Future-Ready Roadmap

ASSET MANAGEMENT PLAN PHASE THREE

June 2025

CITY OF Thunder Bay
Superior by Nature

TABLE OF CONTENTS

LAND ACKNOWLEDGEMENT 6
EXECUTIVE SUMMARY 7
1.0 Introduction 13
2.0 State of Local Infrastructure 25
3.0 Transportation 41
4.0 Drinking Water 75
5.0 Stormwater 90
6.0 Wastewater 103
7.0 Facilities 118
8.0 Fleet and Machinery 137
9.0 Equipment 152
10.0 Land Improvements 162
11.0 Asset Investment Strategy 178
12.0 Continuous Improvement 190
APPENDIX A. Location of Data 194
APPENDIX B. Exclusions and Assumptions 194
APPENDIX C. Glossary 195
APPENDIX D. Asset Management Policy 198
APPENDIX E. O.Reg 588/17 Compliance 203
APPENDIX F. Risks Associated with the AMP 205
APPENDIX G. Municipal Plans 207
APPENDIX H. Future-Ready Roadmap Team 211
APPENDIX I. Levels of Service Survey Response Summaries 213

List of Figures

Figure 1.1: The Future-Ready Roadmap **14**
Figure 1.2: Infographic “What is an Asset?” **15**
Figure 1.3: Infographic “What is Asset Management?” **16**
Figure 1.4: Timeline of Phases for developing the Asset Management Program **22**
Figure 2.1: Breakdown of total asset value **27**
Figure 2.2: Five-point rating scale **28**
Figure 2.3: All Asset Condition Profile **29**

Figure 2.4: Condition Profile of All Assets by Class 29
Figure 2.5: Average Age and Estimated Useful Life for All Assets........ 30
Figure 2.6: Intervention Thresholds and Treatment 32
Figure 2.7: Asset Risk Ratings........ 34
Figure 2.8: All Assets Risk Profile 35
Figure 2.9: 10-Year Projection of Average Budget, LOS Investments and Infrastructure Gaps for All Assets 38
Figure 2.10: 10-year Estimated New/ Enhanced Infrastructure Investment by Asset Category 39
Figure 3.1: Condition Profile of Roads 44
Figure 3.2: Condition Profile of Roads Sub-Assets 44
Figure 3.3: Examples of Road Condition Ratings 45
Figure 3.4: Condition Profile of Sidewalks........ 46
Figure 3.5: Condition Profile of Street Lights and Traffic Signals........ 46
Figure 3.6: Condition Profile of Bridges 47
Figure 3.7: Condition Profile of Culverts 47
Figure 3.8: Examples of Bridge Condition Ratings 48
Figure 3.9: Examples of Culvert Condition Ratings 49
Figure 3.10: Average Age and Estimated Useful Life of Roads Sub-Assets........ 50
Figure 3.11: Average Age and EUL of Sidewalks........ 51
Figure 3.12: Average Age and EUL of Traffic Signals and Street Lights........ 51
Figure 3.13: Average Age and EUL of Bridges and Culverts........ 51
Figure 3.14: Examples of Road Lifecycle Strategy........ 53
Figure 3.15: Transportation Asset Risk Profile 71
Figure 3.16: 10-Year Projection of Average Budget, LOS Investments and Infrastructure Gaps for Transportation . 73
Figure 3.17: Estimated Transportation New Infrastructure Projection 74
Figure 4.1: Condition Profile of Watermain Assets........ 77
Figure 4.2: Condition Profile of Drinking Water Treatment and Distribution Facilities 77
Figure 4.3: Average Age and EUL of Drinking Water Assets 77
Figure 4.4: Drinking Water Asset Risk Profile........ 86
Figure 4.5: 10-Year Projection of Average Budget, LOS Investments and Infrastructure Gaps for Drinking Water .. 88
Figure 4.6: Estimated Drinking Water New Infrastructure Projection........ 89
Figure 5.1: Condition Profile of Stormwater Assets 92
Figure 5.2: Average Age and EUL of Stormwater Assets........ 92
Figure 5.3: Stormwater Asset Risk Profile 99
Figure 5.4: 10-Year Projection of Average Budget, LOS Investments and Infrastructure Gaps for Stormwater..... 101
Figure 5.5: Estimated Stormwater New Infrastructure Projection 102
Figure 6.1: Wastewater Assets Condition Profile 104
Figure 6.2: Average Age and EUL of Wastewater Assets 105
Figure 6.3: Wastewater Asset Risk Profile........ 114
Figure 6.4 : 10-Year Projection of Average Budget, LOS Investments and Infrastructure Gaps for Wastewater ... 116
Figure 6.5 : Estimated Wastewater New Infrastructure Projection 117
Figure 7.1: Condition Profile of Facilities........ 120
Figure 7.2: Average Age and Estimated Useful Life of Facilities........ 121
Figure 7.3: Facility Components 50 Year Renewal Forecast........ 123
Figure 7.4: Facilities Asset Risk Profile 133
Figure 7.5: 10-Year Projection of Average Budget, LOS Investments and Infrastructure Gaps for Facilities........ 135
Figure 7.6: Estimated Facilities New Infrastructure Projection 136
Figure 8.1 Fleet and Machinery Condition Profile 140
Figure 8.2: Average Age and EUL of Fleet and Machinery........ 141

Figure 8.3: Facilities Asset Risk Profile 148
Figure 8.4: 10-Year Projection of Average Budget, LOS Investments and Infrastructure Gaps for Fleet and Machinery........ 150
Figure 8.5: Estimated Fleet and Machinery New Infrastructure Projection 151
Figure 9.1: Condition Profile of Equipment 154
Figure 9.2: Average Age and EUL of Equipment 155
Figure 9.3: Equipment Asset Risk Profile........ 158
Figure 9.4: 10-Year Projection of Average Budget, LOS Investments and Infrastructure Gaps for Equipment 160
Figure 9.5: Estimated Equipment New Infrastructure Projection........ 161
Figure 10.1: Condition Profile of Land Improvements........ 165
Figure 10.2 : Average Age and EUL of Land Improvement assets........ 166
Figure 10.3: Land Improvement Asset Risk Profile 174
Figure 10.4: 10-Year Projection of Average Budget, LOS Investments and Infrastructure Gaps for Land Improvements 176
Figure 10.5: Estimated Land Improvement New Infrastructure Projection 177
Figure 11.1: 10-Year Projection of Average Budget, LOS Investments and Infrastructure Gaps for All Assets 180
Figure 11.2: Total Tax-Supported Projected Long-Term Debt 183
Figure 11.3 : Tax Based Capital Funding Profile........ 184
Figure 11.4: Sustainable Funding Projection for Current Service Levels 188
Figure 11.5: Sustainable Funding Projection for Proposed Service Levels 189

List of Tables

Table E1: Overview of Asset Classes in the Asset Management Phase Three Plan........ 10
Table 2.1: Subsections found in each chapter of the plan 25
Table 2.2: Overview of Assets 26
Table 3.1: Transportation Services Asset Overview 43
Table 3.2: Community Levels of Service for Roads 56
Table 3.3: Technical Levels of Service for Roads........ 59
Table 3.4: Community Levels of Service for Sidewalks 60
Table 3.5: Technical Levels of Service for Sidewalk 61
Table 3.6: Community Levels of Service for Street Lighting and Traffic Signals 62
Table 3.7: Technical Levels of Service for Street Lighting and Traffic Signals 63
Table 3.8: Community Levels of Service for Bridges and Culverts 64
Table 3.9: Technical Levels of Service for Bridges and Culverts 66
Table 4.1: Drinking Water Asset Overview 76
Table 4.2: Community Levels of Service for Drinking Water Assets........ 79
Table 4.3: Technical Levels of Service for Drinking Water Assets 81
Table 4.4: Energy Consumption for Bare Point WTP, Reservoirs and Pumping Stations 83
Table 5.1: Stormwater Asset Overview........ 91
Table 5.2: Community Levels of Service for Stormwater Assets 94
Table 5.1: Technical Levels of Service for Stormwater Assets 95
Table 6.1: Wastewater Asset Overview 104
Table 6.2: Community Levels of Service for Wastewater Assets........ 107
Table 6.3: Technical Levels of Service for Wastewater Assets 109
Table 6.4: Annual Effluent Quality 111
Table 6.5: WPCP and Lift Stations Energy Consumption........ 112

Table 7.1: Facilities Asset Overview 119
Table 7.2: Community Levels of Service for Facilities 123
Table 7.3: Technical Levels of Service for Facilities 132
Table 8.1: Fleet and Machinery Asset Overview 138
Table 8.2: Community Levels of Service for Fleet and Machinery 143
Table 8.3: Technical Levels of Service for Fleet and Machinery 147
Table 9.1: Equipment Asset Overview 153
Table 9.2: Community Levels of Service for Equipment 157
Table 9.3: Technical Levels of Service for Equipment 158
Table 10.1: Land Improvement Asset Overview 163
Table 10.2: Community Levels of Service for Land Improvements 168
Table 10.3: Technical Levels of Service for Land Improvements 170
Table 12.1: Continuous Improvement 192
Table A.1: O.Reg 588/17 Compliance 203
Table A.2: Risks Associated with Implementation of the AMP 205
Table A.3: Municipal Plans 207

List of Maps

Map 3.1: Thunder Bay Road Classifications 67
Map 3.2: Thunder Bay Sidewalks 68
Map 3.3: Thunder Bay Street Lights 69
Map 3.4: Thunder Bay Bridges and Culverts 70
Map 4.1: Thunder Bay Water Supply 84
Map 4.2: Thunder Bay Hydrant Coverage 85
Map 5.1: Thunder Bay Northward Storm Network 96
Map 5.2: Thunder Bay Southward Storm Network 97
Map 5.3: Thunder Bay Flood Resilience Map 98
Map 6.1: Thunder Bay Sanitary Service Area 113
Map 10.1: Thunder Bay Parklands 171
Map 10.2: Thunder Bay Forested Parklands 172
Map 10.3: Thunder Bay Multi-Use Trails 173

LAND ACKNOWLEDGEMENT

This document was prepared on the traditional territory of the Ojibwa Anishinabek, which includes Fort William First Nation, signatory to the Robinson-Superior Treaty of 1850, and the Métis peoples. We respectfully acknowledge these nations as the caretakers of the lands and waters on which the City of Thunder Bay is now present.

The Future-Ready Roadmap is a pathway to improve relationships with the land and the people with who we share it as we work together toward truth and reconciliation and achieving sustainable services through asset management.

Acronyms and Abbreviations Quick Reference

BCI: Bridge Condition Index

BWA: Boil Water Advisory

CCTV: Closed Circuit Television Video

EUL: Estimated Useful Life

FCI: Facility Condition Index

GHG: Greenhouse Gas

LOS: Level of Service

OCI: Overall Condition Index

O.Reg 588/17: *Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure*

Plan: Asset Management Plan

Regulation: See O.Reg 588/17

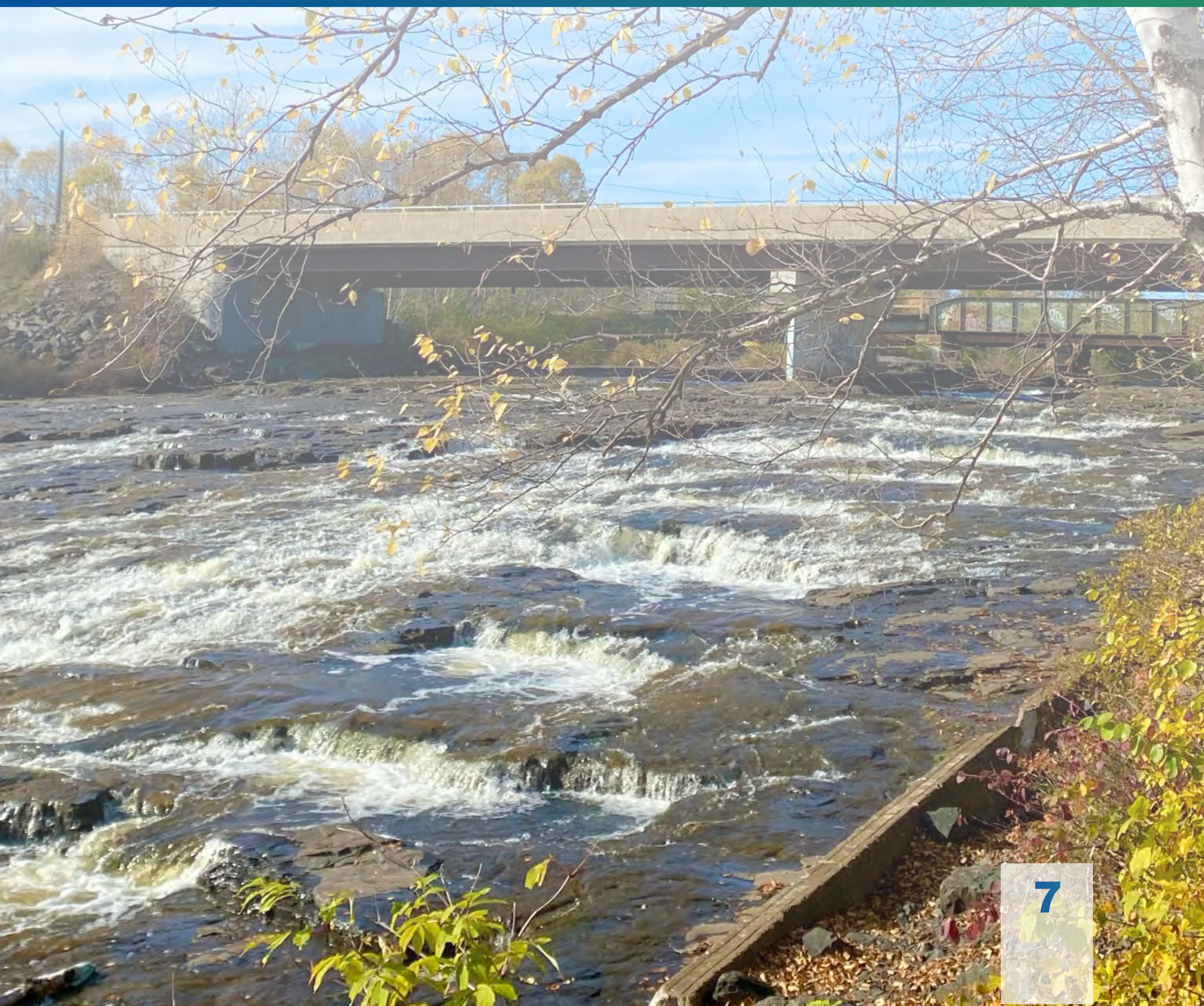
SGAP: Smart Growth Action Plan

TCA: Tangible Capital Asset

WPCP: Wastewater Pollution Control Plant

WTP: Water Treatment Plant

EXECUTIVE SUMMARY



EXECUTIVE SUMMARY

The City of Thunder Bay (the City) boasts a diverse population with strong rooted history. Residents and visitors connect to our community through the use of programs and services offered by the City. To deliver those services, the City must own, operate and maintain a wide range of assets.

Assets are valuable, long-lasting, and require investment. They can be found delivering services throughout our City; whether drinking clean water, biking on a multi-use trail or driving on plowed roadways, assets are used every day to maintain and deliver a high quality of life. To support the delivery of services the City has developed the Future-Ready Roadmap as a long-term planned and integrated approach to managing these assets. The Asset Management Plan (AMP) provides guiding direction for strategic and financial decisions, helps to reduce overall risk to our services and promotes sustainability. The Plan will be used in conjunction with other municipal strategies and planning documents to move key strategic initiatives forward. The Future-Ready Roadmap is our ongoing asset management program that will see continuous improvement to the City's Asset Management Plan.

The development of this Plan works towards the sustainability goal of the 2023 - 2027 Maamawe, Growing Together Strategic Plan to improve long-term financial sustainability by maximizing return on community investments.

Phase Three: Asset Management Plan and Investment Strategy

This Asset Management Plan marks the culmination of a multi-phase initiative to ensure sustainable, efficient, and forward-thinking infrastructure management. Guided by the Future-Ready Roadmap, this plan is a living document that integrates condition data, financial strategies, community input, climate resilience, and risk management into long-term capital planning.

This plan includes all assets within the municipal inventory that comply with the Tangible Capital Asset (TCA) policy, and natural infrastructure such as trees, along with an Investment Strategy to fund the assets at the current and proposed levels of service. The Plan is divided into sections based on the eight major asset classes: Transportation, Drinking Water, Wastewater, Stormwater, Facilities, Fleet and Machinery, Equipment and Land Improvements.

Guiding Fundamentals

Thunder Bay's asset management approach is grounded in a set of fundamental concepts that support effective, transparent, and sustainable decision-making. These principles guide all aspects of the plan, from condition assessments to investment prioritization:

- **Data-Driven Levels of Service**: Prioritize the maintenance of existing infrastructure, with increases in service levels pursued only when clearly justified.
- **Smart Growth**: Direct growth to serviced areas to reduce infrastructure sprawl and long-term costs.
- **Asset Lifecycle Optimization**: Maximize asset value by considering the full lifecycle, from acquisition to disposal.
- **Risk-Based Decision Making**: Use risk frameworks to prioritize investments and manage vulnerabilities across the asset network.
- **Environmental Stewardship and Climate Resilience**: Align decisions with the City's climate goals and incorporate energy efficiency and sustainability.
- **Sustainable Financial Planning**: Align capital investment with long-term financial capacity, emphasizing renewal over expansion.
- **Continuous Improvement and Adaptability**: Evolve practices through data integration, innovation, and responsiveness to change.

These fundamentals underpin the Future-Ready Roadmap and ensure the City remains proactive, resilient, and fiscally responsible in managing its infrastructure systems.








Infrastructure Snapshot:

Asset Class	Replacement Value	Average Age	Average Condition	Annual Deficit	Percent Funded
Transportation	$1,761,676,000	28 years	**Fair**	-$14,033,000	59%
Drinking Water*	$889,901,000	55 years	**Good**	-	100%
Stormwater	$374,936,000	40 years	**Fair**	-$3,104,000	29%
Wastewater*	$708,267,000	63 years	**Fair**	-	100%
Facilities	$727,618,000	46 years	**Fair**	-$5,550,000	60%
Fleet and Machinery	$127,960,000	11 years	**Fair**	-$2,591,000	77%
Equipment	$62,818,000	14 years	**Fair**	-$1,420,000	77%
Land Improvements	$253,500,000	28 years	**Fair**	-$3,894,000	50%
Total	$4,906,676,000	45 years	**Fair**	-$30,592,000	71%

Table E1: Overview of Assets Classes in the Asset Management Plan: Phase Three

** Financial plans are in place for both the Drinking Water System and the Wastewater System to achieve financial sustainability, full-cost recovery, and affordability for consumers, while maintaining existing and regulated service levels.*

The overall condition of City assets is rated as *Fair*, with approximately 22 percent of assets near or beyond their estimated useful life. While 71% of infrastructure needs are currently funded, the City faces an annual infrastructure deficit of $30.6 million. If unaddressed, this deficit may grow to **$307 million** over the next 10 years to maintain existing service levels, or **$373 million** to reach proposed service levels.

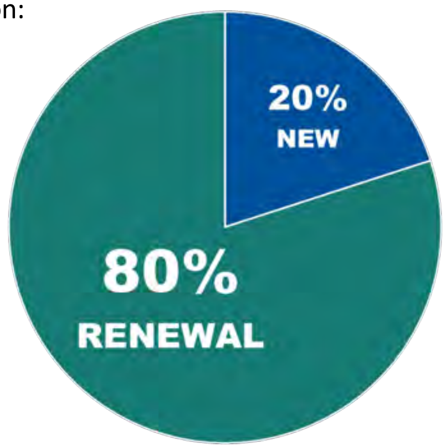
The City currently has a total annual infrastructure deficit of over

$30.6 MILLION

Financial Sustainability and Investment Strategy

The Plan introduces key strategies to strengthen the City's financial foundation:

- **Prioritize Renewal:** Adopt an 80/20 capital funding split—80% for renewal of existing assets and 20% for new infrastructure.
- **Increase Capital Contributions:** Gradually increase capital out of revenue beginning in 2028 to reduce reliance on debt and external funding.
- **Lifecycle-Based Planning:** Align investment decisions with full lifecycle costs, risk exposure, and long-term affordability.
- **Support Smart Growth:** Coordinate asset planning with intensification and infill strategies to limit infrastructure sprawl and reduce ongoing maintenance and replacement obligations.



Levels of Service

Levels of service (LOS) targets are defined for each asset class, based on technical metrics, community expectations, and regulatory requirements. While most current LOS are being maintained, achieving proposed LOS enhancements will require additional investment and careful prioritization. The AMP clearly identifies both the cost and affordability challenges of proposed service improvements.

Risk Management and Climate Resilience

Approximately **$1.3 billion** in assets fall within high or very high-risk categories, meaning they are likely in a poor condition and have a high consequence of failure. To mitigate risk, the City must prioritize **$749 million** in lifecycle investments over the next decade over and above ongoing renewal. The AMP incorporates a robust risk framework to guide capital planning which includes climate risk considerations across all asset classes. In alignment with the Thunder Bay Net-Zero Strategy and the Climate Adaptation Strategy, the City will prioritize sustainable, energy-efficient, and climate-resilient infrastructure solutions.

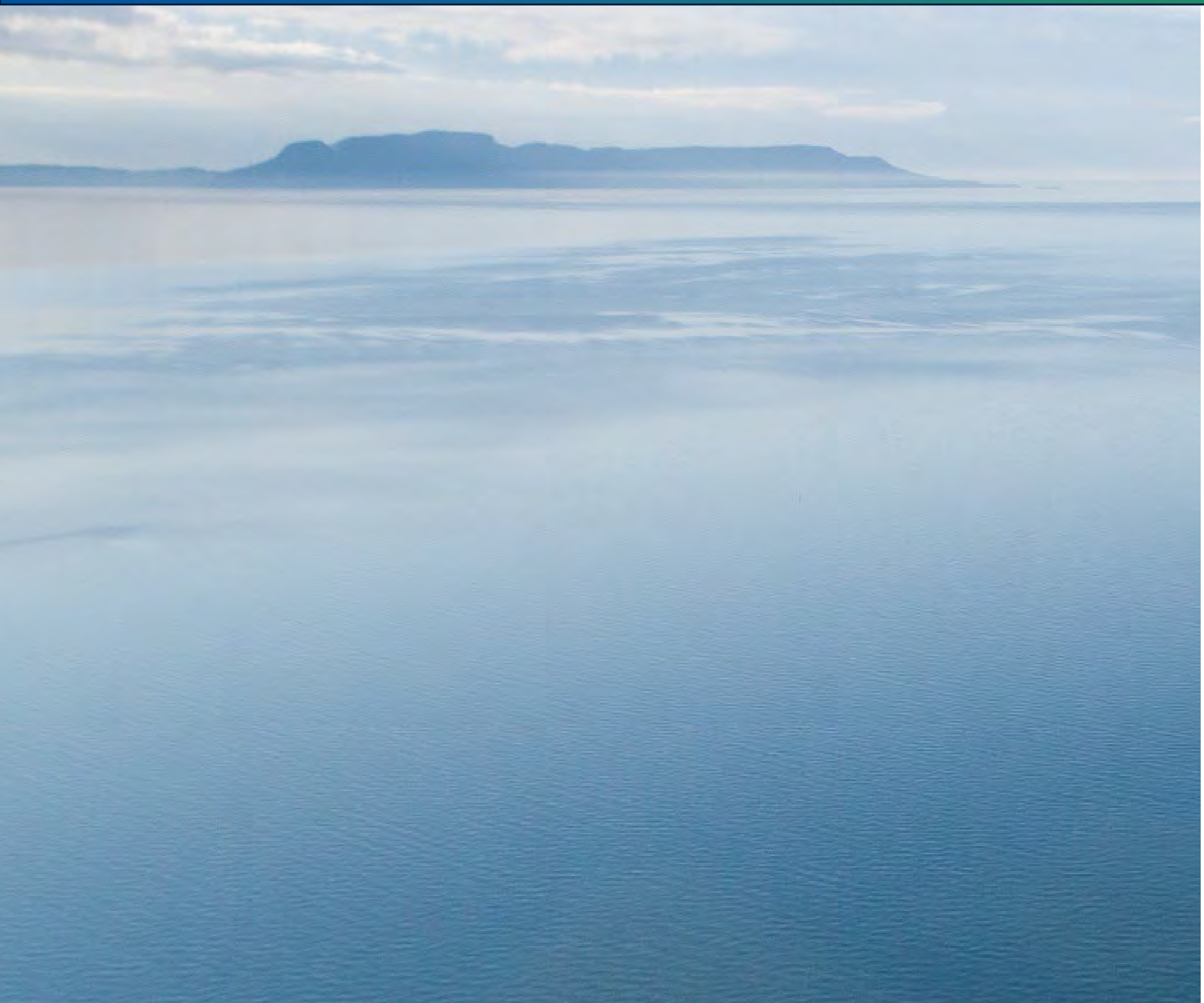
$1.3 BILLION

In high or very high risk

Continuous Improvement and Governance

This Plan is a living document that will evolve with improved data, refined lifecycle models, and future engagement. It is directly aligned with the City's Strategic Plan (*Maamawe – Growing Together*) and supported by other guiding documents, including the Transportation Master Plan, Climate Adaptation Strategy, Accessibility Plan, and Indigenous Relations & Inclusion Strategy. Ongoing compliance with regulatory requirements and alignment with community values remain core priorities of the AMP.

PHASE THREE



1.0 Introduction

1.1 What is an Asset

The City of Thunder Bay (City) owns a wide range of assets to provide services to the citizens of Thunder Bay. Infrastructure, such as a water treatment plant, roads, buildings, vehicles, along with natural assets, such as parks and trees are essential for delivering services including clean drinking water, transportation systems, recreation and emergency services.

Assets are important; they are essential to providing the services that contribute to a high quality of life within Thunder Bay. These assets contribute to the economic health of our community, allowing us to attract new businesses and increase employment.

1.2 What is Asset Management

Asset management is a process that allows Thunder Bay to implement a long-term approach for managing and investing in assets. It includes the planning, design, construction, operation, maintenance, and replacement of assets and infrastructure used to provide City services and is used to prioritize investment in each phase of an asset's life.

Asset management involves collecting data on all assets to understand their condition, expected life, risk of failure, rehabilitation options, and other information to be able to make informed decisions to manage the lifecycle of each asset. Asset management is fiscally responsible, reduces risks, helps the City be sustainable and meet the needs of the community. By maintaining the City's assets, we reduce our environmental impact while increasing day-to-day safety throughout our community. Decisions related to assets affect the types of services that are available to the community. This is why asset management must occur in a planned and integrated manner that maximizes the value of the City's assets.

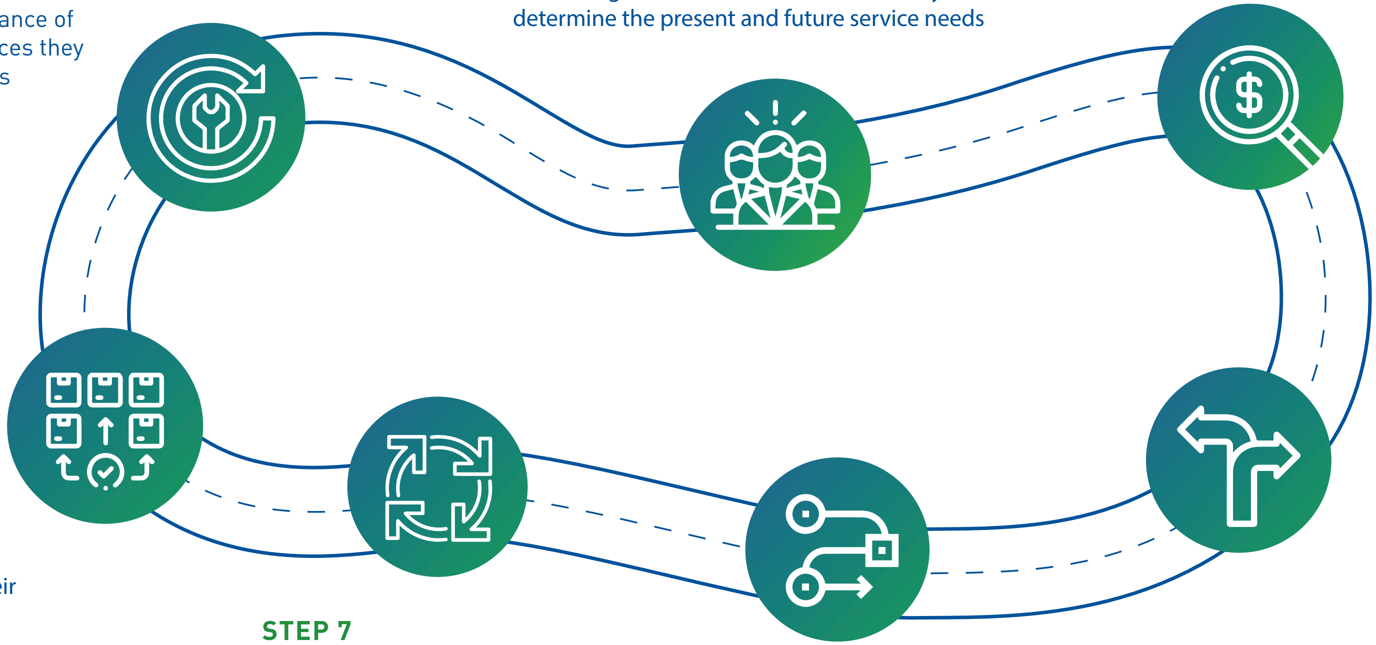
The current estimated cost to replace all City assets is:

$4.9 BILLION

STEPS TO DEVELOP THE ASSET MANAGEMENT PLAN

Future-Ready Roadmap

The goal of the Future Ready Roadmap is to provide sustainable services for the citizens of Thunder Bay. A number of components must be in place to realize that goal.This may not happen all at the same time for each asset type. This roadmap outlines the steps that the City of Thunder Bay will take for each asset to develop the Asset Management Plan.



STEP 1
Inventory
A comprehensive database of the assets owned by the City, their condition and value

STEP 2
Level of Service
Measurable performance of assets, and the services they provide to the citizens

STEP 3
Community Engagement
Consulting with the citizens of Thunder Bay to determine the present and future service needs

STEP 4
Financial Strategy
Alternatives for funding asset repair and replacement

STEP 5
Decision Making
The priorities, costs and steps needed to ensure long-term asset and service performance

STEP 6
Asset Management Plan

STEP 7
Continuous Improvement

Future-Ready Roadmap

Sustainable Services Through Asset Management

Figure 1.1: The Future Ready Roadmap

Website getinvolvedthunderbay.ca/asset-management
Youtube youtube.com/CityThunderBay

WHAT IS AN ASSET?

The City of Thunder Bay provides a wide range of **services** to the citizens of Thunder Bay such as clean drinking water, transportation systems, recreation opportunities, and emergency services. These services are provided by physical components such as roads, bridges and a water treatment plant. **These physical components are called assets. The City's assets exist to enable the provision of services.**

Valuable

Assets owned by the City of Thunder Bay are usually paid for over time.

Long-Lasting

Most assets are semi-permanent, and have a relatively long life span.

Requires Investment

Maintenance and repair help to prolong the life of the asset.

Assets Enable Services

Assets are necessary to provide the services that offer a high quality of life for our citizens, such as playgrounds and sports fields for recreation, and bike lanes and buses for transportation. They also contribute to the economic health of our community, allowing us to attract new businesses and increase employment. By ensuring that these assets are well maintained, we also reduce our environmental impact, while increasing the day to day safety throughout our community.

City Hall
(Buildings)

Canada Games Complex
(Pools)

Trowbridge Falls
(Parks)

Ambulance
(Emergency Vehicles)

WHAT IS ASSET MANAGEMENT?

Asset management is a **long-term approach** for managing and investing in assets. Decisions related to assets affect the types of services available to our citizens. That is why asset management must occur in a planned manner, that maximizes the value to the community.

$4.9 BILLION DOLLARS

Estimated replacement value of all City assets

Many of the City of Thunder Bay's assets are quite old, and are now starting to show their age. As assets age, there are increased costs associated with the upkeep and eventual replacement of these important assets. By investing in maintenance and repair at the right time, asset management **increases the life and reduces the lifecycle cost of assets.**

Maintain → **Repair** → **Replace** → **Manage**

Asset Management Benefits

Promotes Sustainability

Is Financially Responsible

Preserves Assets & Services

Meets Community Needs

Future-Ready Roadmap

Sustainable Services Through Asset Management

Website getinvolvedthunderbay.ca/asset-management
Youtube youtube.com/CityThunderBay

Figure 1.3: Infographic "What is Asset Management"

1.3 Purpose of the Future-Ready Roadmap for Asset Management

The City of Thunder Bay has called our asset management program the Future-Ready Roadmap (Roadmap). The purpose of the Roadmap is to set a path to sustainable services through asset management. Building a resilient community with valued, sustainable services is the ultimate goal. A Roadmap (Figure 1.1) depicts the path to creating the Asset Management Plan including the requirements of future iterations. The Roadmap is made up of many elements including an asset and infrastructure inventory, measurable levels of service, community involvement and consultation, a financial strategy, and a decision-making process which includes setting priorities. The results from these steps will produce the Asset Management Plan which will be a living document being continuously upgraded as more information is collected on the City's assets to make better informed decisions.

1.4 Purpose of an Asset Management Plan

An Asset Management Plan provides a comprehensive reference for the construction, maintenance, rehabilitation, disposal, and replacement of the City's assets based on sound asset management practices and principles. It provides information on the condition (where applicable), level of service and required funding for each asset category and will serve as a support document for strategic and financial decisions.

1.5 Asset Management Fundamentals

Thunder Bay's Asset Management Program is grounded in a set of fundamental concepts that guide the efficient, sustainable, and strategic management of public infrastructure throughout its lifecycle. These fundamentals align with the Guiding Financial Principle of *Sustainable & Integrated Capital Planning: The development and implementation of a dynamic, long-term capital funding plan that aligns infrastructure needs with financial capacity, supports asset stewardship, and positions the City to respond effectively to growth opportunities*.

The asset management fundamental concepts are to be considered as a whole and are as follows, in no priority order as all fundamentals need to be adhered to in order to meet the Plan as set out:

Data-Driven Levels of Service: Prioritizing maintenance of existing assets over new.

Municipal assets exist to deliver services to residents, businesses, and visitors. Increases to levels of service should only be considered when supported by clear evidence, community needs, and alignment with strategic priorities and financial principles to ensure responsible and financially sustainable decision-making.

Asset management decisions will prioritize the maintenance of existing assets, guided by current and future service demands, and strategic plans.

Smart Growth: Fostering sustainable growth.

The City will direct growth within existing serviced areas to reduce infrastructure sprawl, better utilize existing assets, and minimize ongoing lifecycle and replacement costs.

To enhance service efficiency and long-term sustainability, the City will promote multi-functional, flexible spaces and the consolidation of infrastructure.

Asset Lifecycle Optimization: Maximizing value through full lifecycle asset planning.

Asset management will consider the full lifecycle of infrastructure assets, from planning and acquisition to maintenance, renewal, rehabilitation, and eventual disposal. Decisions will be guided by asset performance, evolving service requirements, and alignment with long-term strategies.

Where possible, assets will be rehabilitated or repurposed to extend their useful life, or divested before full replacement is considered. This approach provides long-term sustainability and cost-effectiveness across all asset categories.

Risk-Based Decision Making: Reducing risk to provide reliable, resilient services.

Proactive identification and mitigation of risks, including asset failures, retirement obligations, climate change projections and impacts, financial constraints, and growth pressures will guide asset management decisions. This provides resilient and reliable service delivery under a range of future scenarios.

Environmental Stewardship and Climate Resilience: Building sustainable, climate-ready infrastructure.

Asset decisions will incorporate principles of environmental sustainability, energy efficiency, and climate adaptation. The City will strive to meet its Net-Zero goals by 2050 by replacing aging assets with energy-efficient or net-zero alternatives wherever feasible.

Nature-based solutions, climate-resilient designs and materials will be considered along with risk and vulnerability assessments, lifecycle cost analysis, and co-benefit evaluations to enhance resilience to natural disasters and environmental stresses.

Sustainable Financial Planning: Investing wisely for long-term affordability and impact.

The City will strive for long-term financial sustainability by aligning capital planning decisions with the Long-Term Financial Plan. The City will prioritize asset renewal and rehabilitation over the construction of new infrastructure to support long-term financial sustainability. This approach ensures that capital funding is directed toward renewal needs first. Strategic new investments may be prioritized where they support revitalization or unlock growth potential. Investment decisions will be guided by full-cost recovery principles, lifecycle costing, and a commitment to affordability for both current and future residents.

Continuous Improvement and Adaptability: Evolving practices to meet changing needs and priorities.

The Asset Management Program will evolve through ongoing review and data collection, integration of new technologies, and responsiveness to changing conditions. This commitment to continuous improvement means the City remains agile in responding to growth, shifting service demands, and emerging best practices in infrastructure management.

Data-informed decision-making will remain at the core of the City's asset strategies, supporting innovation, accountability, and efficiency across all service areas.

1.6 Assets Included in this Plan

In compliance with *Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure* under the *Infrastructure for Jobs and Prosperities Act, 2015*, Phase Three of the Asset Management Plan includes all assets owned by the City of Thunder Bay that comply with the Tangible Capital Asset Policy of individual assets over $10,000 and pooled assets over $50,000 in value. Natural assets such as trees are also included as per the *Regulation.* The Assets are categorized by asset class as follows: Transportation, Drinking Water, Stormwater, Wastewater, Facilities, Fleet and Machinery, Equipment, and Land Improvements.

> *'Creating an asset management plan can help your municipality address specific infrastructure needs while also preparing for climate change. It can help identify the infrastructure investments that make the most financial sense in the long run.'*
>
> *– Federation of Canadian Municipalities*

1.7 Relationship to Other Municipal Plans

The Asset Management Program and Plan directly support the strategic priority of "improve long term financial sustainability by maximizing return on community investments." as outlined in the 2023 - 2027 Maamawe, Growing Together Strategic Plan.

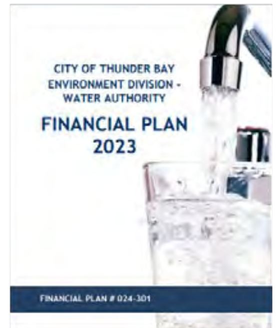
Asset management supports key strategic priorities from other City planning and policy documents. The role of asset management is to integrate the asset-based items that will assist with moving forward other City goals.

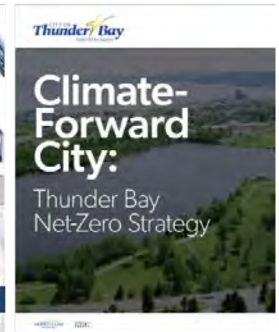
The other plans include but are not limited to:

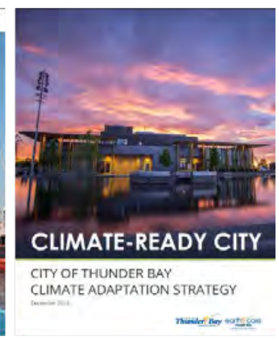
- 2023 - 2027 Maamawe, Growing Together Strategic Plan
- Accessibility Plan
- Active Transportation Plan
- Boater's Services Financial Plan
- Clean Green and Beautiful Policy
- Climate Ready City: City of Thunder Bay Climate Adaptation Strategy
- Climate-Forward City: Thunder Bay Net-Zero Strategy
- Community Safety and Well-Being Plan
- Create. Connect. Grow. Culture Plan
- Corporate Digital Strategy
- Corporate Energy Management Plan
- Drinking Water System Financial Plan
- Fit Together: Recreation and Facilities Master Plan
- Indigenous Relations & Inclusion Strategy
- Pollution and Prevention Control Plan
- Solid Waste Financial Plan
- Solid Waste Management Strategy
- Strategic Master Fire Plan
- Stormwater Management Plan
- Superior North EMS, 2021-2030 Paramedic Services Master Plan
- Transportation Master Plan
- The City of Thunder Bay's Official Plan
- Urban Forest Management Plan
- Wastewater System Financial Plan

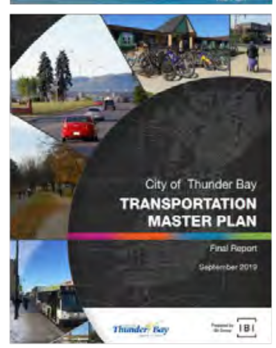
These documents complement each other and provide direction to achieve long-term social, environmental, and economic sustainability.

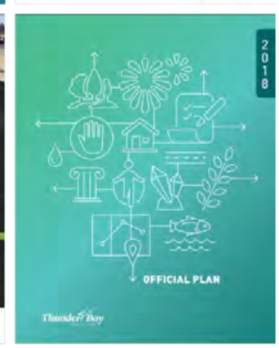
For a brief description of these plans, please see Appendix G.











1.7.1 Asset Management in Action: Link to the Indigenous Relations and Inclusion Strategy

Through asset management, the City will collaborate on new place-making initiatives and opportunities for welcoming spaces in the City, conduct research in collaboration with academic and Indigenous partners to identify Indigenous heritage recognition opportunities in City spaces and maintain and enhance existing place-making spaces.

Managing our assets in such a way will support the **Indigenous Relations & Inclusion Strategy 2021-2027:** Pillar 3, Commitment 8: Honour & celebrate Indigenous space and place:

- 8.1 Collaborate with staff on City-led initiatives that promote Indigenous inclusion.
- 8.2 Honour Indigenous history and culture in City spaces through exhibits and activities.
- 8.3 Collaborate on new place-making initiatives and opportunities for welcoming spaces in the city.

One example of this is the new Northwood Splash Pad. During consultation the splash pad was identified as an opportunity for reconciliation using the theme “Water is Life”, an important Anishinaabe teaching. The process for creating this splash pad involved extensive consultation with the Indigenous community and partners in every step of the project.

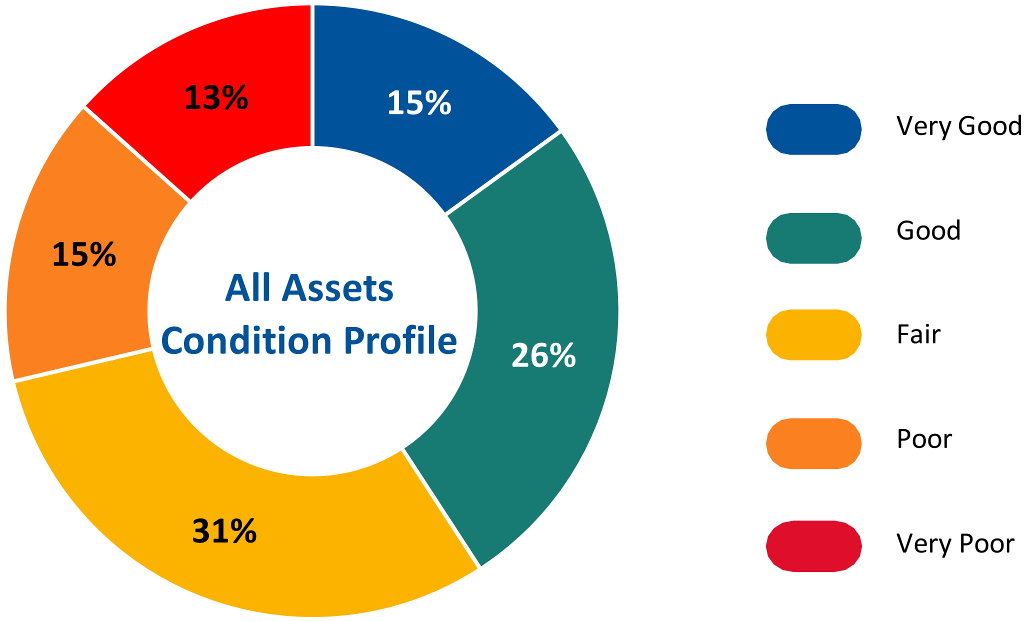


Figure 2.3: All Asset Condition Profile

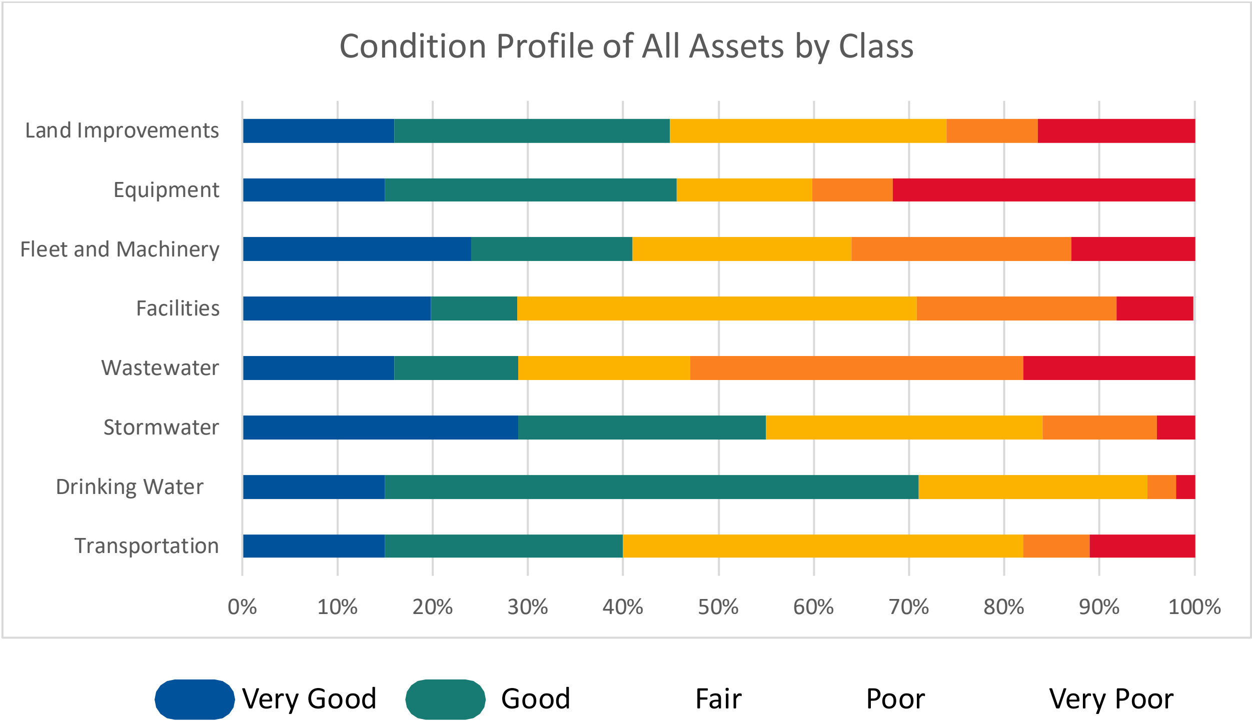


Figure 2.4: Condition Profile of All Assets by Class

The City has created methods and models that predict the deterioration of assets over time. Using these models, the City is able to identify at what point minor or major intervention would be required. Multiple factors dictate when the need for these events are "triggered". Some of those factors are maintaining an acceptable level of service, prolonging the assets effective useful life, and a cost benefit analysis.

Figure 2.6 below shows the normal deterioration of an asset represented by the solid line. Once that drops below a rehabilitation threshold it has reached the end of its estimated useful life. Completing lifecycle events such as a minor and major rehabilitation shows how the estimated useful life of an asset, represented by the dotted line, can be extended.

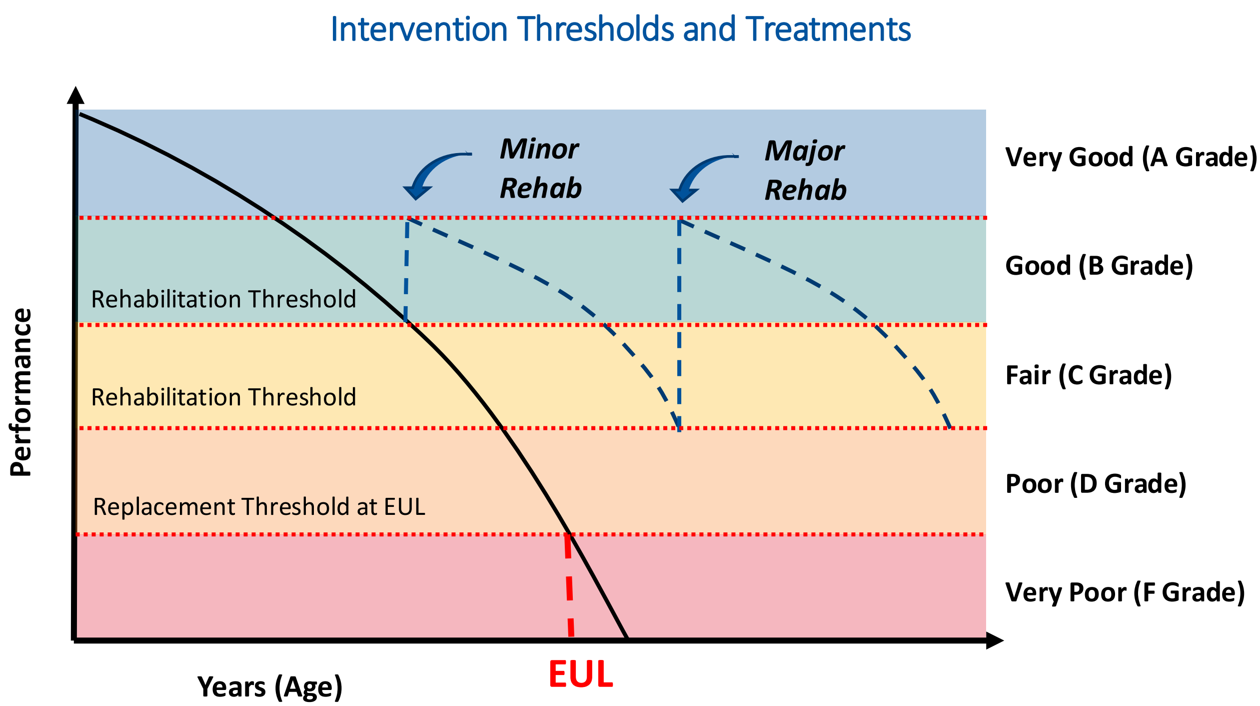


Figure 2.6: Intervention Thresholds and Treatment

2.3 Levels of Service

Levels of service (LOS) describe how an asset performs and supports community use. The safe and acceptable target LOS for each asset must be identified. This includes clear and measurable performance indicators to meet service expectations of citizens as well as compliance with governmental regulations.

The *Regulation* requires municipalities to identify the current LOS being provided for all assets. The LOS metrics are prescribed in the *Regulation* for core assets and are developed by the municipality for non-core assets. LOS are measured based on performance over the previous two (2) years. These metrics help to explain the performance of assets and include both community (qualitative) and technical (quantitative) metrics.

Community LOS are qualitative, non-technical descriptions. An example is a description of the traffic that is supported by municipal bridges (e.g. heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists). Some community LOS metrics are legislated such as for the core asset categories.

Technical LOS are quantitative descriptions. An example is the percentage of bridges in the municipality with loading or dimensional restrictions. LOS metrics may be legislated, City service objectives, or industry standards.

Levels of service will help to:

x Inform citizens on the assets required to provide services;

x Identify the cost, affordability, and benefit of the services;

x Evaluate the suitability and equity of the services; and

x Assess the effectiveness of this Plan.

The community is changing and their expectations and needs along with it. New and/or enhanced LOS initiatives are contained within Strategic Plans, various master plans, and Council resolutions. These documents help inform proposed LOS performance metrics for each service area contained in the Asset Management Plan. At times, these LOS initiatives may represent both asset capacity and financial pressures beyond what can be accommodated. Such imbalances are presented in the Plan as the cost to achieve proposed LOS infrastructure deficits. When an infrastructure deficit exists, this indicates the estimated future expenditures required to achieve the proposed LOS exceeds the existing planned budget and available reserve fund balance. Thus, there is a need to examine proposed LOS targets, lifecycle management activities, and financing strategies to address future infrastructure needs.

2.4 Risk

The asset management risk framework supports the prioritization of asset investment needs and capital projects to where they are needed the most while considering available financial resources. The City of Thunder Bay has developed a framework that assesses the potential likelihood and consequences of asset failures to estimate the risk exposure of the City using a series of specific qualitative and quantitative metrics.

The asset management risk framework is summarized as follows:

Probability of Failure (POF): The likelihood of failure relates to how likely it is that an asset will fail at a given time and cease to provide the service. The current physical condition and service life remaining are two commonly used risk parameters in determining this likelihood. The ranges used to determine an asset's POF are aligned with the following qualitative rating scale: 1 – Rare, 2 – Unlikely, 3 – Possible, 4 – Likely, 5 – Almost Certain.

Consequence of Failure (COF): The consequence of failure describes the overall effect that an asset's failure will have on an organization's asset management goals. Consequences of failure can range from non-eventful to impactful: a small diameter watermain break in a subdivision may cause several rate payers to be without water service for a short time. However, a larger trunk watermain may break outside a hospital, leading to significantly higher consequences. Many assets depend on other infrastructure systems to function, so a single failure may have cascading impacts. The COF parameters are also organized by the type of consequence they pertain to; these include Economic, Social, Environmental, Operational and Health & Safety consequence types. The ranges used to determine an asset's consequence of failure are aligned with the following qualitative rating scale: 1 – Insignificant, 2 – Minor, 3 – Moderate, 4 – Major, 5 – Severe.

After identifying the attribute information available that can be utilized as probability and/or consequence of failure metrics and applying the most appropriate range and weighting to each metric, the risk rating for each asset can be calculated using the Risk formula above. The risk ratings are then pooled into five levels: Very Low, Low, Moderate, High, and Very High Risk.

Figure 2.7: Asset Risk Ratings

2.7 Future Outlook

As asset inventories grow and are expanded to service projected growth and achieve the vision for the City, there will be a need for increased ongoing renewals and funding to operate and maintain the growing inventories over time.

The Plan largely presents the suggested base level of investment required to maintain and reach target levels of service for the City's existing assets. With Thunder Bay's population growth goals, it is important that the City's decisions to build additional or upgraded assets to meet the demand for services be informed by full lifecycle costing and that the expansions be included in long-term asset management planning.

With the upcoming Smart Growth Action Plan, the City will have various growth-related initiatives on the horizon. There are several master plans and studies that will also need to be updated over the next few years to align with the Smart Growth Action Plan.

In addition to updating plans, there will be a number of new and/or expanded infrastructure assets required to realize the growth targets. There are several major growth/service improvement related infrastructure projects currently underway or on the horizon including North Core Streetscape, Victoriaville Reimagined, Central Avenue Development, Burwood Extension, other road and service extensions, Active Transportation infrastructure, Tree Plantings, Net-Zero Building Upgrades, and Net-Zero Fleet.

The figure below summarizes the City's estimated 10 year expenditures for the new infrastructure projects by asset category:

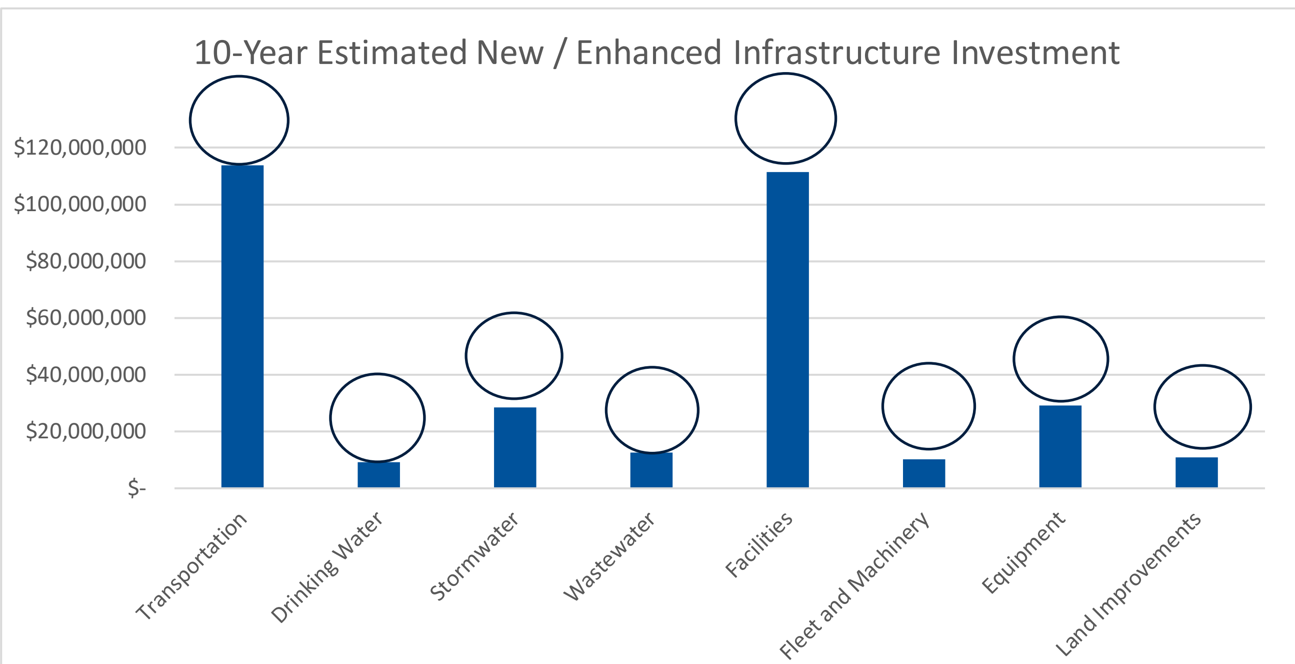
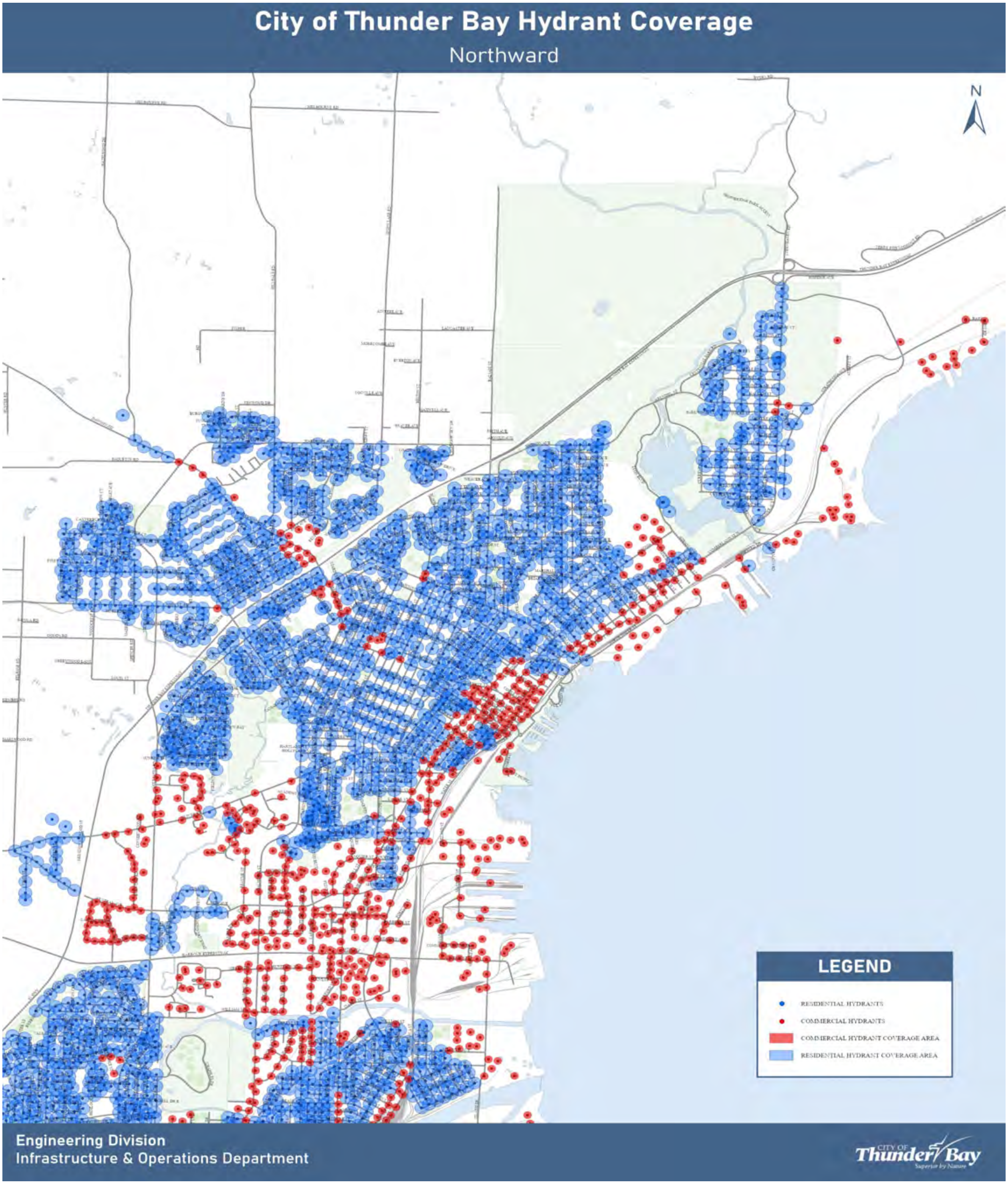


Figure 2.10: 10-Year Estimated New/Enhanced Infrastructure Investment by Asset Category



Map 4.2: City of Thunder Bay Hydrant Coverage Northward Map

4.4 Risk

Asset Dependencies

In addition to supplying drinking water for residents, drinking water infrastructure also supports fire protection and facilities infrastructure.

Drinking water infrastructure has dependencies on communications, gas, and electricity for water treatment, pumping, and system controls, however backup generation is in place for temporary outages. Assets are also dependent on fleet and equipment for maintenance.

Within the infrastructure class, assets are interdependent, relying on all assets “upstream”, starting at the water treatment plant, to deliver services.

Likelihood and Consequences

Within the asset class, failures are more likely with increased age, and lower condition. For water mains, asset materials and surrounding soils can predict likelihood of failure, with plastic mains in free draining soils at lower risk; with ductile iron pipes in clay and silt at higher risk.

The water treatment plant itself would have the most significant consequence if it failed, as the distribution assets depend on it to deliver services. Within distribution, pumping stations and mains serving larger areas and volumes of water or critical services, such as the hospital, would be expected to have more significant consequences than if more peripheral assets failed.

Total failure of critical drinking water assets, especially the drinking water plant, would have severe, long lasting impacts for health, economy, strategic, operations, and would likely have a disproportionate impact on underserved and marginalized communities.

The following risk profile provides a visual representation of the drinking water assets in the very low to very high-risk categories.

Very Low	Low	Moderate	High	Very High
$522 million	$169 million	$155 million	$37 million	$3 million

Figure 4.4: Drinking Water Asset Risk Profile

Key Hazards

Water mains can be significantly impacted by land movements, including erosion, settling, and frost heave. Control systems can be impacted by cyber-attack or communications outages, with the potential to damage facilities.

Key equipment and water treatment processes can be impacted by supply chain disruptions, with limited sources for essential items. Any foregone or delayed maintenance could have a significant impact on any aspect of this infrastructure class.

Risk Drivers

Factors that are expected to increase risks over the lifespan of the assets include climate change increasing severe weather events, and community growth increasing urban sprawl and capacity demands. Though changes in regulation are ongoing, they are generally expected to contribute to reduced risk over time.

4.5 Climate Change Considerations

The Drinking Water Network is directly impacted by climate change. Weather events such as cold temperatures can cause watermains to break and services to freeze. The repair, renewal and replacement of water assets consider the following climate risks, adaptation and mitigation opportunities.

Climate Risks Identified with Drinking Water Assets

- Potential increased service disruptions in drinking water network with more frequent and severe weather events.
- Increased damage to in-ground infrastructure due to deep frost, frost-heaving and freeze-thaw cycles from greater temperature variability.
- Potential increased maintenance and replacement costs as infrastructure and facilities' durability and lifespan decreases with more frequent and severe weather events.

Future Climate Adaptation Measures

- Conduct a ‘threat mapping’ exercise to identify critical drinking water infrastructure and facilities that would be impacted by extreme weather events, and prioritize and implement projects to protect them.

Future Climate Mitigation Measures

- Explore further opportunities to increase water pumping efficiency (Objective #16, Thunder Bay Net-Zero Strategy.)
- Consider other processes for backwash treatment to reduce flows to the Water Pollution Control Plant.

4.6 Investing in the Assets

To achieve a sustainable level of funding for drinking water services for both the short and long-term, the Drinking Water System has a Council approved 20 year Financial Plan prepared in accordance with the Ministry of Environment Financial Plans *O.Reg 453/07*. The plan, which is updated every five (5) years, achieves full cost recovery over the long-term and maintains current service levels while limiting overall water costs to consumers. The Drinking Water Financial Plan includes a healthy reserve for proposed levels of service.

To maintain the proper level of repair, renewal, and replacement of the Drinking Water Network, the annual sustainable funding amount is $14,133,000. The five (5) year historical budgeted funding allocated to the drinking water assets was in line with the sustainable funding amount, meaning that there is no funding deficit for the drinking water assets. There are no identified infrastructure gaps for funding proposed levels of service.

A 10 year projection of the average budget, LOS Investment and infrastructure gaps for all drinking water assets is shown below.

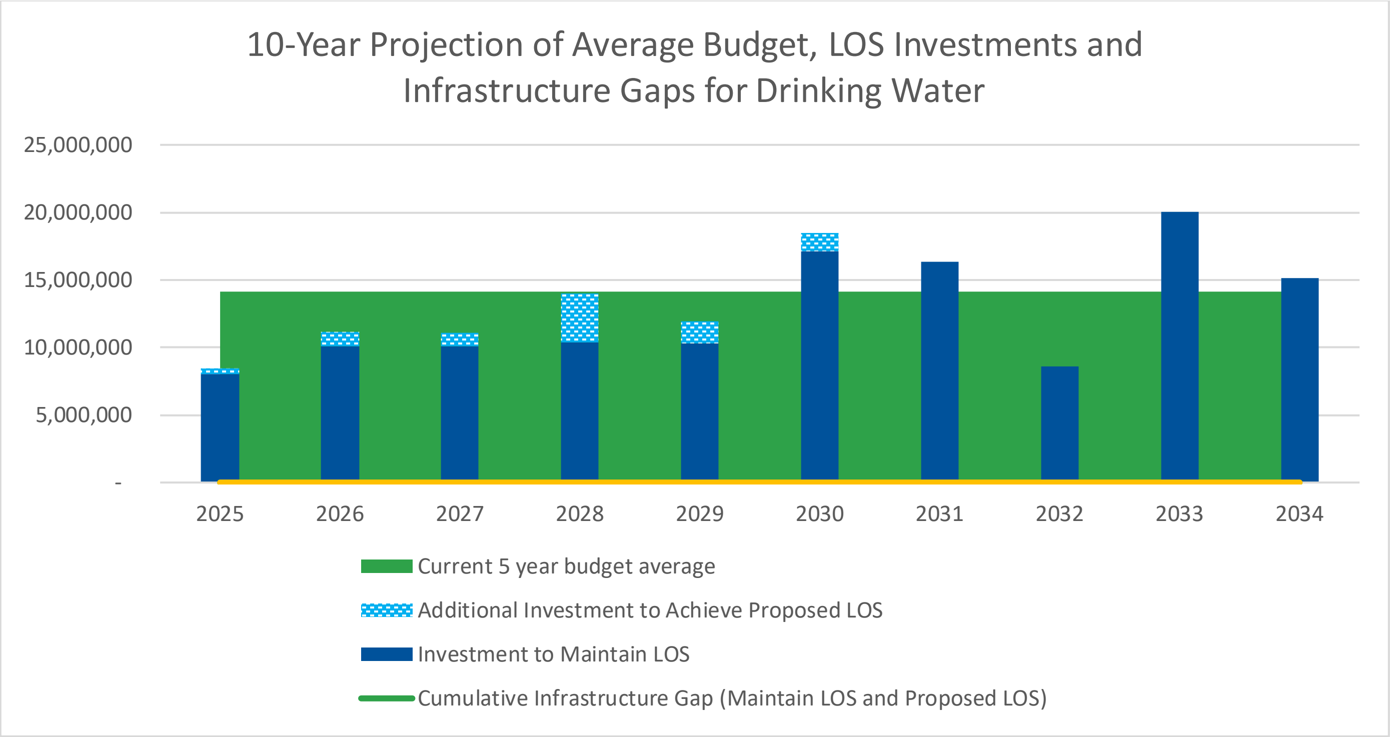


Figure 4.5: 10-Year Projection of Average Budget, LOS Investments and Infrastructure Gaps for Drinking Water

Drinking Water Assets are

100% FUNDED

4.7 Future Outlook

As asset inventories grow and are expanded to service projected growth and achieve the vision for the City, there will need to be increased ongoing renewals and funding to operate and maintain them over time.

The major growth / service improvement related infrastructure projects for Drinking Water currently underway or on the horizon include but are not limited to: Burwood extension, Central Avenue Development, other road and service extensions.

The total estimated increase in value of Drinking Water assets for these projects is estimated at $9.1 million. These will result in an approximate annual lifecycle investment increase of $66,000 by 2034.

The figure below summarizes the City's estimated expenditures for the new infrastructure projects by year:

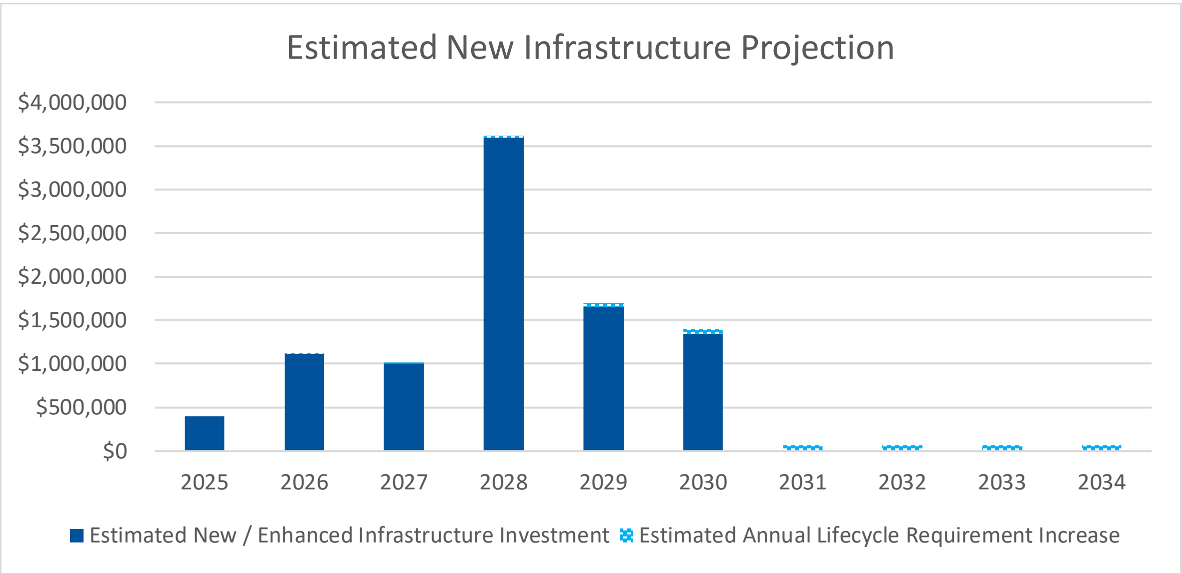


Figure 4.6: Estimated Drinking Water New Infrastructure Projection

There is no identified infrastructure deficit for proposed levels of service in the Drinking Water section which includes estimated annual lifecycle investments that will be required for these new assets once they are built. As new infrastructure is built and existing assets are expanded based on master plans, studies, and models to service forecasted growth, they will require additional investment to renew them as they deteriorate over time. The Drinking Water Financial Plan is updated every five (5) years to capture changing asset investment requirements.

STORMWATER

Assets that relate to the collection, transmission, treatment, retention, infiltration, control, or discharge of stormwater.

5.0 Stormwater Assets

The City of Thunder Bay's stormwater assets manage the runoff of rain and melted snow that flows overland into catchbasins, ditches, streams, rivers and lakes. Stormwater is soaked up like a sponge in natural landscapes, which then nourishes plants and slowly replenishes streams, lakes, wetlands and aquifers. In more urban areas, impervious or hard surfaces such as asphalt, concrete and rooftops prevent stormwater from naturally soaking into the ground. Instead, the water runs quickly into catchbasins and sewer systems and then to lakes and rivers. These hard surface areas create more stormwater runoff of poorer quality carrying more pollutants such as oil, grit and debris into surrounding lakes and rivers. The runoff may contain chemicals, sediment and litter. In addition, the proper operation of the stormwater assets directly impacts the transportation assets. Road performance is directly impacted by drainage. Providing positive drainage in road right-of-ways and limiting ponding water increases the life of our road assets. Stormwater assets have a total replacement value of $374,936,000.

5.1. Asset Overview

The City of Thunder Bay's stormwater assets include 345 km of storm sewers, 486 km of ditches, three (3) stormwater retention ponds, more than 11,000 catch basins, 6,062 manholes, two (2) dams, 47 stormwater management facilities, 50 oil-grit separators, and 373 outlets to receiving waters. Table 5.1 outlines the inventory, replacement cost, average age and condition for each of the stormwater asset types.

Asset Class	Replacement Value	Asset Totals	Average Age	Average Condition
All Stormwater Assets	$374,936,000	See below	39 years	**Fair**
Stormwater Assets				
Storm Sewers	$350,027,000	345 km	39 years	**Fair**
Pumping Stations	$6,611,000	4 pumping stations	24 years	**Good**
Stormwater Management Facilities	$3,000,000	47	4 years	**Very Good**
Oil Grit Separators	$2,400,000	50	7 years	**Very Good**
Dams	$12,898,000	2	26 years	**Very Good**

Table 5.1: Stormwater Asset Overview

5.1.1 ASSET CONDITION

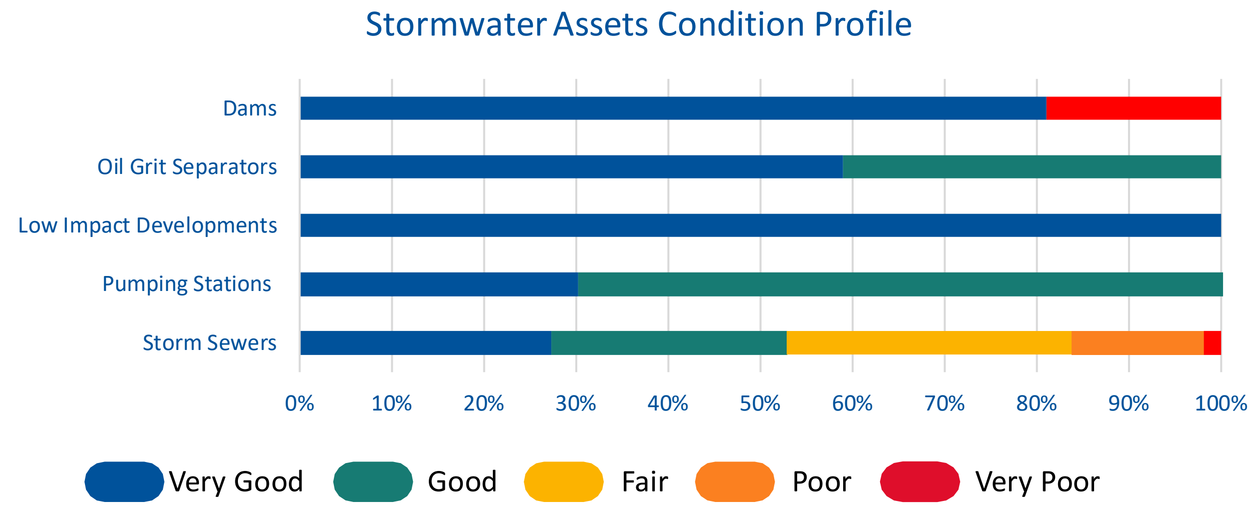


Figure 5.1: Condition Profile of stormwater assets broken down as percentage of total replacement cost.

Several components of the system such as the storm sewer system, catch basins and manholes are inspected if a problem is reported or suspected. The City's Roads Maintenance Objectives identify that each year a percentage of the City's inventory of culverts and ditches and associated works are inspected for obstructions and appropriate action is undertaken for the drainage system to function properly.

The stormwater pumping stations are inspected a minimum of once a month and an annual work order system is in place to remind and record inspection and maintenance requirements for the components of the pumping station. The stormwater management and treatment facilities and storm sewer outfalls are generally inspected on an annual basis, although seasonal inspections are often completed as the function of the facilities can change from season to season.

5.1.2 ASSET AGE

The average age and estimated useful life of the stormwater assets are displayed in the following figure:

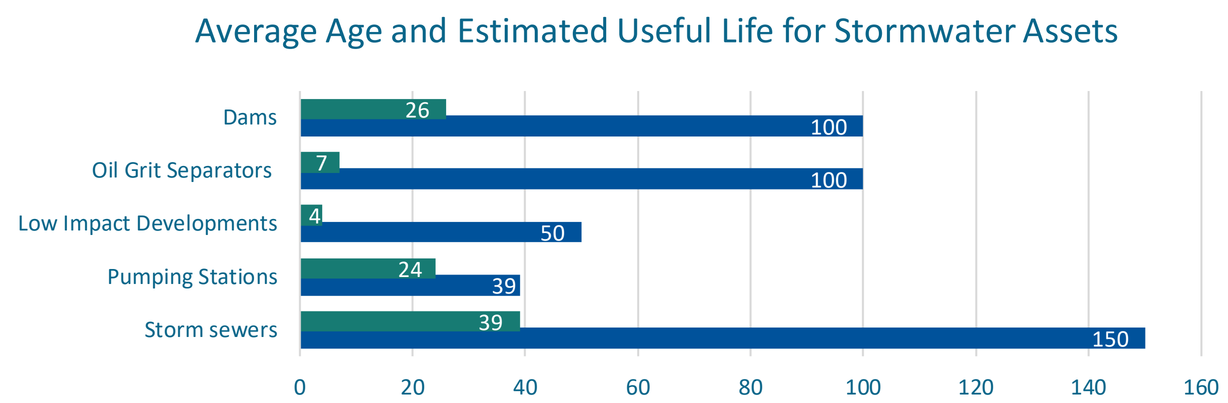


Figure 5.2: Average Age and EUL of Stormwater Assets

5.2 Lifecycle of the Asset

If the appropriate lifecycle activities are not completed and a backlog of maintenance occurs there is a potential for the failure of stormwater assets. The consequence of a failure for storm sewers are tied directly to the size of the sewer. The failure of a storm sewer may cause a significant backup throughout the system; larger storm main failures will have greater impacts. The failure of a storm sewer will have significant environmental, economic, safety and public health impacts.

Maintenance

- Maintenance of the stormwater assets happens on an as needed basis with emergency repairs, maintenance of ditches, flushing outlet structures, cleaning of oil and grit separators. Catch basins on arterials and high traffic areas are vaccuumed out annually. Actions like this support the lowest lifecycle cost by extending the length between capital projects.

Rehabilitation

- The City of Thunder Bay is able to inspect stormwater sewers with camera technology. Relining of stormwater sewers is an option to extend the lifecycle of the asset.

Replacement/Reconstruction

- Stormwater sewers are replaced based on condition determined during camera inspections or operation issues.

Disposal

- Stormwater sewers are either removed during the renewal construction or are disconnected and abandoned in place. The decision between removal and abandonment is based on construction effort, costs, and future plans. Sewers that have been abandoned are capped and filled to protect the surrounding and other infrastructure.

Growth / Service Enhancement

- Additional stormwater infrastructure required for resiliency will be added based on the Stormwater Management Plan. Expansions to previously existing facilities may occur to enhance the stormwater functions and allow for more growth area to be serviced. Projects relate to stormwater trunk extensions and expansions.

5.3 Levels of Service

Stormwater assets help to reduce flooding risks and protects roads, structures, properties and waterways. The regulation provides metrics to measure the current community (qualitative) LOS and technical (quantitative) metrics. Additionally, public survey responses were collected to aid in measuring levels of service. Survey responses can be found in Appendix I.

5.3.1 COMMUNITY LEVELS OF SERVICE

Service Attribute	Performance Measure	2023/2024 Performance	Target LOS (2025-2035)
Scope	Description, which may include maps, of the user groups or areas of the municipality that are protected from flooding, including the extent of the protection provided by the municipal stormwater management system.	Maps have been provided on pages 96 and 97 depicting the areas of the City of Thunder Bay that are protected from flooding by means of storm sewers and/or low impact developments, or stormwater retention ponds.	Increase, continue to implement the Stormwater Management Plan to enhance stormwater protection across the City.
Scope	Percentage of survey respondents that have experienced flooding impacts on their property.	45% of the 2023 Stormwater Levels of Service Survey respondents reported having experienced flooding impacts on their property.	Minimize flooding, continue to implement the Stormwater Management Plan to enhance stormwater protection across the City.
Quality / Reliability	Percentage of survey respondents that have NOT had to delay or cancel travel due to roads being flooded in the last 5 years.	66% of the 2023 Stormwater Levels of Service Survey respondents have never had to delay or cancel travel due to roads being flooded.	Maintain
Community Satisfaction	Percentage of survey respondents that feel Thunder Bay is taking enough steps to reduce the risk of flooding in the City.	The 2023 Stormwater Levels of Service Survey respondents responded with the following when asked about the City taking enough steps to reduce the risk of flooding: - 25% said Yes - 33% said No - 42% said Unsure	Increase communication around stormwater management initiatives.

Table 5.2: Community Levels of Service for Stormwater Assets. Survey responses from the 2023 Stormwater Levels of Service Survey can be found in Appendix I.

5.3.2 Technical Metrics Level of Service

Service Attribute	Performance Measure	2023/2024 Performance	Target LOS (2025-2035)
Scope	Percentage of properties in the municipality resilient to a 100-Year Storm.	95.23% percent of properties are resilient to riverine flooding from a 100-year storm. A map illustrating the flood resilience for riverine flooding based on a 100-Year Storm and the Regional Storm can be found on page 98. Additional modelling is required to determine resiliency to urban flooding.	Maintain, determine resiliency for entire City to urban flooding.
Scope	Percentage of the municipal stormwater management system resilient to a 5-year storm.	50% of the stormwater management system is resilient to a 5-year storm. In 2015 the design standard changed from a 2-year storm to a 5-year storm as a minimum rainfall intensity.	Increase resilience
Quality / Reliability	Number of calls to dispatch regarding ditch concerns.	The City of Thunder Bay responded to 240 reports from the public regarding ditches in 2024.	Continue to respond to all citizen concerns. Minimize flooding concerns.
Cost Efficiency	Capital re-investment rate vs. target re-investment rate	0.34% vs. 1.17%	Increase

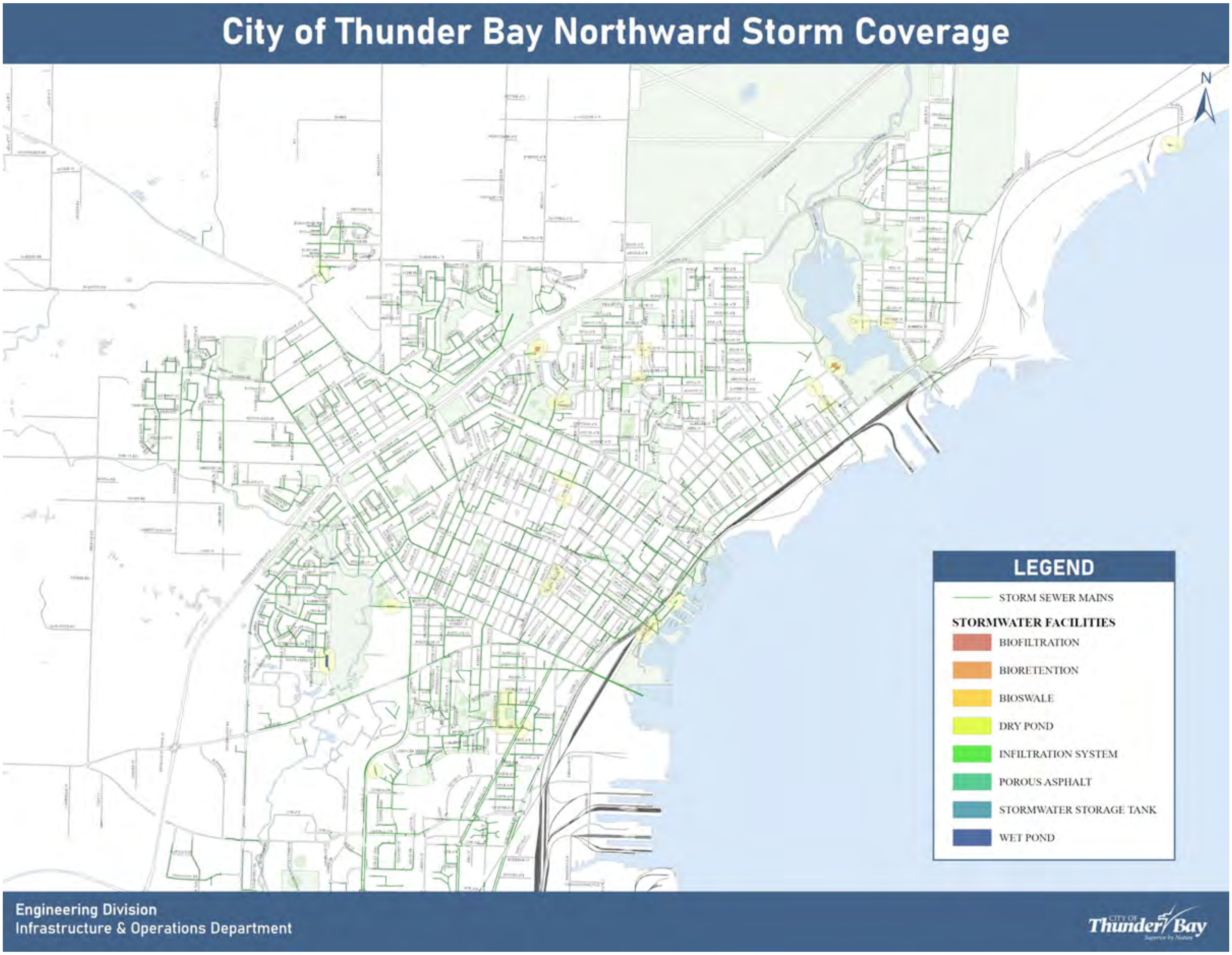
Table 5.2: Technical Levels of Service for Stormwater Assets.

What is the 100-Year Storm?

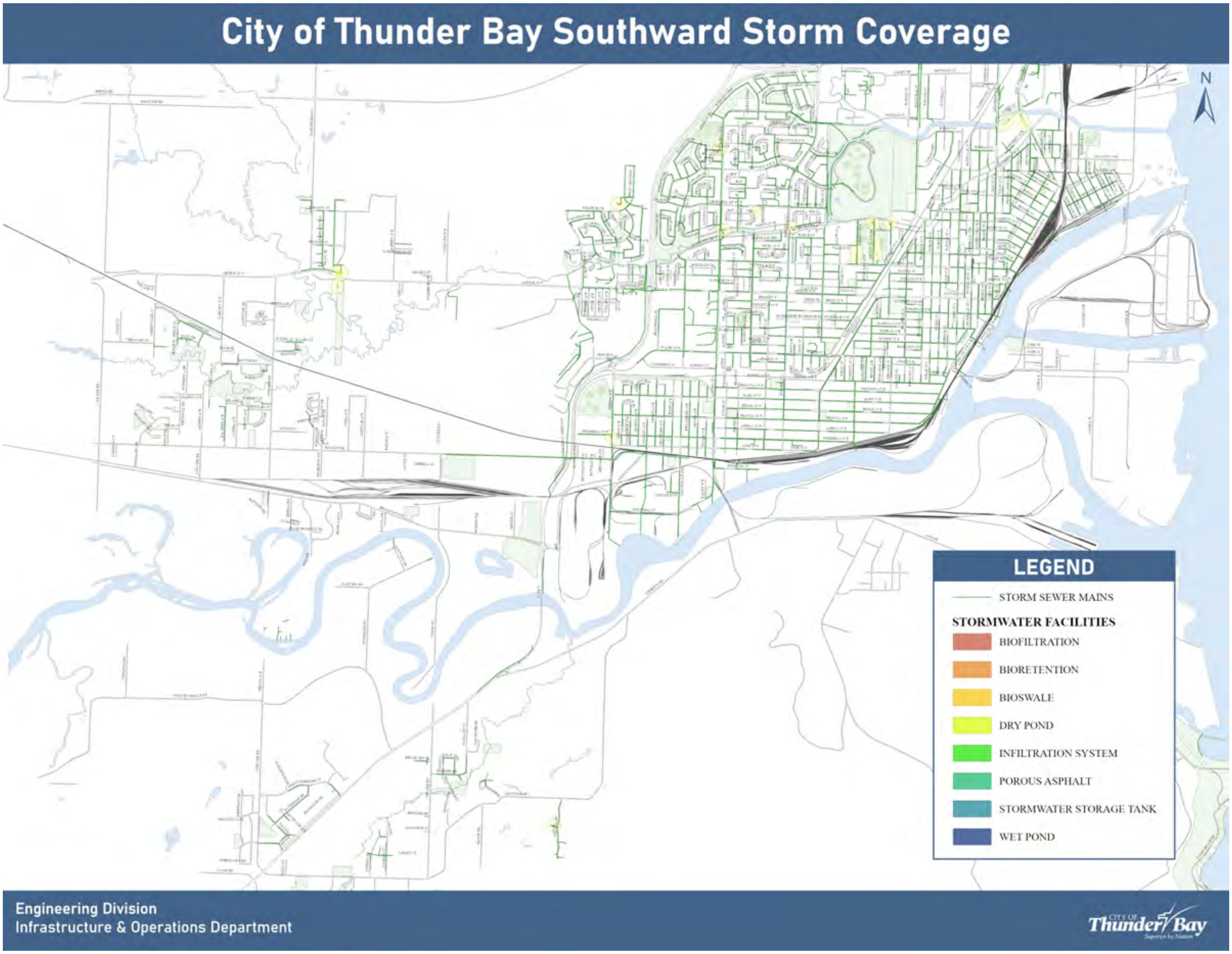
The term “100-year storm” is used to simplify the definition of a rainfall event that statistically has a one (1) percent chance of occurring or being exceeded in any given year, at any given place. A 100-year storm does not mean that it will only occur once every 100 years.

What is the Regional Storm?

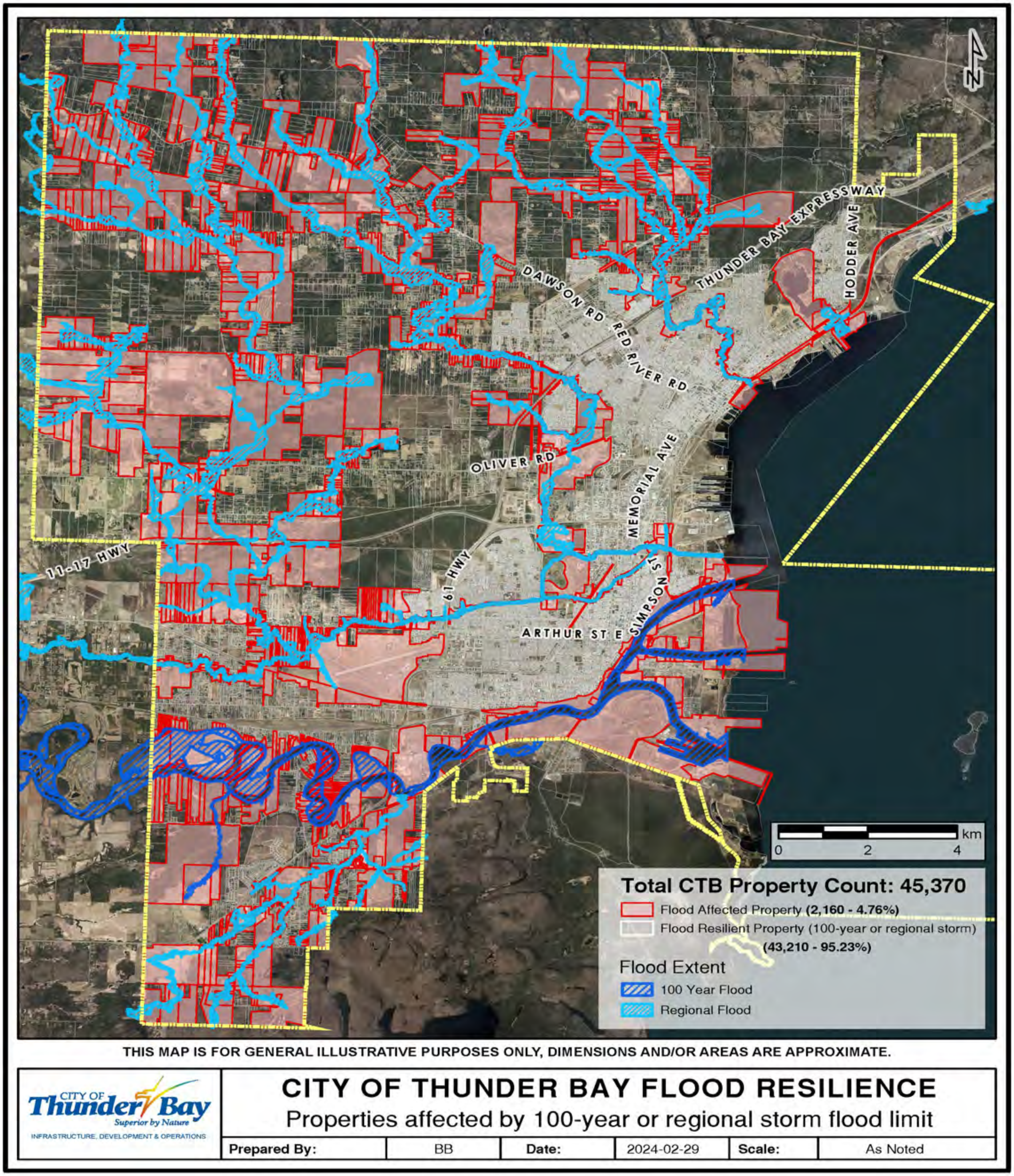
A Regional Storm is a specific rainfall event used by the Lakehead Region Conservation Authority to model and assess the potential impacts of flooding in the watersheds. The Regional Storm for Northern Ontario is a storm that occurred in Timmins, Ontario in 1961 in which 193 millimetres of rain fell in 12 hours. In most cases the Regional Storm exceeds the 100-year storm.



Map 5.1 Thunder Bay Northward Storm Map



Map 5.2: Thunder Bay Southward Storm map



Map 5.3: Thunder Bay Flood Resilience Map

5.4 Risk

The stormwater system is interdependent, relying on assets downstream to continue to drain any stormwater collected, while relying on upstream assets to limit amounts of water delivered. Pumping stations are dependent on electricity.

Many other asset classes are dependent on stormwater assets to provide drainage and prevent flooding.

Likelihood and Consequences

Age and assessed conditions are two of the most significant indicators of failure likelihood, with pumping stations, grey components of LIDs, and stormwater sewers predicted by age, while dams and “green” components of low impact developments (soil and plants) are better predicted by condition ratings. The likelihood of a stormwater sewer failure is also determined by material, with sewers made of PVC or concrete least likely to fail, while sewers made of wood stave, or corrugated steel are more likely to fail.

Consequences are highest in the case of a dam failure, which would cause severe flooding downstream. For other assets, consequences are considered higher for larger diameter and trunk sewers, both for cost of replacement and impact on services, and consequences are lower with local, smaller diameter sewers. For stormwater management facilities, assets with a larger catchment area and higher replacement cost are predicted to have higher consequences of failure. However, even a failure of a minor stormwater asset can lead to significant localized flooding.

The following risk profile provides a visual representation of the stormwater assets in the very low to very high risk categories.

Very Low	Low	Moderate	High	Very High
$147 million	$158 million	$51 million	$9 million	$5 million

Figure 5.3: Stormwater Asset Risk Profile

Key Hazards

Significant hazards identified include foregone maintenance, extreme precipitation, and land subsidence and other land movement events representing significant hazards. For green components found in LIDs, hazardous material or oil and gas spills can cause significant damage, and they are more likely to be exposed to the hazard as any spill in the catchment area will drain towards the asset if not contained. Regular maintenance of all stormwater assets is considered essential.

Risk Drivers Factors that are expected to increase risks over the lifespan of the assets include potential for underfunded maintenance, increased development without stormwater management, and a changing climate leading to more intense precipitation events and associated erosion.

5.5 Climate Change Considerations

Stormwater assets are directly impacted by climate change such as flooding due to significant rainfall. The repair, renewal and replacement of stormwater assets consider the following climate risks, adaptation and mitigation opportunities.

Climate Risks Identified with Stormwater Assets:

- Potential increased infrastructure and building damage as more frequent and severe weather events increase overland flooding from stormwater ponding in low-lying areas.
- Increased springtime flooding and decrease in spring time groundwater recharge due to greater frost depth from extreme cold.

Future Climate Adaptation Opportunities:

- Designing and implementing measures to minimize future storm impacts with green infrastructure and low impact development (LID) facilities that reduce and treat stormwater.
- Increasing the capacity of the minor drainage system in areas that experience flooding problems and bottlenecks in trunk systems by up-sizing the storm sewers.

Future Climate Mitigation Opportunities:

- Explore opportunities for enhanced carbon sequestration through green infrastructure on city-owned and private land (aligns with Objective #2, Thunder Bay Net-Zero Strategy).

Low impact development (LID) is a term used to describe a land planning and engineering design approach to managing stormwater runoff. LID emphasizes conservation and use of on-site natural features to protect water quality. This approach implements engineered small-scale hydrologic controls to replicate the pre-development hydrology through infiltrating, filtering, storing, evaporating and detaining runoff close to its source. Some examples of LID techniques are bio-retention, permeable pavement, rain barrels, grassed swales, green roofs, reducing impermeable surfaces and tree box filters.

5.6 Investing in the Assets

To maintain the proper level of repair, renewal and replacement of all assets, the annual sustainable funding amount is $4,360,000. The 5 year historical budgeted funding allocated to all assets was $1,256,000. This means that there is an annual infrastructure deficit, or shortfall, of **$3,104,000.** Over the next ten years this could result in a cumulative deficit of $31,040,000 to maintain LOS, or a cumulative deficit of $31,807,000 for proposed LOS.

The shortfall has and will continue to create a backlog of work and will require significant funding to overcome. A 10 year projection of the average budget, LOS Investment and infrastructure gaps for all stormwater assets is shown below.

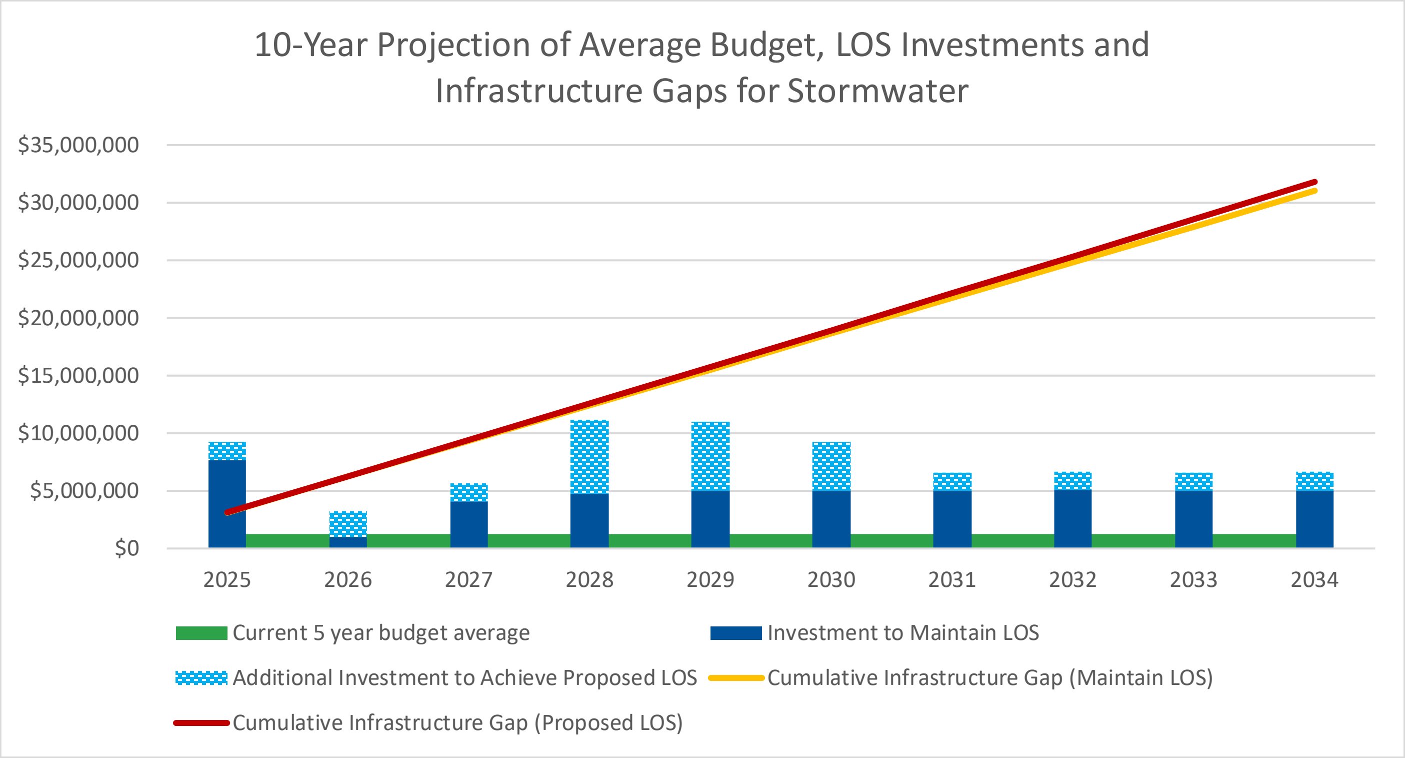


Figure 5.4: 10-Year Projection of Average Budget, LOS Investments and Infrastructure Gaps for Stormwater

Stormwater Annual Infrastructure Deficit:

$3,104,000

5.7 Future Outlook

As asset inventories grow and are expanded to service projected growth and achieve the vision for the City, there will be a need for increased ongoing renewals and funding to operate and maintain them over time.

The major growth / service improvement related infrastructure projects for Stormwater currently underway or on the horizon include but are not limited to: Victoriaville Reimagined, Central Avenue Development, other road and service extensions, and low impact developments for disaster mitigation and adaptation.

The total estimated increase in value of stormwater assets for all of these projects is estimated at $28.6 million. The will result in an approximate annual lifecycle investment increase of $115,872 by 2034.

The figure below summarizes the City's estimated expenditures for the new infrastructure projects by year:

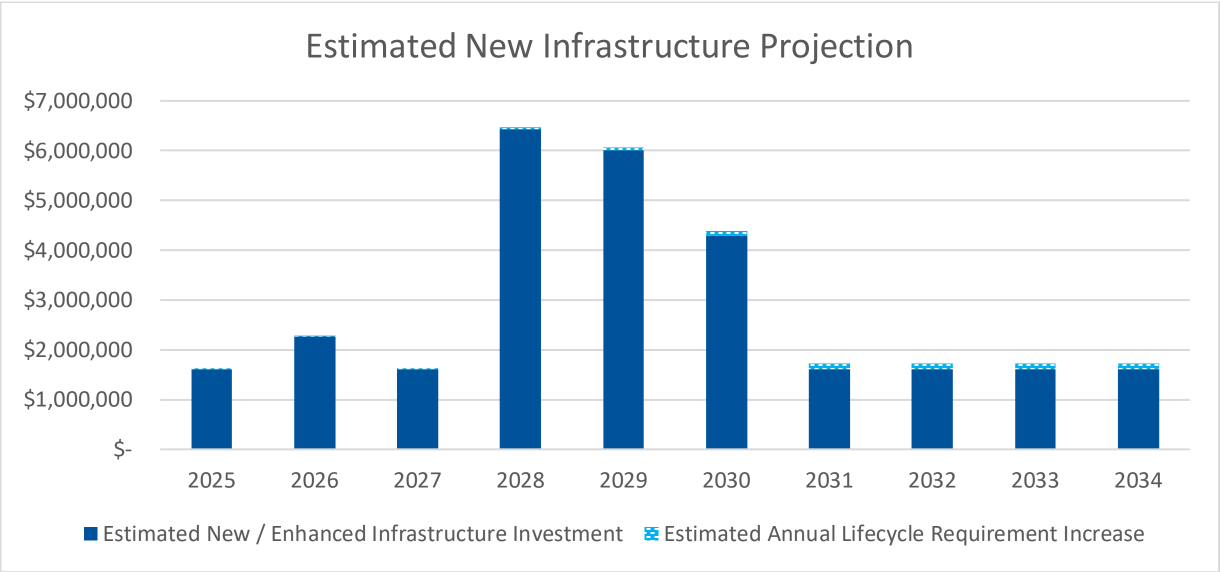


Figure 5.5: Estimated Stormwater New Infrastructure Projection

The infrastructure deficit for proposed levels of service in the previous section includes estimated annual lifecycle investment requirement that will be required for these new assets once they are built. As additional new stormwater infrastructure is built and existing assets are expanded based on master plans, studies, and models to service forecasted growth, they will require investment to renew them as they deteriorate over time. This will place additional pressure on maintaining the state of stormwater infrastructure.

WASTEWATER

Assets that relate to the collection, transmission, treatment, or disposal of wastewater.

6.0 Wastewater Assets

The City of Thunder Bay's wastewater network is comprised of the Atlantic Avenue Water Pollution Control Plant (WPCP) and the sanitary sewer network. The WPCP provides service to residents of Thunder Bay and has a rated capacity to treat 84.5 million litres per day. Wastewater assets have a total replacement value of $708,267,000.

6.1 Asset Overview

The wastewater network includes the WPCP, four (4) lift stations, 34,969 service connections, and 526 kilometers of sanitary sewers. Table 6.1 outlines the inventory, replacement cost, average age and condition for the wastewater assets.

Asset Class	Replacement Value	Asset Totals	Average Age	Average Condition
All Wastewater Assets	$708,267,000	See below	63 years	**Fair**
Wastewater Assets				
Sanitary Sewers, Service connections and Manholes	$522,677,000	526 km of sanitary sewers, 6,062 manholes, 34,969 service connections	63 years	**Poor**
Water Pollution Control Plant and Process Assets	$183,349,000	1 (Atlantic Ave WPCP)	18 years	**Good**
Lift Stations	$2,241,000	4 lift stations	40 years	**Good**

Table 6.1: Wastewater Asset Overview

6.1.1 ASSET CONDITION

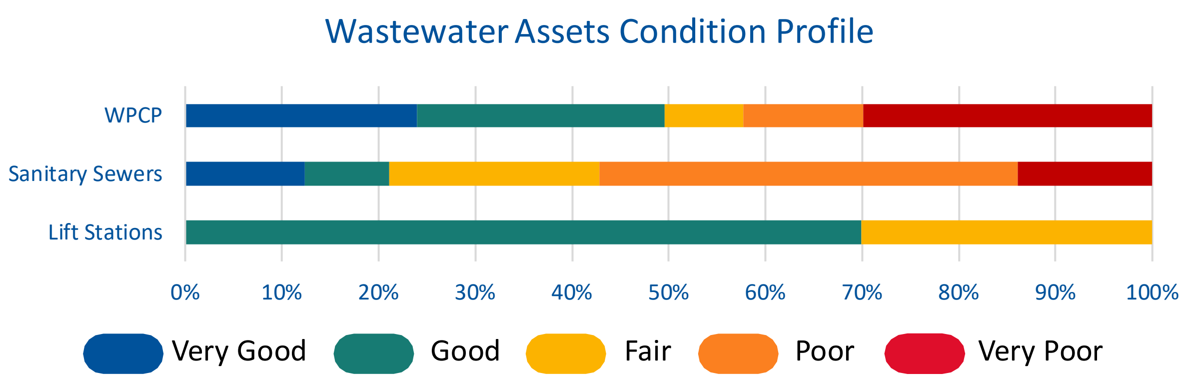


Figure 6.1: Wastewater Assets Condition Profile broken down as a percentage of replacement cost.

Inspection of the City's sanitary sewers is completed with camera technology. Approximately 40 km of the City's 526 km of sewers are inspected yearly. Based on the defects observed in the sewer, it is given a one to five rating.

6.1.2 ASSET AGE

The average age of the assets within the Wastewater network:

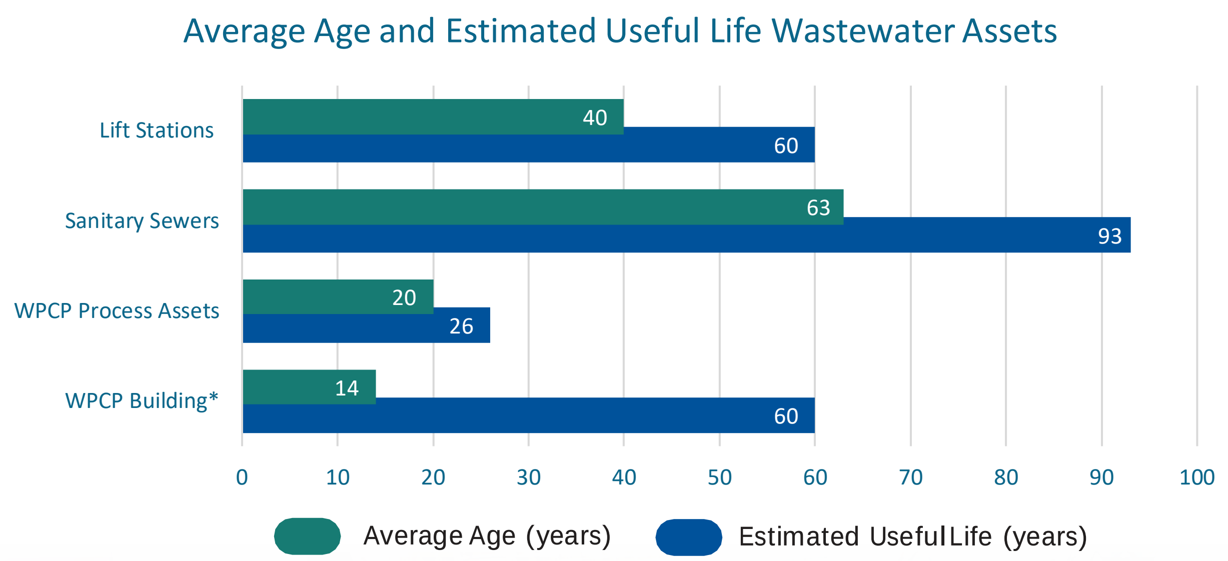


Figure 6.2: Average Age and EUL of Wastewater Assets.
**The Water Pollution Control Plant age is based on the last building expansion in 2009. It was built in 1964 with expansions in 1975, 1991, 2004, 2009, and major investments in 2014 and 2016.;*

6.2 Lifecycle of the Asset

Wastewater assets require the proper lifecycle activities to collect and treat sewage and safeguard residents health and the environment. If the proper lifecycle activities do not occur, there is a potential risk of asset failure, which may result in consequences such as environmental, economic, public health, and safety impacts.

The WPCP provides wastewater treatment for the entire sanitary sewer services within the City of Thunder Bay. Operation of the WPCP is regulated by the Ministry of Environment, Conservation and Parks (MECP) under the Environmental Protection Act, as well as additional reporting requirements for Environment and Climate Change Canada (ECCC) under the Wastewater Systems Effluent Regulation. A detailed description of the WPCP, lift stations and related operating criteria can be found in the annual wastewater report available on the City's website.

Maintenance

- Maintenance of wastewater assets happens on an as needed basis with emergency repairs and preventative maintenance. Maintenance actions support the lowest lifecycle cost by extending the length between capital projects.

Rehabilitation (minor)

- The City is able to inspect sanitary lines with camera technology. Rehabilitation, such as grouting, seals cracks and prevents ingress of tree roots and groundwater infiltration to maintain capacity and extend the overall life of the asset. For sanitary sewers with more deterioation, activities such as relining can be used to extend the useful life of a pipe.

Replacement/Reconstruction

- Sanitary lines are replaced based on camera rating and operational issues.

Disposal

- Some combined sanitary sewers have been repurposed as storm sewers in the past as part of the City's sanitary/storm system separation. There are no opportunities for this going forward.
- Sanitary sewers are either removed during the renewal construction or are disconnected and abandoned in place. The decision between removal and abandonment is based on construction effort, costs, and future plans. Sewers that have been abandoned are capped and filled to protect the surrounding and other infrastructure.

Growth / Service Improvement

- Replacement of local wastewater collection pipe sections with an increased size as appropriate to increase capacity.
- Linear projects relate to extensions and expansions to service previously unserved areas.
- Plant and Lift Station expansions may be necessary for additional capacity to accomodate growth.

6.3 Levels of Service

The wastewater network collects and treats the wastewater from homes and businesses. Wastewater travels through our sanitary sewer system to the WPCP for treatment.

The *Regulation* provides metrics to measure the current community (qualitative) LOS and technical (quantitative) metrics. Additionally, the *Regulation* requires the Municipality to report on the energy consumption for such assets that would measure energy usage and operating efficiency. Survey responses from the 2023 Wastewater Levels of Service Survey can be found in Appendix I.

6.3.1 COMMUNITY LEVELS OF SERVICE

Service Attribute	Performance Measure	2022/2023 Performance	**Target LOS (2025-2035) / Associated Plan**
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system.	A map has been provided on page 113 depicting the user groups and areas that are connected to the wastewater service system.	Increase in service connections based on growth and intensification.
Scope	Percentage of survey respondents that are connected to Thunder Bay's municipal wastewater sewer service.	90% of the 2023 Wastewater Levels of Service Survey respondents are connected to the municipal wastewater sewer service.	Increase in service connections based on growth and intensification.
Accessibility	Percentage of survey respondents that have a front clean out to enable inspection and maintenance of sewer connections.	52% of the 2023 Wastewater Levels of Service Survey respondents have a front clean out. 28% of respondents were unsure if they have a front clean out.	Increase communication around the importance of having a front clean out.
Reliability	Percentage of survey respondents that rated the City's sanitary sewer collection system and services Good or Very Good.	58% of the 2023 Wastewater Levels of Service Survey respondents rated the sanitary sewer collection system and services Good or Very Good.	Increase satisfaction. Implementation of Environmental Compliance Approval for Municipal Sewage Collection System

Reliability	Description of how combined sewers in the municipal wastewater system are designed with overflow structures in place which allow overflow during storm events to prevent backups into homes.	470 m of combined sewer system and 5 catch basins remain to separate. Most of this will be completed in 2025. There are two sanitary sewer emergency overflows directed to watercourses that remain. They include the Montreal Street pumping station to the Kaministiquia River and the overflow on the McVicar trunk sewer to McVicar Creek. Previously, there were many combined sewer overflows (CSO) that discharged into local rivers. These had regulating manholes that allowed high flows during storm events in the combined sewer to overflow to the river. Many of these former combined sewer overflows were converted to duckbill valves at the river outfalls in the 1990s to prevent river water from backing up into the combined sewers as the original flap gate style valves in the regulating manholes were subject to being held open by sticks and debris from the river. Currently there is one left in the system that is scheduled for removal as part of a storm separation project under the Pollution Prevention and Control Plan.	Reduce based on the Pollution Prevention and Control Plan
Reliability	Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches.	The City of Thunder Bay had a total of four (4) combined sewer overflow (CSO) points in 2024. For the four (4) CSO points, there was a total of one (1) overflow event with a total volume of 2.8 m^3 discharged in 2024.	Minimize overflows

Reliability	Description of how stormwater can get into sanitary sewers in the municipal wastewater system causing sewage to overflow into streets or backup into homes.	Rivers can back up into combined sewers where outlet flapper gates or duckbill valves get stuck open due to debris. Stormwater can enter the sanitary network where overflow pipes exist between sanitary and storm sewers or from roof leader and foundation drain connections to the sanitary system. Stormwater can also enter the sanitary system at manholes through holes in manhole lids, improper sealing or damage of the manhole.	Reduce as per PPCP
Reliability	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to avoid events described.	Historically CSOs were converted to duckbill valves at river outfalls to prevent river backup into combined sewers. The City has two (2) remaining regulating type maintenance holes with flap gates combined with high pipe inverts that flow to the Kaministiquia River still existing. Most overflow pipes between sanitary and storm sewers have been abandoned, plugged and/or removed. Repairs to and sealing of manholes are completed as issues are identified. New technologies addressing stormwater inflow issues are assessed as they become available. As new storm sewers are constructed, property owners are encouraged to connect their roof leaders and foundation drains.	Reduce as per PPCP.

Table 6.2: Community Levels of Service for Wastewater Assets; Survey responses from the 2023 Water Levels of Service Survey can be found in Appendix I.

6.3.2 TECHNICAL METRICS LEVEL OF SERVICE

Service Attribute	Performance Measure	2023/2024 Performance	**Target LOS (2025-2035) / Associated Plan**
Scope	Percentage of properties in the municipality connected to the	There are 34,969 or 80.9% of properties connected to the wastewater system.	Increase based on growth and intensification

	municipal wastewater system.		
Quality / Reliability	Number of sewer issues called in to Dispatch.	There were 1384 sewer issues called in to Dispatch in 2024.	Continue to respond to all citizen concerns.
Reliability	Description of the effluent that is discharged from sewage treatment plants in the municipal water system.	A chart has been provided on page 114 with the WPCP Annual Average Effluent Quality from 2013-2024 outlining the effluent discharged to surface waters after treatment.	Maintain
Quality / Reliability	The number of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system.	There was 1 event or 0.003% of the total number of properties connected to the system where combined sewer flow exceeded the system capacity in 2024.	Maintain
Quality / Reliability	The number of connect-days per year impacted due to wastewater backups compared to the total number of properties connected to the municipal wastewater system.	There were 30 connect-days or 0.09% of the total number of properties connected to the system impacted due to wastewater backups.	Reduce, Swift comply program in place to prevent sewer backups from Fats, Oils, and Greases.
Quality / Reliability	The number of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system.	There were two (2) effluent violations or 0.008% of properties connected to the system.	Reduce
Environmental Stewardship	Energy Consumption	See energy tables on next page 111.	Decrease Natural Gas usage. Increase electricity usage. Implements renewable energy projects.
Cost Efficiency	Capital re-investment rate vs. target re-investment rate	1.91% vs. 1.91%	Maintain

Table 6.3: Technical Levels of Service for Wastewater Assets

6.3.3 WPCP Annual Average Effluent Quality

Year	Total Treated Volume ML	Average Treated Volume MLD	% of Rated Capacity	Days Flow > Rated Capacity (84.5 MLD)	Precipitation mm	BOD Carb 5 mg/L	TSS mg/L	Total Phos mg/L	E Coli #/100 mL	pH SU	Temp °C
2013	29,948	78.1	92	101	595	6.8	8.4	0.4	97	7.5	14.1
2014	29,664	77	91	97	634	8.2	8	0.4	50	7.2	13.8
2015	29,396	76.6	91	96	667	6.2	7.6	0.4	66	7.2	14.3
2016	31,144	81	96	99	639	5.6	8.5	0.4	80	7.4	14.9
2017	28,886	82	97	131	666	7	6.9	0.3	51	6.9	14
2018	25,681	70.3	83	38	633	5.6	7.1	0.3	73	6.4	13.9
2019	26,317	72.1	85	88	673	6.9	8.3	0.3	52	7.5	13.3
2020	23,409	63.9	76	18	487	6.4	6.9	0.3	60	7.4	14.1
2021	21,230	57.2	68	19	554	10.5	10.2	0.4	52	7.4	14.1
2022	28,026	76.7	91	80	798	7.4	8.5	0.3	138	7.4	13.8
2023	21,805	59.7	71	43	389	11.3	11.2	0.4	42	7.3	14.6
2024	21,493	58.7	69	15	553	7.5	9.2	0.3	31	7.3	12.7
Average	**26,417**	**71**	**84**	**69**	**612**	**7**	**8**	**0**	**72**	**7**	**14**
Limit	**-**	**-**	**-**	**-**	**-**	**25**	**25**	**1**	**200**	**6.0 to 9.6**	**No limit**
Max	**31,144**	**82**	**97**	**131**	**798**	**11**	**11**	**0**	**138**	**8**	**15**
Min	**21,230**	**57**	**68**	**18**	**389**	**6**	**7**	**0**	**42**	**6**	**13**

Table 6.4: Annual Effluent Quality

6.3.4 ENERGY CONSUMPTION

The City of Thunder Bay tracks and monitors energy usage within the wastewater facilities. Utility consumption data and costs are monitored and tracked digitally for all commodities including electricity, natural gas and water. This allows for the creation of a variety of reports including, but not limited to benchmarking, identifying energy savings opportunities and reporting greenhouse gas emissions. Data can also be viewed over time to compare a variety of parameters including consumption and costs with built in weather normalization.

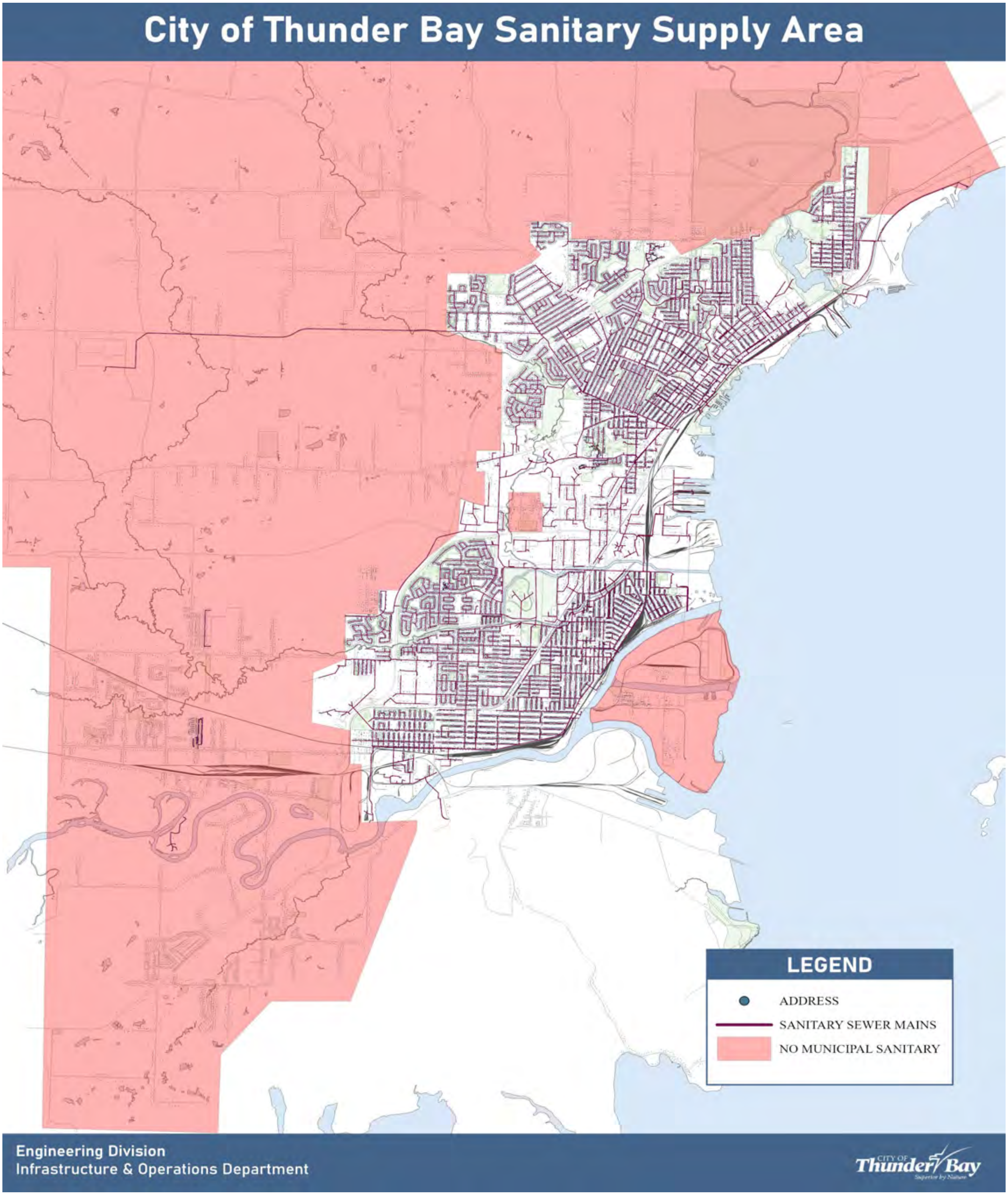
Energy Consumption for Atlantic Avenue Water Pollution Control Plant and Pumping Stations

Category	Electricity (KWH)		Natural Gas (m^3)	
Year	**2023**	**2024**	**2023**	**2024**
WPCP	11,408,607	11,452,380	919,992	870,169
Pumping Stations	33,227.00	34,886.00		

Table 6.5: WPCP and Pumping Stations Energy Consumption

Biogas contains approximately 60% methane (the combustible component of natural gas). The cogeneration system at the WPCP converts the biogas from the treatment process to electricity and captures the heat generated from the engine. The biogas can also be used in the plant boilers to generate heat.

In 2024, there was 2,000 MWh of electricity generated on site at the Water Pollution Control Plant. Over 85% of gas generated in digesters was used to generate electricity or heat on-site buildings.



Map 6.1: Sanitary Service Area

6.4 Risk

The Wastewater treatment plant is dependent on sanitary sewers, electricity, communications, interdependent within class, as well as equipment and fleet for maintenance. Facilities are also dependent on wastewater infrastructure to remain operational.

Likelihood and Consequences

Age and assessed conditions are two of the most significant indicators of failure likelihood. The likelihood of a sewer failure is also determined by material, with sewers made of concrete and plastics least likely to fail, while sewers made of made of clay or iron more likely to fail.

Consequences are considered highest for the Water Pollution Control Plant itself, followed by higher capacity sewers and pumping stations.

Failures at any level can lead to environmental damage, health and safety hazards, and reputational harm.

The following risk profile provides a visual representation of the wastewater assets in the very low to very high-risk categories.

Figure 6.3: Wastewater Asset Risk Profile

Key Hazards

This asset class includes a diverse mixture of facilities, equipment, and linear assets, different asset types are exposed to different hazards.

The system as a whole can be damaged by extreme precipitation, sewers can be damaged by land movements, including erosion, settling, and frost heave, and severe weather can cause significant impacts, particularly if combined with another hazard, such as extreme heat with a coolant or electricity failure.

Any foregone or delayed maintenance could have a significant impact on any aspect of this infrastructure class.

Risk Drivers

Factors that are expected to increase risks include a changing climate leading to more intense precipitation events and associated inflows and infiltration.

6.5 Climate Change Considerations

The wastewater network is directly impacted by climate change. Weather events such as heavy rain and flooding can cause pressurized flows and joints to fail, sewers to deform or collapse, sewer backups and sewer overflows. The WPCP is dependent on electricity and susceptible to power outages caused by wind and ice storms.

The repair, renewal and replacement of wastewater assets consider the following climate risks, adaptation and mitigation opportunities.

Climate Risks Identified with Wastewater Services:

- Potential increased service disruptions in services with more frequent and severe weather events.
- Potential increased maintenance and replacement costs as infrastructure durability and lifespan decreases with more frequent and severe weather events.
- Potential increased wastewater treatment and management as more frequent and severe weather events increase inflows from storm water runoff to wastewater overflow.

Current Climate Adaptation Measures:

- Capacity of the wastewater system to respond to extreme weather is monitored.
- Wastewater and stormwater sewer separation is almost complete, reducing environmental risks and weather impacts on WPCP.
- Financial assistance is provided to residents to install sewer back-up prevention valves in their homes (drainage rebate).

Future Climate Mitigation Opportunities:

- The WPCP requires substantial amounts of energy to operate. Increasing process efficiency will result in reduced energy consumption and GHG emissions (aligns with Objective #2, Thunder Bay Net-Zero Strategy).
- In addition to improving process efficiency, fuel switching will be explored to reduce the use of fossil fuels in operations.

6.6 Investing in the Assets

To achieve the sustainable level of funding to provide wastewater collection and treatment services to the City for both the short and long-term, the wastewater system has a Council approved 20 Year Financial Plan with the goal of achieving financial sustainability, full-cost recovery and affordability for consumers while maintaining the City's existing and future service levels along with a reserve for proposed levels of service for sewage collection and treatment.

To maintain the proper level of repair, renewal and replacement of the Wastewater network, the annual sustainable funding amount is $13,482,000. The five (5) year historical budgeted funding allocated to the wastewater assets was in line with the sustainable funding amount, meaning there is no funding deficit for the wastewater assets. There are no identified infrastructure gaps for funding proposed levels of service.

A 10 year projection of the average budget, LOS Investment and infrastructure gaps for all Wastewater assets is shown in Figure 6.4 below.

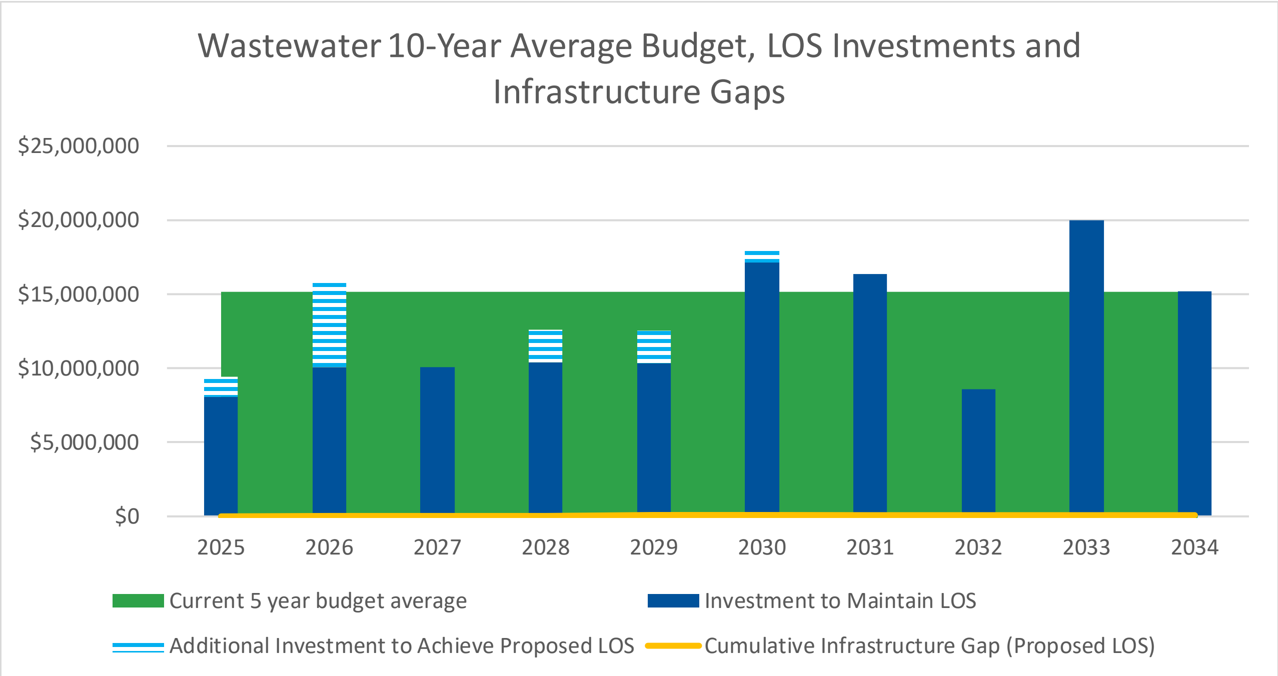


Figure 6.4 : Wastewater 10-year average budget, LOS Investment and infrastructure gaps

Wastewater Infrastructure is

100% FUNDED

6.7 Future Outlook

As asset inventories grow and are expanded to service projected growth and achieve the vision for the City, there will be a need for increased ongoing renewals and funding to operate and maintain them over time.

The major growth / service improvement related infrastructure projects for Wastewater currently underway or on the horizon include but are not limited to: Central Avenue Development, Burwood Extension, other road and service extensions.

The total estimated increase in value of land improvement assets for these projects is estimated at $12 million. These will result in an approximate annual lifecycle investment increase of $83,000 by 2034.

The figure below summarizes the City's estimated expenditures for the new infrastructure projects by year:

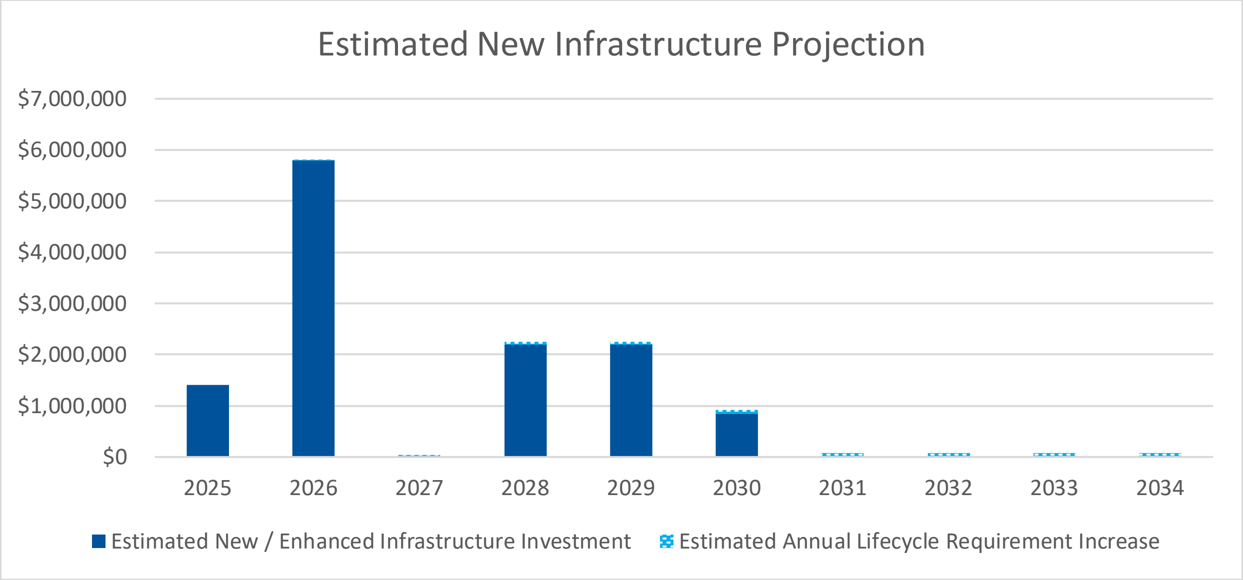


Figure 6.5: Estimated Wastewater New Infrastructure Projection

There is no identified infrastructure deficit for the proposed levels of service in the Wastewater section which includes estimated annual lifecycle investment that will be required for new assets once they are built. As new infrastructure is built and existing assets are expanded based on master plans, studies, and models to service forecasted growth, they will require additional investment to renew them as they deteriorate over time. The Wastewater Financial Plan is updated every five (5) years to capture changing asset investment requirements.

FACILITIES

Buildings and structures that provide key services to the community, some of which include recreation, administrative, social services, emergency services, and more.

7.0 Facilities

The City of Thunder Bay owns and operates a vast array of diverse buildings and structures as part of its built environment that provide key services to the community, some of which include recreation, administrative, emergency services, social services, parks, and operations. These assets support service delivery by providing safe and efficient facilities for use by staff, Council, Boards and Agencies and members of the public. The City manages and maintains these assets to meet safety, regulatory requirements, and functional requirements, in a reliable and sustainable manner. Facilities assets have a total replacement value of $727,618,000.

7.1 Asset Overview

The Facility asset inventory includes 193 facilities located throughout the service delivery area of the City of Thunder Bay. It also includes several facilities owned by the City but managed by a board and/or agency as they operate and provide services from these locations. It does not include Water, Wastewater or Stormwater facilities as those are reported under the respective sections. A Facility asset includes the building and systems to support it for example, the building structure, roof, HVAC, mechanical/ electrical systems and lifesaving systems in the building.

Table 7.1 outlines the inventory, replacement cost, average age, and condition for each asset in the category. Replacement costs are based on like-for-like replacement. Improvement values to meet Net-Zero targets or functionality are not included.

Asset Class	Facilities Included	Replacement Value	Asset Totals	Average Age	Average Condition
All Facilities Assets		$727,618,000	193 Facilities	46 years	**Fair**
City of Thunder Bay					
Administrative	City Hall, Archives, Pool 6, Victoriaville Civic Centre, McKellar Mall, Whalen Building	$95,796,000	6 Facilities 293,201 sq. ft.	66 years	**Fair**
Emergency Services	EMS and Fire	$53,837,000	15 Facilities 133,757 sq. ft.	37 years	**Fair**
Operations	Egan Yard, Mountdale Yard, Solid Waste & Recycling, Animal Services, Parks North, Traffic Control & Street Lighting	$47,992,000	29 Facilities 175,061 sq. ft.	34 years	**Poor**
Parks	Prince Arthur's Landing, Chippewa Park, Trowbridge, Centennial, Golf Clubhouses, All Other Parks Buildings	$54,669,000	91 Facilities 168,929 sq. ft.	43 years	**Poor**

Recreation and Tourism	Pools, Arenas & Stadia, Community Centres, Older Adult Centres, Tourism	$199,123,000	33 Facilities 504,284 sq. ft.	46 years	**Poor**
Social Services	Daycares, Homes for the Aged, Transit	$74,945,000	5 Facilities 221,698 sq. ft	42 years	**Very Good**
Parking	Parkades	$38,500,000	2 Facilities 431,445 sq.ft	38 years	**Poor**
Outside Boards and Agencies					
Facilities Management Agreements	CN Station, Magnus Theatre, Tournament Centre, Shelter House, Museum, Sports Hall of Fame, Thunder Bay Community Auditorium	$103,958,000	8 Facilities 212,780 sq. ft.	79 years	**Good**
Thunder Bay Police Services	Balmoral Police Station	$28,165,000	1 Facility 65,500 sq.ft	39 years	**Poor**
Thunder Bay Public Library	Libraries	$30,633,000	3 Facilities 38,165 sq.ft	66 years	**Fair**

Table 7.1: Facilities Asset Overview

7.1.1 ASSET CONDITION

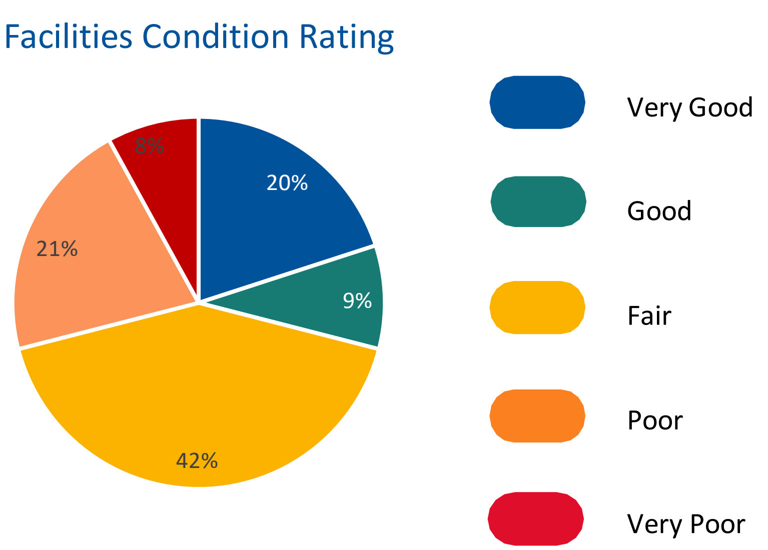


Figure 7.1: Condition Profile of Facilities broken down as percentage of total replacement cost.

Condition assessments are carried out by qualified assessors who provide objective, verified information for optimizing long-term facilities investments. Standard, comprehensive and specialized (i.e. structural, energy) assessments are completed typically on a five (5) to six (6) year basis.

To monitor facility performance over time, the City of Thunder Bay uses a Facility Condition Index (FCI) based on an industry standard asset management tool which measures an asset's condition at a specific point in time. Individual facility ratings are updated when capital work or a condition assessment is completed. The lower the value of FCI, the better condition that a facility is in.

$$\textbf{Facility Condition Index (FCI)} = \frac{\textbf{Sum of Renewal Needs in a Given Period of Time } (\$)}{\textbf{Current Replacement Value } (\textbf{CRV}) \ (\$)}$$

The 5-Scale condition rating system is as follows:

Asset Condition Rating	Facility Condition Index (FCI)
Very Good	<3%
Good	3 - 5%
Fair	5 - 10%
Poor	10 - 30%
Very Poor	>30%

7.1.2 ASSET AGE

The average age of facilities is 46 years.

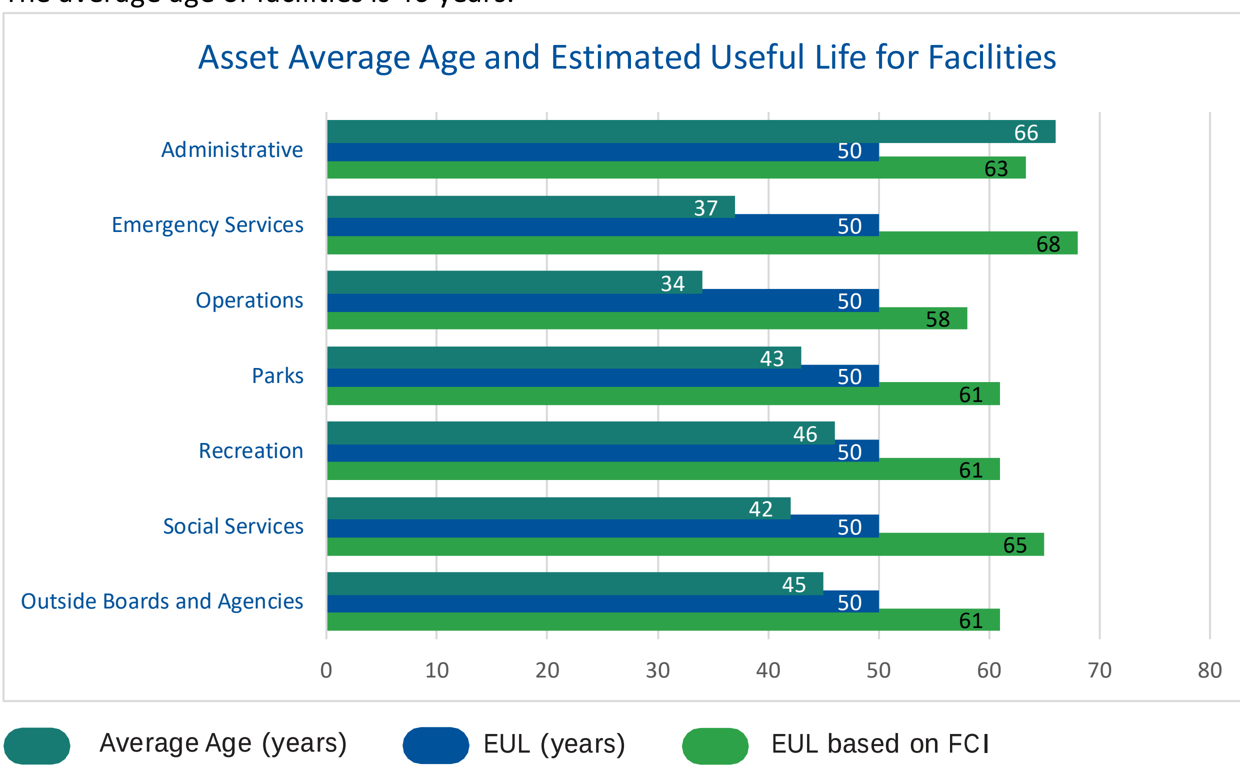


Figure 7.2: Average Age and Estimated Useful Life of Facilities.

7.2 Lifecycle of the Asset

The City's facilities require the proper lifecycle activities to deliver safe and functional buildings. If the proper lifecycle activities do not occur, there is a potential risk of failure which may result in environmental, economic, social impacts, or reputational harm. The consequences of the failure of facilities are tied directly to the function of the facility. The failure of a facility or part of a facility may cause service disruptions, closures and risk to the health and safety of facility occupants.

Maintenance

- Regularly scheduled inspections and maintenance and more significant repair and activities associated with unexpected events. Maintenance addresses major emergency facility-related equipment failures and replacement not included in the operating budgets or the current capital renewal budgets. Component solutions are considered in all stages of the planning process to identify opportunities to optimize asset lifecycles and reduce asset related service delivery costs.

Rehabilitation (major or minor)

- Rehabilitation of facilities includes the planned replacement of major building components including roof systems, HVAC systems, building envelope systems, electrical systems, plumbing systems, and interior finishes. Replacement of components or systems are based on physical condition, timeframe within its lifecycle, the priority index assigned to individual components or systems, and alignment with the Corporate Energy Management Plan. New systems, components, or finishes are energy efficient and environmentally sustainable in nature and consideration is made so that facilities can meet Net-Zero requirements.

Replacement / Reconstruction

- Facilities are replaced when directed if the asset is nearing the end of its useful life of 50 years, based on the condition rating, or functional obsolescence.

Disposal

- Appropriate and proper disposal of facilities occurs once the asset has reached the end of its useful life, is in poor condition and/or is underperforming, or is otherwise no longer needed by the municipality due to realignment, or replacement/construction of another facility. When the operational costs of maintaining the facility exceed the benefits of rehabilitation, typically the City investigates disposing of or replacing the asset.

Growth / Service Improvement

- Improvements and/or new facilities may be required for various services to accomodate growth. Recommendations for expansions, improvements, or new facilities will be done through master plans.
- Facility improvements such as AODA compliance and Net-Zero targets are considered during rehabilitation and/or replacement of facilities.

The individual components of a facility are inspected if a problem is reported or suspected and appropriate action is taken as necessary. Facilities generally undergo a comprehensive condition assessment on a five (5) to seven (7) year basis which includes critical infrastructure. The following graph outlines the costs projected to maintain the components so that the facilities are maintained at a FAIR condition rating over the next 50 years. The 2025 projection includes the significant backlog of projects currently outstanding for Facilities.

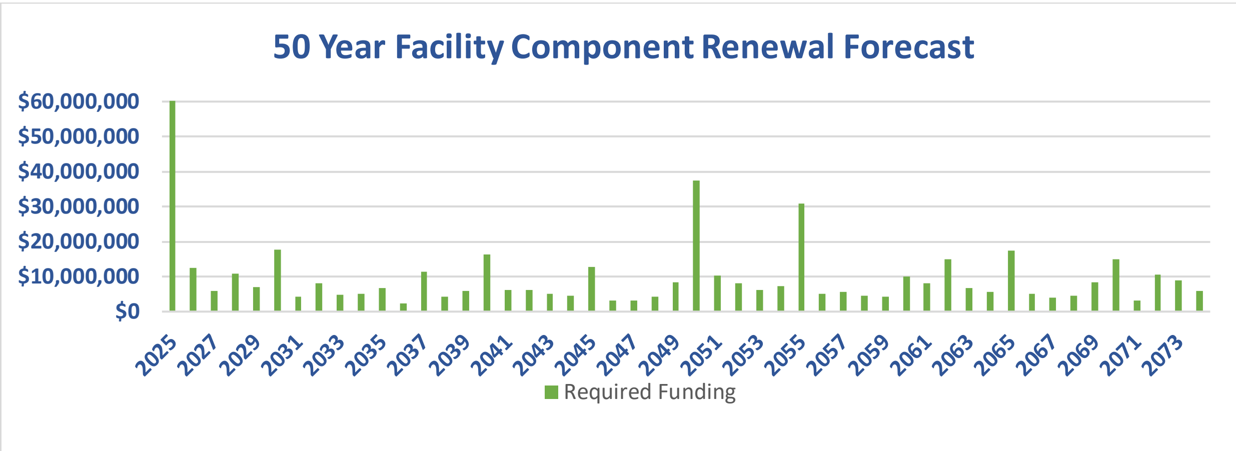


Figure 7.3: Facility Components 50 Year Renewal Forecast

7.5 Levels of Service

To maintain safe and functional facilities the City of Thunder Bay continually adheres to all municipal, provincial and federal regulations and standards. Accessibility audits are completed to identify required improvements to meet AODA.

Over the next twenty years at the current level of funding, many of the aging facilities will degrade and likely not be able to maintain the expected LOS. This issue is compounded by the fact that there is currently a significant backlog of work and a high amount of capital and maintenance requirements for many of the facilities.

For Facility LOS the City needs to ensure that quality services are delivered affordably, and are both accessible and reliable, while also emphasizing sustainability and public safety. In addition, the City needs to ensure that there are appropriate resources to respond to unexpected events. The City strives to balance between providing diverse services at the appropriate levels while keeping costs and associated risks as low as possible.

7.3.1 COMMUNITY LEVELS OF SERVICE

Service Attribute	Performance Measure	2023/2024 Performance	Target LOS (2025 – 2035)
Scope	Total number of facilities in the City of Thunder Bay's service delivery area.	The City of Thunder Bay has an inventory of 181 facilities that comply with the TCA policy, these include:	Maintain services that are provided by the various facilities.

		Six (6) Administrative, 15 Emergency Services, 31 Operations, 91 Parks, 33 Recreation, three (3) Social Services, and two (2) Parkades. The Outside Boards and Agencies inventory includes 12 facilities: Eight (8) Facilities Management Agreements, One (1) Thunder Bay Police Services, Three (3) Thunder Bay Public Library	Review potential for possible divestment, development of multi-functional, flexible spaces, and the consolidation of infrastructure where possible. Consider improvements to accessibility and energy efficiency/net-zero as appropriate.
Scope	Description, number, and usage of **Administrative Facilities.**	There are six (6) Administrative Facilities including City Hall, Archives, Pool 6, Victoriaville Civic Centre, McKellar Mall, and Whalen Building which contain administration offices and public-facing counters. Regular open hours for these facilities are Monday to Friday: 8:30 a.m. - 4:30 p.m. Hours that the facilities are open to the public vary by facility and can be found online at thunderbay.ca. Administrative Facilities have an average FCI of 7.18 which corresponds to a FAIR rating.	Maintain services; Complete a space optimization plan and review potential for consolidation of services where possible (one stop shop for all municipal services).
Scope	Description, number, and usage of **Emergency Facilities.**	There are 15 Emergency Services Facilities used for Fire and EMS Services which are operational 24/7 to respond to emergency services. There are 10 Facilities used for Thunder Bay Fire Rescue services with an average FCI of 8.79 which corresponds to a FAIR rating. There are 5 Facilities owned by the City of Thunder Bay for Superior North EMS services with an average FCI of 2.04 which corresponds to a VERY GOOD rating.	Review District EMS stations to improve emergency response capabilities and promotion of staff recruitment and retention through the consolidation and new construction of stations. Review for consolidation of infrastructure where possible. Review recommendations in the Thunder Bay Fire Rescue Master plan around station realignment options considering growth.
Scope	Description, number, condition and usage of **Operations Facilities.**	There are 29 Operations Facilities open for staff as required. Transit: One transit terminal and one administrative building and garage. Water Street terminal is open to the public 6 a.m. to midnight every day.	Maintain services; Review potential for consolidation of services with other municipal services

		The administrative building is open to the public Monday to Friday 8:30 a.m. to 4:30 p.m. The garage is open for staff during operating hours. Operations Facilities have an average FCI of 12.54 which corresponds to a POOR rating.	where possible (one stop shop for all municipal services).
Scope	Description, number, condition and usage of **Parks Facilities.**	There are 91 Parks Facilities. Facilities open to the public such as washrooms, changerooms, kitchen and laundry facilities, and concessions which are open seasonally. Chippewa Park has seven seasonal cabins available for rent. Other Parks facilities such as garages, workshops, offices and electrical buildings are for staff to operate and maintain and used on an as needed basis. Parks Facilities have an average FCI of 10.78 which corresponds to a POOR rating.	Maintain services; Review potential for possible divestment, development of multi-functional, flexible spaces, and the consolidation of infrastructure where possible.
Scope	Description, number, condition and usage of **Parkades.**	Provide parking services by offering long-term and short-term or hourly rental rates in parkades. Parkades are open for public parking 24/7. Parkades have an average FCI of 16.21 which corresponds to a POOR rating.	Maintain
Scope	Description, number, and usage of **Recreation and Culture and Toursim Facilities.**	Arenas and Stadia –The City operates six (6) arenas with ice season rentals available at various facilities from late September to early April. One Arena ice surface remains open for ice rentals throughout the summer months. Arena building rentals are also available during the off-season. The City operates the Fort William Stadium and Port Arthur Stadium. Rental rates can be found online at thunderbay.ca. Community Centres – Thunder Bay has nine (9) Community Centres offering neighbourhood and community-based programs and	Construct multiuse indoor turf facility. Arenas and Stadia – Maintain current services; Complete an Arena renewal plan and review potential for possible divestment, development of multi-functional, flexible spaces, and the consolidation of infrastructure where possible. Community Centres – Maintain services; review potential for possible divestment, development of multi-functional, flexible spaces, and the consolidation

		events. Most of the centres are operated by external boards. A brief overview of the programming, events and services offered by each Centre can be found online at thunderbay.ca. Community Pools – Thunder Bay has three indoor pools and two outdoor pools. Pools offer public swimming, lessons, certifications, and are available for rental. The Canada Games Complex offers a variety of social, recreational, competitive, instructional and therapeutic activities. See thunderbay.ca for details on each pool. Older Adult Centres, such as the 55+ Centre and West Arthur Community Centre offer recreational programs, activities, and services for those 55 and older in our community. Hours of operations and programming can be found online at thunderbay.ca. One (1) Youth Centre – The Kinsmen Youth Centre offers year-round drop-in and registered recreational programs, activities, and services for youth between the ages of 10-18. Two (2) tourism facilities including the Pagoda and Terry Fox Tourism Centre. Recreation and Culture and Tourism Facilities have an average FCI of 10.18 which corresponds to a POOR rating.	of infrastructure where possible. Community Pools – Maintain current services Older Adult Centres – Maintain current services; review potential development of multi-functional flexible spaces that could be utilized for Older adult services and programming. Youth Centre – Maintain current services; review potential development of multi-functional flexible spaces that could be utilized for Youth services and programming. Maintain tourism services.
Scope	Description, number, and usage of **Social Services Facilities.**	Pioneer Ridge: A long-term care home providing each resident with quality services and programs. Information on this facility can be found online at thunderbay.ca. Pioneer Ridge also has a maintenance garage. Child Care: Algoma Child Care and Grace Remus Child Care (inside Pioneer Ridge) are childcare facilities	Pioneer Ridge: Maintain Services Child Care: Maintain Services

		that provide a safe, stimulating and nurturing environment. Hours of operation: Monday to Friday, 7 a.m. to 5:30 p.m. Social Services Facilities have an average FCI of 0.67 which corresponds to a VERY GOOD rating.	
Scope	Description, number, and usage of **Outside Boards and Agencies Facilities**	Facilities Rental Agreements: Facilities such as CN Station, Magnus Theatre, Tournament Centre, Shelter House, Museum, Sports Hall of Fame, Jumbo Gardens and the Thunder Bay Community Auditorium have facility rental agreements with The City of Thunder Bay and are managed according to the individual agreements. Thunder Bay Police Service Station: Facility is open 24/7 to respond to emergencies. Current Headquarters no longer meets the needs of the Police Service Thunder Bay Public Library: Provides the space, collections, services and programs that residents need to learn, grow, create and be successful. Hours that the facilities are open to the public vary by facility and can be found online at [https://www.tbpl.ca/.](https://www.tbpl.ca/) Outside Boards and Agencies Facilities have an average FCI of 7.89 which corresponds to a FAIR rating.	Maintain services; review Facility Rental Agreements as they expire. Maintain services, undertake Police Headquarters design evaluation. Maintain Library services
Quality and Reliability	Description that illustrates the different levels of facility condition.	For facilities, a Facility Condition Index (FCI) is used to measure defects in the facility. The FCI rating falls between zero percent (0%) and one hundred percent (100%) and is used to determine if a facility has an overall condition of very good, good, fair, poor or very poor. Individual facility ratings are updated when capital work or a condition assessment is completed. The lower	Not applicable

		the value of FCI, the better condition that a facility is in.	
Customer Satisfaction	Percentage of respondents that are either very or somewhat satisfied with the quality of **programming, services & activities** of City Recreation and Culture facilities based on the 2024 Levels of Service Survey.	Fort William Gardens: 85% Satellite Arenas: 90% Fort William Stadium: 93% Port Arthur Stadium : 91% Canada Games Complex: 91% Community Pools: 88% Outdoor Pools: 88% Supervised Beaches: 88% 55+ Centre: 95% West Arthur Community Centre (City-operated): 92% Community Centres (Board Operated): 92% Baggage Building Arts Centre: 86% Water Garden Pavilion: 86% Skate/Splash Pad at Prince Arthur's Landing: 86% Kinsmen Youth Centre: 85% Note – low level of survey respondents	Maintain high level of satisfaction;
Customer Satisfaction	Percentage of respondents that are either neutral, satisfied, or very satisfied with the quality of **assets and their amenities (e.g. equipment, rooms, change rooms/washrooms, concessions, outdoor spaces, etc.)** of City Recreation and Culture facilities based on the 2024 Levels of Service Survey.	Fort William Gardens: 64% Satellite Arenas: 68% Fort William Stadium: 72% Port Arthur Stadium : 72% Canada Games Complex: 83% Community Pools: 92% Outdoor Pools: 72% Supervised Beaches: 73% 55+ Centre: 97% West Arthur Community Centre (City-operated): 93% Community Centres (Board Operated): 91% Baggage Building Arts Centre: 85% Water Garden Pavilion: 85% Skate/Splash Pad at Prince Arthur's Landing: 87% Kinsmen Youth Centre: 91%	Maintain high level of satisfaction;
Customer Satisfaction	Residents at Pioneer Ridge satisfaction with general repair and upkeep of the building and grounds from the	Excellent – 55% Good – 38% Fair – 7% Poor and Very Poor – 0%	Maintain high level of satisfaction

	Resident satisfaction survey in 2024		
Customer Satisfaction	Residents at Pioneer Ridge rating of the home as a place to live from the Resident satisfaction survey in 2024	Excellent – 28% Good – 59% Fair – 7% Poor – 3% Very Poor – 0% N/A – 3%	Maintain high level of satisfaction
Customer Satisfaction	Percentage of respondents that rate the service the family receives from the City's Child care centres from the Child Care survey in 2024	96% of survey respondents rate the service their family receives at City Childcare centres either Good or Very Good.	Maintain high level of satisfaction
Customer Satisfaction	Family and Caregiver of residents at Pioneer Ridge rating for care at the facility with 0 being the worst and 10 being the highest from the Family and Caregiver satisfaction survey in 2024	10 – 46% 9 – 31% 8 – 17% 7 – 6% 6 and below – 0%	Maintain high level of satisfaction
Quality / Reliability	Number of minutes survey respondents think is acceptable for the arrival on-scene of **Fire and Rescue** services personnel based on the 2024 Levels of Service Survey	Less than 4 minutes: 25% 4 to 6 minutes: 32% 6 to 8 minutes: 17% 8 to 10 minutes: 16% 10 to 20 minutes: 8% 20 plus minutes: 1% Unsure: 1%	Maintain Fire response objectives outlined in the Strategic Fire Master Plan.
Quality / Reliability	Number of minutes survey respondents think is acceptable for the arrival on-scene of **EMS** services personnel for a **life-threatening** emergency based on the 2024 Levels of Service Survey	Within City: Less than 4 minutes: 21% 4 to 6 minutes: 45% 6 to 8 minutes: 14% 8 to 10 minutes: 14% 10 to 20 minutes: 3% 20 plus minutes: 2% Unsure: 1% District: Less than 4 minutes: 20% 4 to 6 minutes: 30% 6 to 8 minutes: 22.5% 8 to 10 minutes: 22.5%	Maintain EMS response objectives relating to location of EMS Stations.

		10 to 20 minutes: 5% 20 plus minutes: 0%	
Quality / Reliability	Number of minutes survey respondents think is acceptable for the arrival on-scene of **EMS** services personnel for a **non life-threatening** emergency based on the 2024 Levels of Service Survey	Within City: Less than 4 minutes: 3% 4 to 6 minutes: 5% 6 to 8 minutes: 11% 8 to 10 minutes: 49% 10 to 20 minutes: 32% 20 plus minutes: 0% Unsure: 0% District: Less than 4 minutes: 2.5% 4 to 6 minutes: 10% 6 to 8 minutes: 10% 8 to 10 minutes: 27.5% 10 to 20 minutes: 32.5% 20 plus minutes: 17.5%	Maintain EMS response objectives relating to location of EMS Stations.
Safety	Percentage of respondents that feel either safe and comfortable or very safe and comfortable when using **Recreation and Culture Assets** based on the 2024 Levels of Service Survey.	Fort William Gardens: 83% Satellite Arenas: 83% Fort William Stadium: 83% Port Arthur Stadium : 81% Canada Games Complex: 84% Community Pools: 84% Outdoor Pools: 83% Supervised Beaches: 83% 55+ Centre: 82% West Arthur Community Centre (City-operated): 82% Community Centres (Board Operated): 80% Baggage Building Arts Centre: 82% Water Garden Pavilion: 83% Skate/Splash Pad at Prince Arthur's Landing: 83% Kinsmen Youth Centre: 81%	Maintain
Customer Satisfaction	Percentage of respondents that indicate the number of **Recreation and Culture Assets is** 'just right' based on the 2024 Levels of Service Survey.	Arenas: 51% Indoor Aquatics: 67% Outdoor Aquatics: 48% 55+ Centres: 50% Community Centres: 67% Stadia: 52% Event & Concert Hosting Venues: 52% Youth Centres: 26%	Maintain; review potential for development of multi-functional flexible spaces.

		Arts Centres: 45%	
Customer Satisfaction	Percentage of respondents that somewhat or definitely agree with the statements regarding **Recreation and Culture Facilities** based on the 2024 Levels of Service Survey.	Accessible to individuals living with a disability: 87% Clean and in good repair: 89% Comfortable with appropriate levels of lighting and noise: 89% Easy to locate, with clearly marked public entrances: 85% Inviting, appealing, and attractive: 87% Safe, equitable, and inclusive spaces for all: 86%	Maintain
Customer Satisfaction	Survey responses to the 2024 **Recreation and Culture** Levels of Service Survey question: would you choose to maintain or improve service delivery if doing so meant tax increases, or would you prefer to cut or reduce the service to limit tax increases.	Strongly support a tax increase for improved services: 12% on average Somewhat support a tax increase for improved services: 16% on average Maintain current services and tax rates: 46% on average Somewhat support a service reduction: 21% on average Strongly support a service reduction: 5% on average	Not applicable, for information.
Customer Satisfaction	Survey responses to the 2024 **Fire and Rescue** Levels of Service Survey question: would you choose to maintain or improve service delivery if doing so meant tax increases, or would you prefer to cut or reduce the service to limit tax increases.	Strongly support a tax increase for improved services: 38% Somewhat support a tax increase for improved services: 20% Maintain current services and tax rates: 15% Somewhat support a service reduction: 11% Strongly support a service reduction: 17%	Not applicable, for information.
Customer Satisfaction	Survey responses to the 2024 **EMS** Levels of Service Survey question: would you choose to maintain or improve service delivery if doing	Within City: Strongly support a tax increase for improved services: 51% Somewhat support a tax increase for improved services: 27% Maintain current services and tax rates: 16%	Not applicable, for information.

	so meant tax increases, or would you prefer to cut or reduce the service to limit tax increases.	Somewhat support a service reduction: 3% Strongly support a service reduction: 3% District: Strongly support a tax increase for improved services: 43% Somewhat support a tax increase for improved services: 45% Maintain current services and tax rates: 12%	

Table 7.2: Community Levels of Service for Facilities. Survey responses from the various Facility services Levels of Service Surveys can be found in Appendix I.

7.3.2 TECHNICAL METRICS LEVEL OF SERVICE

Service Attribute	Performance Measure	2023/2024 Performance	Target LOS (2025 – 2035)
Quality	The overall facility condition index value.	Facility condition index in 2023 is 7.89 or FAIR.	Maintain average FAIR rating.
Reliability	Provide reliable facilities without unexpected downtime. Number of facilities with unscheduled downtime (4 or more hours)	Number of facilities with unscheduled downtime (4 or more hours) in 2023: One (1)	Maintain low amount of unscheduled downtime.
Reliability	Average response time of Emergency vehicles from stations.	Fire: 4min 34 sec. on average EMS: 11 min on average	Maintain
Energy Efficiency	For facilities, the overall energy usage.	Electricity usage for all facilities in 2023 and 2024 was 18,976,122 kwh, and 19,008,128 kwh respectively. Natural gas usage for all facilities in 2023 and 2024 was 3,068,815 m^3 and 2,729,657 m^3 respectively.	Decrease natural gas usage, increase electricity usage, increase facility energy efficiency. Implement renewable energy projects in line with Net-Zero by 2050 goal and Corporate Energy Demand Management Program.
Safety and Regulatory	Percentage of safety inspections that pass minimum legislated safety standards.	100% of Facilities passed safety inspections in 2023 and 2024.	Maintain

Sustainability	Percentage of facilities in fair or better condition. Percentage of facilities in poor or very poor condition.	55.44% of municipal facilities are in fair or better condition in 2023. 44.56% of municipal facilities are in poor or very poor condition in 2023.	Decrease number of municipal facilities in poor and very poor condition.
Accessibility	Percentage of Facilities compliant with AODA	15% of all facilities meet current AODA standards. All facilities built prior to AODA legislation are being updated as component renewals occur.	Increase
Cost Efficiency	Capital re-investment rate vs. target re-investment rate	1.09% vs. 2.00%	Increase

Table 7.3: Technical Levels of Service for Facilities.

7.4 Risk

Many assets are dependent on facilities for housing, support, and maintenance. Facilities generally rely on utilities, communications, equipment, water and wastewater infrastructure to deliver services.

Likelihood and Consequences

Likelihood of failure relates to condition ratings, particularly condition of building envelope and electrical components.

Consequences of failure are highest for facilities that support critical services such as emergency response, long-term care, and transit; while facilities supporting administration, parks, and recreation are typically of lower consequence, the impact may still be significant.

Impacts are largely dependent on the service the facility supports, but any impacts to emergency services and transit would be expected to disproportionately impact underserved and marginalized communities.

The following risk profile provides a visual representation of the facilities assets in the very low to very high-risk categories.

Very Low	Low	Moderate	High	Very High
$3 million	$134 million	$51 million	$102 million	$437 million

Figure 7.4: Facilities Asset Risk Profile

Key Hazards

Significant hazards identified include foregone maintenance, fire, flooding, and severe weather events, particularly if combined with utility failures (such as electricity outage in a heat wave, or natural gas interruption in winter weather).

Risk Drivers

Climate change is expected to increase the frequency and intensity of severe weather hazards; while changes to regulation may reduce risk exposure but may increase expenses.

7.5 Climate Change Considerations

Facilities are directly impacted by climate change weather events such as rainstorms and flooding, high winds, extreme heat, extreme cold, significant snowfall and frequent freeze and thaw cycles. A Facility can also contribute to climate change with its carbon footprint. The repair, renewal and replacement of facility assets consider the following climate risks, adaptation and mitigation opportunities:

Climate Risks Identified for Facilities:

- Potential facility infrastructure damage and increased maintenance and replacement costs as more frequent and severe weather events occur.
- Potential service disruptions and facility closures due to more frequent and severe weather events.

Future Climate Adaptation Measures:

- Identify facilities that may be impacted by extreme weather events, and increase the frequency of inspections and maintenance.
- Design and implement measures to minimize climate change impacts such as changes to building envelope materials, building specifications, site considerations, new technology, and other protection methods for both new construction and retrofitting existing facilities to minimize service disruption and increase resiliency.
- Design and implement considerations for adapting facilities as community emergency and disaster service sites.
- Standardize stormwater best management practices on new and existing facility sites.

Future Climate Mitigation Opportunities:

- Explore further opportunities for greenhouse gas reductions and improving energy performance (Objectives #4-6, and Objective #9, Thunder Bay Net-Zero Strategy).
- Investigate areas of priority to incorporate best practices, low carbon materials, and green infrastructure into facility planning and design.

7.6 Investing in the Assets

To maintain the proper level of repair, renewal and replacement of facilities, the annual sustainable funding amount is $13,995,000. The 5 year historical budgeted funding allocated to all assets was $8,336,000. This means that there is an annual infrastructure deficit, or shortfall, of **$5,549,000.** Over the next ten years this could result in a cumulative deficit of $55,495,000 to maintain LOS, or a cumulative deficit of $93,292,000 for proposed LOS.

There is a significant backlog of work on building components such as roofing, HVAC, etc. as seen in section 7.2. The following figure shows the 10-year projection of the required investment to maintain levels of service for facilities along with the additional investments required to achieve proposed levels of service. Proposed level of service assumptions for this projection include the required funding to maintain facilities in FAIR condition along with all the upgrades required for facilities to become net zero by 2050. The projection is based on the current condition ratings and life expectancy of the facility. The 2025 projection includes the significant backlog of projects currently outstanding for Facilities.

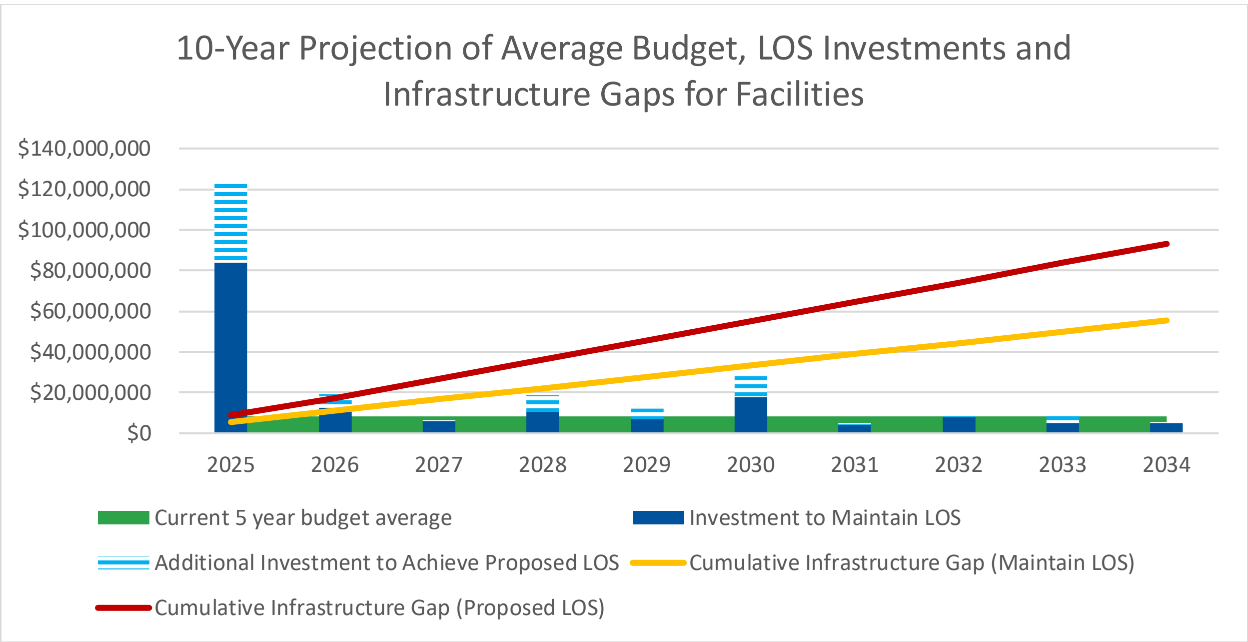


Figure 7.5:10-Year Projection of Average Budget, LOS Investments and Infrastructure Gaps for Facilities

Facilities Annual Infrastructure Deficit:

$5,549,000

7.7 Future Outlook

The major growth / service improvement related infrastructure projects for Facilities currently underway or on the horizon include but are not limited to: Victoriaville Reimagined, Indoor Turf Facility , and Net-Zero Building Upgrades.

The total estimated increase in value of Facilities assets for these projects is estimated at $111 million. The will result in an approximate annual lifecycle investment increase of $3.9 million by 2034.

The figure below summarizes the City's estimated expenditures for the new infrastructure projects by year:

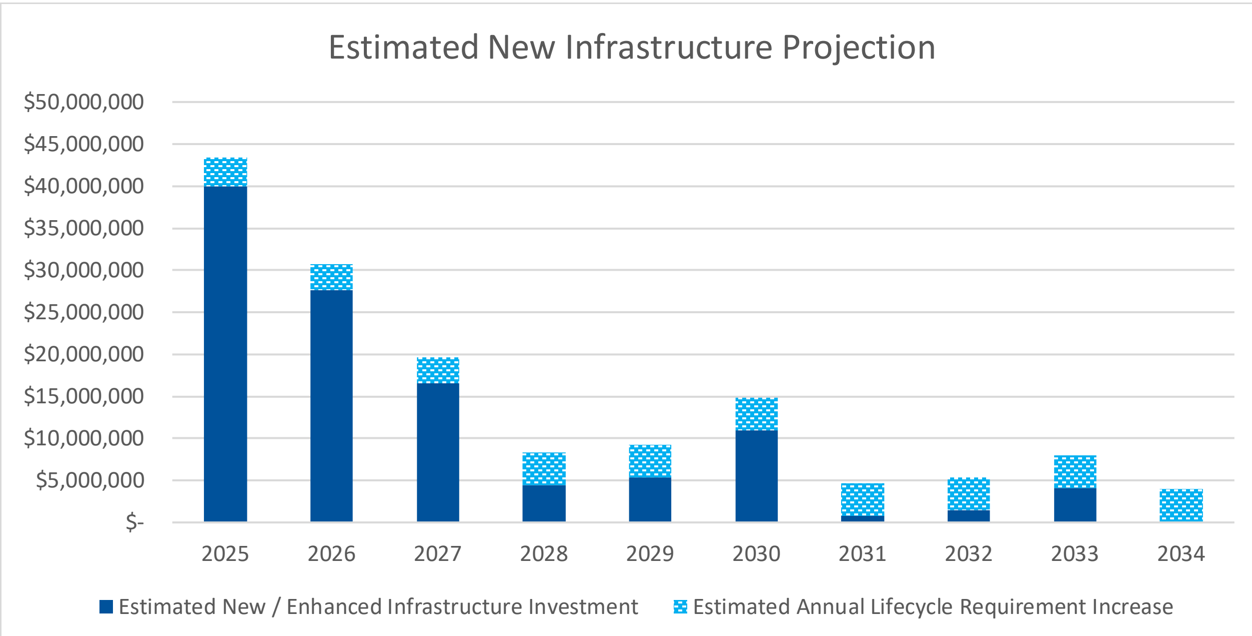


Figure 7.6: Estimated Facilities New Infrastructure Projection

The infrastructure deficit for proposed levels of service in the previous section includes estimated annual lifecycle investment requirements that will be required for these new assets once they are built. As new infrastructure is built and existing assets are expanded based on master plans, studies, and models to service forecasted growth, they will require investment to renew them as they deteriorate over time. This will place additional pressure on maintaining the state of facilities infrastructure.

FLEET AND MACHINERY

Vehicles and machinery assets that allow staff to efficiently deliver municipal services.

8.0 Fleet and Machinery

The City of Thunder Bay owns and operates a vast array of vehicles and machinery which allows staff to efficiently deliver municipal services. Fleet and Machinery assets have a total replacement value of $126,336,000.

8.1 Asset Overview

The types of fleet and machinery that the City owns and maintains range from small passenger vehicles, to Transit buses, to heavy equipment for construction operations and snow removal. There are also specialized vehicles such as fire trucks, ambulances and police vehicles for emergency services. Specialized machinery such as riding lawn mowers, trailers, forklifts and ice resurfacers are also included in the City's Fleet.

Table 8.1 outlines the inventory, replacement cost, average age and condition for each of the fleet and machinery assets. Note that the only assets that are recorded in this list are those that comply with the Tangible Capital Asset Policy of individual assets over $10,000 and pooled assets over $50,000 in value.

Asset Class	Asset Sub-Class	Replacement Value	Asset Totals	Average Age	Average Condition
All Fleet and Machinery Assets		$126,336,000	749	11 years	**Fair**
Fleet Vehicles					
Light Vehicles	Half Ton	$2,739,000	53	8 years	**Good**
	Midsize	$321,000	7	4 years	**Very Good**
	Three Quarter Ton	$2,768,000	48	8 years	**Fair**
	Vans	$1,559,000	29	8 years	**Good**
Medium Vehicles	Bus - Specialized	$5,725,000	27	4 years	**Very Good**
	Medium Truck	$4,353,000	25	11 years	**Good**
	One Ton	$1,423,000	13	9 years	**Good**
Heavy Vehicles	Packer	$7,084,000	16	10 years	**Poor**
	Heavy Truck	$10,278,000	35	11 years	**Good**
	Bus - Conventional	$33,851,000	48	10 years	**Good**
Emergency Vehicles	Police Vehicles	$3,974,000	94	6 years	**Fair**
	Fire Vehicles	$14,029,000	43	12 years	**Fair**
	EMS Vehicles	$6,849,000	58	6 years	**Poor**

Asset Class	Asset Sub-Class	Replacement Value	Asset Totals	Average Age	Average Condition
Machinery					
Light Machinery	Lawn Care, Trailers, Misc	$6,516,000	129	6 years	**Fair**
	Off-road: Forklifts, sidewalk tractors, skid steers, tractors, ATV's	$4,031,000	52	6 years	**Fair**
Medium Machinery	Compressors, hoists and lifts, snowblowers	$2,716,000	19	5 years	**Very Good**
	Off-road, asphalt patcher, backhoe loader, ice resurfacer, sweepers, vacuum	$5,090,000	29	11 years	**Fair**
Heavy Machinery	Off-road: Articulating dump, graders, compactors, excavators, loaders	$10,059,000	26	10 years	**Fair**

Table 8.1: Fleet and Machinery Asset Overview

8.1.1 ASSET CONDITION

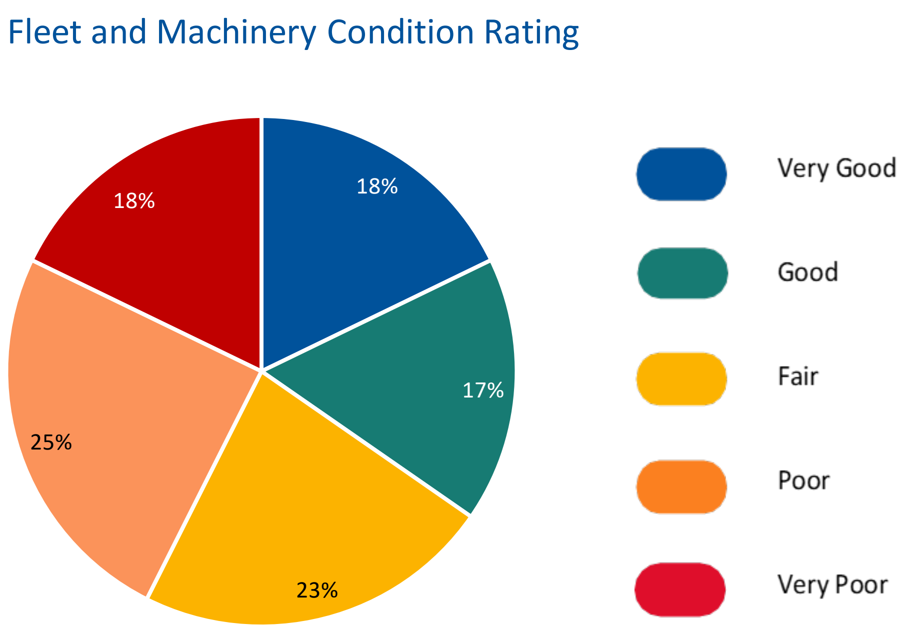


Figure 8.1 Fleet and Machinery Condition Profile broken down as a percentage of total replacement cost.

All fleet and machinery assets are inspected according to a prescribed maintenance schedule or if a problem is reported or suspected. Appropriate action is taken and documented if issues are identified. A condition assessment rating system for vehicles and equipment has been developed to prioritize fleet replacements and optimize lifecycle costs. Fleet Services assets are regulated by the Ministry of Transportation, Ministry of Environment, and Technical Safety Standards Authority.

8.1.2 ASSET AGE

The average age of fleet and machinery assets is 11 years. Each of the fleet and machinery assets carry useful lives that vary by department and use.

Figure 8.2 outlines the average age and the average estimated useful life of the different types of fleet and machinery.

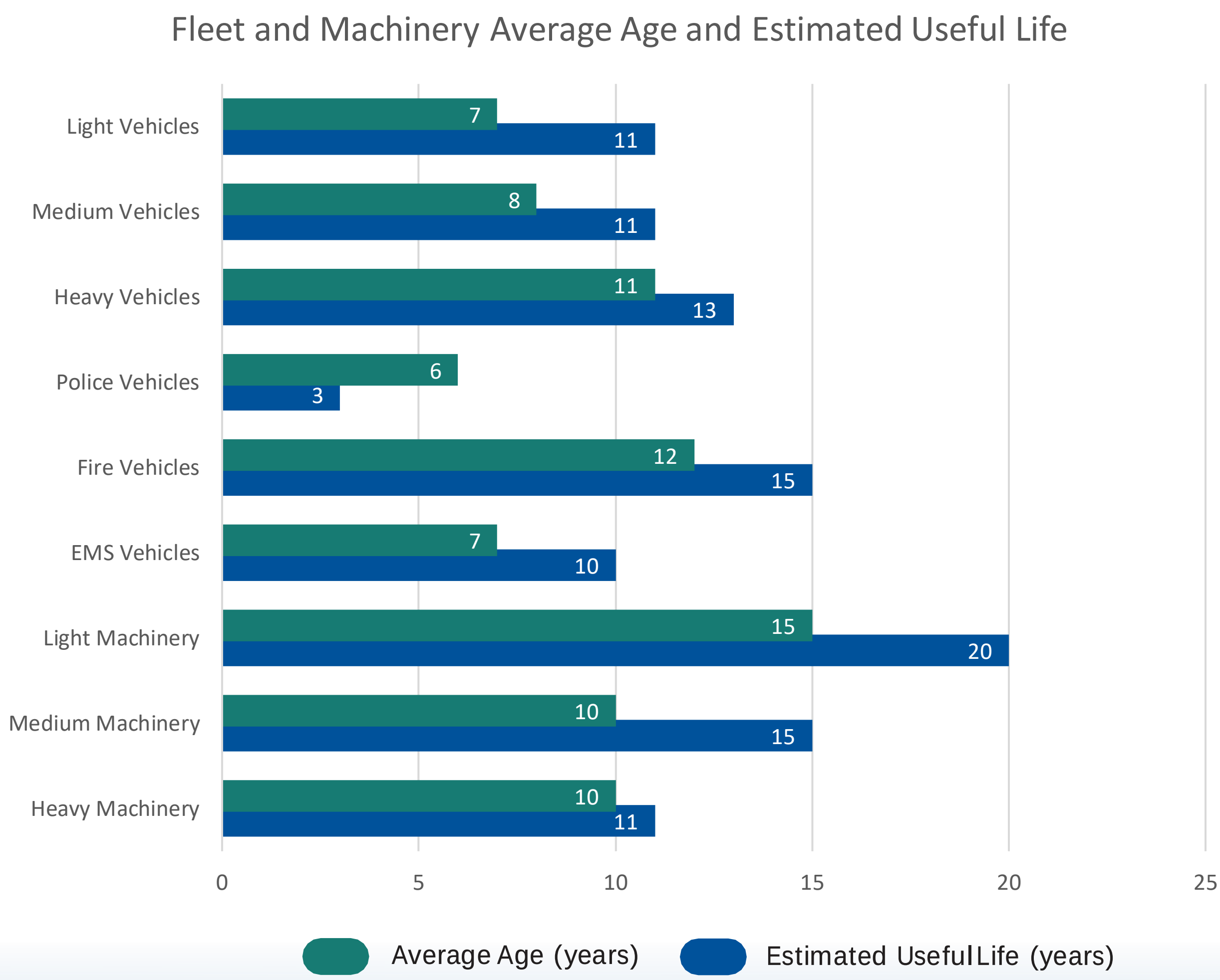


Figure 8.2: Average Age and EUL of Fleet and Machinery

8.2 Lifecycle of Fleet and Machinery Assets

The City's fleet and machinery assets require the proper lifecycle activities to deliver municipal services to the public. If the proper lifecycle activities are not completed and a backlog of maintenance and replacement occurs, there is a potential risk of vehicle and equipment failure which may impact services and result in environmental, economic and social impacts. The maintenance, rehabilitation and replacement of fleet assets are based on inspections, manufacturer recommendations, industry best practice, past performance and regulatory requirements in order to optimize fleet asset lifecycles.

The City's Fleet has five main lifecycle activities:

Maintenance

- Fleet and machinery are inspected and maintained per regulatory requirements and best practices. Preventative maintenance of fleet assets is carried out on a regular basis, with very minor outsourcing due to specialty repairs. Reactive maintenance occurs for circumstances that cannot be easily mitigated such as vehicle accidents requiring immediate repair, or faster than anticipated vehicle or equipment breakdowns. The objective is to minimize unplanned non-standardized work to support the lowest lifecycle cost by extending the length of time to rehabilitate or replace.

Rehabilitation

- Renewals and rehabilitations are driven by regular preventative maintenance programs. Major overhauls or reconditioning of fleet assets are very costly and generally do not add enough extended life in order to add value.

Replacement

- Strategic assessment of fleet and equipment for optimal asset lifecycles is determined by timing replacement that minimizes maintenance and repair work and maximizes salvage value. When determining the most appropriate option for the fleet assets, a thorough review of service life remaining, condition, mileage, performance, lifecycle management, regulatory compliance, operational need, criticality, and annual repair costs are taken into consideration, with some assets being transferred or rotated to different departments or a lighter function. The City of Thunder Bay uses procurement practices to acquire high quality assets with longer lifecycles, extended warranties, and service agreements. Consideration is given to alternative fuel options in order to reduce greenhouse gases.

Disposal

- Fleet and machinery are disposed through auction to maximize salvage value, or environmental salvage activities.

Growth / Service Improvement

- Additional fleet and machinery may be required for various services to accomodate growth. Recommendations for fleet expansions, improvements will be done through master plans.
- Fleet enhancements such as electrification considered during fleet replacement.

8.3 Levels of Service

To maintain safe and functioning fleet and machinery the City has established Fleet Maintenance Standards, revised in 2022. These Standards provide trigger points when maintenance needs to be done either by frequency or based on a physical condition.

8.3.1 COMMUNITY LEVELS OF SERVICE

Service Attribute	Performance Measure	2023/2024 Performance	Target LOS (2025 – 2035)
Scope	Description of types of fleet and machinery	The City of Thunder Bay has an inventory of 749 vehicles and machinery that comply with the TCA policy, categorized as follows: **Light Vehicles:** 53 half ton trucks, 7 midsize trucks, 48 three quarter ton trucks, 29 vans; **Medium Vehicles:** 27 specialized buses, 25 medium trucks, 13 one ton trucks; **Heavy Vehicles:** 16 packers, 35 heavy trucks, 48 conventional buses; **Emergency Vehicles:** 94 police vehicles both marked and unmarked as well as utility and transport; 41 fire vehicles including rescue trucks and boat, fire pumpers, ladders, command vehicles, atv's; 58 EMS vehicles including ambulances, and emergency response vehicles; **Light Machinery:** 166 assets of various smaller machinery including lawn care, trailers, forklifts, sidewalk tractors, skid steers, tractors, atv's, and miscellaneous equipment; **Medium Machinery:** 48 assets of various medium sized machinery including compressors, hoists and lifts, snowblowers, asphalt patcher, backhoe loader, ice resurfacers, sweepers and vacuums; **Heavy Machinery:** 26 assets of various larger heavy machinery including articulating dump, graders, compactor, excavators and loaders.	Maintain services that are provided by the various fleet. Review potential for divestment and right sizing of vehicles.
Customer Satisfaction	Percentage of survey respondents that are either neutral, very or	52% of respondents are either neutral, very, or somewhat satisfied with Thunder Bay Transit service.	Increase satisfaction with Transit service.

	somewhat satisfied with the Thunder Bay Transit Service from the 2025 **Thunder Bay Transit** Survey.		
Customer Satisfaction	Percentage of survey respondents that felt the bus is clean during trips from the 2025 **Thunder Bay Transit** Survey.	72% of respondents felt that the bus is generally somewhat or very clean, or neutral during their trip.	Maintain cleanliness of transit busses.
Customer Satisfaction	Percentage of survey respondents that felt the bus is usually or always on time from the 2025 **Thunder Bay Transit** Survey.	61% of respondents felt that the bus is usually or always on time.	Maintain
Customer Satisfaction	Survey respondents' top factors are most important to you with **Thunder Bay Transit.**	1. Reliability / punctuality 2. Frequency 3. Affordability 4. Safety and Security	Investigate issues and challenges for transforming transit.
Customer Satisfaction	Survey responses to the 2025 **Thunder Bay Transit** Levels of Service Survey question: would you choose to maintain or improve service delivery if doing so meant tax increases, or would you prefer to cut or reduce the service to limit tax increases.	Strongly support a tax / rate increase for improved services: 31% Somewhat support a tax / rate increase for improved services: 28% Maintain current services and tax rates: 32% Somewhat support a service reduction: 6% Strongly support a service reduction: 4%	Not applicable, for information.
Customer Satisfaction	Percentage of survey respondents that rate the service provided by EMS as Very Good or Good from the 2025 **Superior North EMS** Survey.	City: 73% District: 71%	Maintain high level of satisfaction with EMS service.
Customer Satisfaction	Survey responses to the 2024 **Superior North EMS** Levels of Service Survey question: would you choose to maintain or improve service delivery if doing so meant tax increases, or would you prefer to cut	Within city: Strongly support a tax increase for improved services: 51% Somewhat support a tax increase for improved services: 27% Maintain current services and tax rates: 16% Somewhat support a service reduction: 3% Strongly support a service reduction: 3%	Not applicable, for information.

	or reduce the service to limit tax increases.	District: Strongly support a tax increase for improved services: 43% Somewhat support a tax increase for improved services: 45% Maintain current services and tax rates: 12%	
Customer Satisfaction	Percentage of survey respondents that are either very or somewhat satisfied with the quality of Thunder Bay Fire Rescue from the 2025 **Thunder Bay Fire Rescue** Survey.	Fire Suppression: 92% Auto extraction: 90% Hazardous material spills: 86% Industrial accidents: 84% Tiered medical response: 83% High/low angle rescue: 87% Ice and Water rescue: 90% Urban search and rescue: 78% Trench rescue: 79% Confined space rescue: 76% Public fire safety education: 90% Fire prevention inspections and code enforcement under the Ontario Fire Code: 85% Emergency management and planning for the community: 79%	Maintain high level of satisfaction with quality of Thunder Bay Fire Rescue service.
Customer Satisfaction	Percentage of survey respondents that are either very or somewhat satisfied with their ability to access Thunder Bay Fire Rescue services from the 2025 **Thunder Bay Fire Rescue** Survey.	Fire Suppression: 90% Auto extraction: 90% Hazardous material spills: 77% Industrial accidents: 81% Tiered medical response: 83% High/low angle rescue: 86% Ice and Water rescue: 91% Urban search and rescue: 81% Trench rescue: 80% Confined space rescue: 82% Public fire safety education: 90% Fire prevention inspections and code enforcement under the Ontario Fire Code: 82% Emergency management and planning for the community: 78%	Maintain high level of satisfaction with ability to access Thunder Bay Fire Rescue service.
Customer Satisfaction	Survey responses to the 2024 **Fire and Rescue** Levels of Service Survey question: would you choose to maintain or improve service delivery if doing so meant tax increases, or would you	Strongly support a tax increase for improved services: 38% Somewhat support a tax increase for improved services: 20% Maintain current services and tax rates: 15% Somewhat support a service reduction: 11%	Not applicable, for information.

	prefer to cut or reduce the service to limit tax increases.	Strongly support a service reduction: 17%	
Customer Satisfaction	Percentage of survey respondents that feel that Thunder Bay Fire Rescue is very or somewhat prepared and equipped to handle various emergency scenarios from the 2025 **Thunder Bay Fire Rescue** Survey.	80% of survey respondents	Maintain high level of satisfaction with Thunder Bay Fire Rescue service.
Customer Satisfaction	Percentage of survey respondents that feel that priority road routes are plowed in a reasonable amount of time.	65.5% of the 2023 Roads, Street Lighting, and Traffic Signals Levels of Service Survey respondents feel that the priority routes are either always or most of the time plowed in a reasonable amount of time.	Maintain Winter Operation Standards
Customer Satisfaction	Percentage of survey respondents that feel that sidewalks are plowed in a reasonable amount of time.	51.1% of the 2023 Active Transportation Levels of Service Survey respondents feel that the sidewalks are either always or most of the time plowed in a reasonable amount of time.	Maintain Winter Operation Standards
Safety	Description of the process for maintaining the safety of fleet.	All fleet assets are inspected per regulatory requirements and repairs are completed as needed based on inspections and servicing requirements. All staff that utilize City fleet are required to complete pre-use inspections, document their findings in the asset logs, and must carry and maintain operator licenses.	Maintain

Table 8.2: Community Levels of Service for Fleet and Machinery

8.3.2 TECHNICAL METRICS LEVEL OF SERVICE

Service Attribute	Performance Measure	2023/2024 Performance	Target LOS (2025 – 2035)
Quality / Reliability	The average condition of fleet and machinery assets	FAIR	Maintain fleet in FAIR condition
Quality / Reliability	Average downtime due to breakdowns (time in the shop for unplanned maintenance/repairs) per vehicle/machinery type (in hours)	There was an average of eight (8) hours of unplanned downtime per vehicle/machinery type in 2024.	Reduce amount of unplanned downtime.
Quality / Reliability	Percent of vehicles with more than eight (8) hours of annual downtime due to breakdowns	58% of vehicles had more than eight (8) hours of downtime due to breakdowns.	Reduce downtime due to breakdowns
Quality / Reliability	Annual average cost of reactive maintenance/repairs per asset	$7,580 per asset in 2024.	Reduce reactive costs/asset.
Quality / Reliability	Number of snow clearing concerns called in to Dispatch	There were 660 snow clearing concerns called in to Dispatch in 2024.	Continue to respond to all citizen concerns.
Quality / Reliability	Number of garbage or recycling concerns called in to Dispatch	There were 563 garbage or recycling concerns called in to Dispatch in 2024.	Continue to respond to all citizen concerns.
Reliability	Total number of calls responded to by Thunder Bay Fire Rescue	Total responses in 2024: 17183 (number of times an apparatus was dispatched). Total incidents in 2024: 9712 (some incidents involved multiple apparatus being dispatched).	Continue to respond to all calls to Thunder Bay Fire Rescue
Reliability	Total number of Superior North EMS Ambulance call reports.	33,531 in 2024	Continue to respond to all calls to Superior North EMS
Safety and Regulatory	Percentage of legislated commercial motor vehicle inspections completed on time	100% in 2024	Maintain
Cost Efficiency	Cost per hour, depending on asset class	$133.84 in 2024	Maintain
Environmental Stewardship	Fuel usage for Fleet	Diesel: 2,711,727 L in 2023, and 2,720,998 L in 2024 Gasoline: 1,454,698 L in 2023, and 1,320,054 L in 2024	Reduce fuel consumption
Cost Efficiency	Capital re-investment rate vs. target re-investment rate	6.55% vs. 8.94%	Increase

Table 8.3: Technical Levels of Service for Fleet and Machinery.

8.4 Risk

Asset Dependencies

Fleet vehicles are directly reliant on roads, and fuel infrastructure to operate, and facilities such as the transit facility and equipment shops provide essential supports for vehicle operation. While fleet functioning can proceed through a power failure, communication outage, or interruption in IT services; operations supporting the fleet may be interrupted eventually impacting fleet assets. These interrupted operations can include maintenance, dispatch, and vehicle tracking.

Many services delivered by the City are dependent on fleet and can be compromised by fleet failures; particularly emergency services, snow clearing, transit, garbage collection, and any other mobile operations. In the case of a winter storm, a lack of snow clearing would have major impacts on critical services throughout the City, impacting all transportation including emergency services.

Likelihood and Consequences

The likelihood of a fleet vehicle to fail increases with age, mileage, and operational use (compared to predicted useful life), as well as conditions identified. Older equipment is at higher risk for mechanical failures, while newer equipment may be more likely to have technology failures.

Consequences of fleet asset failure are generally higher with snow removal (season dependent) and emergency services fleet, followed by transit vehicles, followed by waste collection vehicles; as these assets support critical services in the community. Fleet items supporting recreation or administration support are lower priority, as an interruption in service is considered to have lower consequences, and vehicles may be able to be replaced far easier.

Although individual assets failing are considered to have mild to moderate impacts to municipal operations or expenses; any failures affecting a larger portion of fleet at once (e.g. incidents at a facility impacting all parked vehicles, or critical supply chain disruption) would have severe impacts on service delivery and have very high costs to address. Many specialized vehicles already may take several years to acquire after an order is made; therefore, any requirement to replace many at once can lead to prolonged impacts for the City. Interruptions to services such as transit and emergency services are also considered to disproportionately impact underserved or marginalized communities.

The following risk profile provides a visual representation of the fleet and machinery assets in the very low to very high-risk categories.

Figure 8.3: Facilities Asset Risk Profile

Key Hazards

Significant hazards identified include traffic accidents, weather hazards, supply chain disruptions, mechanical failures. Vehicle collisions or accidents can cause severe damage to individual fleet assets; and are more likely if there are new operators, or if there are adverse weather conditions.

Weather hazards not only can increase the chances of vehicle collisions, but directly contribute to vehicle damage and condition; with winter conditions, storms, and extreme temperatures reducing vehicle lifespans. Extreme weather may also impact a large number of fleet vehicles at once, increasing impacts. Supply chain disruptions impact vehicle maintenance and replacement, lengthen mechanical failures and can accelerate degradation. Any foregone or delayed maintenance leads to a higher risk of failure and reduced lifespan, and may reduce service levels over a longer period.

Risk Drivers

Factors that are expected to increase risks over the lifespan of the assets include increasing challenges hiring qualified operators, costs increasing faster than the pace of inflation, increasing challenges with replacing parts, vehicles, or equipment due to supply chain disruptions and tariffs, and increases in extreme weather events. Planned fleet electrification may change the nature of failures or vulnerabilities; and are expected to have higher replacement costs per vehicle.

8.5 Climate Change Considerations

Fleet and machinery assets are directly impacted by climate change. Weather events such as extreme temperatures and significant rainfall or snowfall can cause fleet and equipment to break down. Fleet and machinery can also contribute to climate change with their carbon footprint and the type of fuel used for its operation. The repair, renewal and replacement of fleet and machinery assets consider the following climate risks, adaptation and mitigation opportunities.

Climate Risks Identified with Fleet:

- Potential service disruptions due to fleet and machinery not being sized appropriately for handling weather events.
- Potential shortage of fuel sources due to more frequent and severe weather events affecting the global supply chain.

Future Climate Adaptation Measures:

- Consider Climate Change impacts in the procurement and operation plan for fleet.

Future Climate Mitigation Opportunities:

- Implement policy changes such as reduced idling, and driver training that includes fuel-efficient driving techniques.
- Monitor fuel consumption, emissions, and driving behaviour to help increase the efficiency of the fleet.
- Public Transit is convenient, accessible, and low carbon, with a target of converting the municipal transit fleet to 100% electric by 2035 (Objective #12, Thunder Bay Net Zero Strategy).
- Vehicles are powered with low-carbon energy, with a target of converting all muncipal fleet to 100% electric by 2040 (Objective #14, Thunder Bay Net-Zero Strategy).

8.6 Investing in the Assets

To maintain the proper level of repair, renewal and replacement of fleet and machinery, the annual sustainable funding amount is $11,146,000. The 5 year historical budgeted funding allocated to all assets was $8,747,000. This means that there is an annual infrastructure deficit, or shortfall, of **$2,398,000.** Over the next ten years this could result in a cumulative deficit of $23,986,000 to maintain LOS, or a cumulative deficit of $25,284,000 for proposed LOS.

The shortfall has and will continue to create a backlog of work and will require significant funding to overcome. The following figure shows the 10-year projection of the required investment to maintain levels of service for facilities along with the additional investments required to achieve proposed levels of service. The projection is based on the current condition ratings and life expectancy of fleet and machinery assets. The 2025 projection includes the significant backlog of projects currently outstanding for Fleet and Machinery assets.

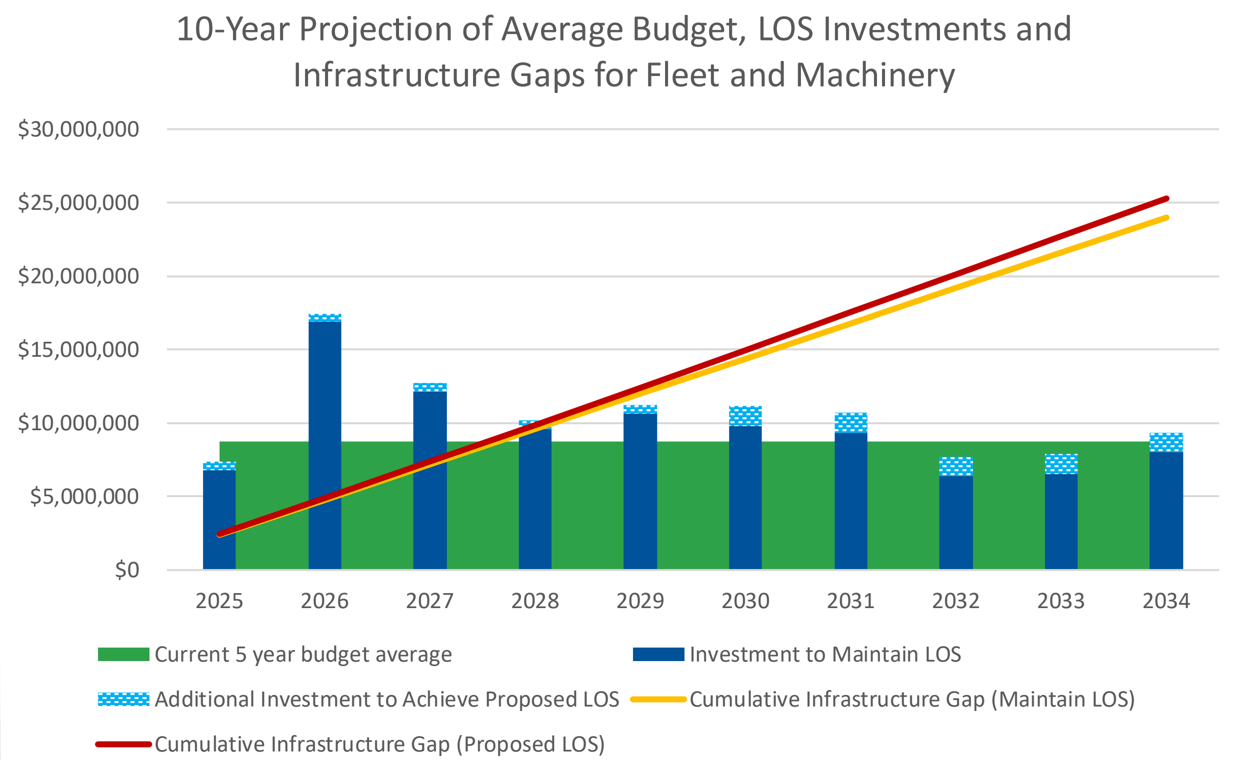


Figure 8.4: 10-Year Projection of Average Budget, LOS Investments and Infrastructure Gaps for Fleet and Machinery

Fleet and Machinery Infrastructure Deficit:

$2,398,000

8.7 Future Outlook

The major growth / service improvement related infrastructure projects for Fleet and Machinery currently underway or on the horizon include but are not limited to: Net-Zero fleet transition and Transform Transit On Demand vehicles.

The total estimated increase in value of fleet assets over the next ten (10) years for these projects is estimated at $11,475,000. This will result in an approximate annual lifecycle investment increase of $179,000 by 2035.

The figure below summarizes the City's estimated expenditures for the fleet improvement projects by year:

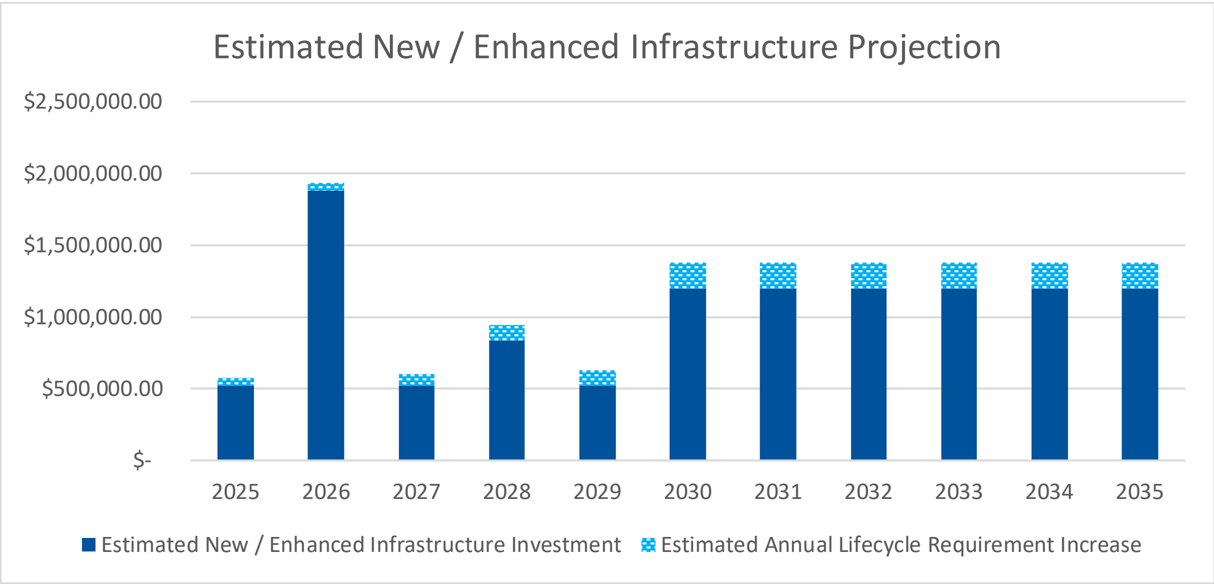


Figure 8.5: Estimated Fleet and Machinery New Infrastructure Projection

The infrastructure deficit for proposed levels of service in the previous section includes the estimated annual lifecycle investment requirement that will be required for these new assets once they are built. As new fleet are acquired based on master plans, studies, and models to service forecasted growth, they will require investment to renew them as they deteriorate over time. This will place additional pressure on maintaining the state of fleet and machinery assets.

EQUIPMENT

Assets that are utilized to maintain public infrastructure and support the delivery of services.

9.0 Equipment

The City of Thunder Bay owns and operates a vast array of equipment which allows staff to efficiently deliver municipal services. Equipment assets have a total replacement value of $62,818,000.

9.1 Asset Overview

In order to maintain a high quality of public infrastructure and support the delivery of services the City owns several types of equipment. This includes, but is not limited to:

- Parks amenities, benches and waste receptacles;
- Administrative computers, hardware and software;
- Equipment required to provide long-term care;
- Equipment to maintain and repair infrastructure;
- Equipment for public use within recreation centers;
- Equipment to deliver emergency services: and
- Transit equipment and shelters

Table 9.1 outlines the inventory, replacement cost, average age and condition for each asset in the category. Note that the only assets recorded in this list are those that comply with the Tangible Capital Asset Policy of individual assets over $10,000 and pooled assets over $50,000 in value.

Asset Class	Examples	Replacement Value	Asset Totals	Average Age	Average Condition
All Equipment Assets		$62,818,000	4800	14 years	Fair
Equipment					
IT Services	Hardware, Software, Servers, etc.	$12,287,000	927*	5 Years	Good
Emergency Services	EMS, Fire and Police equipment	$17,840,000	342	9 Years	Poor
Recreation Services	Arena boards and glass, Sound systems, water slide, gym equipment, etc	$2,327,000	49	19 Years	Poor
Parks Services	Parks amenities, waste receptacles, benches, etc	$12,440,000	2875*	24 Years	Good
Long-Term Care Services	Kitchen equipment,	$2,920,000	253*	15 Years	Poor

	lifts, medical equipment, etc.				
Transit	Fair boxes, shelters, radio system, hoists, etc.	$6,590,000	155	8 Years	**Poor**
Other Equipment	Equipment required for General Government, Parking, Landfill, Planning etc.	$8,398,000	199	18 Years	**Poor**

Table 9.1: Equipment Asset Overview;
** Total asset counts may be much lower than expected as many assets in this asset class such as laptops, desktops, beds, and lifts are pooled assets.*

9.1.1 ASSET CONDITION

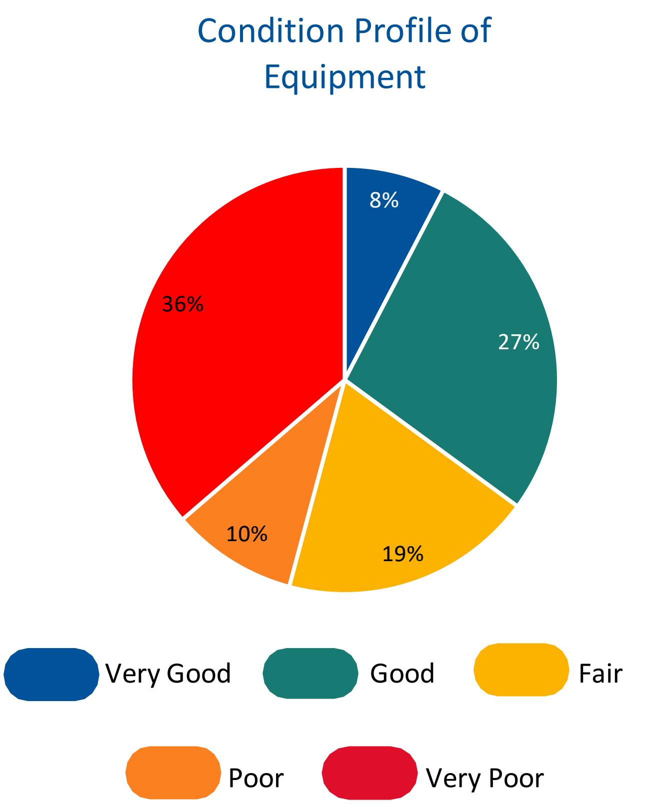
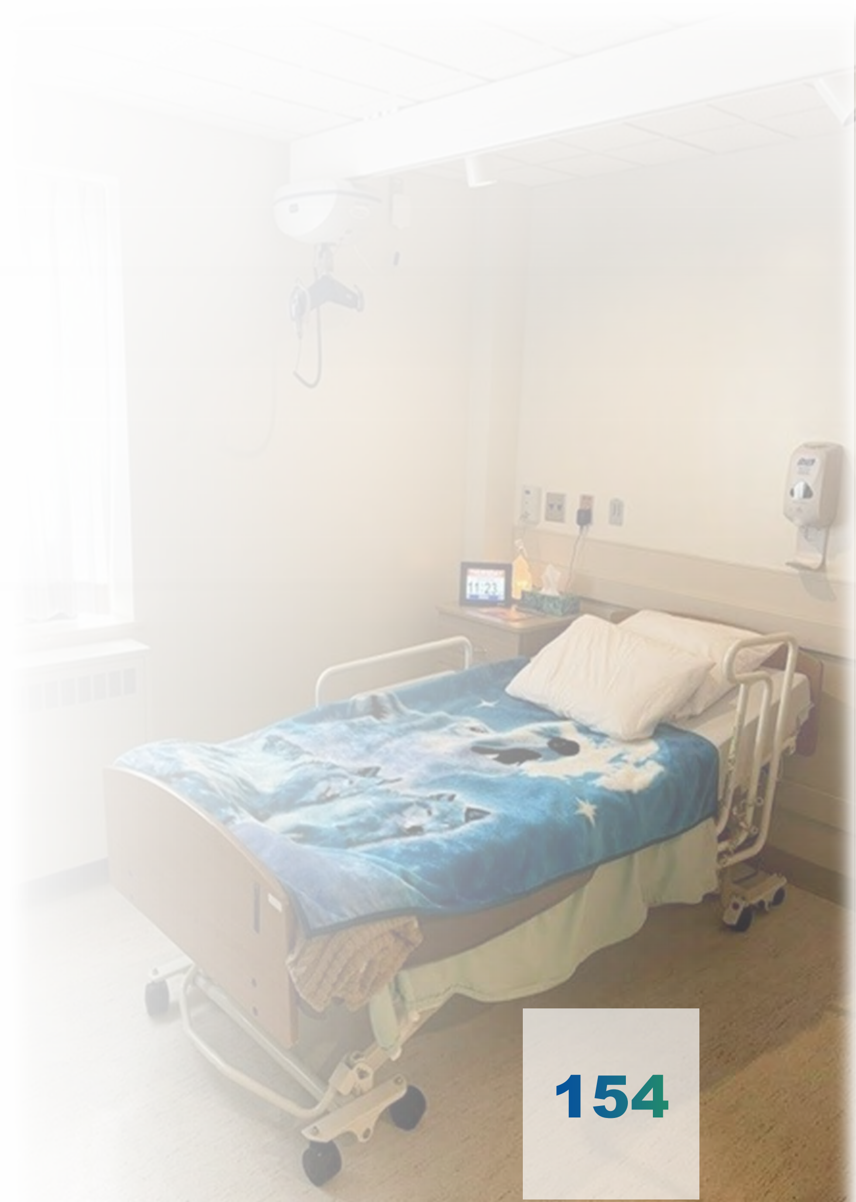


Figure 1.1: Condition Profile of Equipment broken down as a percentage of total replacement cost.



9.1.2 ASSET AGE

The average age of equipment is 14 years. Each of the equipment assets carry useful lives that vary by department and use.

Figure 9.2 outlines the average age and the average estimated useful life of the different types of equipment.

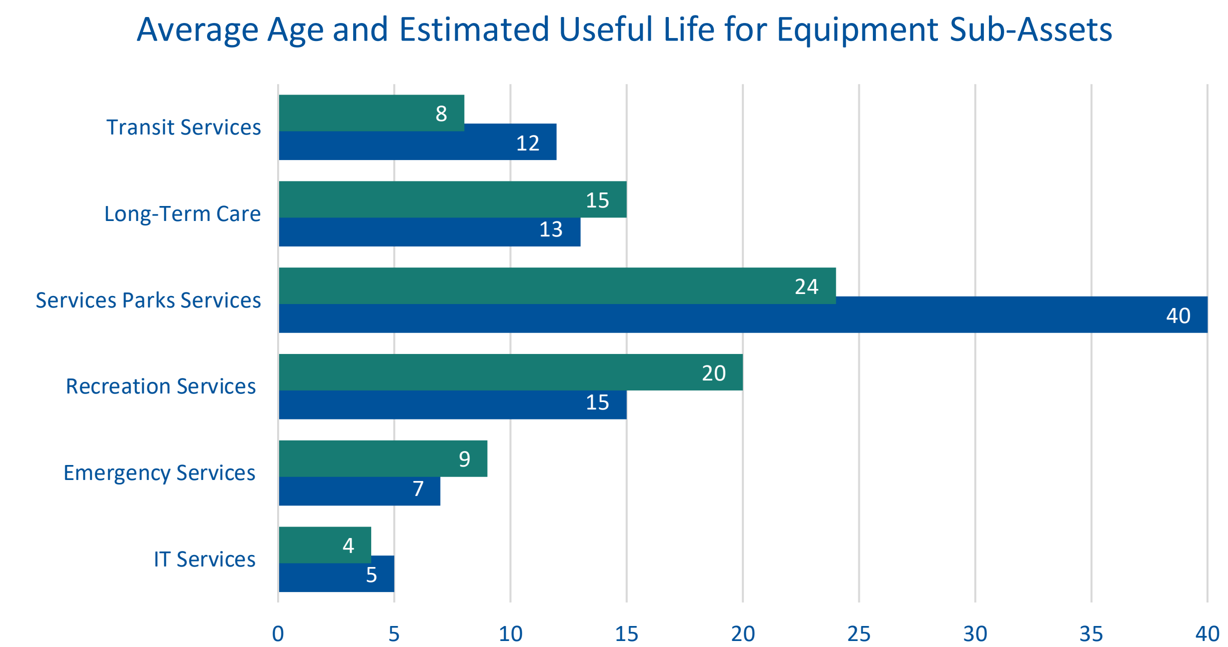


Figure 9.2: Average Age and EUL of Equipment

9.2 Lifecycle of the Equipment

The City's equipment assets require the proper lifecycle activities to deliver municipal services to the public. If the proper lifecycle activities are not completed and a backlog of maintenance and replacement occurs there is a potential risk of equipment failure which may result in environmental, economic and social impacts.

Generally, equipment has four main lifecycle activities:

Maintenance

- Equipment that is in good or very good condition are inspected and maintained per best practices. Reactive maintenance occurs for circumstances that cannot be easily mitigated such as faster than anticipated deterioration or equipment breakdowns. Emergency services equipment and other critical assets are inspected and maintained more rigorously.

Rehabilitation

- Small upgrades or repair is driven by manufacturer recommendations and municipal staff expertise. Reactive rehabilitation or maintenance occurs for circumstances that cannot be easily mitigated such as faster than anticipated deterioration or equipment breakdowns.

Replacement

- Upgrades or complete replacement occurs as per manufacturer or developer recommendations or when equipment falls into poor or very poor condition. Staff prioritize replacement of assets based on their criticality, available redundancies and budget constraints.

Disposal

- Equipment is disposed through best management practice, procurement policies, or environmental salvage activities.

Growth / Service Improvement

- Enhanced procurement practices to acquire higher quality assets with longer lifecycles.
- Additional equipment may be required for various services to accomodate growth. Recommendations for equipment expansions, or improvements will be done on a case by case basis.

9.3 Levels of Service

The following tables identify the City's current level of service for equipment. The metrics include technical and community level of service metrics that are determined by municipal staff.

9.3.1 COMMUNITY LEVELS OF SERVICE

Service Attribute	Performance Measure	2023/2024 Performance	Target LOS (2025 – 2035)
Reliability	Description of redundancies available to ensure equipment is available, as necessary, for operations.	Redundancies are present in the majority of equipment asset classes to ensure continuous operations. For computers and IT devices staff members can work from any City device of which there are spares. For critical operations there are back-ups or spares available.	Maintain
Affordability	Description of the timelines for equipment inspections or IT software and hardware upgrades	Lifecycle activities vary widely depending on the type of equipment and are guided by the criticality of the asset and budget constraints. IT software and hardware upgrades are completed based on manufacturer or developer recommendations and subscriptions.	Maintain
Sustainability	Description of the current condition of equipment and the plans that are in place to maintain or improve the condition.	The majority of equipment assets are maintained reactively and are repaired or replaced at end-of-life or as needed.	Maintain

Table 9.2: Community Levels of Service for Equipment

9.3.2 TECHNICAL METRICS LEVEL OF SERVICE

Service Attribute	Performance Measure	2023/2024 Performance	
Quality	Percentage of equipment assets where their age is greater than their useful life.	10%	Maintain
Sustainability	Percentage of equipment that is in good/very good condition	35%	Maintain
Sustainability	Percentage of equipment that is in poor/very poor condition	46%	Decrease. Maintain equipment in FAIR condition
Performance	Capital re-investment rate vs. target re-investment rate	6.23% vs. 9.79%	Increase re-investment rate

Table 9.3: Technical Levels of Service for Equipment

9.4 Risk

Asset Dependencies

Almost all municipal operations depend on some form of equipment asset, particularly IT, emergency services, maintenance, and transit. Much equipment depends on facilities, utilities, and fleet to deliver services.

Likelihood and Consequences

Equipment is a diverse category, but generally likelihood of failure increases with increasing age, amount of use, and worse condition.

Most equipment categories have very limited impacts if individual assets fail, however failures that affect a larger number of a type of equipment, such as a software failure for IT, or a significant recall for emergency services equipment can have very significant impacts.

Generally, equipment with higher replacement costs or equipment supporting critical services such as emergency response is considered to have a higher consequence for a failure. However, for some equipment supporting critical services, particularly in IT, sometimes a single asset failure is considered to have a negligible consequence, due to the degree of redundancy supporting continued operations, and service contracts providing cost certainty.

The following risk profile provides a visual representation of the equipment assets in the very low to very high-risk categories.

Figure 9.3: Equipment Asset Risk Profile

Key Hazards

Significant hazards identified include extreme weather, supply chain issues, recalls, or cyber attack. These are hazards that have the potential to damage or disable significant amounts of equipment at one time.

There are also several hazards, such as a heat wave can have significant hazards if combined with another failure such as a loss of electricity or cooling infrastructure.

Risk Drivers

Cyber attacks are expected to continue to increase in frequency, climate change will increase the frequency and intensity of natural hazards, and for some equipment types, costs are expected to continue to increase faster than the general rate of inflation and there may be more frequent supply chain disruptions, particularly for specialized equipment.

9.5 Climate Change Considerations

City equipment can be exposed to the events and impacts of climate change. Weather events such as extreme temperatures and significant rainfall or snowfall can cause, power outages and power surges causing equipment to break down. The repair, renewal and replacement of equipment assets consider the following climate risks, adaptation and mitigation opportunities.

Climate Risks Identified with Equipment:

- Potential for equipment to breakdown or not function during extreme weather events.
- Potential shortage of replacements due to more frequent and severe weather events affecting the global supply chain.

Future Climate Adaptation Measures:

- Monitor outdoor equipment and determine if there is equipment that is suceptible to increased deterioration or being inaccessible or damaged during extreme weather events based on location.

Future Climate Mitigation Opportunities:

- Implement the procurement and operation plan for low carbon equipment.
- Monitor emissions to and investigate areas of priority to incorporate best practices and green technology into equipment.
- Identify appropriateness of equipment that is optimized with the most efficient and right amount of assets to meet operational needs.

9.6 Investing in the Assets

To maintain the proper level of repair, renewal and replacement of equipment, the annual sustainable funding amount is $6,590,000. The 5 year historical budgeted funding allocated to all assets was $4,728,000. This means that there is an annual infrastructure deficit, or shortfall, of **$1,862,000.** Over the next ten years this could result in a cumulative deficit of $18,620,000 to maintain LOS, or a cumulative deficit of $25,042,000 for proposed LOS.

The shortfall has and will continue to create a backlog of work and will require significant funding to overcome. The following figure shows the 10-year projection of the required investment to maintain levels of service for equipment along with the additional investments required to achieve proposed levels of service. The projection is based on the current condition ratings and life expectancy of equipment assets. The 2025 projection includes the significant backlog of projects currently outstanding for equipment assets.

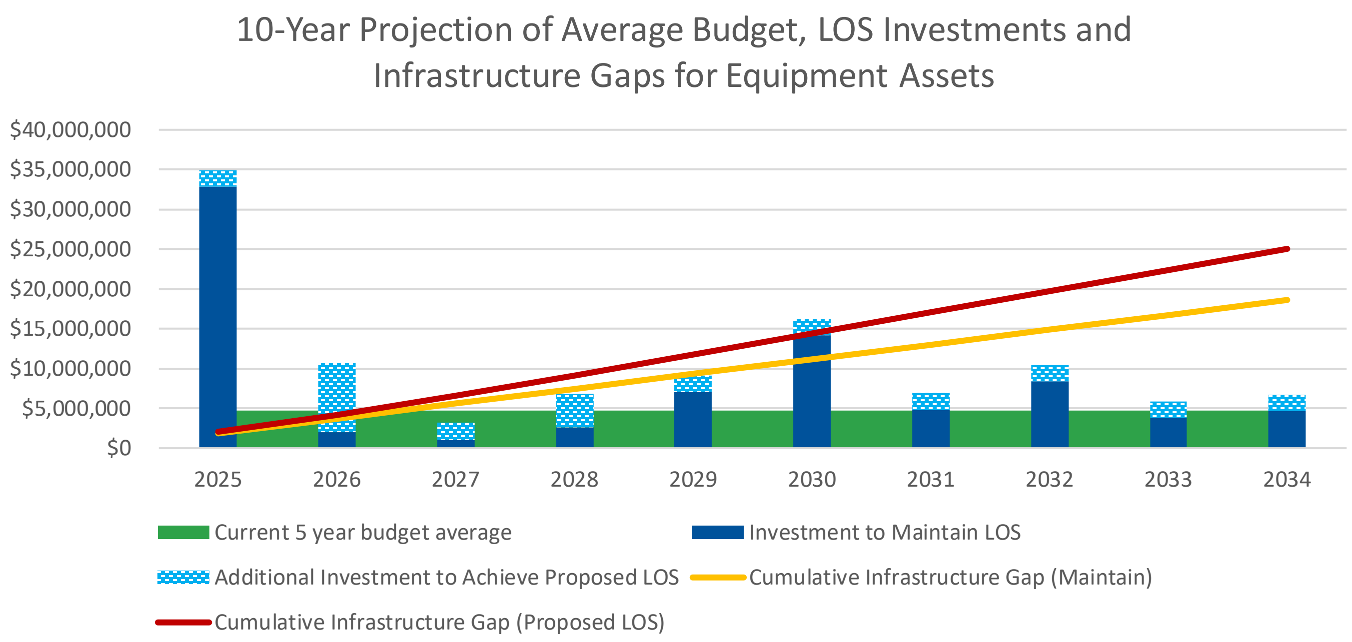


Figure 9.4: 10-Year Projection of Average Budget, LOS Investments and Infrastructure Gaps for Equipment

Equipment and Machinery Annual Infrastructure Deficit:

$1,862,000

9.7 Future Outlook

The major growth / service improvement related infrastructure projects for Equipment currently underway or on the horizon include but are not limited to: Net-Zero fleet charging infrastructure and solid waste bins for automated cart collection.

The total estimated increase in value of equipment assets for these projects is estimated at $29.3 million over the next 10 years. The will result in an annual lifecycle investment increase of up to approximately $786,000 by 2034 .

The figure below summarizes the City’s estimated expenditures for the new infrastructure projects by year:

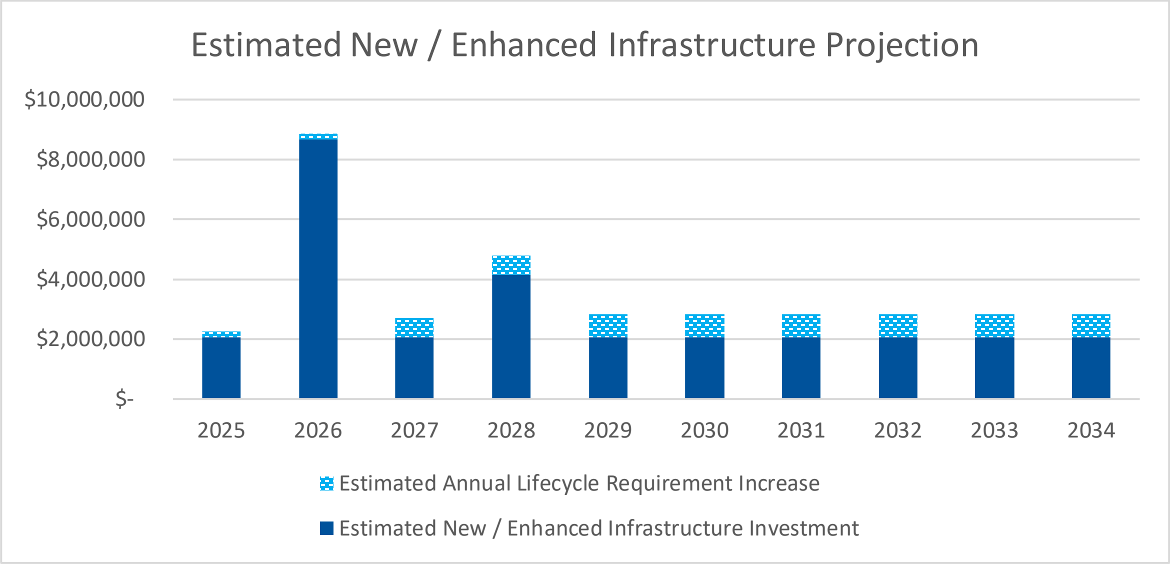


Figure 9.5: Estimated Equipment New Infrastructure Projection

The infrastructure deficit for proposed levels of service in the previous section includes estimated annual lifecycle investment requirements that will be required for these new assets once they are built. As new assets are acquired and existing assets are expanded based on master plans, studies, and models to service forecasted growth, they will require investment to renew them as they deteriorate over time. This will place additional pressure on maintaining the state of equipment assets.

LAND IMPROVEMENTS

Assets that serve to improve the utility and/or the enjoyment of outdoor spaces.

10.0 Land Improvement Assets

Land Improvement assets represent a variety of asset types that serve to improve the utility and/or the enjoyment of outdoor spaces. Land Improvement assets are managed by several different departments. Land Improvement assets have a total replacement value of $253,499,000.

The City of Thunder Bay recognizes the importance citizens place on a healthy environment and have a number of plans to protect and enhance nature such as the: Urban Forest Management Plan, Solid Waste Management Strategy, Urban Design Guidelines, Net-Zero Strategy, Climate Adaptation Plan and Stormwater Management Plan.

10.1 Asset Overview

This asset class includes parking lots, trails and walkways, play parks, sports fields, public art, fencing, docks, other siteworks such as fueling areas in public works yards and the leachate system at the landfill, as well as natural infrastructure such as trees and forests.

Table **10.1** outlines the inventory, replacement cost, average age, and condition for each of the Land Improvement assets. Note that the only assets that are recorded in this list are those that comply with the Tangible Capital Asset Policy of individual assets over $10,000 and pooled assets over $50,000 in value.

Asset Class	Asset Sub-Class	Replacement Value	Asset Totals	Average Age	Average Condition
All Land Improvements		253,499,000	See below	28 years	Fair
Parks					
Play Parks	Playgrounds, Bike/Skate Parks, Dog Parks, Adult Fitness, Splashpads	$21,589,000	136	19 years	Good
Trails	Paved trail system	$26,544,000	73 km	14 years	Good
Sports	Baseball fields, soccer fields, cricket fields, tennis courts, pickleball courts, basketball courts	$14,027,000	102	31 years	Good
Structures	Fencing, dugouts, pergolas, canopies	$17,714,000	100 shade structures, 30,077m of fencing	30 years	Fair
Utilities	Lighting, Underground Distribution Lines, Electrical panels, Transformers	$8,874,000	284	20 years	Fair

Historical Artifacts	Monuments, Plaques, Displays	$1,904,000	126	31 years	Good
Landfill					
Landfill	Cells, leachate system, gas collection system, paving and fencing	$18,270,000	8	13 years	Good
General Land Improvements					
Parking lots and entrance roads.	Surfaces and curbs	$60,212,000	261	31 years	Fair
All other land improvements	Transit terminal land improvements, fencing, fueling facilities	$2,478,000	77	23 years	Fair
Public Art					
Public Art Pieces	Art Pieces	3,615,000	40	13 years	Good
Natural Assets					
Individual Trees	Boulevard and Maintained Parks Trees	$80,844,000*	40,422	N/A	Fair
Parks Forested Areas	Dense Forested Areas	N/A	1305 hectares	N/A	Fair

Table 10.1: Land Improvement Asset Overview;
**Replacement includes the removal of the old tree, planting a new young tree, and watering for three years.*

Natural Infrastructure within the City of Thunder Bay has a

Current value of

$392 million

A Replacement Cost of

over $80 million

and generates a flow of **ANNUAL service value of**

$13 million

The urban forest is recognized both as an asset and a vital component of our green infrastructure, natural heritage system and our quality of life. Unlike our other assets, trees are living and increase in value with age for most of their lifecycle. Our urban forest is at risk from insects, disease, weather damage and development pressures. In the past, there has been a reactive approach to managing these issues. The development of proactive and timely asset management practices is critical to sustain a healthy urban forest. The current total replacement value of boulevard and maintained parks trees is $80,844,000. The calculation for tree replacement includes the removal of the old tree, planting a new young tree, and watering for three (3) years. However, trees appreciate over the life of the tree and it is not possible to replace mature trees with an equivalent tree. The current value of our existing boulevard and maintained Parks trees is therefore much higher than the replacement cost at $392,000,000. As forested areas regenerate naturally, a replacement cost is not generated for the purposes of this Plan. To determine the service value of natural assets values were placed on the assets according to the services and benefits they provide such as recreation opportunities, water treatment, stormwater absorption, improved air quality, providing habitat for wildlife and more.[1] The values associated with natural assets will be updated and refined through the renewal of the Urban Forest Management Plan.

Public art beautifies cities, gives meaning to place and builds community identity. It contributes to a visually dynamic environment, creating public spaces that celebrate, engage and stimulate. Residents of Thunder Bay take immense pride in the magnificent natural setting of their northern community and rich cultural heritage. Numerous works within our public art collection are reflective of these elements.

Developing an asset management plan for the maintenance and renewal of public art entails recognizing both its differences and similarities compared to managing other assets. Unlike replaceable items such as equipment in an arena or a new truck in a fleet, public art pieces are unique and irreplaceable.

10.1.1 ASSET CONDITION

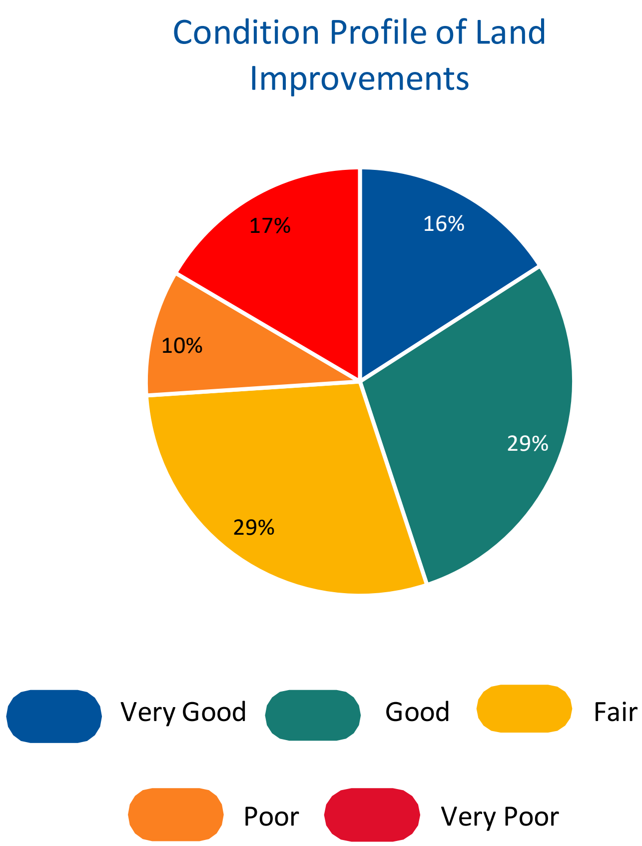


Figure 10.1: Condition Profile of Land Improvements broken down as a percentage of total replacement cost.

[1] Values placed on trees were derived from The economic value of Canada's National Capital Green Network | PLOS ONE for forests and the 2023 i-tree report for Thunder Bay's Boulevard Trees.

10.1.2 ASSET AGE

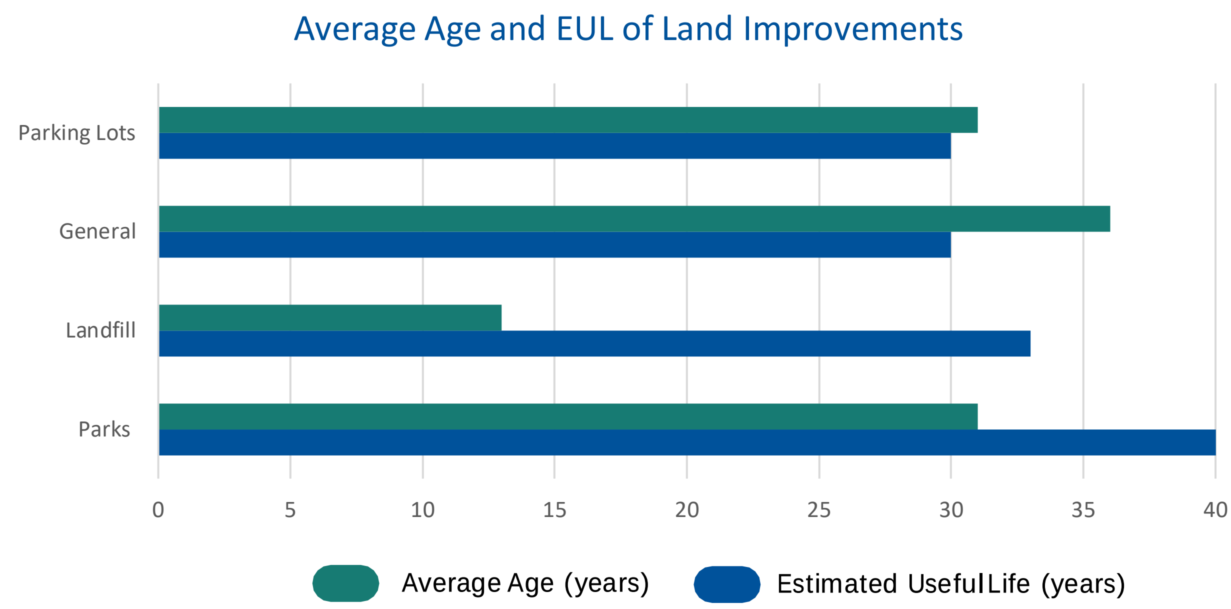


Figure 10.2 : Average Age and EUL of Land Improvement assets.

Figure 10.2 shows the average age and estimated useful life (EUL) of land improvements. The overall average of land improvement assets is 28 years. Data is not currently available to estimate the age of trees in the Urban Forest. Public art does not have an EUL; however, maintenance and conservation planning are vital to ensure the integrity and longevity of the pieces.

10.2 Lifecycle of the Asset

If the appropriate lifecycle activities are not completed and a backlog of maintenance occurs there are significant consequences to land improvement assets including impacts to user safety and the environment.

Maintenance

- Planned activities such as inspections, monitoring, patching and minor repair. Work orders are issued for identified deficiencies.
- Residents can submit complaints to Infrastructure and Operations Dispatch regarding the state of land improvement assets. Complaints are reviewed, triaged, and responded to accordingly.
- City boulevard and parks trees are maintained through activities including trimming, injections or treatment, and watering new trees based on available resources. The trees are monitored and problems are addressed when triggered by staff or public observations.

Rehabilitation

- There are certain activities that can be performed to extend the life of land improvement assets. Repairs are driven by health and safety concerns, customer complaints / expectations and budget constraints.
- Activities to extend the life of mature trees include deep root fertilization, bolting and cabling, soil remediation and root barriers

Replacement/Reconstruction

- Land Improvement assets are replaced at end-of-life;
- Public Art pieces are intended to be maintained in perpetuity.
- Trees that are dead or dying are considered for replacement. This includes the removal of dead tree and stump. The site is prepared for a new tree to be planted. There may be use of underground technologies to provide protected rooting zone in conjunction with utilities, sidewalks, and in some cases roads. Where it is determined there are too many conflicts with the existing site, new trees are planted in different locations where they are expected to be more successful.

Disposal

- Disposal of Land Improvement assets occur in line with best practices when service changes are required or when changes in usage make them unnecessary.
- When tree removal is considered necesary, disposal activities include: tree, brush, and wood removal, stump removal, site restoration.

Growth / Service Improvement

- Growth needs for land improvements will be identified based on master plans or the Official Plan. Projects typically include new Parks for subdivisions.
- Service improvements such as the addition of splash pads or sports amenities are done in consultation with the community.

10.3 Levels of Service

10.3.1 COMMUNITY LEVELS OF SERVICE

Service Attribute	Performance Measure	2023/2024 Performance	Target LOS (2025-2035)
Scope	Description, which may include maps, of the areas of the municipality that are parkland	A map has been provided on page 175 depicting the areas of the City of Thunder Bay that are parklands.	Maintain
	Description, which may include maps, of the areas of the municipal parkland that are forested.	A map has been provided on page 176 depicting the areas of the City of Thunder Bay of forested parkland.	Increase based on the Urban Forest Management Plan
	Description, which may include maps, of the multi-use trails within the City.	There are 73 km of paved multi-use trails. A map has been provided on page 177 depicting the multi-use trails in the City of Thunder Bay.	Increase priority network elements as described in the Active Transportation Plan.
Customer Satisfaction	Percentage of survey respondents that are either very or somewhat satisfied with the quality of services related to Parks Assets.	Splash Pads - 68% Sports fields, diamonds, courts, rinks, and skate/bmx parks - 53% Recreational trails - 64% Playground equipment - 63% Other park amenities: signage, lighting, bleachers, benches, shade structures - 49% Parks and parkettes natural open spaces - 58% Boulevard/Park Trees and flower displays - 59%	Increase satisfaction with quality of parks services
Customer Satisfaction	Percentage of survey respondents that are either very or somewhat satisfied with the quantity of services related to Parks Assets.	Splash Pads - 65% Sports fields, diamonds, courts, rinks, and skate/bmx parks - 53% Recreational trails - 61% Playground equipment - 59% Other park amenities: signage, lighting, bleachers, benches, shade structures - 44% Parks and parkettes natural open spaces - 55%	Increase satisfaction with quality of parks services

		Boulevard/Park Trees and flower displays - 53%	
Customer Satisfaction	Percentage of survey respondents that feel that the multi-use trail network should be maintained at a GOOD (current) rating.	75.5% of the 2023 Active Transportation Levels of Service Survey respondent feel that multi-use-trails should be maintained at a GOOD rating.	Maintain trails in GOOD condition
Customer Satisfaction	Percentage of survey respondents that feel that the City spends an adequate amount on multi-use trails.	30.8% of the 2023 Active Transportation Levels of Service Survey respondents feel that the City spends an adequate amount on multi-use trails. 50.3% of respondents would like more spent on multi-use trails.	Not applicable, for information.
Customer Satisfaction	Percentage of survey respondents that are either Neutral, somewhat or very satisfied with the quality and quantity of services related to **Public Art**	Quality: 85% Percentage that feel the amount of public art assets are 'just right': 37%	Enhance public art and creative placemaking within the city in alignment with the Create. Connect. Grow. Culture Plan
Safety	Description of the interventions taken to ensure the regular safe use of land improvement assets.	Land improvement assets are inspected at various intervals based on the asset type. Residents can also file service requests if they identify issues relevant to any of the City's assets.	Maintain
Safety	Percentage of survey respondents that feel safe while using multiuse trails.	73.2% of the 2023 Active Transportation Levels of Service Survey respondent feel somewhat or very safe while using multi-use trails. 66.6% of those that use a mobility device feel safe using the device on a multi-use trail.	Maintain safety

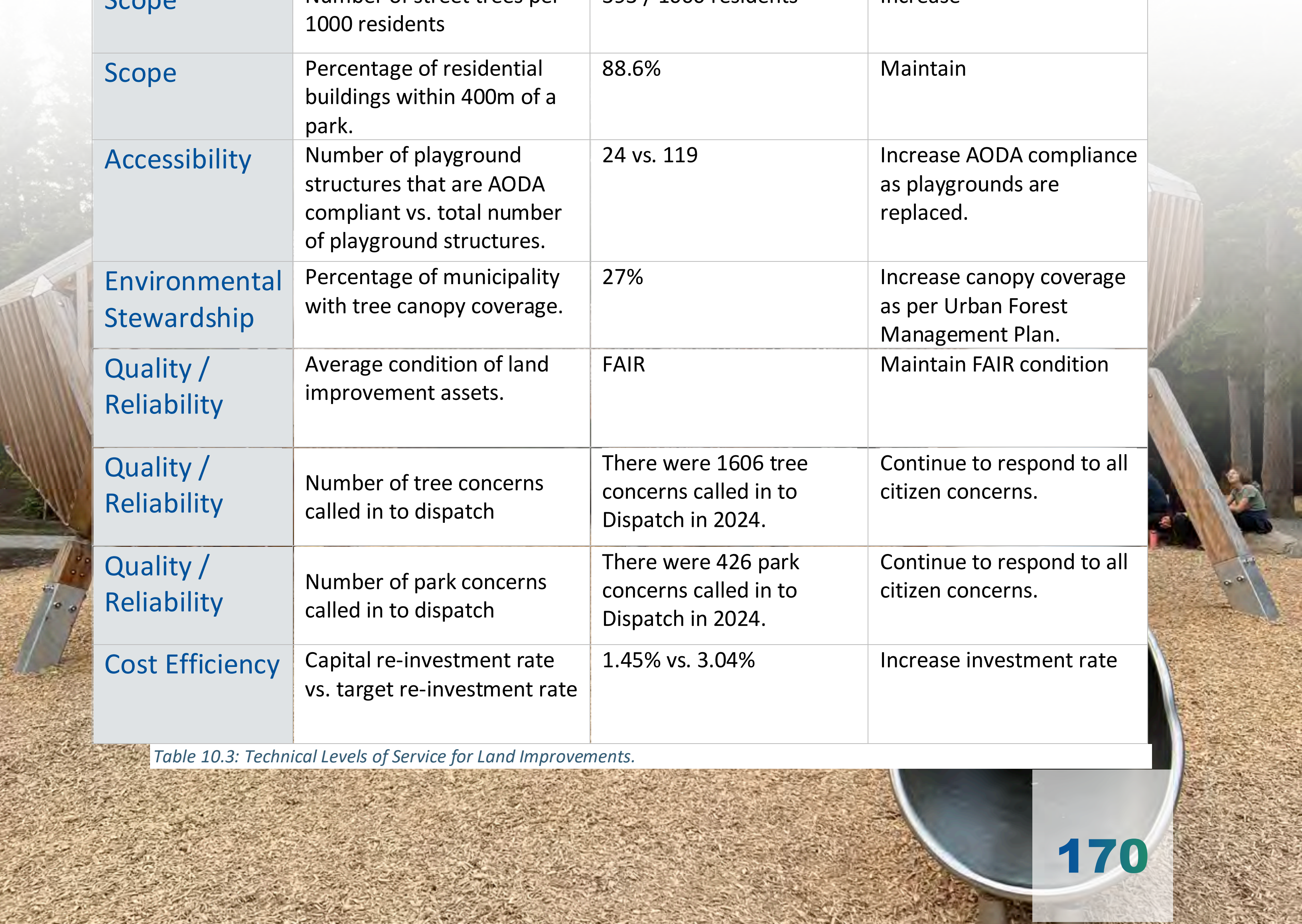
Safety	Survey respondents' top reasons for feeling unsafe using multiuse trails.	1. Poor connectivity (eg. Limited road crossings, trails don't connect, etc.) 2. Other (eg. Poor lighting, more separation between vehicular and active transportation infrastructure needed, personal safety concerns) 3. Surface condition (eg. Significant cracking, tripping hazards, potholes)	For information

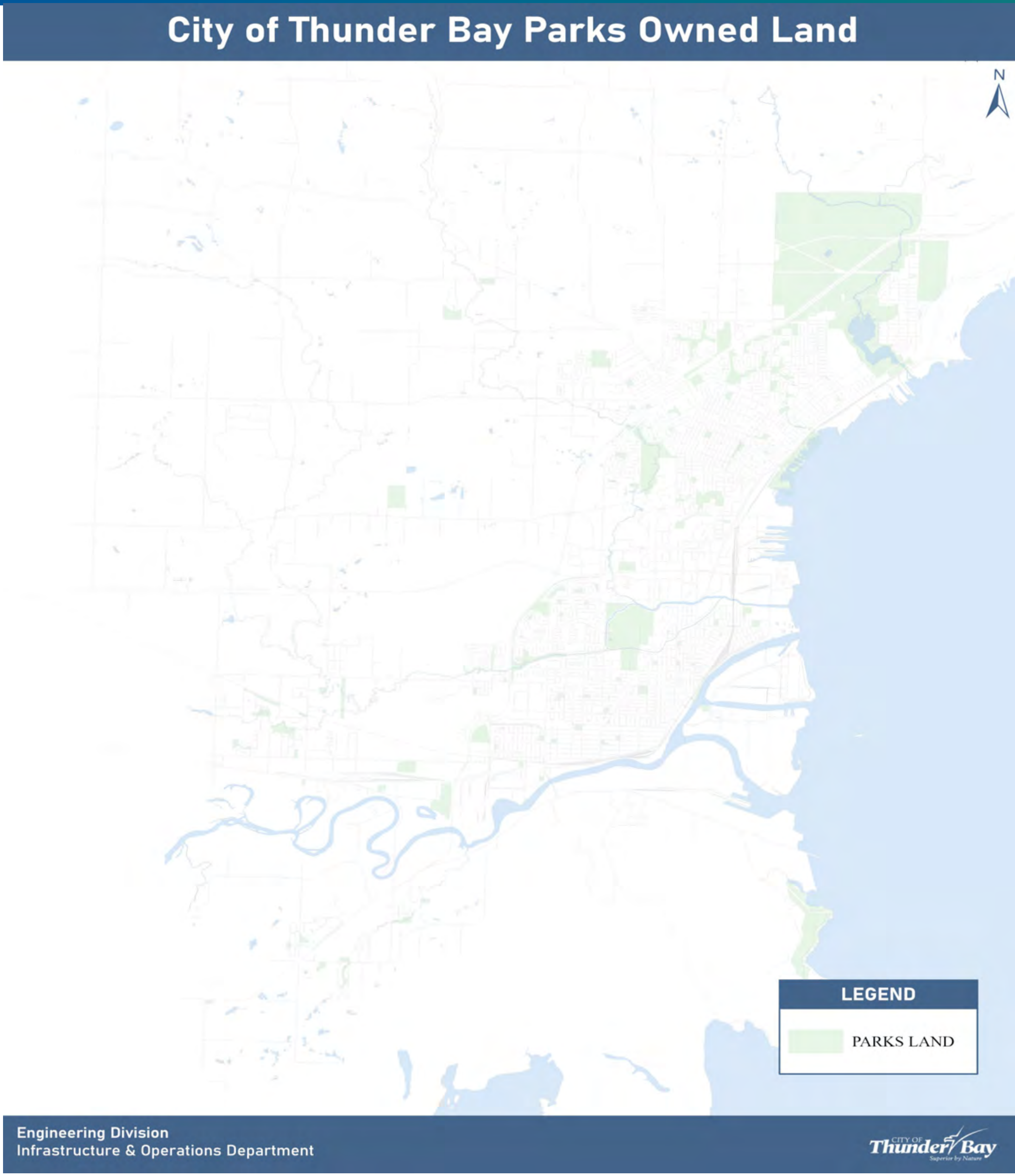
Table 10.2: Community Levels of Service for Land Improvements. Survey responses from the 2023 Active Transportation Levels of Service Survey and 2024 Parks Levels of Service survey can be found in Appendix I.

10.3.2 TECHNICAL LEVEL OF SERVICE

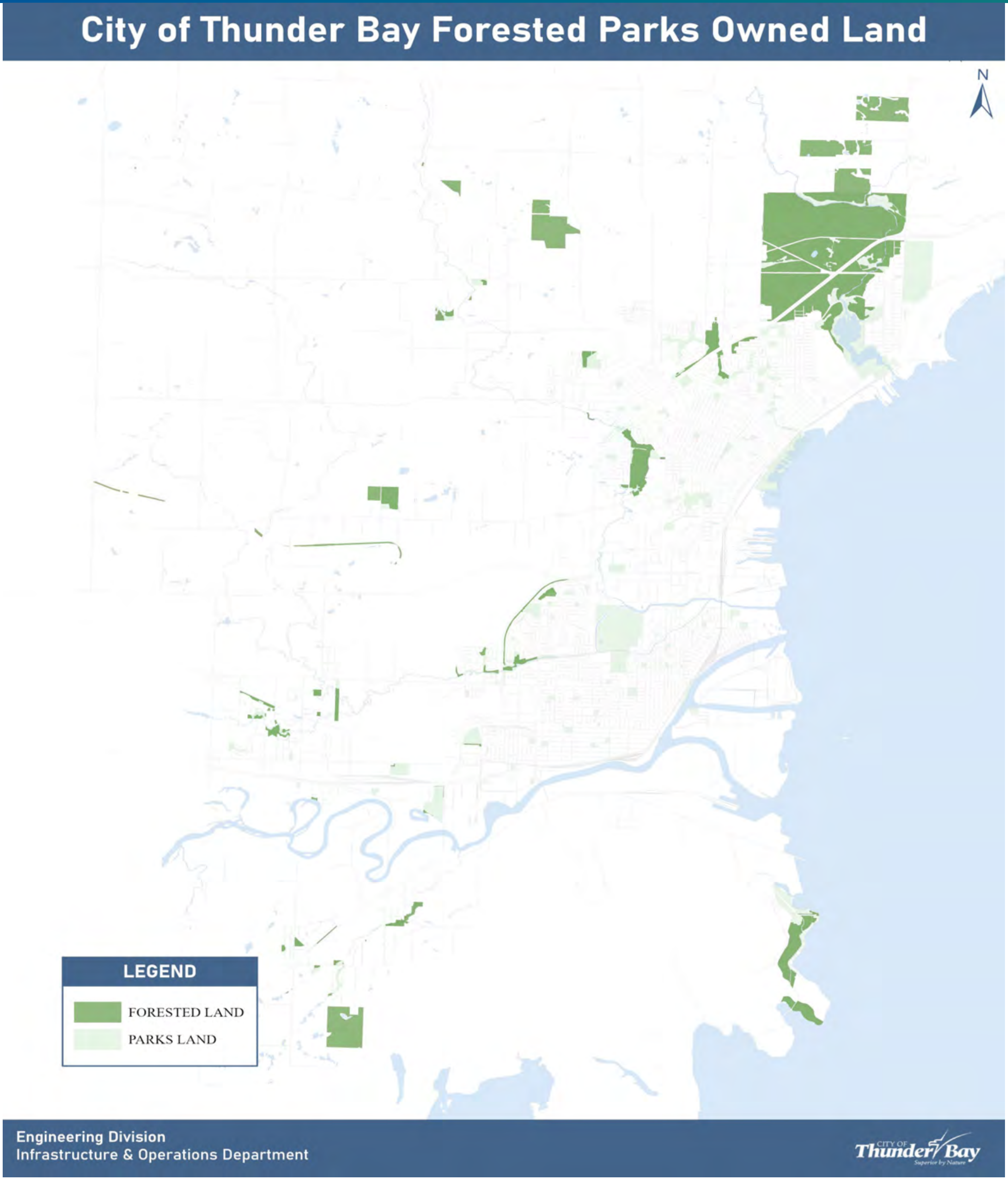
Service Attribute	Performance Measure	2022/2023 Performance	Target LOS (2025-2035)
Scope	Total parkland per 1000 residents	19 ha/ 1000 residents	Maintain
Scope	Number of street trees per 1000 residents	393 / 1000 residents	Increase
Scope	Percentage of residential buildings within 400m of a park.	88.6%	Maintain
Accessibility	Number of playground structures that are AODA compliant vs. total number of playground structures.	24 vs. 119	Increase AODA compliance as playgrounds are replaced.
Environmental Stewardship	Percentage of municipality with tree canopy coverage.	27%	Increase canopy coverage as per Urban Forest Management Plan.
Quality / Reliability	Average condition of land improvement assets.	FAIR	Maintain FAIR condition
Quality / Reliability	Number of tree concerns called in to dispatch	There were 1606 tree concerns called in to Dispatch in 2024.	Continue to respond to all citizen concerns.
Quality / Reliability	Number of park concerns called in to dispatch	There were 426 park concerns called in to Dispatch in 2024.	Continue to respond to all citizen concerns.
Cost Efficiency	Capital re-investment rate vs. target re-investment rate	1.45% vs. 3.04%	Increase investment rate

Table 10.3: Technical Levels of Service for Land Improvements.

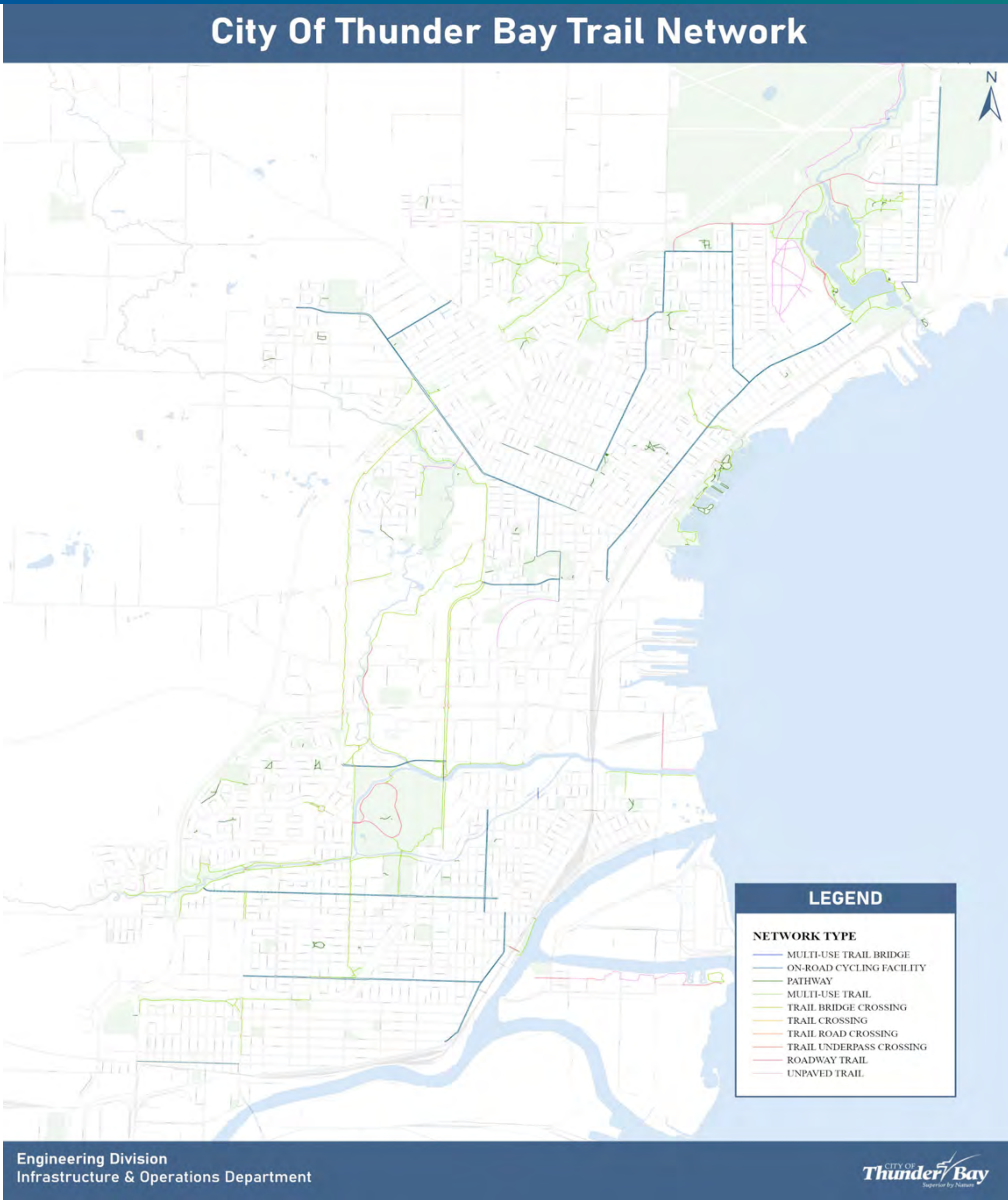




Map 10.1: City of Thunder Bay Parklands



Map 10.2: City of Thunder Bay Forested Parklands



Map 10.3: City of Thunder Bay Multi-use Trails

10.4 Risk

Asset Dependencies

Land improvements generally directly support service operations as opposed to supporting other asset classes, though natural assets can reduce demands on other systems, especially stormwater.

Many land improvements are dependent on utilities, fleet, and equipment to deliver services.

Likelihood and Consequences

The likelihood of a land improvement experiencing failure generally increases with worse condition ratings and older ages, though some natural assets like trees are most vulnerable when new.

Consequences are highest for those supporting critical services with limited redundancy, notably improvements at the landfill. This is followed by regulated services like cemetery. Recreational land improvements are generally considered to be less critical. For green infrastructure like trees, large mature canopy trees in parks or boulevard are most critical, with new plants in forested area being lower consequence of failure.

Although individual trees dying do not have a significant impact, a larger number dying or damaged at once, particularly in one area from a storm, fire, or mandated removal, can have significant impacts on services provided, and reputational risk.

The following risk profile provides a visual representation of the land improvement assets in the very low to very high risk categories.

Very Low	Low	Moderate	High	Very High
$25 million	$72 million	$99 million	$55 million	$0

Figure 10.3: Land Improvement Asset Risk Profile

Key Hazards

Natural hazards such as tornadoes, fire, or unseasonable weather (such as a cold snap after tree budding) can cause significant damage and have the potential to affect a large number of assets at once, creating a much larger impact.

Foregone maintenance, particularly for young trees, can contribute or lead directly to asset failures.

Intentional damage, including stunt driving on playing fields, can also cause significant impacts to individual assets in a short period of time.

Risk Drivers

Climate change is expected to increase the frequency and intensity of natural hazards.

Meanwhile, new best practices and additional regulation are typically expected to reduce the impact of hazards, although they may represent potential increases in replacement costs.

10.5 Climate Change Considerations

Land Improvements assets are directly impacted by climate change such as more frequent freeze thaw cycles, and flooding due to significant rainfall. The repair, renewal and replacement of land improvement assets consider the following climate risks, adaptation and mitigation opportunities.

Climate Risks Identified with Land Improvement Assets:

- Potential increased infrastructure damage as more frequent and severe weather events increase overland flooding from stormwater ponding in low-lying areas.
- Increased springtime flooding and decrease in spring time groundwater recharge due to greater frost depth from extreme cold.
- Potential increased maintenance and replacement costs as pavement and other exposed land improvement assets durability and lifespan decreases with more severe weather events and freeze and thaw cycles.

Future Climate Adaptation Opportunities:

- Consider Climate Change impacts in the design, location, construction and maintenance of the land improvement assets while considering affordability and co-benefits.
- Incorporate new technology and best practices in the design, construction and maintenance of new land improvements to minimize service disruption and increase resiliency.
- Increase urban tree canopy coverage to aid in stormwater management, reduce heat island effect, and improve air quality.

Future Climate Mitigation Opportunities:

- Investing in complete, connected cycling and pedestrian networks in the short to medium term (aligns with Objective #13, Thunder Bay Net-Zero Strategy).
- Assess embodied carbon of materials used in land improvement projects and explore opportunities to use materials and construction methods with lower embodied carbon.
- Increase the landfill capture rate (Objective #15, Thunder Bay Net-Zero Strategy)

10.6 Investing in the Assets

To maintain the proper level of repair, renewal and replacement of land improvement assets, the annual sustainable funding amount is $6,806,000. The 5 year historical budgeted funding allocated to land improvements was $3,901,000. This means that there is an annual infrastructure deficit, or shortfall, of **$3,808,000.** Over the next ten years this could result in a cumulative deficit of $38,085,000 to maintain LOS, or a cumulative deficit of $38,425,000 for proposed LOS.

The shortfall has and will continue to create a backlog of work and will require significant funding to overcome. A 10 year projection of the average budget, LOS Investment and infrastructure gaps for all land improvement assets is shown below.

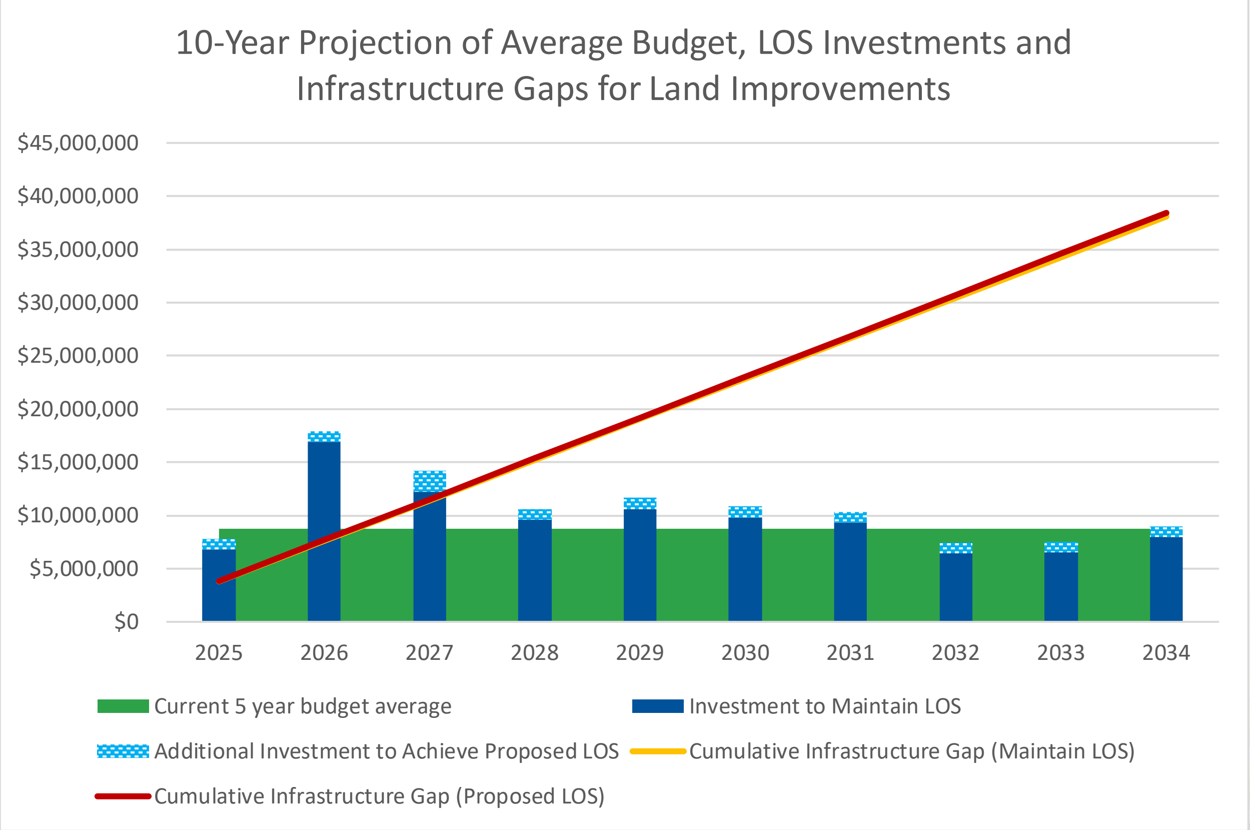


Figure 10.4 : 10-Year Projection of Average Budget, LOS Investments and Infrastructure Gaps for Land Improvements

Land Improvement Annual Infrastructure Deficit:

$3,808,000

10.7 Future Outlook

The major growth / service improvement related infrastructure projects for Land Improvements currently underway or on the horizon include but are not limited to: active transportation multi-use trails and tree plantings.

The Net-Zero strategy recommends planting an additional 100,000 trees within the municipal boundary by 2050 to help achieve the Net-Zero vision.

The total estimated increase in value of land improvement assets for these projects is estimated at $11 million. These will result in an approximate annual lifecycle investment increase of $40,000 by 2034.

The figure below summarizes the City's estimated expenditures for the new infrastructure projects by year:

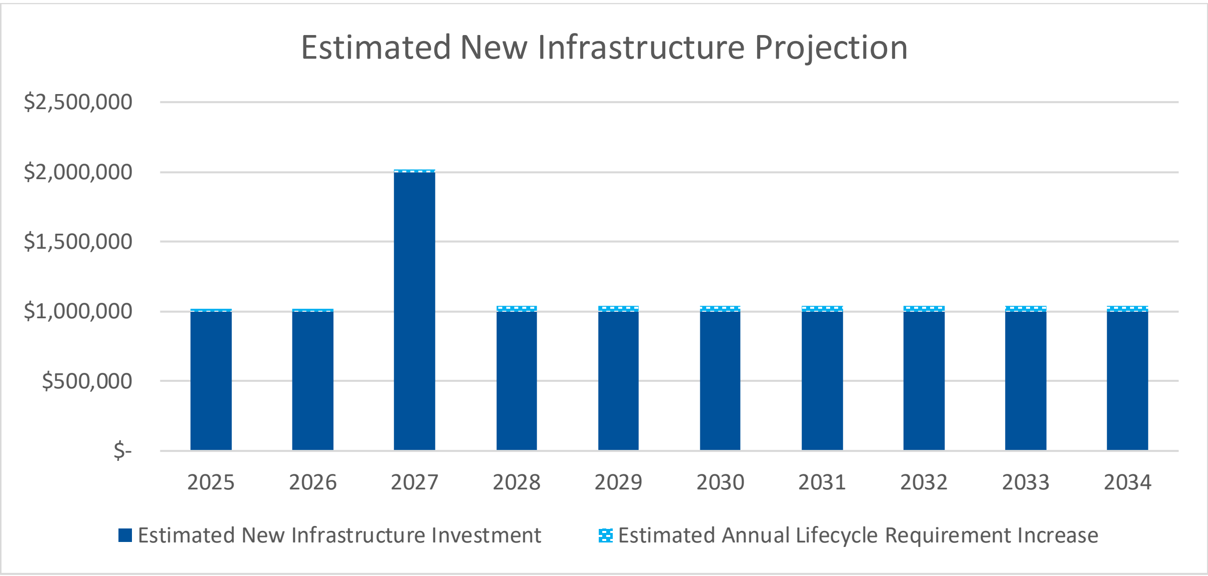


Figure 10.5 : Estimated Land Improvement New Infrastructure Projection

The infrastructure deficit for proposed levels of service in the previous section includes estimated annual lifecycle investment requirement that will be required for these new assets once they are built. As additional new infrastructure is built and existing land improvements are expanded based on master plans, studies, and models to service forecasted growth, they will require investment to renew them as they deteriorate over time. This will place additional pressure on maintaining the state of land improvement assets.

ASSET INVESTMENT STRATEGY

A proactive, data-driven approach to infrastructure planning.

11.0 Asset Investment Strategy

Effective asset and financial management will enable Thunder Bay to sustain asset networks that provide the appropriate level of service for the City to achieve its goals and objectives. Creating a Long-Term Financial Plan (LTFP) that connects the City's Budget to the AMP is critical for the City to be able to fund the various networks lifecycle activities such as renewals, maintenance and acquisitions at the optimal time.

Thunder Bay is under increasing pressure to meet the wants and needs of its customers while keeping costs at an affordable level and maintaining its financial sustainability. Without funding asset activities properly, the City will have difficult choices to make in the future which will include options such as higher cost reactive maintenance and operational repairs, reduction of service, and potential reputational damage. Information provided in each section of the plan includes the infrastructure deficit and the sustainable funding required over a 50-year projection for maintaining current levels of service and proposed levels of service. Proposed levels of service are outlined in each section of this plan. Proposed levels of service include, but are not limited to, additional infrastructure required for growth, community need, or long-term strategic planning. In some cases increases to average asset condition, and complying with performance targets such as energy efficiency and accessibility are included.

When an infrastructure deficit occurs or an asset is underfunded, the asset does not receive the proper repair, renewal, and replacement and typically a backlog of work will occur. Through asset management planning, sustainable funding strategies will help reduce the infrastructure deficit, clear the backlog of work, and set aside funding for future lifecycle costs.

An indicator of asset portfolio sustainability is the difference between required and actual rates of re-investment. The re-investment rate is the amount budgeted for capital renewal as a share of the total replacement value of the asset portfolio. A target sustainable re-investment rate has been calculated based on annual required funding for lifecycle activities as a share of the total replacement value. The **current re-investment rate is 1.52%** versus the **target sustainable re-investment rate of 2.14%**. This shows that the City is supporting only **71%** of the capital renewal requirements annually. At this rate of capital renewal, the capital backlog will continue growing and the asset portfolio's ability to support established service levels will continue to deteriorate. The financial strategy required to close the gap between the current and sustainable re-investment rates requires strategies for reducing the overall cost of assets as well as increasing investment.

11.1 Forecasting Asset Investment Needs and Deficits

Thunder Bay, as with many other cities in Ontario and Canada, continues to struggle with infrastructure deficits. To better understand future capital investment requirements, the City used its Citywide Decision Support Tool to analyze the state of existing infrastructure, lifecycle strategies, current and proposed levels of service, and risk.

The analysis covered a 50-year time horizon, from 2025 to 2075, and evaluated both current and proposed levels of service. It identified overdue and near-term rehabilitation and replacement needs, calculated annual funding requirements, and compared them against a five-year average budget to determine annual deficits. This process allows consistent assessment of investment needs over the long-term.

The following figure shows the 10-year projection of the required investment to maintain current levels of service for all assets along with the additional investments required to achieve proposed levels of service.

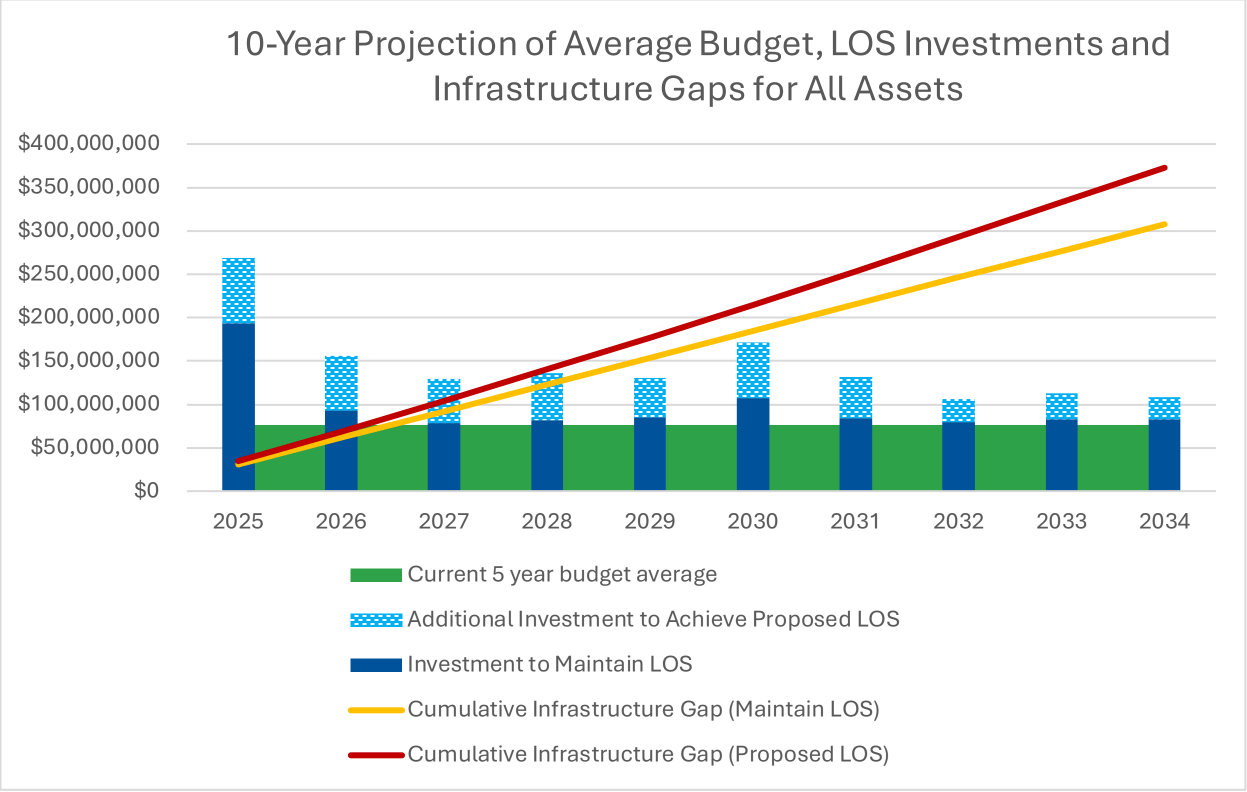


Figure 11.1: 10-year projection of average budget, LOS Investment, and Infrastructure Gaps for all assets.

Results indicate that maintaining current levels of service requires an additional **$30.6 million** annually. Over the next ten years this could result in a cumulative deficit of **$307 million** to maintain current LOS, or a cumulative deficit of **$373 million** for proposed LOS.

11.2 Understanding and Managing Risk

As noted in the State of Infrastructure section, Thunder Bay currently has approximately **$1.3 billion** assets currently classified as high or very high risk. An estimated **$215 million** in lifecycle investments is immediately needed to address these assets, with a total of **$749 million** required over the next 10 years to prevent further deterioration and manage existing risks. The City uses its asset management risk framework to consistently evaluate and prioritize these investment needs, ensuring capital projects are aligned with available funding in the Capital Budget and Forecasts.

11.3 Understanding How Our City Is Funded

Municipalities have limited avenues to generate revenue, relying primarily on property taxes, user fees, and government transfers to fund services and infrastructure. This challenging financial landscape requires careful management of resources while responding to local needs and emerging challenges such as climate adaptation, public safety, and unexpected expenses due to global conditions or others.

Property Tax and Assessment Growth

Property taxes are the City's main source of stable and predictable revenue. Taxes are levied on residential, commercial, and industrial properties based on their assessed value. As the city grows, additional tax revenues are generated through assessment growth from new development or property improvements. The City's Assessment Growth Policy will allocate these funds strategically to support growth and infrastructure. New assessment revenue will be used to fund approved growth initiatives with any remaining funds allocated as follows:

- If under $100,000: 100% to the Capital General Reserve Fund.
- If $100,000 or more: 40% to the Capital General Reserve Fund, 40% to debt reduction, and 20% to parks, recreation facilities, or major enhancements beyond routine renewal.

Payments in Lieu of Taxes (PILT)

PILT are payments made by tax-exempt institutions such as universities, colleges, hospitals, federal or provincial governments. These payments help compensate municipalities for the services they provide including emergency services and infrastructure maintenance.

Supplementary Taxes

A supplementary tax bill is issued for various scenarios such as when a house has been newly built on land that had been assessed as vacant, a new building has been constructed on a business property, or the use of a property has changed resulting in a change in tax class.

Sustainable Grants

The City actively seeks government grants and funding opportunities to support local projects and enhance community services. Many grants are a result of stimulus or other one-time funding that are more difficult to forecast. In general, grants are only included in the budget when confirmed.

The following grants are included in the sustainable grants profile:

- The Ontario Community Infrastructure Fund (OCIF) provides funding to help small, rural and northern communities renew and rehabilitate critical infrastructure.
- The Canada Community-Building Fund (CCBF) is a stable, predictable, and indexed source of funding provided up front to provinces and territories who, in turn, flow this funding to their communities. The funding allows local communities to make strategic investments in essential infrastructure, such as roads and bridges, public transit, drinking water and wastewater infrastructure, and recreational facilities.

- In Ontario, the Provincial Gas Tax program provides funding for municipal transit systems to improve public transportation, reduce traffic congestion, and ease traffic congestion.

The City will require ongoing, predictable and sustainable funding help from senior levels of government to successfully deal with the infrastructure deficits that are currently prevalent.

User Fees and Other Revenue Streams

User fees are charged to individuals who use fee-based programs and services provided by the City, regardless of their status as taxpayers. These fees are typically applied when the services benefit specific individuals rather than the community as a whole. Examples of user fees include transit fares, recreation program fees, landfill tipping fees, water and wastewater user rates. Revenue projections for user fees are determined through historical trends, market analysis, and adjustments to fee structures.

It is assumed that revenues will increase as forecasted in the various rate based financial plans for the following services: Drinking Water, Wastewater, Solid Waste (Landfill), Prince Arthur's Landing – Boater Services, and Parking. Fees collected are used to finance both operating and capital expenditures as well as contributions to reserves for future infrastructure projects.

The City also generates revenue through licensing and permits, fines, penalties and interest, donations, naming rights, sponsorships, and earns investment income.

Debt

Long-term debt is a critical component of the City's long-term capital financing strategy. The City employs two methods to borrow for its capital program:

Debentures: Infrastructure Ontario (IO) has established a lending program for municipalities and other public sector organizations to access financing for capital programs at competitive interest rates and predictable repayment schedules. Capital projects eligible for the IO lending program include any capital project with a useful life longer than the term of the debenture. Once the capital projects are complete, the City applies to IO for financing and issues a debenture(s), which IO purchases to provide the required funding.

Internal Loans: Funds may be borrowed from the City's own reserves and reserve funds, allowing for flexibility and reduced reliance on external borrowing. Interest is charged at 0.5% above the historical five-year average investment rate.

The City has a Capital Financing and Debt Policy (#05-01-12) and Debt Management Strategy designed to ensure responsible borrowing and fiscal sustainability. The primary objectives, in priority order, are:

- Adhere to statutory requirements
- Ensure long-term financial flexibility and sustainability
- Limit financial risk exposure
- Minimize long-term cost of financing
- Match the term of the capital financing to the useful life of the related asset and
- Maintain a superior credit rating.

On a consolidated basis the Debt Management Strategy also limits total annual debt repayments (including Tbaytel) to no more than 10% of the City's annual own source net revenue; a threshold well below the provincially mandated maximum of 25%. Currently, the City allocates about 5.6% of its net revenue toward debt repayment reflecting a cautious and disciplined approach to borrowing. This approach supports the City's commitment to sound financial management while maintaining flexibility for future investments. Figure 11.2 outlines the total tax-supported projected long-term debt over the next 10 years. Rate supported debt is not projected in this AMP as the debt for rate programs will continue in line with the financial plans associated with those assets.

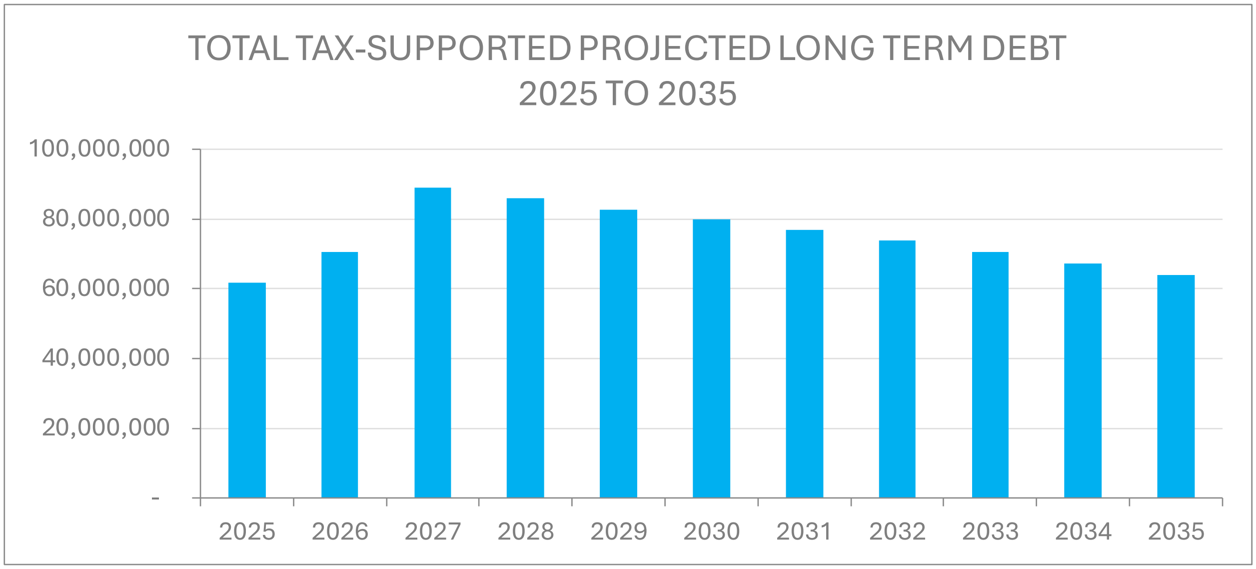


Figure 11.2: Total Tax-Supported Projected Long-Term Debt

Reserves and Reserve Funds

The establishment and use of reserves and reserve funds is an essential part of the City's long-term financial planning. These funds, built up over time through prudent financial management, allow the City to address both planned and unforeseen needs without relying on increased taxes or new debt. The primary objectives of reserves and reserve funds are:

- Adherence to statutory requirements
- Promotion of financial stability and flexibility
- Provision for major capital expenditures
- Smooth expenditures which would otherwise cause fluctuation in the operating budget
- Facilitate long-term financial planning; and/or
- Leverage funding opportunities.

Only those reserve contributions that are planned, cyclical contributions have been included in the financial analysis. One-time contributions can assist in infrastructure renewal and in leveraging grants but are not a sustainable and predictable source of financing when planning for the future.

Current Tax Based Capital Profile

Current sustainable funding sources for the Tax-based Capital Budget are further detailed in Figure 11.3 below. These reflect only predictable and recurring funding sources. One-time grants such as Clean Water Wastewater Fund (CWWF), Disaster Mitigation and Adaptation Funding (DMAF), and the Investing in Canada Infrastructure Program (ICIP) – Public Transit are currently shown in the 'Other' category of the profile. These types of grants are excluded from the sustainability calculations as they are not guaranteed in the long-term.

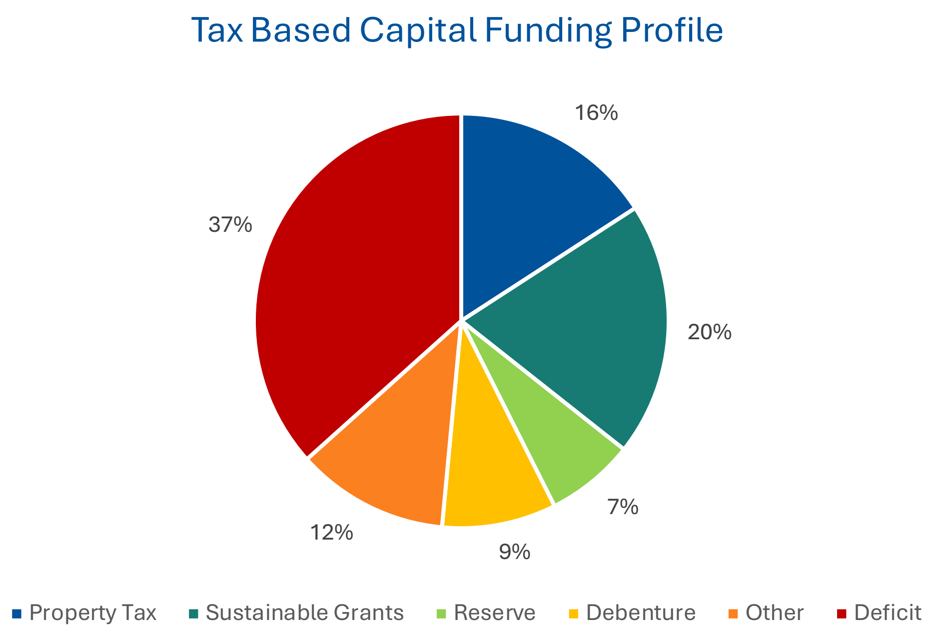


Figure 11.3: Tax Based Capital Funding Profile

Grants remain a key funding source but are treated separately to highlight the importance of stable, long-term financing when planning for infrastructure renewal and investment. Grants are also often tied to new infrastructure and do not help to maintain the City's existing assets.

Capital Budget

The Capital Budget is a difficult balancing act. There are always more needs than funds available which means projects must be prioritized. A Capital Investment Prioritization Matrix is under development to align the Capital Budget with the strategies outlined in this AMP.

Projects are prioritized and submitted at the department level and include a description and justification for the project, how the project links to strategic plans, total costs broken down by year, the risks associated with not doing the project, and the impact of the project on future operating costs. Possible funding sources are also identified. Full lifecycle costing requires that the City plan for not only the rehabilitation and replacement of an asset, but also significant operating costs of the asset.

Project related to legislative changes, health & safety, and protecting the environment are likely to be first on the priority list. Next, the focus is on replacement and renewal of existing assets and integrated projects to ensure assets continue to provide the services that are expected. Finally, new projects/growth projects are considered usually relating to specific strategic initiatives or available funding from other levels of government.

Key Financial Policies and Bylaws

The development of the infrastructure financing strategies is guided by several of the City's financial policies. This alignment ensures the infrastructure financing strategies maintain Thunder Bay's financial stewardship over public assets and funds.

Key financial policies and by-laws include:

- Strategic Asset Management Policy: To provide leadership in and commitment to the development and implementation of the City's asset management program and financial sustainability.
- Budget Policy
- User Fee Framework Policy 05-06-01: To ensure consistency across the Corporation with respect to the calculation of user fees.
- Reserve and Reserve Fund Policy 05-01-08: To establish guiding principles for the establishment, maintenance, management and accounting of Reserves and Reserve Funds.
- Reserve Fund By-law 220-2023: To consolidate and provide for the establishment of and maintenance of all Reserve Funds of The Corporation of the City of Thunder Bay
- Capital Financing and Debt Policy 05-01-12: To ensure that all statutory requirements with respect to incurring debt for capital purposes and the issuance of debentures and prescribed financial instruments for or in relation to the debt are complied with.
- Tangible Capital Asset Policy 05-01-15: To ensure that all statutory requirements with respect to the accounting for and reporting of tangible capital and infrastructure assets are fulfilled.
- Investment Policy 05-01-04: To summarize and define the investment objectives, risk tolerance and liquidity needs and investment horizon for the City's investment portfolio.
- Supply Management By-law 359-2024: Governs the way the Corporation purchases goods, services and construction.
- Assessment Growth Policy 05-02-06 – Integrates growth-related tax revenues into the City's long-term financial planning.
- Local Improvement Policy 11-03-03 - To ensure that the costs being assessed to the property owners are the full actual cost of the Local Improvement except for those costs required to be borne by the City under the Local Improvement Charge Regulation 119/03 and flankage exemptions.

Work is underway on the City of Thunder Bay's Long-Term Financial Plan. This Plan will include a comprehensive review of the City's existing financial policies and by-laws to assess their relevance, effectiveness, and alignment with best practices. This review will help identify any gaps, inconsistencies, or outdated provisions and where necessary, new policies or updates will be recommended to support long-term fiscal sustainability.

11.4 Financial Strategy for Sustainable Infrastructure Investment

Thunder Bay is taking a proactive, data-driven approach to infrastructure planning. Using the Citywide Capital Planning & Analysis tool, the City can forecast infrastructure funding needs and identify cost-effective lifecycle interventions. The financial strategy outlined here recommends gradually increasing asset renewal investments over time to address the infrastructure backlog, achieve targeted service levels, and maintain long-term affordability.

Well-maintained infrastructure lasts significantly longer and costs less over its full lifecycle than assets left to deteriorate and require full replacement. By properly funding lifecycle activities, like maintenance and rehabilitation, the City can extend asset life and reduce long-term costs. To support this, deterioration models built into the Citywide tool help determine the optimal timing for these interventions.

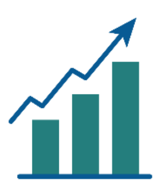
The goal of this strategy is to fund lifecycle activities in a phased, sustainable manner that maintains or achieves desired service levels, reduces risk, and aligns with Thunder Bay's financial capacity.

To achieve the Plan and support long-term affordability, resilience, and reliable service delivery, Thunder Bay is implementing a coordinated set of strategies that emphasize smart investment, climate responsibility, and maximizing the value of existing infrastructure.

KEY STRATEGIES TO REACH LONG-TERM SUSTAINABILITY

1. Strengthen Financial Foundations

- **Prioritizing Asset Renewal Over Expansion:** The City will adopt an 80/20 funding split between capital renewal and new infrastructure investment, ensuring the majority of capital funding supports the renewal and optimization of existing assets rather than expansion.



- **Increasing Capital Investment:** To reduce reliance on debt and external sources, the City will gradually increase the Capital out of Revenue base, beginning with 2% in 2028, 3% in 2029, and 4% annually from 2030 onward, until financial sustainability targets are achieved. Based on the 2025 Budget, a 4% increase in Capital out of Revenue would result in an estimated 0.25% increase to the overall tax levy. This strategy should allow time for growth to be realized and to direct a portion of assessment growth to capital reserves to minimize impacts on the overall tax levy.

- **Complete Lifecycle Investments:** Continue to extend the life of existing assets by identifying and completing lifecycle interventions when they are most cost-effective.

- **Fostering Capital Discipline:** To ensure transparency and strategic alignment, in-year capital project approvals outside of the budget process will only be considered when related to urgent health and safety needs, required support for unforeseen growth, time sensitive funding requirements, or regulatory compliance.

2. Optimize Asset Use and Investment

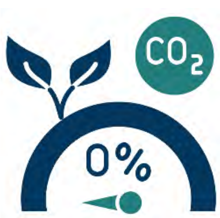
- **Utilizing Lifecycle Costing and Risk-based Prioritization in Capital Planning:** All capital investment decisions will incorporate lifecycle costing and risk assessments, ensuring long-term operational, maintenance, and replacement costs are considered at the planning stage to avoid future financial burdens. This approach ensures that the appropriate resources are allocated to projects with the highest risk of impacting delivery of services, public health and safety, or environmental impact.

- **Adopting Integrated Project Delivery as the Standard:** The City will use Integrated Project Delivery as the default approach for capital works, coordinating infrastructure planning, design, and construction in shared corridors. Exceptions may be applied when the condition of a single asset warrants prioritizing it for rehabilitation. This approach ensures reduced duplication, fewer disruptions, lower costs, and improved long-term performance.

- **Maintaining Appropriate Service Levels:** The City will maintain current levels of service wherever feasible, recognizing that increases will only be pursued when justified by evidence-based priorities such as accessibility, climate mitigation, adaptation, resilience, regulatory compliance, or equity of service delivery.

- **Rationalization of Assets and Review of Service Levels:** The City will regularly evaluate its asset portfolio and service levels to identify opportunities for consolidation, repurposing, or divestment of underutilized or non-core assets, reducing liabilities and aligning infrastructure with community needs.

3. Align with Climate and Growth Goals



- **Advancing Climate Goals Through Net-Zero Infrastructure:** All new municipal infrastructure will be designed and built to be net-zero ready, and the goals of the *Thunder Bay Net-Zero Strategy* will be extended to achieve net-zero emissions across all municipal buildings and fleet operations by 2050 in line with federal targets.

- **Sustainable Development:** Growth of the City will be focused within the designated urban settlement boundary. Further expansion of City services outside of these limits will be prohibited unless aligned with the Official Plan, to protect natural lands and promote sustainable development.

- **Continuing Support of Smart Growth Without Development Charges:** To stimulate infill and intensification, the City will not pursue a development charges policy and bylaw until 2030 at the earliest. A comprehensive Development Charges Background Study will be undertaken in the meantime to evaluate long-term implications and recommend a sustainable, equitable funding model aligned with smart growth principles.

4. Enhance Revenue Diversity and Resilience

- **Reviewing Rate Structures for Full Cost Recovery:** Rate based service models, particularly for water, wastewater, landfill and boater services, will be reviewed regularly to ensure they reflect the true cost of service delivery, encourage conservation, and support equitable cost-sharing across users. The Plan assumes that the City will follow the various Financial Plans to sustainably fund the assets associated with those plans. Fees collected are used to finance both operating and capital expenditures as well as contributions to reserve funds for future infrastructure projects.

- **Diversifying Revenue Streams:** To strengthen financial resilience and reduce reliance on property taxes, the City will pursue a diverse mix of funding strategies. These include exploring Public-Private Partnerships for shared-benefit infrastructure projects, leveraging municipal assets through leases or divestment, charging fair user fees, and actively pursuing shorter-term grants and subsidies from other levels of government.

The following figure shows how these strategies would fund **current** levels of service and reach a sustainable level of funding by 2064.

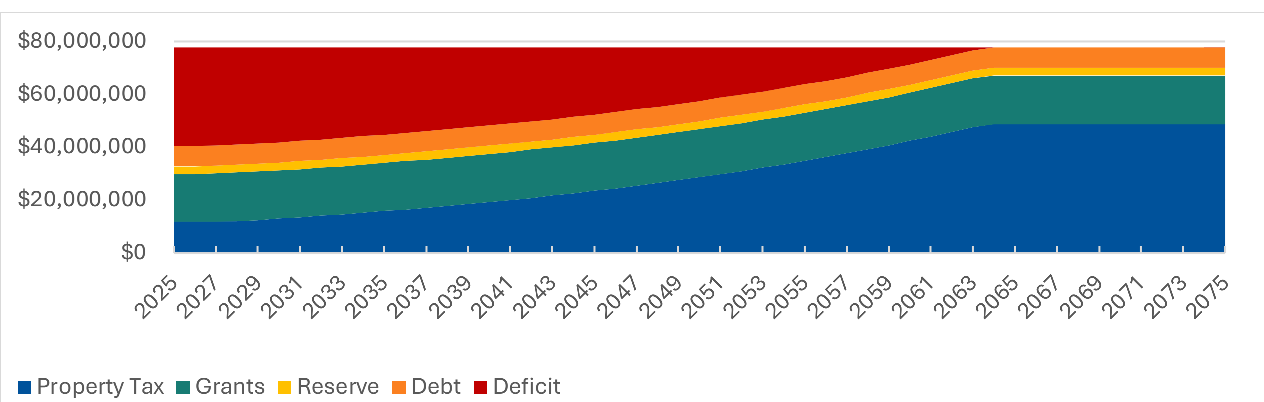


Figure 11.4: Sustainable Funding Projection for Current Service Levels

The following figure shows how these strategies would fund **proposed** levels of service and reach a sustainable level of funding by 2066.

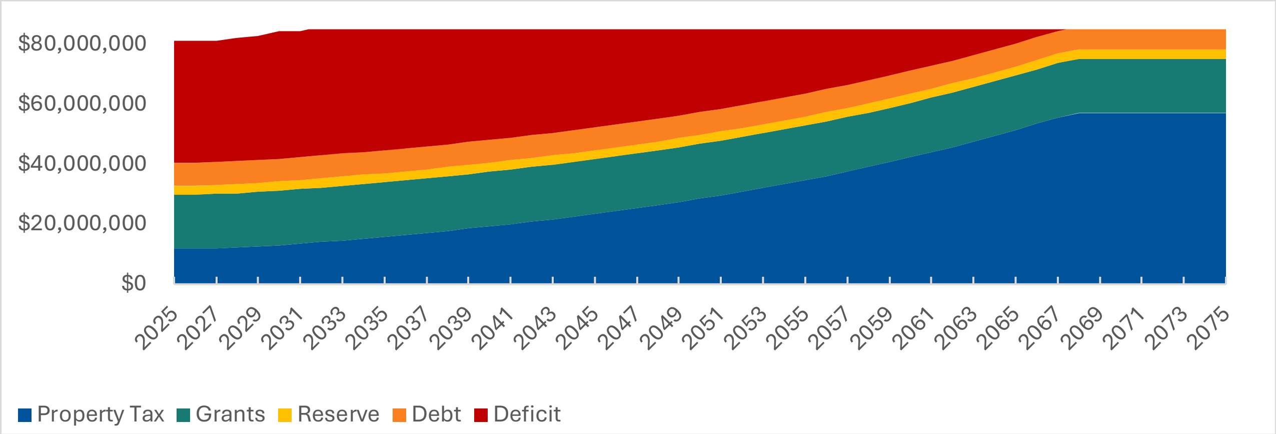


Figure 11.5: Sustainable Funding Projection for Proposed Service Levels

By aligning its financial tools and decision-making frameworks with long-term infrastructure goals, Thunder Bay is demonstrating strong fiscal stewardship. This approach supports responsible cost management while preparing for future growth, evolving service demands, and climate challenges.

Progress will be monitored through the upcoming Corporate Performance Management Framework and Dashboard, which will allow transparent, organization-wide tracking of performance. The City will also continue to report the State of Infrastructure annually to Council to meet regulatory requirements and uphold public accountability.

CONTINUOUS IMPROVEMENT

Exploring future enhancement opportunities to improve the quality of asset data, strengthen asset management processes, and allow for ease of annual monitoring and reporting.

12.0 Continuous Improvement

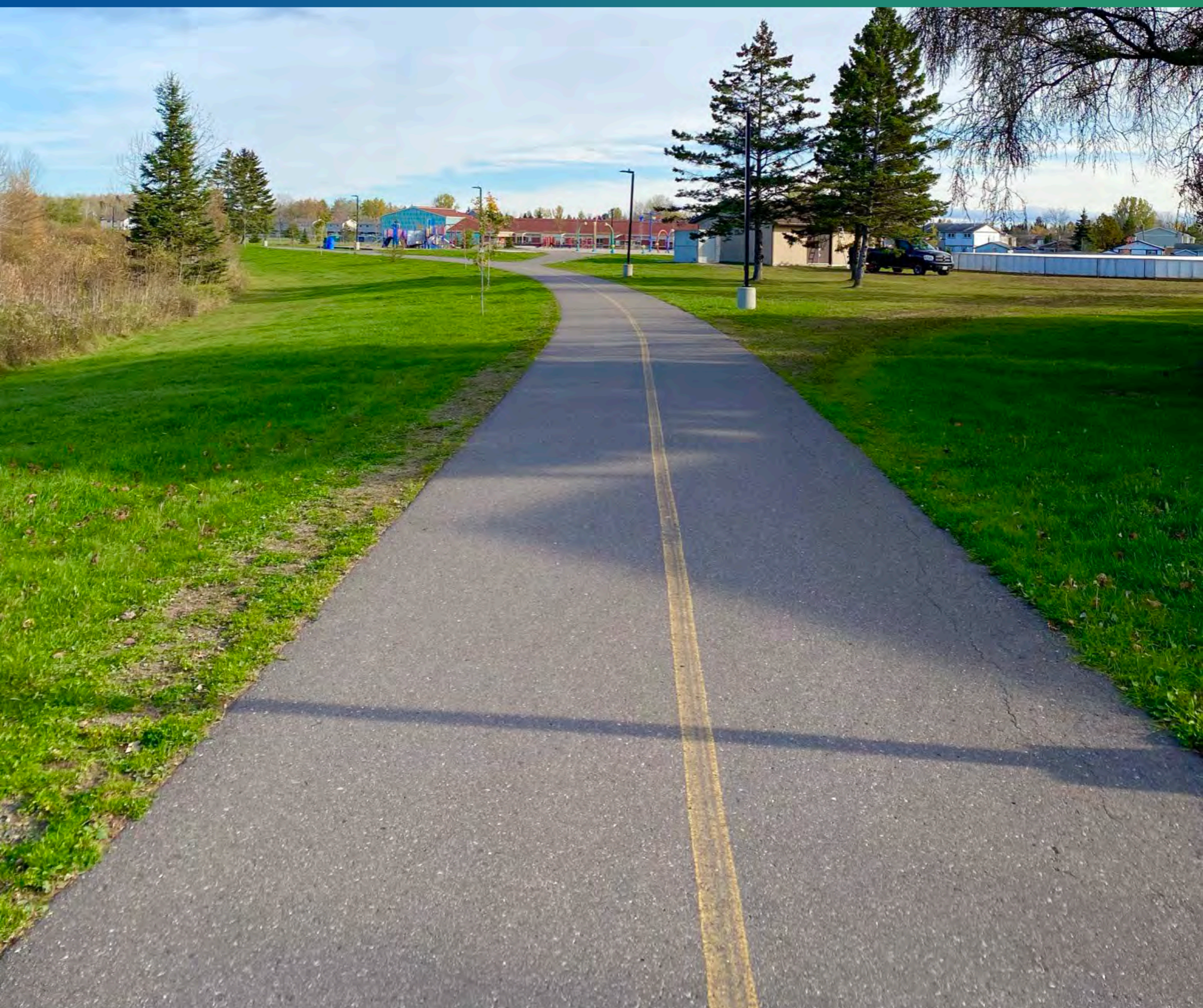
The City of Thunder Bay is committed to continuous improvement and is working towards an Enterprise-Wide Asset Management Program (EAM). Throughout the City's corporate asset management journey, there have been a number of lessons learned, and opportunities identified. Many of the improvements that have been implemented to date have helped the City achieve the past and current regulatory requirements. Moving forward, the City of Thunder Bay is committed to exploring future enhancement opportunities to improve the quality of asset data, strengthen asset management processes, and allow for ease of annual monitoring and reporting.

Actions	Timeline
Data Management	
Complete Asset and Work Order System review and roadmap to determine the best path forward for an enterprise-wide asset management system.	2025
Create a data governance framework for movement of data between asset and work order systems.	2026-2029
Where duplication or multiple systems/data sets are necessary, ensure the datasets are the same and that each asset has a unique ID that ties together all attribute information and where possible have seamless, backend integration of systems to reduce the need for manual reconciliation of datasets.	2026-2029
Improve understanding of operating and maintenance needs through analysis of available data to refine lifecycle strategies and forecasting of future operating and maintenance costs for new assets.	2026-2029
Refresh lifecycle strategies and costs for all assets using the latest technical studies, tender contract pricing, and other available data.	2026-2029
Continue to review risk management data and attributes within Citywide for managing and assigning risk scores.	2026-2029
Processes	
Streamline the process of connecting capital and operating costs to assets to enhance the whole lifecycle costing approach for both existing and new assets.	2026-2029
Formalize a process for including asset management data within the budget process.	2025/2026
Formalize and document new processes and staff responsibilities.	2026-2029
Move towards a consolidation of systems to manage asset and work management processes.	2026-2027
Replace manual and paper-based processes with end-to-end digital processes to reduce resource requirements for maintaining systems and eliminate data re-entry errors.	2026-2029
Improve mobile access to data where applicable to improve data and decision making in the field.	2026-2029
Improve corporate asset management condition assessment approaches, methodologies and ratings for all assets to enhance accuracy and confidence of asset condition results	2026-2029

Financing	
Complete a Long-Term Financial Plan in line with the Asset Management Program	2025
Conduct a Development Charges Study	2026 - 2029
Complete a thorough review of all assets for divestment potential to lower required funding needs.	2027
Create a dedicated infrastructure renewal reserve fund for excess funds from growth, after growth pays for growth.	2028
Continue to review and implement cost recovery mechanisms such as assets sales or leasing, cost-cutting efficiency measures, economic development initiatives, user fee framework, sponsorships, and more.	2026 - 2029
Reporting	
Improve the asset management program's reporting capabilities and visualization of outputs, including developing mapping capabilities.	2026-2030
Annual reports to Council on the progress of the City's asset management program and State of Infrastructure Reports	2026-2030

Table 12.1: Continuous Improvement

APPENDICES



APPENDIX A. Location of Data

The data and information used for this Plan is stored using various software programs and databases. A central repository of information is within CityWide Asset Manager Module (CityWide AM). This software holds financial records for all assets deemed to be tangible capital assets (TCA) and is used as the source data for the Plan.

Other software and databases currently used by the City include Infor PS (Hansen), Ameresco, Esri GIS and databases used by individual sections. Physical road assessment information is input into a Pavement Management System to model robust deterioration curves and used to predict the current road condition. For assets that do not have an objective condition rating, internal subject matter experts assess the assets within that asset class to determine a subjective condition rating.

A copy of the City of Thunder Bay's Asset Management Policy and the Future-Ready Roadmap: Sustainable Services through Asset Management are available on the City's website.

APPENDIX B. Exclusions and Assumptions

The development of this Phase Three Plan was guided by the requirements of the regulation and considers the following exclusions and assumptions. The Plan:

- Does not account for any future legislative changes;
- Does not assume material growth to service areas from new development activities;
- Does not consider deferred maintenance, using assets beyond their useful life, and/or unplanned debt to maintain, rehabilitate or replace assets;
- Does not consider lifecycle activities that are missed or delayed, such as maintenance, rehabilitation or disposal;
- Does not include inflation;
- Expresses information in 2023 dollars;
- Includes a growth rate of nil to financial forecasts[1]; and
- Includes state of infrastructure at a single point-in-time.

[1] The current growth rate is fluctuating between the positive and negative rate of <1%.

APPENDIX C. Glossary

Arterial Road: Arterial roads are classified as urban or rural, minor, or major and are planned, designed and constructed to carry moderate to large volumes of through-traffic (vehicles, transit, pedestrians, and cyclists) travelling at moderate speeds throughout the City.

Asset Management: The process that allows a municipality to implement a long-term approach for managing and investing in assets. It includes the planning, design, construction, operation, and maintenance of assets and infrastructure used to provide City services.

Asset Management Plan: Provides a comprehensive reference for the construction, maintenance, rehabilitation, disposal, and replacement of the City's assets based on sound asset management practices and principles.

Asset Category: A category of municipal assets that is an aggregate of assets or composed of any other aggregate of municipal infrastructure assets that provide the same type of service.

Asset Condition: The condition of an asset based on overall health and physical condition, and is used to help estimate how long before repair, renewal, or replacement is required.

Collector Roads Collector roads are planned, designed, and constructed to carry moderate volumes of medium-distance traffic (vehicles, transit, pedestrians, and cyclists) travelling at moderate speeds between local and arterial roads. The function is to accommodate traffic movements and provide direct access to properties.

Community Levels of Service: See Levels of Service.

Connect-days: The number of properties connected to a municipal system that are affected by a service issue, multiplied by the number of days on which those properties are affected by the service issue.

Core Asset: Any municipal infrastructure asset that is a:

a) Water asset that relates to the collection, production, treatment, storage, supply or distribution of water;
b) Wastewater asset that relates to the collection, transmission, treatment or disposal of wastewater, including any wastewater asset that from time to time manages stormwater;
c) Stormwater management asset that relates to the collection, transmission, treatment, retention, infiltration, control or disposal of stormwater;
d) Road asset; or a
e) Bridge or Structural culvert.

Estimated Useful Life (EUL): The estimated useful life is based upon the previous asset longevity and design life of an asset.

Future-Ready Roadmap: This is the name given to the City of Thunder Bay's Asset Management Plan and Program.

Green Infrastructure Asset: An infrastructure asset consisting of natural or human-made elements that provide ecological and hydrological functions and processes and includes natural heritage features and systems, parklands, stormwater management systems, street trees, urban forests, natural channels, permeable surfaces and green roofs.

Infrastructure Deficit: Amount of capital that remains unfunded when comparing the required funding and planned capital budget.

Lane-kilometre: A kilometre-long segment of roadway that is a single lane in width.

Levels of Service (LOS): Levels of Service are indicators that are comprised of many factors that define and establish quality thresholds at which municipal services are provided. Community LOS are qualitative, non technical descriptions. Technical metrics LOS are quantitative. Performance measures may be legislated, City service objectives, or industry standards.

Lifecycle Activity: Activities undertaken with respect to a municipal infrastructure asset over its service life, including constructing, maintaining, renewing, operating and decommissioning, and all engineering and design work associated with those activities.

Local Road: Local roads are planned, designed, and constructed to provide property access and carry low volumes of traffic (vehicles, transit, pedestrians, and cyclists) travelling at relatively slow speeds between points of origin and collector roads.

Low Impact Development (LID): Low Impact Development, term used in Canada and United States to describe a land planning and engineering design approach to managing Stormwater runoff. A LID emphasizes conservation and use of on-site natural features to protect water quality. This approach implements engineered small-scale hydrologic controls to replicate the pre-development hydrology through infiltrating, filtering, storing, evaporating, and detaining runoff close to its source. Some examples of LID techniques include permeable pavement, rain barrels, grassed swales, green roofs, and tree box filters.

Municipal Infrastructure Asset: An infrastructure asset, including a green infrastructure asset, directly owned by a municipality or included on the consolidated financial statements of a municipality, but does not include an infrastructure asset that is managed by a joint municipal water board.

Ontario Structure Inspection Manual: The Ontario Structure Inspection Manual (OSIM), published by the Ministry of Transportation and dated October 2000 (revised November 2003 and April 2008) and available on a the Government of Ontario website.

Operating Costs: The aggregate of costs, including energy costs, of operating a municipal infrastructure asset over its service life.

Service Life: The total period during which a municipal infrastructure asset is in use or is available to be used.

Significant Operating Costs: Where the operating costs with respect to all municipal infrastructure assets within an asset category exceed a threshold amount set by the municipality, the total amount of those operating costs.

Stormwater: Runoff, such as rain and melted snow, that flows overland into catchbasins, ditches, streams, rivers and lakes. Stormwater assets relate to the collection, transmission, treatment, retention, infiltration, control, or discharge of stormwater.

Structural Culvert: Has the meaning set out for “culvert (structural)” in the Ontario Structure Inspection Manual.

Sustainable Funding: The amount of annual funds required to be available to manage the expected costs of maintaining the assets at their current levels of service. It provides a stable level of funds allowing for accurate and consistent planning. It includes an average maintenance/replacement cost with an additional amount used for savings.

Technical Metric Levels of Service: See Levels of Service.

Transportation Services: Assets that relate to the road system that are paved or gravel, bridge assets categorized as any vehicle, pedestrian, or multi-use bridge, and structural culvert assets which are any cross culverts larger than 3 m in diameter.

Total Annual Funding: Includes the capital portion of tax revenue (including Enhanced Infrastructure Renewal Plan) at 70%, Provincial Gas Tax, Canada Community Building Fund, Ontario Community Infrastructure Fund, planned debt and cyclical reserve contributions. Tax funding is allocated proportionally based on the percentage deficit - the larger the infrastructure deficit, the larger the allocation of tax funding.

Wastewater: Water that has been used in a home, business, or as part of an industrial process. Wastewater, or raw sewage, from across the City, is collected in large trunk sewers and flows, mainly by gravity, to the Main Pump Station at the Atlantic Avenue Water Pollution Control Plant. Wastewater assets relate to the collection, transmission, treatment, or disposal of wastewater, including any wastewater assets that, from time-to-time, manage stormwater.

APPENDIX D. Asset Management Policy

CITY OF Thunder Bay
Superior by Nature

CORPORATE POLICY ***Policy No. 11-02-08***
Effective Date: 03/20/2019

SECTION:	ASSET MANAGEMENT
DEPARTMENT/DIVISION	INFRASTRUCTURE & OPERATIONS
SUBJECT:	***Strategic Asset Management Policy***

POLICY STATEMENT

The City of Thunder Bay is committed to developing and implementing a corporate wide **Asset Management Program** in compliance with Ontario Regulation 588/17(O. Reg. 588/17), Asset Management Planning for Municipal Infrastructure, under the *Infrastructure for Jobs and Prosperity Act, 2015*. The program will promote informed infrastructure investment decisions based on sound asset management practices and will include social, environmental and economic considerations.

PURPOSE

The purpose of this policy is to provide leadership in and commitment to the development and implementation of the City's asset management program. It is intended to guide the consistent use of **Asset Management (AM)** across the organization, to facilitate logical and evidence-based decision-making for the management of **Municipal Infrastructure Assets** and to support the delivery of sustainable community services now and in the future as the City focuses on smart growth. The AM Program will support sustainable growth by planning, maintaining and evolving in a way that facilitates development and revitalization while managing lifecycle costs and affordability. This policy demonstrates an organization-wide commitment to the good stewardship of municipal infrastructure assets and to improved accountability and transparency to the community through the adoption of best practices in asset management.

BACKGROUND

The City is responsible for providing a range of services to the community including reliable transportation services for the movement of people and goods, safe drinking water, environmentally safe collection and treatment of wastewater and stormwater, safe and functional public facilities, and recreation programs and opportunities, among many others. To deliver these services it owns and manages a diverse portfolio of municipal infrastructure assets that includes roads, sidewalks, bridges, culverts, watermains, treatment plants and pump stations, sanitary and storm sewer services, facilities and parks, as well as an extensive inventory of equipment and fleet. As the social, economic and environmental well-being of the community depends on the reliable performance of these municipal infrastructure assets it is critical to implement a systematic, sustainable approach to their management. An asset management approach allows organizations to make informed decisions regarding the planning, building, operating, maintaining, renewing, replacing and disposing of municipal infrastructure assets through a wide range of **Lifecycle Activities**. As the City focuses on growth, having an asset management plan is crucial to understanding the impacts of development and making informed decisions.

ALIGNMENT WITH THE MUNICIPALITY'S STRATEGIC DIRECTIONS

The Asset Management Program will be informed by several of the City's planning documents including the City of Thunder Bay Official Plan; the Corporate Strategic Plan; the Climate-Forward City: Thunder Bay Net-Zero Strategy; and the Climate Ready City: City of Thunder Bay Climate Adaptation Strategy, among others. Additional direction will be provided through growth related plans and strategies, such as the Smart Growth Action Plan. These documents complement each other and provide direction on achieving long-term social, environmental, and economic and growth-supportive sustainability that support the development of the City's assets in accordance with citizen input.

PRINCIPLES

To guide Thunder Bay's asset management program, the following statements have been developed in compliance with O. Reg. 588/17:

1. Implement continuous improvement protocols and adopt best practices regarding asset management planning, including:
    i. Asset Management Fundamentals
    ii. Complete and accurate asset data
    iii. Condition assessment protocols
    iv. Risk and criticality models
    v. Lifecycle management
    vi. Financial strategy
    vii. **Level Of Service** framework

2. Maintain service levels where feasible. Increases will only be pursued when justified by accessibility, climate adaptation, resilience, regulatory compliance, growth, or equity of service delivery. Underused or non-core assets will be regularly reviewed for consolidation, repurposing, or divestment.

3. Continue to develop and maintain an asset inventory of all municipal infrastructure assets.

4. Allocate the majority of capital funding to renewing existing infrastructure, gradually increase capital contributions from tax revenue, and limit in-year capital approvals to urgent, compliant, or growth-driven needs. Capital funding allocations will be consistent with the Long-Term Financial Plan.

5. Develop an **Asset Management Plan** that incorporates all municipal infrastructure assets that meet the **Capitalization Thresholds** outlined in the organization's Tangible Capital Asset Policy, as summarized in Schedule A of this Strategic Asset Management Policy. With the exception of work-in-progress, all single and pooled municipal infrastructure assets that fall within one of these asset classes and meet the capitalization threshold will be incorporated in future asset management plans.

   Future asset management plans may include any assets to which work is completed through approved capital projects, regardless of whether these assets meet existing capitalization thresholds.

   After 2025, the plan will be updated at least every five years in accordance with O. Reg. 588/17 requirements to promote, document and communicate continuous improvement of the Asset Management Program.

6. Integrate the asset management program with long-term financial planning and budgeting strategies. This includes the development of financial plans that determine the level of funding required to achieve short-term operating and maintenance needs, in addition to long-term funding needs to replace and/or renew municipal infrastructure of existing and new infrastructure, including considerations for climate mitigation and adaptation. This will also incorporate phased capital investment increases, risk-based prioritization, and strategies to support net-zero infrastructure where feasible.

7. Continue to develop performance metrics to transparently communicate the current state of the asset management program to Council and the community. These metrics will consider indicators related to infrastructure capacity, development readiness and alignment with strategic growth priorities.

8. Consider full lifecycle costs and service risk, including social, economic, and environmental risks and vulnerabilities of municipal infrastructure assets. This includes risks relating to climate change and the actions that may be required including, but not limited to, anticipated costs that could arise from these impacts, adaptation opportunities, mitigation approaches, disaster planning and contingency funding. Impacts may include matters relating to construction, operations, levels of service and lifecycle management. Integrated project delivery will be used to coordinate infrastructure works and reduce duplication.

9. Align, annually through the capital budget process, asset management planning with financial plans prepared under the Safe Drinking Water Act, 2002, such as the City of Thunder Bay's Drinking Water System Financial Plan, as well as any financial plans related to the Municipality's other assets, as approved by Council.

10. Align all asset management planning with the Province of Ontario's land-use planning framework, including any relevant policy statements issued under section 3(1) of the Planning Act; any provincial plans as defined in the Planning Act, and the City of Thunder Bay's Official Plan. Support compact, sustainable development by focusing growth within the urban settlement boundary and avoiding expansion of municipal services beyond those limits except where consistent with the Official Plan.

11. Continue to coordinate asset management planning where infrastructure assets connect or are interrelated with neighbouring communities wherever viable and beneficial.

12. Provide opportunities for municipal residents and other interested parties to offer input into asset management planning.

13. Review and, if necessary, update this Strategic Asset Management Policy at least every five years.

14. The City shall consider where applicable the principles as outlined in Section 3 of the *Infrastructure for Jobs and Prosperity Act, 2015*, when making decisions regarding asset management.

ROLES AND RESPONSIBILITIES

1. **Council**
   i. Approve AM policy and policy updates
   ii. Approve the AM plan and plan updates
   iii. Approve the human and financial resources required to support the elements of sustainable service delivery

iv. Consider the impact of policy decisions and expansion to infrastructure on the City's ability to maintain existing assets

v. Consider the sustainability of growth and the Levels of Service delivered to the community when making decisions

2. **Executive Lead (Commissioner - Infrastructure and Operations)**

   i. Seek Council endorsement of the AM plan, policy, and any updates

   ii. Report to Council and the Executive Leadership Team on AM program and required planning resources

REFERENCES

1. As of the effective date of this policy the following regulatory documents apply:
   a. *Infrastructure for Jobs and Prosperity Act, 2015*.
      i. Section 3: Infrastructure Planning Principles
   b. Ontario Regulation 588/17, Asset Management Planning for Municipal Infrastructure
2. Corporate Report No. R 16/2019

DEFINITIONS

Unless otherwise noted, the definitions provided in this document align with those outlined in Ontario Regulation 588/17 (O. Reg. 588/17), Asset Management Planning for Municipal Infrastructure, under the *Infrastructure for Jobs and Prosperity Act, 2015*.

1. **Asset Management (AM)** – the coordinated activity of an organization to realize value from assets. It considers all asset types, and includes all activities involved in the asset's lifecycle from planning and acquisition/creation; to operational and maintenance activities, rehabilitation, and renewal; to replacement or disposal and any remaining liabilities. Asset management is holistic and normally involves balancing costs, risks, opportunities and performance benefits to achieve the total lowest lifecycle cost for each asset (ISO 55000).

2. **Asset Management Program –** The people, processes, tools, and other resources involved in the delivery of asset management.

3. **Asset Management Plan** – documented information that specifies the activities, resources, and timescales required for an individual asset, or a grouping of assets, to achieve the organization's asset management objectives (ISO 55000). Under O. Reg. 588/17, by 2024 AM plans for all infrastructure assets will be required to include the current levels of service being provided; the current performance of each asset category; a summary of assets in each asset category, their replacement cost, average age, condition information, and condition assessment protocols; lifecycle activities required to maintain current levels of service; discussion of population and economic forecasts; and documentation of processes to make inventory and condition related background information available to the public.
4. **Capitalization Threshold** – the monetary value of a municipal infrastructure asset at or above which a municipality will capitalize the value of the asset and below which the municipality will expense the cost.

5. **Level Of Service** – parameters, or combination of parameters, which reflect social, political, environmental and economic outcomes that the organization delivers. Parameters can include, but

are not necessarily limited to, safety, customer satisfaction, quality, quantity, capacity, reliability, responsiveness, environmental acceptability, cost, and availability (ISO 55000).

6. **Lifecycle Activities** – activities undertaken with respect to a municipal infrastructure asset over its service life, including constructing, maintaining, renewing, operating and decommissioning, and all engineering and design work associated with those activities.

7. **Municipal Infrastructure Asset** – an infrastructure asset, including a green infrastructure asset, directly owned by a municipality or included on the consolidated financial statements of a municipality, but does not include an infrastructure asset that is managed by a joint municipal water board.

Schedule A – Tangible Capital Asset Policy

As per Appendix A of the Tangible Capital Asset Policy, the City has established asset categories and capitalization thresholds in accordance with Public Sector Accounting Board reporting guidelines. This includes single asset capitalization thresholds as outlined below:

Asset Type	Single Asset Capitalization Threshold
Land	$0
Land – Depreciable	$0
Land Improvements	$10,000
Buildings (minimum 100 ft^2)	$10,000
Machinery & Equipment	$10,000
Vehicles	$10,000
Linear	$10,000
Work-In-Progress	Capitalize upon substantial completion of work, and/or when asset is placed into service

The City has also identified two exceptions to the rule that municipal infrastructure assets must meet the capitalization threshold in order for those assets to be capitalized in financial statements. These exceptions deal with large bulk purchases and cyclical capital projects, which will be captured as a pooled asset as follows:

Exception	Exception Criteria	Pooled Asset Capitalization Threshold
Large Bulk Purchase	Asset falls into the General Capital – Machinery and Equipment class.	Individual cost >= $10,000 Bulk purchase >= $50,000
Cyclical Capital Project	Asset falls into the General Capital – Machinery and Equipment class; project is identified as a capital project; project is a repetitive annual or cyclical project.	Individual cost >= $10,000 Project cost >= $10,000

APPENDIX E. O.Reg 588/17 Compliance

O.Reg.588/17Section	Requirement	Mapping to AMP
0	Summary of assets in each category	Asset Sections - #.1
5.(2) 3.	Replacement cost of assets in each category	Asset Sections - #.1
5.(2) 3.	Average age of assets in each category	Asset Sections - #.1
5.(2) 3.	Condition of assets in each category	Asset Sections - #.1
5.(2) 3.	Description of municipality's approach to assessing condition of assets in each category	Asset Sections - #.1.1
5.(2) 1.	Current levels of service, with core asset LOS determined in accordance with tables	Asset Sections - #.3
5.(2) 2.	Current performance measures of assets in each category based on metrics established by the municipality (e.g. measures for energy usage, operating efficiency, etc.)	Asset Sections - #.3
5.(2) 4.	Lifecycle activities needed to maintain current LOS, options for lifecycle activities, risks associated with lifecycle activities	Asset Sections - #.2
5.(2) 4.	Costs of providing lifecycle activities needed to maintain current LOS, based on assessment of lifecycle, options, risks, lower cost	Asset Sections - #.6
5.(2) 5.	For population <25K, description of population or economic forecast assumptions, and how these connect to lifecycle cost projections for current LOS	Not Applicable
5.(2) 6.i.	For population 25K or more, population and employment forecasts	Section #1.8
5.(2) 6.ii.	For population 25K or more, lower tier in GGH, Sched 7 or portion of upper tier growth plan forecast, or assumptions	Not Applicable
5.(2) 6.iii.	For population 25K or more, upper/single tier outside GGH, population and employment forecasts in OP, or assumptions	Not Applicable

5.(2) 6.iv.	For population 25K or more, lower tier outside GGH, portion of upper tier growth plan forecast	Not Applicable
5.(2) 6.vi.	For population 25K or more, capital and significant operating costs for each of 10 years, to maintain LOS to accommodate increase in demand cause by growth	Service Sections - #.7
5.(2) 3	Description of how all background information and reports will be made available to the public (reports and data from which AMP content is developed)	Section #1.9
6.(2) 1.i.	Proposed levels of service, with core asset LOS determined in accordance with tables	Asset Sections - #.3
6.(2) 2.	The options for the proposed levels of service and the risks associated with those options to the long-term sustainability of the municipality.	Asset Sections - #.3
6.(2) 2.	Explanation of why proposed LOS are appropriate, based on options, achievability, affordability	Sections - #2.3
6.(2) 3.	Proposed performance measures of assets based on metrics established by the municipality (e.g. measures for energy usage, operating efficiency, etc.)	Asset Sections - #.3
6.(1) 4.	Identification of lifecycle activities needed to provide proposed levels of service for a 10-year period, based on assessment of full lifecycle, options, risks, lowest cost	Asset Sections - #.2
6.(1) 4.	Estimate of the annual costs for each of the 10 years of undertaking the lifecycle activities	Asset Sections - #.6
6.(1) 4.	Identification of the annual funding projected to be available to undertake lifecycle activities and an explanation of the options examined by the municipality to maximize the funding projected to be available.	Section 11
6.(1) 4.iii	Explanation of the options examined to maximize the funding projected to be available	Section 11
6.(1) 4.iv	Identification of funding shortfalls for lifecycle activities over a 10-year period	Asset Sections - #.6

	Identification of lifecycle activities that will be undertaken if there is a shortfall	
6.(1) 4.iv	Explanation of how the risks associated with not undertaking any of the lifecycle activities will be managed	Asset Sections - #.4, Appendix F
6.(1) 5.	For population <25K, description of population or economic forecast assumption, and how these connect to lifecycle cost projections for proposed LOS	Not applicable
6.(1) 6.	For population 25K or more, capital and significant operating costs for each of 10 years, to achieve proposed LOS to accommodate increase in demand caused by growth	Asset Sections - #.7
6.(1) 6. ii.	For population 25K or more, funding projected to be available, by source, due to growth	Section 11
6.(1) 6. iii.	For population 25K or more, overview of the risks associated with implementation of the AMP	Appendix F
6.(1) 7.	Explanation of other key assumptions	Appendix B
7.(1)	Date of review and update of AMP - within 5 years	June, 2025

Table A.1: O.Reg 588/17 Compliance

APPENDIX F. Risks Associated with the AMP

Risk	Potential Impact	Mitigation Action
Plan is not followed	• Less than optimal investments • Potential to shorten useful life • Failure to deliver service • Prioritization process fails and service is impacted	• Monitor and review • Implement quality asset management processes and practices
Failed infrastructure	• Failure to deliver service • Damage to assets and neighbouring assets (private or public) • Injury or death (staff and public) • Residents and businesses unable to carry on their activities	• Refurbish/repair/renew • Increase investment • Utilize innovative technology • Reduce or stop delivering unnecessary services

	• Non-compliance with regulations • Litigation and environmental damage • Additional unplanned costs and asset loss • Negative social impacts	
Inadequate funding	• Increased risk of failure and service reductions • Rising maintenance costs • Prematurely shortens useful life if not maintained • Increased burden on future generations	• Reduce or stop delivering unnecessary services • Find additional cost recovery mechanisms • Update financial planning • Advocate for stable, long-term external funding sources
Incorrect planning assumptions	• Misalignment of infrastructure needs and investment • Ineffective prioritization and resource allocation	• Regular reviews and updates • Monitor and adjust based on performance data and trends • Improve forecasting and scenario analysis
Regulatory requirements, standards, or criteria change	• Non-compliance risk • Sudden cost pressures for upgrades or retrofits • Project delays or redesigns	• Monitor legislative changes • Build flexibility into plans and budgets • Allocate contingency for regulatory risks
Economic fluctuations, inflation, downturns, or changes in revenue/use	• Increased costs (materials, labour) • Delayed or cancelled projects • Reduced affordability • Decreased service levels	• Incorporate inflationary projections • Prioritize critical infrastructure • Adjust service levels where appropriate • Identify alternate revenue sources or partnerships
Climate change, extreme weather, or emergencies	• Damage or loss of assets • Service disruptions • Reallocation of funds to emergency response • Increased lifecycle costs • Community health and safety impacts	• Develop climate-resilient infrastructure • Implement emergency preparedness plans • Build contingencies into capital plans • Incorporate risk-based planning for climate impacts
Lack of Skilled Resources (Internal Capacity Gaps)	• Delays in plan development or execution • Inaccurate data analysis or recommendations • Inability to adapt to changing technology or regulations	• Invest in staff training and development • Establish cross-training and succession planning • Partner with external experts when needed
Poor Data Quality or Incomplete Asset Information	• Misinformed decisions • Ineffective prioritization • Inability to meet reporting requirements	• Implement data governance and standards • Regularly update and validate asset data

		• Use condition assessments and field audits
Community or Political Pressure	• Funding diverted from priority needs • Undermining long-term sustainability • Reduced credibility of asset management	• Increase transparency through public reporting • Strengthen evidence-based decision-making • Align Council decisions with approved strategic plans
Technology Failures or Cybersecurity Threats	• Data loss or manipulation • Operational disruptions • Financial or reputational damage	• Implement cybersecurity protocols • Regular backups and disaster recovery plans • Maintain system updates and patches
Asset Interdependencies Not Considered	• Cascading failures • Unanticipated service disruptions • Inefficient planning and maintenance	• Use integrated asset planning • Conduct risk assessments with interdependencies in mind • Coordinate planning across departments

Table A.2: Risks Associated with the implementation of the AMP

APPENDIX G. Municipal Plans

The Future-Ready Roadmap supports moving key strategic priorities forward and integrates information from other Corporate strategic documents. A brief description of these plans and strategies and how each relates to asset management is provided below.

2023-2027 Maamawe, Growing Together Strategic Plan	• The goal of the Maamawe, Growing Together Strategic Plan is to provide Council's vision, priorities, and strategy for Thunder Bay. The Plan includes four strategic directions: Maamawe - All Together, Safety and well-being, Growth, and Sustainability. • The Future-Ready Roadmap will support the Strategic Plan by aiming to fulfill the goals of: Plan and deliver cost-effective services, take decisive action to respond to the climate emergency, and make it easier to access City services.
Active Transportation Plan	• The goal of the Active Transportation Plan is to increase the number of people walking, biking, or travelling by active transportation; develop infrastructure that supports active transportation; improve the safety for people participating in active transportation; develop policies that support active transportation; and develop community partnerships to help implement a dynamic and sustainable active transportation plan.

	• The Future-Ready Roadmap will support the Active Transportation Plan by planning for the appropriate financing and sustainable funding required to fund, maintain, and upgrade current and future active transportation infrastructure.
City of Thunder Bay Climate Adaptation Strategy	• The goal of the Climate Adaptation Strategy is to reduce the risks inherent to climate change, while taking advantage of opportunities presented. It supports the City to prepare for, respond to, and recover from the potential impacts of climate change. Infrastructure asset management was identified as a focus area within the strategy, with an emphasis on increasing the resilience of infrastructure and the natural environment. • The Future-Ready Roadmap will support the Climate Adaptation Strategy through integrating climate adaptation into municipal asset management. This will inform decision-making and strategic long-term investments to reduce the infrastructure risks associated with climate change and capitalize on opportunities.
Climate-Forward City: Thunder Bay Net-Zero Strategy	• The Net-Zero Strategy is a community-wide energy use and GHG emissions inventory and action plan for Thunder Bay to reach net-zero emissions by 2050. It provides a vision for the community and highlights the scale of changes needed to respond to the climate emergency declared by City Council in January 2020. • The Future-Ready Roadmap will support the Net-Zero Strategy by integrating GHG emissions considerations and prioritizing energy efficiency in the procurement, maintenance, and renewal of assets.
Digital Strategy	• The goal of the City of Thunder Bay Digital Strategy is to use technology to make our community work better in the digital age. It sets out the framework for delivering customer-centred, digitally-powered City services and identifies a number of digital initiatives to be actioned. • Digital Strategy supports the Future-Ready Roadmap by aiding in digitizing processes and managing data well to drive our practices and decision-making.
Drinking Water System Financial Plan	• The goal of the Drinking Water System Financial Plan is to provide safe drinking water in the short and long-term, achieve financial viability, limit overall water costs to consumers, fund the long-term capital plan, achieve full cost recovery over the long-term, and maintain the current service levels. The Plan focuses on achieving a balance between maintaining the water system in a safe and effective manner, while limiting expenditures and water rate increases.

	• The Future-Ready Roadmap will support the Drinking Water System Financial Plan by planning the required maintenance and rehabilitation of assets to reduce lifecycle costs to help keep water network costs in line with the Financial Plan.
Indigenous Relations & Inclusion Strategy	• The goal of the Indigenous Relations & Inclusion Strategy is to support the City's enhancement of its relationship with Indigenous partners and communities, while advancing Indigenous Peoples' inclusion in the City's opportunities and growth, and is guided by the City of Thunder Bay Anishinaabe Elders Council, commitments made under the Anti-Racism & Inclusion Accord and other strategic documents, and the local Indigenous community. • The Future-Ready Roadmap will support the Indigenous Relations & Inclusion Strategy by incorporating and honouring Indigenous history and culture in City spaces through exhibits and activities, collaborating on new place-making initiatives and opportunities for welcoming spaces in the city, conducting research in collaboration with academic and Indigenous partners to identify Indigenous heritage recognition opportunities in City spaces, and by maintaining and enhancing existing place-making spaces.
Fit Together: Recreation and Facilities Master Plan	• The goal of the Fit Together: Recreation and Facilities Master Plan is to outline a series of short, medium to longer term priorities for investement in facilities, services and programs owned and/or delivered/operated by The City of Thunder Bay over a 15-year timeframe. • The Future-Ready Roadmap will support the Recreation and Facilities Master Plan by planning the required maintenance and rehabilitation of assets to enhance where feasible and fiscally sustainable the useful life of existing facilities.
Official Plan	• The goal of the Official Plan is to represent the land use related goals and objectives of Council, identified through The City's Strategic Plan and other documents related to environmental protection and sustainability, climate adaptation, active transportation, culture, urban design, healthy communities, economic prosperity and food systems. • The Future-Ready Roadmap will support the Official Plan by planning for the assets that will be adopted or required by the City to continue to provide services as land use develops.
Pollution Prevention and Control Plan	• The goal of the Pollution Prevention and Control Plan is to outline an implementation plan based on a study done to

	investigate the direct municipal discharges to water courses in the Thunder Bay urban service area. • The Future-Ready Roadmap will support the Pollution Prevention and Control Plan by planning for the appropriate financing and sustainable funding required to fund the final projects identified in the Plan.
Stormwater Management Plan	• The goal of the Stormwater Management Plan is to map out how to achieve a sustainable environment over 20 years, focussing on the stormwater system, and how changes in the environment, land use, and climate affect it. The Plan examines opportunities to assess and improve current infrastructure. • The Future-Ready Roadmap will support the Stormwater Management Plan by planning for the appropriate financing and sustainable funding required to fund future upgrades and maintenance to the stormwater services.
Transportation Master Plan	• The goal of the Transportation Master Plan is to provide a long-term vision for the transportation services and related maintenance required up until 2040 and beyond. • The Future-Ready Roadmap will support the Transportation Master Plan by planning for the appropriate financing and sustainable funding required to achieve the strategic vision for the transportation infrastructure.
Urban Design Guidelines	• The goal of the Urban Design Guidelines is to provide performance standards for a number of site design elements including building orientation and facades, parking and circulation, lighting, stormwater management, and landscaping. • The Future-Ready Roadmap will support the Urban Design Guidelines by planning the required capital for maintenance and rehabilitation of the assets included in the guidelines.
Urban Forest Management Plan	• The goal of the Urban Forest Management Plan is to provide Comprehensive review of the current urban forest program including resources, priorities, successes, service gaps, and capital program • The Future-Ready Roadmap will support the Urban Forest Management Plan by planning the required capital for maintenance and rehabilitation of the assets included in the Plan.
Wastewater System Financial Plan	• The goal of the Wastewater System Financial Plan is to outline the projected operating and capital plan for the next 20 years to achieve financial sustainability, full-cost recovery and affordability for consumers, while maintaining the City's existing service levels for sewage collection and treatment.

	• The Future-Ready Roadmap will support the Wastewater System Financial Plan by planning the required maintenance and rehabilitation of assets to reduce lifecycle costs to help keep wastewater network costs in line with the Financial Plan.

Table A.3: Municipal Plans

APPENDIX H. Future Ready-Roadmap Team

The Future Ready-Roadmap team is overseen by an internal steering committee comprised of senior levels of Administration with representation from all Departments and led by the Commissioner – Infrastructure & Operations. A Project Manager role was created for overall project management and to support the strategic execution of this work.

Executive Lead and Project Management

- Kayla Dixon– Commissioner, Infrastructure & Operations, Executive Lead
- Amy Coomes – Program Lead – Asset Management, Engineering

Steering Committee

- Kerri Marshall – Commissioner, Growth
- Keri Greaves – Commissioner, Corporate Services & City Treasurer
- Matthew Miedema – Director, Engineering
- Cory Halvorsen – Manager, Parks & Open Spaces
- Leah Prentice – Director, Recreation & Culture
- Jana Roy – Capital Asset Accountant/Financial Analyst, Corporate Services
- Andrea Morrison – Director Finance, Corporate Services
- Jessica Strobel – Policy & Research Analyst, Infrastructure & Operations

Collaborative Group Members

- Kelly Andrew – Supervisor Accounts Payable, Corporate Services
- Cory Auger – Coordinator Parks Services, Parks and Open Spaces
- Brent Bigford – GIS Application Specialist, Planning Services
- Lisa Bosch – Planning and Research Analyst, Capital Facilities Construction
- Cherri Braye – Director of Resources, Thunder Bay Public Library
- Barry Caland – Environmental Services Supervisor, Community Services
- Brooklin Caren – Planning and Scheduling Coordinator, Transit Services, Community Services
- Brent Cline – Superintendent, Administrative Services, Superior North EMS
- Henry Connor – Technology Management Specialist, Central Support
- Vanessa DeGiacomo-Zwaresh – Energy Analyst, Engineering
- Joel DePeuter – Director Development Services, Growth
- Nick Enders – Superintendent, EMS Operations
- Laurie Fors – Manager Central Support, Infrastructure & Operations

- Doug Glena – Manager Fleet Services, Community Services
- Martin Hynna – Deputy Fire Chief
- Brad Loroff – Manager Transit Services, Community Services
- Erin Marcella-Fui – Superintendent Bare Point WTP, Environment Division
- Kelvin Jankowski – Manager Capital Facilities Construction, Engineering
- Franco Marchese – Manager of Facility Services, Community Services
- Lindsay Menard – Superintendent Water Pollution Control Plant, Environment Division
- Lee Mesic – Administrator, Pioneer Ridge
- Jesse Mikulinski – Engineering Design and Field Staff Supervisor, Engineering
- Kendra Moen – GIS Technologist, Engineering
- Shane Muir – Chief of EMS
- Rae-Ann Molly – Community Program Coordinator, Community Centres, Community Services
- Dawn Paris – Director of Finance, Fleet, and Facilities, Thunder Bay Police Service
- Jonathan Paske – Supervisor Parking Authority, Corporate Services
- Dave Paxton – Fire Chief
- Jacob Porter – Climate Adaptation Coordinator, Engineering
- Alex Pucci – GIS and Planning Analyst, Parks and Open Spaces
- Jenna Rogozinski – Manager Child Care, Community Services
- Werner Schwar – Supervisor Parks & Open Space Planning
- Kristie Sinclair – Accountant, Corporate Services
- Dave Tarini – Deputy Fire Chief
- Randy Thompson - Division Chief - Apparatus & Equipment, Thunder Bay Fire Rescue
- Mike Vogrig – Project Engineer, Engineering
- Deanna Walker – Manager Realty Services, Growth
- Aaron Ward – Manager Engineering, Infrastructure and Operations
- Michelle Warywoda – Director Environment Division, Infrastructure and Operations
- Julie Wiejak – Policy & Research Analyst, Growth

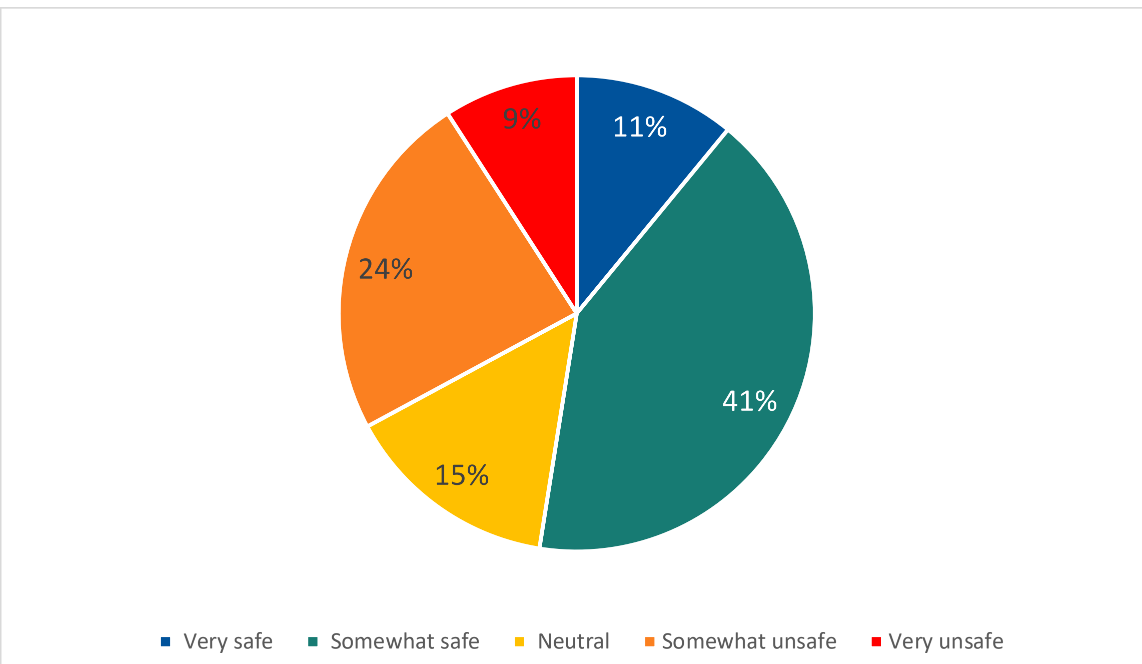
APPENDIX I. Levels of Service Survey Response Summaries

Roads, Street Lighting and Traffic Signals Levels of Service Survey Responses - 219 Participants

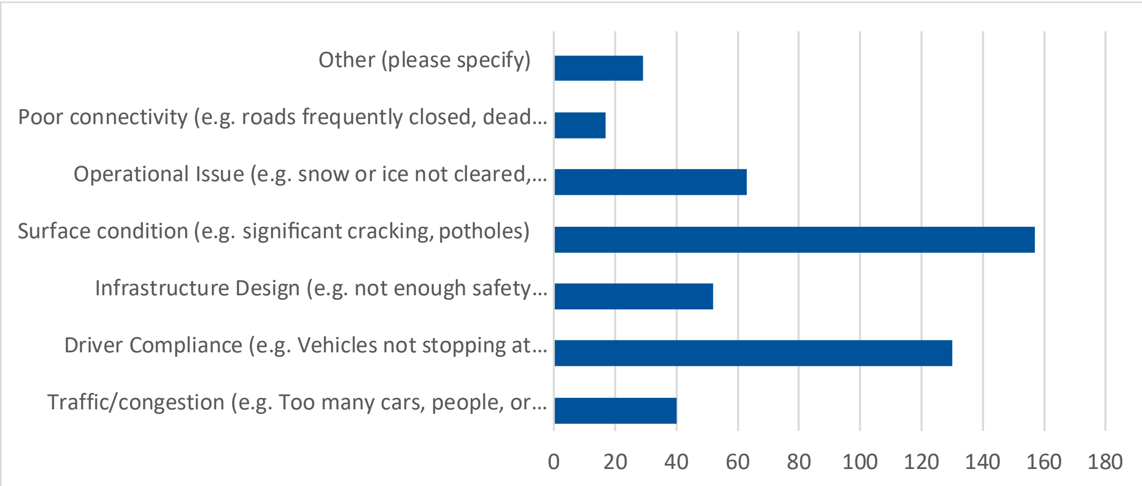
Q1 How do you interact with the roads in Thunder Bay using motorized vehicles? (Are you a driver, a passenger, etc). Rank in order from most (1) to least (3) often.

OPTION	RANK
Driver	1.17
Passenger in a private vehicle	2.00
Passenger on public transit	2.72

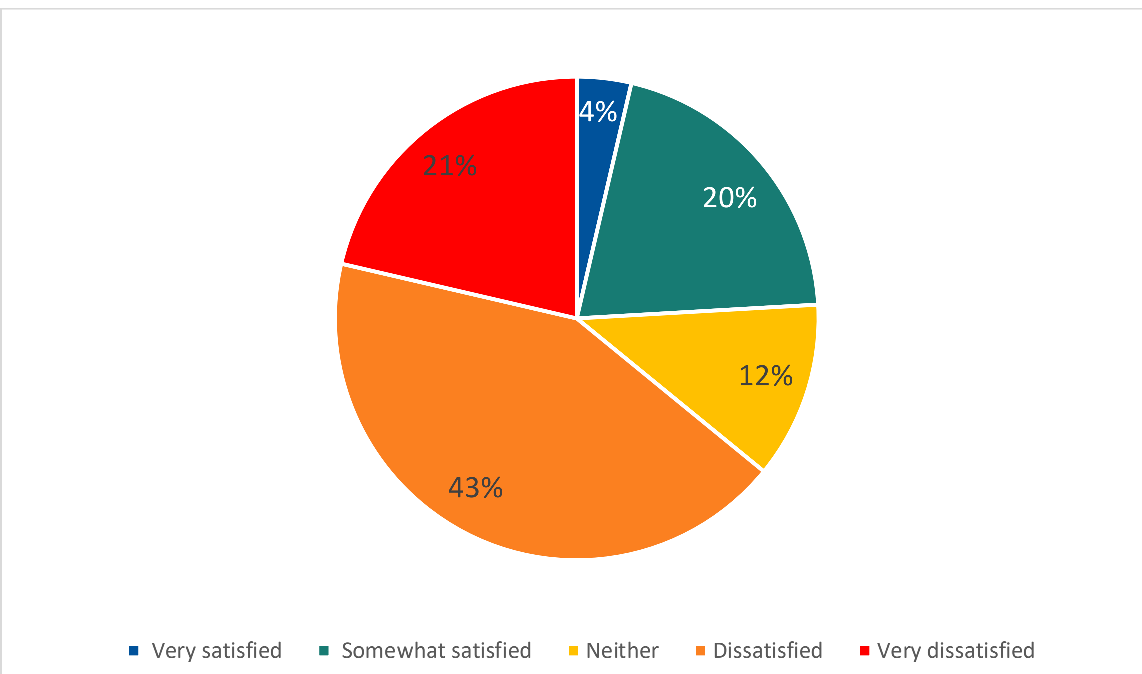
Q2 How safe do you currently feel while using the roads in Thunder Bay in a motorized vehicle?



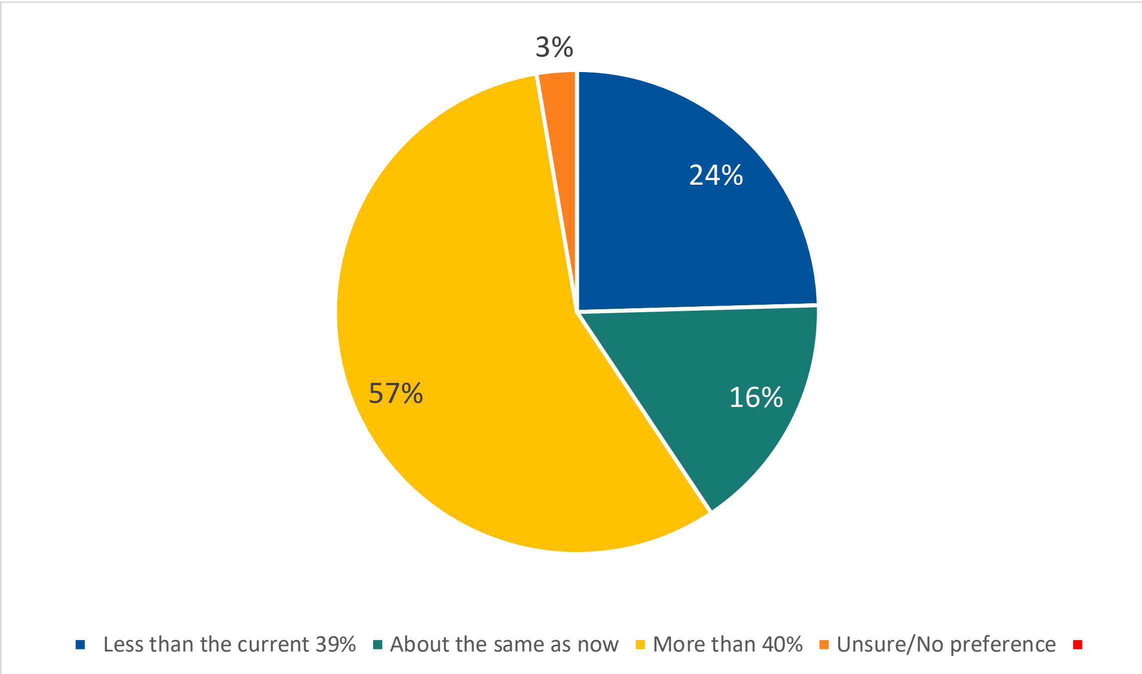
Q3 What are the top reasons you do NOT currently feel safe using a motorized vehicle on roads in Thunder Bay? Select up to 3 max.



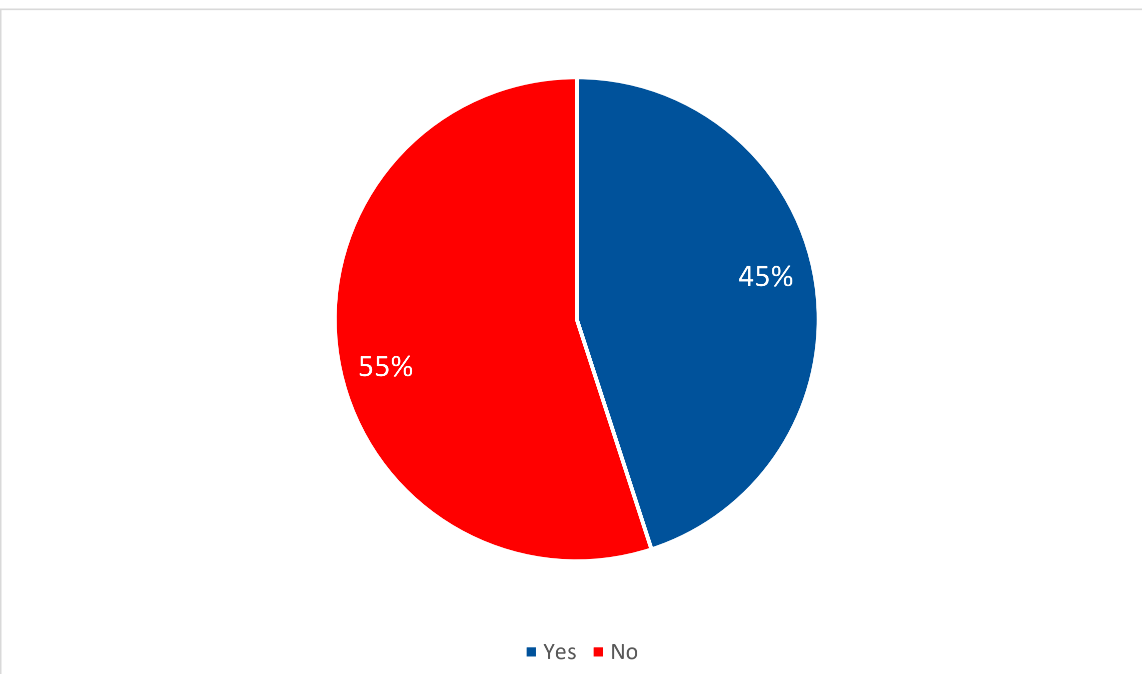
Q4 The current average condition of Thunder Bay roads is FAIR. Please indicate your satisfaction with this as the average condition for the roads.



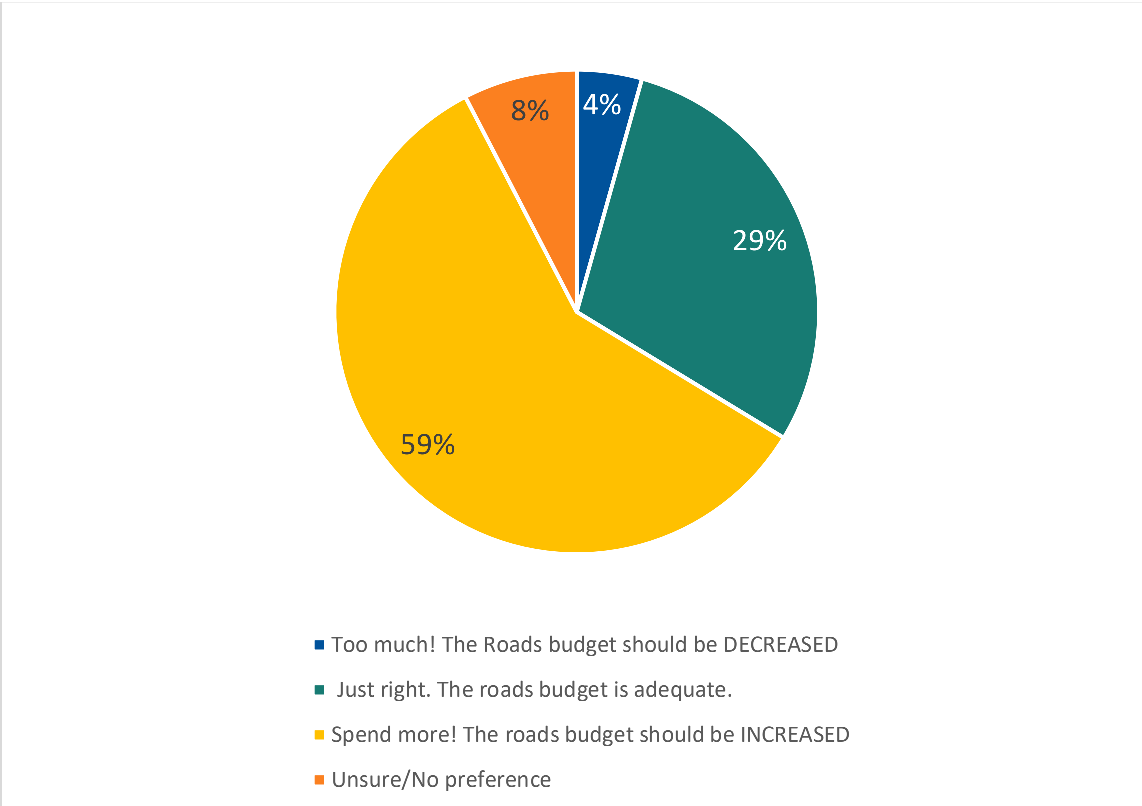
Q5 Currently, 39% of roads in Thunder Bay are in GOOD or VERY GOOD condition, 44% are in FAIR condition. In your opinion, what percentage of roads should be in GOOD or VERY GOOD condition?



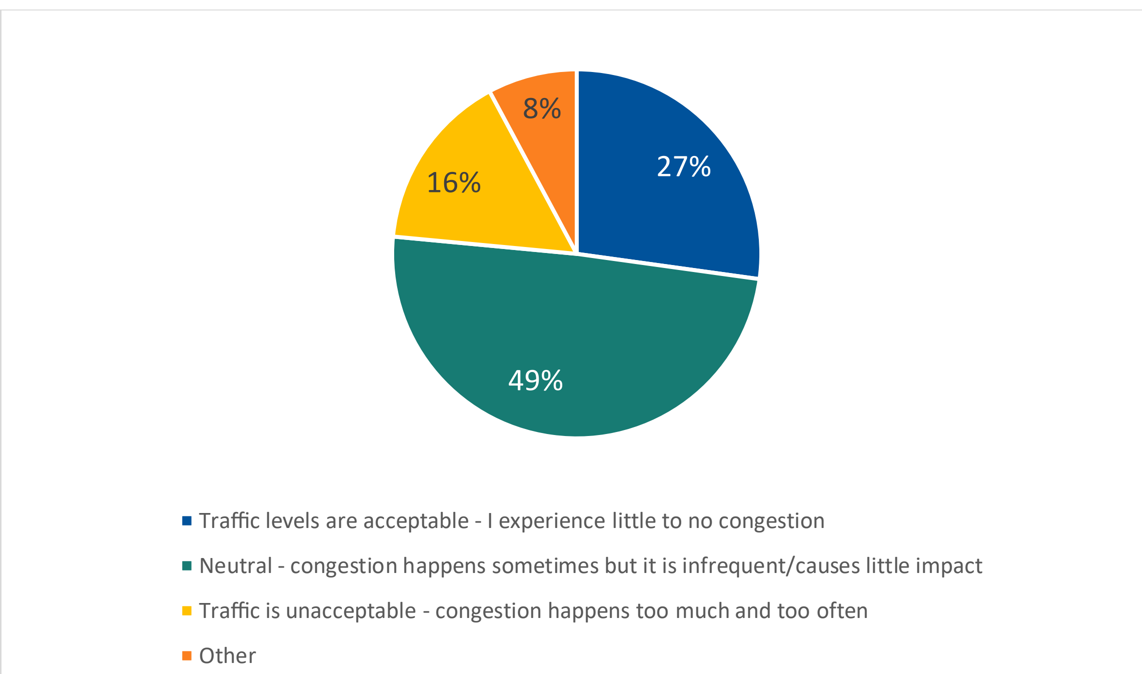
Q6 Would you be willing to pay more taxes to increase the average condition of the roads in Thunder Bay?



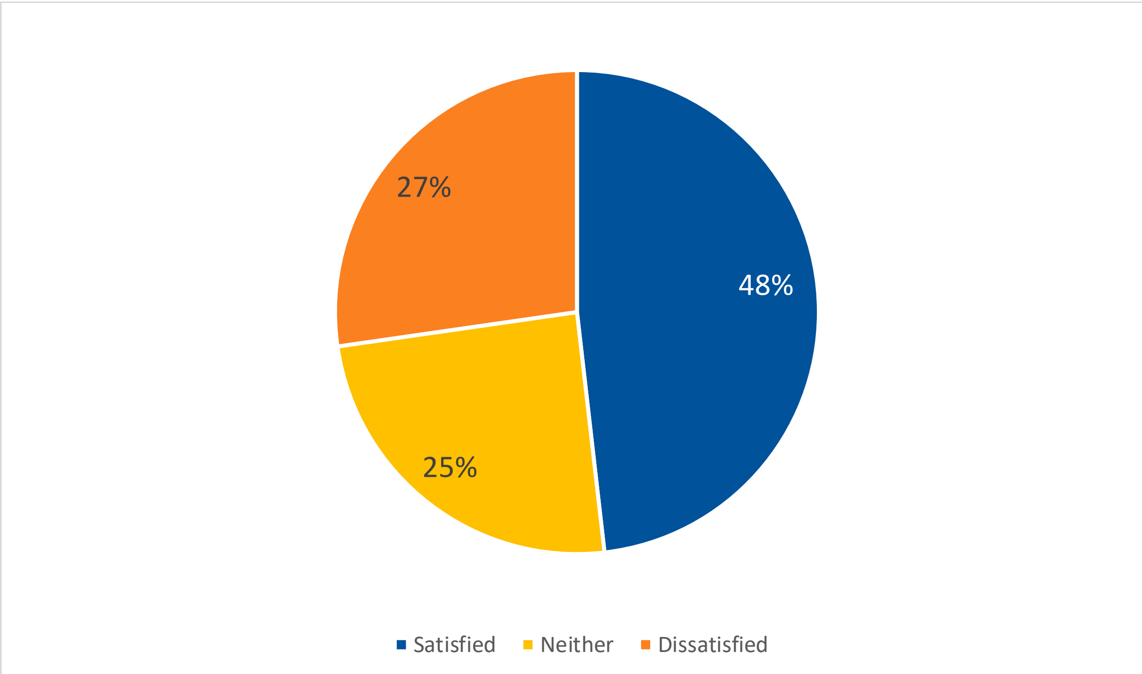
Q7 How do you feel about the amount the City spends on roads each year?



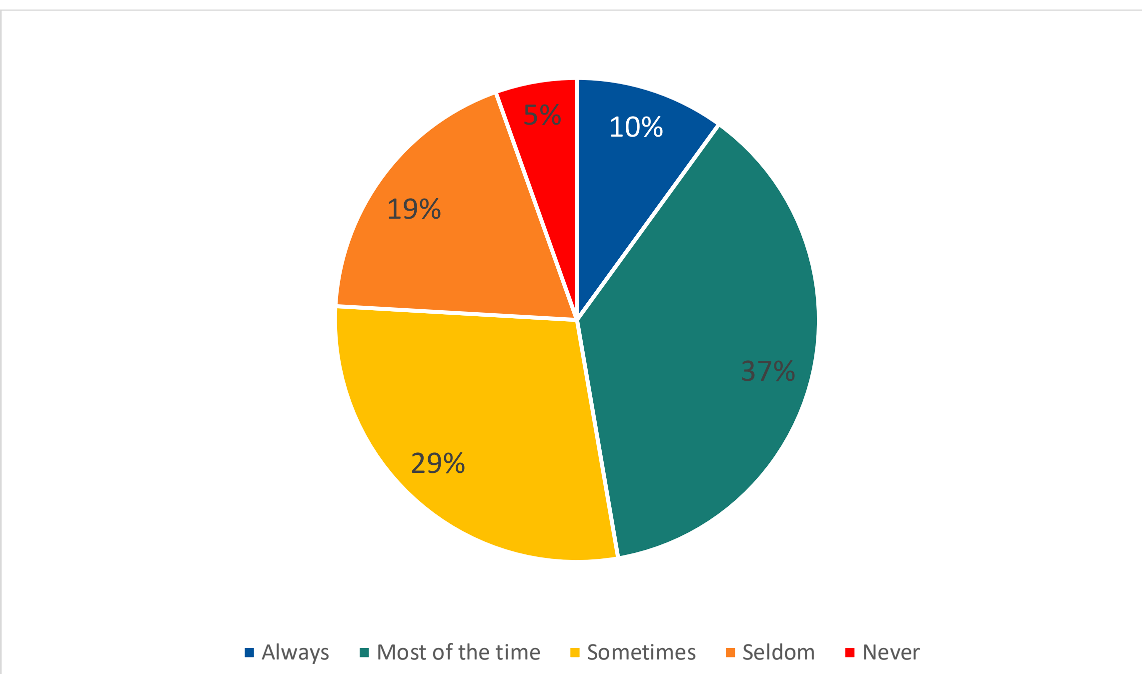
Q9 How do you feel about traffic/congestion on the roads in Thunder Bay?



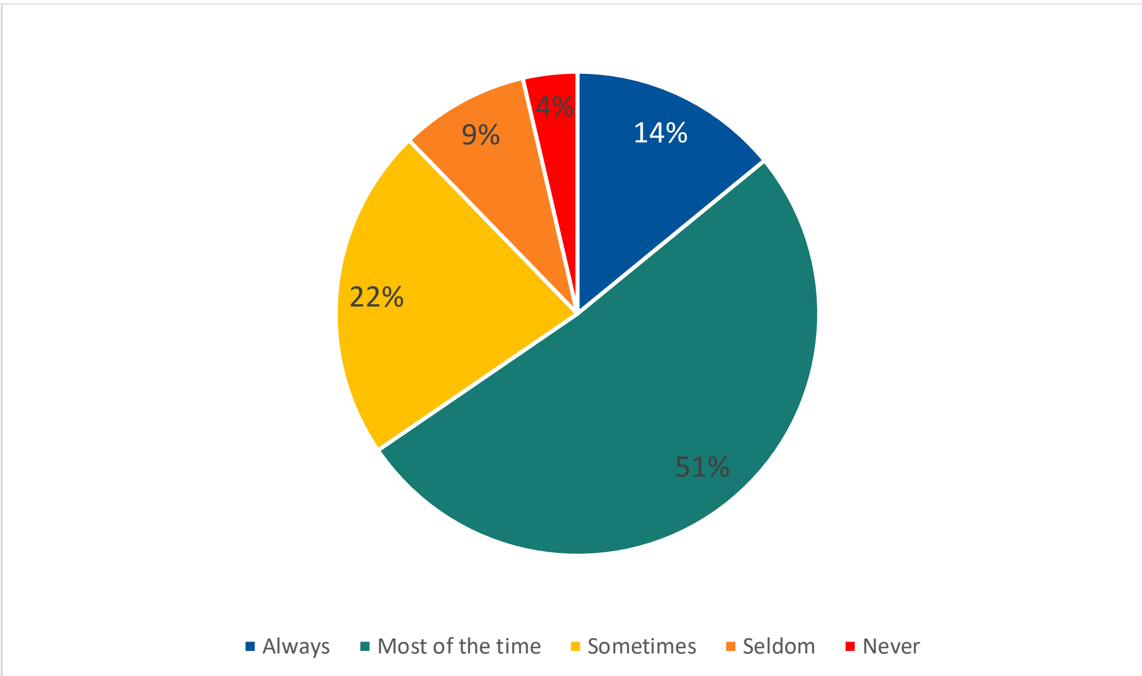
Q10 Please indicate your satisfaction with the current lighting of City streets at night?



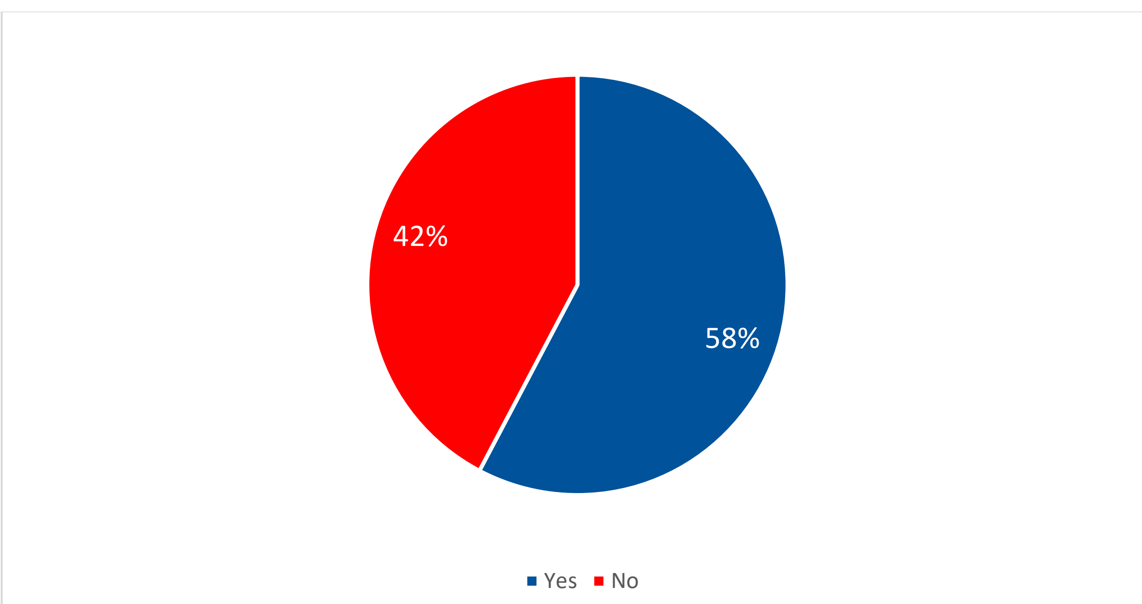
Q12 When road closures occur for maintenance or construction work, do you think the City provides adequate communication and notifications (e.g. signage, updates through local media) to allow you to find alternate routes?



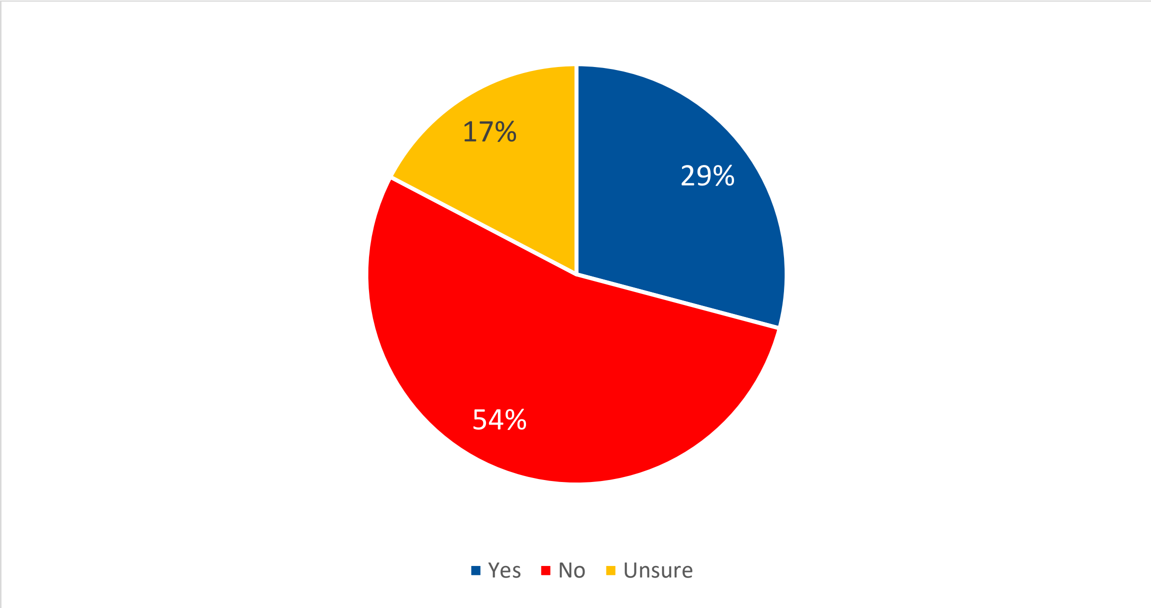
Q14 The Roads Division relies on approximately 70 pieces of equipment which it either owns or contracts to tackle a winter storm. During a winter storm with at least 5cm of snow, do you feel priority routes are plowed in a reasonable amount oftime?



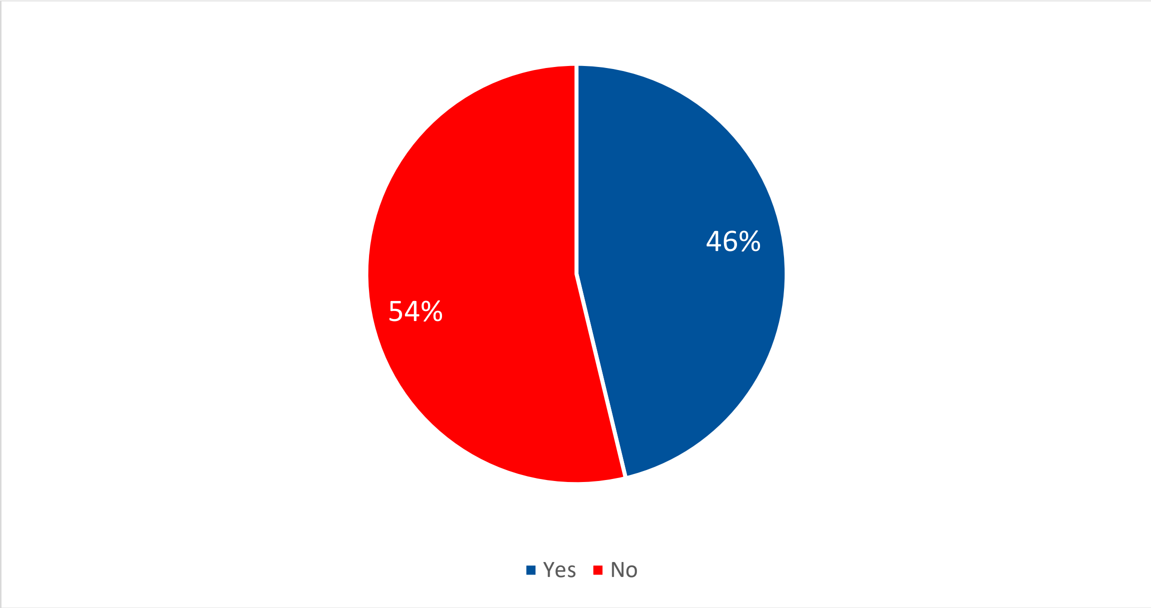
Q15 Have you ever reported a pothole to the City?



Q16 If yes, was the pothole fixed in a timely manner?



Q17 Did you know you can report potholes and other issues to the City online or by phone to help us keep our community active and welcoming?



Residents shared extensive feedback highlighting the following priorities:

1. Traffic Signal Coordination

- Strong support for synchronizing traffic lights, especially on major roads, to reduce delays and improve traffic flow.
- Widespread frustration with unnecessary red lights and left-turn signals when no traffic is present.
- Support for sensor-activated lights and switching to flashing signals during late-night hours.

2. Road Repair and Maintenance

- Desire for higher-quality, lasting repairs over repeated patchwork.
- Emphasis on preventive maintenance, better coordination between utility and paving work, and timely response to potholes.
- Calls for holding contractors and crews accountable for quality and timely completion.

3. Snow and Ice Management

- Requests for more consistent snow plowing, especially in residential areas and on sidewalks.
- Concerns about driveway windrows and sidewalk blockages caused by plows.
- Suggestions to improve winter readiness and equipment deployment during storms.

4. Pedestrian and Cyclist Safety

- Calls for better lighting, longer pedestrian signals, and automated walk signals at crosswalks.
- Advocacy for separated bike lanes and safer crossings, especially near schools, care facilities, and busy intersections.

5. Infrastructure Spending and Priorities

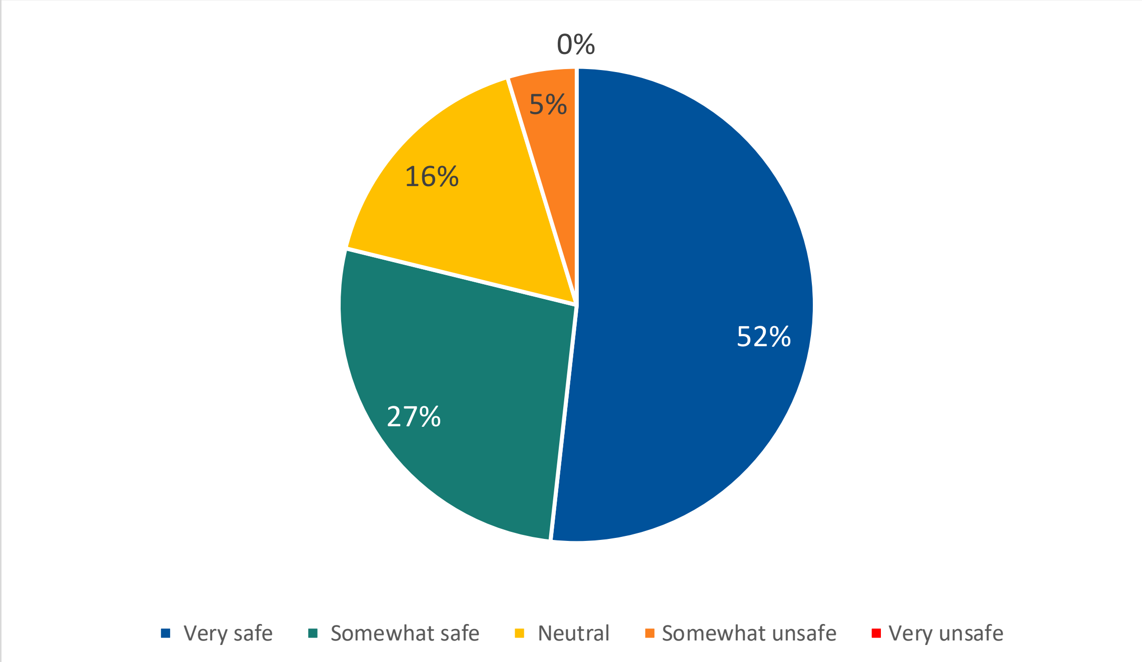
- Clear message to focus investments on fixing existing roads over building new ones.
- Preference for roundabouts and 4-way stops rather than more traffic lights.
- Requests to redirect funds from non-essential projects (e.g., sports facilities) to core infrastructure.

6. Enforcement and Technology

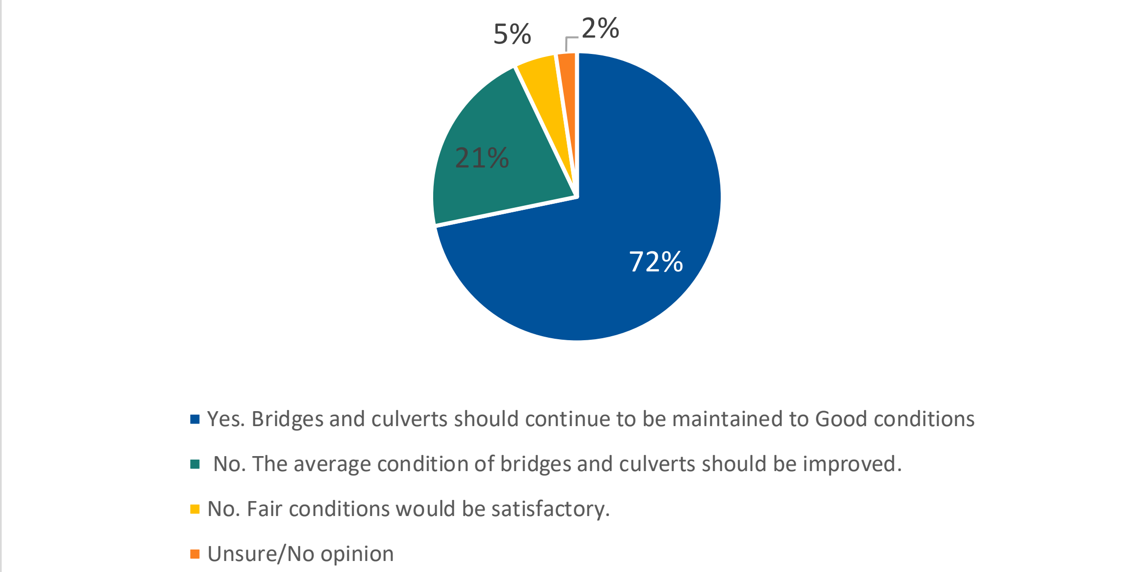
- Strong support for red light and speed cameras to deter unsafe driving and generate funding for road improvements.
- Desire for better monitoring, quicker repairs, and more transparent communication on infrastructure work.

Bridges and Culvers - 84 Participants

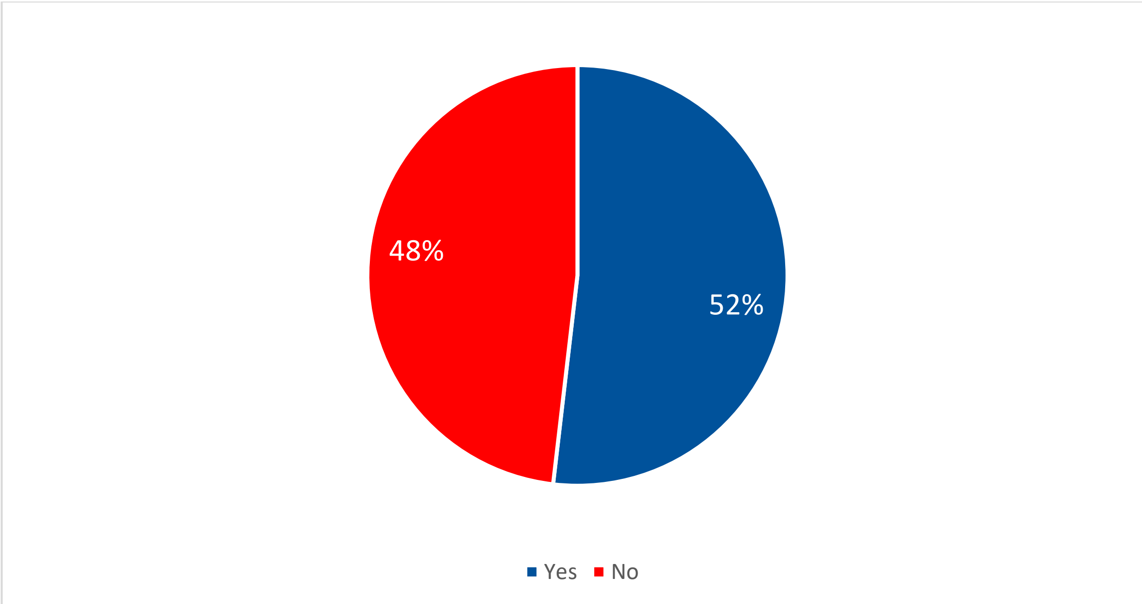
Q1 How safe do you feel while travelling over bridges and culverts in the City?



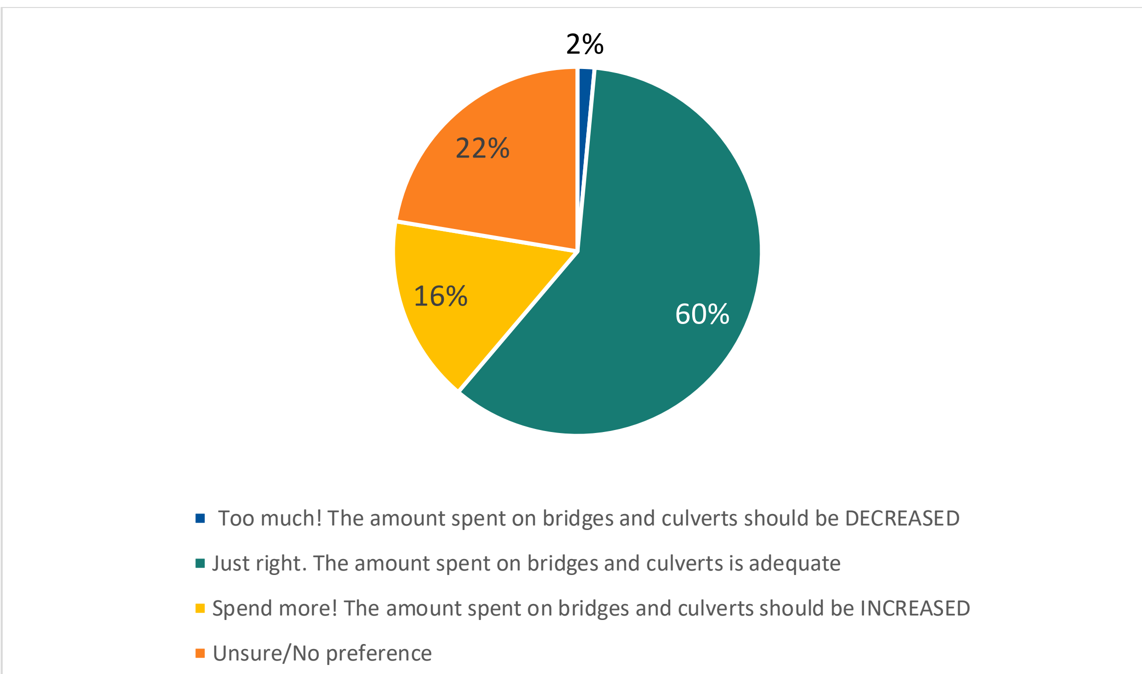
Q2 The average condition of Thunder Bay Bridges and Culverts is GOOD. If the average condition of bridges and culverts is maintained at FAIR, it would result in more reduced load postings, delays and bridge closures. Do you believe bridges and culverts should continue to be maintained to GOOD conditions?



Q3 Would you be willing to pay more taxes to see the condition of bridges and culverts increased?



Q4 How do you feel about the amount the city spends on bridges and culverts each year?



Residents shared clear priorities and concerns regarding the condition, maintenance, and planning of the City's bridge and culvert infrastructure:

1. Proactive Maintenance and Inspection

- Strong calls for more frequent and qualified inspections to prevent failures like the River Street culvert collapse.
- Suggestions included posting inspection dates publicly (e.g. on bridges) to increase transparency and public trust.

2. Drainage and Culvert Upkeep

- Numerous complaints about clogged culverts and overgrown ditches causing localized flooding and damage, particularly in neglected residential areas.
- Residents want routine cleaning of culverts, ditches, and drains, especially in areas prone to flooding or extreme weather.

3. Quality of Construction and Oversight

- Significant frustration with poor road-to-bridge transitions and inadequate workmanship on approach grades.
- Concerns over project delays, contractor performance, and lack of follow-up, particularly in high-profile failures like River Street.
- Residents urged the City to hold contractors and staff accountable and ensure proper training and supervision during infrastructure projects.

4. Aesthetics and Multi-Use Considerations

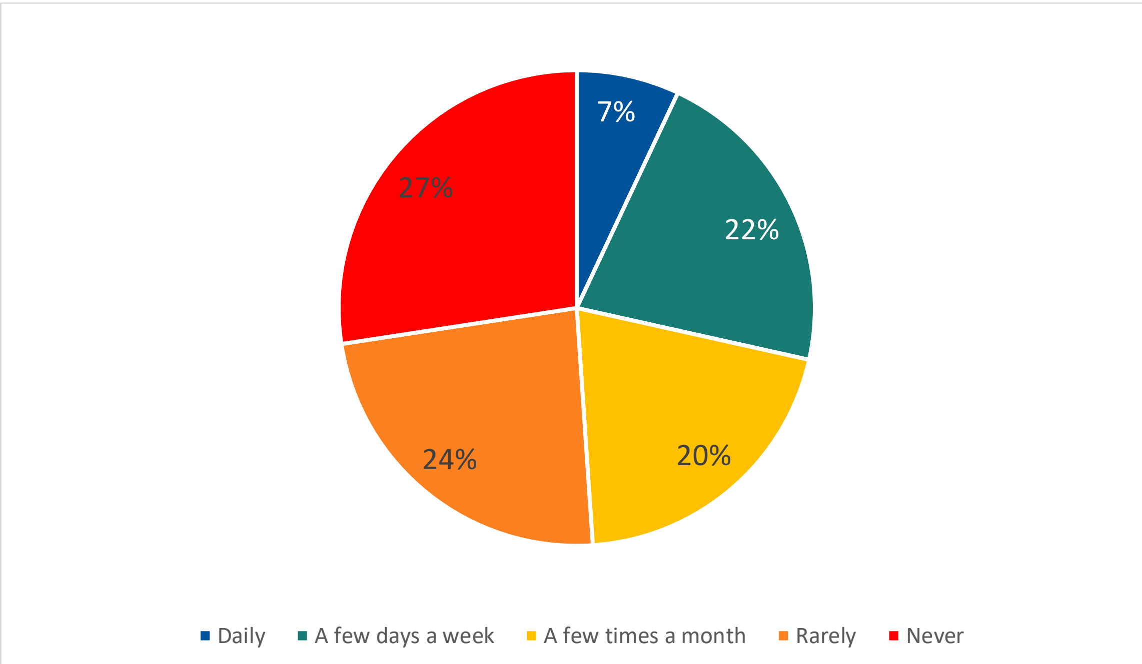
- Residents emphasized that bridges should be functional and visually appealing, especially those used by pedestrians or in tourist areas.
- Requests to design bridges with adequate space for cyclists and pedestrians, including clean, safe shoulders.

5. Better Use of Funds and Smarter Asset Management

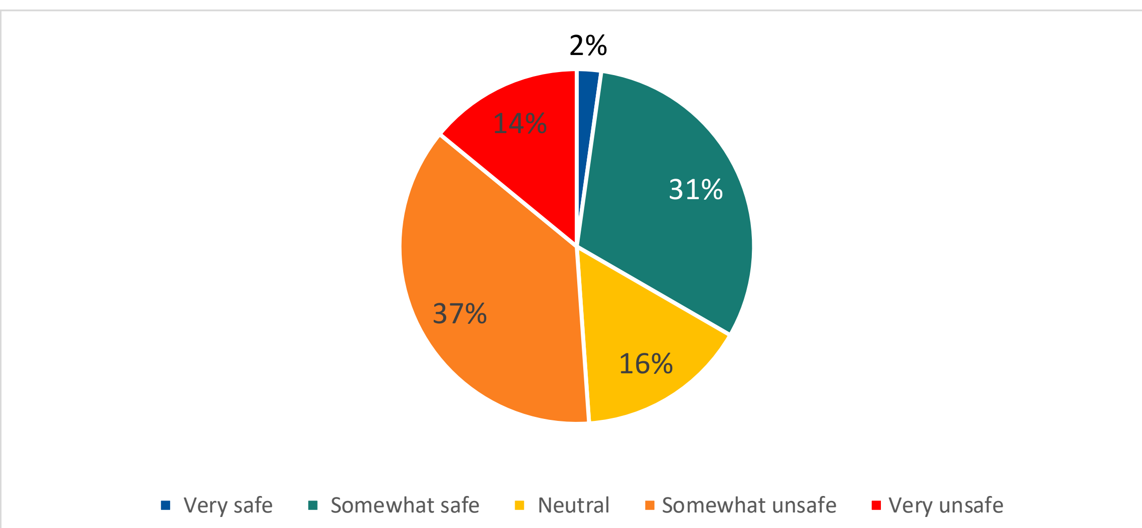
- Many questioned why major infrastructure upgrades seem to require higher taxes, suggesting the City should re-prioritize spending, improve long-term planning, and use preventive approaches to reduce costs over time.
- Some suggested bringing culvert work in-house to reduce costs and improve responsiveness.

Active Transportation Levels of Service (Bike Lanes, Sidewalks, and Multi-use Trails) - 185 Participants

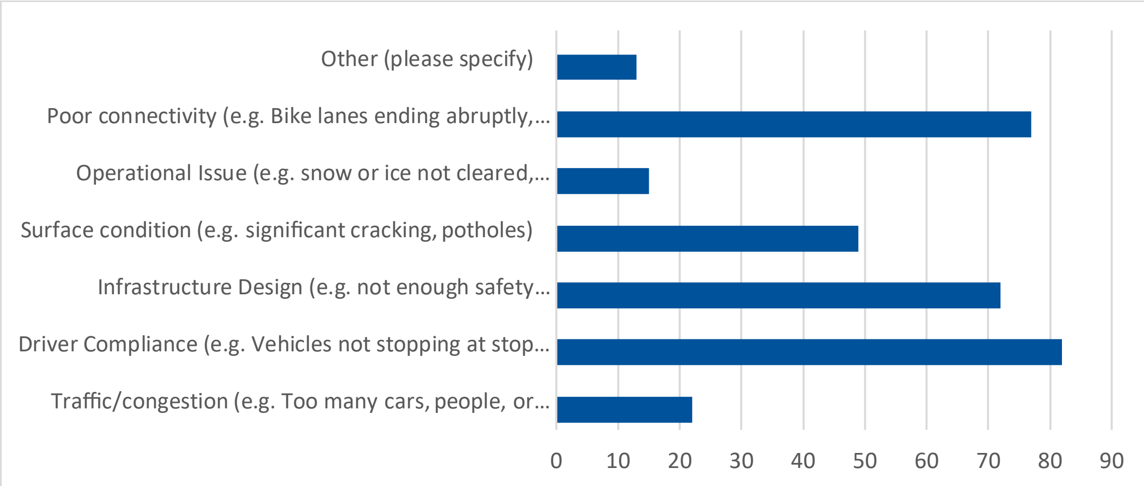
Q1 How often do you cycle through urban areas? (On the roads/streets and/or using bike lanes and buffered bike lanes)



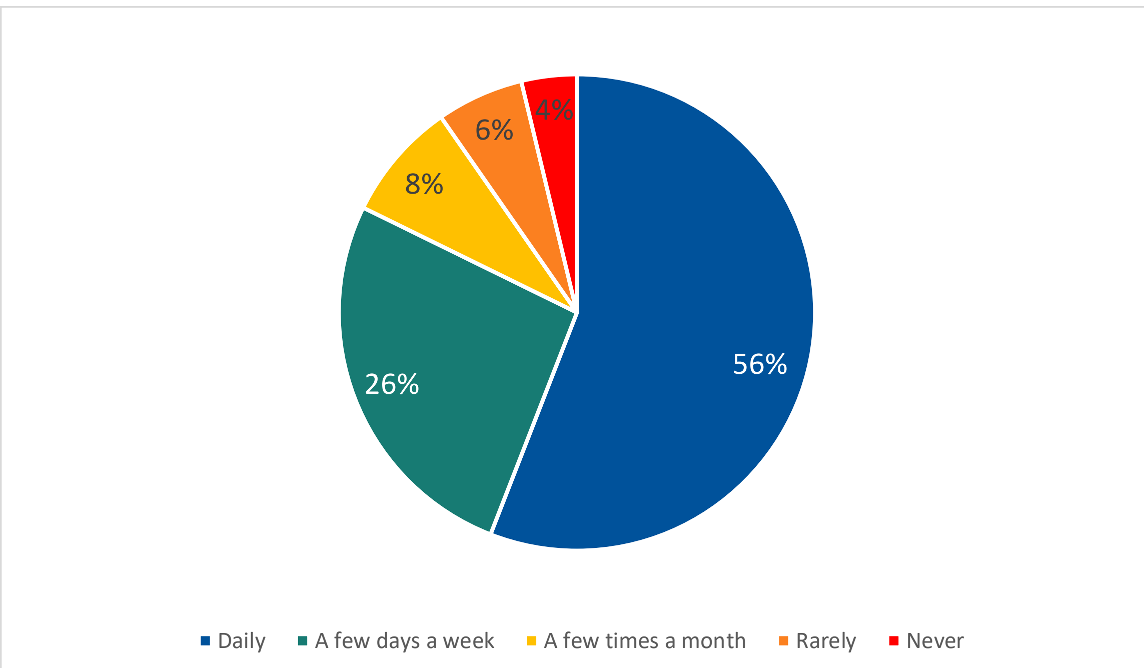
Q2 How safe do you currently feel while cycling through urban areas? (On the roads/streets and/or using bike lanes and buffered bike lanes)



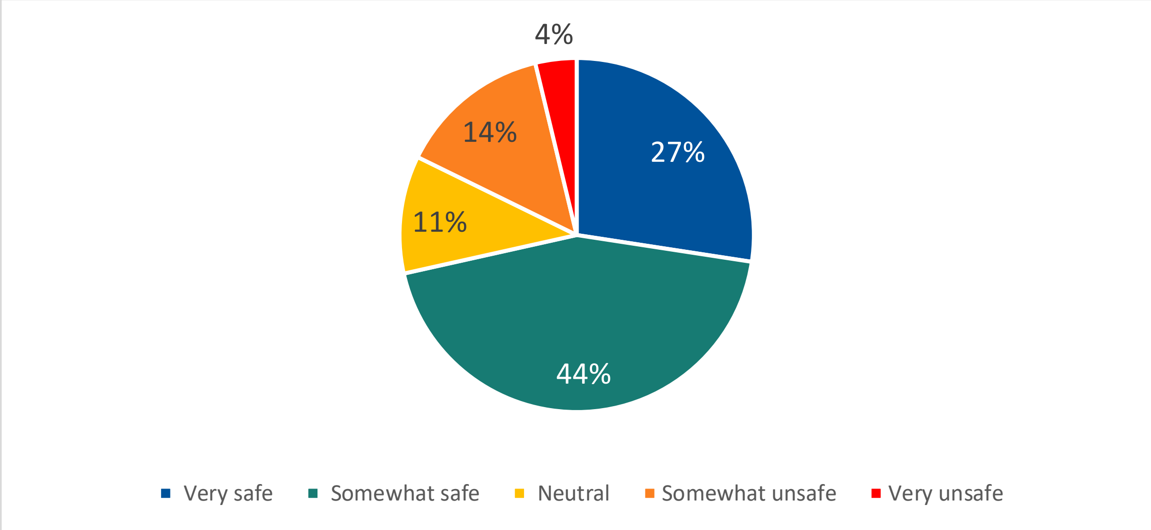
Q3 Select the top reasons why you do NOT currently feel safe cycling through urban areas. (On the roads/streets and/or using bike lanes and buffered bike lanes). Choose up to 3 max.



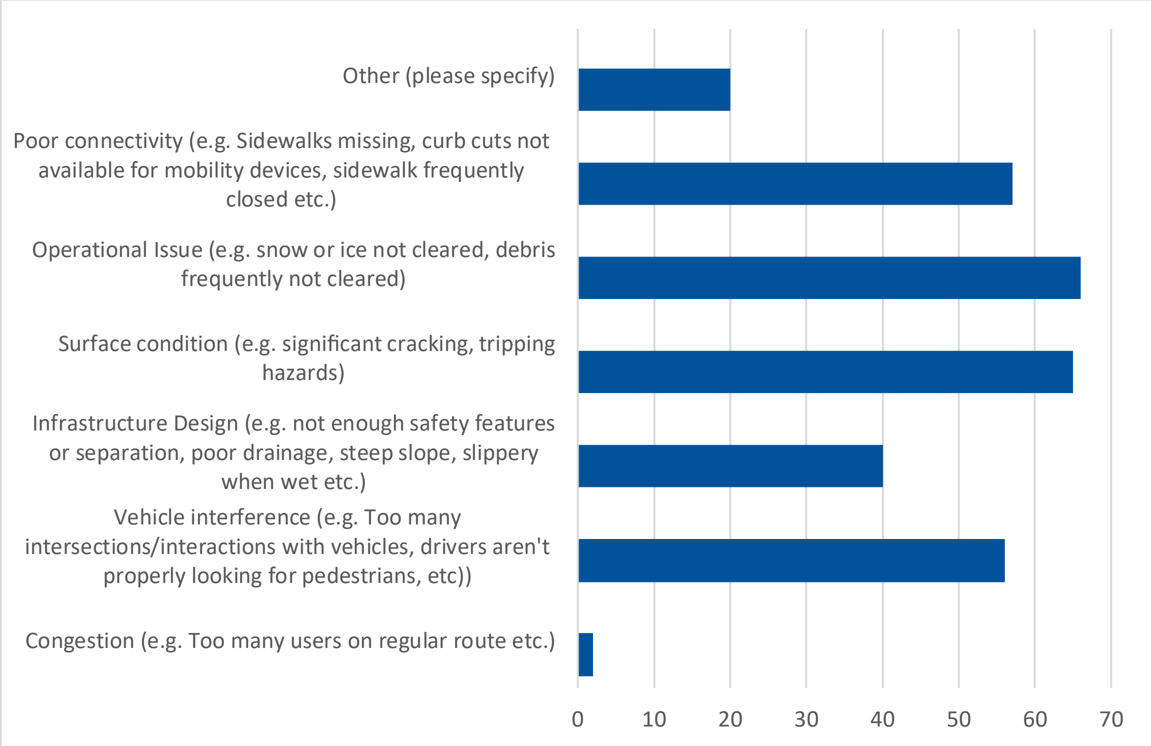
Q4 How often do you use sidewalks (for activities such as walking, jogging and other forms of exercise and/or active transportation)?



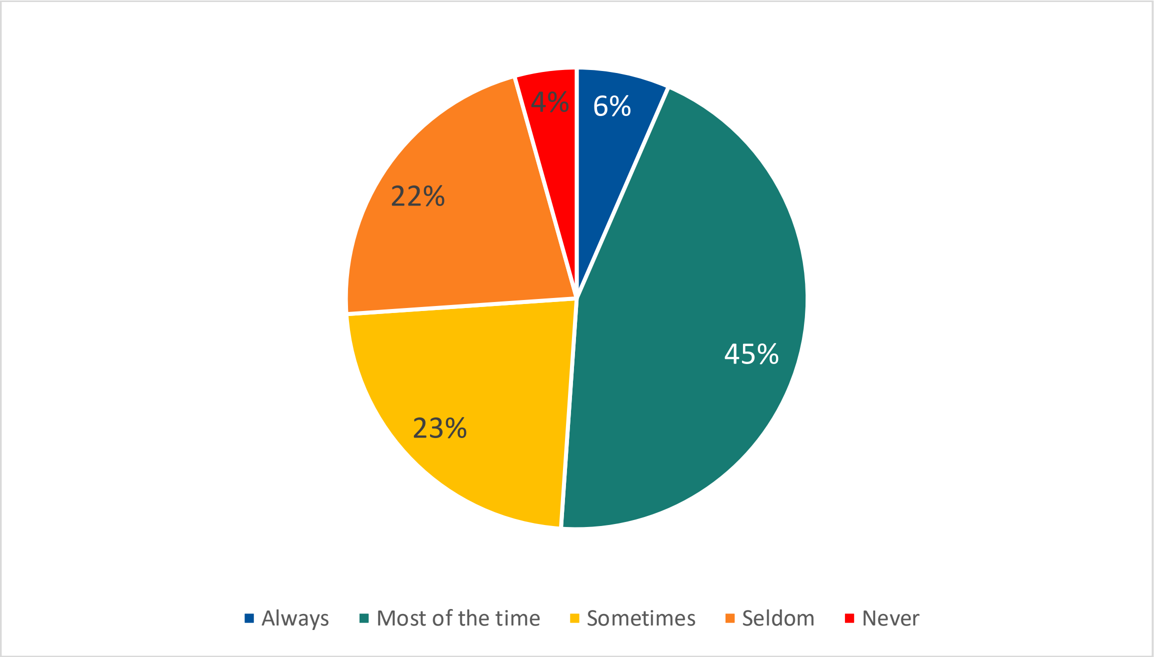
Q5 How safe do you feel while using sidewalks?



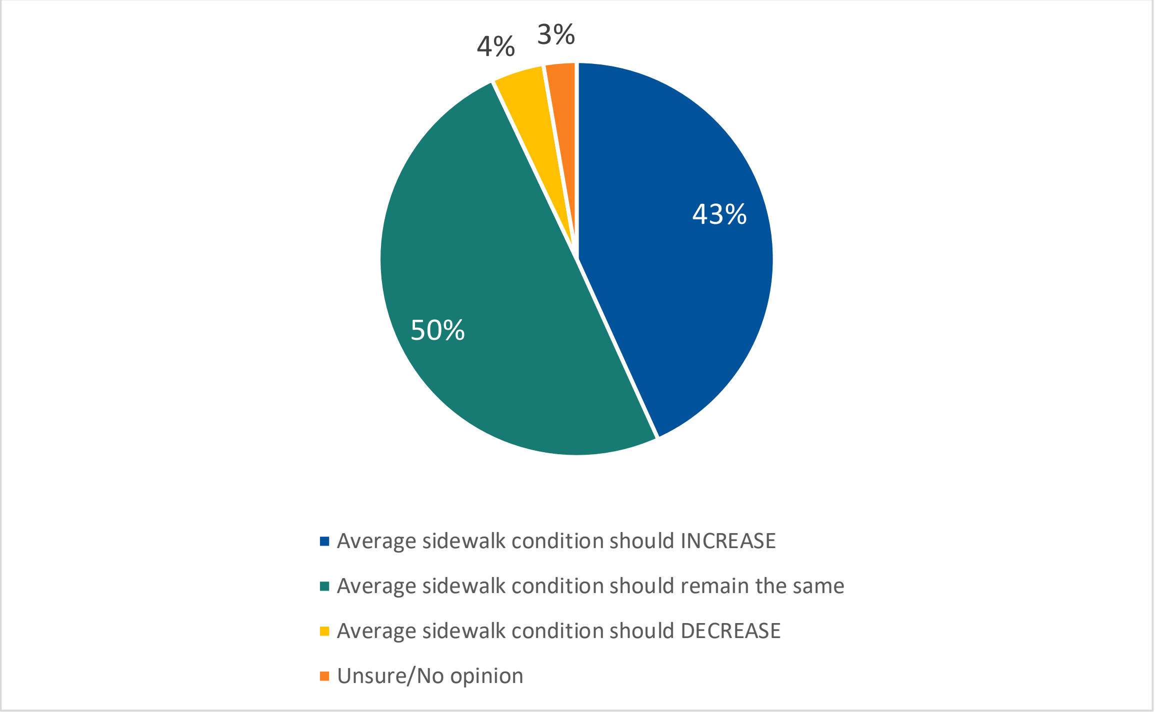
Q6 Select the top reasons you feel unsafe using sidewalks? Choose up to 3 max.



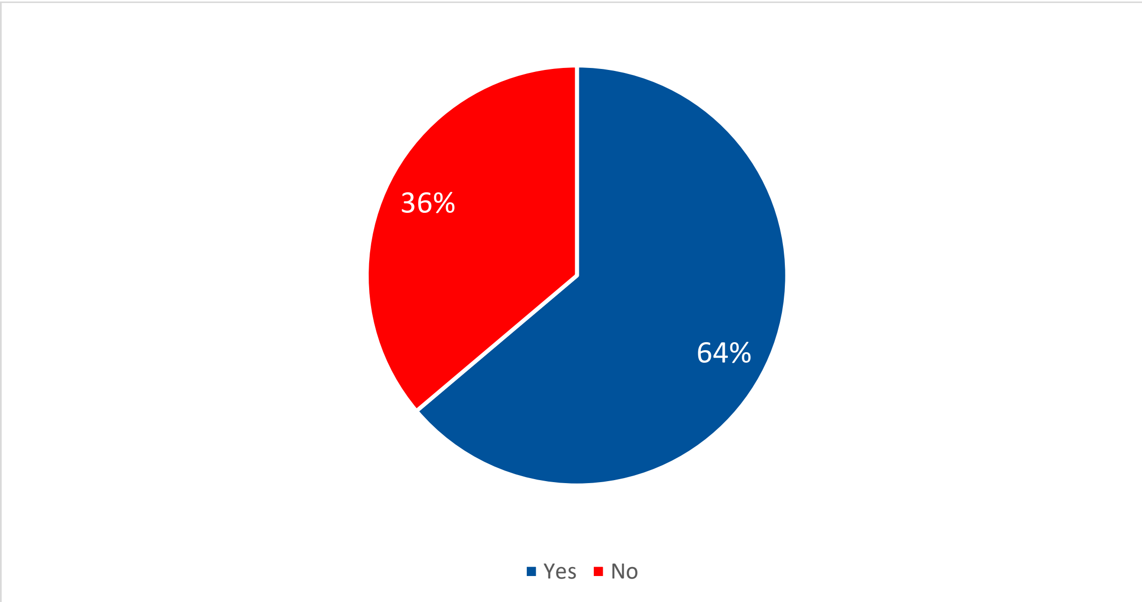
Q7 During a winter storm with at least 5cm of snow, do you think sidewalks are plowed in a reasonable amount of time?



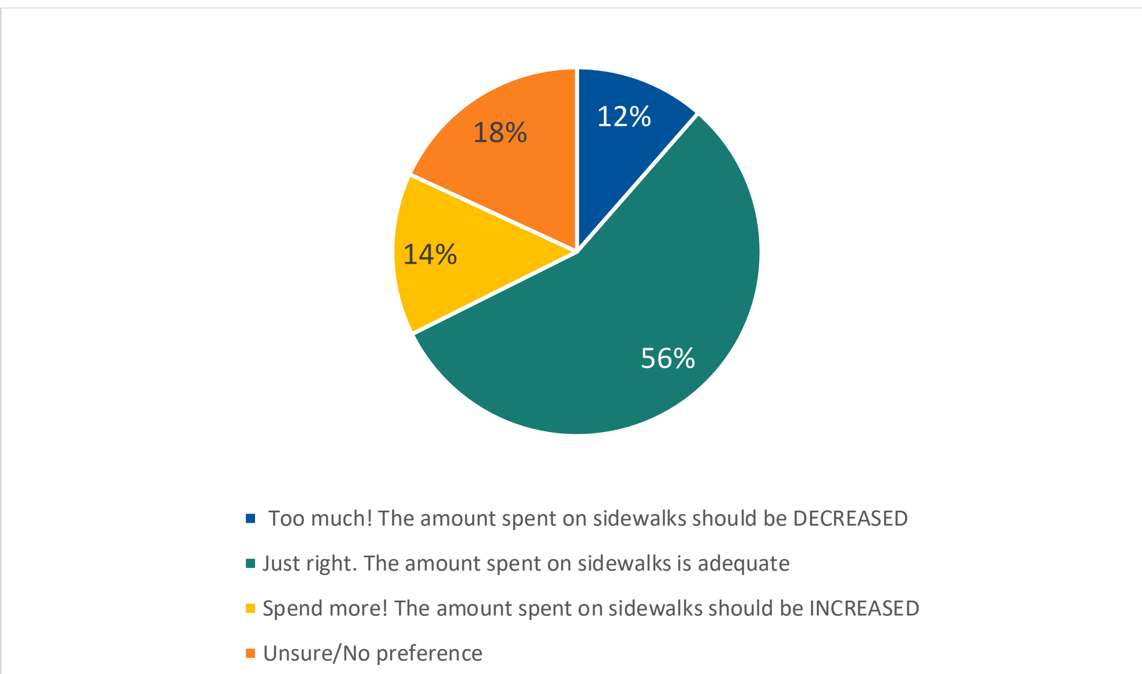
Q8 Currently, the average condition of sidewalks in Thunder Bay is GOOD. What do you feel the average condition of sidewalks should be in the future?



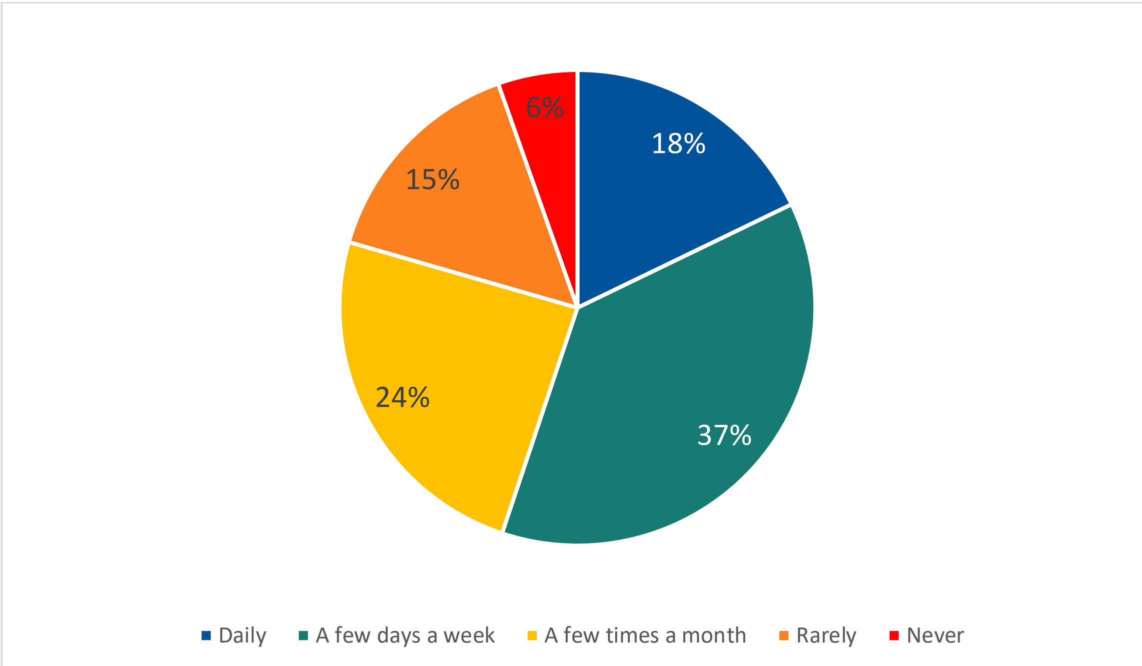
Q9 Would you be willing to pay more taxes to see the average condition of sidewalks increased?



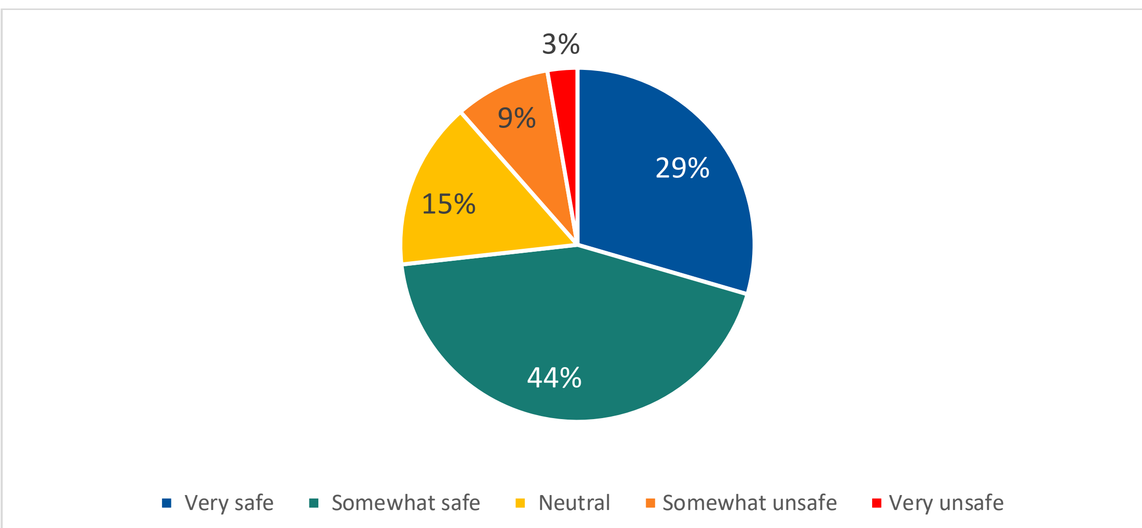
Q10 How do you feel about the amount the City spends on sidewalks?



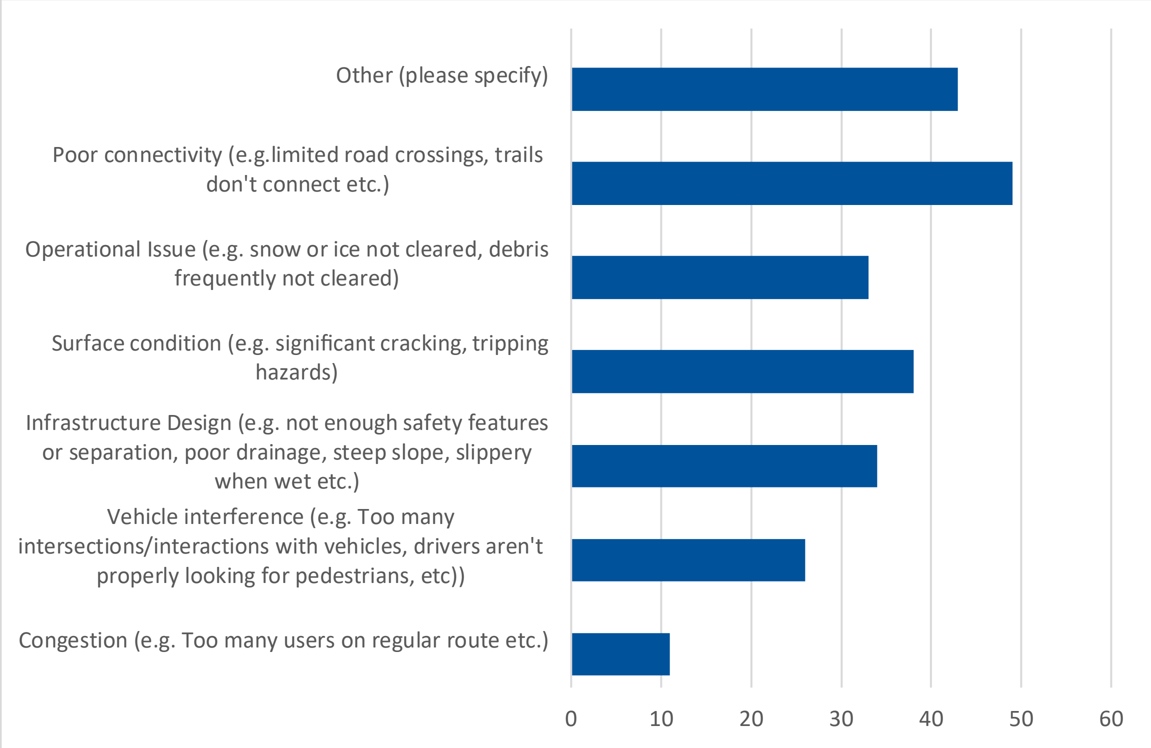
Q12 How often do you use multi-use trails for activities such as walking, jogging, cycling and other forms of exercise and/or active transportation?



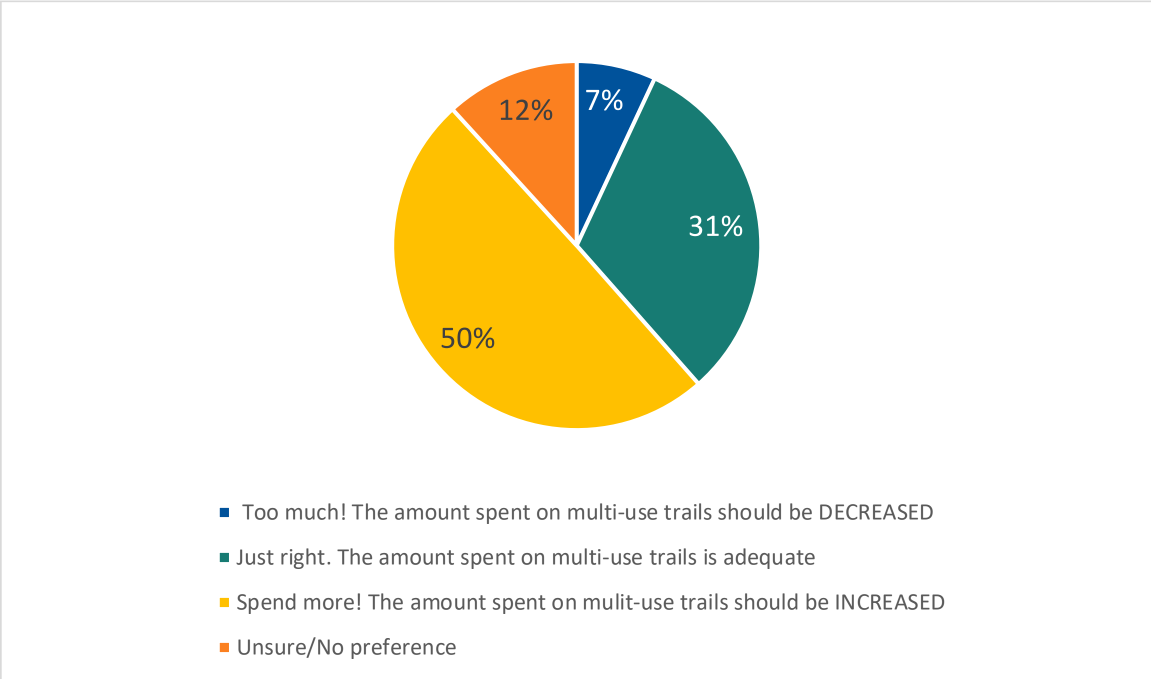
Q13 How safe do you feel while using multi-use trails?



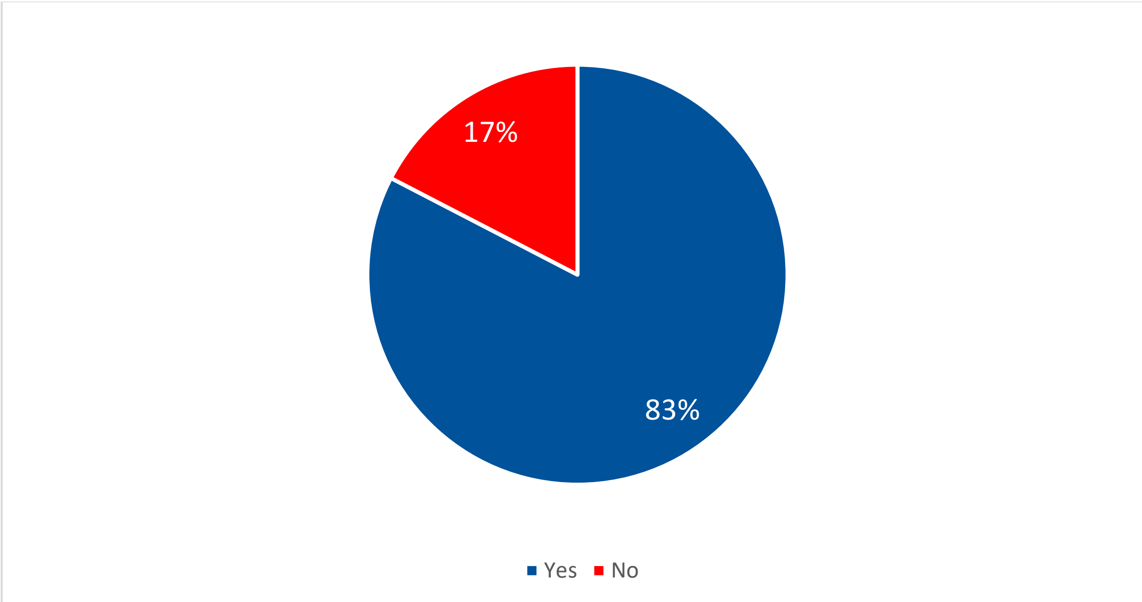
Q14 Select the top reasons you feel unsafe using multi-use trails? Choose up to 3 max.



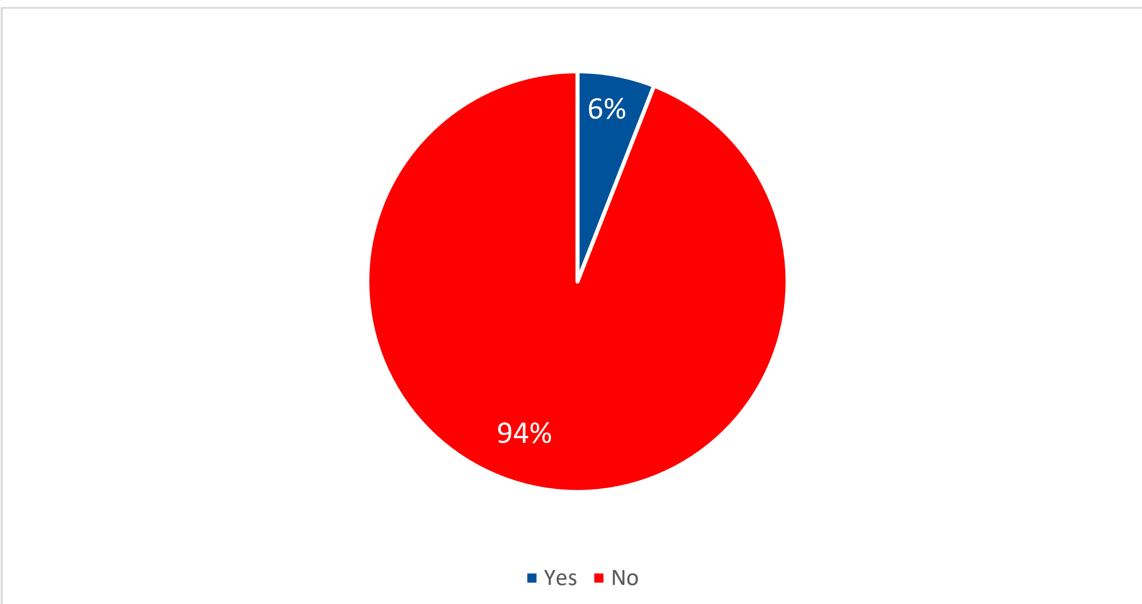
Q15 How do you feel about the amount the City spends on multi-use trails?



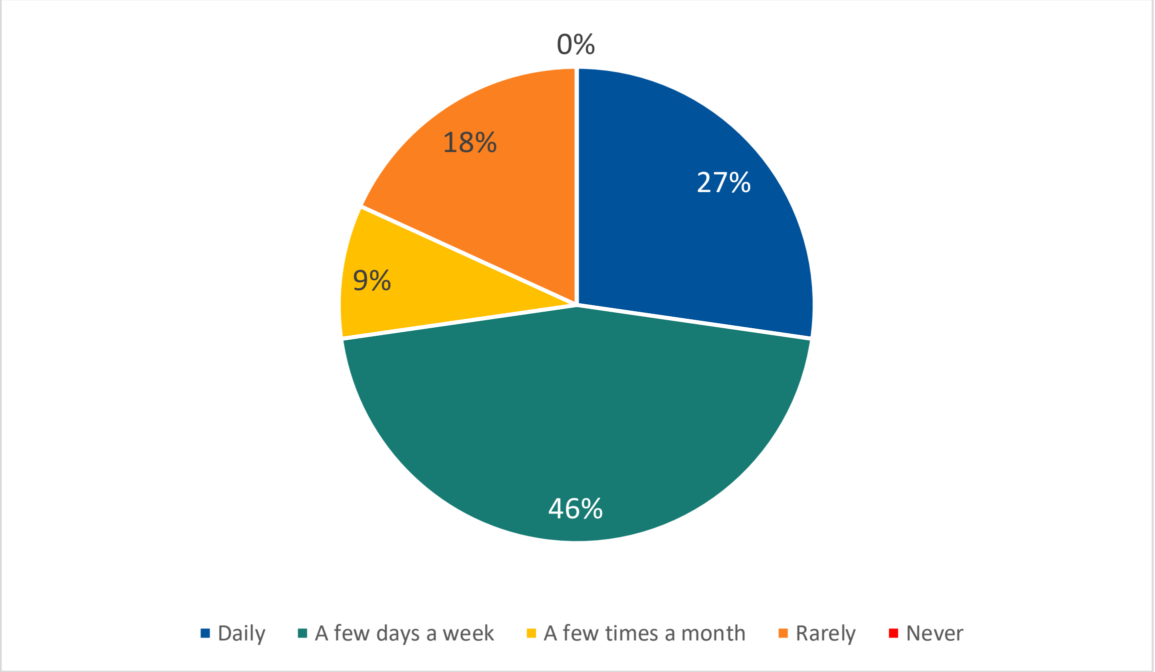
Q16 Would you be willing to pay more taxes to increase spending on multi-use trails?



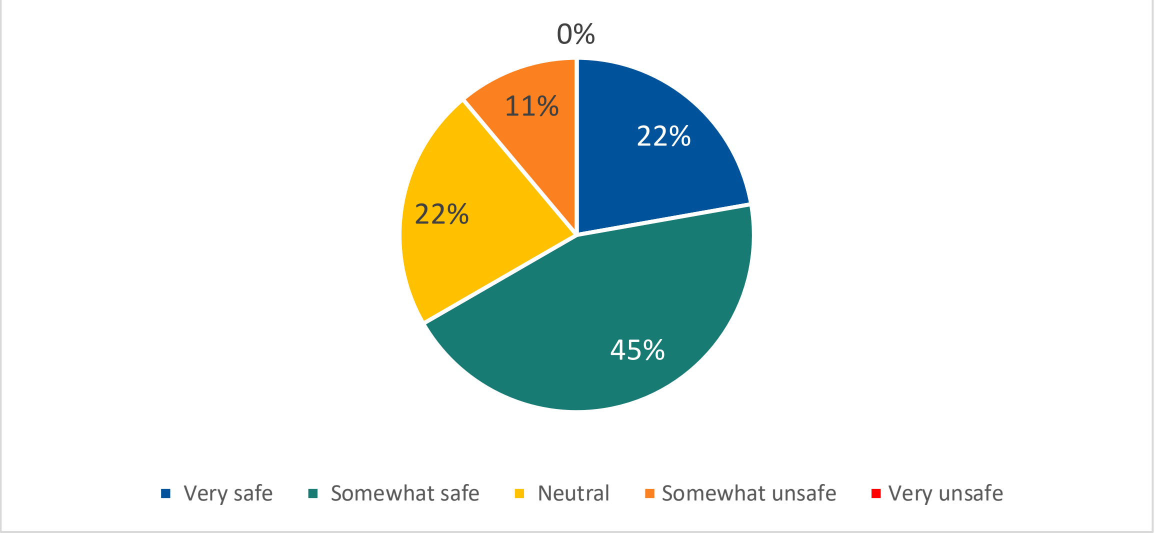
Q17 Do you use a mobility device?



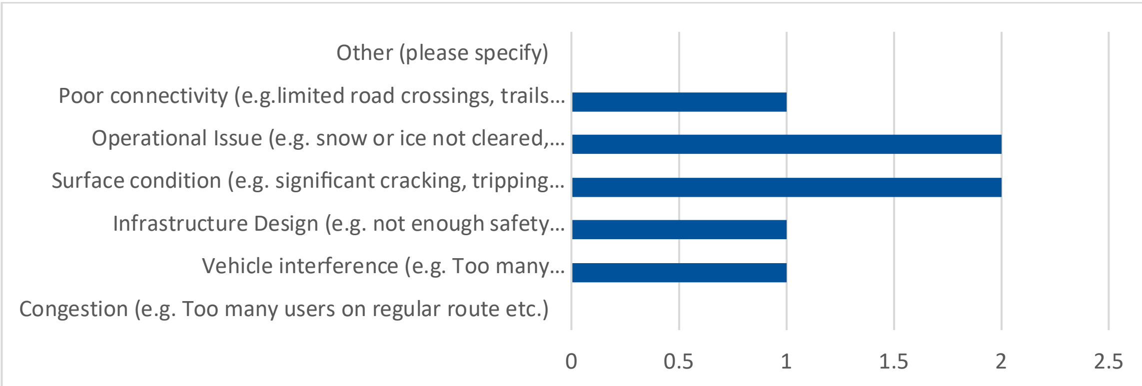
Q18 How often do you use a mobility device on sidewalks and/or multi-use trails?



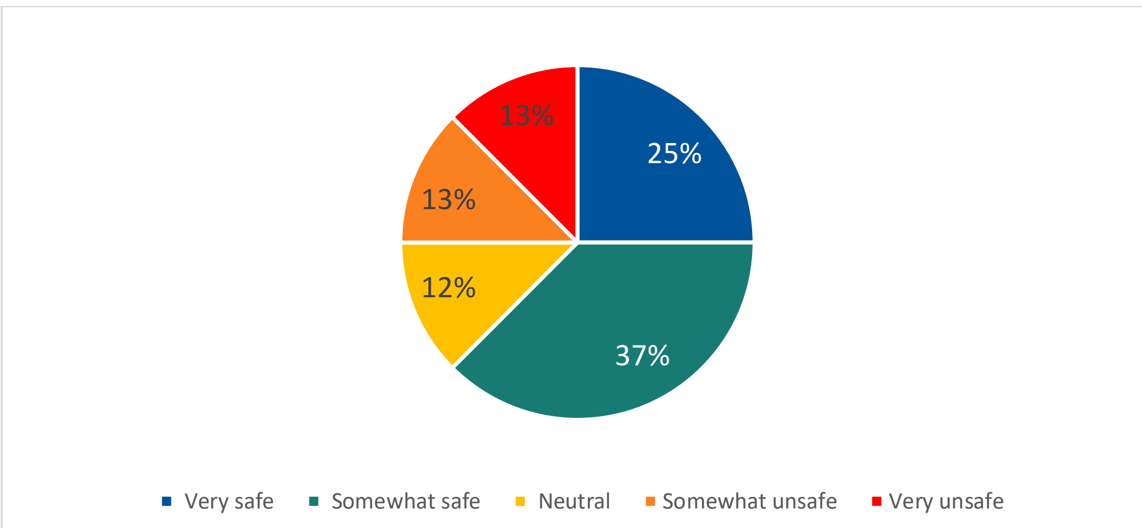
19 How safe do you feel using a mobility device on multi-use trails?



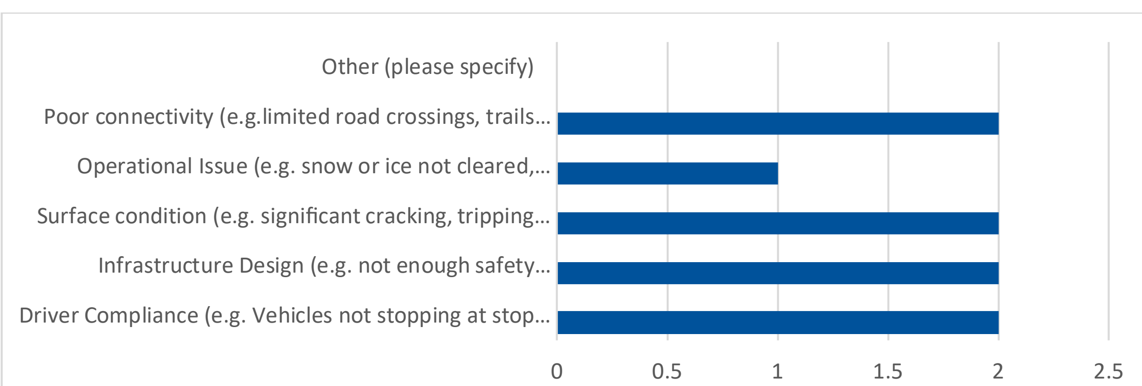
Q20 Select the top reasons you feel unsafe using a mobility device on a multi-use trail. Choose up to 3 max.



Q21 How safe do you feel using a mobility device on City sidewalks?

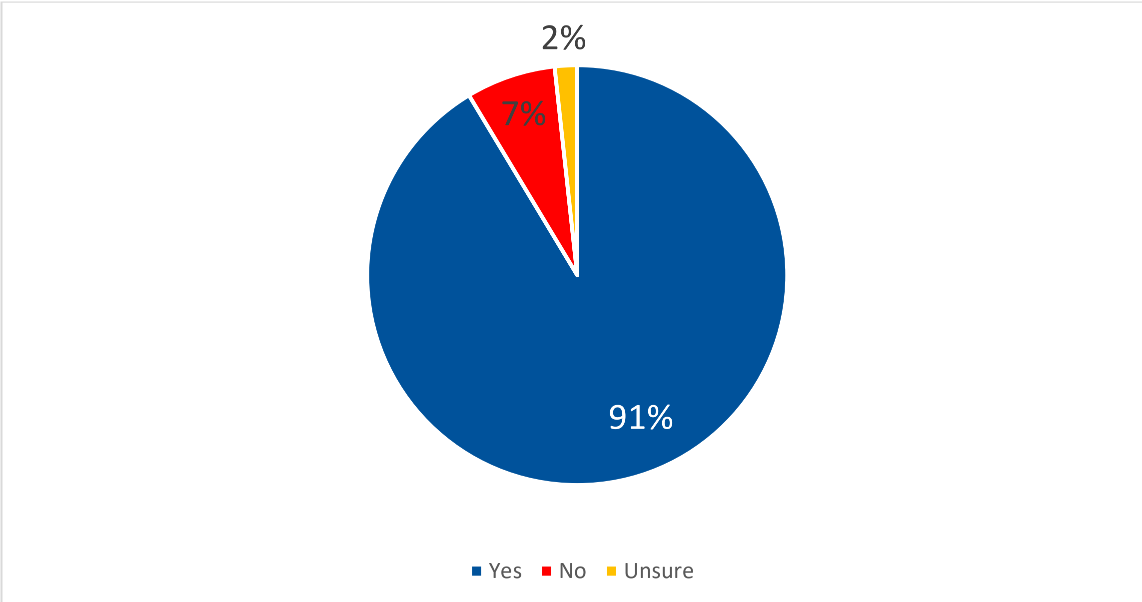


Q22 Select the top reasons you feel unsafe using a mobility device on a sidewalk. Choose up to 3 max.

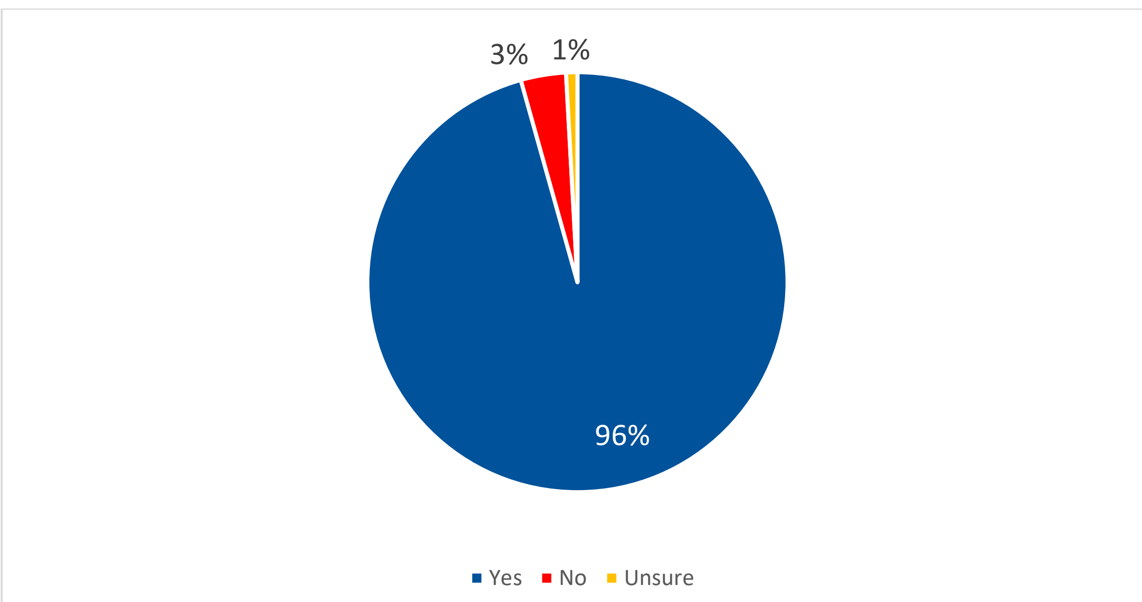


Drinking Water Levels of Service - 116 Participants

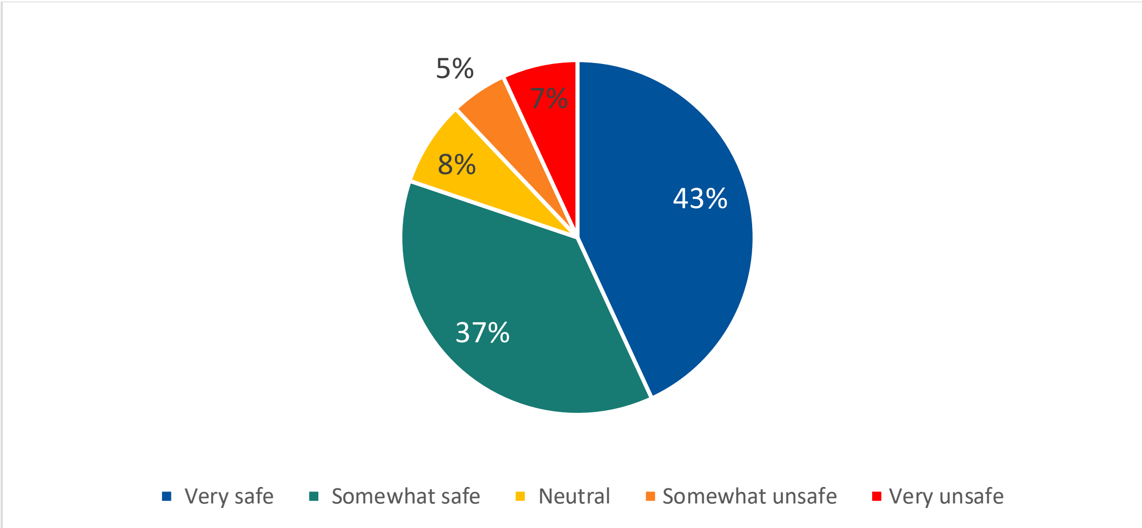
Q1 Are you connected to Thunder Bay's municipal waternetwork?



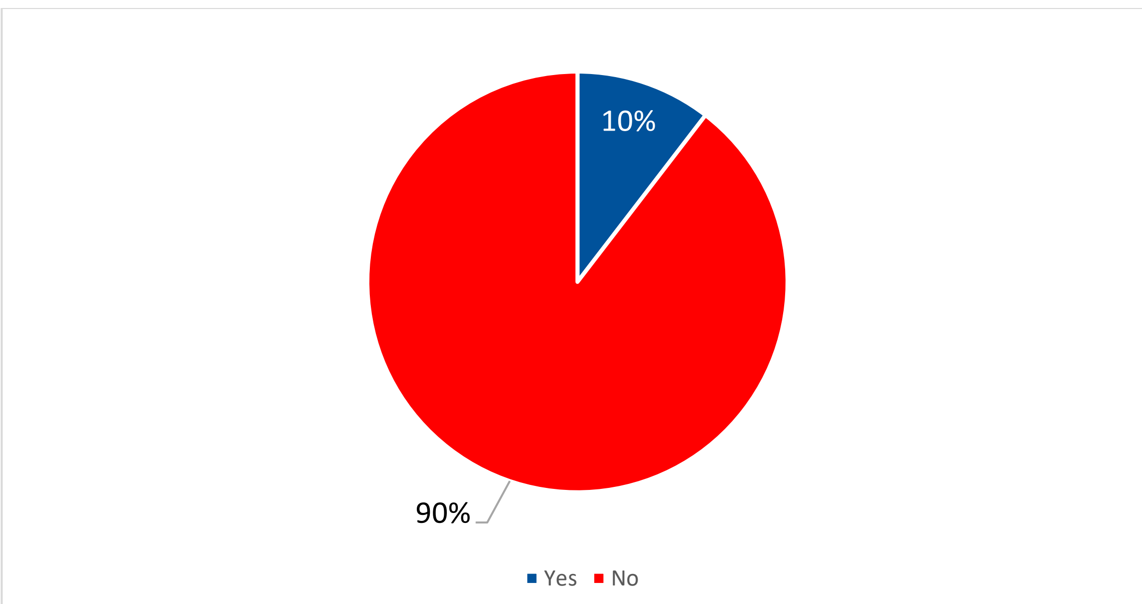
Q2 Do you feel that drinking water is readily available with minimal to no service interruptions?



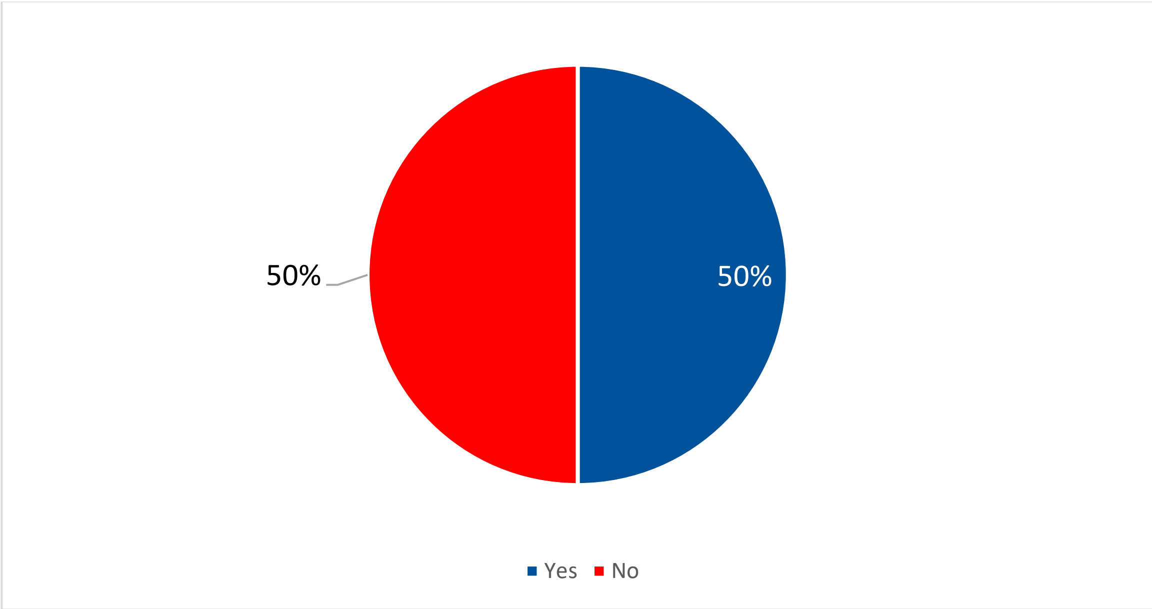
Q3 How safe do you feel the water from your tap is?



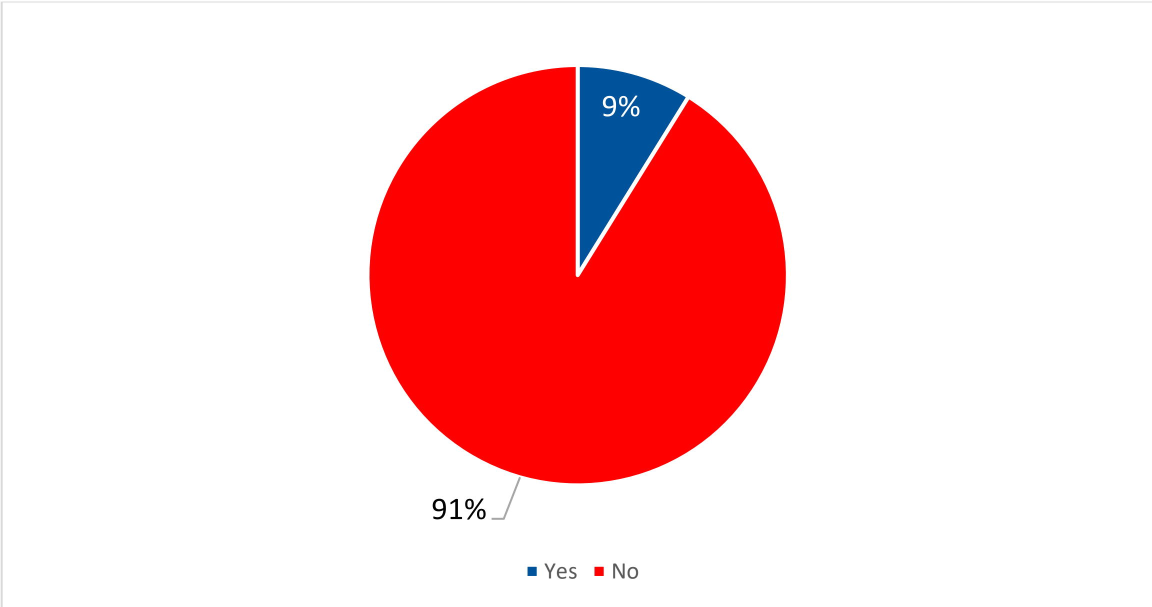
Q4 In the last 12 months, has your household or business had an unplanned water service interruption (e.g. caused by a water main break)?



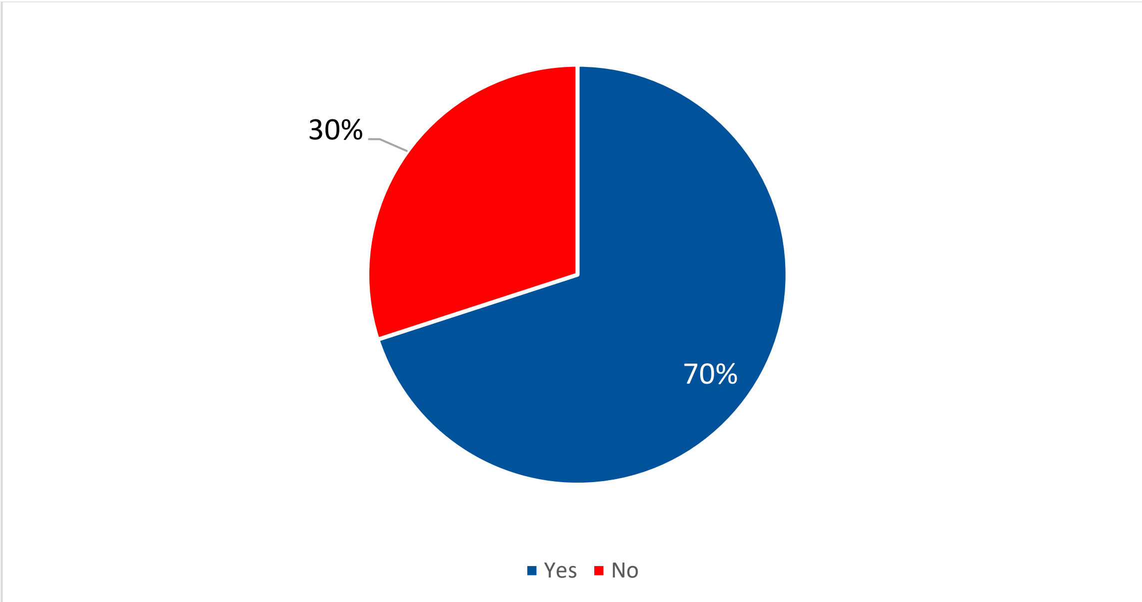
Q5 Do you feel the City responded and resolved the issue in a timely manner?



Q6 In the last 12 months, has your household or business had a planned water service interruption (e..g. planned by the City for maintenance or servicing)?



Q7 Did the City provide you with advanced notice of the interruption?



Residents shared the following key concerns and priorities:

1. Lead Service Line Replacement

- Strong calls for the City to fully fund and accelerate the removal of lead service lines, with concerns about health impacts and the burden on homeowners.

2. Water Quality and Safety

- Requests for improved filtration, reduced chlorine, and better protection from contaminants like microplastics. Some residents reported visible residue or cloudy tap water.

3. Infrastructure and System Reliability

- Suggestions to restore dual-source treatment, continue infrastructure upgrades, and prepare for climate-related risks.

4. Cost and Billing Fairness

- Many feel the current billing structure is unfair to low users and want lower fixed charges and tiered rates based on consumption.

5. Public Information and Transparency

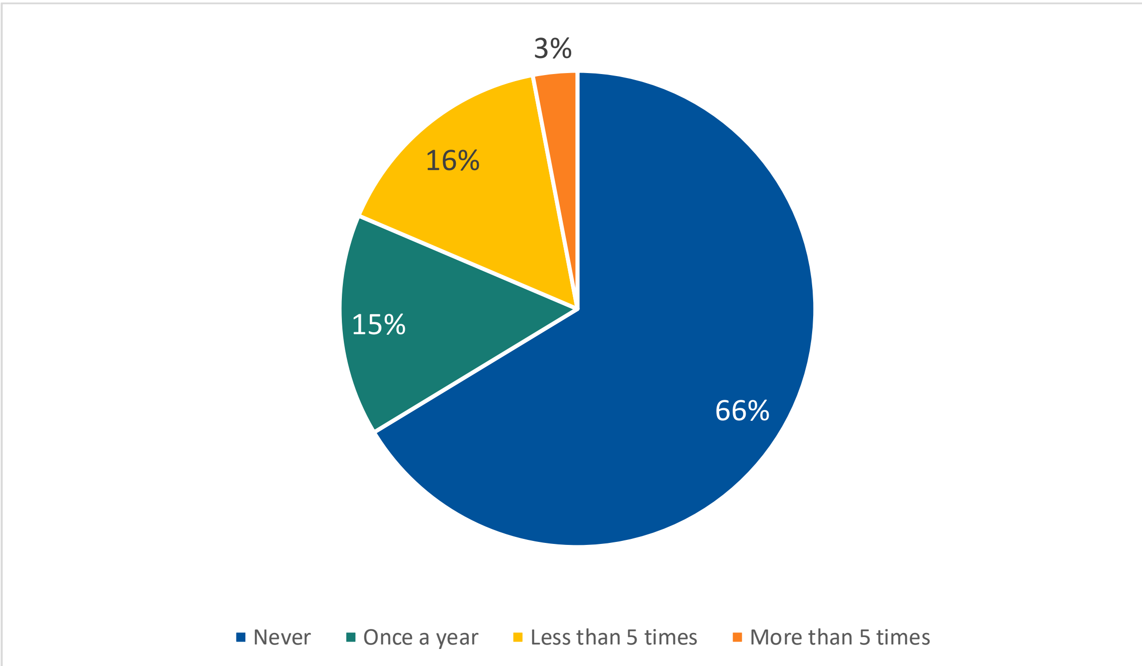
- Residents want clearer communication about water quality, chemical additives, and access to real-time testing data online.

6. Accessibility and Equity

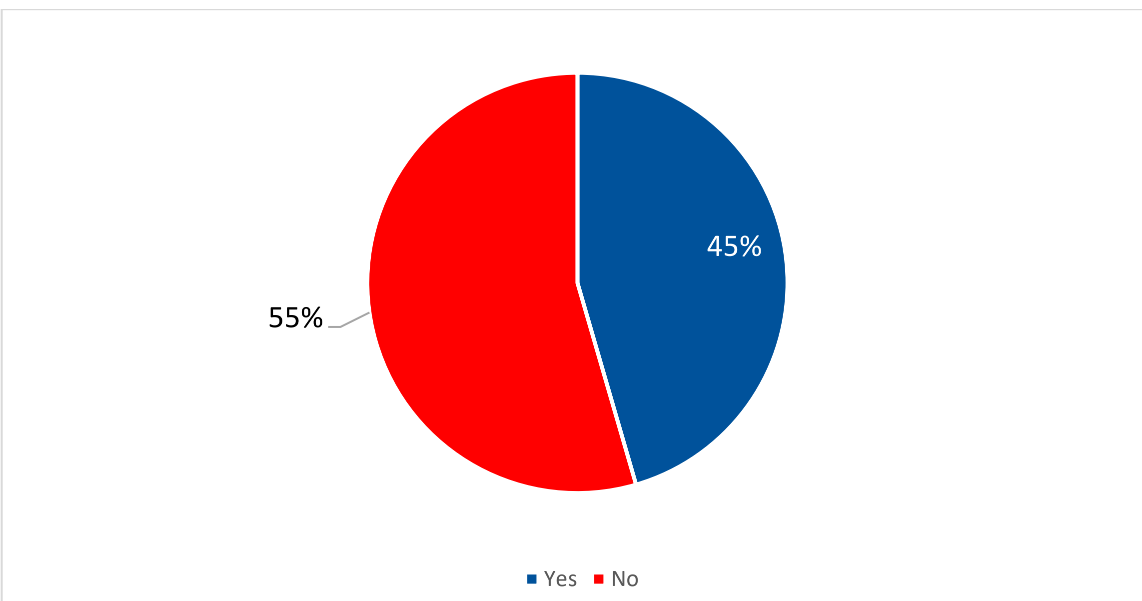
- Calls for more public drinking water stations and expanded access to clean water in underserved areas.

Stormwater Levels of Service - 201 Participants

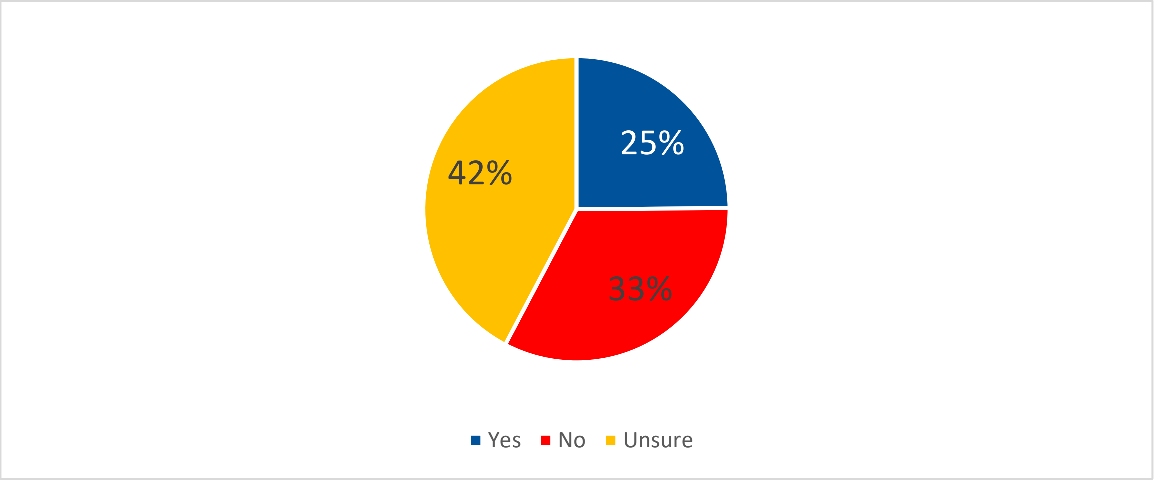
Q1 In the last 5 years how often have you had to delay or cancel travel due to roads being flooded?



Q2 Have you experienced flooding impacts on your property?



Q3 Do you feel that the City of Thunder Bay is taking enough steps each year to reduce the risk of flooding in the City?



Residents highlighted the following key themes:

1. Drainage Maintenance

- Strong support for more frequent clearing of catch basins, culverts, ditches, and storm drains, especially before spring melt and during freeze/thaw cycles.
- Calls for better curb-to-drain grading and improved street and sidewalk drainage to reduce pooling and basement flooding.

2. Flood Prevention & Climate Resilience

- Many want the City to plan for extreme weather and climate-related risks, including flood-prone areas like Intercity, Northwood, and Westfort.
- Suggestions include rain gardens, green infrastructure, and stormwater retention areas to help manage runoff and protect waterways.

3. Public Education & Involvement

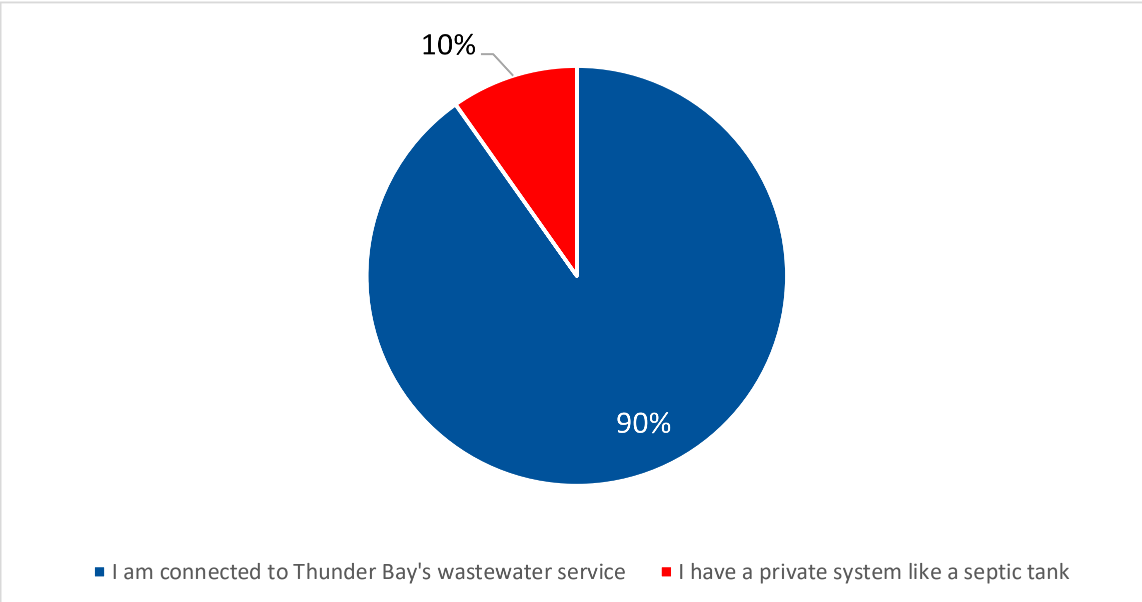
- Residents supported public education efforts, including "Adopt-a-Storm-Drain" programs, tips for homeowners, and communication on drainage responsibilities.
- Interest in incentives for low-impact landscaping and driveway improvements to reduce runoff.

4. Infrastructure Upgrades

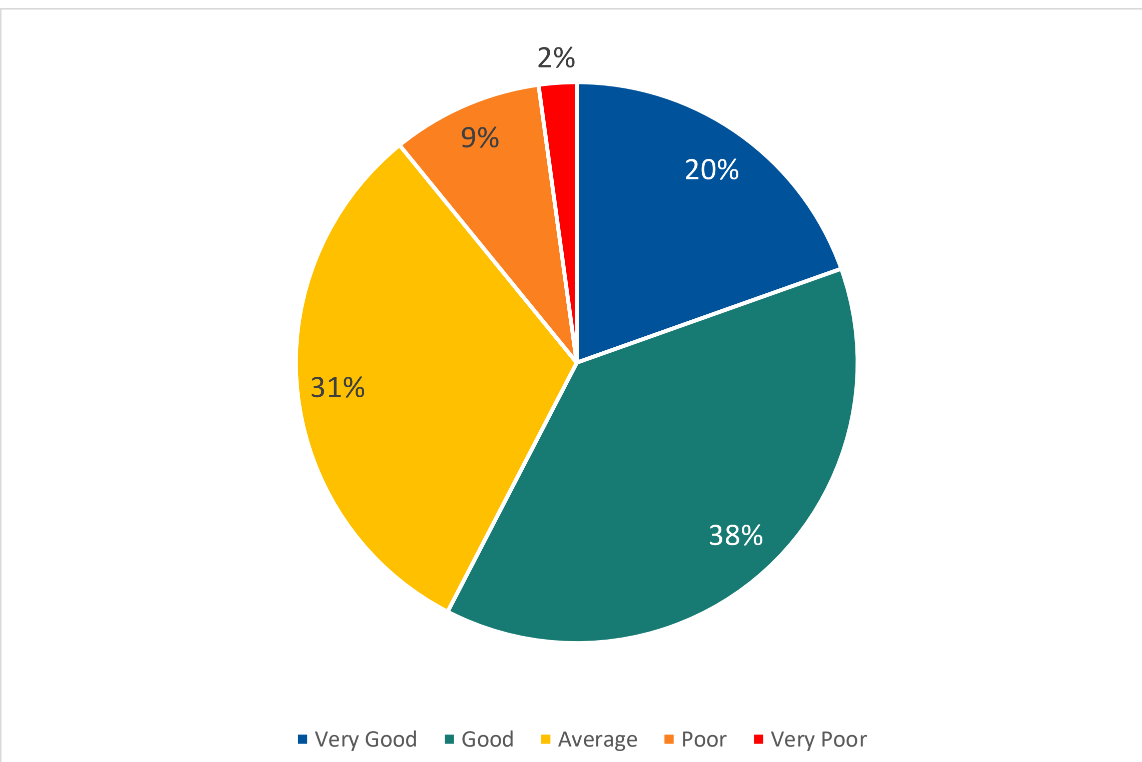
- Feedback emphasized the need for upgraded and properly designed storm sewers, culverts, and grading in older neighbourhoods.
- Concerns raised over poor construction quality and maintenance, with some questioning inspection practices and oversight.

Wastewater Levels of Service - 92 Participants

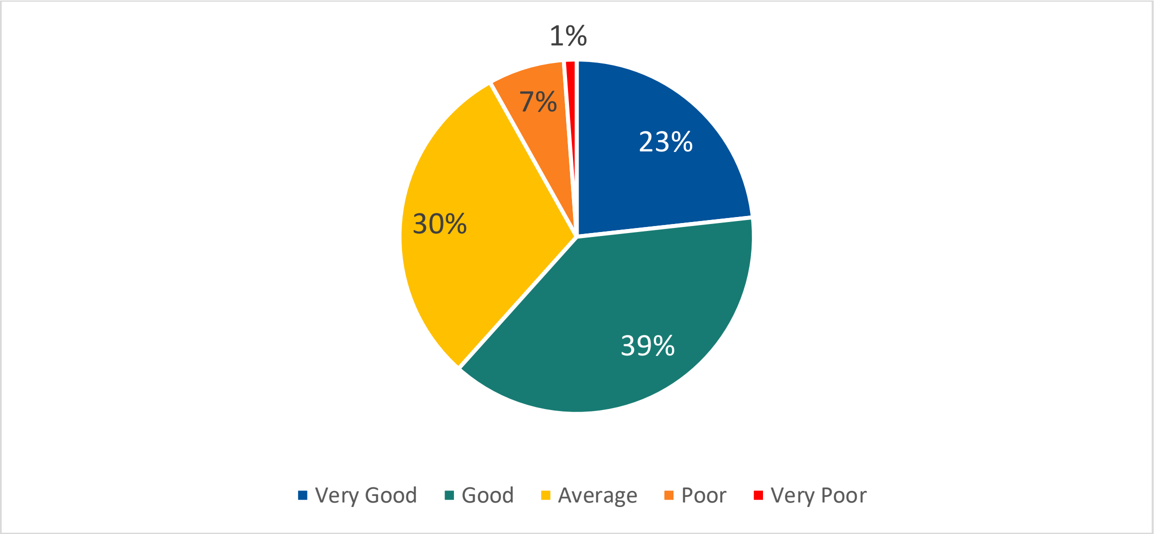
Q1 What type of wastewater sewer service do you have at home?



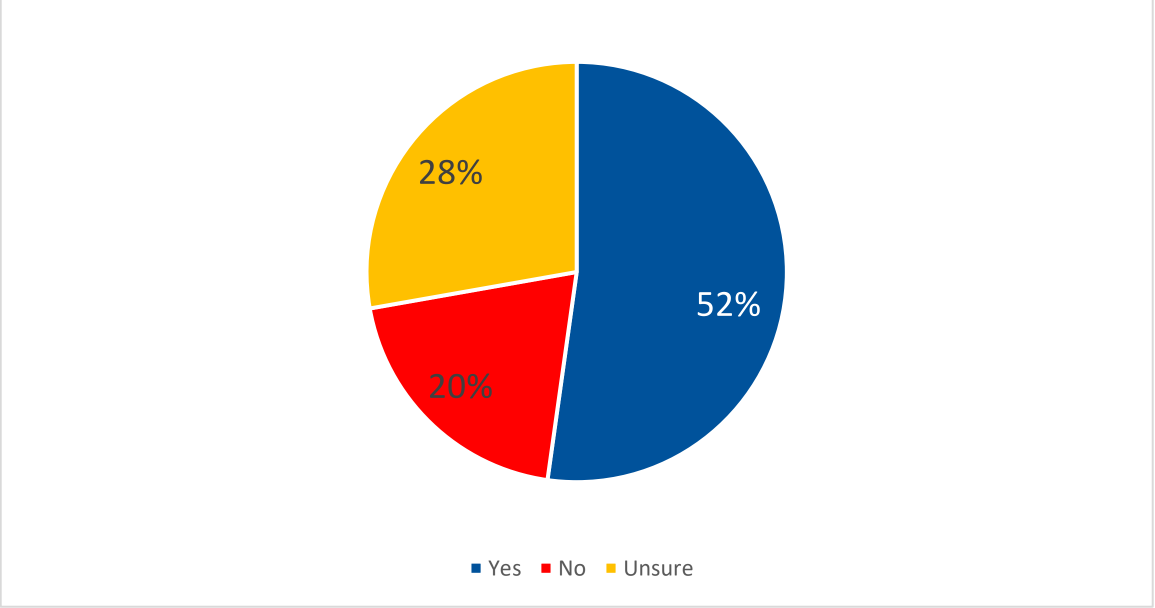
Q2 How would you rate the City's sanitary sewer collection system and services?



Q4 How would you rate the City's wastewater treatment processes and performance?



Q6 According to the Ontario Building Code, sewer and storm connections must have a front clean-out. Front clean-outs are usually located in the basement floor within one metre of the front wall of the house. Your clean-out allows access for inspection and maintenance of your sewer connection. Do you have a clean out at the front of your house?



Residents provided input focused on the following priorities:

1. Cost and Affordability

- Widespread concern over high water and wastewater charges, with calls to review billing structures and reduce set fees.
- Suggestions to align sewer billing with usage and provide transparent cost breakdowns.

2. Maintenance and Upgrades

- Residents want the City to stay on top of system maintenance and respond promptly to issues and emergencies.
- Emphasis on replacing aging infrastructure, especially in areas without proper storm sewer systems.

3. Environmental Protection

- Support for improving treatment standards, with some calling for tertiary treatment and enhanced monitoring of treatment effectiveness.
- Strong concern about pharmaceuticals and contaminants reaching waterways and leakage before full treatment.

4. System Expansion and Septic Reduction

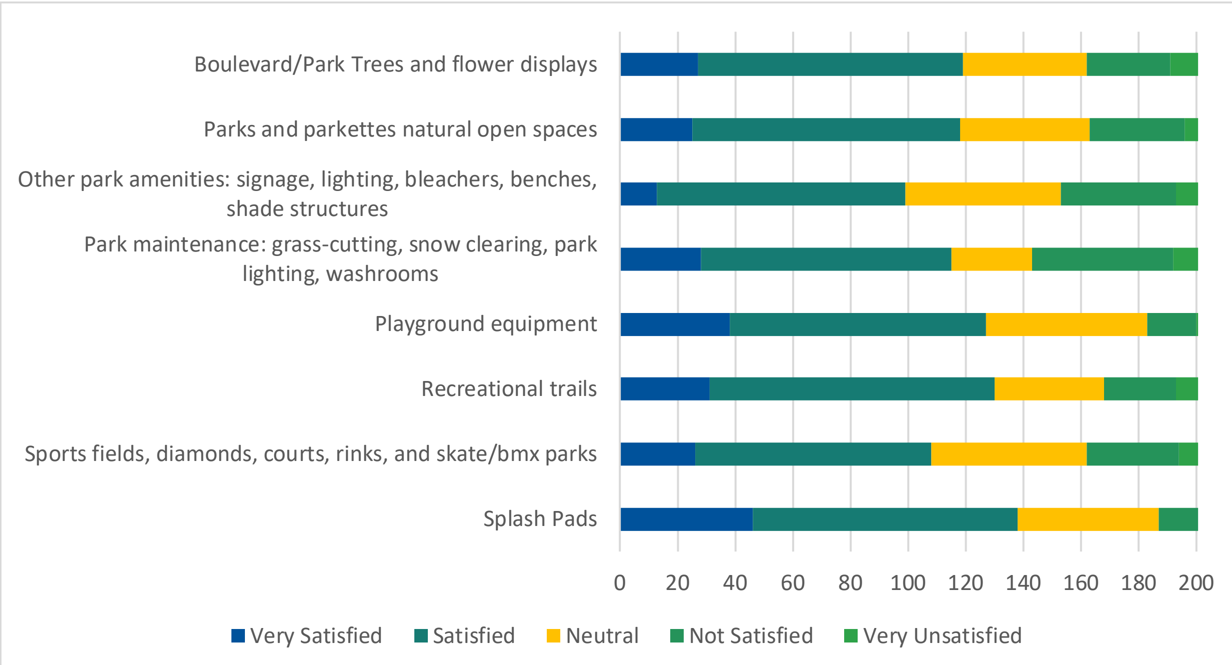
- Calls to phase out septic systems and extend municipal wastewater services to protect groundwater and local streams.

5. Public Reporting and Accountability

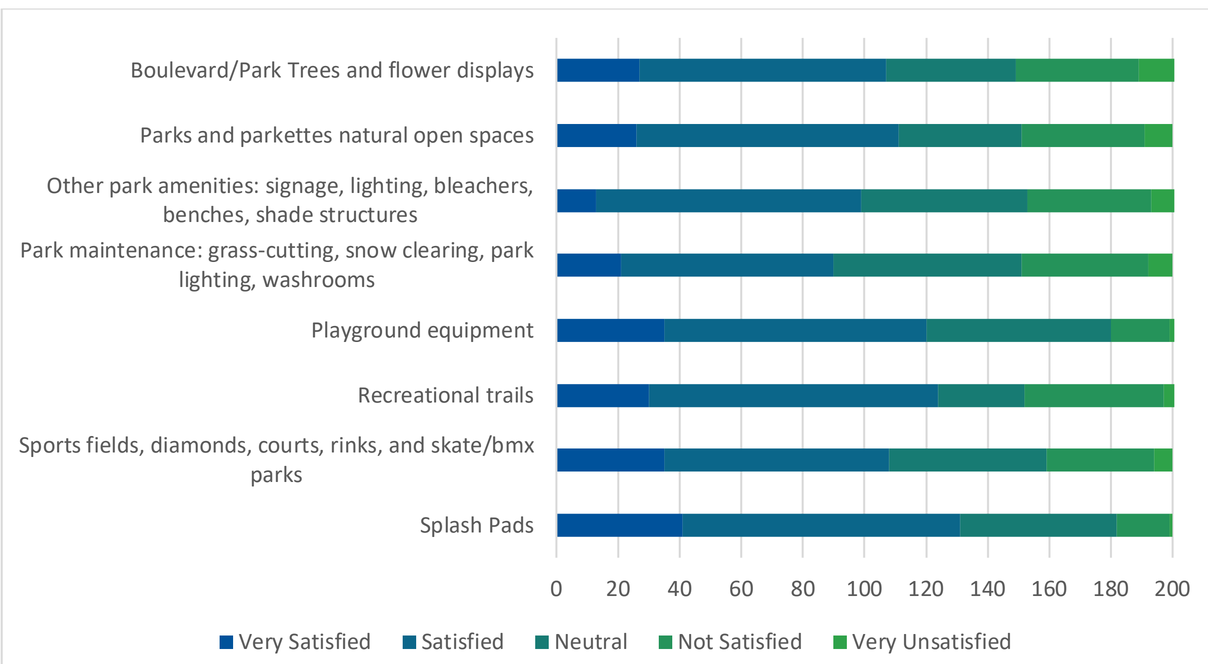
- Requests for increased public reporting on treatment performance, environmental compliance, and how Thunder Bay compares to other municipalities.

Parks and Open Spaces Levels of Service – 203 Participants

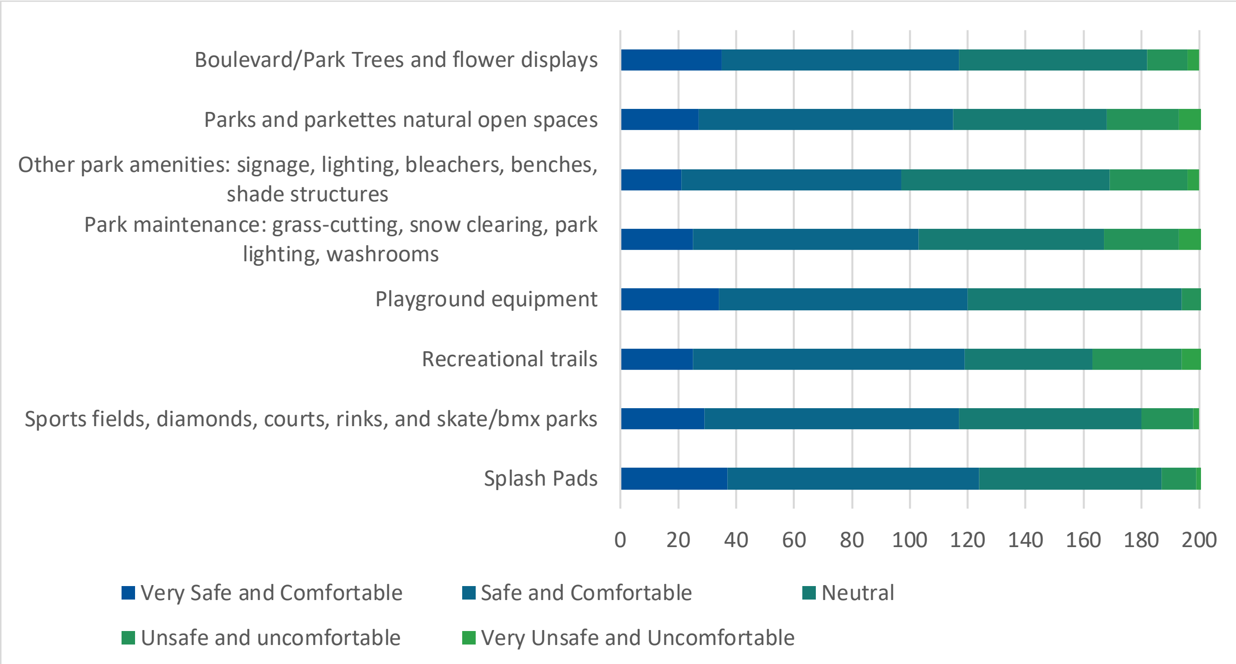
Q1 How satisfied are you with the quality of the following City of Thunder Bay Parks and Open Spaces services?



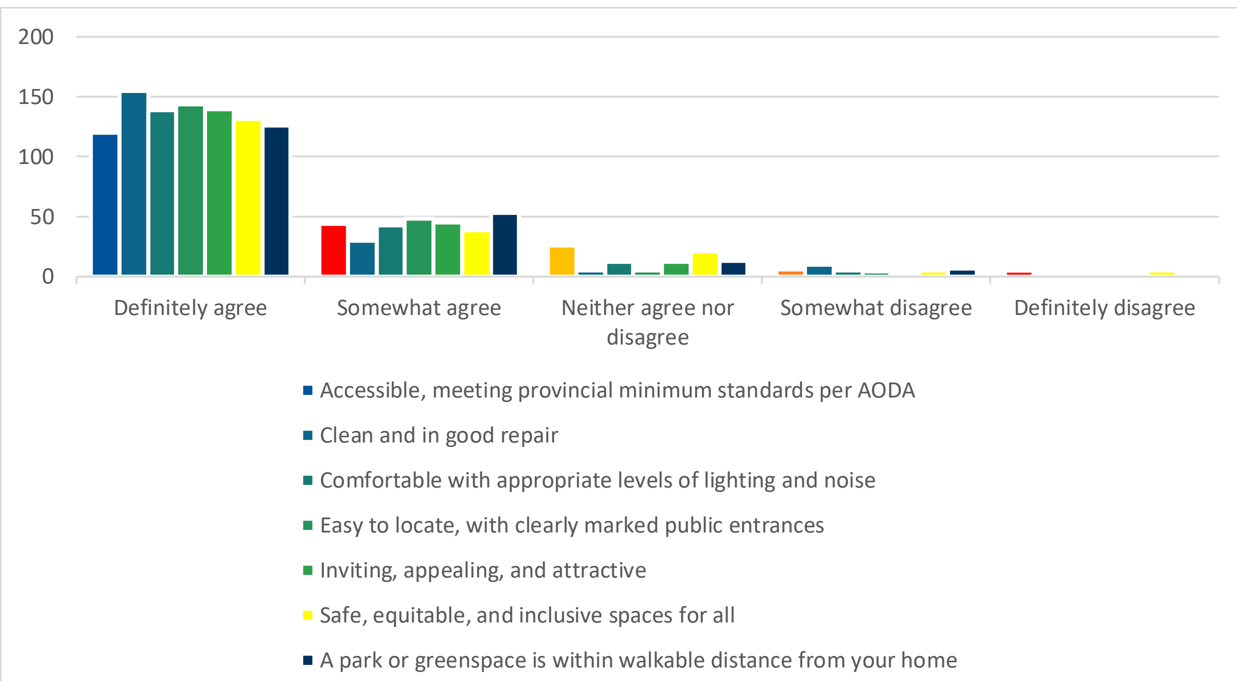
Q2 How satisfied are you with the amount of City of Thunder Bay Parks and Open Spaces assets provided?



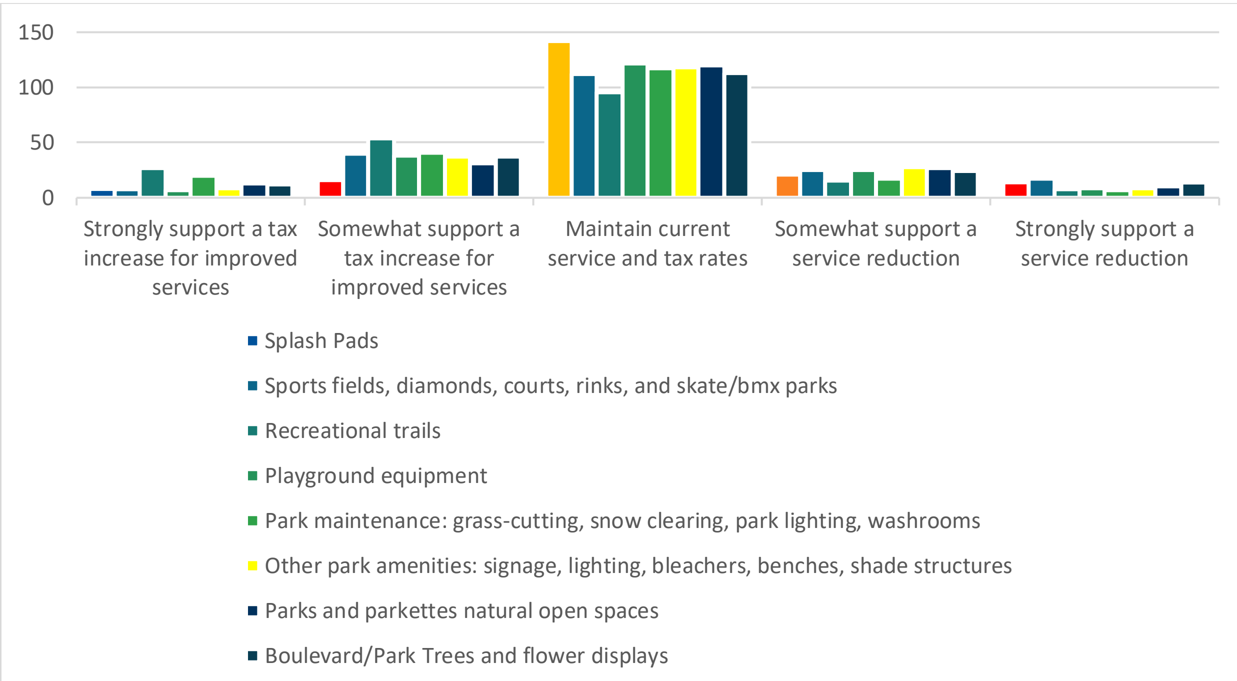
Q3 Do you feel safe and comfortable when using these Parks sites and services?



Q4 Do you agree with the following statements? Thunder Bay Parks' spaces should be:



Q5 For each service below, would you choose to improve it if doing so meant a tax increase, or would you prefer to cut or reduce service levels?



Q6 What changes would you like to see with respect to the City's Parks and Open Spaces to meet your future needs? Summary of Comments:

1. Strategic Planning & Maintenance
   - Improve communication on park priorities, strategic direction, and implementation timelines.
   - Prioritize maintaining existing parks over new projects (e.g., James Whalen tugboat, Pool 6 for cruise ships).
   - Address poor maintenance, especially weeding at Waterfront Park and Boulevard Lake.
   - Increase efficiency in city workers' use of time and resources.
2. Parking Concerns
   - Remove paid parking at Marina Park to restore accessibility.
   - Improve parking at Delaney and ensure proper snow clearing.
3. Safety & Accessibility

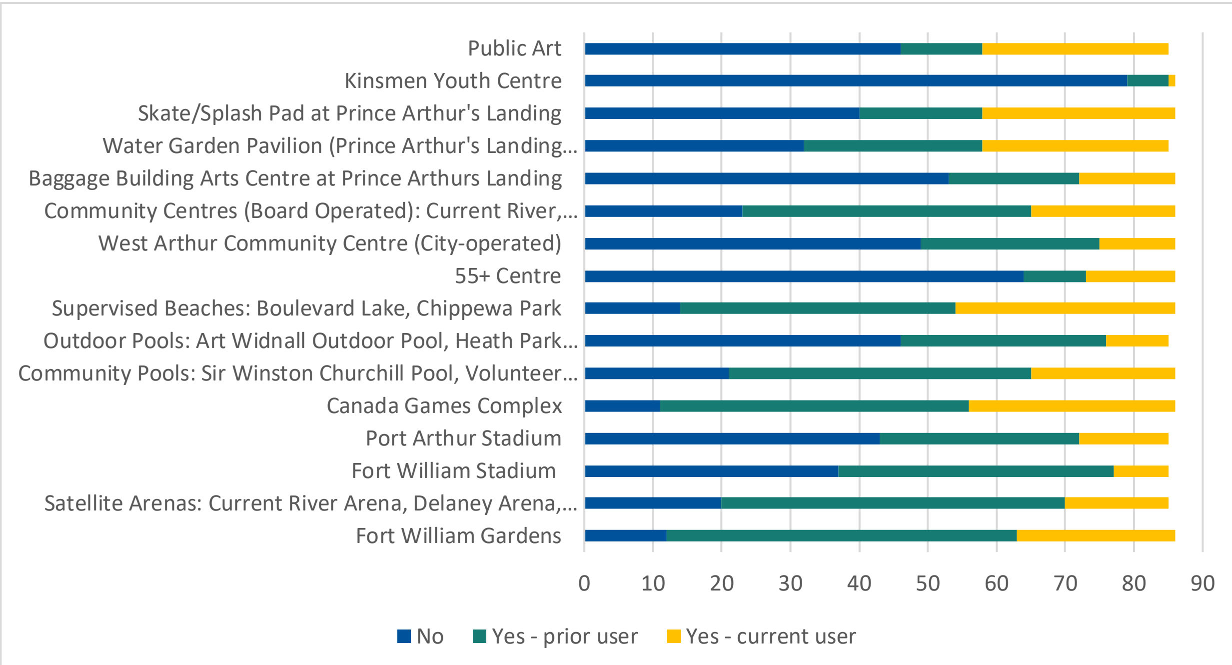
- Address aggressive behaviour and encampments that deter public use.
- Improve trail connections for safer pedestrian and cyclist movement.
- Increase lighting in parks, particularly for winter use.
- Provide more accessible and year-round washrooms.
- Maintain sidewalks and boulevards, including tree trimming.

4. Recreation & Green Space Enhancements
    - Expand and connect recreation trails throughout the city.
    - Maintain and improve soccer fields, playgrounds, and splash pads.
    - Add a hockey rink at the marina.
    - Establish a full-service community center with a pool.
    - Increase tree planting and use of perennials instead of flowers for sustainability.
    - Repurpose underused tennis courts for pickleball.
5. Winter Activities & Extended Seasons
    - Extend camping season to October 31.
    - Increase winter maintenance of trails for walking and recreation.
    - Maintain swings and outdoor play areas year-round.
6. Community Involvement & Cost-Effective Solutions
    - Encourage volunteer programs for park maintenance.
    - Explore corporate sponsorships for neighbourhood park upgrades.
    - Reduce unnecessary costs like excessive mowing while promoting natural habitats.
7. Miscellaneous Requests
    - Repair Waverley Park fountain and add seating.
    - Increase garbage collection and recycling bins.
    - Prevent public land from being sold for private use.
    - Enhance urban design to prioritize walkability and accessibility.

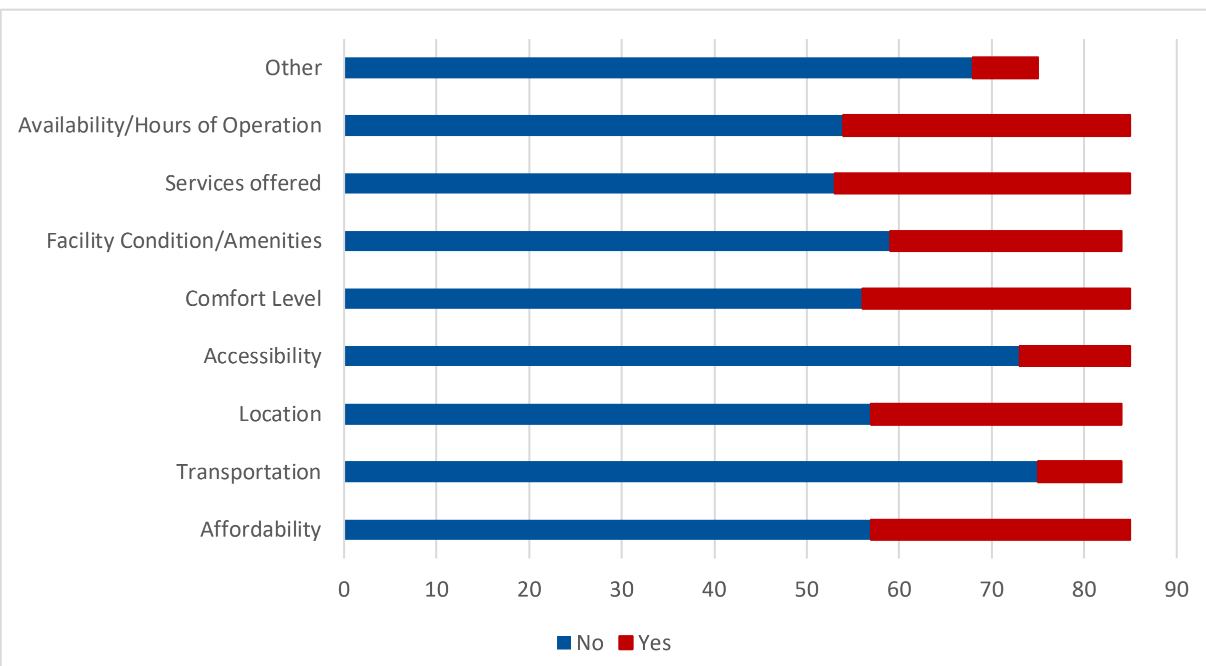
Overall, the feedback highlights an interest in a higher standard of park maintenance, improved accessibility, safety measures, free parking at key locations, and strategic community-focused investments.

Recreation and Culture Levels of Service – 86 Participants

Q1 Have you used the following Recreation and Culture Assets:



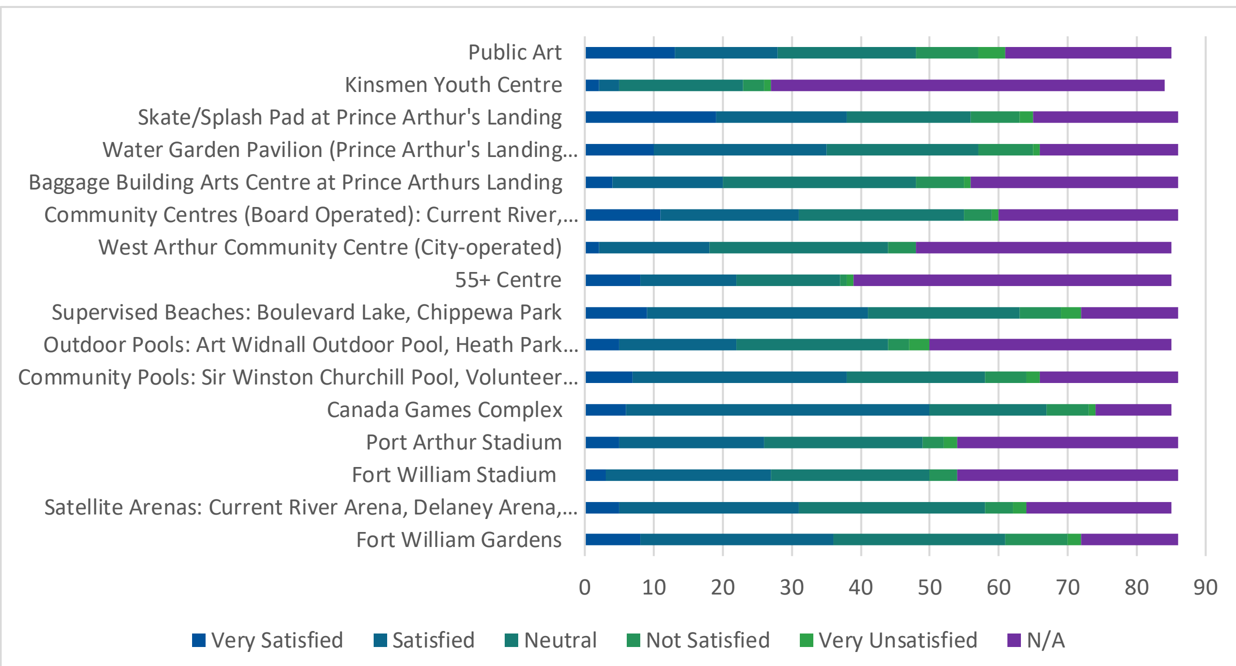
Q2 Do any of the following barriers limit your participation in Recreation & Culture programs, services or facilities?



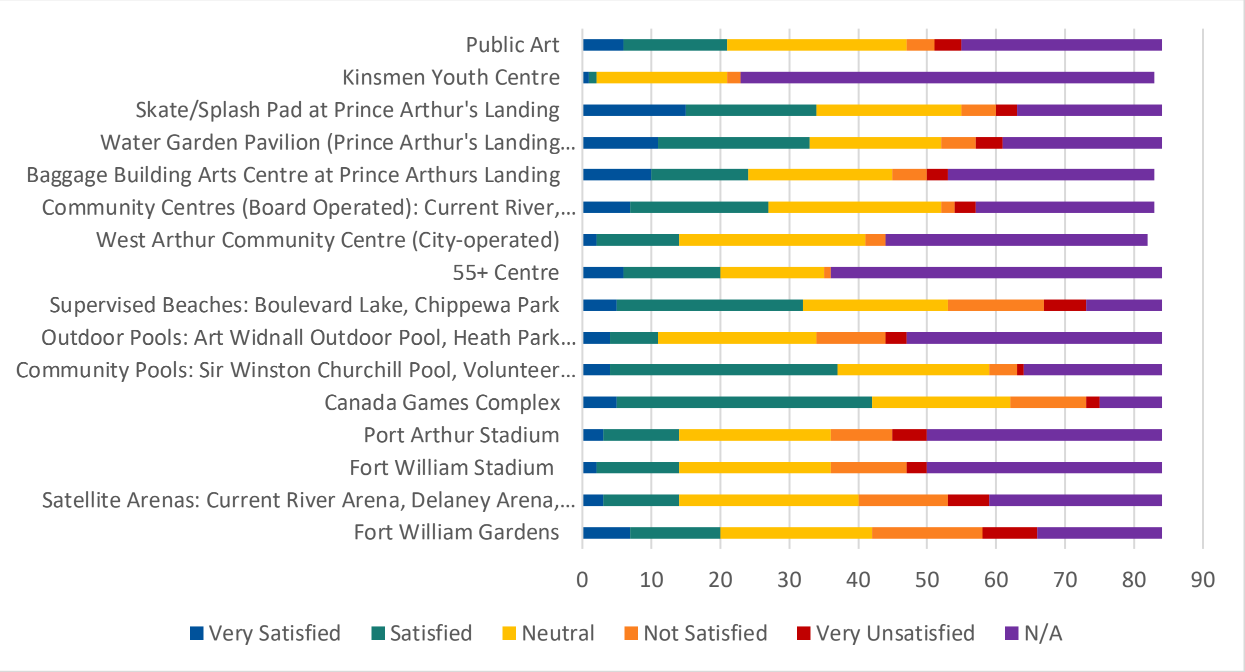
Q3 If you chose 'other' on question 2 please specify: Summary of responses:

1. **Safety Concerns –** Some areas feel unsafe, affecting usage.
2. **Limited Use –** Some people don't use certain facilities because they are outside their daily routines.
3. **Parking Fees –** Charges at the Waterfront have significantly reduced usage, and some feel it's unfair to pay for parking at public parks already funded by taxes. Free parking options are limited, making access more difficult.
4. **Senior Services & Transparency –** Concerns about the management of the 55+ center, including lack of transparency in funding and decision-making.
5. **Affordability & Accessibility –** Difficulty answering survey questions because affordability and accessibility vary based on individual needs and location.

Q4 How satisfied are you with the quality of programming, services & activities at the following City of Thunder Bay Recreation Facilities*:



Q5 How satisfied are you with the quality of the following assets and their amenities (e.g. equipment, rooms, change rooms/washrooms, concessions, outdoor spaces, etc.)*:



Q6 If you are unsatisfied with the quality (question 4 or 5), why?

Summary of responses:

Facility Cleanliness & Maintenance:

- Many city facilities are poorly maintained, with outdated equipment, ripped padding, and overall uncleanliness.
- Washrooms are often dirty, unstocked, cold, and not accessible enough.
- Several facilities, including Fort William Gardens and Port Arthur Stadium, feel outdated and require significant upgrades.
- Dressing rooms in arenas are too small and not well-located.

Accessibility & Usability:

- Poor accessibility at multiple locations, including Port Arthur Stadium and Fort William Gardens, particularly for individuals using walkers.
- Public facilities need more accessible washrooms with hot water, better stall privacy, and functioning door openers.
- Limited year-round bathroom access at parks like Boulevard Lake and Chippewa Park.
- More signage is needed for accessible features at some locations.

Programming & Services:

- A/C should be installed in all city facilities.
- More recreational programs should be offered, and the 55+ Centre requires expansion.
- Some community centers lack programming or have restricted hours, limiting their usefulness.
- Port Arthur Stadium is underutilized and should offer more diverse programming beyond baseball.

Parking & Fees:

- Parking fees should be eliminated at Fort William Gardens and Marina Park.
- Parking lots are hazardous, with flooding and potholes.
- Churchill Pool has inadequate parking despite available space for expansion.

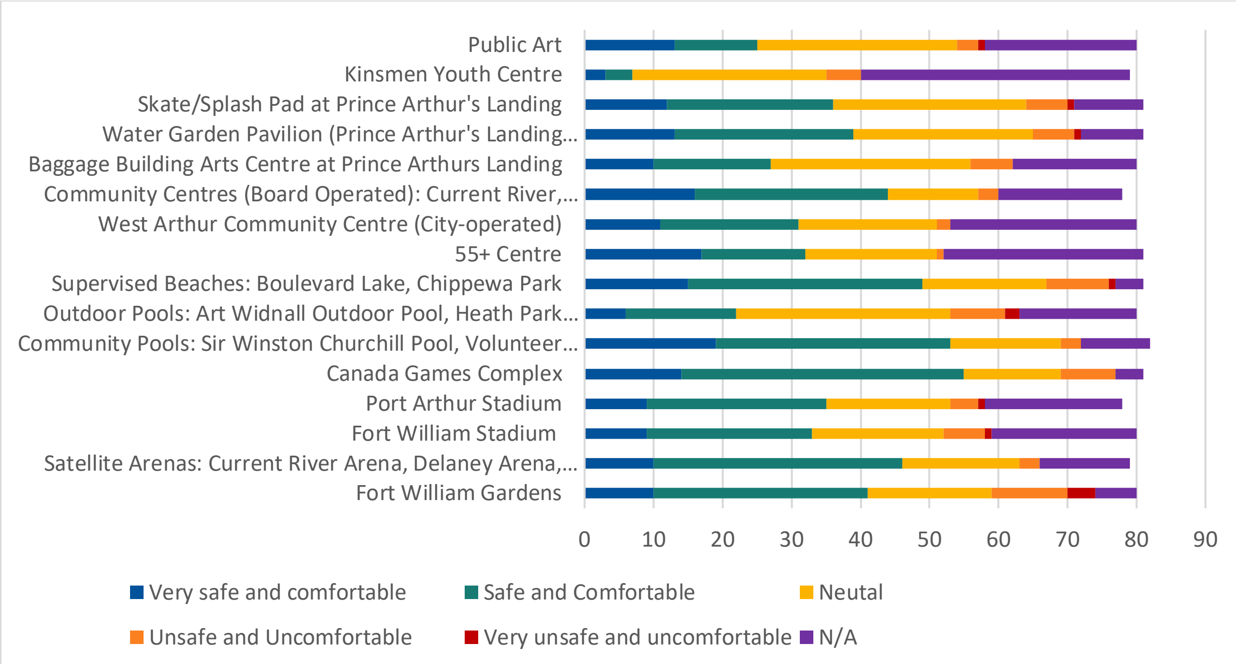
Public Art & Recreational Spaces:

- Some public art is seen as confusing and unattractive.
- The number of outdoor pools is excessive given the area's natural lakes and rivers.
- More public skate times should be available.
- There is demand for designated pet hours at splash pads.

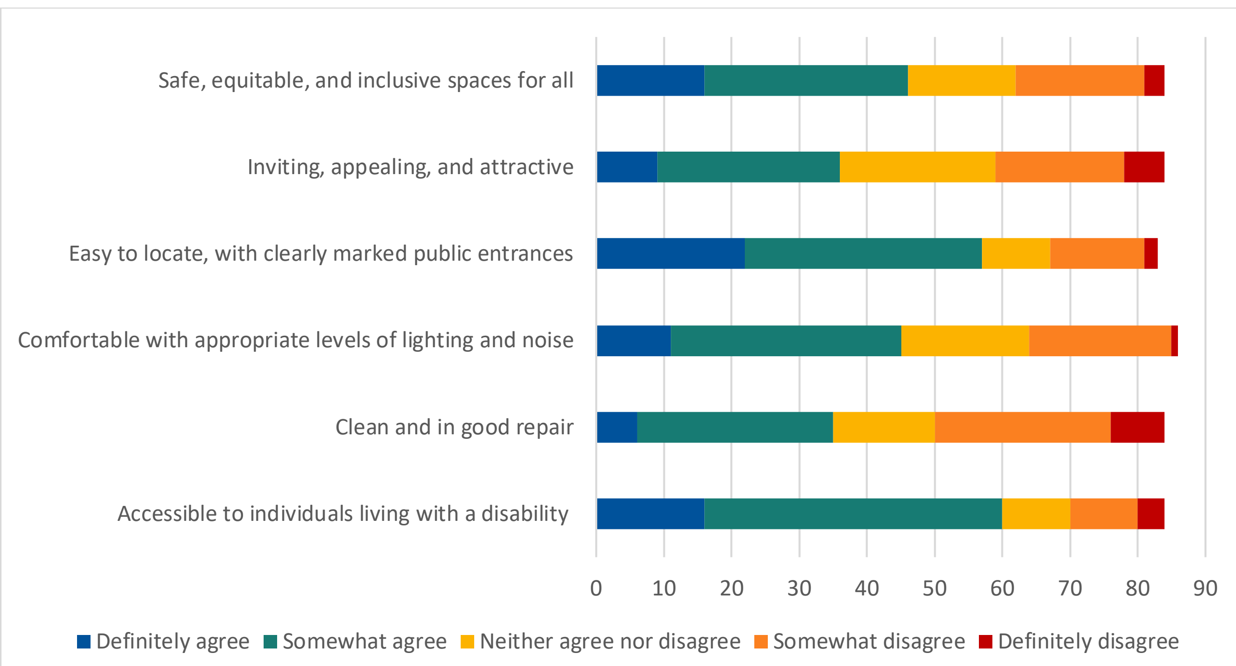
General Sentiment:

- Many facilities feel outdated, overused, and in need of major updates or replacements.
- The city's increasing fees make services less accessible for everyone.
- Some users feel unsafe in public spaces due to homelessness and cleanliness issues

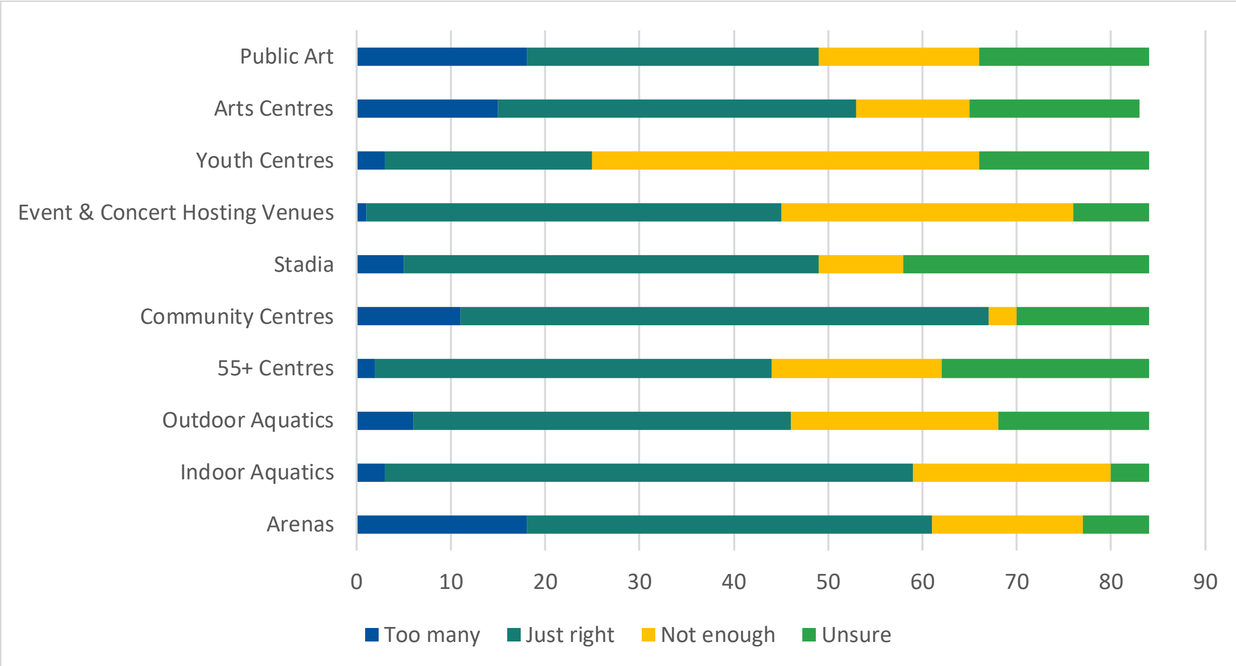
Q7 How safe and comfortable do you feel when using the following Recreation & Culture assets?



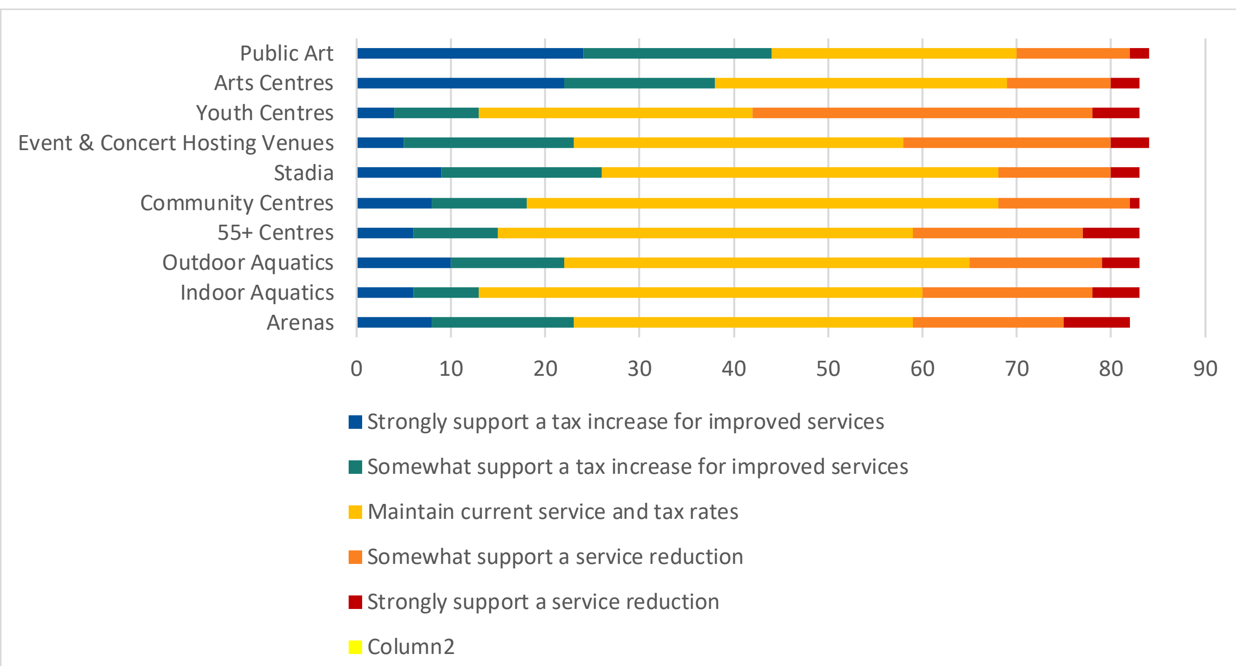
Q8 Do you agree that Thunder Bay Recreation & Culture facilities are:



Q9 How do you feel about the number of assets the City of Thunder Bay offers for:



Q10 Due to factors such as inflation and aging facilities, it is often not possible to maintain status quo for services and assets without increased revenue from sources such as tax and user fee increases. For each service below, would you choose to maintain or improve it if doing so meant tax and fee increases, or would you prefer to cut or reduce the service to limit tax and fee increases?



Q11 What changes would you like to see with respect to the City's Recreation and Culture

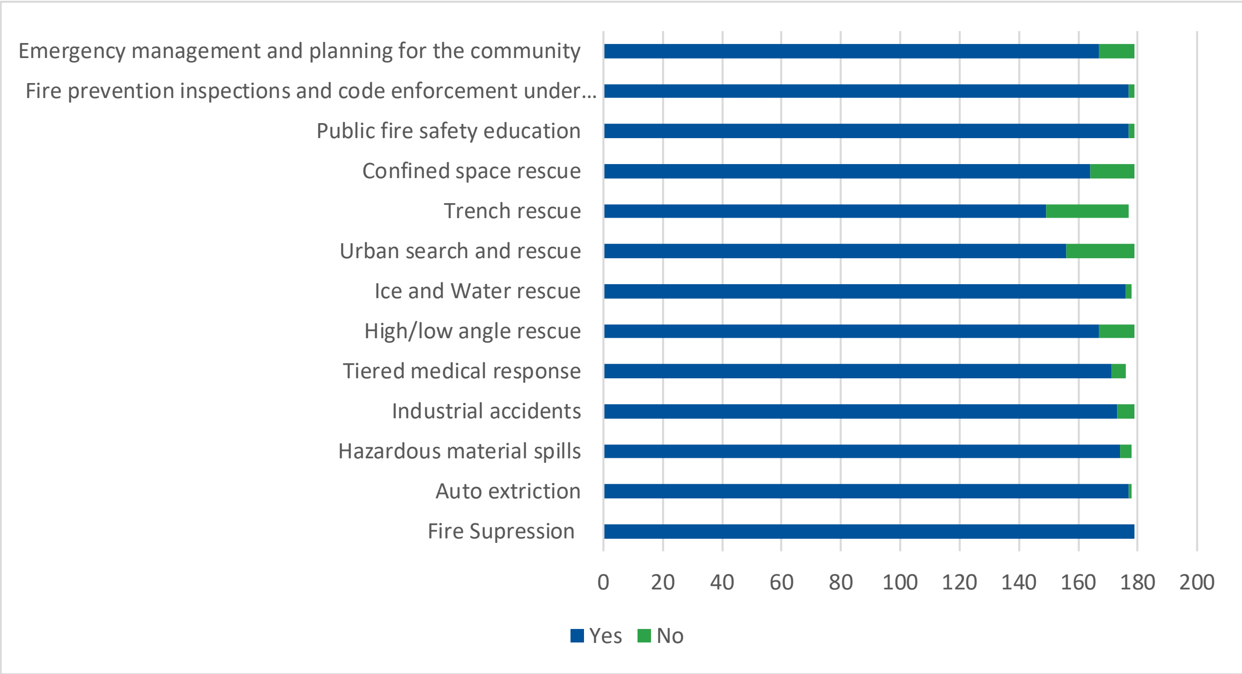
services to meet your future needs? Summary of Comments:

Here's a summary of the comments:

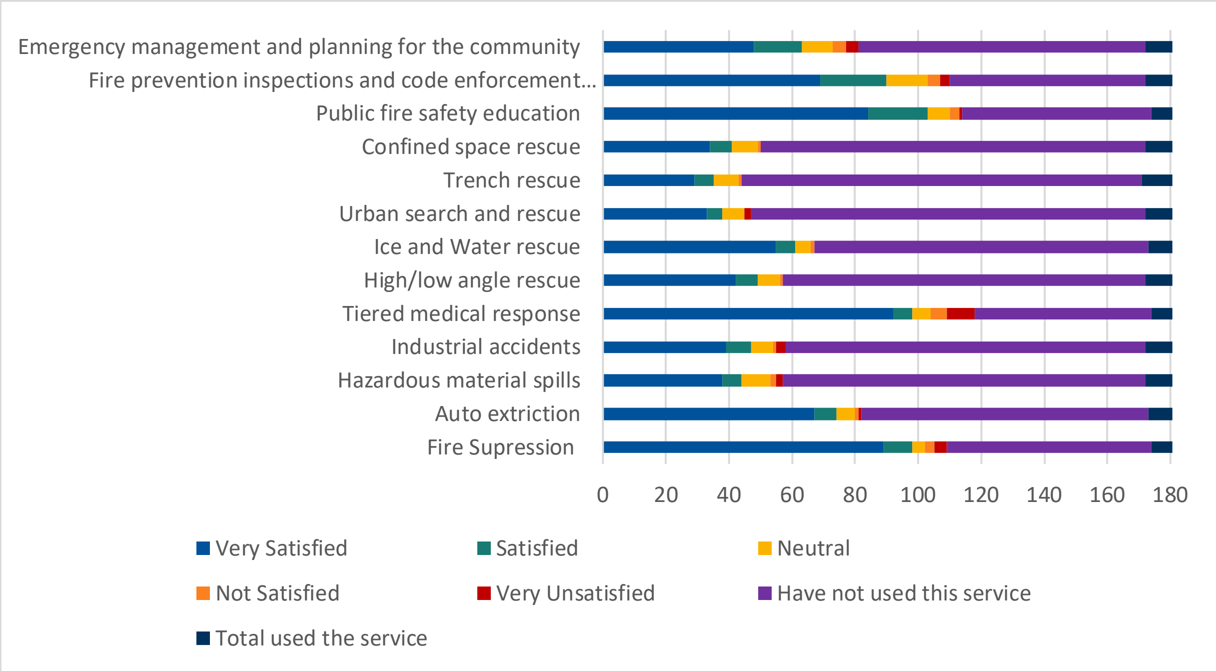
1. Expanded Programming – More diverse programs at community centers, including food, crafting, wellness, and gardening workshops. Increased programming for children, seniors, and Indigenous youth.
2. Affordability & Accessibility – More affordable options for children's programs, better after-school childcare, and removal of parking fees at recreation facilities.
3. Facility Maintenance & Modernization – Upkeep of existing facilities before building new ones, with calls for updates to arenas, community centers, and public spaces. Many facilities feel outdated and poorly maintained.
4. Increased Recreation Opportunities – More swimming lessons, outdoor pools, and expanded trails for biking, running, and walking. Improved waterfront access and additional sports facilities.
5. Senior-Focused Services – Calls for a 55+ center in the south side or central location, more senior programs, and improved accessibility at existing recreation centers.
6. Public Art & Cultural Events – More public art, music, theater events, and artist spaces at Marina Park. Expanded community engagement with public art and cultural programming.
7. Improved Booking & Administration – Streamlining ice time bookings and making facility reservations easier and more user-friendly.
8. Consolidation & Efficiency – Suggestions for a multi-use sports complex to replace aging arenas and a turf facility instead of individual sites.
9. Public Spaces & Cleanliness – Better maintenance of parks, trails, and community spaces, with improved landscaping, restrooms, and cleanliness.
10. Increased Transparency – Requests for more public communication on facility costs, funding, and service decisions.
11. New Facilities & Attractions – Ideas such as a new baseball complex, modernized arena, roller coaster at Marina Park, and a go-kart or drone racing facility.

Thunder Bay Fire Rescue Levels of Service – 179 Participants

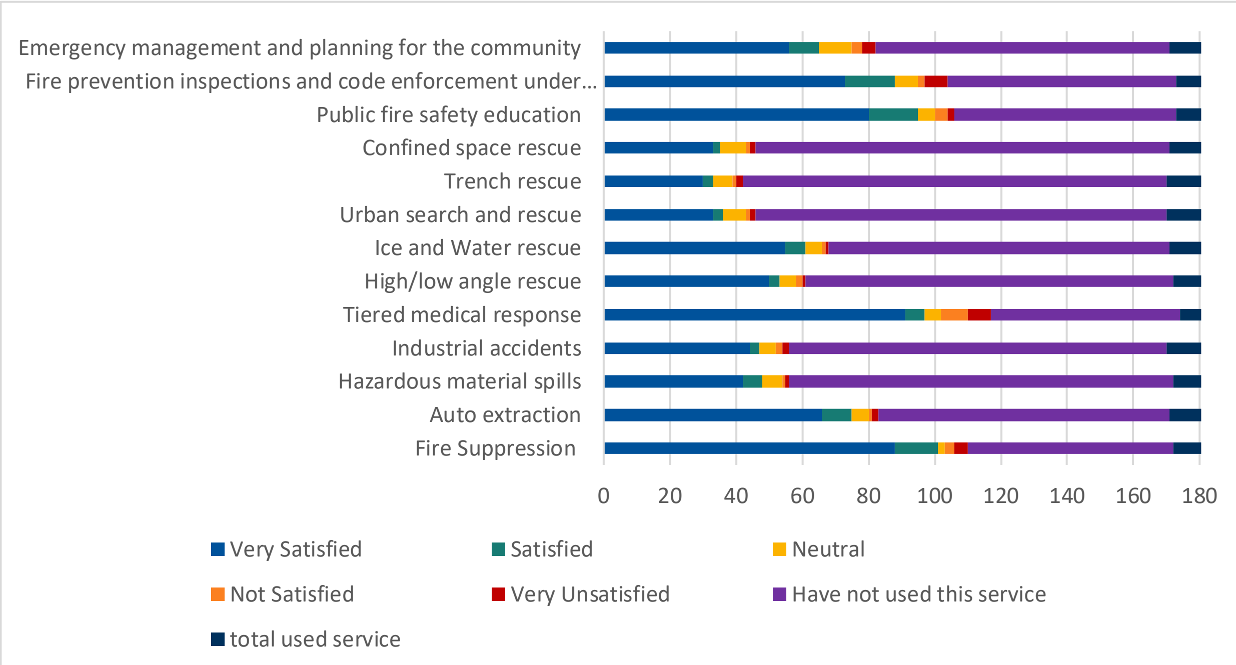
Q1 The Thunder Bay Fire Rescue Department (TBFR) provides multiple services for its citizens. Are you aware of these services?



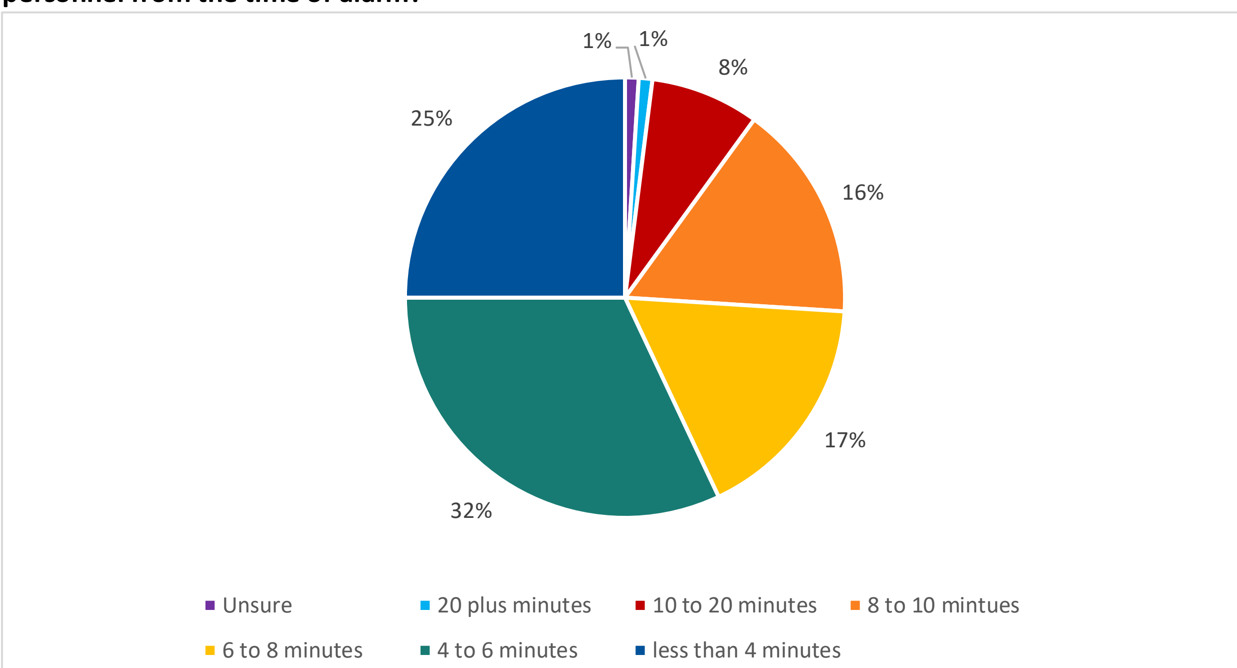
Q2 As a resident have you or someone close to you used TBFR Department's services, how satisfied are you with your ability to access these services? If you or someone close to you have not used these services, please select "Have Not Used This Service".



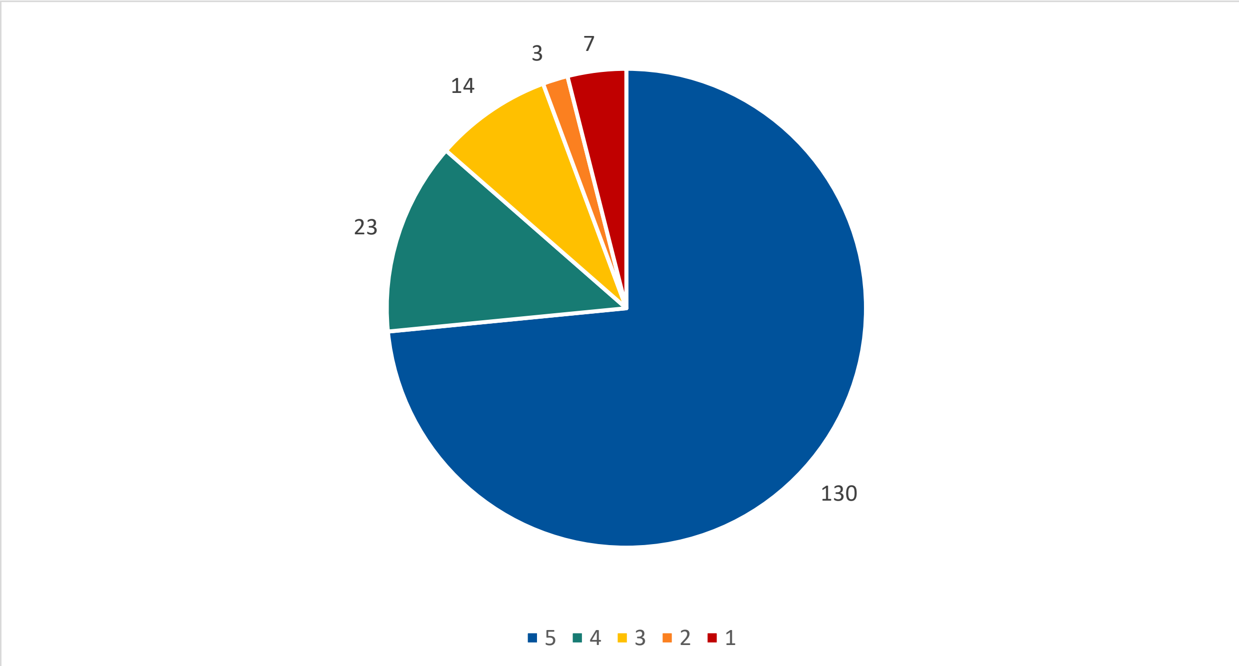
Q3 How satisfied are you with the quality of TBFR services? If you or someone close to you have not used these services, please select "Have not used this service".



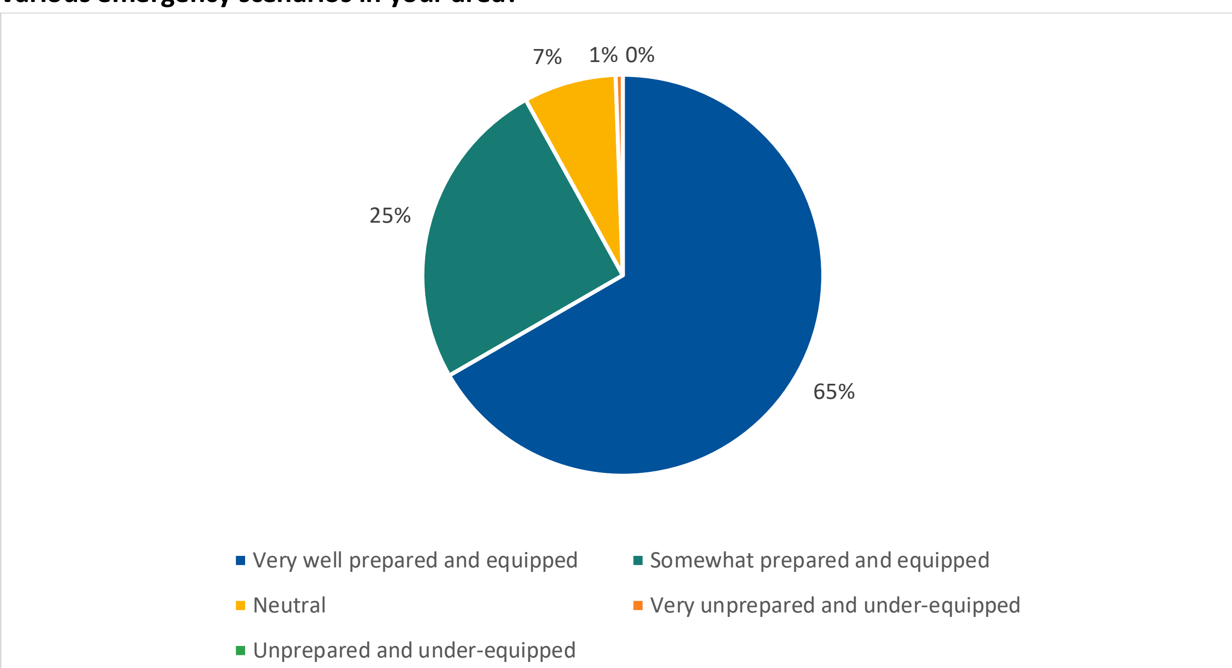
Q4 How many minutes do you think is acceptable for the arrival on-scene of Fire and Rescue personnel from the time of alarm?



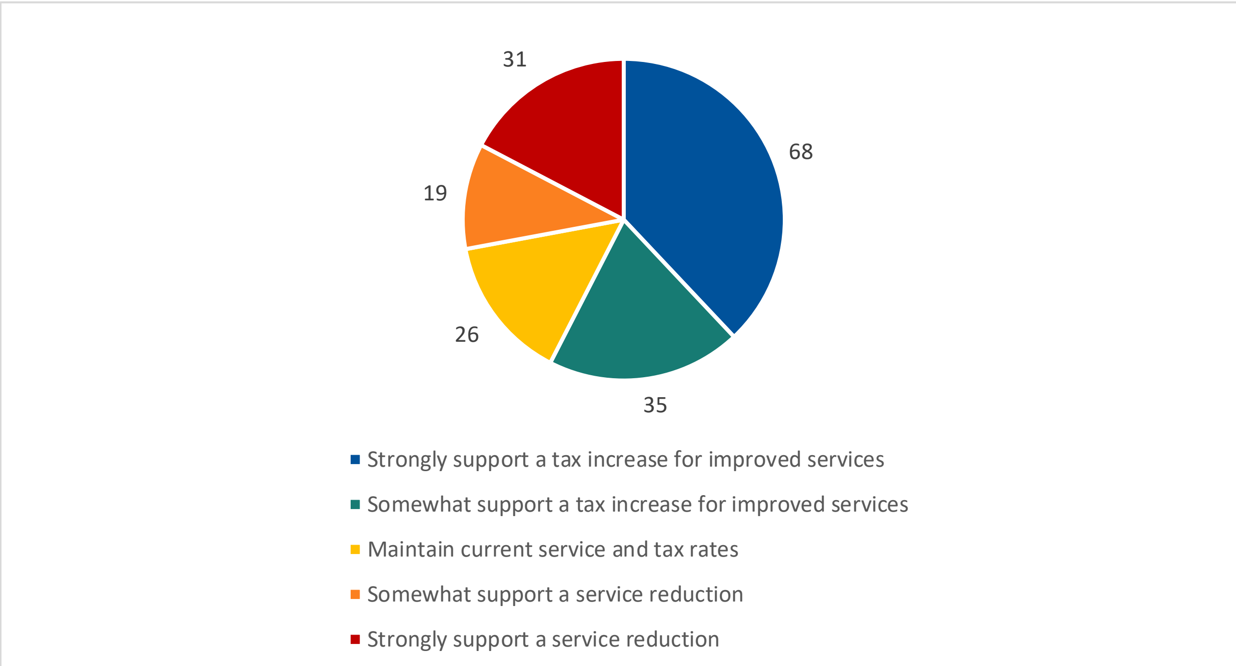
Q5 On a scale of 1 to 5, with 5 being the highest, how would you rate the professionalism and competence of Thunder Bay Fire Rescue personnel?



Q5 How prepared and equipped do you believe Thunder Bay Fire Rescue is to handle various emergency scenarios in your area?



Q6 Due to factors such as inflation and aging facilities, it is often not possible to maintain status quo for services and assets without increased revenue from taxes. Recognizing the services provided by the TBFR, would you choose to maintain or improve service delivery if doing so meant tax increases, or would you prefer to cut or reduce the service to limit tax increases?



Q6 What changes would you like to see with respect to the City's TBFR to meet your future needs? Summary of Comments:

Summary of Comments on Fire Services:

1. Staffing & Resources:
   - Maintain or increase staff and equipment in response to city growth.
   - Improve response times, especially in rural areas.
   - Consider new fire stations in underserved locations.
2. Training & Medical Response:
   - Improve medical training and response effectiveness.
   - Ensure firefighters receive ongoing, high-quality training.
   - Some suggest reducing medical calls and shifting focus back to fire-related services.
3. Equipment & Facilities:
   - Upgrade trucks, gear, and fire halls.

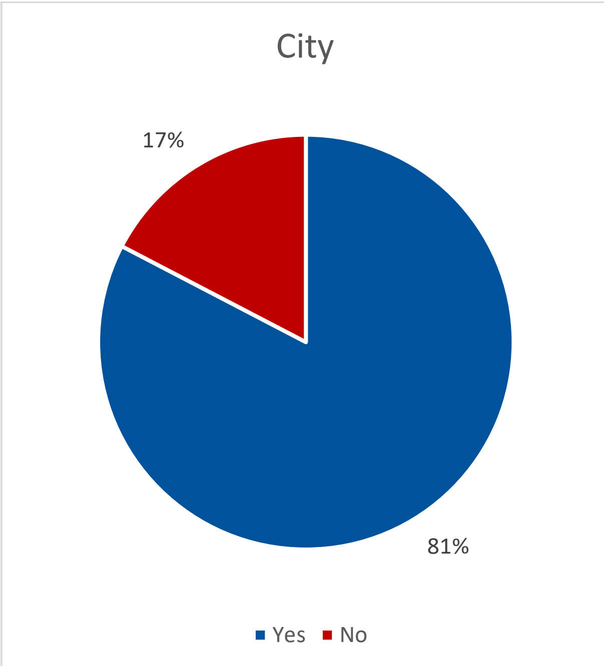
- Ensure access to modern firefighting tools and protective equipment.
- Some want dedicated rescue vehicles and more aerial ladder staffing.

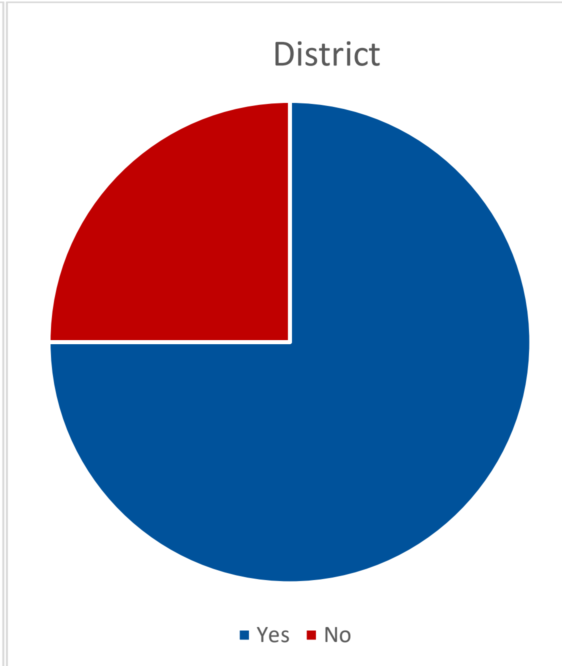
4. Public Education & Awareness:
    - Increase public knowledge of fire services through social media and outreach.
    - Improve emergency preparedness education for citizens.
5. Funding & Budgeting:
    - Some call for increased funding for training, equipment, and staffing.
    - Others suggest cost-cutting, reducing stations, and shifting resources to paramedics.
    - Debate over firefighter salaries and the sustainability of current funding levels.
6. Operational Changes:
    - Mixed views on the role of fire services in medical calls.
    - Some propose a hybrid model with full-time and volunteer firefighters.
    - Interest in optimizing fire hall locations and reducing redundancy.
7. Community Relations & Diversity:
    - Calls for increased diversity in hiring.
    - Suggestions for firefighter engagement with the public through meet-and-greet events.
8. Firefighter Work Conditions:
    - Improve personal protective equipment (PPE) to reduce health risks (e.g., cancer prevention).
    - Enhance physical fitness support for firefighters.
9. Emergency Preparedness:
    - More focus on disaster readiness (wildfires, floods, large-scale accidents).
    - Better coordination with other emergency services.

Overall, opinions are split between maintaining or increasing fire services and reducing them in favour of more efficient emergency response models.

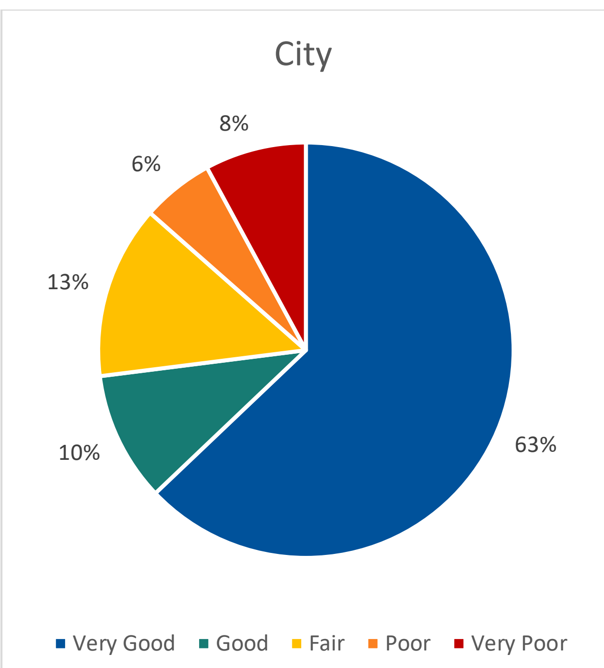
Superior North EMS (Within the City) Levels of Service – 80 Participants; (District) – 40 Participants

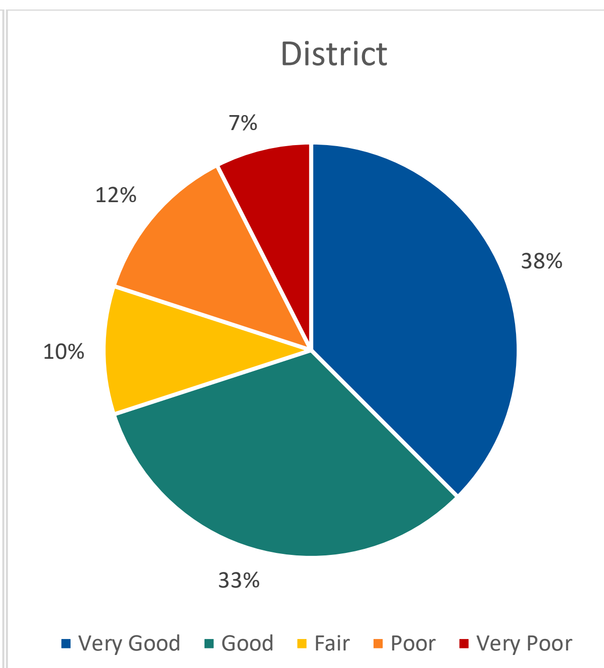
Q1 Have you called 911 for an ambulance either for yourself or someone you know?



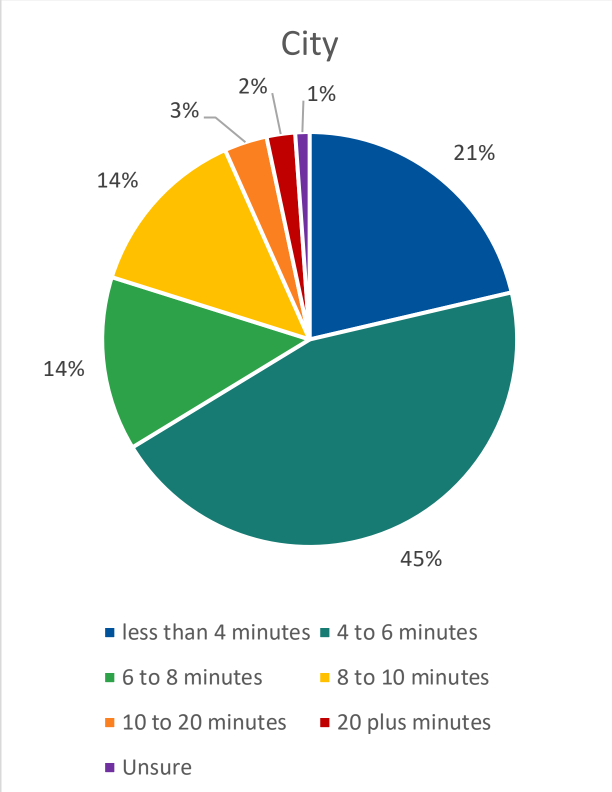


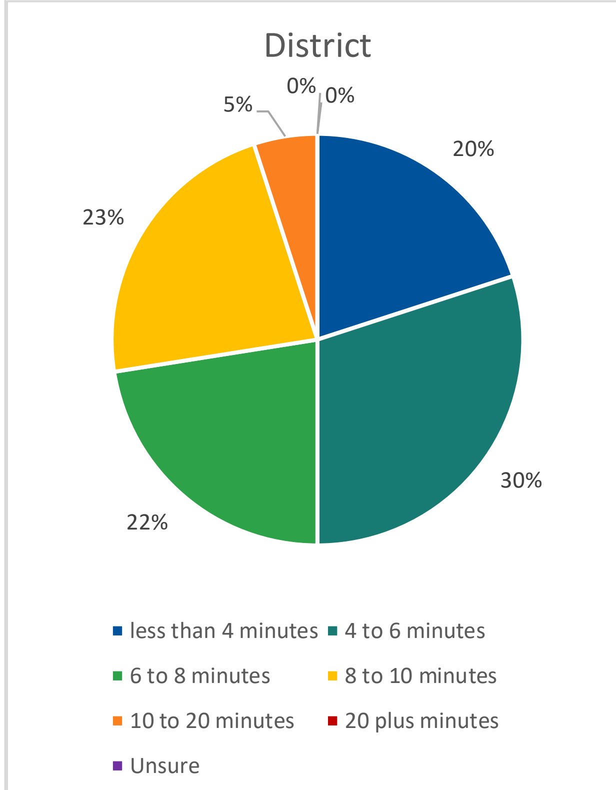
Q2 Based on your experience or knowledge, overall, how would you rate the services provided by Superior North EMS.



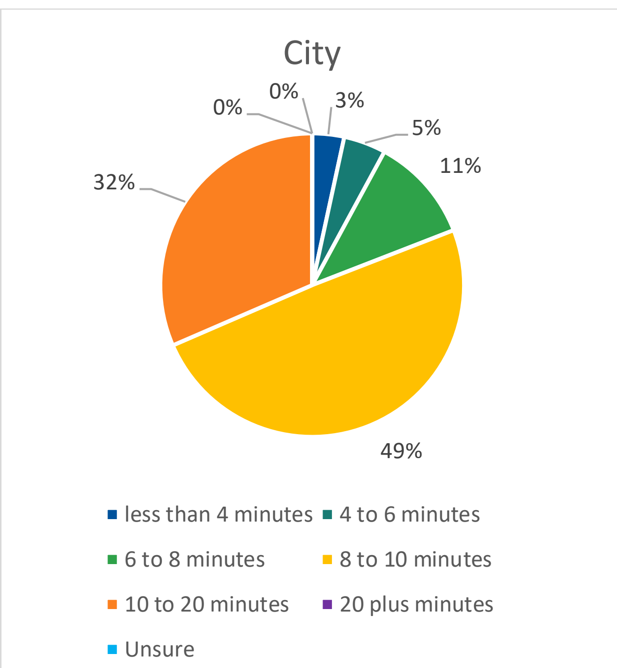


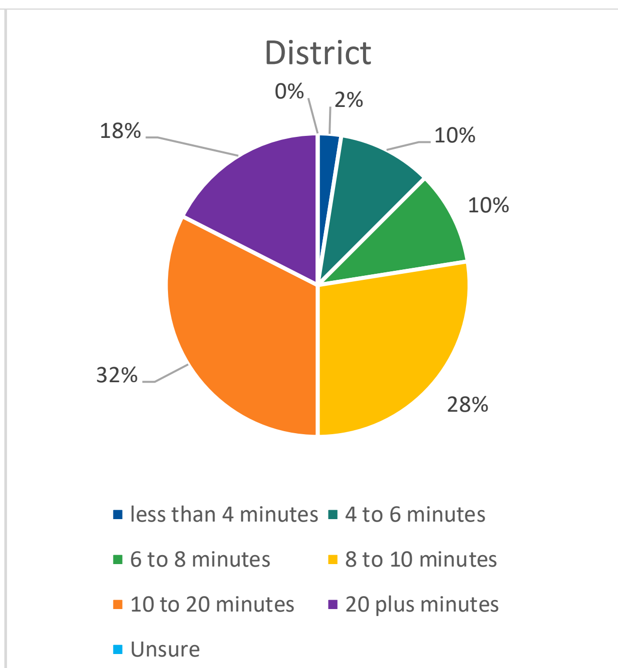
Q3 How many minutes do you think is acceptable for paramedics to arrive for a life-threatening emergency?



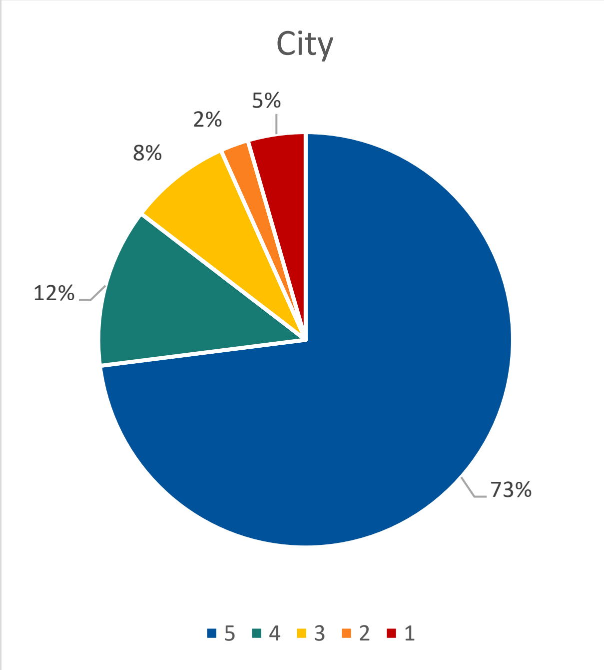


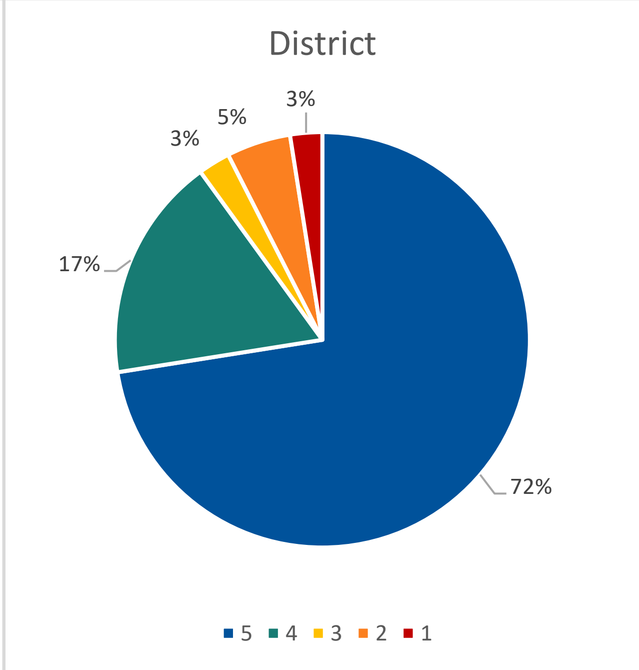
Q4 How many minutes do you think is acceptable for paramedics to arrive for a non-life-threatening emergency?



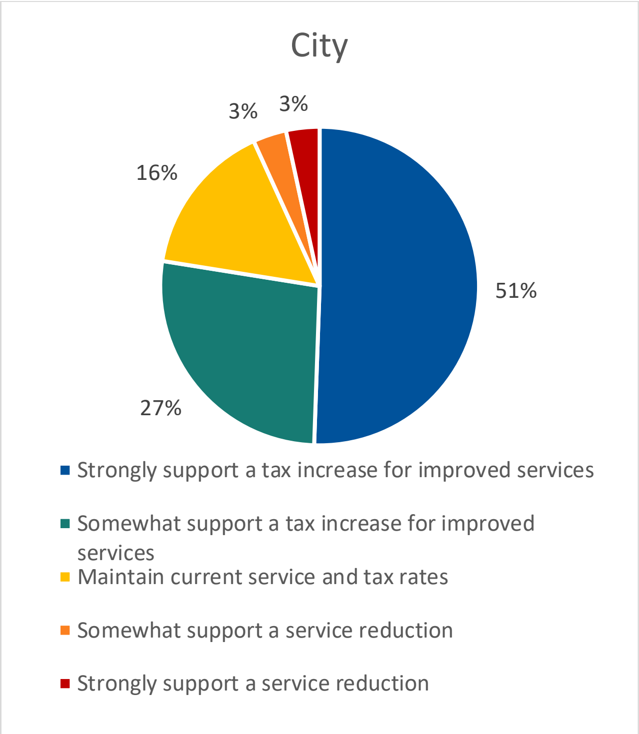


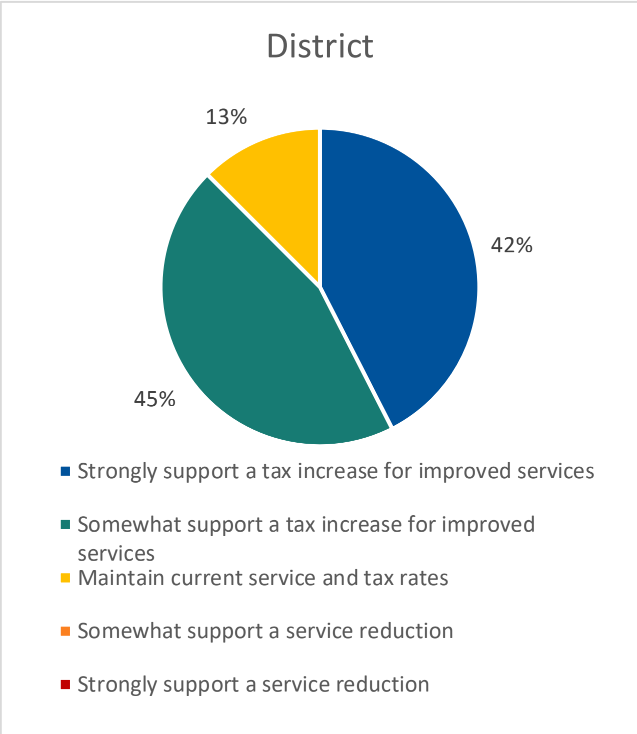
Q5 On a scale of 1 to 5, with 5 being the highest, how would you rate the professionalism and competence of Superior North EMS Paramedics?





Q6 Due to factors such as inflation and aging facilities, it is often not possible to maintain status quo for services and assets without increased revenue from taxes. Would you choose to maintain or improve services delivery if doing so meant tax increases, or would you prefer to cut or reduce the service to limit tax increases?





Q7 What changes would you like to see with respect to the Superior North EMS to meet your future needs? Summary of Public Comments:

City:

1. Invest in Paramedic Compensation and Retention

There is strong support for increasing EMS funding to improve wages, offer competitive benefits, and introduce mental health supports and retention strategies. Financial incentives are needed to attract and retain paramedics, particularly in Northern and rural areas.

2. Address Staffing Shortages and Recruitment

Residents want more paramedics hired to reduce response times and improve coverage. Suggestions include expanding recruitment efforts, offering student incentives, and reducing administrative burdens in favour of frontline staffing.

3. Improve Operations and Emergency Response Capacity

Improving EMS operations requires more ambulances, better-equipped bases, and faster offload times at hospitals. Specialized units (e.g., for mental health crises or frequent callers) and better inter-agency coordination with police and fire were also proposed to optimize response.

4. Enhance Public Awareness and Appropriate Use of EMS

The public should be better informed about EMS limitations (e.g., “code black” scenarios), when to call 911, and alternative services. Increased transparency through media engagement and education campaigns was recommended to reduce misuse and manage public expectations.

5. Support System Reforms and Sustainable Funding

Respondents called for policy changes at provincial and municipal levels to improve working conditions, enable alternative staffing models (e.g., retired professionals), and explore alternative funding sources such as modest user fees for non-emergency calls or reallocating municipal funds.

District:

1. Protect and Improve Rural EMS Coverage

There is strong, widespread concern about insufficient EMS coverage in rural and northern communities like Terrace Bay, Schreiber, and the North Shore. Residents emphasized that ambulance bases must remain open and staffed daily, with at least two full-time ambulances in large catchment areas. Multiple people shared real-life examples of emergencies where no ambulance was available.

2. Increase Staffing and Support Recruitment & Retention

Many respondents stressed the urgent need to hire more paramedics, especially in the district, and called for higher wages, better working conditions, and targeted incentives to attract and retain staff in the North. Suggestions included developing a formal recruitment and retention plan and improving support systems for paramedics, particularly in rural areas.

3. Ensure Fair and Equitable Governance

Residents expressed frustration that Thunder Bay City Council makes decisions about district EMS services without meaningful input from smaller communities. There were strong calls for local representation and voting rights in EMS governance and planning. Many felt rural needs are deprioritized in favour of urban considerations.

4. Enhance Service Delivery and Operational Models

Concerns were raised about poor triage practices, lack of coverage during shift gaps, delayed hospital transfers, and inadequate support for rural hospital patients. Suggestions included:

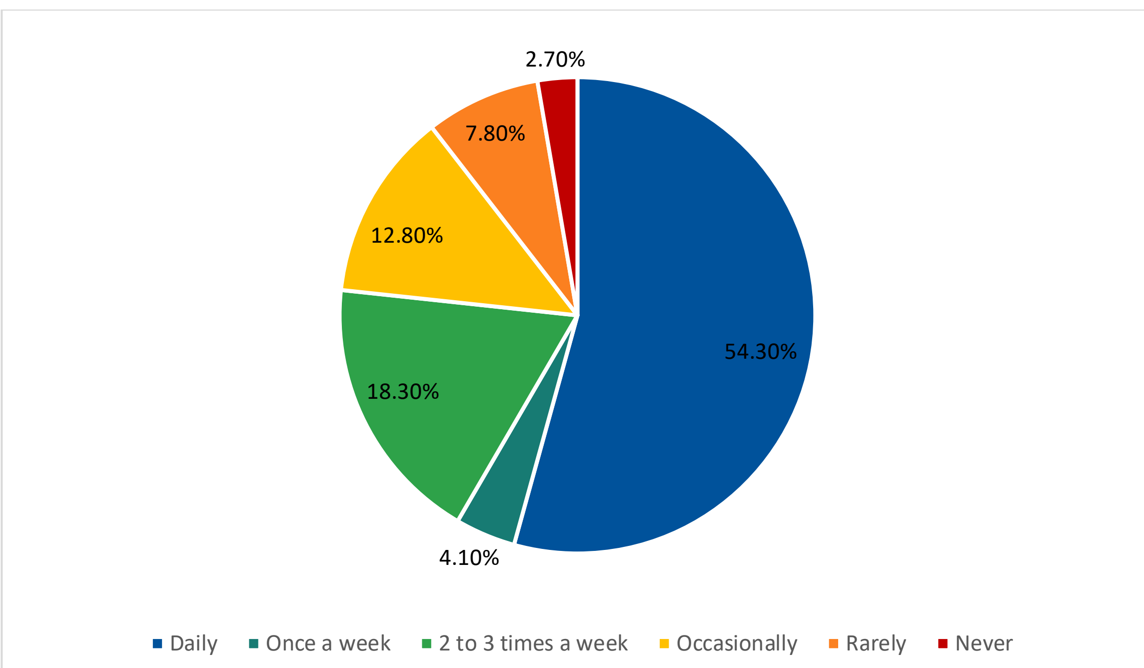
- Educating duty officers and improving triage
- Expanding community paramedicine
- Developing strategic base planning and improving patient transport systems

5. Public Support for Sustainable Funding

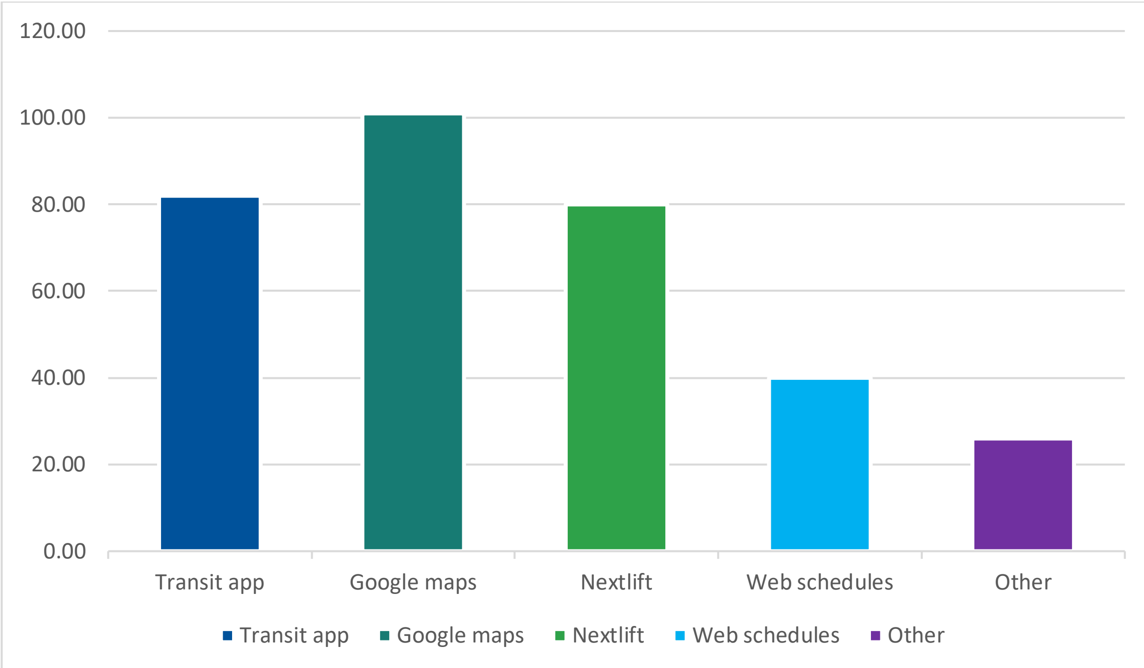
Many residents acknowledged they would support tax increases if they ensured full EMS coverage in rural areas. There was a shared sentiment that cutting EMS costs puts lives at risk and that funding decisions should reflect the critical nature of this public service, regardless of geography or population density.

Transit Levels of Service – 220 Participants

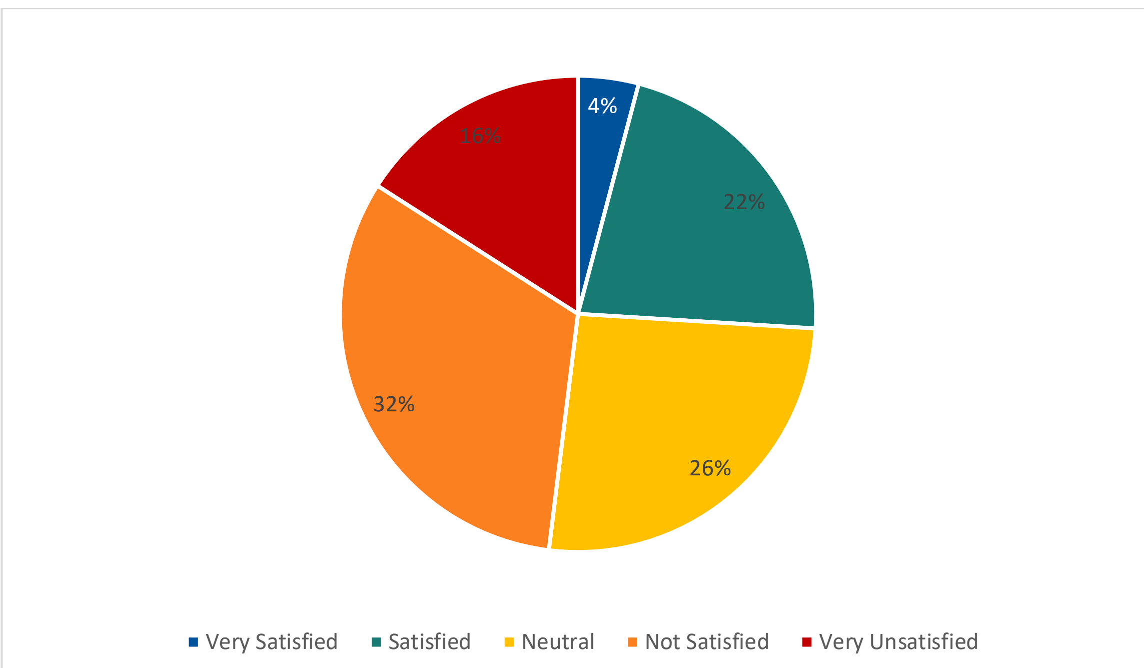
Q1 On average, how frequently do you travel with Thunder Bay Transit?



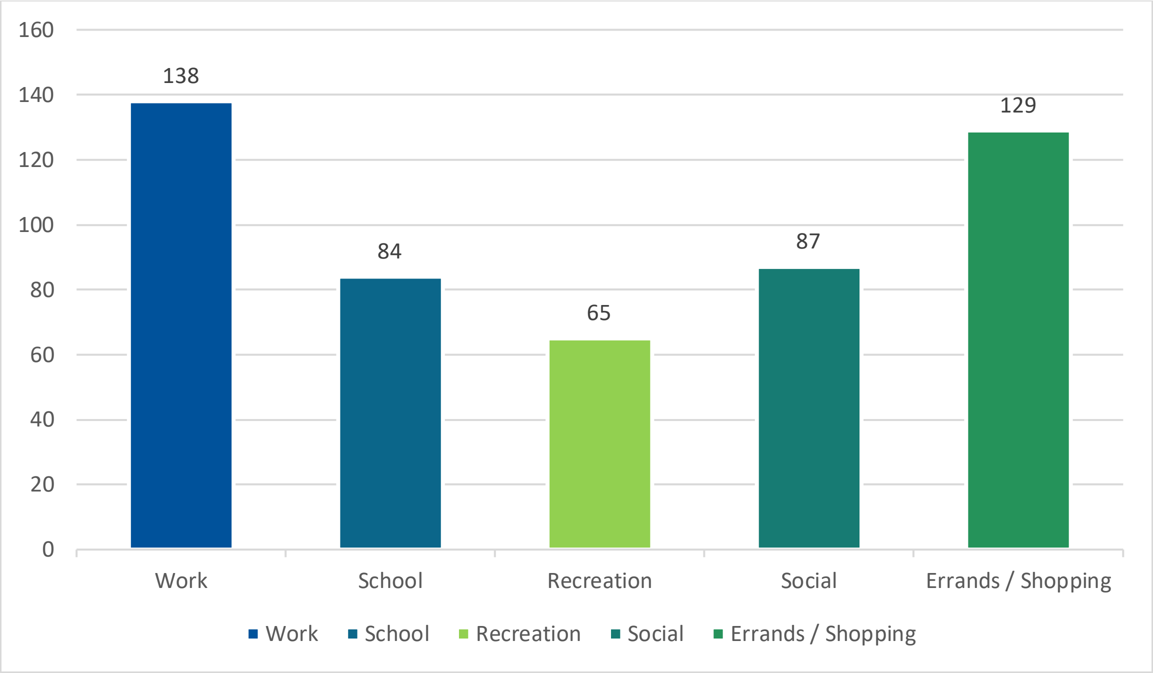
Q2 How do you plan your transit trip? Select all that apply



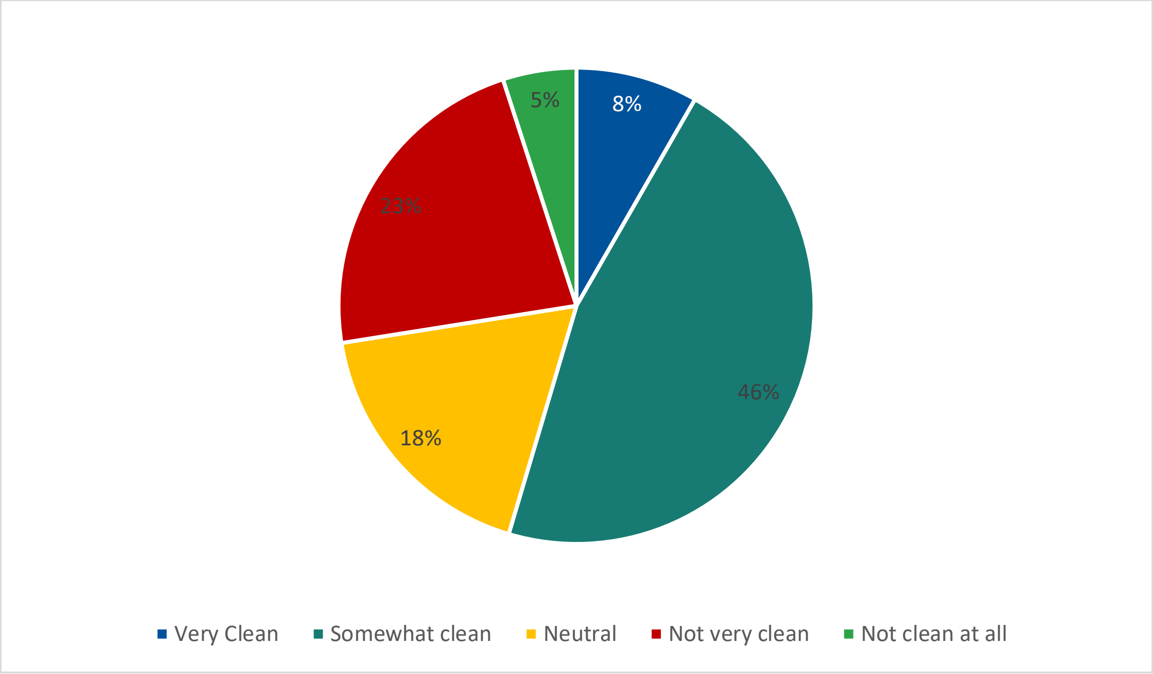
Q3 Please rate your overall satisfaction with the Thunder Bay Transit Service



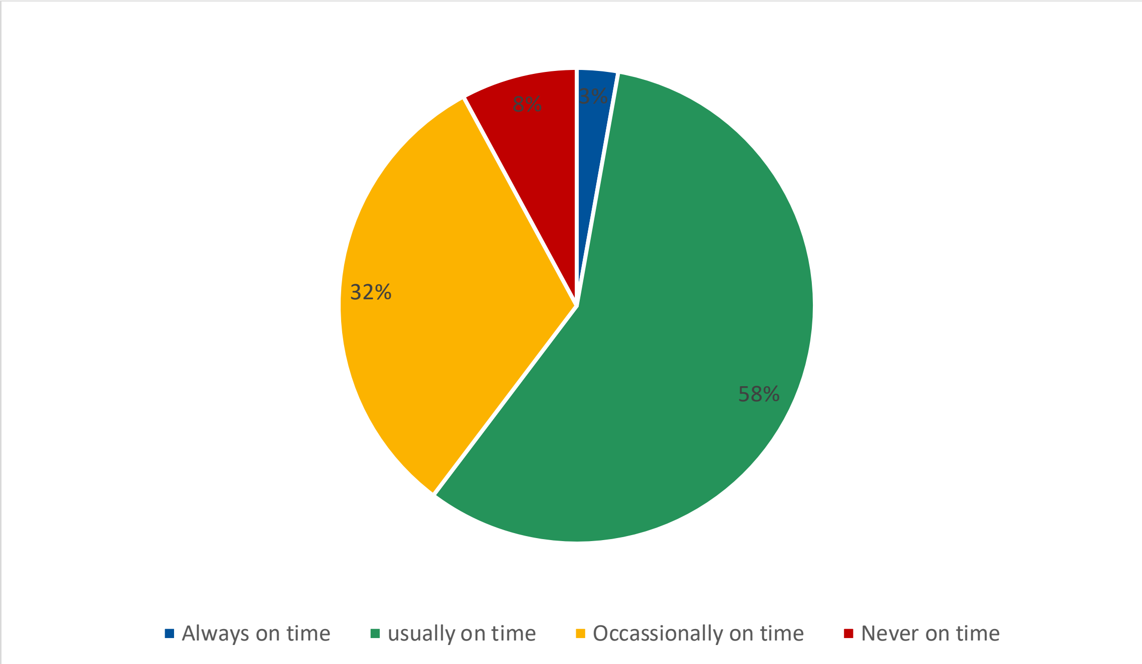
Q4 What is the primary purpose of your travel with Thunder Bay Transit? Select all that apply



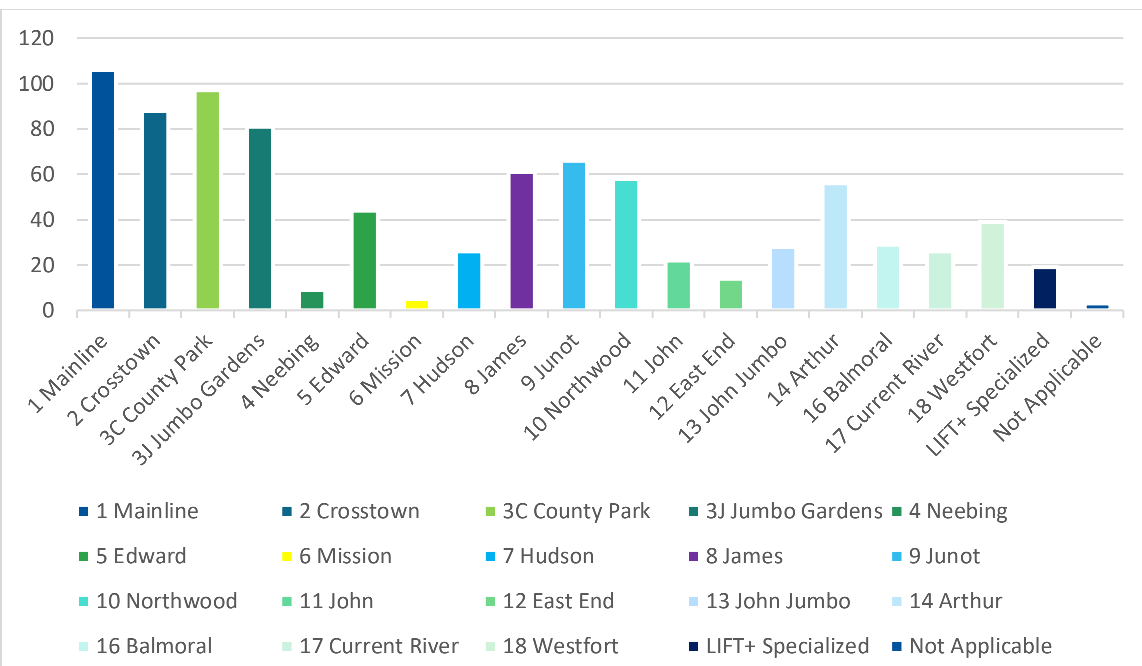
Q5 On average, do you feel that the bus was clean during your trip?



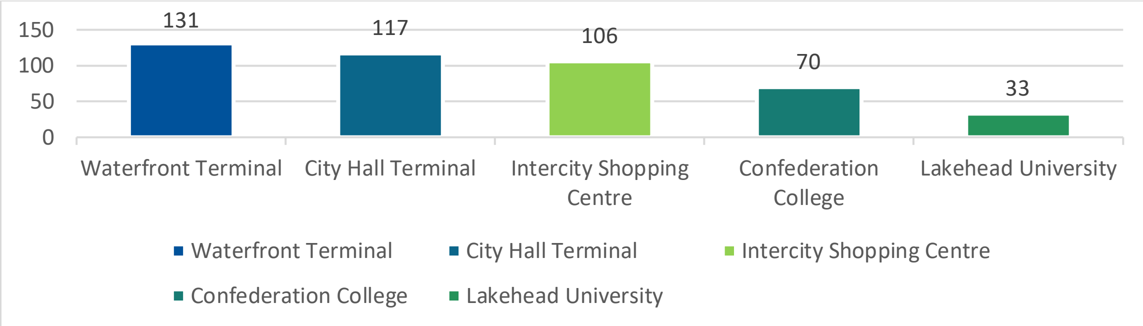
Q6 On average, do you feel that the bus is on time?



Q7 Which route(s) or services do you use most frequently? Select all that apply



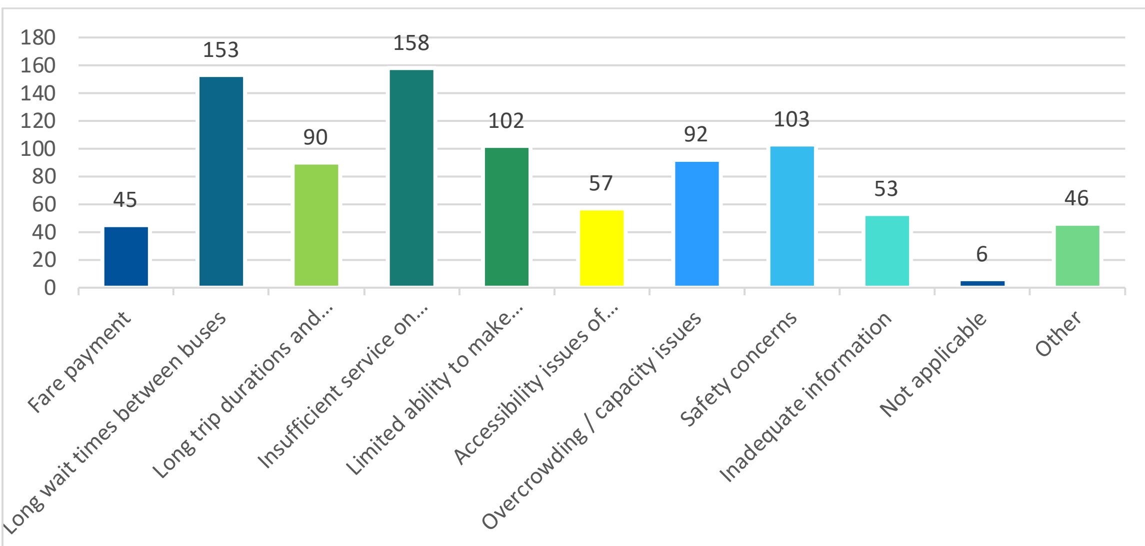
If you need to transfer routes, where do you usually transfer?



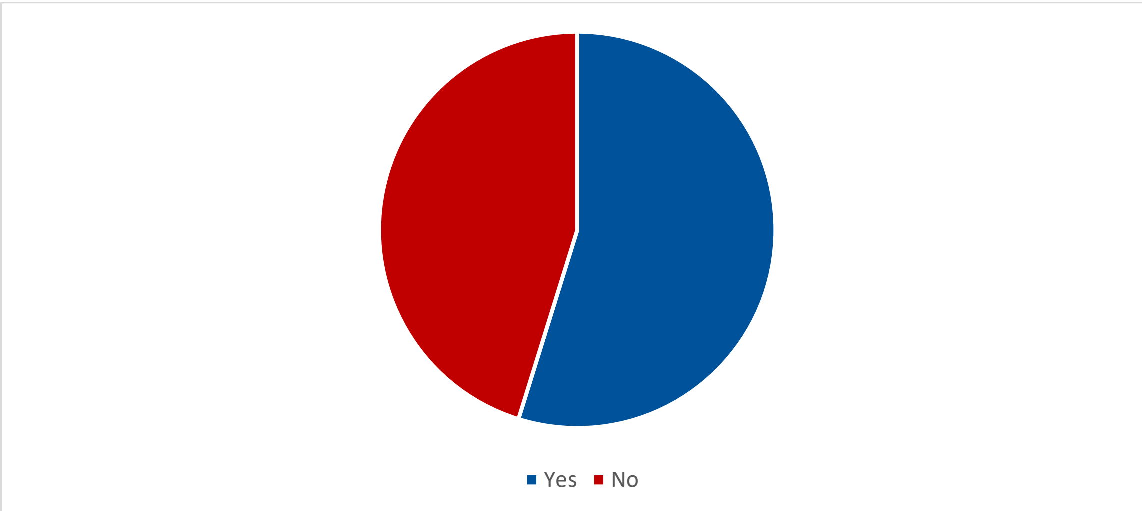
When using Thunder Bay Transit, which factors are most important to you? [Rank from most to least, where 1 is the most important and 8 is the least important]

Options	Average Rank
Reliability / punctuality	2.52
Frequency	3.50
Affordability	3.59
Safety and Security	4.27
Accessibility of bus stops	4.37
Real-time information	5.10
Connectivity	5.25
Sustainability	6.16

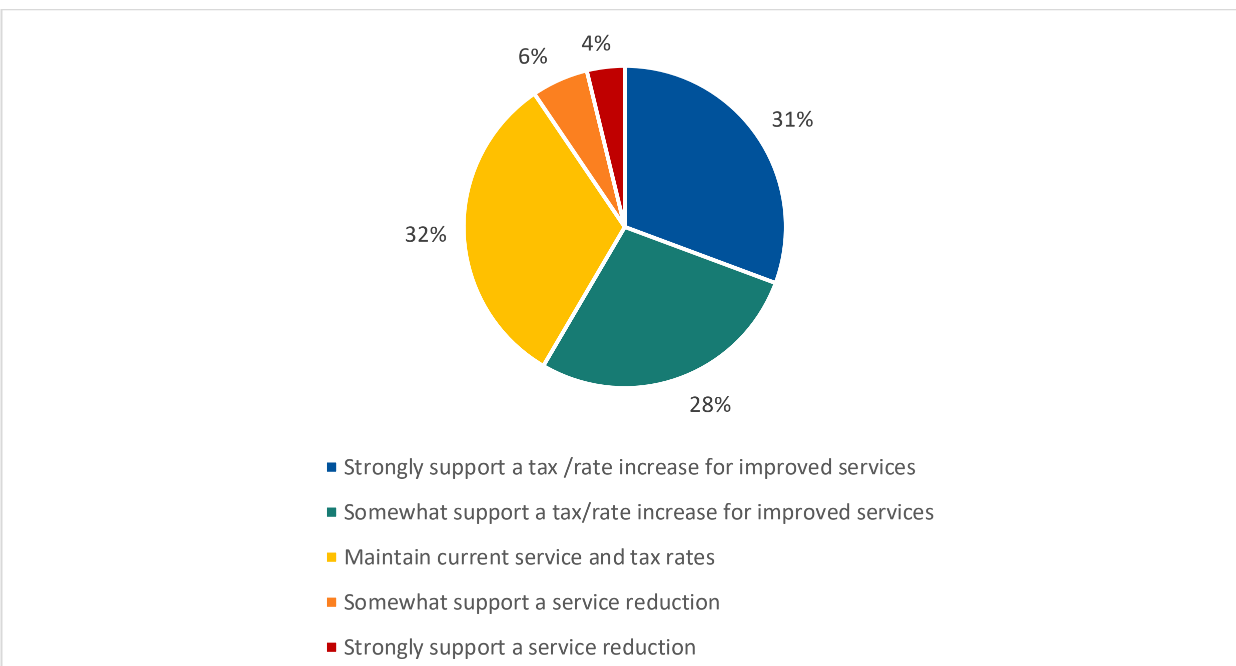
Have you ever encountered any issues or challenges when travelling with Thunder Bay Transit? Select all that apply



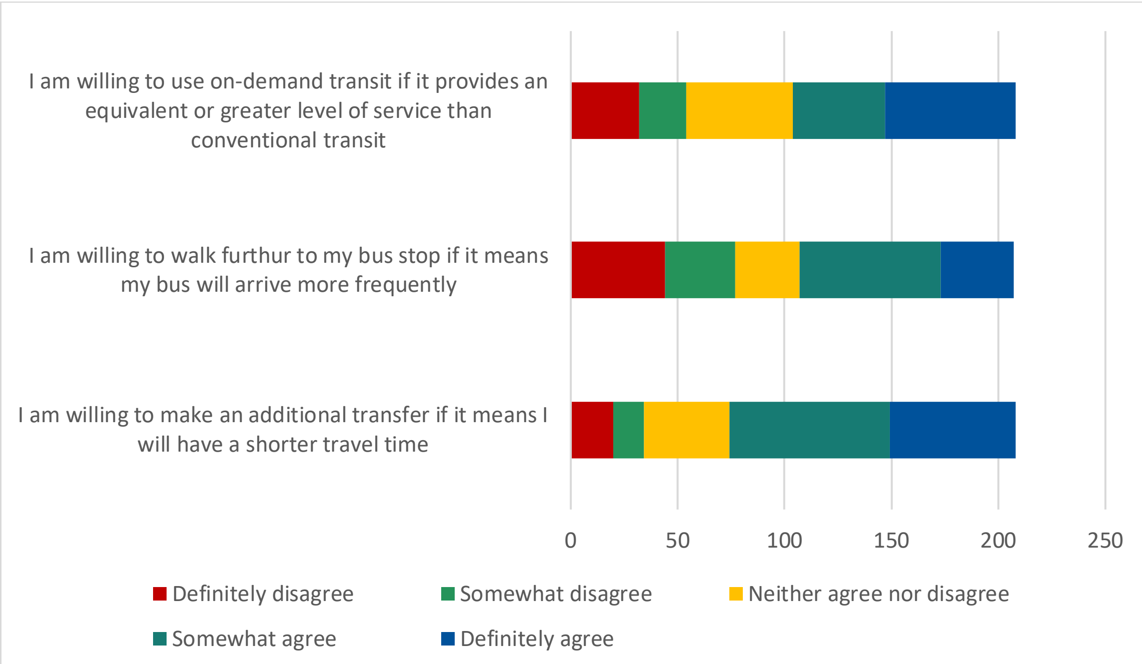
Did you know that the City's website has information about upcoming improvements and detour information?



Due to factors such as inflation and aging assets, it is often not possible to maintain status quo for services and assets without increased revenue from rates and taxes. Recognizing the services provided by the Thunder Bay Transit, would you choose to maintain or improve service delivery if doing so meant rate and tax increases, or would you prefer to reduce the service to limit rate and tax increases?



Like many public transit systems, trade-offs are sometimes necessary to design the best service network. On a scale of 1-5 (1 being strongly disagree and 5 being strongly agree) please rate the extent to which you agree with the following statements:



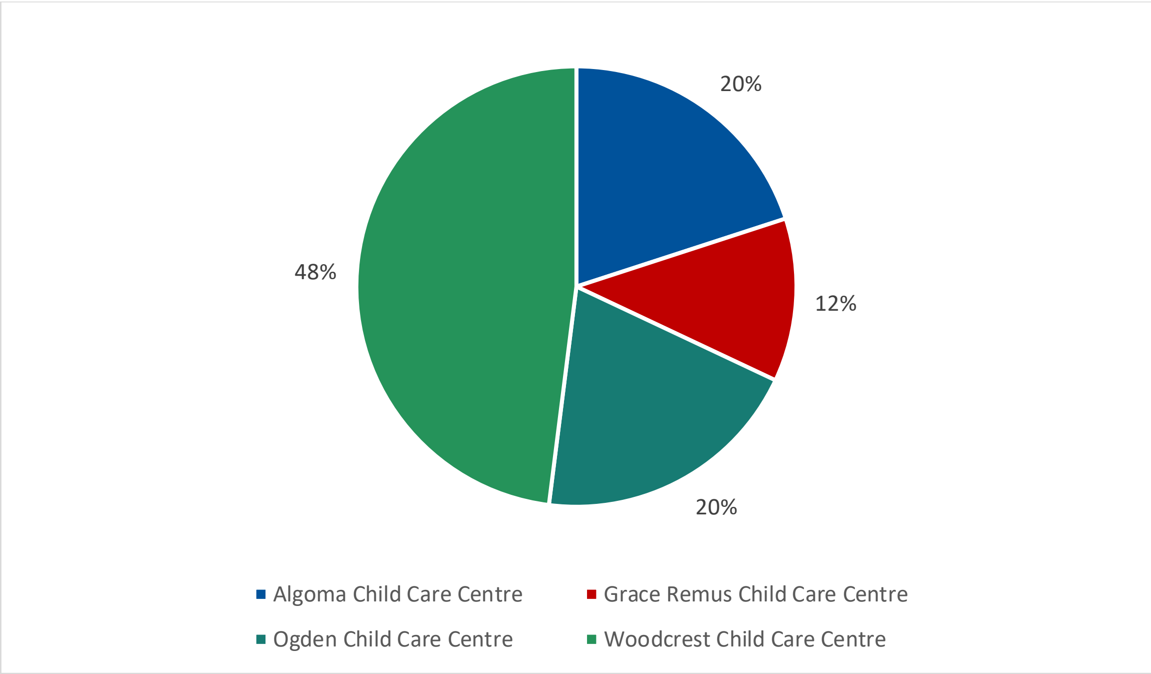
Please provide any additional concerns, feedback, or suggestions. Summary of Comments:

Residents raised a broad range of concerns and suggestions across key themes:

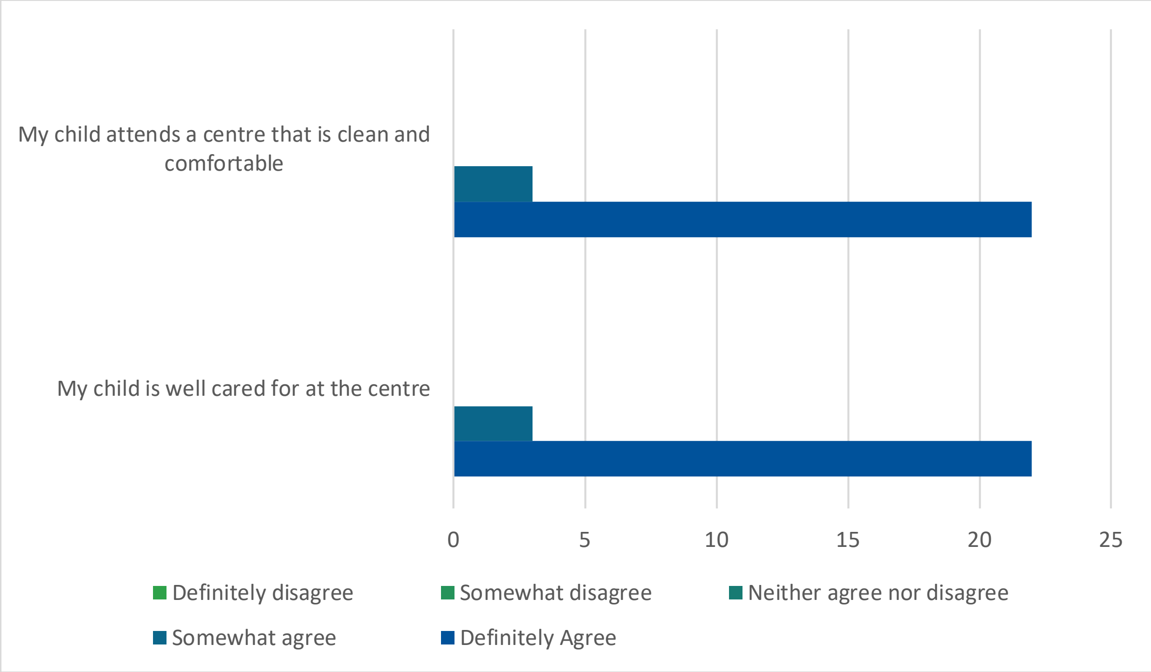
1. Safety and Accessibility
   Riders raised concerns about harassment, drug use, and lack of security on buses and at terminals. People with disabilities reported difficulties using Lift+ and unsafe or inaccessible stops.
2. Service Reliability and Frequency
   Late, early, or cancelled buses, poor transfers, and long travel times were common complaints. Riders want more consistent service, especially in winter and during evenings and weekends.
3. Affordability and Fare Structure
   Many opposed fare increases without service improvements. Suggestions included more equitable pricing options and fare-free routes in key corridors.
4. Equity and Inclusion
   Feedback highlighted the disproportionate impacts of poor service and rising costs on low-income riders, seniors, essential workers, and people with disabilities.
5. Operations and System Planning
   Residents called for better driver training, clearer communication, more public input, and stronger alignment between transit planning and land use to improve coverage and ridership.

Child Care Survey Responses – 25 Participants

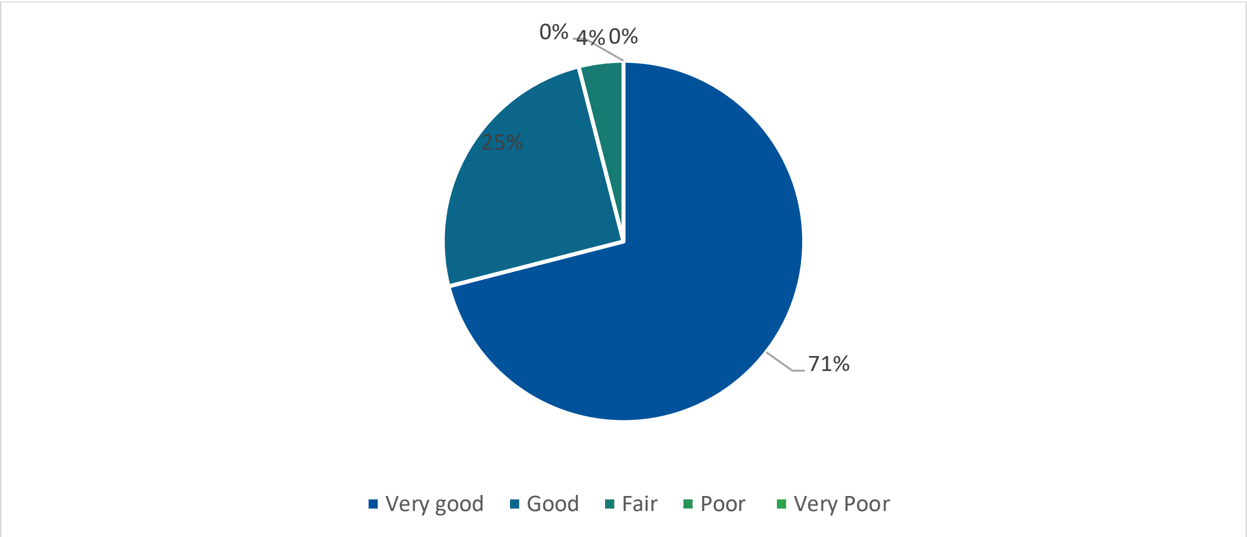
Q1 Which Child Care Centre does your child attend?



Q2 Please indicate your level of agreement with the following statements:



Q4 Overall how would you rate the service your family receives from the City's Child Care Centres?



Q7 What changes would you like to see with respect to the City's Child Care services to meet your future needs? Summary of Public Comments:

Expand Access and Availability

Parents emphasized the urgent need for more childcare spaces, especially for summer programs, siblings, and before/after school care. Long waitlists and limited capacity make planning difficult for families. Suggestions included improving the application process and temporarily filling vacant spots.

2. Supportive Staffing and Supervision

Families deeply value caring, consistent staff and want them fairly compensated. However, concerns were raised about staffing shortages, limited program hours, and the need for more supervision—particularly in toileting and hygiene for younger children.

3. Facility and Program Enhancements

Requests were made for playground upgrades (e.g., replacing sand), better infection control, more dietary accommodations, and extended hours. Parents also want programs that better support children's needs, including potty training and consistent caregiver relationships.

4. Improved Communication and Family Engagement

Parents want more frequent updates and better communication tools (e.g., newsletters, apps, or social media). There's strong interest in receiving regular feedback on their child's day and participating more in centre events and activities.