2023 Program Summary
Office of the Chief Information Security Officer

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Description

Cyber resiliency and intelligence are keys to success in helping to secure the City of Toronto against emerging threats. In an ever-changing cyber threat environment, resiliency will allow the City to explore and onboard new technologies rapidly in a safe manner.

Vision: To become a Global Leader in Urban Cyber Innovation.

Mission: To deliver world class Cyber services to the City of Toronto and build the Cyber practice into a mature Cyber centre of excellence including:

- Cyber Governance Risk & Compliance
- Digital Identity Protection
- Cyber Threat Management
- Cyber Awareness
- Critical Infrastructure Protection

Strategy: To continue building cyber resiliency and cyber intelligence capabilities into the City of Toronto and its agencies & corporations to predict, prevent and respond to emerging cyber threats.

Why We Do It

In addition to the societal benefits, the Office of the Chief Information Security Officer (CISO) continues to fulfill its mandate to:

- Minimize the impact of cyber incidents that result in financials loss, reputational damage, service disruption, legal liability and loss of life through the delivery of relevant cyber governance;
- Support the City's strategic priorities of keeping Toronto moving and building resilience by contributing to improvement initiatives (Financial Transformation, Microsoft 365, ModernTO);
- Promote financial sustainability by containing costs through automated, efficient and/or streamlined processes.

The City of Toronto aims to deliver these outcomes equitably, efficiently and with excellent customer service to help improve the lives of Torontonians and work to earn their trust and confidence.

What Service We Provide

Cyber Services

Digital Government

Who We Serve: All City Divisions, Agencies & Corporations, Councillors, and the Public
What We Deliver:

- Strategy, governance, risk management, and advisory accountabilities across the City's divisions and its agencies & corporations.
- Cyber culture, awareness and training.
- Digital risk management and support the operationalization of digital programs and cloud initiatives.
- Modernizing infrastructure, oversight over cyber compliance, and enhancing the Cyber Practice.
- Detection, prevention, and mitigation of cyber risk including the City's critical infrastructure.

How Much Resources (gross 2023 operating budget): $25.2 million

Business Resilience (including Modernization, Recovery)

Who We Serve: All City Divisions, Agencies & Corporations, Councillors, and the Public
What We Deliver:

- Improve business resilience and support the processes enabling business transactions.
- Assess risk and protect against unauthorized access for business applications.
- Data Rights Protection to safeguard personal and health information of City staff and the Public.

How Much Resources (gross 2023 operating budget): $12.8 million

Budget at a Glance

2023 OPERATING BUDGET

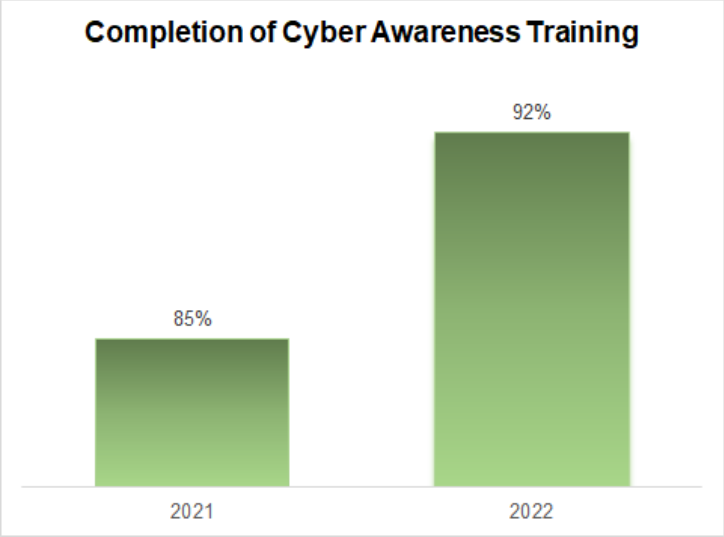
$Million	2023	2024	2025
Revenues	$3.0	$0.0	$0.0
Gross Expenditures	$38.0	$42.2	$47.5
Net Expenditures	$35.0	$42.2	$47.5
Approved Positions	82.0	79.0	79.0

2023 - 2032 10-YEAR CAPITAL PLAN

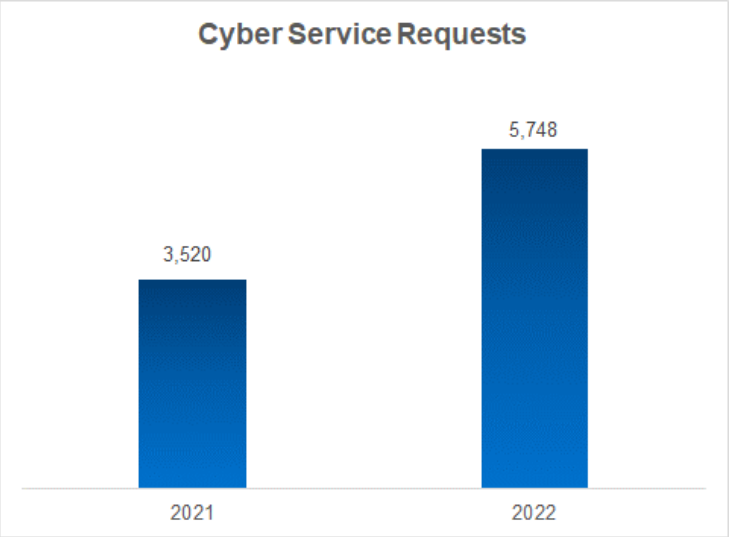
$Million	2023	2024-2032	Total
Gross Expenditures	$5.5	$23.2	$28.7
Debt	$5.5	$23.2	$28.7

Note: Includes 2022 carry forward funding

How Well We Are Doing – Behind the Numbers



- In 2021, over 13,000 hours of training were provided as part of the cyber awareness campaign which included all City employees, contractors and vendors accessing the City's network.
- A new campaign was launched late 2021 and continued into 2022. As of September 1st, 92% users had completed the 60 minutes training. Almost 23,000 hours of training have been provided on topics such as how to detect malicious emails, ransomware, social engineering, physical security and safe web browsing.
- With the increase in cyber awareness training, the City has seen:
  - 18% reduction of employees clicking on malicious emails
  - 7% increase of employees reporting malicious emails



- In 2021, the newly created Office of the CISO division received over 3,500 requests for cyber services ranging from cyber risk assessments of business applications and new technologies to new cyber policies and standards, cyber forensics & investigations and cyber requirements in procurement initiatives and agreements with vendors.
- In 2022, the volume of requests for cyber services has increased significantly by 56% to over 5,700 requests. The cyber services provided are continuing to focus on assessing the effectiveness of cyber controls in business applications and technologies, as well as reviewing the cyber controls of third parties.
- Requests have met approved Service Level Agreements.

How Well We Are Doing

Service	Measure	2020 Actual	2021 Actual	2022 Target	2022 Projection	Status	2023 Target	2024 Target
Outcome Measures								
Digital Government	% of scheduled vulnerability scans completed per quarter		100%	100%	100%	●	100%	100%
	% of existing endpoints monitored by Threat Management solution (servers, workstations, mobiles)		88%	90%	91%	●	90%	90%
Business Resilience	% of risk assessments conducted for critical risk projects		100%	100%	100%	●	100%	100%
	% of investigations reviewed within 30 days		100%	90%	100%	●	90%	90%
Service Level Measures								
Cyber Governance	Inquiries responded and/or actioned within one (1) business day		100%	100%	100%	●	100%	100%
	Cyber service requests responded within two (2) business days		90%	90%	90%	●	90%	90%
	Cyber policies, procedures and standards review requests from City divisions and agencies and corporations actioned within ten (10) business days		90%	90%	90%	●	90%	90%
	Mandatory cyber awareness training conducted yearly for all staff		85%	85%	95%	●	85%	85%

2022 Projection to 2022 Target Comparison

● **80% - 100%** ● **64 - 79%** ● **63% and Under**

Service	Measure	2020 Actual	2021 Actual	2022 Target	2022 Projection	Status	2023 Target	2024 Target
Other Measures								
Cyber Operations	Standard Cyber Incident Management Response Targets • Priority 1: 2 business hours • Priority 2: 8 business hours (1 day) • Priority 3: 24 business hours (3 days) • Priority 4: 48 business hours (6 days)		100%	100%	100%	●	100%	100%
	Ad-hoc security vulnerability scans scheduled within 24 hours *(based on approved change window, scans are scheduled after normal office hours)*		90%	90%	100%	●	90%	90%
	New assets added for vulnerability scanning within 4 hours *(based on assets requests received)*		90%	90%	90%	●	90%	90%
	Addition/changes for security scans within 2 business days *(based on approved user lists for addition/change)*		90%	90%	90%	●	90%	90%
	Enterprise cyber risk assessments completed within 12 weeks*		80%	90%	90%	●	90%	90%

**Assessments include: cloud, threat risk, technical security, architecture reviews, critical infrastructure, vulnerability management, penetration testing, code scanning and privacy impact assessments. Assessments timeline initiated after requirements elicitation is completed and project documentation is delivered by divisions*

2022 Projection to 2022 Target Comparison

● **80% - 100%** ● **64 - 79%** ● **63% and Under**

EXPERIENCES, CHALLENGES AND PRIORITIES

Our Experience and Success

- Increased the City's cyber maturity rating by 70%.
- Embedded Security-by-Design into the Software Development Life Cycle, ensuring that security principles are built into all significant technology change projects.
- Enhanced ransomware strategies across the City.
- Published 11 cyber policies to guide City processes in accordance with best practices in cyber security.
- Restructured the Privacy Impact Assessment (PIA) process, leading to a 500% increase in efficiencies.
- Expanded service offerings to City agencies and corporations.
- Continued to protect the City with 24/7 cyber threat monitoring, management, and incident response services.
- Provided 30,000 hours of cyber training, and led multiple awareness activities, to foster a culture of cyber security across the City.
- Streamlined the Cyber Service Intake process to enhance efficiencies and manage effectively the 63% increase in cyber requests experienced since 2021.
- Partnered with leading cyber industry experts to develop and implement frameworks, technologies, policies and cyber practices that exceed industry standards.
- Conducted more than 70 risk assessments to ensure the City's 2022 municipal election was protected and uncompromised.
- Launched the division's inaugural Annual Report.

Key Challenges and Risks

- Retain and attract cyber talent. Ongoing shortage of cyber resources as the demand for skilled cyber resources far exceeds the supply.
- Maintain target cyber roadmap while sustaining a higher than expected attrition rate.
- High global demand for cyber services may result in limited participation in cyber request for proposal (RFPs) and/or delays from suppliers supporting the City's cyber projects.
- Legacy technology challenges when implementing cyber tools meeting industry best standards.

Priority Actions

Continue to invest to enhance the City's cyber maturity and resilience to cyber risks to minimize the impact of a cyber-attack which could result in potential financial loss, reputational damage, service disruption, legal liability and loss of life.

Cyber Foundation

- Critical In-House Resources
- Support Corporate Strategic Initiatives
- Expand Strategic Relationships
- Cyber Awareness

Digitization Service

- Digital Identities
- Management of Privileged Accounts
- Cyber Threat Detection & Response
- Cyber Risk Management

Business Resilience (Centralization)

- Audit Remediation
- Cyber Maturity Improvement
- Protection and Security Operations
- Critical Infrastructure

RECOMMENDATIONS

City Council adopted the following recommendations:

1. The 2023 Operating Budget for the Office of the Chief Information Security Officer of $38.042 million gross, $3.000 million revenue and $35.042 million net for the following services:

Service:	Gross Expenditures ($000s)	Revenue ($000s)	Net Expenditures ($000s)
Office of the CISO	38,042.4	3,000.0	35,042.4
Total Program Budget	**38,042.4**	**3,000.0**	**35,042.4**

- The above includes a 2023 budgeted staff complement for the Office of the Chief Information Security Officer of 82.0 positions comprised entirely of operating positions.

2. City Council approve 2023 Capital Budget for the Office of the Chief Information Security Officer with cash flows and future year commitments totaling $28.651 million as detailed by project in Appendix 6a.

2023
OPERATING BUDGET

2023 OPERATING BUDGET OVERVIEW

Table 1: 2023 Operating Budget by Service

(In $000s)	2021 Actual*	2022 Budget	2022 Projection**	2023 Base Budget	2023 New / Enhanced	2023 Budget	Change v. 2022 Projection	
By Service	$	$	$	$	$	$	$	%
Revenues								
Office of CISO		5,000.0		3,000.0		3,000.0	3,000.0	N/A
Total Revenues	**0.0**	**5,000.0**		**3,000.0**		**3,000.0**	**3,000.0**	**N/A**
Expenditures								
Office of CISO	15,822.6	45,132.4	24,301.4	38,042.4		38,042.4	13,740.9	56.5%
Total Gross Expenditures	**15,822.6**	**45,132.4**	**24,301.4**	**38,042.4**		**38,042.4**	**13,740.9**	**56.5%**
Net Expenditures (including COVID-19)	**15,822.6**	**40,132.4**	**24,301.4**	**35,042.4**		**35,042.4**	**10,740.9**	**44.2%**
Required COVID-19 Support								**N/A**
Net Budget (excluding COVID-19 supports)	**15,822.6**	**40,132.4**	**24,301.4**	**35,042.4**		**35,042.4**	**10,740.9**	**44.2%**
Approved Positions* **	**65.0**	**80.0**	**N/A**	**82.0**		**82.0**	**N/A**	**N/A**

*Incl. 2021 actuals reported in TSD's IT1280
** 2022 Projection based on 9 Month Variance
***YoY comparison based on approved positions

KEY COST DRIVERS – FUNDING PRIORITIES

Total 2023 Budget expenditures of $38.042 million gross reflect an increase of $13.741 million in spending above 2022 projected year-end actuals, predominantly arising from:

- Annualization of salaries and benefits for many positions filled for only part of 2022 and 2.0 additional complement; and
- Operating impacts of completed capital projects.

EQUITY IMPACTS OF BUDGET CHANGES

No significant equity impacts: The changes in the Office of the Chief Information Security Officer's 2023 Operating Budget do not have any significant equity impacts.

2023 OPERATING BUDGET KEY DRIVERS

The 2023 Operating Budget for the Office of the Chief Information Security Officer of $38.042 million in gross expenditures is $13.741 million gross or 56.5% higher than the 2022 Projected Actuals. Table 2 below summarizes the key cost drivers for the 2023 Budget.

Table 2: 2023 Operating Budget by Revenue / Expenditure Category

Category (In $000s)	2020 Actual*	2021 Actual	2022 Budget	2022 Projection**	2023 Budget	2023 Change from 2022 Projection	
	$	$	$	$	$	$	%
Transfers From Capital	5.1						
Contribution From Reserves/Reserve Funds			5,000.0		3,000.0	3,000.0	
Total Revenues	**5.1**		**5,000.0**		**3,000.0**	**3,000.0**	
Salaries and Benefits	1,734.6	7,393.1	14,338.2	11,061.7	16,290.9	5,229.2	47.3%
Materials & Supplies	0.1	0.0	39.2	0.6	39.2	38.6	6429.6%
Equipment	168.2	186.1	71.6	110.4	40.7	(69.7)	(63.1%)
Service and Rent	5,477.8	8,242.2	30,683.4	13,128.7	21,606.0	8,477.3	64.6%
Contribution To Capital							
Contribution To Reserves/Reserve Funds					65.5	65.5	
Other Expenditures	39.8						
Inter-Divisional Charges	0.4	1.2					
Total Gross Expenditures	**7,420.9**	**15,822.6**	**45,132.4**	**24,301.4**	**38,042.4**	**13,740.9**	**56.5%**
Net Expenditures	**7,415.8**	**15,822.6**	**40,132.4**	**24,301.4**	**35,042.4**	**10,740.9**	**44.2%**

*Incl. 2020 actuals reported in TSD's IT1280

**Projection based on 9 Month Variance

Key Base Drivers:

Salaries & Benefits:

Increase due to:

- Annualization of positions approved in 2022, cost of living increases and the full year impact of human resourcing decisions;
- Prorated salaries and benefits for 2.0 additional complement; and
- 2023 full year impact resulting from 3.0 Concept-2-Key positions transferred from the City Manager's Office in 2022.

Materials and Supplies:

Increased to meet business needs.

Services and Rents:

Increase resulting from 2023 operating impacts of capital projects following procurement delays from global cyber resource shortage of skilled talent.

Other Revenue Changes:

Reduction in one-time reserve funding approved in 2022 by $2.0 million.

2024 & 2025 OUTLOOKS

Table 3: 2024 and 2025 Outlooks

($000s)	2023 Budget	2024 Incremental Outlook	2025 Incremental Outlook
Revenues			
Removal of 2023 One-Time Reserve Revenue		(3,000.0)	
Total Revenues	**3,000.0**	**(3,000.0)**	
Gross Expenditures			
Salaries and Benefits		33.7	(381.1)
Line-by-Line		(2,152.3)	1,429.9
Operating Impact - Cyber Foundation		3,537.6	3,761.9
Operating Impact - Digitization Support Services		2,745.2	480.1
Total Gross Expenditures	**38,042.4**	**4,164.2**	**5,290.8**
Net Expenditures	**35,042.4**	**7,164.2**	**5,290.8**
Approved Positions	**82.0**	**(3.0)**	**0.0**

Key drivers

The 2024 Outlook with total gross expenditures of $42.207 million reflects an anticipated $4.164 million or 10.9% increase in gross expenditures above the 2023 Operating Budget; The 2025 Outlook expects a further increase of $5.291 million or 12.5% above 2024 gross expenditures.

These changes arise from the following:

Impacts of 2023 Decisions

- Growth in 2024 and 2025 reflects the additional cyber solutions required to continue to enhance the cyber foundation and increase the City's cyber posture.

Salaries and Benefits

- 2024 Salaries and Benefits reflect 262 business days compared to 260 in 2022 and 261 in 2025.
- Deletion of 3.0 positions from City Manager's Office in August 2024 with full impact in 2025.

Line-by-Line

- 2024 reflects line-by-line expenditures review to address future and ongoing business requirements.

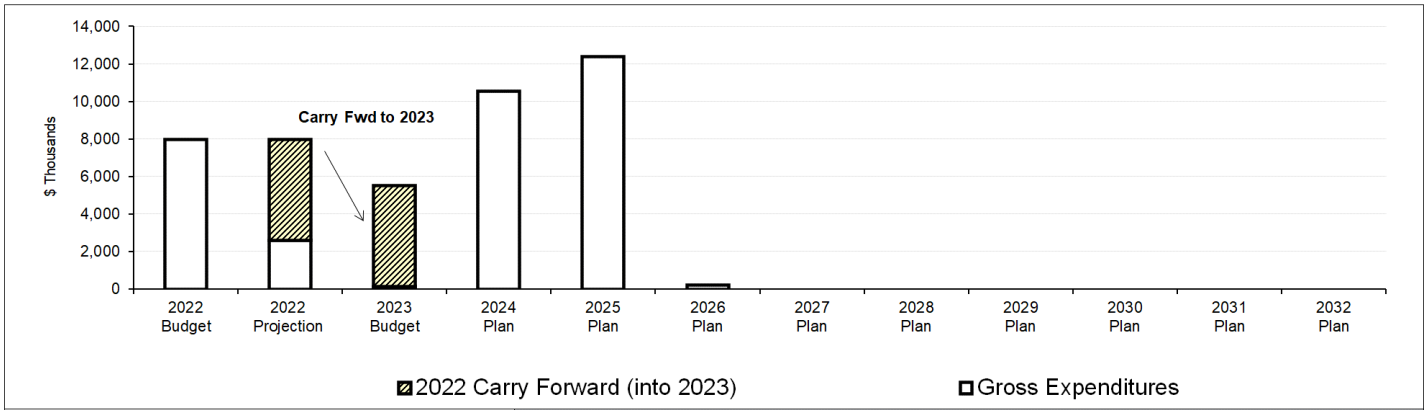
One-Time Funding Reversal

- Reversal of one-time funding for Cyber Foundation.

2023 – 2032
CAPITAL BUDGET AND PLAN

2023 – 2032 CAPITAL BUDGET & PLAN OVERVIEW

Chart 1: 10-Year Capital Plan Overview



	2022		2023 Capital Budget and 2024 - 2032 Capital Plan										
			2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Total 10 Year Plan
In $000's	Budget	Projected Actual											
Gross Expenditures by Project Category:													
Health & Safety & Legislated													
SOGR													
Service Improvement & Growth	7,970	1,296	5,528	10,551	12,368	204							28,651
Total by Project Category	**7,970**	**1,296**	**5,528**	**10,551**	**12,368**	**204**							**28,651**
Financing:													
Debt			**5,528**	**10,551**	**12,368**	**204**							**28,651**
Reserves/Reserve Funds													
Development Charges													
Provincial													
Federal													
Debt Recoverable													
Other Revenue													
Total Financing			**5,528**	**10,551**	**12,368**	**204**							**28,651**

Changes to Existing Projects

($1.2 Million)

The 2023-2032 Capital Budget and Plan reflects the following changes to existing projects over the nine common years (2023-2031):

- $1.2 million decreased funding for the *Cyber Foundation* in 2023.
- $2.4 million funding reallocated from *Digitization Support Services* to *Cyber Foundation* in future years, resulting in a net zero impact to the division.

Note:

For additional information, please refer to Appendix 6 for a more detailed listing of the 2023 and 2024-2032 Capital Budget & Plan by project; and Appendix 8 for Capacity to Spend Review, respectively.

2023 – 2032 CAPITAL BUDGET AND PLAN

$28.7 Million 10-Year Gross Capital Program

A Well-Run-City	**Infrastructure**
$7.5 M	$21.2 M
26%	74%
• Implementation cost for new cyber initiatives to detect, protect and response to cyber threats.	• MSSP Infrastructure • Digital Forensics • Infrastructure cost for new cyber initiatives to detect, protect and response to cyber threats.

☑ - Project supports Climate Resiliency and / or Greenhouse Gas (GHG) Reduction*
☑ - Project includes workforce development requirements as outlined in the City's Social Procurement Program

*Information above includes full project / sub-project 2023-2032 Budget and Plan cash flows. Does not break out the climate component costs separately

How the Capital Program is Funded

City of Toronto	
$28.7 M **100%**	
Debt	$ 28.7 M

OPERATING IMPACT OF COMPLETED CAPITAL PROJECTS

Approval of the 2023 Capital Budget will impact the 2024 Operating Budget by a total of $4.806 million in added net costs arising from *Cyber Foundation* and the *Digitization Support Services*, as shown in Table 4 below.

Table 4: Net Operating Impact Summary

Projects	2023 Budget		2024 Plan		2025 Plan		2026 Plan		2027 Plan		2023-2027		2023-2032	
	$000s	Positions	$000s	Positions	$000s	Positions	$000s	Positions	$000s	Positions	$000s	Positions	$000s	Positions
Previously Approved														
Cyber Foundation	(426.5)		3,111.1		6,873.0						9,557.7		9,557.7	
Digitization Support Services	(1,050.1)		1,695.1		2,175.2						2,820.2		2,820.2	
Sub-Total: Previously Approved	**(1,476.6)**		**4,806.2**		**9,048.2**						**12,377.9**		**12,377.9**	
Total (Net)	**(1,476.6)**		**4,806.2**		**9,048.2**						**12,377.9**		**12,377.9**	

Previously Approved projects

- An aggregate total of $12.378 million (including $2.820 million for *Digitization Support Services* and $9.558 million for *Cyber Foundation*) is required to implement and support new cyber initiatives to detect, protect and respond to cyber threats.

APPENDICES

Appendix 1

COVID-19 Impact and Recovery

N/A

Appendix 2

2023 Affordability Measures

N/A

Appendix 3

Summary of 2023 Service Changes

N/A

Appendix 4

Summary of 2023 New / Enhanced Service Priorities Included in Budget

N/A

Appendix 5

Summary of 2023 New / Enhanced Service Priorities Not Included in Budget

N/A

Appendix 6

2023 Capital Budget;
2024 - 2032 Capital Plan Including Carry Forward Funding

Projects (In $000s)	2023 Budget	2024 Plan	2025 Plan	2026 Plan	2027 Plan	2028 Plan	2029 Plan	2030 Plan	2031 Plan	2032 Plan	2023 - 2032 Total	Health & Safety & Legislated	SOGR	Growth & Improved Service
Cyber Command Centre		8,777	8,777								17,554			17,554
Cyber Foundation	6,103	1,001	2,591	204							9,899			9,899
Digitization Support Services	618	773	1,000								2,391			2,391
2023 Reduction Target - Cyber Foundation	(1,193)										(1,193)			(1,193)
Total Expenditures (including carry forward from 2022)	5,528	10,551	12,368	204							28,651			28,651

☑ - Project supports Climate Resiliency and / or Greenhouse Gas (GHG) Reduction
☑ - Project includes workforce development requirements as outlined in the City's Social Procurement Program

*Information above includes full project / sub-project 2023-2032 Budget and Plan cash flows. Does not break out the climate component costs separately

Appendix 6a

2023 Cash Flow and Future Year Commitments Including Carry Forward Funding

Projects (In $000s)	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Total 2023 Cash Flow & FY Commits	Previously Approved	Change in Scope	New w/ Future Year
Cyber Command Centre		8,777	8,777								17,554	17,554		
Cyber Foundation	6,103	1,001	2,591	204							9,899	7,549	2,350	
Digitization Support Services	618	773	1,000								2,391	4,741	(2,350)	
2023 Reduction Target - Cyber Foundation	(1,193)										(1,193)		(1,193)	
Total Expenditures (including carry forward from 2022)	5,528	10,551	12,368	204							28,651	29,844	(1,193)	

Appendix 6b

2024 - 2032 Capital Plan

N/A

Appendix 7

Reporting on Major Capital Projects: Status Update

N/A

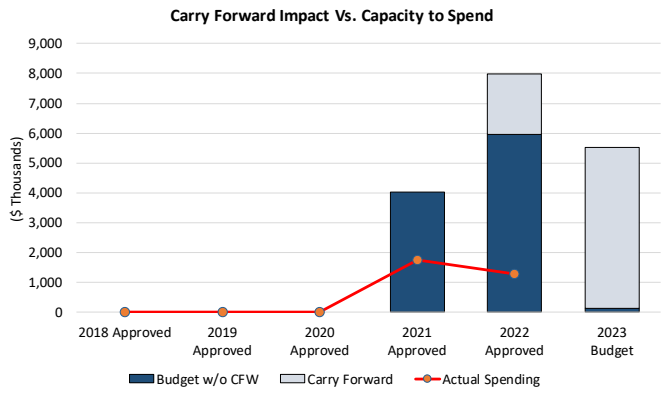
Appendix 8

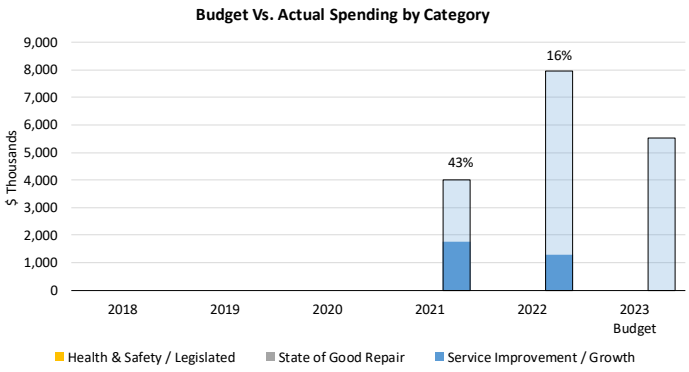
Capacity to Spend Review

The 10-Year Capital Plan has been developed with consideration of historical demonstrated ability to spend within any given year of the ten year capital plan. A review was undertaken to ensure budgets align with the Office of the Chief Information Officer's ability to spend and the markets capacity to deliver.

A key component in determining an appropriate level of annual cash flows includes historical capacity to spend reviews by project categories (Chart 3 below) as well as the level of projected 2022 underspending that will be carried forward into 2023 to complete capital work.

Chart 3 – Capacity to Spend





Capacity to Spend Review Impact on the 10-Year Plan

Based on the review of historical capital spending constraints and a capacity to spend review, $5.388 million in capital spending originally cash flowed in 2022 has been deferred to 2023, with an additional $0.156 million deferred to 2024. Adjustments to the Capital Plan are noted below:

- Reallocation of $2.350 million from *Digitization Support Services* to *Cyber Foundation* based on a reassessment of project needs.

Appendix 9

Summary of Capital Needs Constraints

N/A

Appendix 10

Inflows and Outflows to/from Reserves and Reserve Funds

2023 Operating Budget

Program Specific Reserve / Reserve Funds

N/A

Corporate Reserve / Reserve Funds

The 2023 Operating Budget includes a one-time draw of $3.000 million (for one-time costs) from funds available and set aside in the Tax Stabilization Reserve.

Inflows and Outflows to/from Reserves and Reserve Funds

2023 – 2032 Capital Budget and Plan

Program Specific Reserve / Reserve Funds

N/A

Corporate Reserve / Reserve Funds

N/A

Appendix 11

Glossary

Approved Position: Permanent or temporary positions that support the delivery of City services and service levels as approved by Council.

Actuals: An actual financial amount paid (or received) for the delivery of City services (these exclude any commitments to be paid in the future).

Capacity to Spend: Ability to spend money along with the capacity to deliver projects as demonstrated by historic spending patterns and approved contractual obligations.

Capital Budget: A Capital Budget is the City's plan to acquire / build assets or extend the useful life of existing assets; an example of a capital expenditure is the construction of a new community centre.

Capital Needs Constraints: The capital needs that cannot be accommodated within the capital plan that the Division or Agency have the capacity to deliver.

Complement: Positions that support the delivery of City services and service levels as approved by Council.

Efficiencies: Reductions in the cost of delivering a service without a reduction in service level.

New / Enhanced Service Priorities: New and enhanced service changes resulting in an increase in service levels from what was previously approved by Council.

Operating Budget: An Operating Budget is the City's annual plan to provide services to the residents of Toronto; the budget includes all revenues and expenses needed to provided services; an example of an operating cost would be the cost to run the TTC subways.

Operating Impact of Completed Capital Projects: The additional expense (or savings) and positions needed to operate or maintain a new asset; an example would be the additional expense and staff needed to operate a recently completed community centre.

Rate Supported Budget: Budget fully funded by user fees such as Solid Waste, Toronto Water and Toronto Parking Authority

State of Good Repair (SOGR): The cost of maintaining assets to ensure they are able to support the delivery of City services and meet service outcomes

Tax Supported Budget: Budget funded by property taxes.

User Fees: Program generated fee and rental revenue for the use of its services (such as the TTC fare, ice rental fees and various City permits).