Block 501	1,114	-	-	-	-	-	-	
Paving Program	1,659	926	2,785	3,711	**3,680**	3,550	2,760	
Phone System	-	40	320	360	-	-	-	
PHs- New Piping	1,631	(97)	175	190	-	-	-	
Plotter Replacement	22	-	-	-	-	-	-	
Pool Upgrades	43	-	-	-	-	-	-	
Portable Radios	153	-	-	-	-	-	-	
Potable Water Reservoir Repairs	-	121	750	-	-	-	-	
Post- Secondary Feasibility /Econ. Impacts Study	58	-	-	1	-	-	-	
Preventative Maint. for Multi-Facility Generator	-	-	65	85	-	-	-	
Printers & Multifunction Devices	-	-	56	56	-	-	-	
Propane-Fueled Fire Trainer	-	90	-	98	-	-	-	
Public Safety In-Car Computers	28	-	-	-	-	-	-	
Public Transit Review	-	-	50	50	-	-	-	
Public Work Garage Upgrade	-	-	50	50	-	-	-	
Pump Replacement Program	12	18	100	100	**100**	100	100	
Pumphouse & Liftstation Upgrades	-	-	50	50	-	-	-	
Pumphouse 1 Infrastructure Upgrades	-	-	500	25	-	-	-	
PW Land Fund Capital Projects	2,080	-	-	-	-	-	-	
Range Lake Trail Upgrade	-	-	-	-	-	210	-	
Reservoir Inspection & Repairs	87	-	-	-	-	-	-	
Revitalization Strategy for Downtown	-	75	-	75	-	-	-	
RIMP Building Structural Assessment	-	-	-	-	-	75	-	
SCADA Upgrades (Federal)	466	560	50	300	-	-	-	
SCBA Compressor and Fill Station	-	-	-	-	-		80	
School Draw Parking Lot Improvement	-	247	-	247	-	-	-	
Seasonal Vehicles (Class 9)	-	10	-	10	-	-	-	
Secondary Site & Data Replication	2	10	-	10	-	-	-	
Security Cameras	2	-	-	-	-	-	-	

CAPITAL FUND - 2020 Capital Projects

Capital Projects	2018 Actuals ($000's)	2018 CarryForward ($000's)	2019 Budget ($000's)	2019 Forecast ($000's)	2020 Budget ($000's)	2021 Budget ($000's)	2022 Budget ($000's)	Note
Self-Contained Breathing Apparatus	-	-	225	-	**225**	-	-	
Server & Storage Infrastructure	16	-	59	50	**-**	-	-	
Sewage Force Main Twinning	-	-	250	75	**250**	4,175	4,220	
Site Restoration	2	199	-	199	**-**	-	-	
Snowmobiles	-	26	-	44	**-**	-	-	
Solid Waste Facility Upgrades	-	100	100	200	**-**	-	-	
Stanton Equipment Relocation	-	50	100	150	**-**	-	-	
Submarine Drinking Water Line Replacement	-	-	-	-	**1,000**	1,000	1,000	
Submarine Line Contracted Costs	23	57	-	29	**-**	-	-	
Survey Equipment & AutoCAD Software	7	-	-	-	**-**	-	-	
Sustainability Coordinator	121	-	120	120	**-**	-	-	
SWMP Implementation	-	-	100	25	**-**	-	-	
Tommy Forrest Ball Park Upgrades	206	-	200	200	**200**	-	-	
Traffic Lights Video Detection Equipment	100	-	80	80	**90**	90	90	
Trail Enhancement & Connectivity	16	-	-	6	**-**	-	-	
Transfer Station & Cell Access Improvement	90	110	-	110	**-**	-	-	
Transit Upgrades (Federal)	160	169	-	169	**-**	-	-	
Twin Pine Hill Trail Development	381	-	-	-	**-**	-	-	
Voice Radio Support Equipment	55	20	-	15	**-**	-	-	
W&S- Service Repairs	12	-	-	5	**-**	-	-	
Waste Audit & Long-Term Planning Study	30	-	-	-	**-**	-	-	
Water & Sewer Infrastructure Replacement	4,433	922	3,840	3,150	**3,650**	3,650	4,590	
Water & Sewer Piped Services Expansion Study	-	-	70	70	**-**	-	-	
Water & Sewer Replacement - PAVING	515	-	-	-	**-**	-	-	
Water Source Selection Study	15	-	-	-	**-**	-	-	
Website / Online Services Renewal	32	-	-	-	**-**	-	-	
Website Upgrade	-	-	-	-	**-**	50	-	
Weigh Out Station At SWF	-	300	-	80	**-**	-	-	
Wildland Fire Mitigation Emergency Measures	97	93	-	6	**-**	-	-	
Wiley Road Improvement (Smart Growth/Harbour Plan)	4	38	-	38	**-**	-	-	
Wireless Infrastructure	-	-	-	-	**-**	75	-	
Yellowknife Rotary Park Trail Extension	-	1	-	1	**-**	-	-	
Total Capital Projects	**21,946**	**10,458**	**19,059**	**19,508**	**19,012**	**57,040**	**29,067**	

Capital Projects	2020 Budget ($000's)	Formula Funding ($000's)	Gas Tax Rebate ($000's)	Other Grants ($000's)	Community Public Infrastructure Funding ($000's)	IT Reserve ($000's)	Mobile Equipment Replacement Reserve ($000's)	Major Community Facility Reserve ($000's)	User Fees ($000's)
Accessibility Implementation	**584**	-	-	-	(584)	-	-	-	-
Aquatic Centre	**4,805**	-	-	(2,375)	-	-	-	(2,430)	-
Asset Management	**409**	(109)	(292)	-	(8)	-	-	-	-
Backup Power Liftstation Generator Installation	**100**	(100)	-	-	-	-	-	-	-
City Hall Upgrades	**367**	-	-	-	(367)	-	-	-	-
Columbarium	**100**	-	-	-	(100)	-	-	-	-
Community Energy Plan Projects	**120**	(120)	-	-	-	-	-	-	-
Council Chambers Audio Visual Equipment & Webcasting	**185**	-	-	-	-	(185)	-	-	-
Email Management Solution	**90**	-	-	-	-	(90)	-	-	-
FDM Software	**65**	-	-	-	(65)	-	-	-	-
Fire Hall Backup Power Generator	**120**	(120)	-	-	-	-	-	-	-
Fleet Management	**1,326**	-	-	-	-	-	(1,326)	-	-
Flooring Replacement Project (Library, Arenas, Curling Club)	**150**	-	-	-	(150)	-	-	-	-
Information Technology Infrastructure Renewal	**337**	-	-	-	-	(337)	-	-	-
Lagoon Control Structure Replacement	**250**	-	(250)	-	-	-	-	-	-
Multiplex Iceplant Upgrade	**595**	-	-	-	(595)	-	-	-	-
Multi-Purpose Asphalt Surface - Hall Crescent Park	**52**	(45)	-	-	(7)	-	-	-	-
Parker Park Field Outfield	**87**	-	-	(80)	(7)	-	-	-	-
Parking Structure Feasibility Study	**75**	(75)	-	-	-	-	-	-	-
Paving Program	**3,680**	(568)	-	(2,756)	(356)	-	-	-	-
Pump Replacement Program	**100**	-	(100)	-	-	-	-	-	-
Self-Contained Breathing Apparatus	**225**	-	-	-	(225)	-	-	-	-
Sewage Force Main Upgrades	**250**	-	(250)	-	-	-	-	-	-
Submarine Drinking Water Line Replacement	**1,000**	-	-	(750)	(250)	-	-	-	-
Tommy Forrest Ball Park Upgrades	**200**	-	-	(140)	(60)	-	-	-	-
Traffic Light Upgrades	**90**	-	-	-	(90)	-	-	-	-
Water & Sewer Infrastructure Replacement	**3,650**	-	(830)	-	-	-	-	-	(2,820)
	19,012	**(1,137)**	**(1,722)**	**(6,101)**	**(2,864)**	**(612)**	**(1,326)**	**(2,430)**	**(2,820)**

Department CS Community Services **Division** Directorate
Project 50036570 Accessibility Implementation

Budget

	2020	2021	2022
	$	$	$
Expenditures	**584,000**	**581,000**	**567,000**
Funding			
Formula Funding		270,150	487,000
Other Grants			80,000
Community Public Infrastructure Funding	584,000	310,850	
Total Funding	**584,000**	**581,000**	**567,000**

Description

Purpose

To continue the implementation of the Accessibility Audit Report of the City's facilities including trails, parks and playgrounds through the removal of barriers as identified.

Background

Council provided funding in the 2017 Budget for the development of an Accessibility Audit. The scope of work included auditing the City of Yellowknife facilities and infrastructure, focused on structural design of facilities as well as functional usability based on accessibility needs of individuals with a wide range of challenges including mobility, visual, hearing, cognitive and sensory disabilities. A prioritized implementation strategy has been developed and approved by Council to guide the work as the City moves towards full accessibility in these key areas.

The implementation strategy identifies a number of projects for a variety of facilities and infrastructure that will assist Council in achieving their stated Community and Corporate Vision of an inclusive City. Additionally, the implementation of the accessibility audit will move Council to achieving a high qualify of life for all, including future generations.

Key areas for 2020 includes projects at the Community Arena, Wildcat Cafe, Library, Fire Hall, City Hall, playgrounds, sports fields, sport courts and Niven Trail.

Operational Impact

There will be no additional O&M impact.

Department CS Community Services **Division** Pool
Project 55006570 Aquatic Centre

Budget

	2020	2021	2022
	$	$	$
Expenditures			
Balancing Difference	4,805,000	33,635,000	9,610,000
Total Expenditures	**4,805,000**	**33,635,000**	**9,610,000**
Funding			
Formula Funding		5,990,000	7,235,000
Gas Tax Rebate		4,805,000	
Other Grants	2,375,000	8,150,000	2,375,000
Reserves	2,430,000	690,000	
Debt Funding		14,000,000	
Total Funding	**4,805,000**	**33,635,000**	**9,610,000**

Description

Purpose

The development of an Aquatic Centre is a multi-year project that started in 2018 with the input of the Aquatic Centre Advisory Committee (ACAC) and is anticipated to be completed, pending Council and voter approval in the first quarter of 2022.

Background

The ACAC completed the task of carrying out a public consultation process which resulted in Council adopting the Aquatic Centre Pre-Design Plan.

The Pre-Design Plan recommends that the facility includes a 52m lap pool, a warm water leisure pool complete with a lazy river and various play features, spectator viewing, diving boards, hot tub, steam room, canteen, multi-purpose rooms, storage and office space for youth groups as well as the required change room space and staff space. These components are detailed at the conceptual level within the Plan.

Funding in the amount of $1.75 million was provided in 2019 to proceed with the completion of a Design-Build process including the contracting of a Bridging Consultant, and a Project Manager, and various site related activities. An Aquatic Centre Design Committee will further the Pre-Design Plan to develop a final design for Council approval.

Department	CS Community Services	**Division**	Pool
Project	55006570 Aquatic Centre		

The Design-Build process will entail the pre-qualification of design-build teams that will be provided with a stipend to complete the design of the Aquatic Centre as per the requirements of the City.

Pending Council approval and the results of a referendum, subsequent year funding will include the construction costs of the Aquatic Centre which will likely commence in 2020 with completion in early 2022 as shown in Gallery 1.

Operational Impact

It is anticipated that the project will be completed in 2021 with the full impact of the operational costs to be in effect in 2022. The Pre-Design Plan indicates that the net operational cost of the facility will be $3.2 million annually.

Department CS Community Services **Division** Pool
Project 55006570 Aquatic Centre

Gallery

Gallery 1

Year	Phase	Cost ($)	Build Canada Fund ($)	City ($)
2018	Public Consultation	75,000	0	75,000
2019	Architectural/ Engineering	1,750,000	0	1,750,000
2020	Construction	4,805,000	2,375,000	2,430,000
2021	Construction	33,635,000	8,150,000	25,485,000
2022	Construction	9,610,000	2,375,000	7,235,000
Total		**49,875,000**	**12,900,000**	**36,975,000**

Department GG General Government **Division** Directorate
Project 40006570 Asset Management

Budget

	2020	2021	2022
	$	$	$
Expenditures	**408,500**	**255,000**	**280,000**
Funding			
Formula Funding	108,500	255,000	
Gas Tax Rebate	292,450		
Community Public Infrastructure Funding	7,550		
Reserves			280,000
Total Funding	**408,500**	**255,000**	**280,000**

Description

Purpose

To support Asset Management best practices that help ensure financially responsible management of the City's assets.

Background

The City's mandate is to ensure that citizens are provided with services that are essential to their quality of life, including clean drinking water, transportation, recreational facilities and programs, and emergency response. All of these services depend on infrastructure assets such as pipes, buildings, roads, vehicles, and technology.

The community entrusts the City to take care of these assets in a financially responsible manner to ensure that the full value of the assets is optimized, that risks are minimized, and that services are responsive to agreed upon levels of service: this is asset management.

While the City has been informally applying asset management principles to many of its assets and the related decisions, the escalating complexity and value of its assets, the continuing infrastructure gap, the growing demands to comply with new environmental and safety standards, the increasingly stringent demands around external funding, and growing expectations of increased transparency and accountability all mean the City needs to become even more strategic about how assets and related spending are managed.

This requires a more formalized asset management framework that encompasses all disciplines and involves the entire organization in strategically managing existing and new assets to ensure sustainable service delivery and to increase resiliency in the face of a changing climate and economy.

Department	GG General Government	**Division**	Directorate
Project	40006570 Asset Management		

The City has previously endeavoured to apply more structure to its asset management efforts. Notably:

-In 2006, FSC Architects & Engineers was contracted to conduct an Infrastructure Needs Assessment. The study inventoried all of the City's capital assets, assessed their condition, determined their replacement costs, and quantified deferred maintenance.
-2008 changes to the Public Sector Accounting Board's standards introduced requirements for municipalities to report the equivalent of depreciation, and so the City developed mechanisms to track estimated asset values for this purpose.
-In 2010, the City established an Asset Management Task Force that included the Mayor, several Directors, and representatives from the business community. The Task Force provided oversight to work done by Dillon Consulting to conduct another inventory of assets and assess their condition, maintenance, and replacement needs.
-In 2017, Public Works staff undertook to address asset management through a sustainability lens. They joined FCM's Climate and Asset Management Network and leveraged funding to provide some basic asset management education to a handful of staff.

These undertakings achieved some limited success in specific functions within the organization, particularly with respect to fleet and linear infrastructure. However, the 2006 and 2011 reports essentially sit on the shelf as the organization has not had the dedicated resource capacity to lead the work to advance this.

In late 2018 Administration assembled an Asset Management Working Group to establish formalized corporate-wide asset management processes and practises at the City. The group utilized a competitive process to seek external expertise that could leverage the experiences, successes, and lessons learned from asset management experiences at other municipalities. In May of 2019, Dillon Consulting was awarded a contract to assess the usability of the previously compiled data, compare City practices to best practices, and develop an Asset Management Roadmap to guide the City's next steps.

Dillon consulted with members of the Working Group to assess the current status of asset management relative to the key competencies in FCM's asset management readiness scale, plus a sixth area to reflect the importance of measuring levels of service and managing risk. These competency areas, and related asset management outcome areas, are shown in Gallery 1.

Based on staff interviews, table-top exercises, and documentation reviews, the evaluation process rated the City's state in each of these competencies on a scale of one to five, where one describes an organization just starting out with asset management and five is considered beyond the standard.

Department	GG General Government	**Division**	Directorate
Project	40006570 Asset Management		

As shown in Gallery 2 - Asset Management Readiness, when the City's overall rating is expressed in the more descriptive terminology used in asset management standards, it shows the City's current state at just beyond Awareness. A visioning exercise expressed the staff's intention to position the City at the Excelling end of the continuum however, after considering the tasks and resources required to advance asset management, a conservative interim vision state between Establishing and Competence was identified, although if the City is able to complete all of the work identified in the Roadmap at the end of its five year path the organization could be at the high end of Competence.

The consultants looked at the City's current asset management state and identified the work that needs to be done to move the organization to its sought-after state. It organized this work into a five year time frame, centered around a theme for each year, and developed a Roadmap to guide the City; it is summarized in Gallery 3 - Roadmap Overview.

The Roadmap identifies almost 3,000 days of work that will be required for the City to make the requisite asset management advances. While some of it can be done by internal staff, about half of it will benefit from external expertise.

Gallery 4 - Resource Estimates summarizes the anticipated resource requirements by year for each of the five years encompassed by the initial Roadmap. Resource needs for the following year are also included to illustrate that investments will continue beyond the time frame of the Roadmap. These cost estimates assume an average hourly consultant rate of $150 per hour and eight hour days, while the internal resource cost estimates are based on a rate of $75 per hour and seven hour days.

Using external resources for specified tasks will allow the City to benefit from specialized expertise and learn from the experiences of other municipalities. Therefore, it is recommended that the amounts shown in Gallery 5 - Capital Amounts be allocated to asset management during the term of this budget.

These amounts are slightly higher than the costs identified in the consultants' report and in the previous table: about 15% has been added to reflect potential travel costs and expenses. The investment will enable the City to maintain focused and directed momentum on asset management initiatives.

Council has clearly articulated the importance of asset management by establishing "Develop and resource an asset management plan to guide long-term decision-making" as a key objective for their 2019 – 2022 term. This reflects how important asset management is to the City. It can help ensure effective stewardship of its increasingly valuable and complex assets, timely mitigation of the infrastructure gap, compliance with funding requirements, increased transparency and accountability, and can support better informed decision making.

Department	GG General Government	**Division**	Directorate
Project	40006570 Asset Management		

Previous attempts at formalizing corporate wide asset management practises at the City have stalled due to lack of resources. Therefore, it is critical that this initiative be adequately resourced if it is to be successful.

Operational Impact

The volume of work to be addressed by internal resources reflects efforts that will be required over and above existing responsibilities, however there is no capacity to assume these additional tasks. Therefore it is recommended that a new asset management leadership position be created for a five year term, beginning in 2020 to provide direction, oversight, and coordination; this is being addressed through the Budget 2020 P/Y process.

These numbers do not include the amount of time that will be required to record, enter, and track the additional data that will be captured on an ongoing basis to support the asset management processes. Therefore it is further recommended that one additional asset management position be created in 2021 for a four year term to provide these services.

Department GG General Government **Division** Directorate
Project 40006570 Asset Management

Gallery

Gallery 1

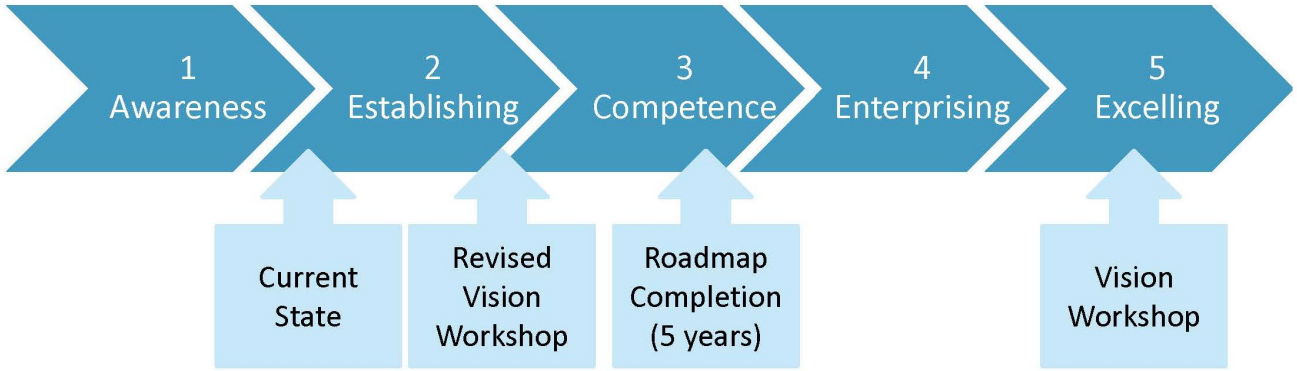
Competency Areas	Asset Management Outcome Areas
Policy & Governance	Policy & Objectives Strategy & Framework Measurement & Monitoring
People & Leadership	Cross-Functional Groups Accountability Resourcing & Commitment
Data & Information	Asset Data Performance Data Financial Data
Planning & Decision-Making	Documentation & Standardization Asset Investment Plans Budgets
Contribution to Asset Management Practice	Training & Development Knowledge Sharing – Internal Knowledge Sharing – External
Asset Management Practices, Processes, and Procedures	Risk Management Levels of Service (LOS) Asset Management Plan

Table I – Asset Management Key Competencies

Department	GG General Government	**Division**	Directorate
Project	40006570 Asset Management		

Gallery

Gallery 2



Department GG General Government **Division** Directorate
Project 40006570 Asset Management

Gallery

Gallery 3

Year	Theme	Description of Opportunities
Year 0 (2019)	Raising awareness	Asset management is a team sport requiring broad support across the organization. In 2019, the City is developing key documents and bringing them forward to Council. This includes the AM Roadmap, AM Policy and AM Strategy and Vision.
Year 1 (2020)	Building the base	Following the successful launch of the AM Roadmap through Council adoption and the annual budget process, a solid base for asset management will be set by establishing roles and responsibilities within the asset management framework and initiating data management opportunities, as well as a corporate risk framework. The opportunities in Year One and onward will be guided by the Policy, Vision and Roadmap established during Year Zero.
Year 2 (2021)	Asset performance	During Year Two of the AM Roadmap, the condition of assets will be determined using a standardized methodology, along with the expected level of service in order to establish a baseline for evidence-based service and capital planning.
Year 3 (2022)	Asset management plans	In Year Three there will be a continued focus on opportunities that contribute to asset management practices, and a comprehensive update of the asset management plans will be undertaken to incorporate the practices and information from preceding years.
Year 4 (2023)	Integration with demand management	In Year Four, master planning will be undertaken to complete the pictures of service and asset requirements. Work will continue to develop asset management plans across all City assets and to enhance those completed with validated asset strategies.
Year 5 (2024)	Operations and recalibration	In Year Five, focus will shift towards maintenance improvements and the Roadmap implementation will be reviewed and recalibrated based on new information.

Table II – Roadmap Overview

Department GG General Government **Division** Directorate
Project 40006570 Asset Management

Gallery

Gallery 4

Year	Total		External		Internal	
	Days	Costs	Days	Costs	Days	Costs
2019	70	$46,172.50	14	$16,440.00	57	$29,732.50
2020	444	$382,181.25	221	$265,500.00	222	$116,681.25
2021	463	$368,206.25	185	$222,300.00	278	$145,906.25
2022	408	$352,493.75	205	$245,700.00	203	$106,793.75
2023	552	$510,975.89	328	$393,557.14	224	$117,418.75
2024	548	$489,011.61	298	$357,842.86	250	$131,168.75
2025	456	$412,761.61	257	$307,842.86	200	$104,918.75

Table III – Resource Estimates

Department GG General Government **Division** Directorate
Project 40006570 Asset Management

Gallery

Gallery 5

Year	Capital Budget Investment
2020	$408,500
2021	$255,000
2022	$280,000

Table IV – Capital Amounts

Department PW Public Works & Engineering **Division** Water & Sewer
Project 93007670 Backup Power Liftstation Generator Installation

Budget

	2020	2021	2022
	$	$	$
Expenditures	**100,000**	**350,000**	
Funding			
Formula Funding	100,000		
Gas Tax Rebate		55,550	
Community Public Infrastructure Funding		294,450	
Total Funding	**100,000**	**350,000**	

Description

Purpose

To implement backup power generators that help ensure the City is able to provide water distribution and sewage pumping capabilities during electrical power outages.

Background

The City received a written order from an Environmental Health Officer in July 2018 that requires the City to take steps towards installing backup power at all sewage liftstations to prevent overflow situations into receiving environments.

In 2019, the City had three sewage liftstations that did not have backup power generation, two in the Niven Lake area and one on Norseman Drive. Budget was provided in 2019 for the addition of backup power for Liftstation 12, adjacent to Lemay Drive in Niven Lake.

The requested 2020 budget allocation will be for detailed design and location for backup power for Liftstation 11, which is located on Deweerdt Drive, also in Niven Lake. The project will need to look at location for the generator as the land parcel that Liftstation 11 resides on is small and land locked. It will also include design of the generator, transfer switch and building enclosure.

Department	PW Public Works & Engineering	**Division**	Water & Sewer
Project	93007670 Backup Power Liftstation Generator Installation		

Operational Impact

Without backup power, there is risk of sewage overflows into neighborhoods and/or other receiving environments. Environmental cleanup efforts are time consuming and costly. This project is an addition to the City's capital assets and will require maintenance consistent with standard asset management principles.

Department CS Community Services **Division** City Hall
Project 56016570 City Hall Upgrades

Budget

	2020	2021	2022
	$	$	$
Expenditures	**367,450**		
Funding			
Community Public Infrastructure Funding	367,450		
Total Funding	**367,450**		

Description

Purpose

To complete the necessary repair of the City Hall exterior stairs.

Background

City Hall was constructed in 1975 and has served as the administrative centre for the City since that time. There have been many positive changes and renovations over these years, and to ensure that the building continues to meet the requirements of the community and staff in a safe and comfortable manner, continued work is required.

The 2018 budget included a $210,000 capital project to repair the main entrance steps to City Hall. The design portion of the project was carried out through a Request for Proposal call at a cost of just over $27,450. Several options were provided for review and the most cost effective approach was selected. The work also included improving the lighting of the stairs and design to reduce the increase in maintenance that has been required over the past years.

Following the completion of the architectural and design phase of the project, it was estimated by the architect that the cost to complete the project would be $253,000. With the available funds of $182,550 remaining in the project budget the project was put on hold pending additional funds being allocated by Council. In 2019, $90,000 was was provided through the 2019 budget to increase the available funds to $272,550 to account for cost escalations. The work was tendered in early 2019 and garnered one response, which surpassed the architectural and engineering estimate.

To address ongoing issues with peeling, cracking, and safety, as well as ensure that the City maintains assets to a high standard of care, the project is presented again for additional funds to complete.

Operational Impact

It is anticipated that this project will not affect the current O&M budget.

Department	CS Community Services	**Division**	Parks & Trails
Project	53536570 Columbarium		

Budget

	2020	2021	2022
	$	$	$
Expenditures	**100,000**	**150,000**	
Funding			
Community Public Infrastructure Funding	100,000	150,000	
Total Funding	**100,000**	**150,000**	

Description

Purpose

To build an additional Columbarium in the Lakeview Cemetery, thereby increasing the total number of niches from 100 to 200.

Background

In 2013, the City installed a 100-niche columbarium at the Lakeview Cemetery. At the present time, the Columbarium is already 75% full. In the last few years the demand for niches in the Columbarium has grown to the point that it is expected to be fully occupied or reserved within two years.

This aesthetically pleasing area within Lakeview Cemetery will provide a place for quiet reflection and will have two columbaria for the interment of cremated human remains in an above-ground monument-type installation. The additional Columbarium will use land that would otherwise be unsuitable for burials as well as provide citizens with an alternative to ground burials.

The first year of the project will include the necessary ground work, landscaping and site preparation, and the second year will see the purchase and installation of the Columbaria.

Operational Impact

There will be no additional operational costs associated with this project.

Department PW Public Works & Engineering **Division** Community Energy Plan
Project CP0004 Community Energy Plan Projects

Budget

	2020	2021	2022
	$	$	$
Expenditures			
Sustainability Projects Coordinator	120,000	120,000	120,000
Centralized Boiler (City Hall)		2,500,000	
Total Expenditures	**120,000**	**2,620,000**	**120,000**
Funding			
Formula Funding	120,000	120,000	120,000
Gas Tax Rebate		2,500,000	
Total Funding	**120,000**	**2,620,000**	**120,000**

Description

Purpose

To implement projects related to the City's Community Energy Plan (CEP) and Strategic Waste Management (SWMP) Implementation Plan.

Background

This project contains two items that relate to the City's sustainable projects development. Sustainability Projects Coordinator and the Centralized Boiler Project.

The Sustainability Projects Coordinator (previously titled the Energy Coordinator), was made a permanent position with the City in 2009. The primary duties of this position are:

-Researching, developing and implementing policies and projects that fall within the environmental sustainability portfolio including the Community Energy Plan.
-Participating in the CEP Implementation Committee.
-Carrying out specific objectives defined in the 2018 Strategic Waste Management Plan.

This position has grown in its scope of work and has been instrumental in implementing the Community Energy Plan and waste diversion strategies throughout the City. With growing pressures on solid waste management, the implementation of the SWMP is high priority for the department.

Department	PW Public Works & Engineering	**Division**	Community Energy Plan
Project	CP0004 Community Energy Plan Projects		

The City's Community Energy Plan sets out ambitious targets for greenhouse gas emissions, renewable energy use, and increased energy efficiency. One way to meet these targets is to implement centralized boiler systems that are used to heat numerous buildings, such as the one that was recently installed to heat the Multiplex, Fieldhouse, Fire Hall, City Garage, and Community Services Shop.

The City of Yellowknife will undertake a feasibility study in 2019 to determine how many buildings could be incorporated into the projected. Currently there are five buildings in consideration under three levels of government, municipal, territorial and federal. The buildings include City Hall, RCMP Detachment, Joint Task Force North (DND), the Legislative Assembly and Price of Wales Museum.

The outcome of the feasibility study will determine the next steps in the process. If favorable, the City would move towards detailed engineered design and construction in future years.

Operational Impact

These projects will have positive operational impacts in regards to fuel and power cost savings as well as prolonging the life of the current landfill. They are also consistent with standard asset management principles.

Department GG General Government **Division** Information Technology
Project CO0007 Council Chambers Audio Visual Equipment & Webcasting

Budget

	2020	2021	2022
	$	$	$
Expenditures	**185,000**		
Funding			
Reserves	185,000		
Total Funding	**185,000**		

Description

Purpose

To replace key components of the City's webcasting and Audio/Visual infrastructure.

Background

Council and Committee webcasts were introduced in late 2014 and have developed a steady viewership, which parallels the general public interest in the various issues and events that go before City Council. In addition to webcasting of Council and Committee meetings, the webcasting equipment has been used to showcase other events such as the Win Your Space Grand Finale.

The City's current webcasting equipment was acquired in 2014 and key components were due for replacement in 2019: further delays in replacing the equipment will increase the risk of failure and service interruptions.

The replacement offers an opportunity to access advanced features available in newer equipment. These include closed-captioning to address recommendations contained within the Accessibility Audit, HD quality streaming, on-demand text and sound search capability, and picture-in-picture display to provide simultaneous video streaming and presentation viewing. They also provide more flexibility to host a variety of events where streaming services could be provided.

Department	GG General Government	**Division**	Information Technology
Project	CO0007 Council Chambers Audio Visual Equipment & Webcasting		

The Audio (microphones, teleconferencing and speaker system) and Visual (display screens in the Council Chamber) are essential tools for meetings held in the facility and for the webcasting of Council and Committee meetings. However the current components cannot be properly integrated with each other, the display screens are not reliable, and the systems are difficult to operate requiring frequent time-consuming troubleshooting efforts. Cables and equipment under the City Clerk's desk take up considerable space and are messy, causing a tripping hazard (Gallery 1). This equipment, including what is on the desk (Gallery 2), should be placed in a cabinet out of the way and secured from public access. Equipment used by the media (Gallery 3) is old and unreliable resulting in poor quality audio recordings.

This project will begin by assessing the current components to determine what must be replaced and what can effectively be left in service. Then appropriate acquisitions will be made and deployed to create a more integrated, intuitive, and reliable system. Investigations into systems available in the marketplace could provide a solution to integrate both the Council Chamber A/V system and the Webcasting Renewal Project from a preferred vendor, and could result in significant savings.

The existing equipment can be relocated and used at an alternate site in the event that City Hall or the Council Chamber experiences an unforeseen disaster, or if an offsite Emergency Operations Centre is established.

Operational Impact

It will be more cost effective to replace 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 completed, this project will not impact the O&M budget. However, if it does not proceed, ongoing troubleshooting and repair costs will have to be factored into future O&M budgets.

Department	GG General Government	**Division**	Information Technology
Project	CO0007 Council Chambers Audio Visual Equipment & Webcasting		

Gallery

Gallery 1

Department	GG General Government	**Division**	Information Technology
Project	CO0007 Council Chambers Audio Visual Equipment & Webcasting		

Gallery

Gallery 2

Department	GG General Government	**Division**	Information Technology
Project	CO0007 Council Chambers Audio Visual Equipment & Webcasting		

Gallery

Gallery 3

Department GG General Government **Division** Information Technology
Project CO0014 Email Management Solution

Budget

	2020	2021	2022
	$	$	$
Expenditures	**90,000**		
Funding			
Reserves	90,000		
Total Funding	**90,000**		

Description

Purpose

To implement an email management solution that integrates with the City's document management system and helps to ensure that all digital information conveyed by email is properly retained in the document management system.

Background

Communication by email continues to grow, not only internally within the City but also with external partners. The current method of storing and recording emails and associated attachments is time consuming and cumbersome as it is not fully integrated with the document management system. The sharing, distribution and records management of this information is becoming increasingly time consuming and important given the requirements for storage and tracking of emails and associated attachments. The recommended solution will integrate with the City's current document management system, providing better tracking, recording and management of information received or distributed.

Operational Impact

Providing a more robust, secure and manageable solution for the retention and tracking of information will enable the City to meet its legal obligation to keep, maintain and provide information when requests are received, and help employees properly retain and manage valuable City data and information.

Department PS Public Safety **Division** Fire & Ambulance
Project 63007670 FDM Software

Budget

	2020	2021	2022
	$	$	$
Expenditures	**64,500**	**22,500**	
Funding			
Formula Funding		22,500	
Community Public Infrastructure Funding	64,500		
Total Funding	**64,500**	**22,500**	

Description

Purpose

Acquisition of a Mobile Computer-Aided Dispatch (CAD) system will improve information sharing and dispatching through installation of a computer terminal in fire apparatus to relay critical information from a dispatch computer directly to First Responders enroute to an incident site. FDM Roster is an expandable module of current software supporting YKFD to enhance management of employee information including training, scheduling and operations.

Background

An enhancement for the FDM suite of programs currently in use within YKFD is a Mobile CAD component. This enhancement would improve the effectiveness of support to fire and ambulance operators within YKFD in locating the site of an incident, planning the best travel route, identifying primary and secondary hydrant location, and determining road closures or areas where construction is creating traffic congestion. Happening concurrently, the Fire Officer or EMS attendant uses a manual Run Book to locate a street address of an emergency call to start planning for access, site overview, structures, or potential exposures to aid pre-arrival incident size-up. Mobile CAD will eliminate lost time as the route will be provided automatically by Mobile CAD software on the computer operating from the fire apparatus responding to the call. Mobile CAD will also add a seamless additional product by utilizing an automatic vehicle location (AVL) using pre-loaded GIS mapping. This system enhancement will also improve Dispatchers' availability for other critical tasks during the dispatch and monitoring of an emergency call including being able to maintain safety, security and accountability; ensure accuracy of data; triage and re-route calls; and re-route resources.

Department	PS Public Safety	**Division**	Fire & Ambulance
Project	63007670 FDM Software		

In addition, FDM Roster is another system enhancement to support effective planning and operations. Currently, all vacation and leave requests, scheduling of training, shift scheduling and administration, and injury-related time off is tracked manually through hard copy documents and manually maintained Leave Boards. FDM Roster is a comprehensive tool that can be used by all YKFD members for day-to-day staffing functions. FDM Roster provides a graphical representation of a department's operational requirements, available personnel and current staffing schedules. With FDM Roster, administrative staff will be able to quickly see the daily qualified members for positions that are unfilled due to illness and training, and it allows for tracking employee work history with ease and efficiency. This project was postponed to 2021 by Council during budget deliberations.

Operational Impact

This initiative will lead to greater efficiency in operations and planning but will require key positions and a number of staff to develop intricate knowledge of software functionality. Minimal operational impacts are anticipated as costs related to maintaining and operating this system can be absorbed within existing YKFD budget levels.

Department PS Public Safety **Division** Directorate
Project PS0001 Fire Hall Backup Power Generation

Budget

	2020	2021	2022
	$	$	$
Expenditures	**120,000**		
Funding			
Formula Funding	120,000		
Total Funding	**120,000**		

Description

Purpose

To complete the backup power generation project for electrical redunancy at the Fire Hall.

Background

A capital project was brought forward in the 2017 Capital Plan for the installation of a new backup power generator at the Fire Hall. The existing generator is 29 years old and beyond it's useful life and is now under capacity for changes in Fire Hall operations, most notably the relocation of dispatch services from Pump House #1 to the Fire Hall. By relocating dispatch operations to the Fire Hall, the associated infrastructure has increased the electrical demand on the facility. Dispatch infrastructure also needs to have reliable and competent backup power generation in the case of a prolonged power outage.

The 2017 budget for the project was $100,000, at the time a decision was made to remove and replace the existing generator of same size and output. A larger generator would not physically fit within the existing Fire Hall footprint. However, In 2018 after further consultation with Fire Hall staff it became clear that more capacity was necessary for the backup generator, and the budget was increased by $100,000 to increase the size of the generator with potential relocation outside the footprint of the Fire Hall which would also require an enclosure.

A quote was obtained for the installation which was approximately $171,000 over budget, for a total of $371,000. This prompted staff to look into alternative options.An analysis was completed of the existing 1.2MW generator that supplies backup power for the Multiplex, Fieldhouse and Lift Station #5.The existing overall full load on the generator is approximately 650 kW, leaving capacity to service the Fire Hall.

Engineering was completed on the project in 2019, which included a Class A estimate of $272,295, minus the remaining budget carryover of $163,000, leaves a project shortfall of approximately $109,295.

Department	PS Public Safety	**Division**	Directorate
Project	PS0001 Fire Hall Backup Power Generation		

The 2020 capital request is for $120,000, that includes the projected budget required to complete the project and an allocation for professional inspection and commissioning services by a qualified electrical engineer.

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 the present generator.

Department PW Public Works & Engineering **Division** Fleet Management
Project 71507801 Fleet Management

Budget

		2020	2021	2022
		$	$	$
Expenditures				
		1,326,150	1,335,000	1,300,000
	Total Expenditures	**1,326,150**	**1,335,000**	**1,300,000**
Funding				
Reserves		1,326,150	1,335,000	1,300,000
	Total Funding	**1,326,150**	**1,335,000**	**1,300,000**

Description

Purpose

To continue replacing and redeploying fleet units according to the City's Fleet Management practices.

Background

The mobile equipment fleet has a replacement value of $16.4 million and must be maintained to meet the service levels expected by residents. The City has a fleet of 159 pieces of heavy-duty and mobile equipment that support Fire and Ambulance, Road Maintenance, Water and Sewer Maintenance, Solid Waste, Parks, Arenas and Administrative functions, as well as 26 stationary engines for emergency power generation and fire pumping capacity.

Fleet management practices allow the City to maximize life cycle and 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 downtime due to repairs or failures, which could negatively impact the delivery of City services such as snow removal or water/sewer repairs.

Department	PW Public Works & Engineering	**Division**	Fleet Management
Project	71507801 Fleet Management		

Summary of Units:

Small Equipment – 30 units
Small equipment includes miscellaneous equipment required by City departments to do their work. Included are: riding mowers, snowmobiles (Municipal Enforcement Division), all-terrain vehicles (Fire Fighters), 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. The City currently has 41 pickup trucks and vans in the fleet. The ages vary from one year to more than ten years.

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 8 medium-duty trucks in the fleet.

Heavy-duty Trucks – 15 units
The 15 heavy-duty trucks and trailers include trailers, tandem tractors, and dump trucks. The heavy-duty 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 rather than hiring contractors is approximately half. Each truck is operated for approximately 1,000 hours per year, saving the City $45,000 a year for 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
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 hours per year, saving the City $45,000 a 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.

Department	PW Public Works & Engineering	**Division**	Fleet Management
Project	71507801 Fleet Management		

Mobile Tractors – 9 units
This includes zambonis, skid steers, compactors, and forklifts. The anticipated lifespan of these units is ten years.

Municipal Enforcement Vehicles – 4 units
These are to be replaced every four years or 100,000 kilometres. 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 cycles of these vehicles. One Municipal Enforcement vehicle must be replaced yearly to maintain the City standards and in order to reduce O&M costs and labour requirements.

Emergency Vehicles – 10 units
This includes fire trucks, ambulances and water trucks. Due to increased demand, the replacement life cycle standard was re-evaluated by Public Works and the Fire Division, and the standard for replacement was reduced from 30 years to 20 years for most fire fighting equipment. Ambulances are now replaced on a 12 year cycle due to the high amount of use and reliability issues with ambulances as they get older. The City has 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 such as a light duty pickup truck is removed from its primary use, it is placed into a lower priority use, such as vehicle used for summer student work activities. If the 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 and Engineering.

Stationary Engines – 26 Units
The City's 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 for 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, twelve are over 20 years old, fourteen are over 10 years old, and only seven are under 10 years old. Parts are often unavailable for engines over 20 years old. Although 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, and that one engine a year be replaced until all stationary engines are less than 20 years old.

Department	PW Public Works & Engineering	**Division**	Fleet Management
Project	71507801 Fleet Management		

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 vactor 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.

Operational Impact

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 downtime due to repairs or failures, which could negatively impact the delivery of City services such as snow removal or water/sewer repairs.

Department	CS Community Services	**Division**	Multiplex
Project	FC0015 Flooring Replacement Project (Library, Arenas, Curling Club)		

Budget

	2020	2021	2022
	$	$	$
Expenditures			
Library	94,000		
Community Arena Concession	20,000		
Curling Club	36,000		
Total Expenditures	**150,000**		
Funding			
Community Public Infrastructure Funding	150,000		
Total Funding	**150,000**		

Description

Purpose

To replace flooring in the Library, Arenas and Curling Club facilities.

Background

The flooring that is included in this project is at the end of its useable life and requires replacement to ensure that City facilities are maintained to a reasonable standard of care. The carpet at the library was installed over ten years ago. With the amount of traffic through that facility, approximately 200,000 visitors annually, the carpet has met its ten year life expectancy and is in need of replacement.

Likewise, the Curling Club carpet is well beyond its life expectancy. It has not been replaced in over 20 years and is in need of replacement. Flooring in the Community Arena concession has been in place for over 20 years and has become a safety and health concern.

The carpet in the Library and Curling Club have both exceeded their useful life and are now in a state that detracts from the cleanliness, safety and atmosphere of the facilities. The concession floor at the Community Arena has not been replaced in over 20 years and has become a safety issue due to lifting and it can no longer be sanitized.

These replacement projects will ensure that the City is addressing the ongoing maintenance and proper management of these facility components.

Department	CS Community Services	**Division**	Multiplex
Project	FC0015 Flooring Replacement Project (Library, Arenas, Curling Club)		

Operational Impact

The work at the Library will be accommodated such that the facility will not be required to close to the public to be carried out. The Curling Club and Arena flooring will be carried out on the off-season to minimize the disruption to operations.

Department GG General Government **Division** Information Technology
Project CO0016 Information Technology Infrastructure Renewal

Budget

	2020	2021	2022
	$	$	$
Expenditures	**337,000**	**336,000**	**350,000**
Funding			
Reserves	337,000	336,000	350,000
Total Funding	**337,000**	**336,000**	**350,000**

Description

Purpose

To continue the City's planned and incremental investment in its Information Technology Infrastructure to provide reliable services while maximizing the service life of each component.

Background

The City's Information Technology infrastructure is essential for effective service delivery. This project will ensure consistent and reasonable investments in each of the four main categories of infrastructure in place at the City: servers and storage, network devices, printers and multifunction devices, and client hardware.

Servers and Storage
The City 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. This project will continue the City's planned and incremental investment in its server fleet and file storage infrastructure to help meet the growing requirements being placed on it.

The City's dependence on its server fleet intensifies with each activity that is automated. In addition to traditional financial applications, staff and stakeholders 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, bulk water billing, and black/green cart management. To keep pace with these demands, the servers need to remain current and reliable, and the number of servers must continue to grow (Gallery 1).

Department	GG General Government	**Division**	Information Technology
Project	CO0016 Information Technology Infrastructure Renewal		

In late 2007, the Information Technology Division adopted a virtualization strategy as a way to meet accelerating demands. 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. This provides the flexibility to quickly deploy additional servers as needs arise. However, there are still limits to what can be accommodated within a single physical server and so growth in demand must be matched by growth in capacity. During the term of this budget, the Information Technology Division will use the allocated funds to grow the capacity of this environment, redeploy server equipment that is nearing the end of its life expectancy, and sustain a reasonable inventory of spare parts to ensure replacements are readily available when failures occur.

As with the demand for server capacity, the organization's need for storage continues to grow. For example, the City now has the ability to capture aerial images and thus provide much needed up-to-date information for tasks ranging from sewage lagoon management to assessment reviews, but a lack of disk space has left staff scrambling to find room to house the images. In recent years, significant progress has been made in expanding disk space capacity, allowing the City to move towards industry standard backup practises. However, storage demands continue to expand rapidly and the City must constantly invest in its infrastructure to ensure adequate capacity.

Network
The network that provides connectivity among the City's computers, laptops, servers, printers, cameras, mobile devices, telephones, traffic lights, SCADA monitors, and emergency voice radios is vital to the City's operations. This project will sustain 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.

As shown in Gallery 2, the City's network employs Ethernet, leased and city-owned fiber, wireless, and microwave technologies to create connections among fourteen 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; as depicted in Gallery 3, this initiative alone added 63 network devices to the City's infrastructure. With additional traffic lights and cameras on the horizon, this complement will continue to grow.

There was a substantial network expansion again in 2018 when wireless connectivity was established to the City's Pumphouses and Liftstations. However, it also added another 23 network devices to the City's infrastructure (Gallery 4).

Department	GG General Government	**Division**	Information Technology
Project	CO0016 Information Technology Infrastructure Renewal		

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 (Gallery 5). The network's firewall and other protective mechanisms routinely deny more than 100 unauthorized access attempts per minute while its spam filter rejects almost 85% of the email 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 implemented Computer-Aided Dispatch; adopted enterprise solutions such as City Works, City View, and City Explorer; 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; established traffic light connectivity; and enhanced its Customer Service functions. All of these data-intensive 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 Dispatch 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, there will continue to be a strong focus on security because threats – both internal and external – are becoming increasingly sophisticated and pervasive. Recommended initiatives include ongoing cyber-threat awareness campaigns to help staff become more knowledgeable and mindful users, continual refinement of security configurations to mitigate risks from all sources, and enhanced and more granular monitoring of network activity.

Another priority will be continued repatriation of network connectivity solutions. In recent years, City-owned and operated connections have been established between several sites and the City is gradually terminating the associated leased services. This reduces its reliance on third party fiber services and lowers overall network operating costs; as of the third quarter of 2019, these savings are expected to total $85,000 annually.

Other work will include proactively replacing key network equipment to replace obsolete gear, reduce unplanned outages, and prepare for future technologies and growth.

Printer and Multifunction Devices
The City maintains a fleet of printers and multifunction devices to meet the printing, scanning, and copying requirements of stakeholders. This project will continue the organization's incremental approach to implementing and maintaining multifunction devices throughout the organization so that these requirements can be met in the most cost-effective manner possible.

Department	GG General Government	**Division**	Information Technology
Project	CO0016 Information Technology Infrastructure Renewal		

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 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 identified three tiers of devices and all subsequent acquisitions have been selected from one of these tiers. This has minimized the variety of devices installed throughout the organization, streamlined consumables management, and reduced costs.

The Plan also identified end-of-life and high-cost, low-usage devices, which were incrementally removed from service. As well, several units were reallocated to better meet varied needs within the organization.

The City currently has two high volume printers that were purchased in January 2015. The bulk of print jobs are composed of utility bills (3,700 per month), assessment notices (5,000 per year) and tax bills (10,000 per year). Additional bulk prints include invoices, statements, and business licenses, adding another 2,000 pages per month. Combined these printers printed over 4.4 million pages in the last four and a half years. Incidents of downtime have consistently increased to where at least one printer has regularly been unavailable due to breakdowns. In order to continue to deliver time sensitive services to City residents, the plan is to replace one of the high volume printers in each of the next two years.

Client (Staff) Hardware
This allocation will be used to renew and augment all client facing hardware components that require regular replacement in accordance with the City's Information Technology Evergreening strategy. This includes widely deployed elements like workstations, laptops, cell phones, desk sets, and radios, as well as more special purpose equipment like digital cameras, conference phones, and projectors.

Operational Impact

City service delivery relies on its Information Technology Infrastructure. When any component is out of service, or not operating to specification, it will interrupt service delivery and reduce productivity.

Servers and Storage
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. Without adequate investment, the organization will not be able to meet escalating server requirements 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

Department	GG General Government	**Division**	Information Technology
Project	CO0016 Information Technology Infrastructure Renewal		

time it will lead to more frequent system outages and necessitate increased support efforts and costs.

Network
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 rather than to experience problems that require excessive troubleshooting and repair or failures that create service outages. Lack of appropriately scaled and timed investment will negatively impact the City's ability to sustain its network and will put the organization at risk of a long term outage while replacement equipment is sourced. Over time, there may be increasingly frequent service disruptions when equipment fails. These failures will interrupt many aspects of City operations, and potentially jeopardize the health and safety of staff, citizens, and visitors.

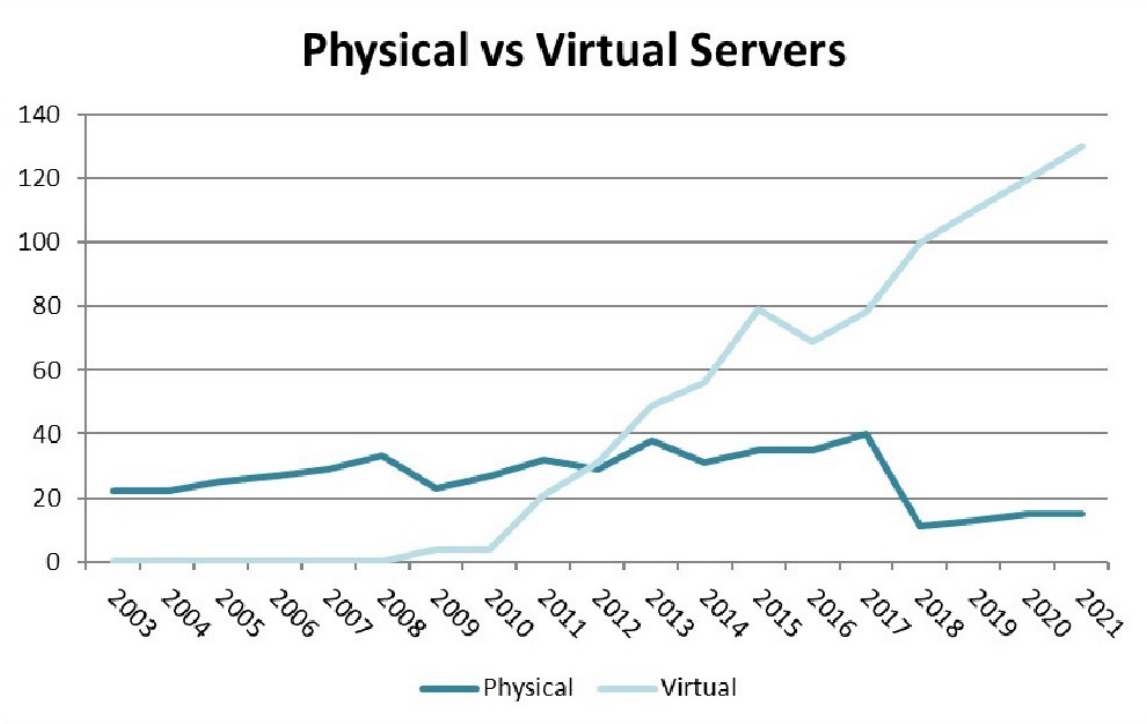
Printers and Multifunction Devices
Many printing and copying tasks are time sensitive, and must be done within legislated timeframes. If the printer and multifunction device fleet is not properly maintained, outages will affect the organization's ability to deliver services.

Client Hardware
Staff all across the organization rely on technology to complete their work and deliver programs and services. Appropriately maintaining client facing hardware components minimizes downtime and enables effective services for both staff and stakeholders. It will reduces troubleshooting and support efforts as replacements are be done in a planned and scheduled manner to minimize operational impact.

Department	GG General Government	**Division**	Information Technology
Project	CO0016 Information Technology Infrastructure Renewal		

Gallery

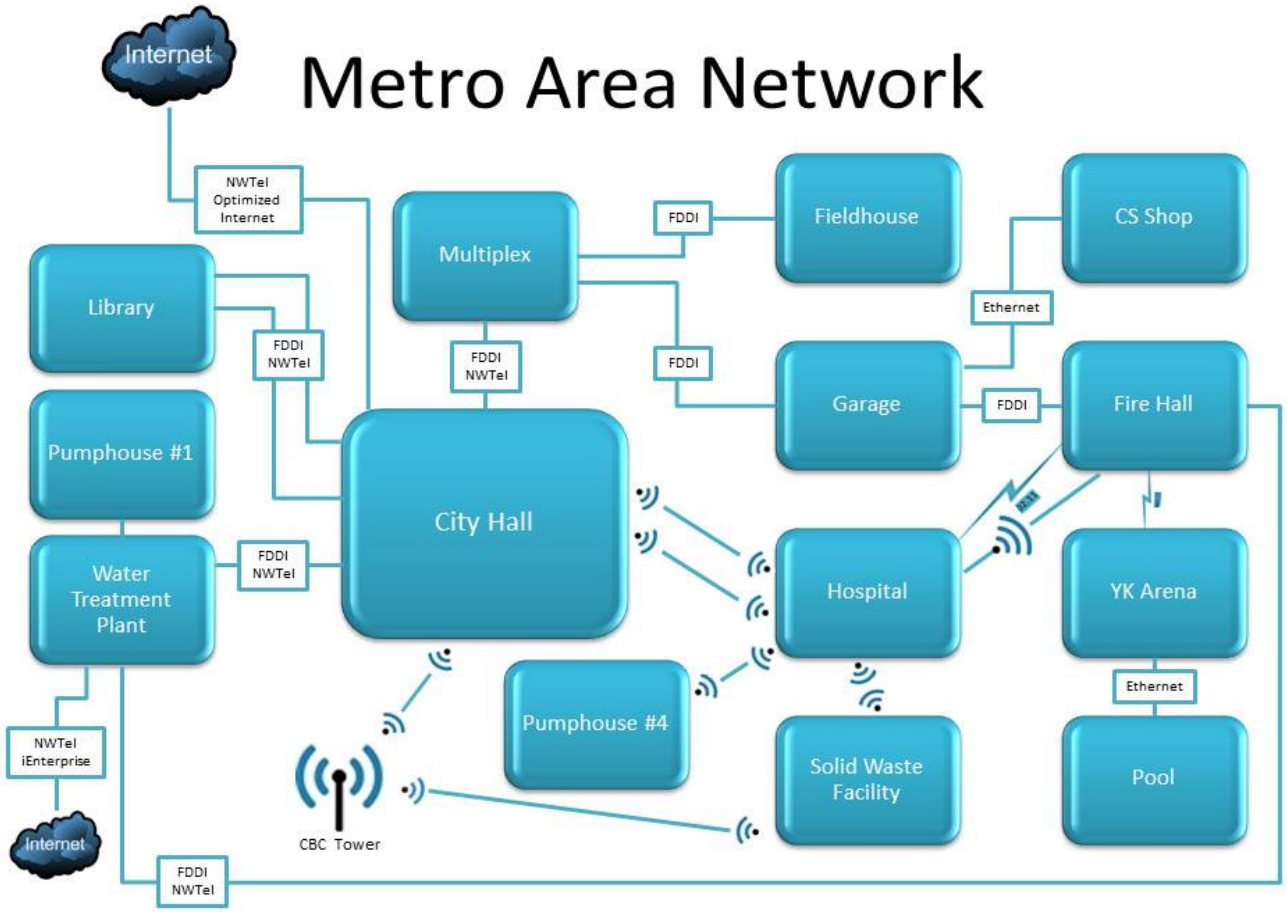
Gallery 1



Department	GG General Government	**Division**	Information Technology
Project	CO0016 Information Technology Infrastructure Renewal		

Gallery

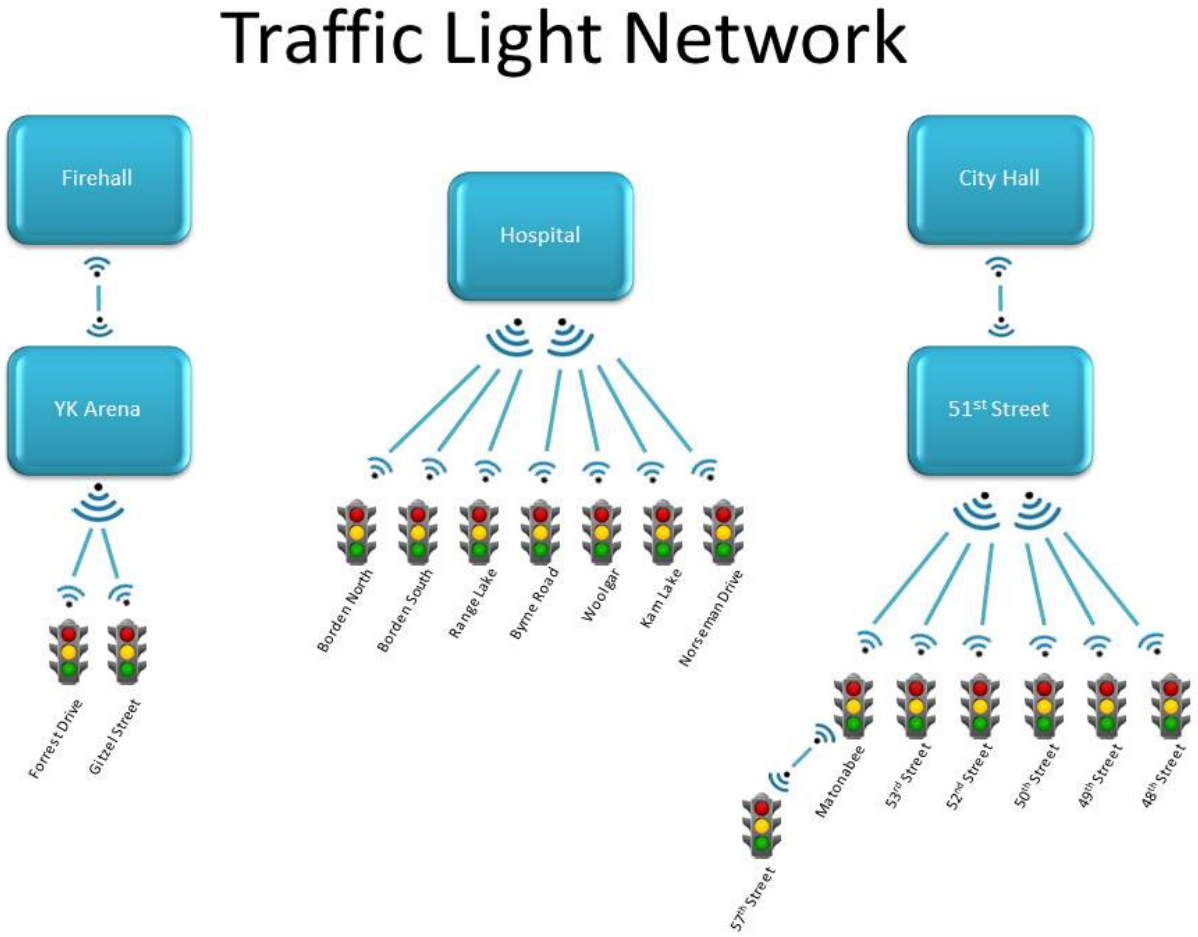
Gallery 2



Department	GG General Government	**Division**	Information Technology
Project	CO0016 Information Technology Infrastructure Renewal		

Gallery

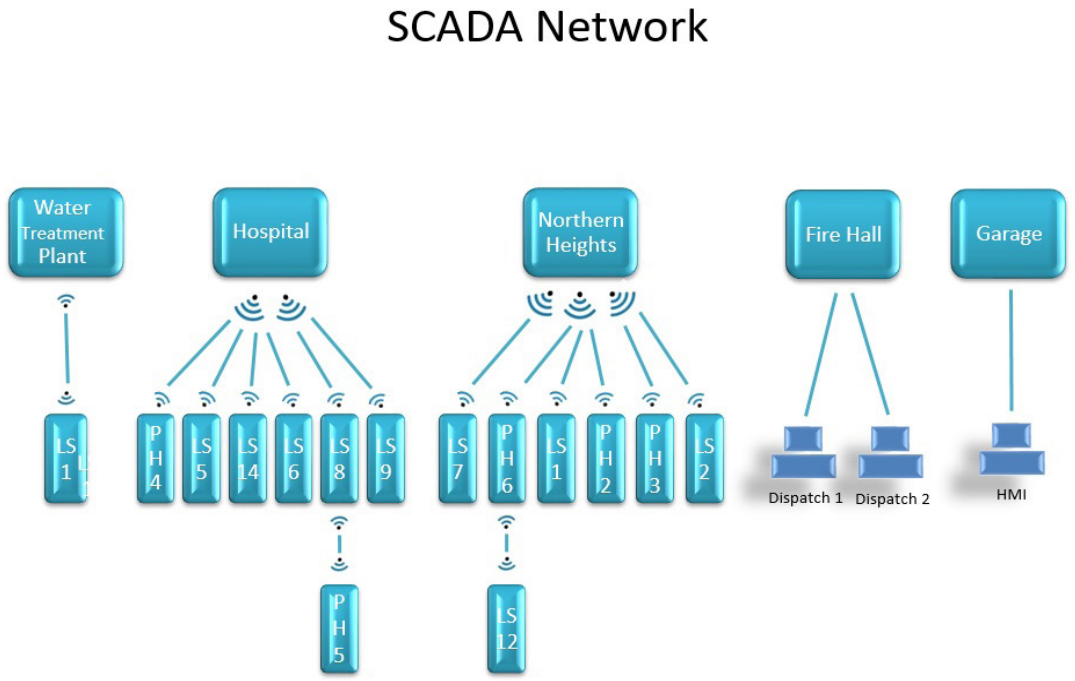
Gallery 3



Department	GG General Government	**Division**	Information Technology
Project	CO0016 Information Technology Infrastructure Renewal		

Gallery

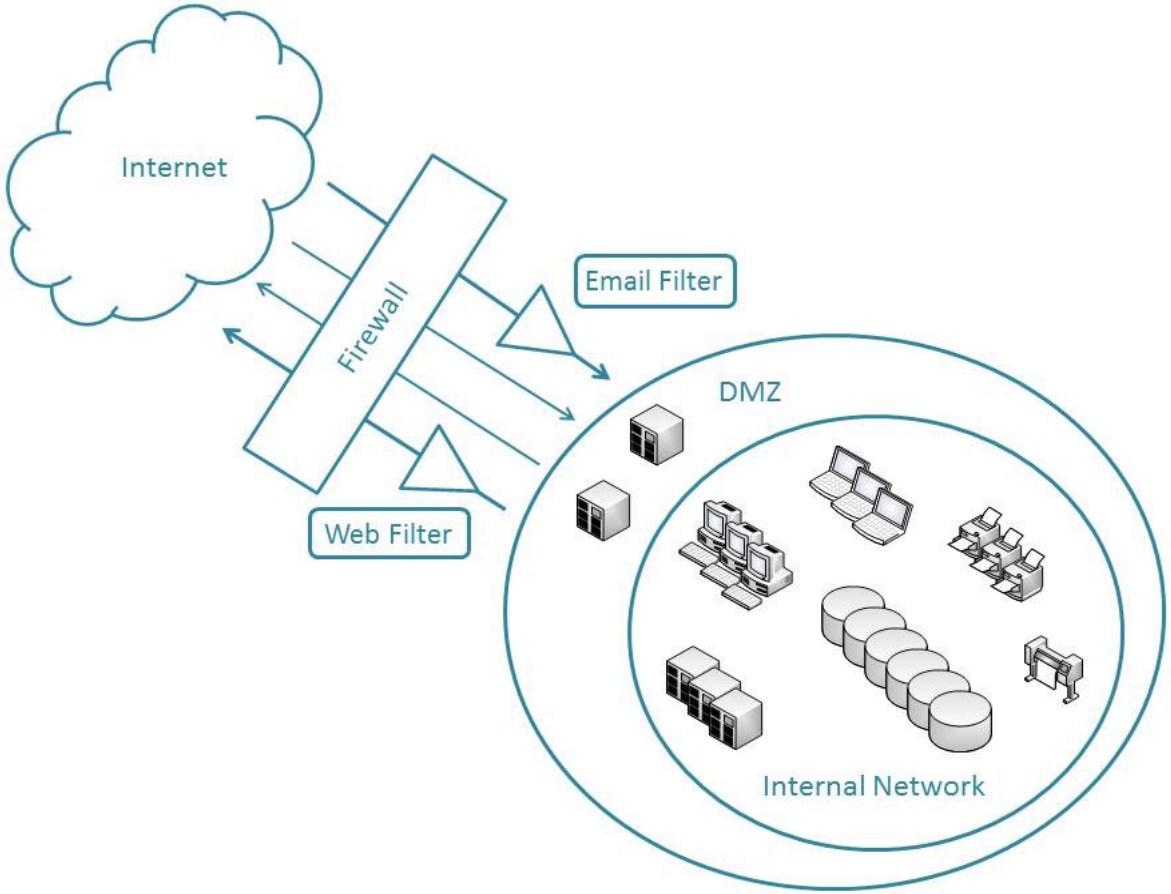
Gallery 4



Department	GG General Government	**Division**	Information Technology
Project	CO0016 Information Technology Infrastructure Renewal		

Gallery

Gallery 5



Department PW Public Works & Engineering **Division** Water & Sewer

Project 94006570 Lagoon Control Structure Replacement

Budget

	2020	2021	2022
	$	$	$
Expenditures	**250,000**		
Funding			
Gas Tax Rebate	250,000		
Total Funding	**250,000**		

Description

Purpose

To replace failing control structures on Trapper's Lake to divert flow away from the Fiddler's Lake sewage lagoon.

Background

The Fiddler's Lake Sewage Lagoon System was built in 1980. As part of the system, the drainage pathways for Trapper's Lake were altered to divert them from the sewage lagoon area (Galleries 1 and 2). This ensured water from Trapper's Lake was not flowing into the lagoon, which would increase the volume of effluent entering the lagoon and affect its capacity.

In order to divert the flow from Trapper's Lake, a series of earthen dykes and dams were built in low-lying areas along the shoreline. A concrete and earth control structure was built in the location chosen for flow from the lake into the designated drainage area. As part of the City's water licence requirements, these dams, dykes and control structure must be inspected every four years. During the last inspection, it was noted that these structures are no longer performing as intended and require rebuilding.

Rebuilding of the dams, dykes and control structure will stop the flow from Trapper's Lake to Fiddler's Lake sewage lagoon, which will help to reduce the total amount of runoff entering the lagoon system, thus increasing the overall capacity of the lagoon.

This is a multi-year project which saw the engineering work done in 2019 and will conclude with the rebuilding of the dams, dykes and control structures in 2020.

Department	PW Public Works & Engineering	**Division**	Water & Sewer
Project	94006570 Lagoon Control Structure Replacement		

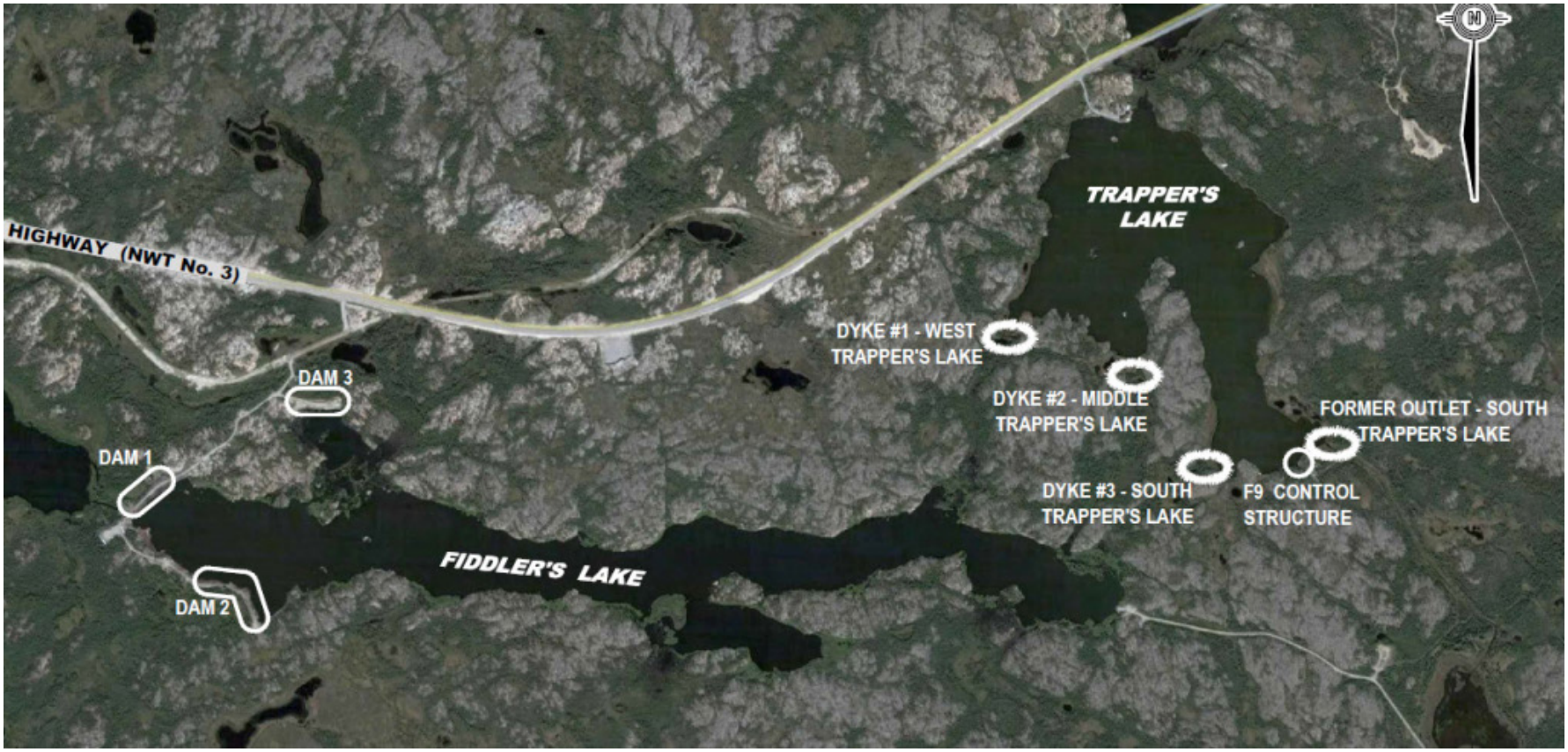
Operational Impact

This project has negligible direct effect on operations. Maintenance of control structures at Trapper's Lake is a requirement of the City's water licence and is consistent with good asset management principles.

Department	PW Public Works & Engineering	**Division**	Water & Sewer
Project	94006570 Lagoon Control Structure Replacement		

Gallery

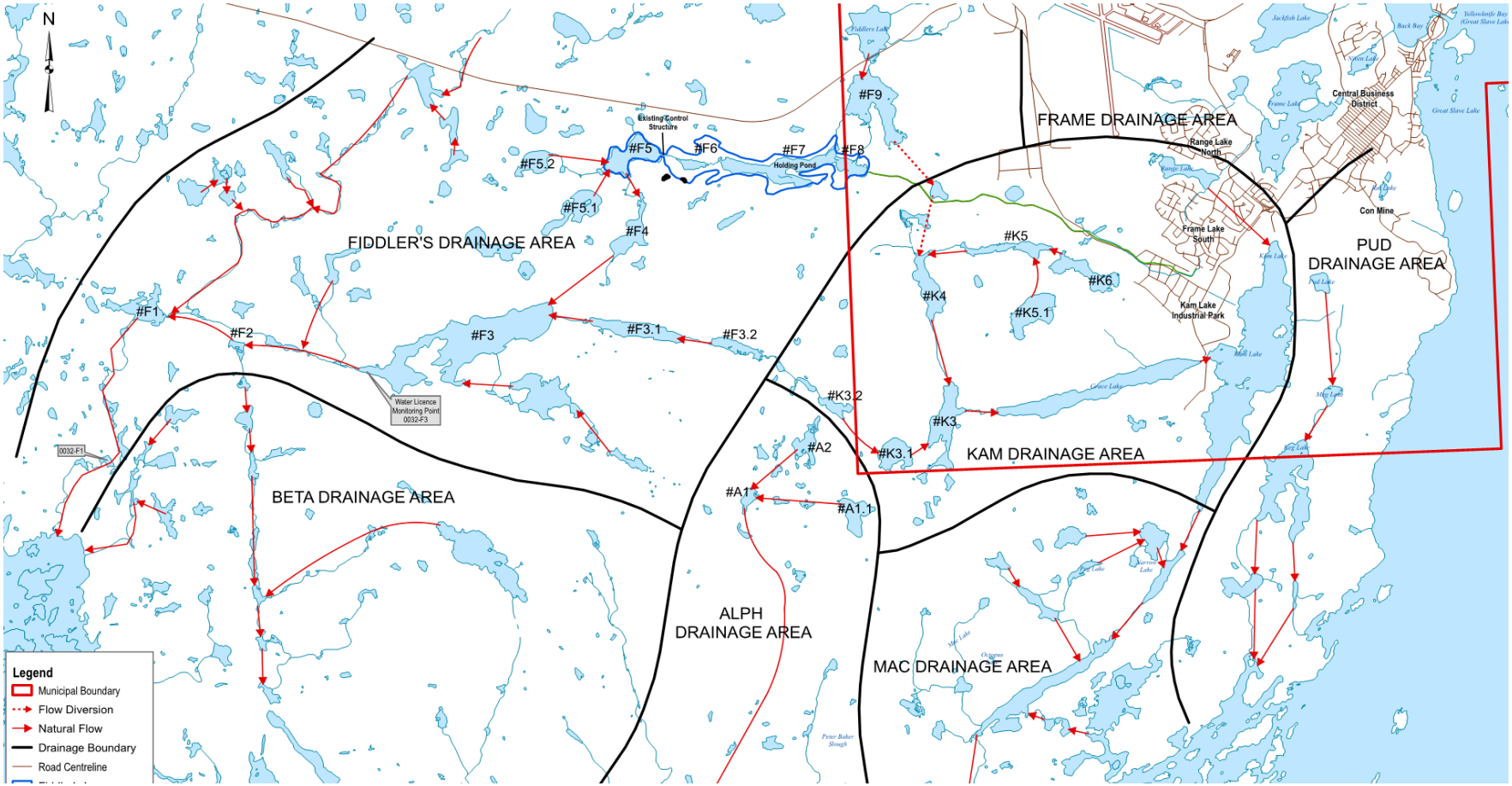
Gallery 1



Department	PW Public Works & Engineering	**Division**	Water & Sewer
Project	94006570 Lagoon Control Structure Replacement		

Gallery

Gallery 2



Department CS Community Services **Division** Multiplex
Project FC0017 Multiplex Iceplant Upgrade

Budget

	2020	2021	2022
	$	$	$
Expenditures			
Compressor	400,000		
Electrical Panel	150,000		
Ammonia Safety	45,000	170,000	
Total Expenditures	**595,000**	**170,000**	
Funding			
Formula Funding		170,000	
Community Public Infrastructure Funding	595,000		
Total Funding	**595,000**	**170,000**	

Description

Purpose

To replace the aging ice plant compressors with models that match the existing Community Arena ice plant; replace the faulty electrical control panel at the Multiplex to eliminate an ongoing issue of system power failures; and install an ammonia safety system.

Background

When the Multiplex was in the design stages the typical arena season commenced in the latter part of August and ran through to the following March or April, depending on the date of Easter. The plant was designed to operate during this season plus designed with a large enough capacity to eventually accommodate for summer ice. The typical season now operates from mid-July to the end of April which has caused the compressors to operate more hours each season which has led to an earlier than anticipated replacement date. Replacing the compressors will reduce the maintenance costs on the compressors, significantly reduce the amount of ammonia required, extend the life cycle of the ice plant and reduce the possibility of a compressor failure during the ice season.

Recently there have been repeated electrical failures within the panel that controls the ice plant. When a failure occurs it affects power to the ice plant which in turns affects the facility's main breaker which then leads to complete facility black outs and significant down time which jeopardize both ice surfaces. Extended power outages have the potential to cause the bond between the ice and cooling floor to break, which could lead to the need to completely remove and replace the ice. The system has undergone ongoing repairs and diagnostics by contractors to try and isolate the issues. The problems have been discussed with electrical and refrigeration contractors and the solution proposed is to replace the electrical panel with an

Department	CS Community Services	**Division**	Multiplex
Project	FC0017 Multiplex Iceplant Upgrade		

upgraded model to ensure that power surges are properly addressed.

Ammonia safety is an ongoing concern throughout the industry. The City has a number of established procedures for the arena staff to follow should an ammonia incident occur. These procedures include steps up to and including the evacuation of the building at higher levels of concentration.

It is recommended that the City install an ammonia safety system over two years. In 2020, the first stage would see the installation of upgraded detectors and the installation of an absorption tank containing water. The absorption tank will capture any discharged ammonia that results from a fault or issue with an ice plant component or vessel. Currently when ammonia is detected, the sensor will trigger an exhaust fan to discharge into the environment. The new system will ensure the ammonia is contained in the water tank and not released into environment.

In 2021, an ammonia recovery system will be installed. This system will be activated at a pre-set level of ammonia discharge in the plant room. The detectors will trigger the ammonia recovery system to capture the ammonia charge into an expansion tank, basically vacuuming the ammonia from the plant and storing it safety until the required repairs are completed. This will remove the need to evacuate the building, which is difficult during regular ice activities and comes with additional safety concerns. An additional benefit is that the majority of the ammonia charge will be recovered and can be put back into the plant to allow of immediate start up after repairs.

The installation of the ammonia recovery system is key to continued operations should an ammonia event occur. The system will allow for a much faster response by qualified personnel. Without this system in place, there will be a need to wait for the current system to exhaust the ammonia from the plant room prior to carrying out repairs. The refrigeration contractors must travel to Yellowknife and any additional ammonia will require transportation time. The recovery system will allow for the ammonia charge to be pumped back into the ice plant immediately following repairs.

Operational Impact

The upgrades to the plant will result in an annual savings of $20,000 in maintenance costs as the newer models do not require annual re-builds. The City will also see an annual reduction in power consumption of approximately $40,000 with the newer models.

The work will be completed during the off-arena season to eliminate any disruption to regular ice activities.

Department CS Community Services **Division** Parks & Trails
Project FC0018 Multi-Purpose Asphalt Surface - Hall Crescent Park

Budget

	2020	2021	2022
	$	$	$
Expenditures	**52,000**		
Funding			
Formula Funding	45,000		
Community Public Infrastructure Funding	7,000		
Total Funding	**52,000**		

Description

Purpose

To add a multi-purpose asphalt surface to the playground located in the Lakeshore development.

Background

The area is a new development, which presents an opportunity to add a court and plan for multiple uses of this park. The addition will add options for recreation for adults and youth in the area.

This surface will allow the City to provide a multi-generational recreation experience at this park so that families can be active together. The court addition will open up options for all types of programming and events in the area. The additional amenity to the park will allow for year around activities for the families in the area including court sports such as basketball, tennis, pickle ball as well as providing a safe location for ball hockey. During the winter months the area will be a available for skating and hockey.

Operational Impact

The additional cost to operate during winter and summer months is approximately $6,000 annually, largely through additional casual wages, commencing in 2021.

Department CS Community Services **Division** Parks & Trails
Project FC0012 Parker Park Field Outfield

Budget

	2020	2021	2022
	$	$	$
Expenditures	**87,000**		
Funding			
Other Grants	80,000		
Community Public Infrastructure Funding	7,000		
Total Funding	**87,000**		

Description

Purpose

The project is intended to improve the safety of the fields at Parker Park and to increase the number of playable days each season.

Background

Parker Park has sustained damage to the outfields the past few seasons due to the way that the outfield is holding water in large puddles. Remedial actions have been undertaken over the past few years on a stop-gap basis to improve the drainage. The proposed project will include re-shaping the field with the necessary material including sand, soil, seeding etc. to provide drainage away from the playing surface. These measures will lengthen the softball season and improve the safety of the field for users.

Operational Impact

In the short-term the project will disrupt regular activities for the season as the work is completed. Overall the project will increase playable hours for all user groups. The main impact will be improved safety for the users and decreased liability for the City by providing safer playing surfaces.

Department PD Planning & Development **Division** Directorate

Project PD0003 Parking Structure Feasibility Study

Budget

	2020	2021	2022
	$	$	$
Expenditures	**75,000**		
Funding			
Formula Funding	75,000		
Total Funding	**75,000**		

Description

Purpose

To undertake a feasibility study related to a City of Yellowknife parking structure in the Downtown Zone for the purpose of rethinking the use of existing surface parking lots in the city's core area.

Background

These surface parking lots, which account for approximately 40% of Yellowknife's downtown land could be developed to a higher and better use. In 2008 Council adopted the Development Incentive By-law. One of the incentive components in this by-law is for a Downtown Parking Structure Development. The incentive was designed to promote the construction of a multi-storey or below ground parking structure in the DT – Downtown Zone. The purpose was to better balance the building footprint to surface parking ratio in the downtown; enable the transfer of current surface parking to the structure; provide additional downtown parking; and enable additional development opportunities by opening land currently held by surface parking lots. The incentive was for a Declining Five Year Tax Abatement to reduces in equal increments over five-years (100%-80%-60%-40%-20%).

The City envisioned at the time that a Downtown Parking Structure would contain a minimum of 100 parking stalls, the dedicated to vehicular and bicycle parking and help support the City's revitalization objectives. Currently, parking lots account for approximately 40% of the land in the downtown.

Across Canada, municipalities are taking steps to reduce parking requirement, particularly in the downtown. In Yellowknife, some adjustments have been made, with car share provisions, reduction of parking ratios and the inclusion of bike racks. However, where parking has been reduced there are still requests from residents (purchasers) for parking passes and parking provisions.

Department	PD Planning & Development	**Division**	Directorate
Project	PD0003 Parking Structure Feasibility Study		

Developers and building owners in the downtown have inquired about parking options for the purpose of redevelopment of sites. And, while the incentive has existed for a decade, there have been no uptake on this tool. This recommended capital project proposes to investigate the suitability of the City of Yellowknife taking a lead role in this type of development. The City of Yellowknife owns multiple commercial lots in the downtown and could consider undertaking the construction of a parking structure to help alleviate downtown land dedicated to surface parking lots.

In 2020 a feasibility study (the "Study") is recommended to determine if the City should undertake the planning and construction of a parking structure on a City-owned parcel. The Study will seek to provide information related to:

1. How and why municipal governments build and maintain parking structures
2. Capital, operations, and maintenance costs over 60 years
3. Anticipated impact on revitalization efforts
4. Location options
5. Architectural design considerations
6. Use and operation of current parking structure in the downtown (privately owned/options for better usage)
7. Options and models for operations (City Administration/Private/Other)

Operational Impact

In 2020 the Study will be managed by the Planning & Development Department but will require the participation of all other City Departments in the Study year. Any future capital and operational impacts will be assessed if and when the parking structure proceeds to construction.

Department PW Public Works & Engineering **Division** Roads & Sidewalks
Project 76156570 Paving Program

Budget

	2020	2021	2022
	$	$	$
Expenditures			
	3,680,000	3,550,000	2,760,000
Total Expenditures	**3,680,000**	**3,550,000**	**2,760,000**
Funding			
Formula Funding	923,750		
Gas Tax Rebate		3,550,000	2,760,000
Other Grants	2,756,250		
Total Funding	**3,680,000**	**3,550,000**	**2,760,000**

Description

Purpose

To repair or replace asphalt, concrete and other appurtenances on City streets as required, including storm water infrastructure (Galleries 1 and 2). 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 it will vary significantly due to various factors such as traffic volumes, vehicle types, geotechnical conditions, construction practices, and adequate maintenance.

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, a road is scheduled for reconstruction when it 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 Ltd. to ensure that street lighting levels are evaluated and increased to comply with national standards. Also included in the paving program is coordination with Northland Utilities Ltd., NorthwesTel Inc. and NorthwesTel Cable Inc. to determine if replacement or addition of underground duct work for power and communication infrastructure is required.

Department	PW Public Works & Engineering	**Division**	Roads & Sidewalks
Project	76156570 Paving Program		

Considerations when determining areas of reconstruction include:

- Condition and age of asset,
- Reccurring maintenance costs,
- Priority level of roadway,
- Number of impacted residents, and
- Underground infrastructure requirements.

Gallery 3 shows the 2020 to 2022 planned paving program. Gallery 4 shows the 2020 planned water, sewer and paving projects.

Operational Impact

Aging infrastructure has an operational cost of between two and four percent of replacement costs. Replacing this infrastructure will allow the department to focus operational and maintenance activities on other roads, sidewalks and storm water appurtenances in the City.

Department	PW Public Works & Engineering	**Division**	Roads & Sidewalks
Project	76156570 Paving Program		

Gallery

Gallery 1

Department	PW Public Works & Engineering	**Division**	Roads & Sidewalks
Project	76156570 Paving Program		

Gallery

Gallery 2

Department PW Public Works & Engineering **Division** Roads & Sidewalks
Project 76156570 Paving Program

Gallery

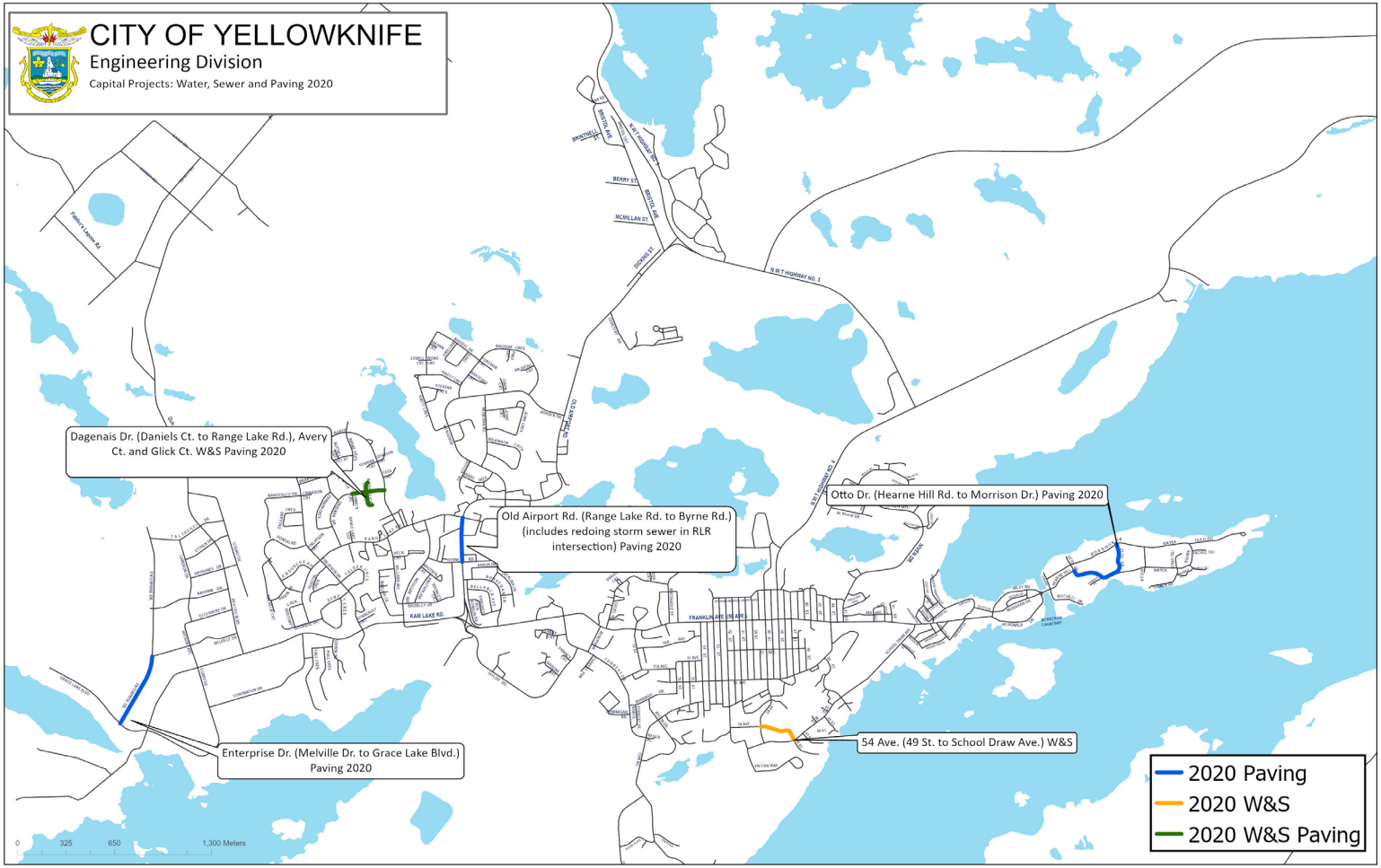
Gallery 3

Year	Street
2020	Otto Drive
	Old Airport Road (Range Lake Rd to Byrne)
	Enterprise Drive (Melville to Grace Lake Blvd)
2021	McDonald Drive
	School Draw (44th to 46th Street)
	Con Road (Rycon South to Con Place)
	Paving - Forrest Park
2022	45 Street (49 Ave to Franklin)
	46 Street (49 Ave to Franklin)
	49 Ave (46 to 45 St)
	52 Street (Franklin to 51 Ave)

Department	PW Public Works & Engineering	**Division**	Roads & Sidewalks
Project	76156570 Paving Program		

Gallery

Gallery 4



Department PW Public Works & Engineering **Division** Water & Sewer
Project 90617610 Pump Replacement Program

Budget

	2020	2021	2022
	$	$	$
Expenditures	**100,000**	**100,000**	**100,000**
Funding			
Gas Tax Rebate	100,000		
Community Public Infrastructure Funding		100,000	
User Fees			100,000
Total Funding	**100,000**	**100,000**	**100,000**

Description

Purpose

To continue replacing pumps at City of Yellowknife Pumphouses and Liftstations on a regularly scheduled basis.

Background

The City of Yellowknife has 14 Liftstations (Sewer) and six Pumphouses (Water).In each of these stations there are multiple large pumps which run long hours and work hard. In total, the City has 35 sewage pumps and 31 water distribution pumps, not including the various chemical pumps used for water treatment and membrane filter cleaning. The City's also has eight comminutors, which are large sewage grinding machines.

Pumps and comminutors must be maintained in order to ensure a continuous supply of water and discharge of sewage for residents. Failure of pumps or comminutors at any liftstation can result in a sewage overflow, which has occurred in the past, resulting in sewage overflowing onto residents' property, and possibly into their homes.

Pump rebuilding costs range from $7,000 to $25,000 per pump, while replacement costs are $10,000 to $60,000 per pump depending on the station capacity. The cost to replace a small communitor is $75,000, and a large comminutor is $110,000.

Based on standard industry practice and the experience of Public Works and Engineering staff, water pumps are to be replaced after approximately 25 years of operation. When it comes to sewage, the replacement intervals are much shorter, and the failure rate it much higher due to the composition of the material in the system. Seeing that there are a large number of pumps and comminutors in our Pumphouses and Liftstations, and considering the high replacement and/or repair cost, regular investments are required to ensure the integrity of the water and sewer system.

Department	PW Public Works & Engineering	**Division**	Water & Sewer
Project	90617610 Pump Replacement Program		

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

Operational Impact

Without a capital allocation for pump replacements, operational budgets at stations with failed pumps will experience large financial variances due to high costs associated with maintenance and failures.

This project falls in line with standard asset management principles.

Department	PW Public Works & Engineering	**Division**	Water & Sewer
Project	90617610 Pump Replacement Program		

Gallery

Gallery 1

Department PS Public Safety **Division** Fire & Ambulance
Project 63137670 Self-Contained Breathing Apparatus

Budget

	2020	2021	2022
	$	$	$
Expenditures	**225,000**		
Funding			
Community Public Infrastructure Funding	225,000		
Total Funding	**225,000**		

Description

Purpose

To replace outdated Self-Contained Breathing Apparatus (SCBA) currently used within the Yellowknife Fire Division (YKFD).

Background

YKFD maintains a schedule to replace SCBA units as they approach the end of their operational life and as operation and maintenance issues become problematic or create a potential for concern. There has been an increase in maintenance costs related to SCBA through more frequent equipment malfunctions and increasing wear and tear on individual units.

The average anticipated life of properly maintained SCBA units is 10 years but each specific unit's operating will vary to some degree based on several determining factors. At present, there are 20 complete SCBA units with 51 spare cylinders and 64 face pieces.

Operational Impact

YKFD has an O&M budget to maintain personal protective equipment and therefore the purchase of new SCBA units to replace aging pieces of equipment will not negatively impact that budget line item. YKFD will be able to properly maintain, service and operate this new equipment.

Department PW Public Works & Engineering **Division** Water & Sewer
Project 93306570 Sewage Force Main Upgrades

Budget

	2020	2021	2022
	$	$	$
Expenditures			
	250,000	4,175,000	4,220,250
Total Expenditures	**250,000**	**4,175,000**	**4,220,250**
Funding			
Formula Funding			686,350
Gas Tax Rebate	250,000		
Community Public Infrastructure Funding		1,787,700	1,024,000
User Fees		2,387,300	2,509,900
Total Funding	**250,000**	**4,175,000**	**4,220,250**

Description

Purpose

To create redundancy for the City's sewage force main to allow for better maintenance and increased capacity of the force main.

Background

The City has one force main that carries sewage from Liftstation #5 to the Fiddler's Lake Sewage Lagoon (Gallery 1). This line was installed in 1979 with an expected 50 year lifespan. As the force main nears the end of its life, increased maintenance and the potential for additional leaks can occur.

In 2018 the City experienced a significant break on the force main that carries sewage from Liftstation #5 to the Fiddler's Lake Sewage Lagoon (Gallery 2). The resulting repair and clean-up resulted in substantial unexpected costs to the City.

Another break occurred in 2019, during which the City shut down operations at Liftstation #5 and allowed the station to overflow in order to minimize contamination of private property. This resulted in significant clean-up of contamination in the City Yard.

In order to address the issues with the existing force main it is necessary to determine the best way to provide redundancy for the force main in the event of failure or general maintenance activities.

Department	PW Public Works & Engineering	**Division**	Water & Sewer
Project	93306570 Sewage Force Main Upgrades		

This project began in 2019 with an assessment of the current system to determine how best to provide redundancy. The work plan for 2020 is to complete design work coming from recommendations from the assessment of this asset with future years seeing the construction phases of the project.

NOTE:
Class A (more defined) estimates will be available after the design phase is complete. The current figures noted for 2021 and 2022 are Class D estimates, based on historical installation costs for work of this nature, and could be subject to change for future budgets.

Operational Impact

Creating redundancy for the force main will reduce the likelihood of spills due to breaks in the force main and will allow for repairs or replacement to be completed when necessary.

Department	PW Public Works & Engineering	**Division**	Water & Sewer
Project	93306570 Sewage Force Main Upgrades		

Gallery

Gallery 1

Department	PW Public Works & Engineering	**Division**	Water & Sewer
Project	93306570 Sewage Force Main Upgrades		

Gallery

Gallery 2

Department PW Public Works & Engineering **Division** Water & Sewer
Project WS0002 Submarine Drinking Water Line Replacement

Budget

	2020	2021	2022
	$	$	$
Expenditures			
	1,000,000	1,000,000	1,000,000
Total Expenditures	**1,000,000**	**1,000,000**	**1,000,000**
Funding			
Formula Funding		250,000	250,000
Other Grants	750,000	750,000	750,000
Community Public Infrastructure Funding	250,000		
Total Funding	**1,000,000**	**1,000,000**	**1,000,000**

Description

Purpose

To replace the original submarine drink water supply line from Pumphouse #2 at the Yellowknife River, to Pumphouse #1 and the Water Treatment Plant.

Background

Currently the City obtains its drinking water from the Yellowknife River through an eight kilometre submarine pipeline that carries water from Pumphouse #2 at the river, through Yellowknife Bay, to the City's Water Treatment Plant. The submarine pipeline is reaching the end of its useful life, and needs to be replaced. Due to the presence of Giant Mine, and the contamination on site, the City was required to evaluate two source options for potable drinking water.

From 2009 to 2011, the City of Yellowknife completed several tasks related to source water selection during design of the City's Water Treatment Plant (WTP):

-Evaluation of water source alternatives, including decision modeling and life cycle costs (as part of the Water Treatment Plant Preliminary Design Report, May 2009)
-Literature review to assess the extent of arsenic in Yellowknife Bay water and sediments (Technical Memorandum, May 5, 2010)
-Water and soil sampling at four locations around the Pumphouse #1 intake (August 2010)
-Monte Carlo (statistical) modeling of arsenic in Yellowknife Bay water (Technical Memorandum, December 2, 2010)

Department	PW Public Works & Engineering	**Division**	Water & Sewer
Project	WS0002 Submarine Drinking Water Line Replacement		

-Water source selection summary and recommendation (Letter, February 25, 2011)

Following public consultation in 2011, the City decided to continue using the Yellowknife River source with emergency supply from the Bay, with the understanding that the issue would need to be revisited before the pipeline reached the end of its lifespan, which was estimated to occur around 2020.

In 2017, the City undertook a study to provide an updated recommendation based on new arsenic data and current cost information. The options were evaluated using a decision matrix model to provide City Council with the information necessary to make a decision on potable water source selection. The study was completed and the recommendation was to retain the Yellowknife River location as the City's water source. A separate review of the study by a third party engineering firm was completed in 2018, and they concurred that the Yellowknife River should remain the water source.

Funding was received in 2019 through the Disaster Mitigation and Adaptation Fund (DMAF), a federal funding program that will cover up to $25.8 million of the project costs, which is 75% of total budget costs. City Council provided approval via Motion #0123-19 on May 13, 2019 to move forward with the Yellowknife River as the City's primary water source, enter into a contribution agreement with Canada for DMAF funding, and to seek additonal funding sources for the City's 25% obligation.City Staff are pursuing additional funding options for the remaining $8.6 million or 25% of total project costs.

The detailed design and regulatory processes are anticipated to occur from 2020 through 2022, with tentative construction to occur during the winter of 2023/2024. This schedule is subject to change.

Gallery 1: Tentative Project Schedule

Operational Impact

The asset has passed the end of its useful life. Failure of the pipeline will require the City to draw directly from Yellowknife Bay with no treatment for arsenic.

Department PW Public Works & Engineering **Division** Water & Sewer
Project WS0002 Submarine Drinking Water Line Replacement

Gallery

Gallery 1

1	Budget	Tentative Project Schedule
2020	$1,000,000	Preliminary Engineering & Regulatory Work Water Line Design for Water Licence Renewal
2021	$1,000,000	Detailed Design Water Line, Pump House Upgrades
2022	$1,000,000	Permitting Project Staging and Preparation
2023/2024	$30,982,958.00	Construction (Winter of 2023/2024)
2024/2025	$500,000	Post Construction Activities

Department	CS Community Services	**Division**	Parks & Trails
Project	53046571 Tommy Forrest Ball Park Upgrades		

Budget

	2020	2021	2022
	$	$	$
Expenditures	**200,000**		
Funding			
Other Grants	140,000		
Community Public Infrastructure Funding	60,000		
Total Funding	**200,000**		

Description

Purpose

To partner with the Yellowknife Men's Fastball Association for the continued development of the Tommy Forrest Ball Park.

Background

Following a presentation from the Yellowknife Men's Fastball Association in 2017, Council established a partnership with the Association for the continued development of the Tommy Forrest Ball Park as a community park.

In Budget 2018, Council allocated $60,000 to the project in each of 2018, 2019, and 2020, contingent upon the Association contributing $140,000 each year. The funding will help develop amenities that include a playground, protective screening, historic display, proper field drainage, and bleachers.

In 2019 the following projects were completed:
- New umpire/bathroom building
- New park/play area
- Picnic table area
- Protective screening

Department	CS Community Services	**Division**	Parks & Trails
Project	53046571 Tommy Forrest Ball Park Upgrades		

The following projects are slated for 2020:
-development of a historical display
-addition of horse shoe pits
-development of dog agility area
-additional green space to be added

There are no direct financial benefits for the City under this partnership, however it will provide an opportunity for the Association to further develop the sport in Yellowknife and provide the opportunity to explore Sport Tourism by seeking out regional and national events.

Operational Impact

There are no anticipated operational costs associated with this partnership arrangement.

Department PW Public Works & Engineering **Division** Roads & Sidewalks
Project 73807611 Traffic Light Upgrades

Budget

	2020	2021	2022
	$	$	$
Expenditures			
	90,000	90,000	90,000
Total Expenditures	**90,000**	**90,000**	**90,000**
Funding			
Formula Funding			90,000
Community Public Infrastructure Funding	90,000	90,000	
Total Funding	**90,000**	**90,000**	**90,000**

Description

Purpose

To improve traffic lights at signalized intersections by introducing technology that makes the intersections safer for vehicular and pedestrian traffic.

Background

There are nineteen intersections which rely on traffic lights for reliable vehicular flow. In recent years, the City has installed equipment that uses different technologies to aid in traffic flow. These technologies include video detection and countdown pedestrian timers.

The video detection equipment (Gallery 1) 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 will require four cameras, one for each direction of traffic. Intersections along Franklin Avenue in the downtown core use vehicle detection for cross streets only, which will require the installation of only two cameras per intersection. Additional cameras will be installed along Franklin Avenue for data collection.

In 2017 when new traffic lights were installed at the intersection of Finlayson Drive and Kam Lake Road, countdown pedestrian timers were included in the installation. This equipment uses the typical pedestrian crossing signals alongside a numerical countdown that ends when the light turns yellow (Gallery 2). The use of this type of signal allows pedestrians to know how much time they have to cross the intersection.

Department	PW Public Works & Engineering	**Division**	Roads & Sidewalks
Project	73807611 Traffic Light Upgrades		

See Gallery 3 for anticipated remaining investments, not in any order of priority.

This project has been ongoing since 2013 in order to improve vehicle detection at intersections with traffic lights. To date, video detection equipment has been installed at ten intersections and countdown timers at 5 intersections. It has been the City's goal to install video detection equipment at two intersections per year. Public Works recommends continuing with this project in order to improve the overall flow of traffic in Yellowknife.

Operational Impact

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

Department	PW Public Works & Engineering	**Division**	Roads & Sidewalks
Project	73807611 Traffic Light Upgrades		

Gallery

Gallery 1

Department	PW Public Works & Engineering	**Division**	Roads & Sidewalks
Project	73807611 Traffic Light Upgrades		

Gallery

Gallery 2

Department	PW Public Works & Engineering	**Division**	Roads & Sidewalks
Project	73807611 Traffic Light Upgrades		

Gallery

Gallery 3

Intersection	Estimate
48 Street	$25,000.00
49 Street	$25,000.00
50 Street	$25,000.00
51 Street	$25,000.00
52 Street	$25,000.00
53 Street	$25,000.00
54 Street	$25,000.00
Byrne Road	$60,000.00
Range Lake Road	$60,000.00
Total Estimate:	**$295,000.00**

Department PW Public Works & Engineering **Division** Water & Sewer
Project 96156570 Water & Sewer Infrastructure Replacement

Budget

	2020	2021	2022
	$	$	$
Expenditures			
	3,650,000	3,650,000	4,590,000
Total Expenditures	**3,650,000**	**3,650,000**	**4,590,000**
Funding			
Gas Tax Rebate	830,000	3,650,000	2,751,000
Community Public Infrastructure Funding			1,839,000
User Fees	2,820,000		
Total Funding	**3,650,000**	**3,650,000**	**4,590,000**

Description

Purpose

To replace failing underground water and/or sewer infrastructure (Gallery 1) 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. Pumphouse #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 entire sections of the city's piped system failing. 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, 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 any pipe installation.

The following are currently included in the annual Water & Sewer Infrastructure Replacement plans:

-Replacement of failed or compromised sewer mains
-Replacement of concrete sewer manholes
-Replacement of failed or compromised water mains
-Replacement of in-line hydrants, valves with hydrants and valves located in insulated concrete vaults with manhole access

Department	PW Public Works & Engineering	**Division**	Water & Sewer
Project	96156570 Water & Sewer Infrastructure Replacement		

-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

Considerations when determining areas of reconstruction include:

-Condition and age of asset
-Recurring maintenance costs
-Priority level of roadway
-Number of impacted residents and services

Gallery 2 shows the 2020 to 2022 work plan. Gallery 3 shows the 2020 planned water, sewer and paving upgrades.

Operational Impact

Aging infrastructure has an operational cost of between two and four percent of replacement costs. Replacing this infrastructure will allow the department to focus operational and maintenance activities in other areas of the water and sewer systems.

This project is consistent with good asset management principles.

Department	PW Public Works & Engineering	**Division**	Water & Sewer
Project	96156570 Water & Sewer Infrastructure Replacement		

Gallery

Gallery 1

Department	PW Public Works & Engineering	**Division**	Water & Sewer
Project	96156570 Water & Sewer Infrastructure Replacement		

Gallery

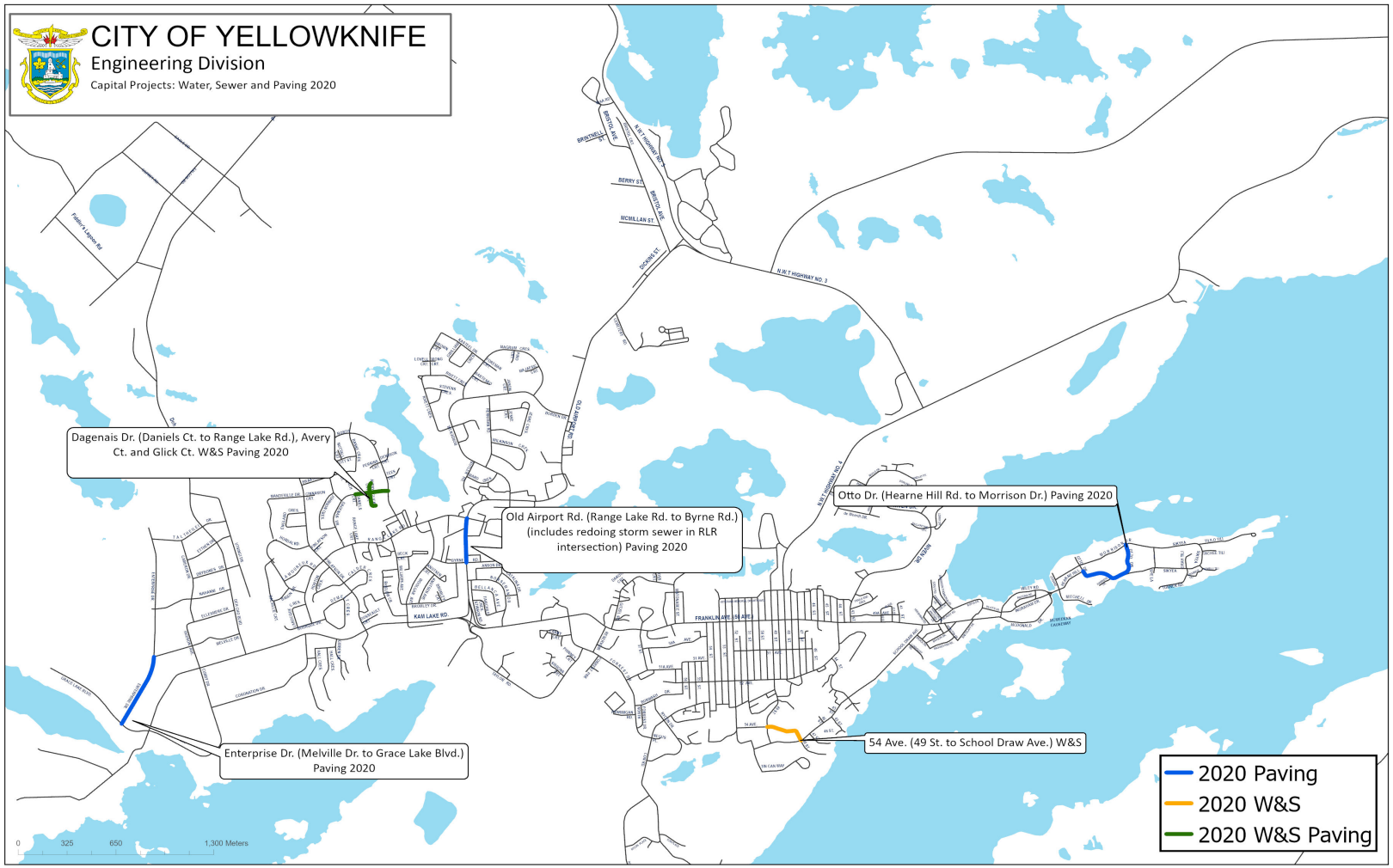
Gallery 2

Year	Street
2020	54 Avenue (49 St. to School Draw Ave.)
	Dagenais Drive (Daniels Ct. to Finlayson Drive North) - Paving
2021	Hordal Road (Phase 1)
	54 Avenue (49 St. to School Draw Ave.) - Paving
2022	Hordal Road (Phase 2)
	Hordal Road (Phase 1) - Paving

Department PW Public Works & Engineering **Division** Water & Sewer
Project 96156570 Water & Sewer Infrastructure Replacement

Gallery

Gallery 3



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