City of Hamilton
GENERAL ISSUES COMMITTEE
AGENDA

Meeting #: 22-012
Date: June 15, 2022
Time: 9:30 a.m.
Location: Council Chambers (GIC)
Council Chambers, Hamilton City Hall
71 Main Street West

Stephanie Paparella, Legislative Coordinator (905) 546-2424 ext. 3993

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1. CEREMONIAL ACTIVITIES

2. APPROVAL OF AGENDA

   (Added Items, if applicable, will be noted with *)

3. DECLARATIONS OF INTEREST

4. APPROVAL OF MINUTES OF PREVIOUS MEETING

   4.1. June 1, 2022

5. COMMUNICATIONS

   5.1. Correspondence from Robert Cooper, respecting Natural Science

   Recommendation: Be Received.

6. DELEGATION REQUESTS

7. CONSENT ITEMS

   7.1. 2022 Tim Hortons NHL Heritage Classic Update (PED22141) (City Wide)

   7.2. 2021 Grey Cup Update (PED18234(g)) (City Wide)

8. STAFF PRESENTATIONS

8.1. Core Asset Management Plan (PW22048) (City Wide)

9. PUBLIC HEARINGS / DELEGATIONS

10. DISCUSSION ITEMS

10.1. Pilot Program, Partnership Between Hamilton Civic Museums and the Hamilton Public Library for Free Museum Admission (PED20069(a)) (City Wide) (Outstanding Business List Item)

10.2. Capital Projects Work-in-Progress Review Sub-Committee Report 22-002 - May 26, 2022

10.3. Environmental Remediation and Site Enhancement (ERASE) Redevelopment Grant Application, 405 James Street North, Hamilton ERG-19-06 (PED22107/FCS22035) (Ward 2)

10.4. Restricted Acts After Nomination Day Delegated Authority (City Wide) (CM22009)

10.5. Revitalizing Hamilton Tax Increment Grant - 16 West Avenue South (PED22115) (Ward 3)

(Deferred from the General Issues Committee on June 1, 2022)

10.6. Advisory Committee for Persons with Disabilities Report 22-006 - May 24, 2022

11. MOTIONS

12. NOTICES OF MOTION

13. GENERAL INFORMATION / OTHER BUSINESS

13.1. Amendments to the Outstanding Business List

a. Proposed New Due Dates

a. Community Benefits Protocol Advisory Committee

Current Due Date: June 15, 2022

Proposed New Due Date: August 8, 2022

14. PRIVATE AND CONFIDENTIAL

14.1. June 1, 2022 - Closed Minutes

Pursuant to Section 9.1, Sub-sections (c) and (k) of the City's Procedural By-law 21-021, as amended, and Section 239(2), Sub-section (c) and (k) of the *Ontario Municipal Act*, 2001, as amended, as the subject matters pertain to a proposed or pending acquisition or disposition of land by the municipality or local board; and, a position, plan, procedure, criteria or instruction to be applied to any negotiations carried on or to be carried on by or on behalf of the municipality or local board.

15. ADJOURNMENT

GENERAL ISSUES COMMITTEE
MINUTES 22-011

9:30 a.m.
June 1, 2022
Council Chambers
Hamilton City Hall, 71 Main Street West, Hamilton, ON

Present: Deputy Mayor B. Johnson (Chair)
Councillors M. Wilson, N. Nann, S. Merulla, R. Powers, T. Jackson, E. Pauls, J. P. Danko, B. Clark, M. Pearson, B. Johnson and L. Ferguson

Absent: Mayor F. Eisenberger - Personal
Councillors J. Farr, A. VanderBeek, T. Whitehead and J. Partridge – Personal

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THE FOLLOWING ITEMS WERE REFERRED TO COUNCIL FOR CONSIDERATION:

1. Status of the Downtown & Barton/Kenilworth Housing Opportunities Program and Other Commercial Districts and Small Business Section Initiatives (PED22116) (City Wide) (Item 7.1)

(Clark/Pearson)
That Report PED22116, respecting the Status of the Downtown & Barton/Kenilworth Housing Opportunities Program and Other Commercial Districts and Small Business Section Initiatives, be received.

Result: MOTION, CARRIED by a vote of 9 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Absent	-	Ward 3	Councillor Nrinder Nann
Yes	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Absent	-	Ward 6	Councillor Tom Jackson, Deputy Mayor
Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark

Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson
Yes	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

2. Hamilton's Climate Change Action Strategy (PED22058/HSC22030) (City Wide) (Item 8.1)

(Danko/Pauls)

(a) That the draft "ReCharge Hamilton – Our Community Energy + Emissions Plan" (CEEP) attached as Appendix "A" to Report PED22058/HSC22030 be received;

(b) That "Hamilton's Climate Vulnerability and Risk Assessment Report" as completion of Milestone 2 of ICLEI Canada's Building Adaptive and Resilient Communities Framework attached as Appendix "B" to PED22058/HSC22030 be received;

(c) That staff be directed to undertake final public and stakeholder consultation on the draft "ReCharge Hamilton – Our Community Energy + Emissions Plan" (CEEP) and the "Hamilton's Climate Change Impact Adaptation Plan" (CCIAP) and report back to the General Issues Committee with the results of the public consultation and the recommended final CEEP and final CCIAP, which together will form Hamilton's Climate Change Action Strategy for Council's consideration;

(d) That staff be directed to report back to the General Issues Committee on the recommended approach for establishing an advisory committee structure for Hamilton's Climate Change Action Strategy ***with a deadline of August 8, 2022***;

(e) That staff be directed to report back to General Issues Committee on a recommended scope, governance and organizational structure, and resourcing for the centralized implementation, monitoring and reporting of Hamilton's Climate Change Action Strategy ***with a deadline of August 8, 2022***.

Result: MAIN MOTION as *Amended*, CARRIED by a vote of 10 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann

Yes	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Absent	-	Ward 6	Councillor Tom Jackson
Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Yes	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

3. Sub-sections (b) through (d) of Report FCS21017(b) - Vacant Home Tax in Hamilton (Item 8.2)

(Nann/Wilson)

(b) That the 2022 implementation costs estimated at $2,600,000 for the Vacant Home Tax be funded through an internal loan plus interest from the Investment Stabilization Reserve (110046) to be repaid from revenues collected from the program over a 5‑year term;

(c) That the estimated gross annual operating costs of $2,200,000 for administration of the Vacant Home Tax Program and related 16 Full Time Equivalents (FTE), to be funded from revenues generated by the program.

(d) That the matter respecting Vacant Home Tax, be removed from the Outstanding Business List.

Result: MAIN MOTION as *Amended*, CARRIED by a vote of 7 to 2, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Absent	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
No	-	Ward 6	Councillor Tom Jackson
No	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Conflict	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Yes	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek

Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

4. Light Rail Transit Sub-Committee Report 22-001, May 16, 2022 (Item 10.2)

(Pearson/Johnson)

(a) Appointment of Committee Vice-Chair for 2022 (Item 1)

That Councillor M. Wilson be appointed as Vice-Chair of the Light Rail Transit Sub-Committee for 2022.

(b) Hamilton Light Rail Transit (LRT) Project Update (PED22117) (City Wide) (Item 8.1)

That Report PED22117, respecting Hamilton Light Rail Transit (LRT) Project Update, be received.

Result: MOTION, CARRIED by a vote of 10 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Yes	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Yes	-	Ward 6	Councillor Tom Jackson
Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Absent	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

5. Proposal to the Red Hill Valley Joint Stewardship Board for the Expansion of the Red Hill Valley Parkway – REVISED (Item 11.1)

(Clark/Pearson)

WHEREAS, on April 13, 2022 Council authorized staff to deliver a Proposal (“the Proposal”) to the Red Hill Valley Joint Stewardship Board (“the JSB”) to consider the proposed expansion of the Red Hill Valley Parkway;

WHEREAS, some preliminary work is being performed in order to assemble the information to be delivered to the JSB in the Proposal; and,

WHEREAS, the City wishes to ensure that it remains fully compliant with the requirements of the Haudenosaunee-Hamilton Red Hill sub-agreement on Joint Stewardship ("the Joint Stewardship Agreement"), including Paragraphs 7.2, 7.3, 7.4, 7.5, 7.12 and 9.9 thereof, respecting the delivery of the Proposal to the JSB;

THEREFORE, BE IT RESOLVED:

That staff be directed to suspend all further engineering and other work in connection with the proposed expansion of the Red Hill Valley Parkway, except for the following:

(a) In-progress technical work necessary to assemble, draft, deliver and present the Proposal as soon as practicable; and,

(b) Ongoing assistance and support to the city representatives of the Red Hill Valley Joint Stewardship Board in its consideration of the Proposal, or other work required to generally fulfill the related obligations of the City pursuant to the Joint Stewardship Agreement.

Result: MOTION, CARRIED by a vote of 9 to 1, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Yes	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Yes	-	Ward 6	Councillor Tom Jackson
Yes	-	Ward 7	Councillor Esther Pauls
No	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Absent	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

6. Acquisition of Land in the City of Hamilton (PED22103) (Ward 10) (Item 14.2)

(Pearson/Clark)

(a) That the direction provided to staff in Closed Session, respecting Report PED22103 - Acquisition of Land in the City of Hamilton, be approved;

(b) That all costs related to the Acquisition of Land in the City of Hamilton, located in Ward 10, as shown in Appendix "A" to Report PED22103, be charged to Capital Account No. 4401356107 – Cherry Beach Lakefront Park;

(c) That $900 K of funding be transferred to Capital Account No. 4401356107 – Cherry Beach Lakefront Park from the Parkland Dedication Reserve No. 104090;

(d) That the sum of $54,188 be funded from Capital Account No. 4401356107 – Cherry Beach Lakefront Park and be credited to Dept. ID Account No. 812036 (Real Estate – Admin Recovery) for recovery of expense including real estate and legal fees and costs;

(e) That the City Solicitor be authorized and directed to complete the Acquisition of Land in the City of Hamilton, located in Ward 10, as shown in Appendix "A" to Report PED22103, on behalf of the City, including paying any necessary expenses, amending the closing, due diligence and other dates, and amending and waiving terms and conditions on such terms deemed reasonable;

(f) That the Mayor and City Clerk be authorized and directed to execute all necessary documents for the Acquisition of Land in the City of Hamilton, located in Ward 10, as shown in Appendix "A" to Report PED22103, in a form satisfactory to the City Solicitor; and,

(g) That the complete Report PED22103, respecting the Acquisition of Land in the City of Hamilton, located in Ward 10, as shown in Appendix "A" to Report PED22103, remain confidential until completion of the real estate transaction.

Result: MOTION, CARRIED by a vote of 10 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Yes	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Yes	-	Ward 6	Councillor Tom Jackson

Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Absent	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

7. Disposition of Property in Ward 1 (PED22110) (Ward 1) (Item 14.3)

(Wilson/Nann)

(a) That the City's property, identified in Appendix "A" to Report PED22110, be declared surplus for sale in accordance with the City's Real Estate Portfolio Management Strategy Plan and the Sale of Land Policy By-law 14-204;

(b) That an Offer to Purchase for the sale of the City's property identified in Appendix "A" to Report PED22110, based substantially on the Major Terms and Conditions outlined in Appendix "B" to Report PED22110, and such other terms and conditions deemed appropriate by the General Manager of Planning and Economic Development Department, be approved and completed;

(c) That the proceeds of the Disposition of Property in Ward 1, identified in Appendix "A" to Report PED22110, be credited to Project ID Account No. 47702-3561850200;

(d) That real estate and legal fees of $30,750 be funded from Project ID Account No. 59806-3561850200 and credited to Dept. ID Account No. 59806-812036 (Real Estate – Admin Recovery);

(e) That the net proceeds of the Disposition of Property in Ward 1, identified in Appendix "A" to Report PED22110, be credited to Parkland Dedication Reserve No. 104090;

(f) That the City Solicitor be authorized to complete the transaction for the Disposition of Property in Ward 1, identified in Appendix "A" to Report PED22110, on behalf of the City, including paying any necessary expenses, amending the closing, due diligence and other dates, and amending and waiving terms and conditions on such terms deemed appropriate;

(g) That the Mayor and City Clerk be authorized and directed to execute any and all necessary documents related to the Disposition of Property in Ward 1, identified in Appendix "A" to Report PED22110, in a form satisfactory to the City Solicitor;

(h) That Report PED22110, respecting the Disposition of Property in Ward 1, remain confidential until final completion of the property transaction.

Result: MOTION, CARRIED by a vote of 10 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Yes	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Yes	-	Ward 6	Councillor Tom Jackson
Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Absent	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

8. Immediate Real Estate Strategy - Hamilton Paramedic Services and Central Stores (PED22035/HSC22011) (City Wide) (Item 14.4)

(Merulla/Jackson)

(a) That the direction provided to staff in Closed Session be approved;

(b) That Corporate Real Estate Office (CREO) staff be authorized and directed to solicit and negotiate on- and/or off-market property acquisition opportunities that meet Hamilton Paramedic Service (HPS) requirements for the Immediate Real Estate Strategy – Hamilton Paramedic Service, including submitting Offers to Purchase or Lease, on such terms and conditions as deemed appropriate by the Chief Corporate Real Estate Officer, in consultation with the Chief, Hamilton Paramedic Service;

(c) That the General Manager of Planning and Economic Development and the Treasurer shall be authorized to execute on behalf of the City of Hamilton, Offers to Purchase or Lease for the Immediate Real Estate Strategy – Hamilton Paramedic Service, together with such other documents as may be required to effect the acquisition of the property required, in a form acceptable to the City Solicitor;

(d) That the City Solicitor be authorized to amend and waive terms and conditions on such terms as considered reasonable to complete the Purchase or Lease for the Immediate Real Estate Strategy – Hamilton Paramedic Service;

(e) That staff be directed to report back to General Issues Committee within 60 days of the completion of the property acquisition or lease for the Immediate Real Estate Strategy – Hamilton Paramedic Service, with an overview of the property acquired and the actual financial expenditures incurred, including an updated financing plan based on the budgeted allocation;

Result: MOTION, CARRIED by a vote of 10 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Yes	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Yes	-	Ward 6	Councillor Tom Jackson
Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Absent	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

9. Acquisition of Land in the City of Hamilton (PED22092/PW22043) (Ward 15) (Item 14.5)

(Powers/Pauls)

(a) That the direction provided to staff in Closed Session, respecting Report PED22092/PW22043, be approved;

(b) That the Property Purchases Reserve (No.100035) be repaid through proceeds from sale of the disposition of the surplus lands, either by internal or external sources depending on final use, plus accumulated interest at an annual interest rate of 3.48%;

(c) That the sum of $370,900 be funded from Project ID Account No.47702-3561850200 and be credited to Dept. ID Account No. 812036 (Real Estate – Admin Recovery) for recovery of expense including real estate and legal fees and costs;

(d) That the City Solicitor be authorized and directed to complete the Acquisition of Land in the City of Hamilton, on behalf of the City, including paying any necessary expenses, amending the closing, due diligence and other dates, and amending and waiving terms and conditions on such terms deemed reasonable;

(e) That the Mayor and City Clerk be authorized and directed to execute all necessary documents for the Acquisition of Land in the City of Hamilton, in a form satisfactory to the City Solicitor;

(f) That the complete Report PED22092/PW22043, respecting the acquisition of land in the City of Hamilton, located in Ward 15, remain confidential until completion of the real estate transaction;

(g) That the financing plan for the Hamilton Fire Department portion of the joint Waterdown Fire and Police station be amended from $7,875,000 to a total cost of $14,915,800, an increase of $7,040,800, to be funded in its entirety by Hamilton Fire Department development charges supported debt;

(h) That the budget for the Hamilton Police Service portion of the joint Waterdown Fire and Police station, as approved through Hamilton Police Service Report 20-052a, be funded by Hamilton Police Service development charges supported debt;

(i) That the General Manager, Finance and Corporate Services, be authorized to negotiate and confirm the terms, placement and issuance of all debenture issue(s), and/or private placement debenture issue(s), in either a public or private market and/or bank loan agreements and debenture issue(s) and/or variable interest rate bank loan agreements and debenture issue(s), in an amount not to exceed $28,049,800 Canadian currency in Tax Supported Development Charges municipal debt for the joint Waterdown Fire and Police station;

(j) That the General Manager, Finance and Corporate Services, be authorized to engage the services of all required professionals to secure the terms and issuance of the debenture issue(s) described in

Recommendation (b) including, but not limited to, external legal counsel, fiscal agents and Infrastructure Ontario's Loan Program and the cost of such services be funded from one of the following sources as deemed appropriate by the General Manager of the Finance and Corporate Services: Development Charge Reserves, Non-Obligatory Reserves, and other approved funding sources;

(k) That the General Manager, Finance and Corporate Services, is authorized and directed to enter into and administer, on behalf of the City of Hamilton, all agreements and necessary ancillary documents to implement Recommendation (i) and in order to secure the terms and issuance of the debenture issue(s) described in Recommendation (i), on terms and conditions satisfactory to the General Manager, Finance and Corporate Services and in a form satisfactory to the City Solicitor.

Result: MOTION, CARRIED by a vote of 10 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Yes	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Yes	-	Ward 6	Councillor Tom Jackson
Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Absent	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

FOR INFORMATION:

(a) APPROVAL OF AGENDA (Item 2)

The Committee Clerk advised of the following changes to the agenda:

5. COMMUNICATIONS

5.1 David Inkley, Vice-President, Engineering and Development, Hamilton Community Enterprises respecting a Community Energy and Emissions Plan

Recommendation: Be received and referred to the consideration of Item 8.1, Hamilton's Climate Change Action Strategy (PED22058/HSC22030)

6. DELEGATION REQUESTS

6.1 Lynda Lukasik, Environment Hamilton, respecting Item 8.1, Hamilton's Climate Change Action Strategy (PED22058/HSC22030) (City Wide) (for today's meeting)

6.2 Ian Borsuk, Environment Hamilton, respecting Item 8.1, Hamilton's Climate Change Action Strategy (PED22058/HSC22030) (City Wide) (for today's meeting)

6.3 Jeffrey Cowan, Hamilton Community Enterprises, respecting Item 8.1, Hamilton's Climate Change Action Strategy (PED22058/HSC22030) (City Wide) (for today's meeting)

6.4 Don McLean, respecting Item 8.1, Hamilton's Climate Change Action Strategy (PED22058/HSC22030) (City Wide) (for today's meeting)

6.5 Kate Flynn, Centre for Climate Change Management, Mohawk College, respecting Item 8.1, Hamilton's Climate Change Action Strategy (PED22058/HSC22030) (City Wide) (for today's meeting)

6.6 Bozica Sajatovic, respecting the Vaccine Mandate for Staff of the City of Hamilton (for a future meeting)

11. MOTIONS

11.1 Proposal to the Red Hill Valley Joint Stewardship Board for the Expansion of the Red Hill Valley Parkway REVISED

(Pearson/Clark)
That the agenda for the June 1, 2022 General Issues Committee meeting, be approved, as amended.

Result: MOTION, CARRIED by a vote of 10 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Yes	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Yes	-	Ward 6	Councillor Tom Jackson

Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Absent	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

(b) DECLARATIONS OF INTEREST (Item 3)

(i) Councillor M. Pearson declared a disqualifying Interest to Item 8.2 respecting the Sub-sections (b) through (d) of Report FCS21017(b) - Vacant Home Tax in Hamilton, as she and her husband are residential rental property landlords.

(iii) Councillor S. Merulla declared a disqualifying Interest to Item 8.2 respecting the Sub-sections (b) through (d) of Report FCS21017(b) - Vacant Home Tax in Hamilton, as he and his wife are residential rental property landlords.

(c) APPROVAL OF MINUTES OF PREVIOUS MEETING (Item 4)

(i) May 18, 2022 (Item 4.1)

(Danko/Pauls)
That the Minutes of the May 18, 2022 General Issues Committee meeting, be approved, as presented.

Result: MOTION, CARRIED by a vote of 10 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Yes	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Absent	-	Ward 6	Councillor Tom Jackson
Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Yes	-	Ward 12	Councillor Lloyd Ferguson

Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

(d) COMMUNICATION ITEMS (Item 5)

(i) David Inkley, Vice-President, Engineering and Development, Hamilton Community Enterprises respecting a Community Energy and Emissions Plan (Item 5.1)

(Wilson/Ferguson)
That the correspondence from David Inkley, Vice-President, Engineering and Development, Hamilton Community Enterprises respecting a Community Energy and Emissions Plan, be received and referred to the consideration of Item 8.1, Hamilton's Climate Change Action Strategy (PED22058/HSC22030).

Result: MOTION, CARRIED by a vote of 10 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Yes	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Absent	-	Ward 6	Councillor Tom Jackson
Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Yes	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

For disposition of this matter, please refer to Items 2, (f)(i) and (f)(ii)

(e) DELEGATION REQUESTS (Item 6)

(Powers/Ferguson)

(a) That the following Delegation Requests, be approved for today's meeting:

(i) Lynda Lukasik, Environment Hamilton, respecting Item 8.1, Hamilton's Climate Change Action Strategy (PED22058/HSC22030) (City Wide) (Added Item 6.1)

(ii) Ian Borsuk, Environment Hamilton, respecting Item 8.1, Hamilton's Climate Change Action Strategy (PED22058/HSC22030) (City Wide) (Added Item 6.2)

(iii) Jeffrey Cowan, Hamilton Community Enterprises, respecting Item 8.1, Hamilton's Climate Change Action Strategy (PED22058/HSC22030) (City Wide) (Added Item 6.3)

(iv) Don McLean, respecting Item 8.1, Hamilton's Climate Change Action Strategy (PED22058/HSC22030) (City Wide) (Added Item 6.4)

(v) Kate Flynn, Centre for Climate Change Management, Mohawk College, respecting Item 8.1, Hamilton's Climate Change Action Strategy (PED22058/HSC22030) (City Wide) (Added Item 6.5)

(b) That the following Delegation Request, be approved for a future meeting:

(i) Bozica Sajatovic, respecting the Vaccine Mandate for Staff of the City of Hamilton (Added Item 6.6)

Result: MOTION, CARRIED by a vote of 10 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Yes	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Absent	-	Ward 6	Councillor Tom Jackson
Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Yes	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

(f) STAFF PRESENTATIONS (Item 8)

(i) Hamilton's Climate Change Action Strategy (PED22058/HSC22030) (City Wide) (Item 8.1)

Trevor Imhoff, Senior Project Manager, Air Quality and Climate Change, Spencer Skidmore, Planner and Kyra Bell-Pasht, Sustainable Solutions Group, addressed Committee with an overview of Report PED22058/HSC22030, respecting Hamilton's Climate Change Action Strategy, with the aid of a PowerPoint presentation.

(Jackson/Ferguson)
That the Presentation respecting Hamilton's Climate Change Action Strategy (PED22058/HSC22030), be received.

Result: MOTION, CARRIED by a vote of 11 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Yes	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Yes	-	Ward 6	Councillor Tom Jackson
Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Yes	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

(ii) (Pearson/Wilson)
That sub-sections (d) and (e) of Report PED22058/HSC22030, respecting Hamilton's Climate Change Action Strategy, be ***amended*** as follows:

(d) That staff be directed to report back to the General Issues Committee on the recommended approach for establishing an advisory committee structure for Hamilton’s Climate Change Action Strategy ***with a deadline of August 8, 2022***;

(e) That staff be directed to report back to General Issues Committee on a recommended scope, governance and organizational structure, and resourcing for the centralized implementation, monitoring and reporting of Hamilton's Climate Change Action Strategy, ***with a deadline of August 8, 2022***.

Result: *Amendment*, CARRIED by a vote of 10 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Absent	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Yes	-	Ward 6	Councillor Tom Jackson
Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Yes	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

For further disposition of this matter, refer to Item 2.

(iii) Sub-sections (b) through (d) of Report FCS21017(b) - Vacant Home Tax in Hamilton (Item 8.2)

Gloria Rojas, Senior Tax Adviser, addressed Committee with a PowerPoint presentation respecting Sub-sections (b) through (d) of Report FCS21017(b) - Vacant Home Tax in Hamilton.

(Pearson/Wilson)
That the Presentation respecting Sub-sections (b) through (d) of Report FCS21017(b) - Vacant Home Tax in Hamilton, be received.

Result: MOTION, CARRIED by a vote of 8 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Absent	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Yes	-	Ward 6	Councillor Tom Jackson

Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Conflict	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Yes	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

(Nann/Wilson)
That sub-section (c) of Sub-sections (b) through (d) of Report FCS21017(b) - Vacant Home Tax in Hamilton, be ***amended*** as follows:

(c) That the estimated gross annual operating costs of $2,200,000 for administration of the Vacant Home Tax Program and related 16 Full Time Equivalents (FTE), to be funded from revenues generated by the program, ~~***be referred to the 2022 Budget Process.***~~

Result: *Amendment*, CARRIED by a vote of 7 to 2, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Absent	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
No	-	Ward 6	Councillor Tom Jackson
No	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Conflict	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Yes	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

For further disposition of this matter, refer to Item 3.

(iv) Annual Update on Economic Development Action Plan (PED22104) (City Wide) (Item 8.3) and Revitalizing Hamilton Tax Increment Grant - 16 West Avenue South (PED22115) (Ward 3) (Item 10.1)

(Pearson/Wilson)

(a) That the Presentation and the consideration of Report PED22104 respecting the Annual Update on Economic Development Action Plan, be DEFERRED to the July 4, 2022 meeting; and

(b) That the consideration of Report PED22115, respecting a Revitalizing Hamilton Tax Increment Grant - 16 West Avenue South, be DEFERRED to the June 15, 2022 meeting.

Result: MOTION, CARRIED by a vote of 9 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Absent	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Yes	-	Ward 6	Councillor Tom Jackson
Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Absent	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

(g) DELEGATIONS (Item 9)

(i) (Pearson/Ferguson)

That the Delegation from Vic Djurdjevic, Nikola Tesla Educational Corporation (NTEC), to present a Cheque to the City for the Public Art Project and Update the City on NTEC Initiatives, be moved up the agenda to immediately follow the consideration of Item 8.1, Hamilton's Climate Change Action Strategy (PED22058/HSC22030) (City Wide).

Result: MOTION, CARRIED by a vote of 9 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr

Yes	-	Ward 3	Councillor Nrinder Nann
Absent	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Absent	-	Ward 6	Councillor Tom Jackson
Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Yes	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

(ii) Vic Djurdjevic, Nikola Tesla Educational Corporation (NTEC), to present a Cheque to the City for the Public Art Project and Update the City on NTEC Initiatives (Item 9.1)

Vic Djurdjevic, Nikola Tesla Educational Corporation, presented a cheque to the City for the Public Art Project, and provided a PowerPoint presentation respecting NTEC Initiatives.

(Pearson/Clark)
That the cheque to the City for the Public Art Project, and the presentation respecting NTEC Initiatives, be received.

Result: MOTION, CARRIED by a vote of 9 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Absent	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Absent	-	Ward 6	Councillor Tom Jackson
Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Yes	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

(iii) Delegations respecting Item 8.1, Hamilton's Climate Change Action Strategy (PED22058/HSC22030) (City Wide)

The following delegations address Committee respecting Item 8.1, Hamilton's Climate Change Action Strategy (PED22058/HSC22030) (City Wide):

(a) Lynda Lukasik, Environment Hamilton (Added Item 9.2)

(b) Ian Borsuk, Environment Hamilton (Added Item 9.3)

(c) Jeffrey Cowan, Hamilton Community Enterprises (Added Item 9.4)

(d) Don McLean (Added Item 9.5)

(e) Kate Flynn, Centre for Climate Change Management, Mohawk College (Added Item 9.6)

(Powers/Jackson)
That the following Delegations respecting Item 8.1, Hamilton's Climate Change Action Strategy (PED22058/HSC22030) (City Wide), be received:

(a) Lynda Lukasik, Environment Hamilton (Added Item 9.2)

(b) Ian Borsuk, Environment Hamilton (Added Item 9.3)

(c) Jeffrey Cowan, Hamilton Community Enterprises (Added Item 9.4)

(d) Don McLean (Added Item 9.5)

(e) Kate Flynn, Centre for Climate Change Management, Mohawk College (Added Item 9.6)

Result: MOTION, CARRIED by a vote of 10 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Absent	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Yes	-	Ward 6	Councillor Tom Jackson
Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor

Yes	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

For further disposition of this matter, refer to Items 2, (f)(i) and (f)(ii)

(Nann/Powers)
That the General Issues Committee recess for one half hour until 1:30 p.m.

Result: MOTION, CARRIED by a vote of 9 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Absent	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Absent	-	Ward 6	Councillor Tom Jackson
Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Yes	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

(h) PRIVATE & CONFIDENTIAL (Item 14)

(i) Closed Session Minutes – May 18, 2022 (Item 14.1)

(Nann/Wilson)
(a) That the Closed Session Minutes of the May 18, 2022 General Issues Committee meeting, be approved; and,

(b) That the Closed Session Minutes of the May 18, 2022 General Issues Committee meeting, remain confidential.

Result: MOTION, CARRIED by a vote of 10 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann

Yes	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Yes	-	Ward 6	Councillor Tom Jackson
Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Absent	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

(Merulla/Jackson)
That Committee move into Closed Session to discuss Items 14.2 to 14.5, pursuant to Section 9.1, Sub-sections (c) and (k) of the City's Procedural By-law 21-021, as amended, and Section 239(2), Sub-section (c) and (k) of the *Ontario Municipal Act*, 2001, as amended, as the subject matters pertain to a proposed or pending acquisition or disposition of land by the municipality or local board; and, a position, plan, procedure, criteria or instruction to be applied to any negotiations carried on or to be carried on by or on behalf of the municipality or local board.

Result: MOTION, CARRIED by a vote of 10 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Yes	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Yes	-	Ward 6	Councillor Tom Jackson
Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Absent	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

(l) ADJOURNMENT (Item 15)

(Nann/Wilson)
That there being no further business, the General Issues Committee be adjourned at 3:56 p.m.

Result: MOTION, CARRIED by a vote of 10 to 0, as follows:

Absent	-	Mayor Fred Eisenberger	
Yes	-	Ward 1	Councillor Maureen Wilson
Absent	-	Ward 2	Councillor Jason Farr
Yes	-	Ward 3	Councillor Nrinder Nann
Yes	-	Ward 4	Councillor Sam Merulla
Yes	-	Ward 5	Councillor Russ Powers
Yes	-	Ward 6	Councillor Tom Jackson
Yes	-	Ward 7	Councillor Esther Pauls
Yes	-	Ward 8	Councillor J. P. Danko
Yes	-	Ward 9	Councillor Brad Clark
Yes	-	Ward 10	Councillor Maria Pearson
Yes	-	Ward 11	Councillor Brenda Johnson, Deputy Mayor
Absent	-	Ward 12	Councillor Lloyd Ferguson
Absent	-	Ward 13	Councillor Arlene VanderBeek
Absent	-	Ward 14	Councillor Terry Whitehead
Absent	-	Ward 15	Councillor Judi Partridge

Respectfully submitted,

_____
Brenda Johnson, Deputy Mayor
Chair, General Issues Committee

_____
Loren Kolar
Legislative Coordinator,
Office of the City Clerk

From: Robert Cooper
Sent: Sunday, June 5, 2022 10:47 PM
To: Holland, Andrea <Andrea.Holland@hamilton.ca>; Pilon, Janet <Janet.Pilon@hamilton.ca>
Subject: Natural Science

Dear Councillors & Mayor;

CC Local Media

Please find attached other organizations that are following the natural science and ending COVID mandates while 5 Councillors and Mayor choose to follow their own skewed political science by bullying and firing hard working City Employees.

I am not including the four Councillors who missed the vote among the hard working City Employees referenced above.

And still I wait to have a cost disclosed on the termination of these employees.....Council couldn't even provide a date for the costs to be reported back.....just more toxic cultural leadership from this Council enforcing the lack of accountability and transparency at City Hall

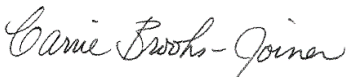
Robert Cooper

https://www.cbc.ca/news/canada/toronto/toronto-police-vaccine-mandate-ending-1.6474624

https://www.theglobeandmail.com/business/article-bay-street-backs-away-from-vaccine-mandates/

https://www.cbc.ca/news/canada/newfoundland-labrador/nl-ends-vaccine-mandate-1.6466874

INFORMATION REPORT

TO:	Mayor and Members General Issues Committee
COMMITTEE DATE:	June 15, 2022
SUBJECT/REPORT NO:	2022 Tim Hortons NHL Heritage Classic Update (PED22141) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Pam Mulholland (905) 546-2424 Ext. 4514
SUBMITTED BY: **SIGNATURE:**	Carrie Brooks-Joiner Director, Tourism and Culture Planning and Economic Development Department 

COUNCIL DIRECTION

At the September 15, 2021 Council meeting, Council approved the Recommendations of Confidential Report PED21177/PW21053 entitled “Potential Major Event Hosting” and directed staff to report back, in a public format, on the nature of the event and the extent of the City of Hamilton’s (City) contribution.

INFORMATION

The 2022 Tim Hortons NHL Heritage Classic (Heritage Classic) was one of three outdoor professional hockey stadium games run by the National Hockey League (NHL), the others being the Winter Classic and the Stadium Series.

The sixth Heritage Classic was played outdoors at Tim Hortons Field (the Stadium) in Hamilton on March 13, 2022. The Buffalo Sabres became the first American team to host and participate in a Heritage Classic. It was also the first Heritage Classic to be played in Ontario and the first to involve the Toronto Maple Leafs.

The Heritage Classic was among the early large-scale pandemic recovery events in the Province and Hamilton as Ontario lifted COVID-19 restrictions on March 8, 2022, including capacity limits on large venues and proof of vaccination for indoor spaces.

A sold-out crowd of 26,119 attended the marquee hockey game, which saw the Buffalo

Sabres defeat the Toronto Maple Leafs by a score of 5 to 2.

This Report provides an overview of:

- The City of Hamilton's financial contribution to the Heritage Classic;
- Heritage Classic Programming; and
- Benefits realized by the Hamilton community.

City's Financial Contribution to the Heritage Classic:

As outlined in Confidential Report PED21177/PW21053, the City's contribution to the Heritage Classic was to be limited to:

- Up to $40,000 towards the cost of HSR shuttles
- Snow removal and stadium readiness costs required to provide the NHL with a snow-free facility as of February 28, 2022

To be offset by:

- Any third-party funding contributions
- The City's share of Stadium concession revenues from the Heritage Classic game

The City's net financial contribution is summarized as follows:

Item	**Cost Actuals**
Cost HSR Shuttles:	$32,687
Snow Removal Costs:	$209,432
Less Private Sector Contributions:	($20,000)
Less City's Share of Concession Revenues:	($48,853)
City's Net Contribution:	**$173,266**

The cost of HSR shuttles was $32,687, of which $12,687 was funded from the Tourism and Culture Division Operating Budget and $20,000 contributed by local hotels through the Hamilton Tourism Development Investment Group.

There were two major snowfall events throughout January 2022, with a total snow accumulation of 50 or more centimetres. This weather event required dispatching an external labour pool from multiple agencies and through various contracts to haul snow out of the Stadium's interior and to clear exterior Stadium property. The total costs associated with the significant snowfalls and a few incidental snow events were $209,432, funded from the 2022 Stadium Operating budget. In addition, the City received concession revenues from the Heritage Classic game in the amount of

$48,853 to offset expenses.

The Heritage Classic Programming:

In addition to the hockey game, the Heritage Classic included the following programming in the Stadium precinct:

- PROLINE+ NHL PreGame, in the Stadium South Plaza and on Cannon Street.
  - Fan Festival that offered fans family-friendly hockey interactive games and attractions, special appearances by NHL Hall of Fame players, and the opportunity to take a photo with the Stanley Cup.

- In-Stadium Opening Ceremony
  - Welcome to the Land led by Chief Stacey Laforme of the Mississaugas of the Credit and Chief Mark Hill of Six Nations of the Grand River;
  - Hamilton's Argyll and Sutherland Highlanders presented the flags of the United States of America (United States) and Canada; and
  - The ceremony concluded with a flypast of CT-155 Hawk Jets from Moose Jaw, Saskatchewan.

- In-Stadium First Intermission: Performance by Canadian Grammy award-winner Alessia Cara.

- In-Stadium Second Intermission: The Olympic gold medal-winning Canadian women's hockey team was honoured in a ceremony featuring Hamilton singer Max Kerman of the multiple Juno Award-winning Hamilton band The Arkells.

The Heritage Classic Realized the Following Benefits for Hamilton:

- Positive national and United States media exposure for Hamilton with the game broadcast on Sportsnet (Hockey Night in Canada), TNT (game analyst Wayne Gretzky), and TVA Sports (Canadian French-language sports channel);

- Increase in tourism visitation and local spending (majority of game attendees were from Toronto and Buffalo) with a realized local economic impact of $5 million to $5.5 million;

- Increase in overnight accommodation stays in local hotels as a direct result of the Heritage Classic. 2,306 room nights at 11 Hamilton hotels with gross earned room revenue of $493,794 (net of applicable rebates and discounts, and excluding food and beverage sales and any incidental revenue such as parking, telephone charges and movie rental);

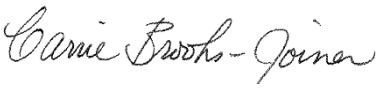
- Development of Hamilton's sports fan base; and
- Showcasing of the City-owned Stadium to principal event organizers.

APPENDICES AND SCHEDULES ATTACHED

None

PM:ac

INFORMATION REPORT

TO:	Mayor and Members General Issues Committee
COMMITTEE DATE:	June 15, 2022
SUBJECT/REPORT NO:	2021 Grey Cup Update (PED18234(g)) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Pam Mulholland (905) 546-2424 Ext. 4514
SUBMITTED BY: **SIGNATURE:**	Carrie Brooks-Joiner Director, Tourism and Culture Planning and Economic Development Department 

COUNCIL DIRECTION

At the January 30, 2019 Council meeting, Council approved the Recommendations of Confidential Report PED18234(a) to host the 108 Grey Cup in Hamilton in 2021. In addition, Council directed staff to report back, in a public format, on the outcomes of the Grey Cup, realized hosting benefits for Hamilton, and the extent of the City of Hamilton's contribution to the event. On December 8, 2021, a Communications Update went to the Mayor and Members of Council outlining the City of Hamilton's (City) financial contribution to the 2021 Grey Cup. The Communications Update was included on the public Council agenda of December 15, 2021. This Report fulfils the remaining outstanding Council directions related to the 2021 Grey Cup.

INFORMATION

The Grey Cup football game and Grey Cup Festival are one of Canada's marquis sporting events. The annual event attracts thousands of spectators and tourists to the host city from across the country and garners millions of spectators on television. This Report provides an overview of Grey Cup programming, the benefits realized by Hamilton as a result of hosting, and City of Hamilton services delivered to the Grey Cup.

108 Grey Cup in Hamilton:

The Grey Cup was held at Tim Hortons Field (Stadium) on December 12, 2021, to a sold-out crowd of 26,324, an all-time Stadium attendance record. The game was won

by the defending champion Winnipeg Blue Bombers, in a 33-25 overtime victory over the Hamilton Tiger-Cats.

On October 28, 2021, the Province of Ontario lifted COVID-19 pandemic restrictions on indoor, non-seated events. However, the lifting of regulations did not allow enough time for Grey Cup Festival event plans to be fully realized. As a result, the Grey Cup Festival ran from December 9 to 12, 2021, in a modified format from previous years with large-scale public events like major concert series, family fun zone and educational events cancelled.

Other 2021 Festival traditional events proceeded, including the Grey Cup trophy's arrival; The Canadian Football League (CFL) Awards; team parties; head coaches conference; and the Commissioner's state of the league session, but with reduced attendance due to the requirement for the physical distancing of attendees.

The Grey Cup game half-time show headliners were Hamilton's Arkells. Grey Cup Festival events also showcased local and Canadian musicians to a national audience. Throughout the Grey Cup week leading up to game day, music events were held at both the Stadium and the Hamilton Convention Centre, hosting several musicians and artists to amplify the variety of events held during the festivities.

The Grey Cup Benefits for Hamilton:

The CFL commissioned an Economic Impact Assessment Report of the 108 Grey Cup, conducted by Sport Tourism Canada. The data included in the following realized benefits overview is contained within the Economic Impact Assessment, attached as Appendix "A" to Report PED18234(g).

- Increased tourism visitation to Hamilton. The majority of attendees were tourists as summarized below:
    - 39% were from Hamilton
    - 11% were from Toronto or other Greater Toronto Area communities
    - 19% were from other Ontario communities
    - 29% were from other provinces; and
    - 2% were from outside Canada

- Increase in overnight accommodation stays in local hotels as a direct result of the Grey Cup:
    - 82% of out-of-town attendees stayed overnight during their visit to Hamilton, resulting in 2,656 room nights sold at Hamilton hotels and gross earned revenue of $693,511 (net of applicable rebates and discounts and excluding food and beverage sales and any incidental revenue such as parking, telephone charges and movie rental);
    - 73% of attendees indicated that Grey Cup was the sole reason for their

visit to Hamilton, and overall, the importance of this event in influencing visitation to Hamilton was 9.3 out of 10.

Note: The visitor statistics cited in this report were derived from an on-site survey conducted by Sport Tourism Canada over three days of the event.

- Generated millions of dollars in economic impact. The total net economic activity (Gross Domestic Product) generated by the Grey Cup was:
  - $21.6 million for Canada
  - $18.2 million for the Province of Ontario
  - $14.5 million for Hamilton

Note: Economic Impact Assessment (EIA) studies measure the positive change in economic activity resulting from hosting an event in a specific city. Sport Tourism Canada developed the STEAMPRO EIA to generate the economic impact from actual spending data during the sports event. The STEAMPRO EIA was utilized to calculate the local economic impact of the Grey Cup.

- Increased operational expenditures in Hamilton. To ensure this event's successful operation and staging, the combined purchase of goods and services by the Canadian Football League and the Hamilton Tiger-Cats in Hamilton was $7,878,474 million. These operational expenditures include but are not limited to fees and commissions; facility rental; marketing and advertising services; professional services; communications; food and beverage; accommodations; merchandise; travel; transportation and storage.

- Positive national and international television exposure for Hamilton with the game broadcast on television networks The Sports Network in Canada and Entertainment and Sports Programming Network in the United States with a viewership of 7.9 million excluding fans who watched on streaming services ESPN+ and CFL Game Pass.

- Showcased the City's premier stadium to support additional business attraction while developing Hamilton's sports fan base.

City of Hamilton Contributions to the Grey Cup:

The City partnered with The Hamilton Tiger Cats Football Club, the rights holder of the 2021 Grey Cup, to meet the hosting requirements. Municipal contributions included the provision of $200,000 in City services, exclusive access to and use of the Stadium facility, including the stadium, equipment and infrastructure, and event marketing and promotion support.

APPENDICES AND SCHEDULES ATTACHED

Appendix “A” to Report PED18234(g) - STEAMPRO Economic Impact Assessment Final Report -108 Grey Cup - Hamilton, Ontario

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Economic Impact Assessment

Final Report – 108th Grey Cup – Hamilton, ON

Prepared by: Derek Mager, STC EI Consultant
Date: March 29, 2022

WHAT IS EI?

Economic Impact Assessment (EIA) studies measure the positive change in economic activity resulting from hosting an event in a specific city/town. There are three factors:

1. The spending of out-of-town visitors while they attend the event(s);
2. The expenditures of the event organizers in producing the event(s);
3. Capital construction costs that are directly attributed to hosting the event(s).

An EI study calculates the amount of new money being spent in the host community as a direct result of hosting the event(s), and then the impact these new monies have on the regional, provincial and national economies as a whole.

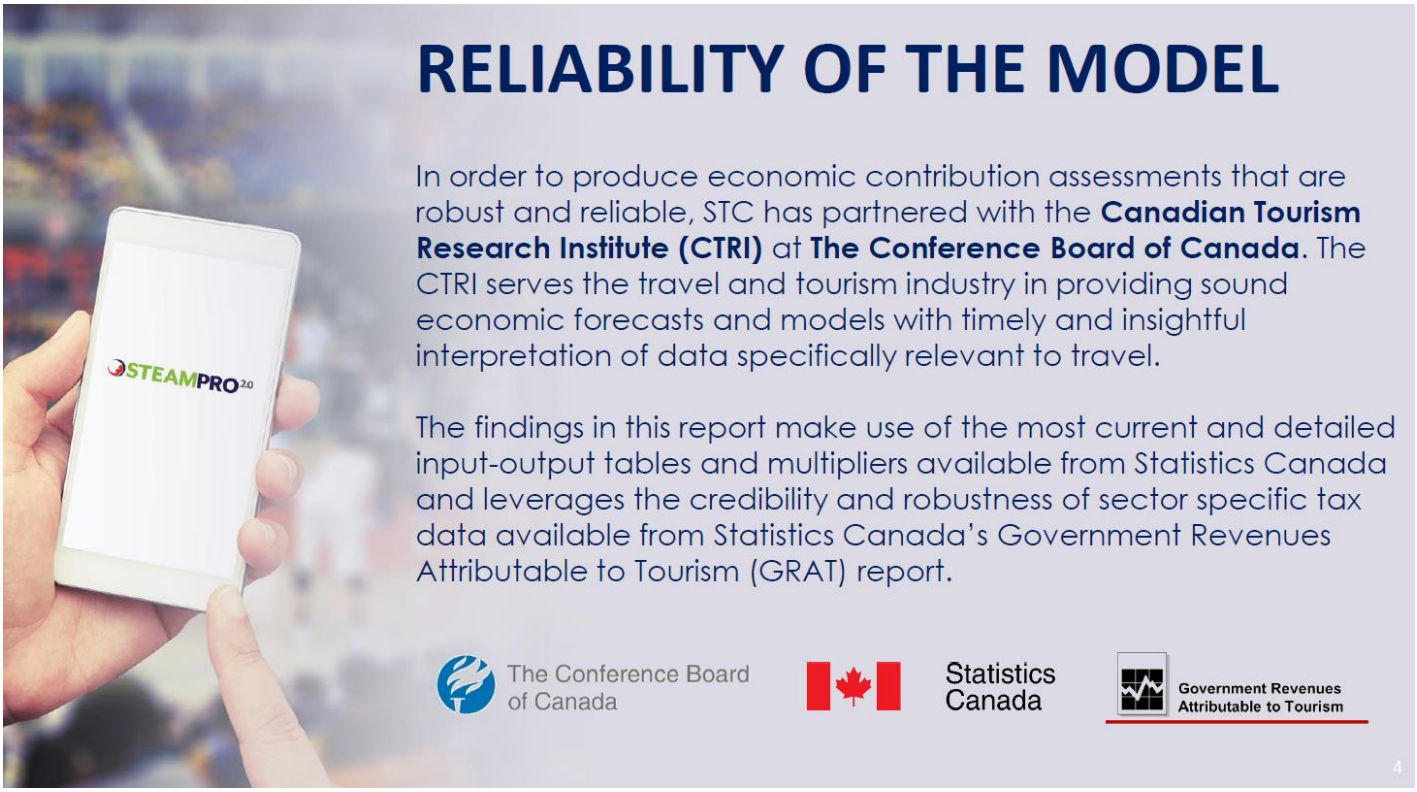
HOW DO WE MEASURE EI?

Sport Tourism Canada (formerly the Canadian Sport Tourism Alliance) has developed three tools called **STEAM**$^{2.0}$, **STEAMPRO**$^{2.0}$ and **FESTPRO** to predict, collect, measure and analyze event data across the three primary channels.

STEAM$^{2.0}$ is designed specifically as a predictive model to determine the expected economic impact of hosting a sport event, while **STEAMPRO**$^{2.0}$ is utilized to generate the economic impact from actual spending data during the sport event itself.

STC's latest tool, called **FESTPRO**, is the sister model to **STEAMPRO**$^{2.0}$. It measures the economic impact of non-sport events like festivals, exhibitions and fairs using actual spending data collected during the event.

Our economic impact services empower event organizers and host cities to accurately assess economic impact resulting from hosting a specific event in a specific location.


RELIABILITY OF THE MODEL
In order to produce economic contribution assessments that are robust and reliable, STC has partnered with the Canadian Tourism Research Institute (CTRI) at The Conference Board of Canada. The CTRI serves the travel and tourism industry in providing sound economic forecasts and models with timely and insightful interpretation of data specifically relevant to travel.
The findings in this report make use of the most current and detailed input-output tables and multipliers available from Statistics Canada and leverages the credibility and robustness of sector specific tax data available from Statistics Canada's Government Revenues Attributable to Tourism (GRAT) report.
STEAMPRO 2.0
The Conference Board of Canada
Statistics Canada
Government Revenues Attributable to Tourism
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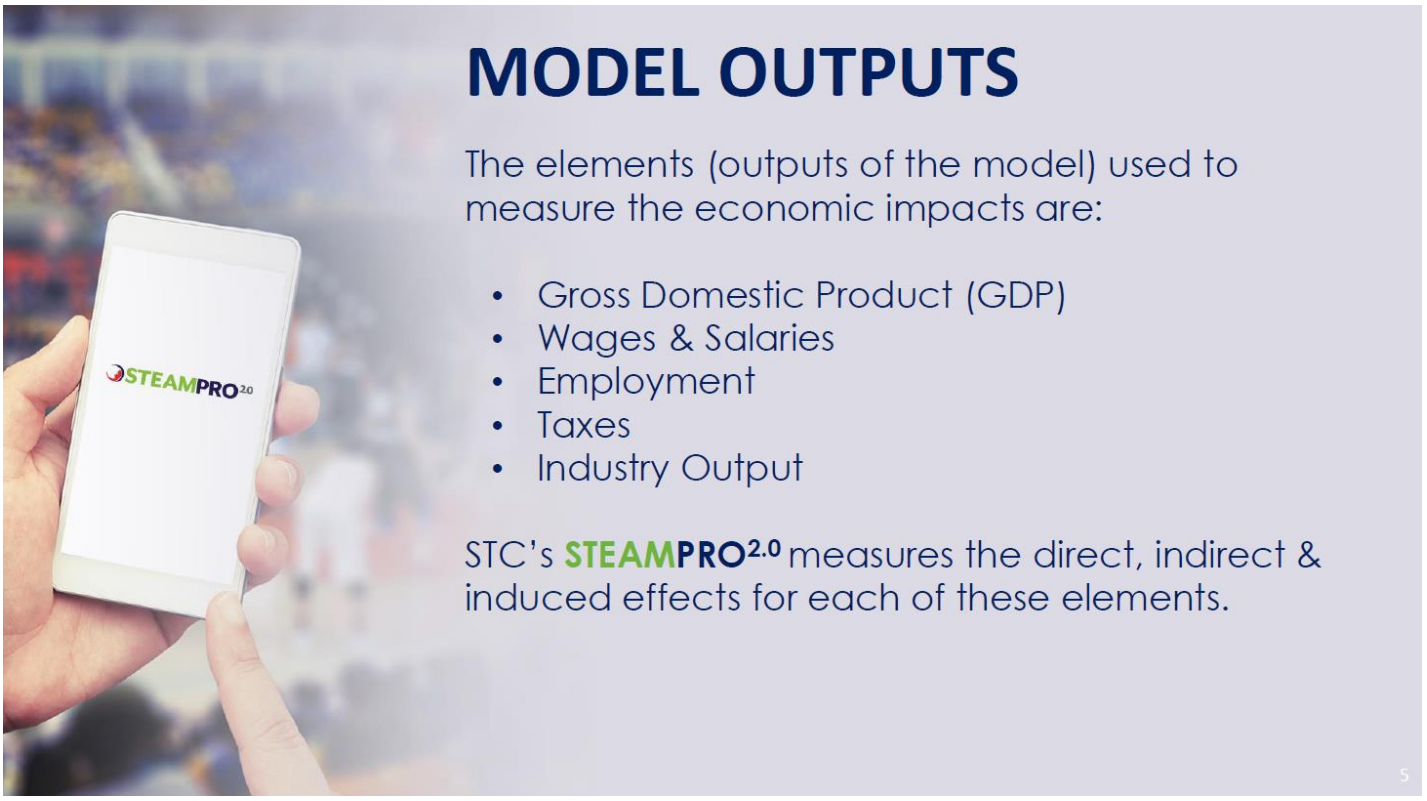
MODEL OUTPUTS
The elements (outputs of the model) used to measure the economic impacts are:
• Gross Domestic Product (GDP)
• Wages & Salaries
• Employment
• Taxes
• Industry Output
STC's STEAMPRO2.0 measures the direct, indirect & induced effects for each of these elements.
STEAMPRO2.0
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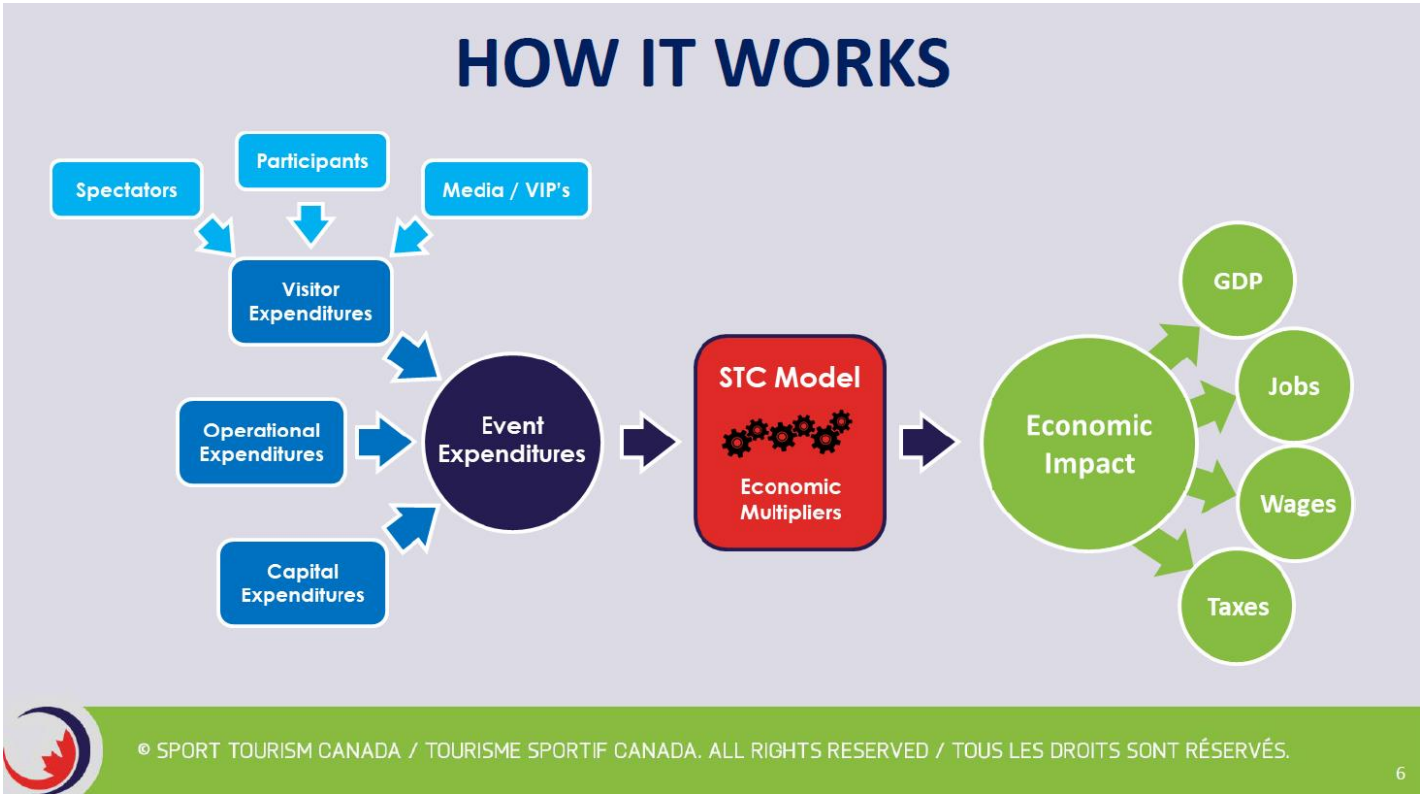
HOW IT WORKS
Spectators
Participants
Media / VIP's
Visitor Expenditures
Operational Expenditures
Capital Expenditures
Event Expenditures
STC Model
Economic Multipliers
Economic Impact
GDP
Jobs
Wages
Taxes
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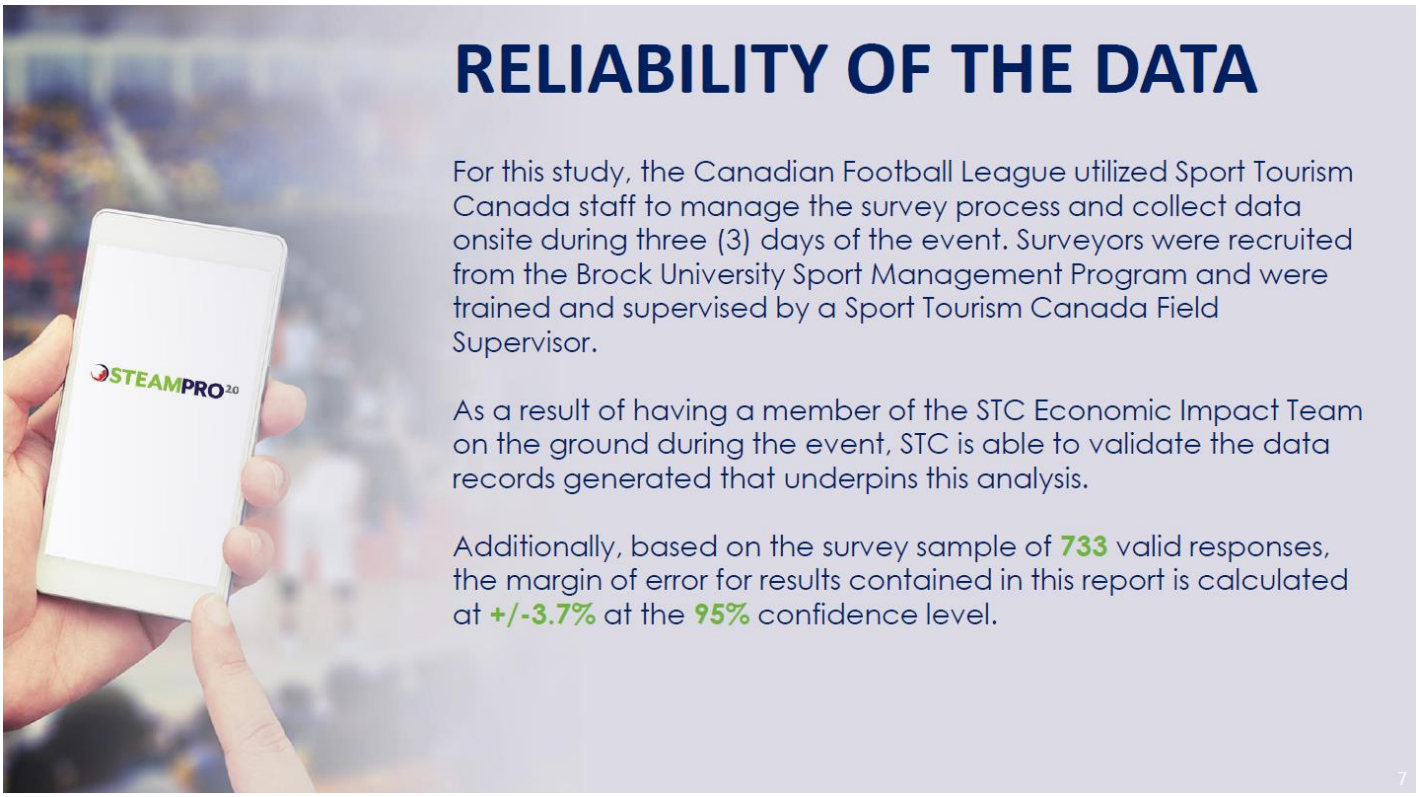
STEAMPRO 2.0
RELIABILITY OF THE DATA
For this study, the Canadian Football League utilized Sport Tourism Canada staff to manage the survey process and collect data onsite during three (3) days of the event. Surveyors were recruited from the Brock University Sport Management Program and were trained and supervised by a Sport Tourism Canada Field Supervisor.
As a result of having a member of the STC Economic Impact Team on the ground during the event, STC is able to validate the data records generated that underpins this analysis.
Additionally, based on the survey sample of 733 valid responses, the margin of error for results contained in this report is calculated at +/-3.7% at the 95% confidence level.
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METHODOLOGY

The visitor statistics cited in this report were derived from an on-site survey that was conducted over three (3) days of the event. The survey was developed by STC specifically for this event and was administered three ways onsite 1) by a team of surveyors intercepting spectators, 2) a series of self-complete kiosks set up in the Social Halls, and 3) through the use of a QR code provided to allow respondents to complete the survey at their leisure on their personal device.

A total of **733** valid responses were collected during this event.

The survey included a variety of questions for the spectators with regards to their age, place of residence, days attended, etc., while respondents from out-of-town were asked about their length of stay in the local area, the amount of money spent in various categories while in the area, as well as the importance of this event in their decision to travel to Hamilton. Additionally, attendees were asked about their feelings of "safety" during COVID and what additional event protocols could have enhanced their feeling of safety.


108
COUPE
GREY CUP
HAMILTON
BLUE BOMBERS
BOMBERS
CP
9

THE EVENT

108TH GREY CUP

SUNDAY, DECEMBER 12, 2021

TIM HORTONS FIELD

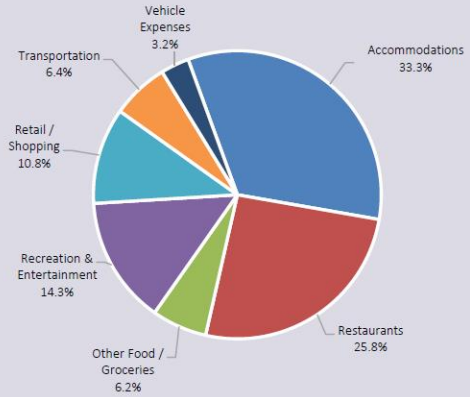
The Grey Cup and Grey Cup Festival are one of Canada's marquis sporting events and one of Canada's longest standing sporting events. The event attracts thousands of spectators and football fans from across the country and boasts millions of spectators on television. The Grey Cup Festival unites fans through a multitude of events including displays, concerts, family fun zones, team parties, and educational events.

The 108th Grey Cup, was held in Hamilton, Ontario at Tim Hortons Field on December 12, 2021 with the Grey Cup Festival running from December 9-12, 2021. An exciting game that was ultimately won by the defending champion Winnipeg Blue Bombers in a 33-25 overtime victory over the Hamilton Tiger-Cats.

SPECTATOR SPENDING

	Per Party	Overall
Accommodations	$550.62	$4,062,342
Restaurants	$426.01	$3,832,995
Other Food / Groceries	$102.19	$919,424
Recreation & Entertainment	$236.26	$2,125,686
Retail / Shopping	$179.15	$1,611,836
Transportation	$105.60	$950,132
Vehicle Expenses	$52.03	$468,163
Total	**$1,651.86**	**$13,970,578**

Aggregate spectator spending was nearly $14 million



** Spectator spending shown here is scaled by "importance of this event" on respondents reason for being in Hamilton (9.3/10 or 93%).*

OTHER VISITOR SPENDING

	Overall
Accommodations	$227,873
Restaurants	$165,466
Other Food / Groceries	$28,308
Recreation & Entertainment	$32,545
Retail / Shopping	$63,732
Transportation	$23,943
Vehicle Expenses	$41,589
Total	**$583,456**

Other visitor spending totalled just over **$583,000** and was calculated from the other constituent groups (i.e. participants, support staff, officials, alumni, media, VIP's, production personnel, and non-participating team delegates.

Aggregate visitor spending was nearly $14.6 million

OPERATIONAL & CAPITAL EXPENDITURES

To ensure the successful operation and staging of this event, the combined purchase of **goods and services** by the CFL and the Organizing Committee in Hamilton was $7,878,474. No capital expenditures were incurred.

Operational	Capital
$7,878,474	$0

These operational expenditures include, but are not limited to fees & commissions, facility rental, marketing and advertising services, professional services, communications, food and beverage, accommodations, merchandise, travel, transportation, and storage.

THE EI RESULTS

The combined spending of out-of-town participants, staff, spectators, media, VIP's, and other people who visited Hamilton for the 108th Grey Cup, in combination with the expenditures made by the event organizers, totalled just over $22.4 million, supporting just over $34.8 million in overall economic activity in Ontario, including over $29.8 million of economic activity in the Hamilton area.

These expenditures supported $12.3 million in wages and salaries in the province through the support of 233 jobs, of which 206 jobs and $10.3 million in wages and salaries were supported locally.

The total net economic activity (GDP) generated by the 108th Grey Cup was:

- $21.6 million for Canada as a whole
- $18.2 million for the province of Ontario
- $14.5 million for the city of Hamilton

The 2021 Grey Cup supported tax revenues totaling almost $7.1 million across Canada.

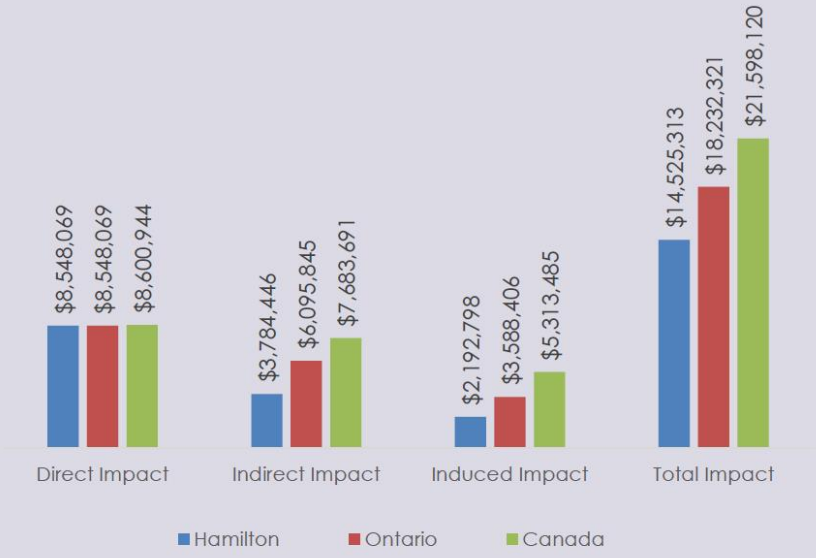
	Hamilton	Ontario	Canada
Initial Expenditure	$22,432,508	$22,432,508	$22,432,508
GDP	$14,525,313	$18,232,321	$21,598,120
Wages & Salaries	$10,269,757	$12,255,735	$14,139,339
Employment	205.9	232.8	267.4
Total Taxes	$4,752,271	$5,911,311	$7,094,130
Federal	$2,216,224	$2,745,575	$3,189,641
Provincial	$2,133,766	$2,691,925	$3,334,230
Municipal	$402,282	$473,811	$570,259
Industry Output	**$29,826,190**	**$34,844,632**	**$41,320,385**

** Figures shown here are the Total Impact for each category (direct + indirect + induced)*

GROSS DOMESTIC PRODUCT

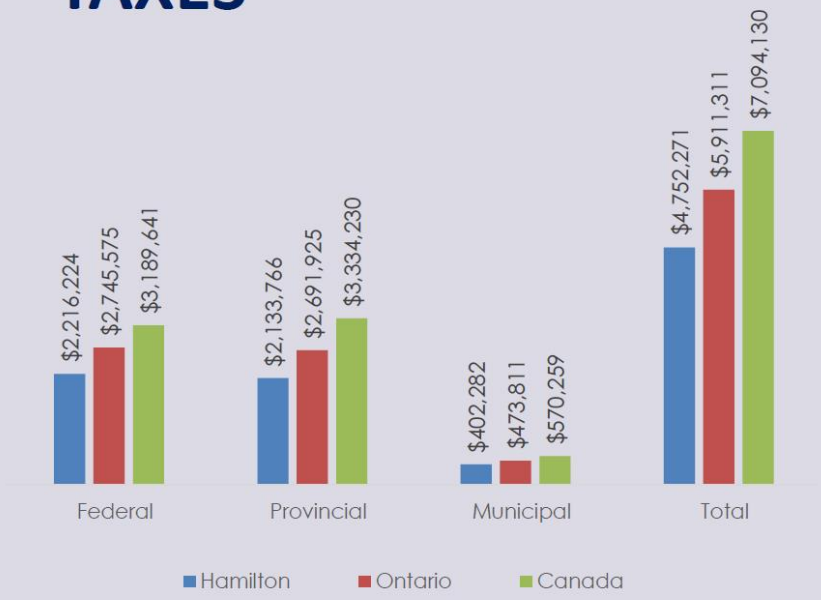
GDP (at basic prices)

By hosting the **108th Grey Cup** in **Hamilton, Ontario** contributed just under **$21.6 million** in GDP to the Canadian economy through direct and spin-off impacts.



TAXES

The 108th Grey Cup hosted in **Hamilto, Ontario** contributed just under **$7.1 million** in federal, provincial, and local **taxes** through direct and spin-off effects throughout Canada.

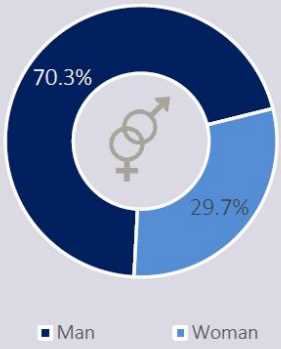


ADDITIONAL QUESTIONS

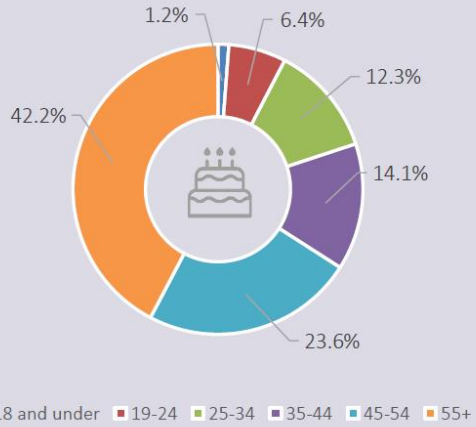
The following pages summarize the results from questions that were included as part of the survey but were not all necessarily required for the economic impact analysis calculations.

DEMOGRAPHICS

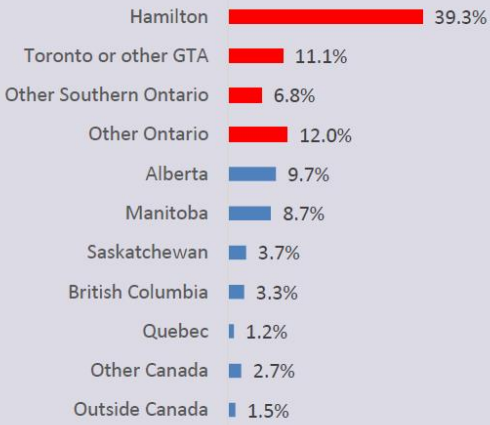
Gender



Age Range

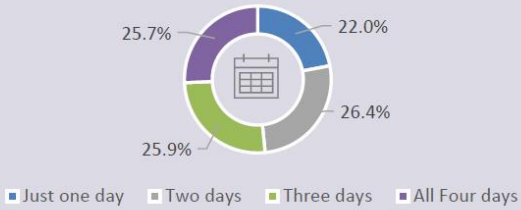


Place of Residence

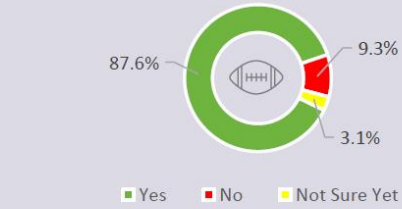


ATTENDANCE CHARACTERISTICS

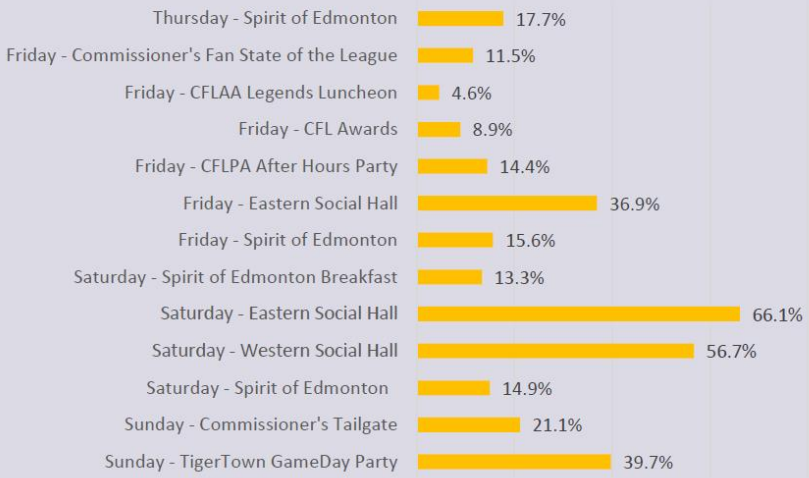
Days Attending



Attending 108th Grey Cup Game



Grey Cup Festival Activities Attended



TRAVEL CHARACTERISTICS

82% of out-of-town attendees stayed overnight during their visit to Hamilton

Average nights in Hamilton = 3.5

IMPORTANT

73% of attendees indicated that this event was the sole reason for their visit to Hamilton.

Overall, the importance of this event in influencing visitation to Hamilton was 9.3/10.

Of those staying overnight…

- 52% Stayed in a hotel
- 14% Stayed with friends/family
- 32% Used a short term rental
- 2% Made other arrangements

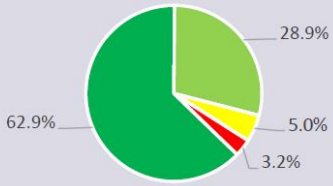
Average travel party size = 1.9 people

18% of out-of-town attendees made an average of 1.7 day trips to Hamilton

HAMILTON TOURISM

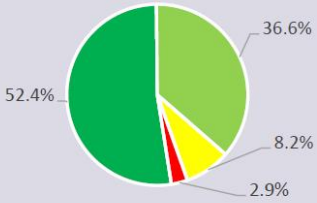
First Visit to Hamilton

Future Visitation to Hamilton



Very Likely | Somewhat Likely | Somewhat Unlikely | Very Unlikely

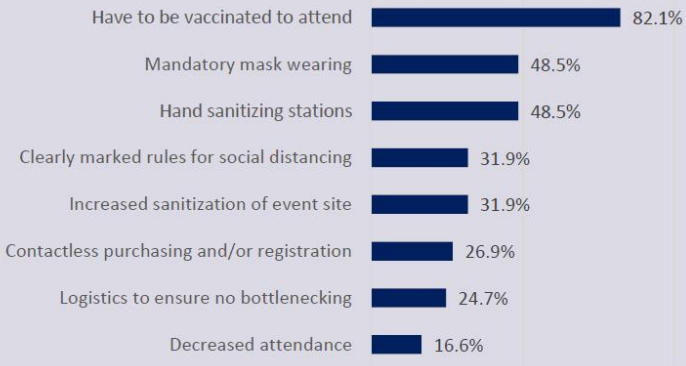
Recommend Hamilton to Others



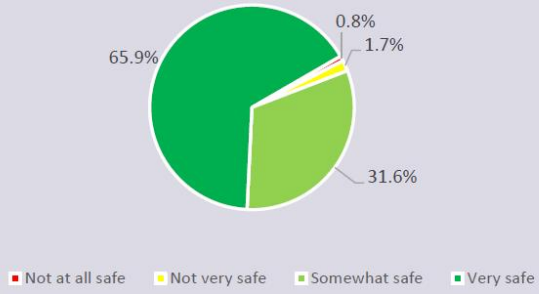
Very Likely | Somewhat Likely | Somewhat Unlikely | Very Unlikely

COVID-19 RELATED

What would make you feel more "safe" attending live sport events?



How "safe" did you feel while attending Grey Cup festivities?



SUMMARY | BY THE NUMBERS

108th Grey Cup in Hamilton – Key Facts & Figures			
$22.4 million of initial expenditures	**$14.6 million** of visitor spending	**206** local jobs supported by the event	**$34.8 million** overall economic activity in the province
18,190 out of town visitors* in Hamilton	**$10.3 million** of wages and salaries supported locally	**$18.2 million** boost to provincial GDP	**$7.1 million** in taxes supported across Canada

** Visitors derived from attendance figures obtained from event organizers combined with results from the survey.*

APPENDIX – GLOSSARY OF TERMS

Initial Expenditure - This figure indicates the amount of initial expenditures used in the analysis. This heading indicates not only the total magnitude of the spending but also the region in which it was spent (thus establishing the "impact" region).

Direct Impact - Relates ONLY to the impact on "front-line" businesses. These are businesses that initially receive the operating revenue or tourist expenditures for the project under analysis. From a business perspective, this impact is limited only to that particular business or group of businesses involved. From a tourist spending perspective, this can include all businesses such as hotels, restaurants, retail stores, transportation carriers, attraction facilities and so forth.

Indirect Impact - Refers to the impacts resulting from all intermediate rounds of production in the supply of goods and services to industry sectors identified in the direct impact phase.

Induced Impact - These impacts are generated as a result of spending by employees (in the form of consumer spending) and businesses (in the form of investment) that benefited either directly or indirectly from the initial expenditures under analysis.

Gross Domestic Product (GDP) - This figure represents the total value of production of goods and services in the economy resulting from the initial expenditure under analysis (valued at market prices). GDP (at factor cost) - This figure represents the total value of production of goods and services produced by industries resulting from the factors of production. The distinction to GDP (at market prices) is that GDP (at factor cost) is less by the amount of indirect taxes plus subsidies.

Wages & Salaries - This figure represents the amount of wages and salaries generated by the initial expenditure. This information is presented by the aggregate of direct, indirect, and induced impacts.

Employment - Depending upon the selection of employment units (person-years or equivalent full-year jobs) these figures represent the employment generated by the initial expenditure. "Equivalent Full-Year Jobs", if selected, include both part-time and full-time work in ratios consistent with the specific industries.

Industry Output - These figures represent the direct & indirect and total impact (including induced impacts) on industry output generated by the initial tourism expenditure. It should be noted that the industry output measure represents the sum total of all **economic activity** that has taken place and consequently involve double counting on the part of the intermediate production phase. Since the Gross Domestic Product (GDP) figure includes only the net total of all economic activity (i.e. considers only the value added), the industry output measure will always exceed or at least equal the value of GDP.

Taxes - These figures represent the amount of taxes contributed to municipal, provincial, and federal levels of government relating to the project under analysis.

CONTACT INFORMATION

If you have any questions concerning the findings in this report, please contact:

Derek Mager, STC EI Consultant

derek@thedatajungle.com

604.787.3605

If you would like to conduct another EI study using STEAM2.0 ,STEAMPRO2.0 or FESTPRO on any other type of event, please contact research@sporttourismcanada.com

CITY OF HAMILTON
PUBLIC WORKS DEPARTMENT
General Manager's Office

TO:	Mayor and Members General Issues Committee
COMMITTEE DATE:	June 15, 2022
SUBJECT/REPORT NO:	Core Asset Management Plan (PW22048) (City Wide)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Jasmine MacDonald (905) 546-2424 Ext. 2641
SUBMITTED BY: **SIGNATURE:**	Patricia Leishman Director, Corporate Asset Management Public Works Department 

RECOMMENDATION

That the Corporate Asset Management Plan Overview and Core Asset Management Plans, attached to Report PW22048 as Appendix “A”, “B”, and “C” to, be approved as required by Ontario Regulation 588/17: Asset Management for Municipal Infrastructure;

EXECUTIVE SUMMARY

This is the first iteration of the Core Asset Management (AM) Plans completed by the Corporate Asset Management (CAM) office in partnership with over fifty asset owners and key stakeholders across the City. The intent of these first plans is to meet Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure (O. Reg. 588/17) requirements including establishing the current levels of service and setting a benchmark for the City’s core assets (water, wastewater, stormwater, roads and engineered structures) in order to identify continuous improvement items for the next iteration of the AM Plans. The intent is also to support addressing findings from the Roads Value for Money Audit (AUD21006) report related to asset management.

A key output of an AM Plan is the infrastructure funding gap. Over the 10-year planning horizon Hamilton’s funding gap for core assets is estimated to be $195.9 million annually. Moving forward, the City will continue to improve its asset lifecycle data, and this will allow for more informed choices as how best to mitigate any impacts and

address the funding gap itself. This gap in funding future plans will be refined over the next three (3) years to improve the confidence and accuracy of the forecasts in alignment with O. Reg. 588/17 requirements and to present proposed levels of service and a funding strategy by 2025 for all City assets. There are no specific financial commitments required at this time from this AM Plan however findings from Report PW22048 will be used to inform the 2023 tax and rate supported budget process.

The total replacement cost for all core assets is approximately $21.3B. Overall, core assets are an average of fair condition, and are an average of 28 years of age with 50% of service life remaining. However, the data confidence levels for these assets are shown as low to medium, indicating that as the City continues to improve data confidence for these assets, these values will change.

The CAM Office recognizes the importance of continuous improvement as an essential part of the asset management journey. As the City embraces improved practices, it is important to recognize that the City is early in this journey and will acknowledge findings through the Improvement Plan and future iterations of the AM Plans. The CAM Office will continue to support asset management through governance, expertise, monitoring, research support, reporting and assurance of consistent practices. Through the efforts of the CAM Office, enhanced asset management practices will become ingrained in the City's culture at all levels of the corporation. Requirements for a permanent CAM Office will be brought to Council through the 2023 budget cycle.

Alternatives for Consideration – Not Applicable

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: The approval of the Corporate Asset Management Plan Overview and Core Asset Management Plans, attached as Appendix "A", "B", and "C" to Report PW22048, is required for the City of Hamilton to qualify for future infrastructure grants.

There are no specific financial commitments required at this time from this AM Plan however the findings from Report PW22048 will be used to inform the 2023 tax and rate supported budget process.

Staffing requirements as discussed below will come to Council through the 2023 budget process.

Staffing: In order to meet the requirements under O. Reg 588/17 the CAM Office was implemented in June 2021 with Council approval for the creation of the Director position on a two-year contract (ending in June 2023). Additional temporary positions were added in late 2021 in order to meet the July 2022 O.Reg.588/17 requirements. As stated above, requirements span past the

June 2023 Director position end date and as such, resource requirements for the Office will be brought to Council through the 2023 budget cycle to begin the process of creating a permanent CAM Office. Asset Management Plans require regular review and updating in order to continue to meet regulatory requirements past the 2025 date. The creation of a permanent CAM Office will support this requirement as well as Council priorities with the creation of an Asset Management Program for the City.

Legal: N/A

HISTORICAL BACKGROUND

Since 2011, the Province of Ontario has held a strategic plan to guide future municipal investments through the development of asset management plans. Through the 2011 Building Together Program followed by the 2013 Municipal Infrastructure Investment Initiative municipalities were required to submit a detailed AM Plan in order to qualify for future Provincial grant program funding. Hamilton's response to this requirement was Report PW14035 Public Works Asset Management Plan which was published in April of 2014 and was the last AM Plan prepared in Hamilton prior to this report.

Ontario Regulation 588/17 – Asset Management Planning for Municipal Infrastructure, under the Infrastructure for Jobs and Prosperity Act, 2015, came into force on January 1, 2018. Building on the Province's 2011 Building Together: Guide for Municipal Asset Management Plans, the Ontario Regulation 588/17 (O.Reg. 588/17) sets out requirements and deadlines for municipal asset management plans and policies.

The key requirements of O.Reg. 588/17 are described in further detail below. They include the preparation of a strategic asset management policy and phased implementation of the asset management plans.

(1) Strategic Asset Management Policy
The deadline for strategic asset management policy implementation was July 1, 2019. It requires Municipal Council endorsement and shall be reviewed and updated every five (5) years. City Council approved the Corporate Asset Management Policy (PW19053) in June 2019, fulfilling this requirement.

(2) Corporate Asset Management Plan (AM Plan)
The Corporate Asset Management Plan (AM Plan) has three implementation deadlines summarized below:

i. July 1, 2022 – Preparation of an AM Plan, including current levels of service (LOS) in respect of a municipality's core municipal infrastructure which is defined as water, wastewater, storm water, roads and engineered structures;

ii. July 1, 2024 – Preparation of an AM Plan with respect to all of its other municipal infrastructure assets; and,

iii. July 1, 2025 –Preparation of an AM Plan, which will include proposed levels of service, with respect to all its municipal infrastructure assets.

The regulation also outlines that a municipality shall review and update its asset management plan at least every five (5) years.

The Core AM Plans are the result of efforts from staff across the city who are involved with managing municipal infrastructure assets, including finance and technical service areas and operations staff. The process of developing the comprehensive Core AM Plans was complex and required multiple meetings and workshops with each of the 5 service areas included in the scope of the Core AM Plans. The Core AM Plans were developed through different stages including data collection, analysis of lifecycle activities, risk and financial management and current levels of service.

Previous Reports pertinent to this Recommendation:

a) Corporate Asset Management Information Report PW22037 May 18, 2022;
b) Strategic Asset Management Policy PW19053 June 17, 2019; and,
c) Public Works Asset Management Plan - Provincial Requirement PW14035 April 7, 2014.

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

O.Reg. 588/17 came into effect January 1, 2018. It requires the City to develop a comprehensive Corporate Asset Management Plan based on a phased approach with three (3) deadlines of July 1, 2022, July 1, 2024, and July 1, 2025. The July 1, 2022 and July 1, 2024 deadlines are where ‘Core’ assets (water, wastewater, stormwater, road and engineered structures) and all other City infrastructure assets, respectively, are required to have an asset management plan documenting current levels of service. The final deadline requires the documentation of proposed levels of service and financial strategies to fund these expenditures.

RELEVANT CONSULTATION

As part of the AM Plan preparation and development process various workshops and meetings were held with all relevant core asset owner groups and stakeholders. These included the following departments and divisions to ensure that all relevant information had been captured accurately:

- Corporate Services Financial Planning and Policy Division;
- Chief Road Official;

- Public Works divisions (Hamilton Water, Engineering Services and Transportation, Operations and Maintenance); and,
- Planning and Economic Development divisions (Transportation Planning, City Planning and Strategic Growth).

ANALYSIS AND RATIONALE FOR RECOMMENDATION

Like many progressive municipalities, Hamilton is shifting its view of asset management and moving to adopt a service-focused view of its infrastructure and investments. By adopting a customer-centric level-of-service framework, measures and targets, and weighing investment based on service impact and risk, the City will establish a clear relationship between infrastructure investment and service outcomes.

A key output of an AM Plan is the infrastructure funding gap. Hamilton's current infrastructure position represents a social investment that has been built up progressively over the last 150 years predominantly due to underinvestment, including a lack of permanent infrastructure funding from senior levels of government, as well as large spikes of growth throughout the years. Hamilton's challenge is to determine how it will manage the gap over the long term to ensure that the City can continue to deliver its services sustainably today and across future generations.

Over the 10-year planning horizon Hamilton's funding gap is estimated to be $1,959 million or $195.9 million annually (see Table 1) with a low-medium data confidence. Moving forward, the City will continue to improve its asset lifecycle data, and this will allow for more informed choices as how best to mitigate any impacts and address the funding gap itself. This gap in funding future plans will be refined over the next three (3) years to improve the confidence and accuracy of the forecasts in alignment with O. Reg. 588/17 requirements and to present proposed levels of service and a funding strategy by 2025. It should be noted that this funding gap relates to core assets (water, wastewater, stormwater, roads and engineered structures) only and as additional asset classes are added to the program and the City applies asset management practices more robustly, it is expected that this gap will increase.

Table 1: Summary of Assets

Asset Category	Replacement Value (B)	Average Age (Years)	Average Condition	Renewal Funding Ratio	10 Year O&M & Renewal Funding Ratio	Funding Gap per year (M)	Funding Gap over 10 years (M)
Water	$4.3	34	Fair	75%	85%	$20	$202
Data Confidence	Low	Medium	Low	Low-Med	Low-Med	Low-Med	Low-Med
Wastewater	$7.3	30	Fair	46%	70%	$49.8	$498
Data Confidence	Low	Medium	Medium	Low-Med	Low-Med	Low-Med	Low-Med
Storm Water	$3.1	22	Good	9.5%	42%	$31	$312
Data Confidence	Medium	Medium	Low	Low-Med	Low-Med	Low-Med	Low-Med
Road Network	$5.1	16	Fair	14%	66%	$87	$866
Data Confidence	Low	Low	Medium	Low-Med	Low-Med	Low-Med	Low-Med
Engineered Structures	$1.5	33	Good	33%	67%	$8.1	$81
Data Confidence	Medium	Medium	Medium	Low-Med	Low-Med	Low-Med	Low-Med
TOTAL	**$21.3**					**$195.9**	**$1,959**

The total replacement cost for core assets is approximately $21.3B. Overall, core assets are an average of Fair condition, and are an average of 28 years of age with 50% of service life remaining. However, the data confidence levels for these assets are shown as low to medium, indicating that as the City continues to improve data confidence for these assets, these values will change. By only having sufficient funding to renew assets at the above stated ratios (see Table 1), the City will be required to make difficult choices that could include a reduction of the level of service, ability to accept more risk and potentially higher costs to maintain assets. These choices could result in increased customer complaints, potential damage to the City's reputation and risk of fines or legal costs.

Over the next three (3) years Hamilton will be updating the Long-Term Financial Plan (LTFP) to connect the current tax and rate financing strategies to the asset management plans and the levels of service Hamilton provides. This will be a critical task for Hamilton to assist with the undertaking of timely renewals, ensuring both legislative compliance (indicating that the city has no choice) and the continuation of services.

The AM plans detail how the City plans to manage and operate the assets at the current levels of service through managing its life cycle costs. These costs are categorized by life cycle phases which includes acquisition, operations, maintenance, renewal and disposal. Over the ten (10)-year planning horizon Hamilton will acquire $1.728 billion worth of core assets and is expecting to invest $3.448 billion in operations and maintenance. Adding additional assets over time significantly impacts the operational and maintenance resources required to sustain the expected or mandatory level of service. It should be noted that a significant amount of operational and maintenance expenditures are mandatory due to legislative requirements and cannot simply be avoided or deferred. Additionally, over the ten (10)-year planning horizon, Hamilton is expecting to invest $913 million in renewals for the five (5) assets covered under this AM Plan. Continually deferring renewals create risks of higher financial costs, decreased availability, and decreased satisfaction with asset performance.

Data Confidence is referenced throughout the report based on asset management best practice and indicates how confident the City is in the data provided. If the data was obtained using reliable documentation or methodology, then the data has higher confidence than if it was estimated. It was difficult to confirm the accuracy of the data, as such the confidence has predominately been estimated based on completeness. It is a continuous improvement item to continue to assess the data accuracy for assets and implement improvements. See Table 2 for the Data Confidence Grading Scale.

Table 2: Data Confidence Grading Scale

Confidence Grade	Reliability	Accuracy
A - Very High	Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment.	Dataset is complete and estimated to be accurate +/- 2%
B - High	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings. For example, some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation.	Dataset is complete and estimated to be accurate +/- 10%

C - Medium	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available.	Dataset is substantially complete but up to 50% extrapolated data and accuracy estimate +/- 25%
D - Low	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis.	Dataset may not be fully complete, and most data is estimated or extrapolated. Accuracy +/- 40%
E - Very Low	None or very little data held.	Dataset does not exist or very little accuracy.

Although the City considers condition as the preferred measurement for planning, many assets in the City do not yet have a process to determine condition. For assets where there was no known condition information, or inspections were not completed in a manner in which the conditions could be converted to a standardized scale, the condition was assumed based on remaining service life.

In January 2022, the CAM Office released its first two (2) surveys related to asset management for core assets on the Engage Hamilton Site (Roads and Water Services Review page). The number of survey respondents for this initial survey only represents a small portion of the population. Some key findings include that 54% of survey respondents rate the road surface as Poor or Very Poor while almost 79% felt safe using the roads in a motorized vehicle. 89% of survey respondents have not experienced an unplanned water service interruption while 87% feel that drinking water is somewhat safe to drink or better. The full results were used to assist with defining customer levels of service within each AM Plan. Future surveys will be released on a regular basis for each service area to ensure the City is continually receiving feedback on City services.

Since demand is not yet an extensive requirement in O.Reg. 588/17 for the July 1, 2022 deadline, this section is not as robust as some other sections of the report. It is an obligation for the report by July 1,2025 and will be expanded in future iterations. Some key demand drivers identified throughout the AM Plans are population change, regulatory changes/obligations, changes in demographics, seasonal factors, consumer preferences and expectations, technological changes, economic factors and environmental awareness/commitments.

Navigating the climate crisis has been a key area of focus for the City of Hamilton, which is represented by historical efforts to understand the challenges that climate change poses to City assets. As part of this work, an inventory of projects/initiatives has been created and can be found in the Climate Change Adaptation sections of the AM Plans. There will be more robust incorporation of climate initiatives in future AM Plans.

Hamilton has begun to undergo a shift in how it evaluates risk in accordance with its infrastructure planning. While high level risks have been identified in the AM Plans, at this time, the City does not have sufficient data to present risks and trade-offs. This information will be presented in the 2025 AM Plan regarding proposed levels of service.

The CAM office recognizes the importance of continuous improvement as an essential part of the asset management journey. As the City begins to embrace asset management practices, it is important to recognize that the City is early in this journey and will acknowledge findings through the Improvement Plan and future iterations of the AM Plans. Improvement findings include categories such as data inconsistencies (e.g. lack of asset registries, gaps, duplication, low confidence, multiple sources, outdated), asset condition (lack of condition assessments, lack of process), lack of governance structure which impacts staff understanding their roles and responsibilities related to asset management and lack of clearly defined asset ownership. Condition was largely based on estimated service life for the majority of assets and as such, a low confidence level was assigned as age is not always an indicator of condition. In addition, replacement costs were based on in-house costs which were not always based on current market rates.

In summary, the CAM Office has made good progress in both the finalization of the Core AM Plans and the development of the Corporate Asset Management Program. Asset Management is a journey. Some great first steps have been taken in not only meeting the requirements under O. Reg 588/17 but also in developing a corporate wide asset management program that will support the City in making better informed decisions about our assets and the services that we provide.

The CAM Office will continue to lead asset management through governance, expertise, monitoring, research support, reporting and assurance of consistent practices. Enhanced asset management practices will become ingrained in the City's culture at all levels of the corporation.

ALTERNATIVES FOR CONSIDERATION

Council could choose not to endorse the Core Asset Management Plan (AM Plan), attached as Appendices "A", "B" and "C" to this report, as required by Ontario Regulation 588/17. This would put the City of Hamilton in a con-compliant state as it relates to Ontario Regulation 588/17.

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

Community Engagement and Participation

Hamilton has an open, transparent and accessible approach to City government that engages with and empowers all citizens to be involved in their community

Economic Prosperity and Growth
Hamilton has a prosperous and diverse local economy where people have opportunities to grow and develop.

Built Environment and Infrastructure
Hamilton is supported by state-of-the-art infrastructure, transportation options, buildings and public spaces that create a dynamic City.

Our People and Performance
Hamiltonians have a high level of trust and confidence in their City government.

Clean and Green
Hamilton is environmentally sustainable with a healthy balance of natural and urban spaces.

APPENDICES AND SCHEDULES ATTACHED

Appendix “A” to Report PW22048 – Corporate Asset Management Plan Overview

Appendix “B” to Report PW22048 – Transportation Asset Management Plan

Appendix “C” to Report PW22048 – Waterworks Asset Management Plan

CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

Hamilton

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CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

EXECUTIVE SUMMARY

This is the first iteration of the Core Asset Management (AM) Plans completed by the Corporate Asset Management (CAM) office in partnership with over fifty asset owners and key stakeholders across the City. The intent of these first plans is to meet Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure (O. Reg. 588/17) requirements including establishing the current levels of service, and setting a benchmark for the City's core assets (water, wastewater, stormwater, roads and engineered structures) in order to identify continuous improvement items for the next iteration of the AM Plans. The intent is also to support addressing findings from the Roads Value for Money Audit (AUD21006) report related to asset management.

A key output of an AM Plan is the infrastructure funding gap. Hamilton's current infrastructure position represents a social investment that has been built up progressively over the last 150 years predominantly due to underinvestment, including a lack of permanent infrastructure funding from senior levels of government, as well as large spikes of growth throughout the years. Hamilton's challenge is to determine how it will manage the gap over the long term to ensure that the City can continue to deliver its services sustainably today and across future generations.

Over the 10-year planning horizon Hamilton's funding gap for core assets is estimated to be $1,959 million or $195.9 million annually (see Table 1) with a low-medium data confidence. Moving forward, the City will continue to improve its asset lifecycle data, and this will allow for more informed choices as how best to mitigate any impacts and address the funding gap itself. This gap in funding future plans will be refined over the next three (3) years to improve the confidence and accuracy of the forecasts in alignment with O. Reg. 588/17 requirements and to present proposed levels of service and a funding strategy by 2025 for all City assets. There are no specific financial commitments required at this time from this AM Plan however findings from Report PW22048 will be used to inform the 2023 tax and rate supported budget process. It should be noted that this funding gap relates to core assets (water, wastewater, stormwater, roads and engineered structures) only and as additional asset classes are added to the program and the City applies asset management practices more robustly, it is expected that this gap will increase.

The total replacement cost for all core assets is approximately $21.3B. Overall, core assets are an average of Fair condition, and are an average of 28 years of age with 50% of service life remaining. However, the data confidence levels for these assets are shown as low to medium, indicating that as the City continues to improve data confidence for these assets, these values will change. By only having sufficient funding to renew assets at the above stated ratios, the City will be required to make difficult choices that could include a reduction of the level of service, ability to accept more risk and potentially higher costs to maintain assets. These choices could result in increased customer complaints, potential damage to the City's reputation and risk of fines or legal costs.

CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

Over the next 3 years Hamilton will be updating the Long-Term Financial Plan (LTFP) to connect the current tax and rate financing strategies to the asset management plans and the levels of service Hamilton provides. This will be a critical task for Hamilton to assist with the undertaking of timely renewals, ensuring both legislative compliance (indicating that the City has no choice) and the continuation of services.

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In summary, the CAM Office has made good progress in both the finalization of the Core AM Plans and the development of the Corporate Asset Management Program. Asset Management is a journey. Some great first steps have been taken in not only meeting the requirements under O.Reg 588/17 but also in developing a corporate wide asset management program that will support the City in making better informed decisions about our assets and the services that we provide.

The CAM Office will continue to lead asset management through governance, expertise, monitoring, research support, reporting and assurance of consistent practices. Through the efforts of the CAM Office, enhanced asset management practices will become ingrained in the City's culture at all levels of the corporation.

CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

1.0 INTRODUCTION

The City of Hamilton is located on the western tip of Lake Ontario and has a population of approximately 570,000. The City is geologically unique as it is bisected by the Niagara escarpment which splits the City into upper and lower parts, and presents unique challenges with respect to transportation network connectivity and water works service delivery, which are the strategic levels focused on in this Core Asset Management Plan.

In 2001, the new City of Hamilton was formed with the amalgamation of Hamilton and its surrounding communities: Ancaster, Dundas, Flamborough, Glanbrook, and Stoney Creek. As a result, the City acquired many assets in varying condition, and with varying levels of documentation. The City has been working for the last 20 years to collect and compile data for our assets to improve decision making City wide and accomplish our vision of being the best place to raise a child and age successfully. The following map shows the City of Hamilton separated by the five (5) communities with major landmarks including the Niagara Escarpment, Hamilton Harbour and Lake Ontario.

It is important to note that the City has acquired core assets over the last 150 years which have required significant effort to operate, maintain, renew, and dispose, and the purpose of this plan is to quantify and compile these existing efforts and identify areas for improvement.

CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

2.0 SCOPE

This is the first iteration of the Core Asset Management Plans (AM Plan) completed by the Corporate Asset Management (CAM) office using the Federation of Canadian Municipalities (FCM) approach to asset management in partnership with the Institute of Public Works Engineering Australasia (IPWEA) and NAMS (National Asset Management System) Canada framework for asset management.

The intent of these first plans is to meet Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure (O.Reg. 588/17) requirements listed below including establishing the current levels of service for core assets, and to establish a benchmark for the City's core assets in order to identify continuous improvement items for the next iteration of the AM Plans.

The City also acknowledges that GM Blue Plan assisted with the initial data collection for this report and the development of the O.Reg. 588/17 community and technical levels of service in the Core AM Plans.

3.0 DEFINITIONS

TERM	DEFINITION
Acquisitions	The activities to provide a higher level of service through either the construction of new assets, expanding an existing assets service capacity or assumption of donated assets.
Asset	An item, thing or entity that has potential or actual value to an organization. It can be tangible or intangible, financial, or non-financial and includes consideration of risks and liabilities**.**
Asset Management Plan	Document that specifies the activities, resources and timescales required for the asset network to achieve its objectives. Long-term plans (usually 10-25 years or more) that outline the asset activities and programs for each service area and resources applied to provide a defined level of services in the most cost effect way
Bridges	Structures which provide a roadway or walkway for the passage of vehicles, pedestrians or cyclists across an obstruction, gap or facility and are greater than or equal to 3 metres in span (Ministry of Transportation, 2008).
Critical Asset	Assets having potential to significantly impact on the achievement of Hamilton's objective and often refer to those assets necessary to provide services to critical customers. The assets that are likely to result in a more significant financial, environmental, and social costs in terms of impact These assets can be safety critical, environmentally critical or performance critical and can relate to legal, statutory, or regulatory requirements.
Culverts	Structures that provide an opening through soil typically as a channel/tunnel for water (e.g. stream, drainage) underneath a road or railway.
Customer	Any person who uses the asset/service or is affected by it. This definition does not require the person to be a ‘rate’ payer or contribute tax dollars to Hamilton.
Demand	The desire customers have for assets or services
Demand Management Actions	take to influence demand for services and assets. This can be done through either the supply side or the demand side. (Supply side - i.e. Minimize water leaks loss through leak detection. Demand side - i.e. Through pricing, regulation, education, and incentives)

CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

TERM	DEFINITION
Disposal	Actions necessary to decommission assets that are no longer required.
Level of Service	Statements that describe the objectives or outputs of an organization or an activity it intends to deliver to its customers. Parameters include Safety, customer satisfaction, quality, quantity, capacity, reliability, responsiveness, environmental acceptability, cost, and availability
Lifecycle	The time that commences with the identification of the need for an asset and terminates with the decommissioning of the asset. 'Stages involved in the management of an asset Acquisition, Operations, Maintenance, Disposal, Renewal
Lifecycle Activity	The activities undertaken by the City to ensure an asset is reaches its intended useful life
Lifecycle Costs	The total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, renewal, and disposal costs.
Linear assets	Assets which traverse multiple sites and are typically defined by length.
Maintenance	The ongoing management of deterioration. Activities Hamilton undertakes to retain an asset as near as practicable to its original conditions (excluding renewals). These activities do not increase the service life or potential however they slow down deterioration or delay when a renewal is necessary. These activities are grouped as either planned or reactive.
Major culverts	Culverts that have a span of 3 metres or larger.
Minor culverts	Culverts that span less than 3 metres. Refer to the Stormwater Section the AMP for information on minor culverts.
Major Retaining Walls	Structures that are considered retaining walls and are >2m in height considered part of an OSIM inspection
Minor Retaining Walls	Structures that are considered retaining walls, which are not considered part of an OSIM inspection
Operations	Regular activities to provide services at a specified standard which typically would include cleaning, inspections, security checks, grass cutting etc.
Overhead Sign Supports	Structures which support static signs (sign boards) or variable message sign systems

CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

TERM	DEFINITION
Planned maintenance	Necessary activities that ensure the reliability or to achieve the useful life of an asset. These can be either periodic or preventative in nature.
Reactive maintenance	Immediate or emergency repairs required to return the asset to its desired condition
Renewal	The activities that return the assets service capability to a state which it had originally provided. This includes replacement or near total reconstruction of assets that are at the end of their lives.
Replacement cost	The cost Hamilton would have to pay to acquire an equivalent new asset with the same service potential on the reporting date
Resilience	The ability for Hamilton to withstand disruption, absorb disturbances, act effectively in a crisis, adapt to changing conditions including climate change, and grow over time.
Retaining Walls	Structures that hold back fill and are not connected to a bridge
Right of Way	A right of way is a type of easement granted over land for transportation purposes (e.g. road, sidewalk)
Risk – The effect of uncertainty	An effect is a deviation from the expected — positive or negative. Uncertainty is the state, even partial, of deficiency of information related to, understanding or knowledge of, an event, its consequence, or likelihood. Risk is often expressed in terms of a combination of the consequences of an event (including changes in circumstances) and the associated likelihood. In the context of the Risk Management standard- Effect of uncertainty on objectives.
Risk Management	Hamilton's coordinated activities to direct and control actions as well as inform decisions with regards to risk
Stormwater assets	Relate to the collection, transmission, treatment, retention, infiltration, control or disposal of stormwater**.**
Strategic Asset Management Policy (SAMP)	Document that details how Hamilton objectives are to be converted into asset management objectives, the approach and rules for creating all detailed asset management plans, defining all organizational definitions and how to integrate asset management organization wide to further support objectives and ensure informed decision making is possible.
Sustainability	A goal for how assets are to be managed. This represents meeting the needs of the future by balancing social, economic, cultural, and environmental outcomes and needs when making decisions today.

CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

TERM	DEFINITION
Useful Life	The period of time Hamilton expects to be available for use. It it's the expected time between placing the asset into service and removing it from service.
Vertical assets	Assets which can only occupy one site and are typically within a building or a facility which may be comprised of multiple components.
Wastewater assets	Relate to the collection, transmission, treatment or disposal of wastewater, including any wastewater asset that from time to time manages stormwater.
Water assets	Relate to the collection, production, treatment, storage, supply or distribution of drinking water.

4.0 KEY STAKEHOLDERS

KEY STAKEHOLDER	ROLE IN ASSET MANAGEMENT PLAN
Customers/Public	- Participate in engagement to allow Hamilton to understand the communities desired level of service.
Mayor & Council	- Represent needs of community/shareholders, and - Review plan and consider recommendations in decision making.
City Manager & General Managers	- Support continuous improvement initiatives, and - Ensure service is sustainable. - Represent needs of community/shareholders, and - Review plan and consider recommendations in decision making.
Chief Road Official	- Asset owner for transportation assets, - Oversees asset management planning activities within their respective functional area with key outputs of operational and capital plans and budgets. - Sets service objectives and monitor's progress. - Allocate resources to meet planning objectives in providing services while managing risks, - Support continuous improvement initiatives, and - Ensure service is sustainable.
Director, Hamilton Water	- Asset owner for water, wastewater and stormwater assets, - Oversees asset management planning activities within their respective functional area with key outputs of operational and capital plans and budgets. - Sets service objectives and monitor's progress. - Allocate resources to meet planning objectives in providing services while managing risks, - Support continuous improvement initiatives, and - Ensure service is sustainable.
Director, Engineering Services	- Allocate resources to meet planning objectives in providing services while managing risks. - Support continuous improvement initiatives, and - Ensure service is sustainable.
Director, Transportation Operations & Maintenance (TOM)	- Allocate resources to meet planning objectives in providing services while managing risks, - Support continuous improvement initiatives, and - Ensure service is sustainable.
Director, Corporate Asset Management (CAM)	- Allocate resources to meet planning objectives in providing services while managing risks. - Creates a Corporate Asset Management Plan as a recognized and consistent tool for making business decisions related to forecasting and budgeting activities.

CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

KEY STAKEHOLDER	ROLE IN ASSET MANAGEMENT PLAN
	- Coordinates approach and stewardship to align asset management planning with the City's financial plans, budget and other relevant Acts, policies, frameworks, and plans.
Field/Operational Staff	- Verify asset data and regularly monitor condition of the assets for public safety, - Provide operational and maintenance service to the assets, - Report to senior management any progress, deficiencies and effectiveness of operations and maintenance activities.
Province of Ontario	- Establishes Legislation for core assets.

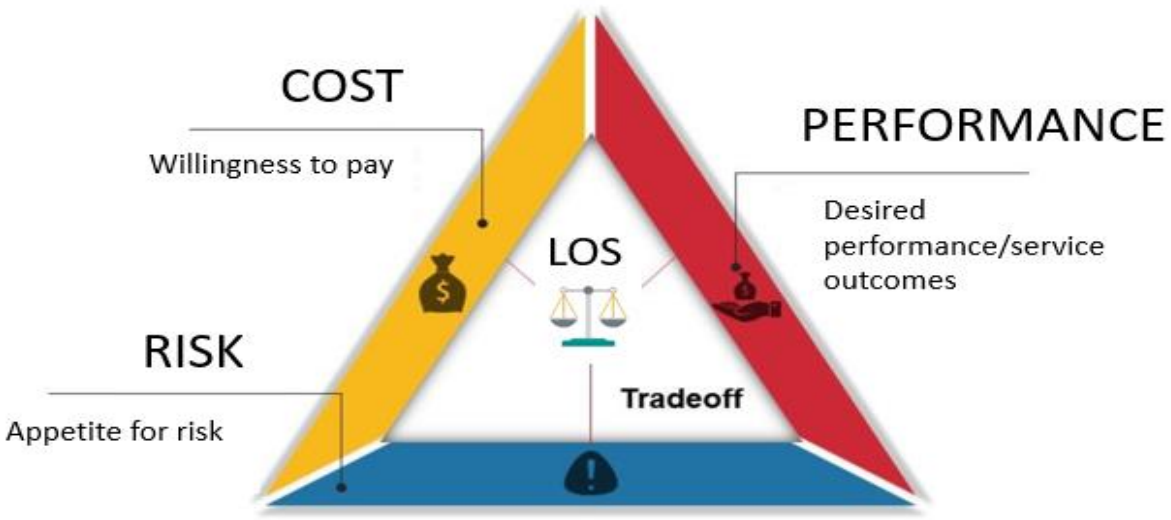
5.0 ASSET MANAGEMENT PLANNING

Asset management relates to the coordinated set of activities and practices an organization applies to achieve strategic objectives through balancing lifecycle costs, risks, and performance to deliver the agreed upon levels of service. In simpler terms, it is about making the right decisions so that the City is doing the right work, on the right asset, at the right time, for the right cost.

Historically, the City has viewed asset management from a lens of "managing assets" which involved specific activities such as completing inventories, performing condition assessments, completing lifecycle activities, and forecasting needs. While those activities are important parts of asset management, if the activities are not coordinated and strategic objectives are not defined, the City will experience disconnects between the activities being completed and the service needs expected by the customer.

These plans are intended to be a shift from "managing assets", to a more holistic view of asset management where the City acts as a steward for assets that contribute to City services which are ultimately paid for and are in service for the customer. It is the City's responsibility to manage costs, risks, and performance in the best interests of the customer, consult customers on their values with respect to these services, and use our technical expertise to set and achieve expectations, in the form of levels of service as shown below in Figure 1.

Figure 1 – Proposed Level of Service Approach



Many municipalities face similar challenges with their assets. Many assets' have long useful lives which can continue through multiple generations, and these assets may cost a significant amount of money throughout their lifecycle. This means that one generation may build an asset

CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

which does not require any substantial works in their lifetime but will lock in future generations with significant costs and risks. Considering the longevity of infrastructure assets in tandem with how the City only has a finite amount of money available to spend on an annual basis means that the City must have a plan in place to conduct and prioritize works so that we are setting up future generations for success. Some questions we are answering in these Asset Management Plans include:

- What do we own?
- What condition is it in?
- Where is it?
- What needs to be done?
- What is it worth?
- When does the work need to be done by?
- Do we have sufficient resources to do the work?
- If we do not have sufficient resources, what are the consequences?
- Are we meeting minimum legislative requirements?
- What level of service are our assets providing?
- How are our assets performing?
- What are our demand requirements?
- How do we manage current and future risks?
- What are the costs required and how do we prioritize competing interests?
- Are there assets that are not needed?
- How successful are we at managing assets?
- Are there areas for improvement?

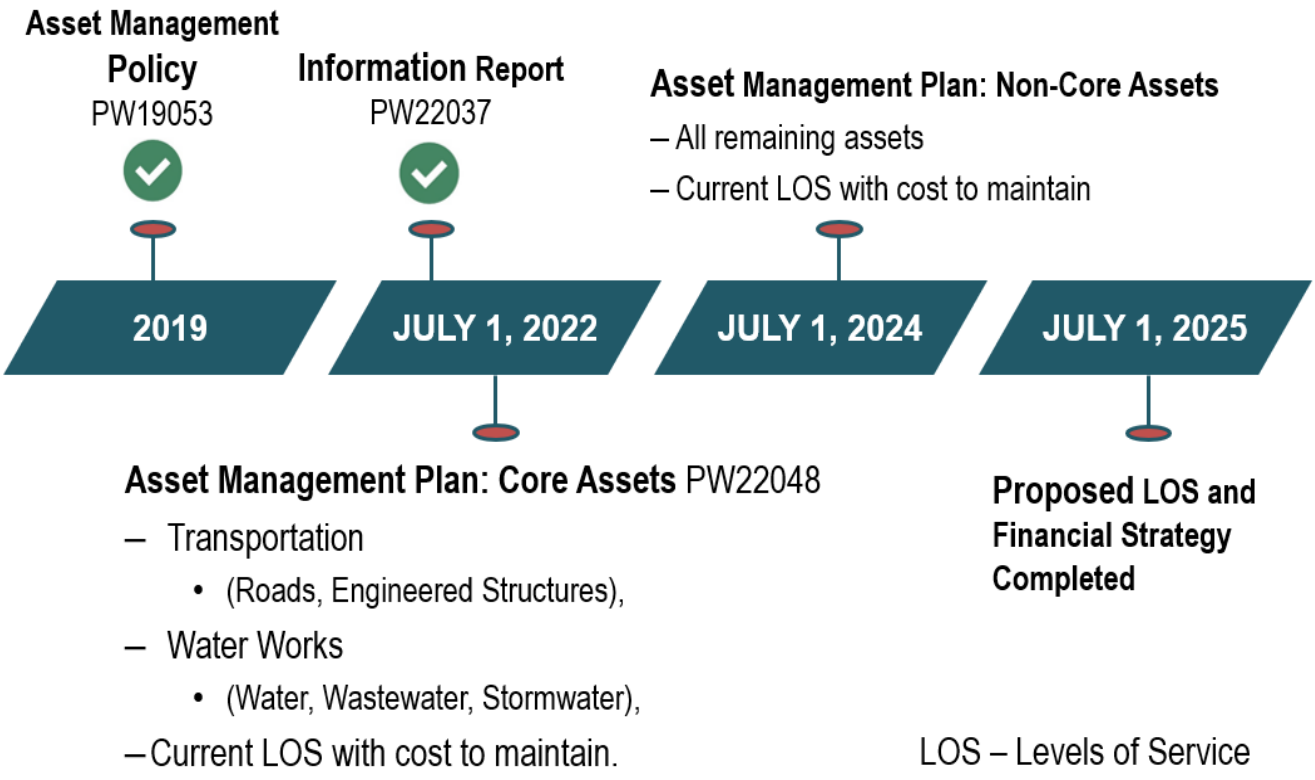
CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

5.1 O.REG. 588/17 OVERVIEW

In January 2018, the province enacted O.Reg. 588/17: Asset Management Planning for Municipal Infrastructure, which was created under the 2015 Federal Infrastructure for Jobs and Prosperity Act. This regulation was created because the province recognized that many Ontario municipalities were facing similar issues with existing infrastructure degrading faster than it was being repaired or replaced. The goals of the regulation were to: standardize asset management plans, spread best practices among municipalities, and improve infrastructure planning in municipalities.

O. Reg. 588/17 prescribed the timelines and requirements municipalities were to complete for the Strategic Asset Management Policy (SAMP), and Asset Management Plans (AM Plans). The regulation separated the AM Plan requirements into core and non-core assets and current and proposed levels of service. Core assets were assets supporting the delivery of the following services: roads, bridges & culverts, water, wastewater, and stormwater. Non-core assets were deemed to be any other assets supporting all other City services. Current levels of service are defined as the level of service the City is currently delivering considering lifecycle costs, performance, and risk, and proposed levels of service are the levels of service the City will be proposing to provide. A brief snapshot of the timelines and requirements for each iteration of the AM Plan is shown below in Figure 2.

Figure 2 – O. Reg. 588/17 Timelines



CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

These 2022 Core Asset Management Plans (AM Plan) is a continuation of the process set out in O.Reg. 588/17, which began with the 2019 Strategic Asset Management Policy, and includes information related to the current levels of service for core assets. The City will continue to proceed with achieving the timelines outlined in the figure above.

5.2 IPWEA & NAMS CANADA FRAMEWORK

Asset management regulations are not new globally, but they are new to Canada. Asset Management has been used globally by multiple governments especially in Australia and New Zealand. There are two (2) international standards that have evolved for asset management which are applied throughout the AM Plan documents: ISO 55000 –Asset Management Standard and ISO 31000 – Risk Management Standard.

The Federation of Canadian Municipalities (FCM) recognizes that there are globally recognized practices that best meet the requirements of O.Reg. 588/17 and therefore, these AM Plans follow the Institute of Public Works Engineering Australasia (IPWEA) and National Asset Management System (NAMS) Canada template and philosophy, while fulfilling the O.Reg. 588/17 timeline and requirements.

The five (5) key asset management principles for organizations to adopt through the IPWEA framework are included below. These principles will be adopted for all asset classes throughout the City:

1. Adopt a lifecycle approach – Apply a whole life methodology for managing infrastructure assets including acquisition, operations, maintenance, renewal and disposal;
2. Endorse evidence-based decision making – Utilize current infrastructure information to support asset planning and decisions;
3. Embrace continuous improvement practices – Implement and adopt asset management practices that formalize and document continuous improvement efforts across the organization;
4. Provide optimal value – Asset service levels will be clearly defined, communicated and fact-based on the realities of today; and,
5. Develop service knowledge – Developing this key competency across the organization will ensure Hamilton is able to balance costs, risk and performance and ensure long term sustainability is achieved.

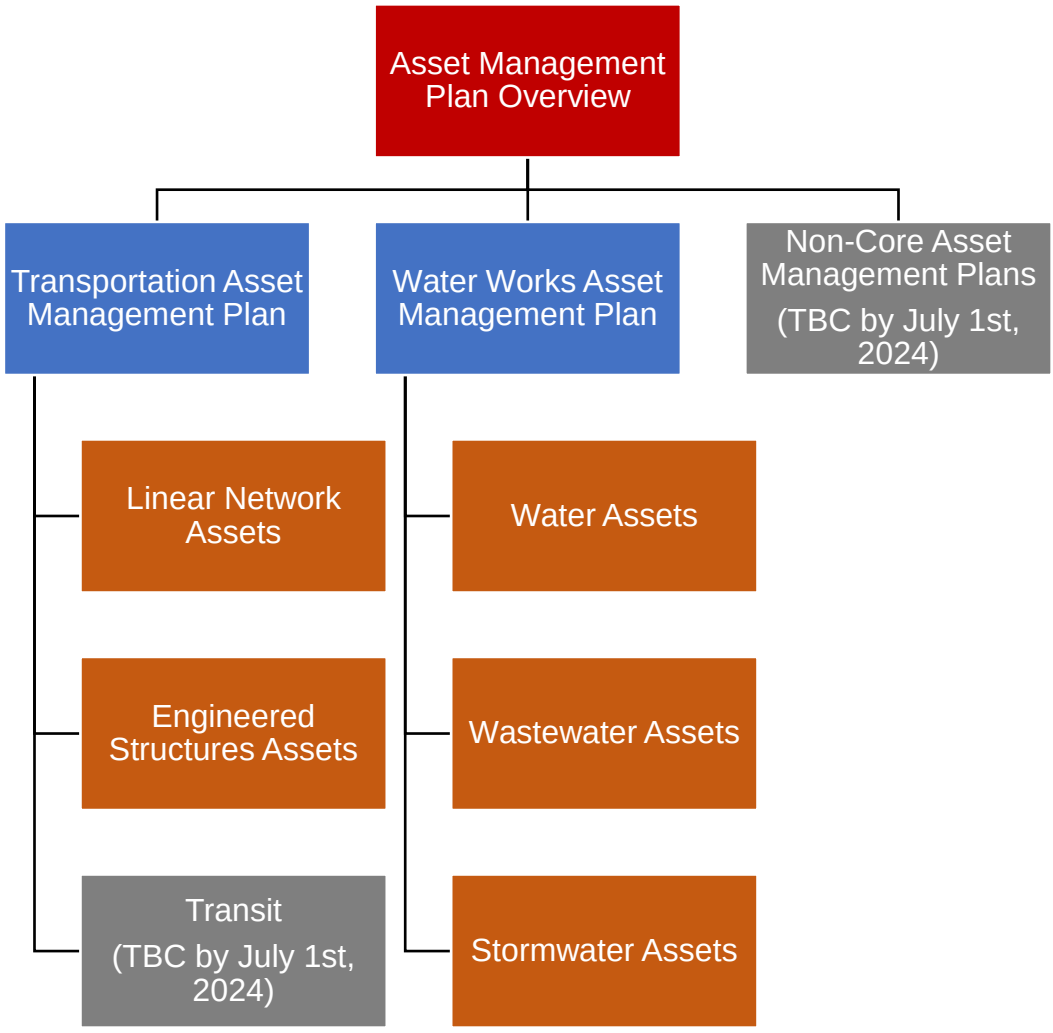
In addition, there are benefits to asset management across the organization, and these six (6) key benefits identified by IPWEA for asset management planning include:

1. Strong Governance and Accountability;
2. Improved Financial Efficiency;
3. More Effective and Sustainable Decisions;
4. Effective Risk Management;
5. Improved Social Outcomes; and,
6. Improved Customer Engagement.

5.3 ASSET MANAGEMENT PLAN NAVIGATION

Per Figure 3 below, the Asset Management Plan is composed of several detailed asset management plan documents which feed into this one Asset Management Plan Overview (AMP Overview). The AMP Overview provides context for all of the AM Plans, summarizes the City's general approach to asset management, and connects the AM Plans together by providing a summary of all the AM Plans completed to date. At the time of writing this report, there are currently three (3) reports including this AMP Overview, but as the City continues along the O.Reg. 588/17 timeline, more AM Plans will be added as shown below in Figure 3.

Figure 3 – Asset Management Plans Structure



5.4 STRATEGIC ALIGNMENT

The City's strategic goals and objectives are shaped by internal drivers such as Council approved strategies and plans, as well as external forces such as citizen expectations, and legislative and regulatory requirements. The specific legislative and regulatory requirements for service areas are provided in each AM Plan.

City objectives provide asset owners with direction regarding levels of service and asset investment priorities. This AM Plan will demonstrate how the City's objectives for core assets can influence levels of service and direct asset expenditures.

The relevant goals and objectives and how these are addressed in the Core AM Plan are summarized in Table 1.

Table 1: Goals and how these are addressed in this Plan

INTERNAL DRIVERS	GOAL	OBJECTIVE	HOW GOAL AND OBJECTIVES ARE ADDRESSED IN THE AM PLAN
Strategic Plan	Economic Prosperity & Growth	Services ensure communities are livable, sustainable, and vibrant, through the provision of infrastructure	The objective of the first iteration of the Core AM Plan is to quantify the current levels of service for core assets.
	Clean and Green	Hamilton is environmentally sustainable with a healthy balance of natural and urban spaces.	The AM Plans consider and identify risks and opportunities for climate change adaptation and resiliency.
	Community Engagement and Participation	Hamilton has an open, transparent and accessible approach to City government that engages with and empowers all citizens to be involved in their community.	The AM Plans engages our customers to understand service level values and expectations.
	Our People and Performance	Hamiltonians have a high level of trust and confidence in their City government.	The AM Plans strive to provide data driven evidence for effective decision making.

CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

INTERNAL DRIVERS	GOAL	OBJECTIVE	HOW GOAL AND OBJECTIVES ARE ADDRESSED IN THE AM PLAN
	Built Environment & Infrastructure	Hamilton is supported by state-of-the-art infrastructure, transportation options, buildings and public spaces that create a dynamic City.	The AM Plans address levels of service associated with their assets.
2018-2022 Council Priorities	Climate Change	The City is committed to improving the health of Hamilton's population through the reduction and prevention of outdoor air pollutant exposure and the mitigation of and adaptation to climate change.	The AM Plans consider and identify risks and opportunities for climate change adaptation and resiliency.
	Multi-Modal Transportation	The City is committed to providing transportation options that meet legislated standards for both personal travel and goods movement in an accessible, convenient, efficient and affordable manner.	The Transportation AM Plan addresses levels of service associated with transportation assets.
	Equity, Diversity and Inclusion	The City is committed to creating and nurturing a city that is welcoming and inclusive.	Future iterations of the AM Plans will incorporate an EDI lens.
	Integrated Growth and Development	The City of Hamilton is committed to planning for and implementing infrastructure in a manner that manages growth in a way that minimizes impact and creates opportunities for both residential and business development, while ensuring the city's overall long-term sustainability.	The Core AM Plans address demand management for assets.
	Trust and Confidence in City Government	The City of Hamilton is committed to promoting an open approach to government. Ensuring public information is readily available and accessible, by promoting	The AM Plans strive to provide data driven evidence for effective decision making.

CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

INTERNAL DRIVERS	GOAL	OBJECTIVE	HOW GOAL AND OBJECTIVES ARE ADDRESSED IN THE AM PLAN
		partnerships and by strengthening and improving its ability to consistently undertake coordinated, transparent and inclusive, evidence-based engagement practices, the City is committed to enabling residents, business owners and community stakeholders to become more involved in decision-making processes and find value in partnering and investing in City programs.	
	Fiscal Health and Financial Management	The City uses financial management tools to plan, direct, monitor, organize and control spending to ensure that the fiscal health of its finances, including its reserves and debt levels.	The AM Plans identify lifecycle needs and the infrastructure gap for assets.
Transportation Master Plan	Sustainable and Balanced Transportation	Integrate walking infrastructure needs into the City's 10 Year Capital Budget so that opportunities for seamless, lower-cost development of pedestrian infrastructure is captured.	The AM Plans identify lifecycle needs and the infrastructure gap for core assets.
	Economic Prosperity and Growth	Provide multi-modal access to/from and within employment lands	The AM Plans identify lifecycle needs and the infrastructure gap for core assets.
Climate Change Task Force	Sustainable Transportation	To change the modal split and investigate strategies so that more trips are taken by active and sustainable transportation than single use occupancy vehicles.	The AM Plans consider and identify risks and opportunities for climate change adaptation and resiliency.

CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

INTERNAL DRIVERS	GOAL	OBJECTIVE	HOW GOAL AND OBJECTIVES ARE ADDRESSED IN THE AM PLAN
Public Works Business Plan 2019-2022	Climate Resiliency	To improve Hamilton's climate resiliency by decreasing our vulnerability to extreme weather, minimizing future damages, take advantage of opportunities, and better recover from future damages.	The AM Plans consider and identify risks and opportunities for climate change adaptation and resiliency.
Strategic Asset Management Policy	Prioritization	Ensure the City continues to provide public services in the road right-of-way, bridges, culverts, drinking water treatment & distribution, wastewater treatment & collection, and storm water systems at defined levels of service.	The objective of the first iteration of the AM Plan is to quantify the current levels of service for core assets.
		Take a long-term view in making asset decisions, especially considering the municipal life cycle of infrastructure assets from acquisition to disposal.	The AM Plans identify lifecycle needs and the infrastructure gap for core assets.
		Clearly identify and respect defined infrastructure priorities. A clearly defined hierarchy for infrastructure priorities is a critical foundation for an effective asset management plan, as priorities should inform investment decisions. Priorities will be further described in the AM Plan.	The objective of the first iteration of the AM Plan is to quantify the current levels of service for core assets.
	Transparency	Infrastructure planning and investment should be made on information that is evidence based, and, subject to any restrictions or prohibitions, on the basis of information that is	The AM Plans have been developed based on available information and evidence based with

CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

INTERNAL DRIVERS	GOAL	OBJECTIVE	HOW GOAL AND OBJECTIVES ARE ADDRESSED IN THE AM PLAN
		either publicly available or is made available to the public.	full disclosure to the public.
		In cases where the City becomes aware of information that has implications for City infrastructure planning, this should be shared with relevant public agencies that may be affected.	
	Health, Safety and the Environment	Ensure health & safety of workers involved in the construction and maintenance of assets is protected.	The AM Plans take into account health, safety and the environment in the risk evaluation process and management of infrastructure lifecycle. The AM Plans consider and identify risks and opportunities for climate change adaptation and resiliency.
		Ensure infrastructure is designed to be resilient to the effects of climate change.	
		Minimize the impact of infrastructure on the environment	
		Respect and help maintain ecological and biodiversity.	
		Endeavour to make use of acceptable recycled materials.	
	Community Focus	Infrastructure planning and investment should promote economic competitiveness, productivity, job creation and training opportunities.	A primary goal of asset management planning is to hear the voice of the community through regular engagement surveys and other means. In all ways, the needs of the public will be considered in the development of
		Promote accessibility for persons with disabilities	
		Promote community benefits, being the supplementary social and economic benefits arising from an infrastructure project that are	

CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

INTERNAL DRIVERS	GOAL	OBJECTIVE	HOW GOAL AND OBJECTIVES ARE ADDRESSED IN THE AM PLAN
		intended to improve the community well-being (creating jobs, improving public space, for example).	infrastructure that support our services.
		Consider the needs of the public by being mindful of the local demographic and economic trends (seniors, commuters, tourists, etc.).	
		Foster innovation by creating opportunities to make use of proven technologies, practices and services (especially those developed in Ontario).	
	Coordination	Be mindful of and align with the other City policies, Strategic Plan, and other plans and strategies in effect. A description of connected plans is provided in further detail in the Asset Management Plan.	This is shown in this table.

5.5 ASSET REGISTRY & HIERARCHY

An asset registry is a single data source which contains an inventory of asset data including attribute information for each individual asset. This attribute information includes a record for each individual asset including condition, age, replacement cost, and asset specific information (e.g. length, diameter, material etc.). At this time, the City does not have an asset registry for core assets but is currently working on implementing an Enterprise Asset Management System (EAM) for Public Works and has multiple systems to manage assets as explained in Section 7.2.3. The asset registry should be structured in the form of an asset hierarchy explained below.

An asset hierarchy provides a framework for structuring data in an information system to assist in collection of data, reporting information and making decisions. The City's asset hierarchy is a functional hierarchy, which means that the hierarchy has been established based on what the asset owner needs or wants the asset or system to do. Generally, assets and systems are organized according to their primary function.

For the AM Plan the asset hierarchy includes the strategic, service area, asset class and asset levels defined below in Table 2. This hierarchy was used for asset planning, financial reporting and service planning and delivery.

It is important to note that the asset hierarchy used in an enterprise asset management system such as the EAM project (explained in Section 7.2.3) will drill down in more detail to the component level of the asset (e.g. pump for a pump station, engine for a vehicle). Since the AM Plan is intended to be a high-level planning document, the asset hierarchy is only provided to the level required for this purpose.

Table 2 – Asset Hierarchy Definitions

HIERARCHY LEVEL	DEFINITION
Strategic	The Strategic level is defined in alignment with the City of Hamilton's corporate priorities and involves decisions from high level stakeholders. The Strategic level should not represent any physical objects i.e., Assets or Systems.
Service Area	The Service Area level identifies subsets of a Strategic level with unique function and service, as defined by the respective Division. Like the Strategic level, the Service Area level should not represent any physical objects i.e., Assets or Systems.
Asset Class	This level further separates the service area level into distinct levels. It is a system used to drill down the service provided within a service area level.

Asset	For the purposes of the asset hierarchy within the AM Plan, an asset is the lowest level where the City is reporting lifecycle activities.

The Strategic Levels that have been identified to contain core assets are Transportation and Water Works. The asset service hierarchies from strategic to the service area are shown below in Table 3. The hierarchy down to the asset level is provided at the beginning of each AM Plan and includes the service area level definitions.

Table 3: Asset Service Hierarchy

Strategic Level	Strategic Functional Definition	Service Area	Asset Class
Transportation	Provide safe, accessible, and efficient movement for people, goods, and services across the City.	Linear Network (Roads)	Road Pavement
			Active Transportation
			Traffic assets
		Engineered Structures	Engineered Structures
		Transit (Future Iteration by July 1st, 2025)	TBD
Water Works	Operate infrastructure that supports the supply of safe, clean drinking water, collection and treatment of wastewater, and collection of storm water.	Water	Vertical
			Linear
		Wastewater	Vertical
			Linear
		Stormwater	Vertical
			Linear

6.0 ASSET BACKGROUND INFORMATION

Throughout the AM Plans, background information includes information related to inventory, condition, replacement cost, and asset usage.

6.1 OVERALL SUMMARY OF ASSETS

An overall summary of the core assets defined in each AM Plan can be found below in Table 4. The total replacement cost for all core assets is approximately **$21.4B**. Overall, core assets are an average of **Fair** condition, and are an average of **27 years** with **52%** of service life remaining. However, it is evident that overall, the data confidence levels for these assets are shown as low to medium, indicating that as the City continues to improve data confidence for these assets, these values will change.

For detailed information for each service area, please refer to the Detailed Summary in each AM Plan.

Table 4 – Core Assets Summary

Strategic Level	Replacement Value	Average Age (% RSL)	Average Equivalent Condition
Transportation*	**$6.7B**	**25 years (49%)**	**3-Fair**
Data Confidence	Low	Low	Medium
Water Works	**$14.7B**	**29 years (54%)**	**3-Fair**
Data Confidence	Low	Medium	Medium
TOTAL	**$21.4B**	**27 years (52%)**	**3-Fair**

***Excluding Transit**

Data confidence is defined in Table 5. As previously mentioned, the data confidence is shown overall as low to medium. As indicated throughout the AM Plans, the City has completed many inventory projects, inspections and condition assessments over the last 20 years. However, it was also found that there is not yet an asset registry for many assets, resulting in many different inventory data sources with conflicting and missing information especially surrounding age data. Currently, there is also a lack of processes for documenting these inspections and assessments to be able to include them as part of the AM Plan. This means that condition was largely based on estimated service life (ESL) for the majority of assets which is a low confidence level as age is not always an indicator of condition. This also means since some assets' have a low

confidence in age data and no known condition data, condition was not able to be estimated for some assets and are shown to be unknown. This has been identified as a continuous improvement item.

In addition, replacement costs were based on in-house costs which were not always based on current market rates. Linear assets typically have a higher level of confidence in replacement costs because these assets are replaced more often. Vertical assets are not typically replaced as frequently and are often high cost assets which is why the replacement cost is often considered low. Improving the process for estimated replacement costs to use current market rates as often as possible has been identified as a continuous improvement item.

6.2 INVENTORY DATA

The information in the following sections indicates where the inventory data in the AM Plan reports were accessed from.

6.2.1 Key Existing Databases

The City maintains various databases to track asset inventory data. For core assets, the City of Hamilton currently manages asset data using the following systems shown below in Table 6. The City is in the process of implementing an EAM system which will consolidate all Public Works data into a single asset registry as explained in Section 6.5. Asset data for this report was collected from the database that was considered the most confident based on asset owner opinion.

Table 6 – Asset Databases

Database	Description	Data	Core Strategic Level
Infor Hansen Work Management System	Work management system used by various business units to store inventory data and manage work orders.	Information from ArcGIS database; Field inventory confirmations;	Transportation, Water Works
ESRI ArcGIS geodatabase	ArcGIS is a geographic information system (GIS) consisting of desktop, server and mobile applications used for storing, mapping and analyzing the City's infrastructure and geographic data.	Information from As Built drawings; Historically input assumed data that has not been verified; Inventories created using aerial data; Field inventory confirmations; Data provided by communities for information related to assets that were acquired during the 2001 amalgamation	Transportation, Water Works
Bridge Management System (BMS)	This tool manages bridge data, provides risk information for the asset, and engineering models and benefit/cost analysis to assist with project planning.	Consultant completed inventories	Transportation

6.2.2 Data Confidence

Data Confidence is referenced throughout the report and indicates how confident the City is in the data provided. If the data was obtained using reliable documentation or methodology, then the data has higher confidence than if it was estimated. At the time of writing the report, it was difficult to confirm the accuracy of the data, as such the confidence has predominately been estimated based on completeness and the current assumed accuracy. It is a continuous improvement item to continue to assess the data accuracy for assets and look for areas for improvement.

Table 5 – Data Confidence Grading Scale

Data Confidence Grading Scale		
Confidence Grade	**Reliability**	**Accuracy**
A - Very High	Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment.	Dataset is complete and estimated to be accurate +/- 2%
B - High	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings. For example, some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation.	Dataset is complete and estimated to be accurate +/- 10%
C - Medium	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available.	Dataset is substantially complete but up to 50% extrapolated data and accuracy estimate +/- 25%
D - Low	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis.	Dataset may not be fully complete, and most data is estimated or extrapolated. Accuracy +/- 40%
E - Very Low	None or very little data held.	Dataset does not exist or very little accuracy.

6.2.3 Enterprise Asset Management (EAM) System

After identifying eleven (11) different software systems currently used to track and manage over $20B in diverse and complex assets, the General Manager's Office in Public Works recognized in 2017 that a single Enterprise Asset Management System (EAM) system was required. Most of these systems were stand-alone solutions managing an individual section's infrastructure with no or limited integration with critical systems such as the Finance system, ESRI ArcGIS Mapping and other City systems.

The existing structure is also characterized by the following issues:

- Processes to manage assets and key work activities are not standardized across Public Works;
- Separate and non-integrated systems and tools;
- Some transfer of data between a small number of systems;
- Multiple versions of the same data, with inconsistencies;
- Multiple versions of data without data integrity;
- Low end-to-end process maturity across the asset lifecycle;
- Some areas managing data and work orders manually, with greater opportunity for error and degraded asset lifecycle, in addition to the associated inefficient manual processes; and,
- Difficulty and cost of providing transparency, repeatability and integrity of the information and consistency of decisions.

Public Works has a unique challenge collecting and managing asset related information due to the disparity between the existing systems and the limited ability of such systems to meet current needs. The current structure leaves most groups without access to aligned, unified and accurate data normally seen through an asset registry. A foundational piece to an EAM environment is the reliable and efficient access to unified and accurate data. This allows for better business process integration, timely decision making and streamlined process execution. A single, integrated EAM system will provide the ability to maintain data integrity across sections with the ability to mine data to improve performance and capital budget decisions. This would simplify and improve data integrity for reporting requirements for various parties and provide an asset registry for assets within the system. As well, streamlining and standardizing processes, designing workflows and hierarchies holistically throughout Public Works, and setting the asset hierarchies within standardized workflows within an integrated system, is a required foundational step in a successful asset management program. The hierarchy identified in Section 6.5 is the draft hierarchy for the EAM project.

In addition, an EAM system enables municipalities to develop comprehensive programs to manage the complete lifecycle of assets, including capital planning and prioritization, preventive, predictive, routine and unplanned maintenance and calibration, while improving the daily effectiveness of operations and technical staff. It also allows for better management of equipment and facilities to increase reliability and ensure compliance with laws, regulations and

industry-specific requirements. The ability to conduct advanced analytics to inform risk prioritization and capital funding priorities, and in some cases, allow some sections that are still paper based and manual to be updated and included in the data schemas is critical.

This prompted a feasibility study in 2018 which concluded that Public Works could reduce its technology footprint to only a few systems and resulted in receiving Council approval through Report PW19035/FCS19040 in January 2020 to proceed with Hexagon's Enterprise Asset Management (EAM) system over a 4-year implementation.

6.3 MUNICIPALITY'S APPROACH TO CONDITION

Condition is the preferred measurement for planning lifecycle activities to ensure assets deliver the agreed upon levels of service and reach their expected useful life. The City outlines the existing condition assessment methodology (if available) for each of the core assets in the Asset Management Plans.

6.3.1 Condition Scoring

Although the City considers condition as the preferred measurement for planning, many assets in the City do not yet have a process to determine condition. For assets where a condition program exists, and a condition score was output, those conditions were converted to the scale below in Table 7 and these conversions are shown in each section of the AM Plans.

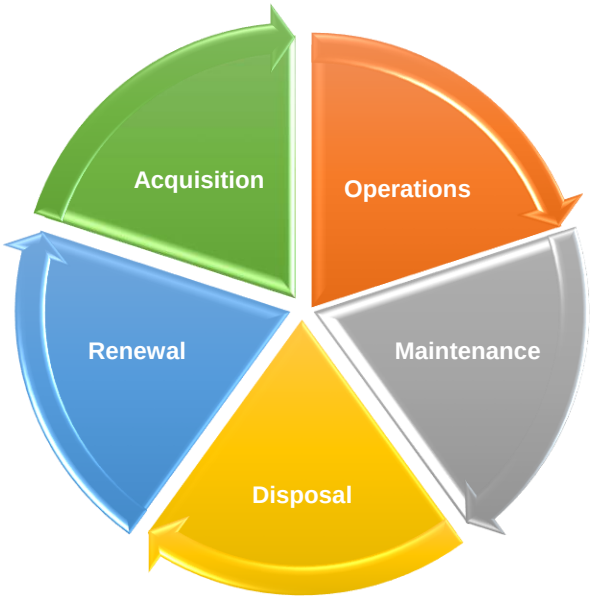
For assets where there was no known condition information, or inspections were not output in a way where the conditions could be converted, the condition was assumed based on remaining service life. In future, the City is investigating completing condition assessments for assets where no program exists. For some assets, condition assessments are not economical, but for many assets, regular inspections occur to ensure these assets are in working order. The City is investigations modifying these inspections to output a condition score.

Table 7 – Condition Scoring

EQUIVALENT CONDITION GRADING	CONDITION DESCRIPTION	% REMAINING SERVICE LIFE
1-Very Good	The asset is new, recently rehabilitated, or very well maintained. Preventative maintenance required only.	>79.5%
2-Good	The asset is adequate and has slight defects and shows signs of some deterioration that has no significant impact on asset's usage. Minor/preventative maintenance may be required.	69.5% – 79.4%
3-Fair	The asset is sound but has minor defects. Deterioration has some impact on asset's usage. Minor to significant maintenance is required.	39.5% - 69.4%
4-Poor	Asset has significant defects and deterioration. Deterioration has an impact on asset's usage. Rehabilitation or major maintenance required in the next year.	19.5% -39.4%
5-Very Poor	Asset has serious defects and deterioration. Asset is not fit for use. Urgent rehabilitation or closure required.	<19.4%

6.4 LIFECYCLE MANAGEMENT APPROACH

The lifecycle management plan details how the City plans to manage and operate the assets at the agreed levels of service through managing its life cycle costs. These costs are categorized by life cycle phases which includes acquisition, operations, maintenance, renewal and disposal.



Once Hamilton acquires an asset, the City then becomes obligated to fund the remaining lifecycle costs such as its operations, maintenance and likely inevitable renewal. These other lifecycle costs are far more significant than the initial construction or purchase cost and are often multigenerational. Since lifecycle costs are spread across multiple decades, it is essential that Hamilton approach its asset planning over the long term to ensure it effectively manages the asset and inform choices.

6.4.1 Acquisition Plan

Acquisitions are activities that either add new assets that did not exist before or improve an existing assets capability or function. The costs and activities that are included as part of the acquisitions and include: design, training, consulting, purchase costs and staff time to ensure the asset is ready for service and can be put into use. Hamilton acquires assets by either construction or through the assumption of assets through development agreements (i.e. donated assets). Typical acquisitions include:

- Extending water works services to unserviced areas;
- Expanding a road from 1 lane to 2 lanes;
- Assuming a storm water management pond from growth or development; and,
- Expanding a bridge to accommodate increased traffic volumes.

CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

Over the ten-year planning horizon Hamilton will acquire $1.728 Billion dollars worth of core assets. Once assets are acquired, the City then becomes the stewards of these assets and is responsible for all ongoing costs for the assets' operation, continued maintenance, inevitable disposal and their likely renewal. It is critical for Hamilton to improve its understanding of the connection between acquisitions and what future costs will be incurred because of these acquisitions.

The City is reviewing its acquisition process through the regular updating of the AM Plans to ensure that it proactively understands what assets are being acquired over the planning period and to ensure they are considered and funded properly across their lifecycle. Improved knowledge of both constructed and donated assets will allow multiple departments across the City to plan for the assets properly such as:

- AM to forecast the long-term needs and obligations of the assets;
- Operations and maintenance can include the assets in their planned activities (inspections, legislative compliance activities); and,
- Finance can ensure that assets are properly captured and recognized appropriately (Audited Financial Statements, TCA process, Provincial reporting such as the FIR)

Figure 4 – Projected Acquired Assets

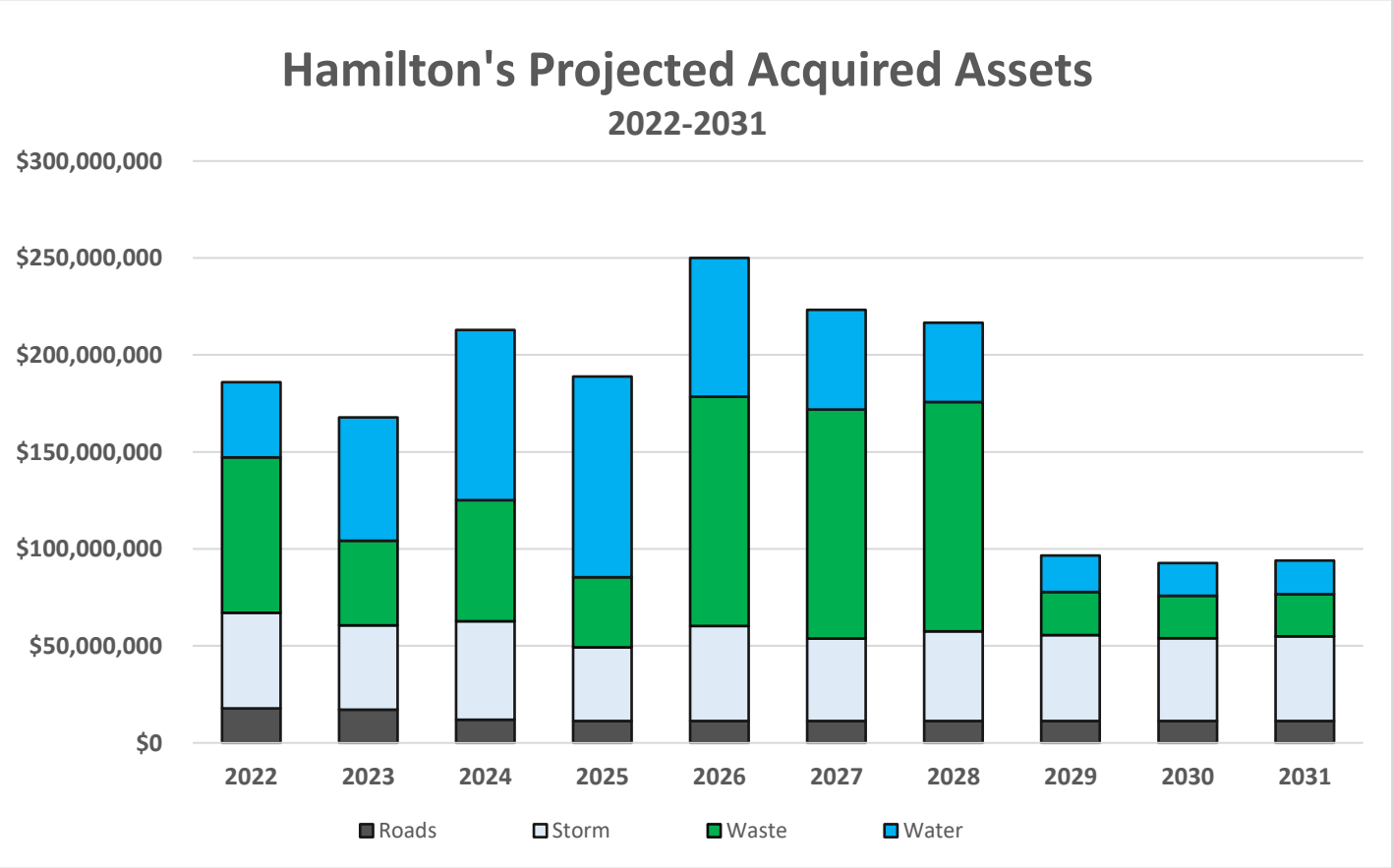


Figure 4 details the planned acquisitions for Hamilton's assets classes covered by these plans across the ten-year planning horizon (2022 – 2031) and includes both constructed and assumed assets. The most significant acquisitions come from the Water Works strategic level with $1.6 billion in acquisitions and Transportation is an additional $125.7 million of acquired assets. It is important to note that engineered structures are missing from this figure because at the time of writing the report there was insufficient data to complete the 10 years in the current forecast. Future iterations will include all known engineered structure acquisitions. All newly acquired assets require ongoing and significant funding to ensure that future levels of services can be maintained, and future generations can enjoy the level of service provided today.

The City has sufficient budget for its planned constructed acquisitions at this time. It will become critical to understand that through the construction or assumption of new assets, the City will be committing to funding the ongoing operations, maintenance and renewal costs which are very significant. The City will need to address what is considered affordable, how to best fund these ongoing costs as well as the costs to construct the while seeking the highest level of service possible.

Future AM Plans will focus on improving the understanding of Whole Life Costs and funding options however, at this time the plan is limited on those aspects. Expenditure on new assets and services will be accommodated in the long-term financial plan but only to the extent that there is available funding.

6.4.2 Operations & Maintenance Plan

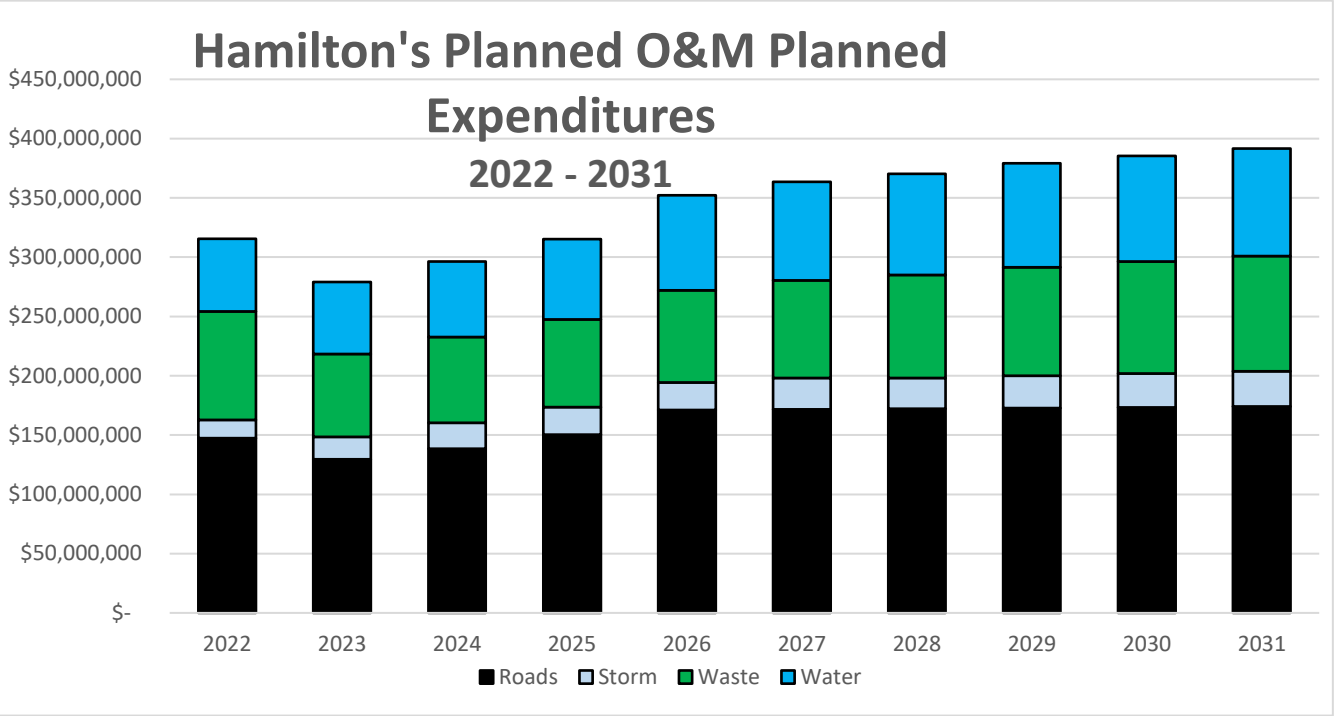
Operations and maintenance activities are an essential component to the lifecycle and are necessary to ensure that an asset is able to provide the service at its expected level. Without these necessary activities and interventions, the assets will not reach their expected useful life and will require costly renewals before their time. Hamilton will review and report on its operational and maintenance activities through the creation of future iterations of the AM Plans.

Operations include all regular activities to provide services. Examples of typical operational activities include snow ploughing, street sweeping, waterline flushing, biennial bridge inspections, and the necessary staffing resources to perform these and other activities.

Maintenance should be viewed as the ongoing management of deterioration. It includes all actions necessary for retaining or returning an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating. Examples of typical maintenance activities include pipe repairs, pothole repairs, bridge deck repairs, dredging storm water management ponds, equipment repairs along with appropriate staffing and material resources required to complete these works.

Proactively funding planned maintenance is always preferred compared to responding to high cost reactive maintenance. Hamilton will continue to review its maintenance planning to ensure it is maximizing its opportunities and investments and minimize the impacts and resources required for reactive maintenance.

Figure 5 – Planned Operations and Maintenance Expenditures



Over the 10-year planning horizon Hamilton is expecting to invest $3.5 billion in operations and maintenance for the 5 assets covered under the Core AM plan. Transportation will invest $1.6 billion to ensure roads are maintained at their current service level and Water Works will invest $1.85 billion to deliver their services at the current level.

Adding additional assets over time significantly impacts the operational and maintenance resources required to sustain the expected or mandatory level of service. It should be noted that a significant amount of operational and maintenance expenditures are mandatory due to legislative requirements and cannot simply be avoided or deferred.

Once an asset has been built, certain operational and maintenance costs are often considered 'locked in' with very little room for Hamilton to influence the mandatory activities. For example, if Hamilton builds 1 km of highway, it then becomes obligated by legislation to care for that section of road as prescribed by the Province. In this situation, Hamilton must follow the Minimum Maintenance Standards (MMS) and plough the road and repair potholes within specific timeframes which all requires resources that are in high demand.

There are operational and maintenance activities that Hamilton can influence once an asset has been constructed such as the frequency of cleaning or inspections as well as preventative maintenance programing. Hamilton will continue to identify and review its operational and maintenance lifecycle activities to ensure the optimal management of its assets.

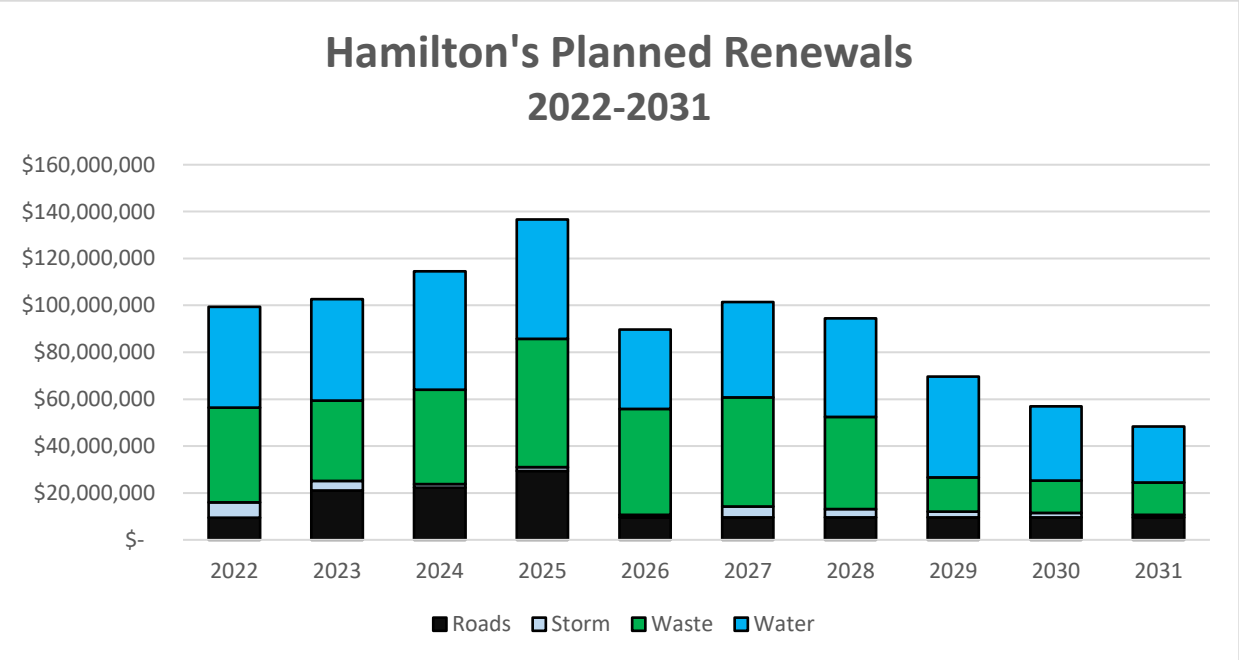
6.4.3 Renewal Plan

As infrastructure is used, it is normal to see a decline in its performance and inevitably, an asset will fail. Asset failure will create service interruptions and may pose a risk to public health and safety. Renewal activities replace an existing asset with an asset of similar type and purpose without changing its service capacity. This lifecycle activity is essential for the provision of service as no asset has an infinite service life. Without timely renewals, an asset typically requires extensive and high cost maintenance activities to ensure the asset can perform its intended function or possible disposal when maintenance efforts are no longer economically feasible.

Asset renewals are typically undertaken to either ensure the assets reliability or quality will meet the service requirements set out by the City. Renewal projects are often triggered by service quality failure and can often be prioritized by those that have the highest consequence of failure, have high usage, have high operational and maintenance costs and other deciding factors.

When renewals are programmed for the optimum time it ensures that services can continue with minimal interruption and that resources are optimized through the mitigation or avoidance of high cost maintenance and risk costs. Renewals being completed in a timely manner is critical to ensure that Hamilton can deliver its services over the long term at their expected level of service.

Figure 6 – Planned Renewals



Over the 10-year planning horizon, Hamilton is expecting to invest $913 Million in renewals for the five (5) assets covered under these AM Plans. Transportation will invest $139 Million to renew transportation assets to their current service level and Water Works will invest $774 Million

to renew existing assets. The forecasted costs above are consolidated from both the capital and operating budget.

Renewal investment is required to ensure the optimal delivery of service is possible. Continually deferring renewals create risks of higher financial costs, decreased availability, and decreased satisfaction with asset performance. Properly funded and timely renewals will ensure the assets perform as expected and it is recommended to continue to analyse asset renewals based on criticality and availability of funds for future AM Plans.

6.4.4 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, possible closure of service, decommissioning, disposal of asset materials, or relocation. Disposals will occur when an asset reaches the end of its useful life. The end of its useful life can be determined by factors such as excessive operation and maintenance costs, regulatory changes, obsolescence or demand for the structure has diminished.

At this time Hamilton has minimal disposals planned for its core asset classes. Future iterations of the AM Plan will improve upon disposal reporting and planning options. Hamilton will provide a summary of the disposal costs and estimated reduction in annual operations and maintenance costs.

6.5 LEVEL OF SERVICE APPROACH

Levels of service (LOS) are measures for what Hamilton provides to its customers, residents and visitors. Service levels are best described as the link between providing the outcomes the community wants, and the way that Hamilton provides those services. Ideally, Hamilton should provide the levels of service that the current and future community both want and are prepared to pay for. Hamilton's approach to developing levels of service is found below.

6.5.1 Level of Service Development

Levels of service are created considering four (4) main components: customer values, level of service statements, customer performance, and technical performance as shown below in Table 8.

Table 8 – Level of Service Definitions

Concept	Definition
Customer Values	What the customer can expect from their tax dollar in "customer speak", and include: ▪ What aspects of the service is important to the customer; ▪ whether they see value in what is currently provided; and, ▪ the likely trend over time based on the current budget provision. These values are gathered using an engagement survey and are used to develop level of service statements.
Level of Service Statements	Level of service statements utilize objectives to spell out exactly what the customer can expect from their tax/rate dollars and tie the customer and technical levels of service together. The LOS statements describe the outputs Hamilton intends to deliver to customers and commonly relate to service attributes such as: quality, reliability, accessibility, affordability, quantity, responsiveness, timeliness.
Customer Performance Measures	Relate to how the customer feels about the service, and so these measurements can be tangible and intangible. These should also be written in "customer speak" and are considered in terms of three (3) factors: ▪ Condition - How good is the service? What is the condition or quality of the service?

Concept	Definition
	▪ Function - Is it suitable for its intended purpose? Is it the right service? ▪ Capacity/Usage - Is the service over or under used? Do we need more or less of these assets?
Technical Performance Measures	Relate to what the City does to deliver the services and are tangible measurements. These should be used internally to measure performance against service levels and are technical in nature. Technical service measures are linked to lifecycle activities and annual budgets covering Acquisition, Operation, Maintenance, Disposal, and Renewal.

6.5.2 Customer Engagement

The City of Hamilton strives to engage with its users to track satisfaction with Hamilton's assets and services to ensure that the City understands customer values and formulates the correct customer performance measures.

In January 2022, the City released its first two (2) surveys related to asset management for core assets on the Engage Hamilton, Roads and Water Services Review page.

These surveys were released individually as to not overwhelm survey respondents. The Corporate Asset Management Office intends to release surveys on a regular basis for each service area to ensure the City is continually receiving feedback on City services.

A summary of the number of submissions for each survey is found below in Table 9:

Table 9 – Summary of Survey Submissions

SURVEY NAME	TOTAL SUBMISSIONS
Roads, Bridges and Culvert Survey	279
Drinking water, Stormwater and Wastewater Survey	184

While these surveys were used to establish customer values and customer performance measures, it's important to note that the number of survey respondents only represents a small portion of the population. The City will continue to improve the marketing strategy to ensure these surveys reach a larger audience. This has been identified as a continuous improvement item.

The results of the survey can be found in Appendix A. These results were used to formulate the customer values and performance measures included in each AM Plan.

6.5.3 Performance Measurement

Historically, the City of Hamilton has identified measuring performance as a priority. In 2017 the Public Works Balanced Scorecard was implemented where metrics were created by senior management based on department priorities, with a motivator of “how do you know that you had a good day?” Data is entered by staff on a pre-determined frequency (e.g. monthly, quarterly) depending on the type of metric. The information from this tool was the starting point to develop the technical performance measures for this iteration of the plan.

However, it was found that the metrics currently in the scorecard typically focused on operations and maintenance lifecycle activities and were measuring how the City is performing in accordance with legislative requirements. Since there are additional lifecycle stages beyond operations and maintenance, and customer preferences and expectations do not always match minimum legislated requirements as discussed in the AMPs, this suggests that these metrics should be revisited for future iterations of the plan to confirm that they are reflecting the entire lifecycle of the assets as well as customer values. This has been identified as a continuous improvement item.

When creating and revising technical performance metrics, the City will be ensuring that SMART criteria are used. The acronym has been defined below:

LETTER	CRITERIA	DEFINITION
S	Specific	Provide a clear description of what needs to be achieved.
M	Measurable	Include a metric with a target that indicates success.
A	Attainable	Set a challenging but realistic target which is agreed to by those who must complete the task.
R	Relevant	Ensure the metric can be applied to known problems
T	Time-based	Establish clear timeframe for achieving the outcome.

6.6 FUTURE DEMAND MANAGEMENT APPROACH

In asset management, demand is defined as the desire customers have for assets or services they use and that they are willing to pay for. These are the desires for either: new assets or services or current assets. Hamilton's approach to demand management is found below.

Since demand is not yet an extensive requirement in O.Reg. 588/17 for the July 1st, 2022 deadline, the demand sections are not as robust as some other sections of the report, however, it is an obligation for the report by July 1st, 2025, and will therefore be expanded in future AMP iterations.

6.6.1 Demand Management

Demand for services is typically measured considering how many customers use the assets. In order to manage demand, the City must plan and take action to influence demand for services or usage of assets. In addition, demand will inevitably change over time and will impact the needs and desires of the community in terms of the quantity of services (e.g. assumption of assets due to development growth) and types of service required (e.g. different assets are required to meet consumer preference).

Some key demand drivers identified throughout the AM Plans are:

- Population Change;
- Regulatory Changes/Obligations;
- Changes in Demographics;
- Seasonal Factors;
- Consumer Preferences and Expectations;
- Technological Changes;
- Economic Factors; and,
- Environmental Awareness/Commitments.

6.6.2 Growth Projections

GM Blue Plan assisted with the Growth Projection analysis for the report. The 2019 Development Charge Background Study thoroughly assessed the impact of growth on demand and the resulting capital and significant operating expenditures that are anticipated for core assets to 2031. These forecasts, results and recommendations are used in the asset management discussions for each asset category.

Per Table 10 below, the City's population is anticipated to reach 614,943 by early 2029 and 636,080 by mid-2031, resulting in an increase of 65,046 and 86,183 persons, respectively, over the 10-year and longer term (2019 to 2031) forecast periods. A requirement per O. Reg. 588/17 was to include the Greater Golden Horseshoe (GGH) projections for Hamilton, which shows that

the population is expected to be approximately 820,000 by 2051. Total employment, including work at home and no fixed place of work (NFPOW) for Hamilton is anticipated to reach 285,130 by early-2029 and 300,000 by mid-2031. This represents an employment increase of 46,114 for the 10-year forecast period and 60,984 for the 2019 to 2031 forecast period. A requirement per O. Reg. 588/17 was to include the Greater Golden Horseshoe (GGH) projections for Hamilton, which shows that employment is expected to be approximately 360,000 by 2051.

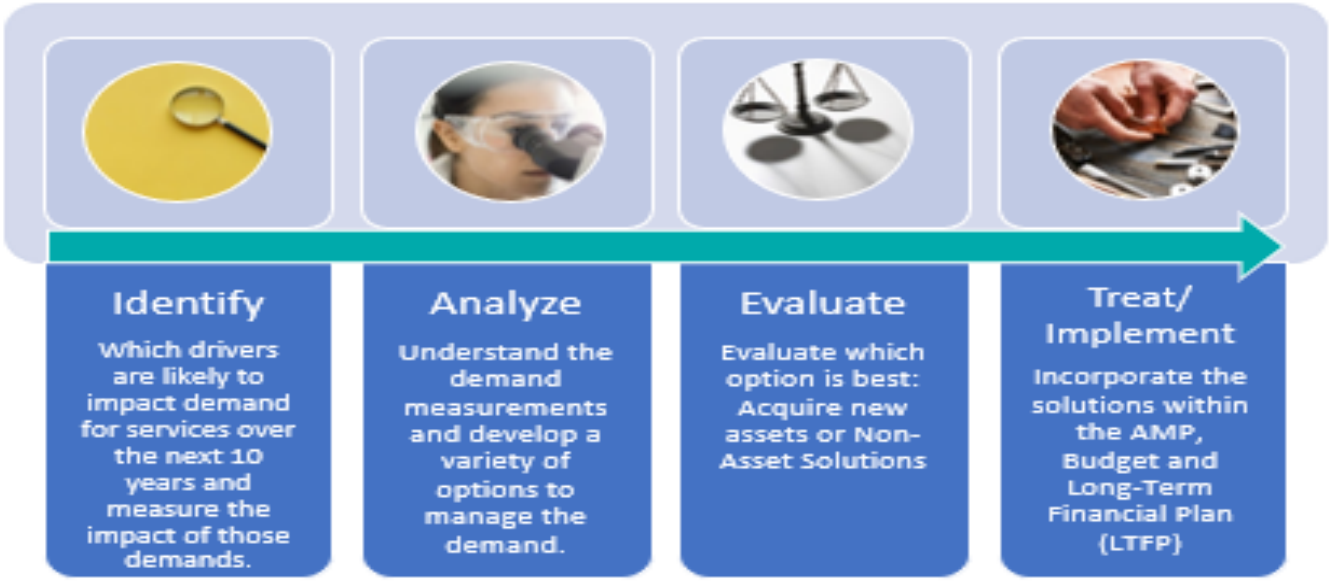
Table 10 – Population and Employment Projections

	2016	Early 2029	Mid 2031	2051
SOURCE	DC STUDY	DC STUDY	DC STUDY	GREATER GOLDEN HORSESHOE
Population	557,110	614,943	636,080	820,000
Employment	203,336	285,130	300,000	360,000

The 2031 DC Study numbers were used for population and employment drivers during the demand process.

6.6.3 Demand Management Process

When quantifying demand in the AM Plans, the four-step process shown below was used to develop a high-level demand management plan for key demand drivers identified for the service area. It is a continuous improvement item to identify additional demand drivers in future for the proposed levels of service requirement in O. Reg. 588/17 by July 1st, 2025.



6.7 CLIMATE CHANGE ADAPTATION APPROACH

Navigating the climate crisis has been a key area of focus for the City of Hamilton, which is represented by historical efforts to understand the challenges that climate change poses to City assets.

6.7.1 Background

In 2019, Hamilton City Council declared a climate change emergency and directed staff to form a Corporate Climate Change Task Force (CCCTF). The task force created overarching goals and areas of focus for both climate mitigation and adaptation and was the start of Hamilton's corporate-wide approach to reduce greenhouse gas (GHG) emissions, where the goal is to achieve net zero GHG emissions by 2050.

6.7.2 Asset Owner Response to Climate

In support of the CCTF, asset owners have responded by working to understand mitigation and adaptation opportunities. The goal is to increase our infrastructure's capacity to recover, adapt, and thrive in the face of adversity, chronic stresses and acute shocks that will be encountered in a future of changing climate conditions.

As part of this work, an inventory of projects/initiatives has been created and can be found in the Climate Change Adaptation sections of the AM Plans.

6.7.3 Asset Management Plan & Climate Change Adaptation

The impacts of climate change will likely have a significant impact on the assets the City manages and the services they provide. In the context of the asset management planning process, climate change can be considered as both a future demand and a risk.

Within the AM Plans, a high-level climate change management plan for key climate change drivers were identified for the service area and were considered as part of demand management. It is a continuous improvement to identify additional demand & climate change drivers in future for the proposed levels of service requirement in O. Reg. 588/17 by July 1st, 2025.

6.8 RISK MANAGEMENT APPROACH

With asset ownership comes inherent risk. Risk is defined as 'the effect of uncertainty on Hamilton's objectives'. Risk management is an essential component of effectively managing infrastructure assets. Hamilton will manage risk and opportunities through a formal risk analysis process. Through continuous application and expansion of the risk process Hamilton will ensure that it explicitly and continually considers risks to its objectives. This process will be completed as part of the AM planning process and will enable Hamilton to address risk proactively versus reactively.

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk in itself is dynamic, iterative, and responsive to change. To manage risk effectively, Hamilton will need to continuously monitor and consider risk to ensure the appropriate mitigation efforts are applied. By continuously monitoring risk Hamilton:

- Ensures evaluation of risk is an integral part of normal business process and part of the decision making process;
- Tailors its risk management to meet community needs and includes human, cultural and social factors;
- Ensures transparency in our decisions; and,
- Explicitly address the uncertainty that is incumbent on asset owners.

6.8.1 Risk Management Process

Hamilton has adopted an infrastructure-based risk process to ensure that all assets will be reviewed utilizing a standardized approach. This will ensure that Hamilton is able to measure and compare risks consistently across a broad spectrum of assets and services. The risk assessment process seeks to identify credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

An assessment of risks associated with delivery of service will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

HAMILTON RISK REVIEW PROCESS

Each step in the risk review process ensures specific questions are answered and a decision is made on how to resolve or mitigate the known risk with identified costs.

6.8.2 Risk Assessment

To ensure a consistent approach to risk, Hamilton has standardized its scales for both consequence (Table 11) and likelihood (Table 12) below. Hamilton will continue to improve the scales and ensure that they accurately reflect what the City believes is appropriate to consider.

Hamilton will utilize standardized risk categories across the City with respect to its assets and services. The risk categories are:

- Injury/Human Safety;
- Legal/Legislative (included in risk evaluation criteria);
- Environmental;
- Interruption/Reduction of services;
- Social & Cultural Outcomes (included in risk evaluation criteria);
- Financial; and,
- Reputational.

CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

Table 11 - Risk Consequence Scale

	REDUCTION / INTERRUPTION OF SERVICE	FINANCIAL	SAFETY	REPUTATION	ENVIRONMENTAL
1	Asset Failure - Little to No Interruption to service. (Few Customers)	< $2500	Potential for Minor Injury	Minimal to no concern	Negligible Impact (restored within 1 week)
2	Asset Failure - Minor Interruption to service. 4 Hours Downtime	$2.5K - $25K	Lost Time Incident, WSIB, Minor Injuries to few people	Internal Concerns	Minor Impact (Restored within 1 month)
3	Asset Failure - Serious Interruption to service. 4 - 24 Hours Downtime	$25k - 250K	Permanent Injury	Public Concerns, Phone calls, emails, council questions	Significant Short-Term Impact (up to 2 Months)
4	Asset Failure - Major Interruption to service. 1 Day-1 Week Downtime	$250K - $2.5 Million	Disabling Injury or Casualty	Local News, TV, Social Media	Significant Long-Term Impact (up to 1 Year)
5	Asset Failure - Catastrophic Interruption to service. > 1 Week of Downtime	> $2.5 Million	Multiple Casualties, Long Term Hospitalizations	National/International News Coverage	Major Long-Term Impact (< 1 year/permanent)

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified with the AM Plans. The residual risk and treatment costs of implementing the selected treatment plan will be incorporated into the next iteration of the plan.

Table 12 - Risk Likelihood Scale

Scoring	Description	Range
1	Very Unlikely	< 1 per 100 Years
2	Possible	1 in 100 to 1 in 10 Years
3	Infrequent	1 in 10 to 1 in 2 Years
4	Regular	1 in 2 years to 10 per Year
5	Common	Over 10 Times per Year

Hamilton will explicitly document its risk consideration within the AM Plan to demonstrate how the City actively considers risk with regards to its assets and the services that are provided to the community. Hamilton will utilize various risk measurements including impact, probability, frequency, and consequences of these risks to inform decisions and optimize choices by either reducing, removing, mitigating or accepting the risk. Hamilton will continuously monitor and report on risk through operational initiatives which include but are not limited to:

- Asset management planning process;
- Condition assessments; and,
- Regular staff inspection programs.

Hamilton will incorporate risk review into its asset management planning to ensure:

- Desired levels of service will be achieved through the balance of cost, risk and performance;
- Prioritized projects can be funded appropriately and within the required planned time;
- Hamilton is compliant with all regulatory and legislative obligations; and,
- Hamilton is continually monitoring risk to identify new and emerging risks as they present themselves and to measure the effectiveness of the City's mitigation efforts over time.

6.8.3 Current Risk

Hamilton has begun to undergo a shift in how it evaluates risk in accordance with its infrastructure planning. For this iteration of the AM Plan staff helped inform a high-level risk evaluation that was utilized to help staff become familiar with the formalized risk process and develop a basic risk profile for the asset classes covered within the plans. The plans currently identify:

- Which assets are deemed to be critical;
- Assessment of some know high level risks;
- Risk mitigation and control efforts; and,
- Resilience approach.

At this time, the City does not have sufficient data to present risks and tradeoffs. This information will be presented in the 2025 AM Plan regarding Proposed Levels of Service.

6.9 FINANCIAL MANAGEMENT APPROACH

Effective asset and financial management will enable Hamilton to ensure its asset networks will provide the appropriate level of service for the City to achieve its goals and objectives. Reporting to stakeholders on service and financial performance ensures the City is transparently fulfilling its stewardship accountabilities.

Creating a Long-Term Financial Plan(LTFP) the connects the Budget to the AMP is critical for the City to ensure that the various networks lifecycle activities such as renewals, operations, maintenance and acquisitions can and do happen at the optimal time. Hamilton is under increasing pressure to meet the wants and needs of its customer while keeping costs at an affordable level and maintaining its financial sustainability.

Without funding asset activities properly for its asset networks, the City will have difficult choices to make in the future which will include options such as higher cost reactive maintenance and operational costs, reduction of service and potential reputational damage.

Future iterations of the plan will ensure that Hamilton:

- Creates and utilizes a LTFP that connects the budget to the AM Plans;
- Provide accurate costs within the planning horizon (30 years);
- Detail the costs to ensure a defined level of service can be achieved;
- Plan how to manage the financial gap that currently exists; and,
- Detail what cannot be done and the effects of underfunding infrastructure.

The City will be seeking to fully incorporate its asset networks into the LTFP. Aligning the LTFP with the AM Plan is critical to ensure all the network's needs will be met while the City is finalizing a clear financial strategy with measurable financial targets. The financial projections will be improved as the discussion on desired levels of service and asset performance matures.

6.9.1 Asset Renewal Funding Ratio

A key sustainability indicator for Hamilton's asset management plan is the asset renewal funding ratio. This ratio is an effective approach to report on how the City is accommodating asset renewals in an optimal and cost-effective manner from a timing perspective and relative to financial constraints. This also includes the risk the City is prepared to accept and service levels it wishes to maintain. The target renewal funding ratio should ideally be between 90% - 110% over the entire planning period. A low result generally indicates that service levels may be achievable however the expenditures are below this level because Hamilton has many assets that compete for finite funding resources or has constraints with acceptable debt levels.

Table 13 illustrates the Asset Renewal Funding Ratio for each service area.

Table 13 – Asset Renewal Funding Ratio

Engineered Structures	33%
Road Network	14%
Storm Water	9.5%
Wastewater	46%
Water	75%

By only having sufficient funding to renew assets at the above stated ratios, the City will be required to make difficult trade off choices that could include:

- a reduction of the level of service and availability of assets;
- increased complaints and reduced customer satisfaction;
- increased reactive maintenance and renewal costs; and,
- damage to the City's reputation and risk of fines or legal costs.

The lack of renewal resources will be addressed in future AM Plan's while aligning the AM Plans to the LTFP. This will allow staff to develop options and long-term strategies to address the renewal rate. The City will review its renewal allocations once the entire inventory has been confirmed and amalgamated.

6.9.2 Infrastructure Gap

Hamilton's current infrastructure position represents a huge social investment that has been built up progressively over the last 150 years. Continued acquisitions over that time compounded with insufficient resources to keep up with the necessary required works has created a 'gap' of funding. This gap represents the difference between what Hamilton currently spends versus the amount of investment required to ensure the optimal delivery of services. Hamilton's financial 'gap' has built up over decades predominantly due to underinvestment, including a lack of permanent infrastructure funding from senior levels of government, as well as large spikes of growth throughout the years. Hamilton's challenge is to determine how it will manage the gap over the long term to ensure that they can continue to deliver its services sustainably today and across future generations.

Currently there is insufficient budget to address the large backlog of renewal work projected by the AM Plans. There is sufficient budget to address the majority of the ongoing operational and maintenance needs for the planning period however with the assumption of assets over time and their increased costs there may be impacts to the service itself. Without some adjustment to available funds or other lifecycle management decisions there will be insufficient budget to address all planned lifecycle activities.

CORPORATE ASSET MANAGEMENT PLAN OVERVIEW

Over the 10-year planning horizon Hamilton's funding gap for core assets is estimated to be $1,959 million or $195.8 million annually as shown in Table 14 below.

Table 14 – 10 Year Planning Funding Gap

SERVICE AREA	ANNUAL FUNDING GAP ($M)	10 YEAR FUNDING GAP ($M)
Engineered Structures	8.1	81
Road Network	86.6	866
Storm Water	31.1	311
Wastewater	49.8	498
Water	20.2	202
Total	$195.8	$1,958

The gap was calculated utilizing identified renewal needs and planned operations and maintenance.

As the City continues to develop condition profiles and necessary works are identified based on their condition, it is anticipated operation and maintenance forecasts will increase significantly.

Future iterations of the plan will include the needs of all lifecycle activities to ensure that a fulsome analysis of the true infrastructure gap can be projected. Hamilton needs to mature further in its asset management knowledge to ensure that it fully capture the needs of its assets throughout their lifecycles and can confidently project the gap. As data and process documentation improve over time, Hamilton will be able determine the best methods to manage the gap.

The options to manage the gap include:

- Maintain Status Quo;
- Continue to defer projects out;
- Dispose/close underutilized assets;
- Reduce the expected level of service; and,
- Increase funding allocations.

Other options include adjustments to current operational and maintenance practices, constructing assets differently, utilizing debt strategies and accepting more risk.

Without sufficient funding the City may have to defer necessary lifecycle activities. Deferring important lifecycle activities is never recommended. The City will benefit from allocating

sufficient resources to developing its long-term financial plan to ensure that over time the City can fully fund the necessary lifecycle activities which ensures the assets are compliant, safe and effectively deliver the service the customers need and desire.

The lack of funding allocated for the backlog of renewals and the necessary lifecycle activities creates an additional issue which is intergenerational equity. Each year that Hamilton defers lifecycle activities it pushes the ever-increasing financial burden on to future generations. It is imperative the City begin addressing the lack of consistent and necessary funding to ensure that intergenerational equity will be achieved. Over time, allocating sufficient funding on a consistent basis ensures that future generations will be able to enjoy the same standards of living being enjoyed today.

Over time the City will continue to improve its lifecycle data, and this will allow for informed choices as to how best to mitigate those impacts and how to address the funding gap itself. This gap in funding future plans will be refined over the next three (3) years and improve the confidence and accuracy of the forecasts.

6.9.3 Long Term Financial Plan (LTFP)

Over the next 3 years Hamilton will be updating the LTFP to connect the current funding allocation within the budget process directly to the asset management plans and the level of services Hamilton provides. This will be a critical task for Hamilton to assist with the undertaking of timely renewals, ensuring legislative compliance and assuring the continuation of services.

The LTFP seeks to accommodate ongoing funding of existing service's lifecycle costs as well as new services and assets as required. The plan itself will connect the revenues and income raised annually and the intended expenditures to ensure the provision of service can be achieved. The LTFP will inform the financial strategy and the likely consequences of diverting from the AM Plans proposed activities. The LTFP ultimately will allow Hamilton to:

- Model financial implications of various service level scenarios to help inform long term planning options;
- Determine a combination of proposals that best meets the needs of the community; and,
- Ensure ongoing financial sustainability and intergenerational equity;

The LTFP will be reviewed annually in conjunction with the budget process and throughout each iteration of every asset management plan.

6.9.4 Financial Targets

Hamilton needs to determine financial targets that are appropriate to achieving its objectives for its infrastructure assets and services. Hamilton will adopt 3 key financial indicators to measure and report on its efforts to deliver its services. The Asset Renewal Funding ratio is mentioned above and is included in this iteration of the plan. Future plans will include 2 additional ratios:

- Operating Surplus Ratio – Assesses Hamilton's Financial Performance
- Net Financial Liabilities Ratio – Assess the ability of Hamilton to utilize debt effectively

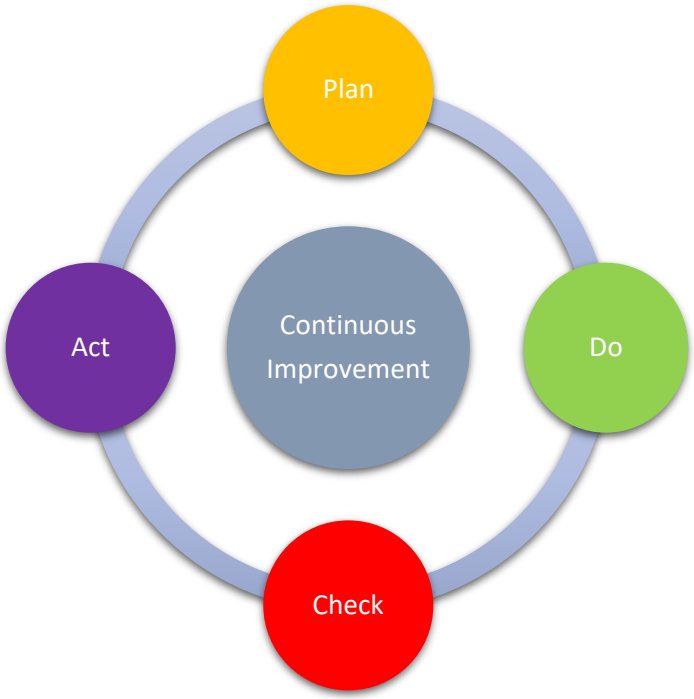
Hamilton has a fiduciary and social responsibility to ensure that it is meeting its financial obligations as it pertains to its assets and the services the City delivers. It must adopt a long-term view and endorse evidence-based decision making to ensure that:

1. Intergenerational Equity can be achieved;
2. Assets and services are affordable and deliver the desired level of service;
3. The infrastructure gap is effectively managed; and,
4. Good stewardship is assured.

Ultimately, the targets are intended to be planning tools and organizational goalposts to ensure Hamilton can monitor its financial performance and understand what financial tools it has at its disposals to manage the City Assets.

6.10 CONTINUOUS IMPROVEMENT & NEXT STEPS

The first AM Plan is a starting point to inform the City on what we own, how we manage it, when we will replace it, and the long-term costs and risks of ownership of these assets. By continuously developing our AM Plans, the City will realize the benefits of applying asset management principles across all service areas. The figure below shows the process for how the City proposes to perform continuous improvement over time.



The AM Plans have identified 100+ opportunities for improvement which will require further discussion and analysis to determine feasibility, resource requirements and alignment to current workplans. Future iterations of this AM Plan will provide updates on these improvement plans. Additional continuous improvement items will be identified in the AM Plan for Proposed Levels of Service due July 1st, 2025.

The section below outlines overall findings for continuous improvement across the AM Plans.

6.10.1 Asset Information Improvements

AM Plans start with the collection of data related to assets (e.g. location, condition, age etc.) called an asset registry. In many cases, registries do not exist or contain gaps (e.g. for many assets, age is not known). Data has been found to be outdated, duplicated and incomplete in some instances. A data confidence scale has been developed shown in Section 7.2.2 to quantify this issue, and data confidence values are presented for key numbers in the AM Plans. The

future implementation of the EAM system for Public Works described in Section 7.2.3 will aid with unifying and improving data integrity.

In addition, asset condition assessments are a key element in AM as without proper assessments, estimated service life (ESL) and age are used to approximate condition. This can result in grossly over or underestimating the actual condition leading to inaccurate forecasts. Similarly, with replacement costs, variation in data and the need to define a robust process has been identified as key areas of concern. The need for governance, consistency and process definition overall has been identified as important next steps and will occur through the development of the AM Program.

Finally, areas exist where asset ownership is unclear due to the complex nature of the City's many assets and their interconnectivity. Clarification will occur as AM governance and standardized processes are developed.

6.10.2 Level of Service Improvements

Level of Service (LOS) is critical for Asset Owners to understand. Currently, owners are learning about and beginning to embrace LOS and understand its connection to performance measurement.

Engagement with the community is paramount in understanding current service provision and desired future state, and the CAM office is proposing to release surveys regularly to continue to collect data to inform the plans. The number of survey respondents for this initial survey only represents a small portion of the population. The City will continue to improve the marketing strategy to ensure these surveys reach a larger audience.

Current technical performance metrics are typically measuring how the City is performing in accordance with legislative requirements for operations and maintenance lifecycle stages. Since there are additional lifecycle stages beyond operations and maintenance, and customer preferences and expectations do not always match minimum legislated requirements as discussed in the AM Plans, this suggests that these metrics should be revisited for future iterations of the plan to confirm that they are in fact reflecting customer values.

6.10.3 Demand & Risk Management Improvements

Since demand and risk management are not yet extensive requirements in O. Reg. 588/17 for the July 1st, 2022 deadline, these sections are not as robust as some other sections of the report,

but they are an obligation for the AMP by July 1st, 2025, and will be expanded on in future iterations of the report.

6.10.4 Financial Management Improvements

Currently, the City has identified a 10-year planning horizon to meet the requirements of O. Reg. 588/17. For future iterations of the AM Plan, the planning horizon will be increased to 30 years per standard AM practice. This ensures visibility to the horizon beyond the capital plan and provides greater transparency for the future.

As previously mentioned, since the replacement costs are at a low confidence level and the current infrastructure gap is largely based on the renewal requirement and backlog, the financials for the AM Plan are also at a low confidence level. As data improves, the financial projections will also improve. In addition, future iterations of the plan will ensure that Hamilton:

- Creates and utilizes a LTFP that connects the budget to the AM Plans;
- Provide more accurate costs within the planning horizon (30 years);
- Detail the costs to ensure a defined level of service can be achieved;
- Plan how to manage the financial gap that currently exists; and,
- Detail what cannot be done and the effects of underfunding infrastructure.

7.0 APPENDICES

7.1 Appendix “A” – Engage Hamilton Survey Results

- Appendix “A” – Engage Hamilton Survey Results (Roads and Water Services Service January 25 – February 18, 2022)

Project Report

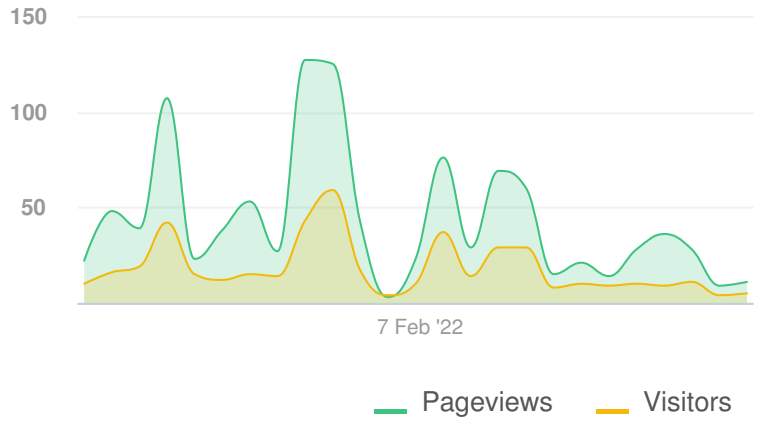
25 January 2022 - 18 February 2022

Engage Hamilton

Roads and Water Services Review

BANG THE TABLE engagementHQ

Visitors Summary



Highlights

TOTAL VISITS	MAX VISITORS PER DAY	NEW REGISTRATIONS
651	59	1

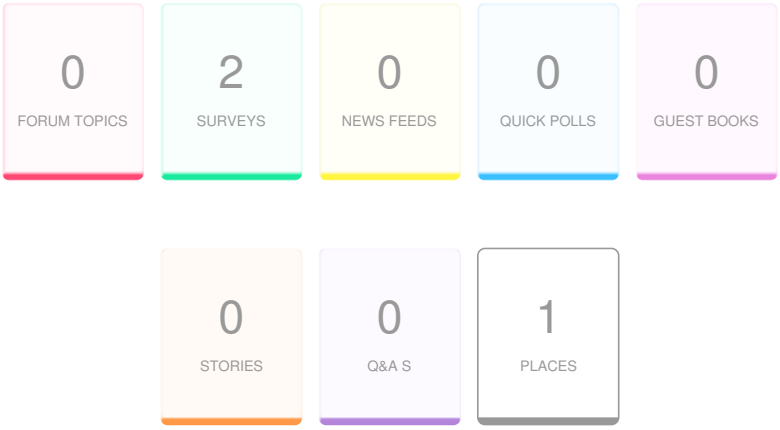
ENGAGED VISITORS	INFORMED VISITORS	AWARE VISITORS
355	424	569

Aware Participants	569
Aware Actions Performed	Participants
Visited a Project or Tool Page	569

Informed Participants	424
Informed Actions Performed	Participants
Viewed a video	0
Viewed a photo	0
Downloaded a document	0
Visited the Key Dates page	2
Visited an FAQ list Page	0
Visited Instagram Page	0
Visited Multiple Project Pages	71
Contributed to a tool (engaged)	355

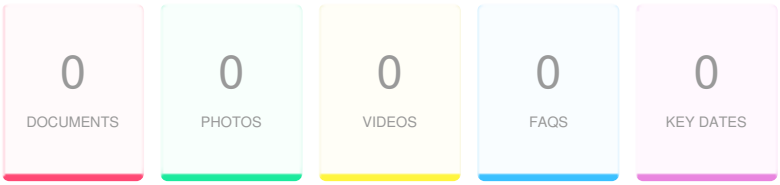
Engaged Participants	355		
Engaged Actions Performed	Registered	Unverified	Anonymous
Contributed on Forums	0	0	0
Participated in Surveys	13	1	332
Contributed to Newsfeeds	0	0	0
Participated in Quick Polls	0	0	0
Posted on Guestbooks	0	0	0
Contributed to Stories	0	0	0
Asked Questions	0	0	0
Placed Pins on Places	5	8	0
Contributed to Ideas	0	0	0

ENGAGEMENT TOOLS SUMMARY



Tool Type	Engagement Tool Name	Tool Status	Visitors	Contributors		
				Registered	Unverified	Anonymous
Place	Current Level of Service Map	Archived	41	5	8	0
Survey Tool	Asset Management - Roads, Bridges and Culverts	Archived	343	9	1	268
Survey Tool	Asset Management - Drinking water, Stormwater and Wastewater	Archived	227	8	1	174

INFORMATION WIDGET SUMMARY



Widget Type	Engagement Tool Name	Visitors	Views/Downloads
Key Dates	Key Date	2	2

ENGAGEMENT TOOL: PLACE

Current Level of Service Map

Visitors 41	Contributors 13	CONTRIBUTIONS 28

2022-01-26 13:56:47 -0500
MSchiau
CATEGORY
Road Condition Deficiency (e.g. pothole, severe cracking, guide rail issue)

Road Surface condition poor
Address: 15 Governor's Road, Hamilton, Ontario L9H 2R1, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-83325

2022-01-26 13:59:21 -0500
MSchiau
CATEGORY
Traffic Deficiency (e.g. signal frequently out, sign missing)

Lighting Needed
Address: 92 Huntingwood Avenue, Hamilton, Ontario L9H 6X8, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-83326

2022-01-26 14:02:24 -0500
MSchiau
CATEGORY
Traffic Deficiency (e.g. signal frequently out, sign missing)

Sidewalk lighting
Address: 492 Governor's Road, Hamilton, Ontario L9H 6Y7, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-83327

2022-01-26 15:03:09 -0500
0987
CATEGORY
Road Condition Deficiency (e.g. pothole, severe cracking, guide rail issue)

Multiple cracks becoming potholes, fix the cracks before they become potholes. Gover nors rd needs a shave and pave now or it will require a full rebuild in a few years.
Address: 3430 Governor's Road, Hamilton, Ontario L0R 1T0, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-83355

2022-02-02 10:43:09 -0500
Nico
CATEGORY
Road Condition Deficiency (e.g. pothole, severe cracking, guide rail issue)

Potholes and cracks
Address: 1141 Burlington Street East, Hamilton, Ontario L8L 0A5, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-83637

2022-02-07 22:01:39 -0500
engaged66
CATEGORY
Reoccurring flooding (e.g. blocked culvert, drainage issue)

Storm water from Parkside Dr between Glen Rd. and Devon Pl. does not drain to swal es in Churchill Park
Address: 26 Parkside Drive, Hamilton, Ontario L8S 3Y1, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-83916

2022-02-07 22:09:54 -0500
engaged66
CATEGORY
Road Condition Deficiency (e.g. pothole, severe cracking, guide rail issue)

Entrance to Churchill Park gravel path at corner Parkside Dr and Devon Pl is not bike fr iendly
Address: 48 Parkside Drive, Hamilton, Ontario L8S 3X5, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-83917

ENGAGEMENT TOOL: PLACE

Current Level of Service Map

2022-02-08 21:58:39 -0500
engaged66
CATEGORY
Road Condition Deficiency (e.g. pothole, severe cracking, guide rail issue)

road shoulder is eroding
Address: 150 Macklin Street North, Hamilton, Ontario L8S 3S1, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-83984

2022-02-10 10:43:05 -0500
M1
CATEGORY
Road Condition Deficiency (e.g. pothole, severe cracking, guide rail issue)

Surface discontinuity
Address: 452 Springbrook Avenue, Hamilton, Ontario L9K 0C1, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84044

2022-02-14 09:04:30 -0500
DeonS
CATEGORY
Road Condition Deficiency (e.g. pothole, severe cracking, guide rail issue)

Road shoulder at turn to Kirk dips and floods over with severe ice built up in winter even causing skidding into on coming traffic.
Address: 2860 Kirk Road, Binbrook, Ontario L0R 1C0, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84220

2022-02-14 09:10:19 -0500
DeonS
CATEGORY
Road Condition Deficiency (e.g. pothole, severe cracking, guide rail issue)

Severe potholes from conservation heavy truck traffic during repairs that ripped up asphalt on stretch of road with major safety concern as vehicles speed through this section and dip. Already had few vehicles break wheel wells with impacts.
Address: 5045 Harrison Road, Hamilton, Ontario L0R 1C0, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84221

2022-02-14 18:16:12 -0500
Waves
CATEGORY
Road Condition Deficiency (e.g. pothole, severe cracking, guide rail issue)

Center Road from 7Th Concession to Campbellivile Road. Pot holes uneven pavement, cracks, crumbling shoulders. Road need complete rebuild.
Address: 1571 Centre Road, Hamilton, Ontario L8N 2Z7, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84268

2022-02-14 18:19:03 -0500
Waves
CATEGORY
Road Condition Deficiency (e.g. pothole, severe cracking, guide rail issue)

From Highway 6 to MilburoughLine, Cracks, uneven pavement, pot holes pavement breaking up, Crumbling shoulders
Address: 228 Carlisle Road, Carlisle, Ontario L0R 1H2, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84269

2022-02-14 18:24:46 -0500
Waves

MainStreet waterdowm from Parkside to #5. Needs to be ground down and repaved. Steet is nothing but bumps and cracks.
Address: 50 John Street West, Hamilton, Ontario L8B 0E6, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84270

ENGAGEMENT TOOL: PLACE

Current Level of Service Map

2022-02-15 17:24:27 -0500
Andy
CATEGORY
Road Condition Deficiency (e.g. pothole, severe cracking, guide rail issue)

Potholes
Address: 553 Aberdeen Avenue, Hamilton, Ontario L8P 2S8, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84440

2022-02-16 16:09:02 -0500
David Hunt
CATEGORY
Road Condition Deficiency (e.g. pothole, severe cracking, guide rail issue)

Hatt St West of Market to Bond St is in terrible condition.
Address: 293 Hatt Street, Hamilton, Ontario L9H 2H5, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84558

2022-02-16 16:59:39 -0500
Alex .
CATEGORY
Reoccurring flooding (e.g. blocked culvert, drainage issue)

Icy sidewalks
Address: 4 Oldmill Road, Hamilton, Ontario L9G 5E2, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84563

2022-02-16 17:04:04 -0500
Alex .
CATEGORY
Road Condition Deficiency (e.g. pothole, severe cracking, guide rail issue)

No sidewalk
Address: 431 Hamilton Drive, Hamilton, Ontario L9G 2A9, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84564

2022-02-17 10:22:06 -0500
Josh765
CATEGORY
Road Condition Deficiency (e.g. pothole, severe cracking, guide rail issue)

Multiple deep potholes in the right most northbound lane
Address: 37 Dundurn Street South, Hamilton, Ontario L8P 4J9, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84669

2022-02-17 10:26:16 -0500
Josh765
CATEGORY
Road Condition Deficiency (e.g. pothole, severe cracking, guide rail issue)

Deep potholes
Address: 25 Fennell Avenue West, Hamilton, Ontario L9C 7V7, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84670

2022-02-18 13:44:43 -0500
jm1231
CATEGORY
Road Condition Deficiency (e.g. pothole, severe cracking, guide rail issue)

signage needed regarding bump in road at train tracks
Address: 199 Wentworth Street South, Hamilton, Ontario L8N 2Z6, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84871

ENGAGEMENT TOOL: PLACE

Current Level of Service Map

2022-02-18 15:03:16 -0500
Grahame
CATEGORY
Road Condition Deficiency (e.g. pothole, severe cracking, guide rail issue)

where the road crosses the railway tracks there is a significant grade change. If going more than 30 km per hour there is likelihood of hitting the asphalt. the speed on Wellington South is 50km until close to the tracks. then 40km with a badly placed sign too high to notice. no speed hump indicated
Address: 199 Wentworth Street South, Hamilton, Ontario L8N 2Z6, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84876

2022-02-18 15:20:09 -0500
Grahame
CATEGORY
Traffic Deficiency (e.g. signal frequently out, sign missing)

No Right on Red sign going southbound
Address: 103 Queen Street North, Hamilton, Ontario L8R 3K5, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84877

2022-02-18 15:25:11 -0500
Grahame
CATEGORY
Traffic Deficiency (e.g. signal frequently out, sign missing)

Speed change to 40KM beside school
Address: 280 Locke Street South, Hamilton, Ontario L8P 4C1, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84878

2022-02-18 15:28:19 -0500
Grahame
CATEGORY
Reoccurring flooding (e.g. blocked culvert, drainage issue)

downspout emptying on sidewalk
Address: 175 Locke Street South, Hamilton, Ontario L8P 4B2, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84879

2022-02-18 15:30:46 -0500
Grahame
CATEGORY
Reoccurring flooding (e.g. blocked culvert, drainage issue)

downspout emptying on sidewalk
Address: 2 King Street East, Hamilton, Ontario L9H 1B8, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84880

2022-02-18 15:36:53 -0500
Grahame
CATEGORY
Traffic Deficiency (e.g. signal frequently out, sign missing)

speed limit signs
Address: 222 Ferguson Avenue South, Hamilton, Ontario L8N 1Z7, Canada

http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84881

2022-02-18 15:51:54 -0500
Grahame
CATEGORY
Reoccurring flooding (e.g. blocked culvert, drainage issue)

water over sidewalk from downspout
Address: 53 Hyde Park Avenue, Hamilton, Ontario L8P 4M8, Canada

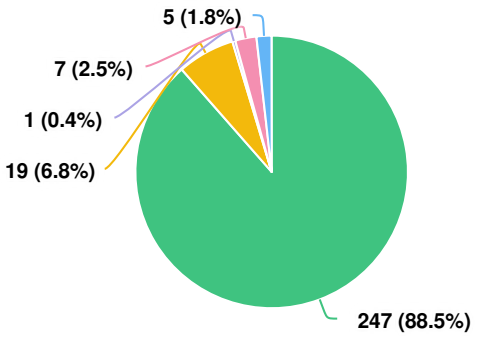
http://engage.hamilton.ca/roadswaterservices/maps/current-level-of-service-map?reporting=true#marker-84884

ENGAGEMENT TOOL: SURVEY TOOL

Asset Management - Roads, Bridges and Culverts

Visitors 343	Contributors 278	CONTRIBUTIONS 279

How would you best describe yourself?



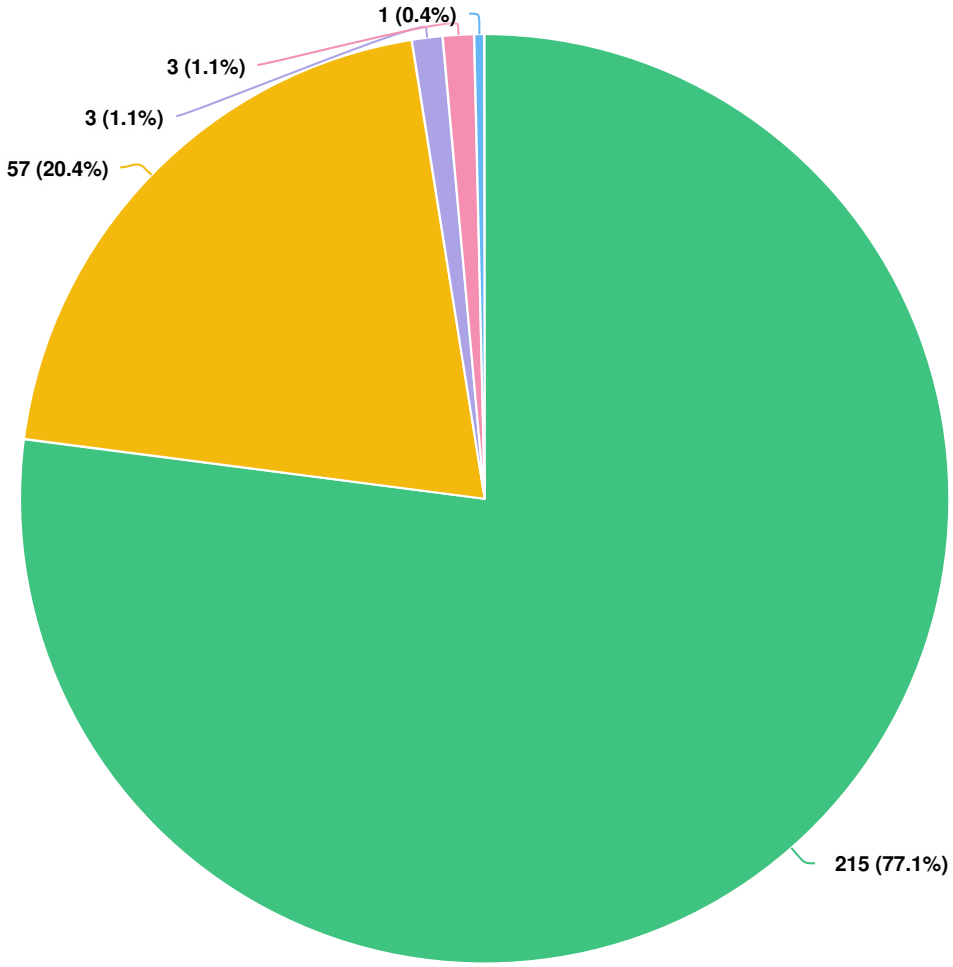
Question options

- I live in Hamilton
- I live in Hamilton and I also run a Hamilton-based business
- I don't live in Hamilton, but I run a Hamilton-based business
- I work in Hamilton (but I live somewhere else)
- Other (please specify)

Mandatory Question (279 response(s))

Question type: Dropdown Question

In the last 12 months, on average how often would you say you travelled on Hamilton's road network, using any mode of transportation? (walking, driving, riding, etc.)



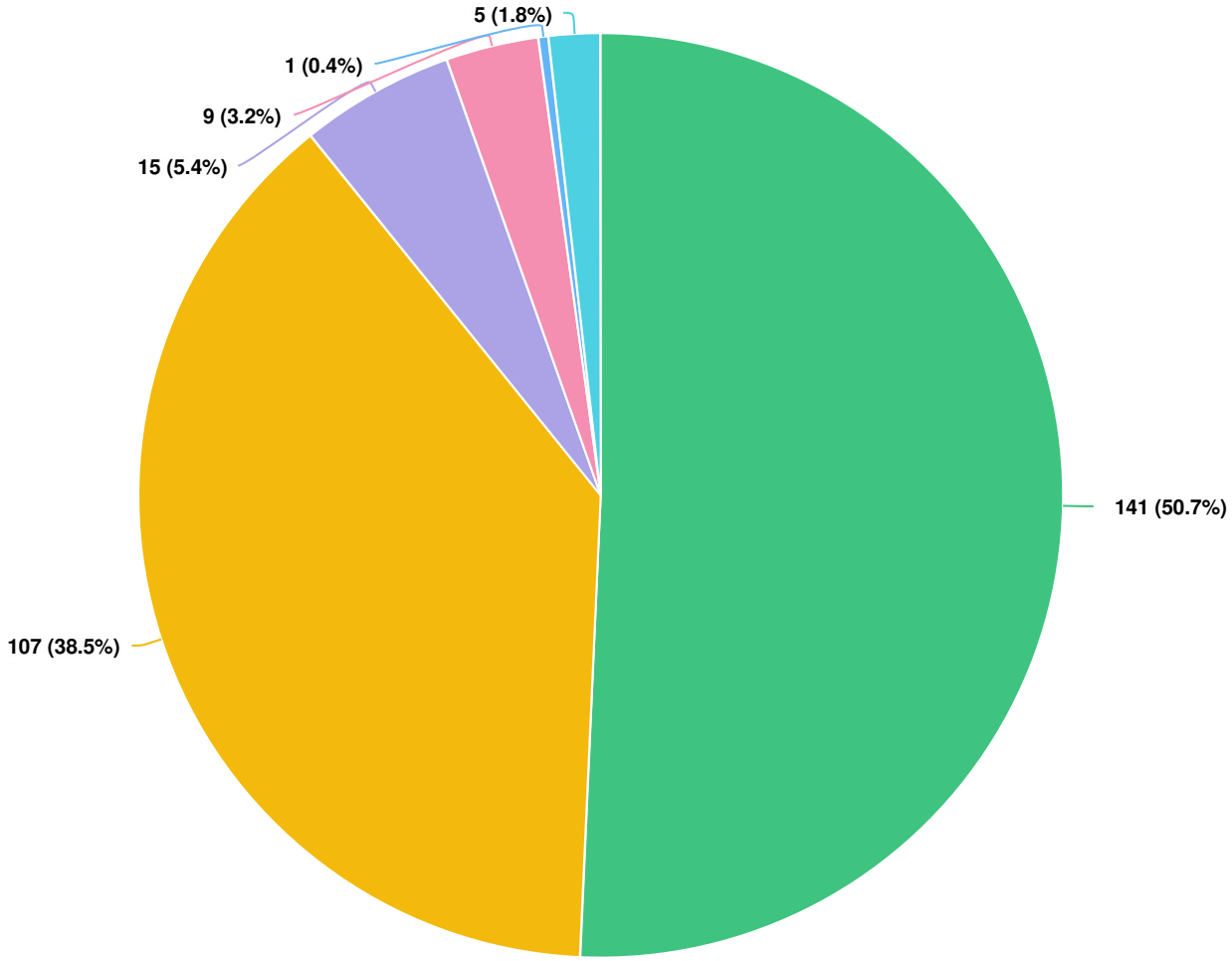
Question options

Every day | A few times a week | About once a week | A few times a month | Rarely

Mandatory Question (279 response(s))

Question type: Dropdown Question

How often do you drive in a motorized vehicle? (i.e. car, motorcycle, etc.)



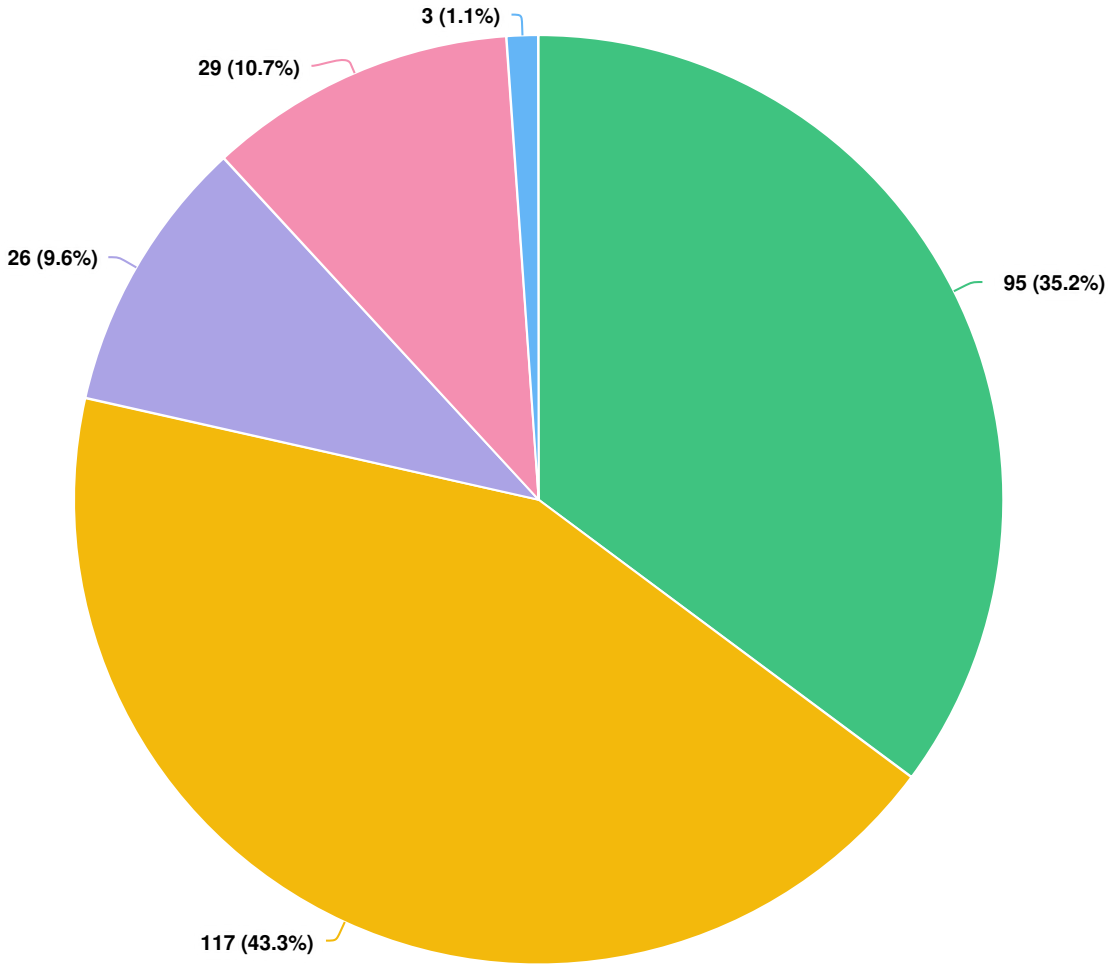
Question options

Every day | A few times a week | About once a week | A few times a month | Rarely | Never

Optional question (278 response(s), 1 skipped)

Question type: Dropdown Question

How safe do you feel using the roads while driving in a motorized vehicle?



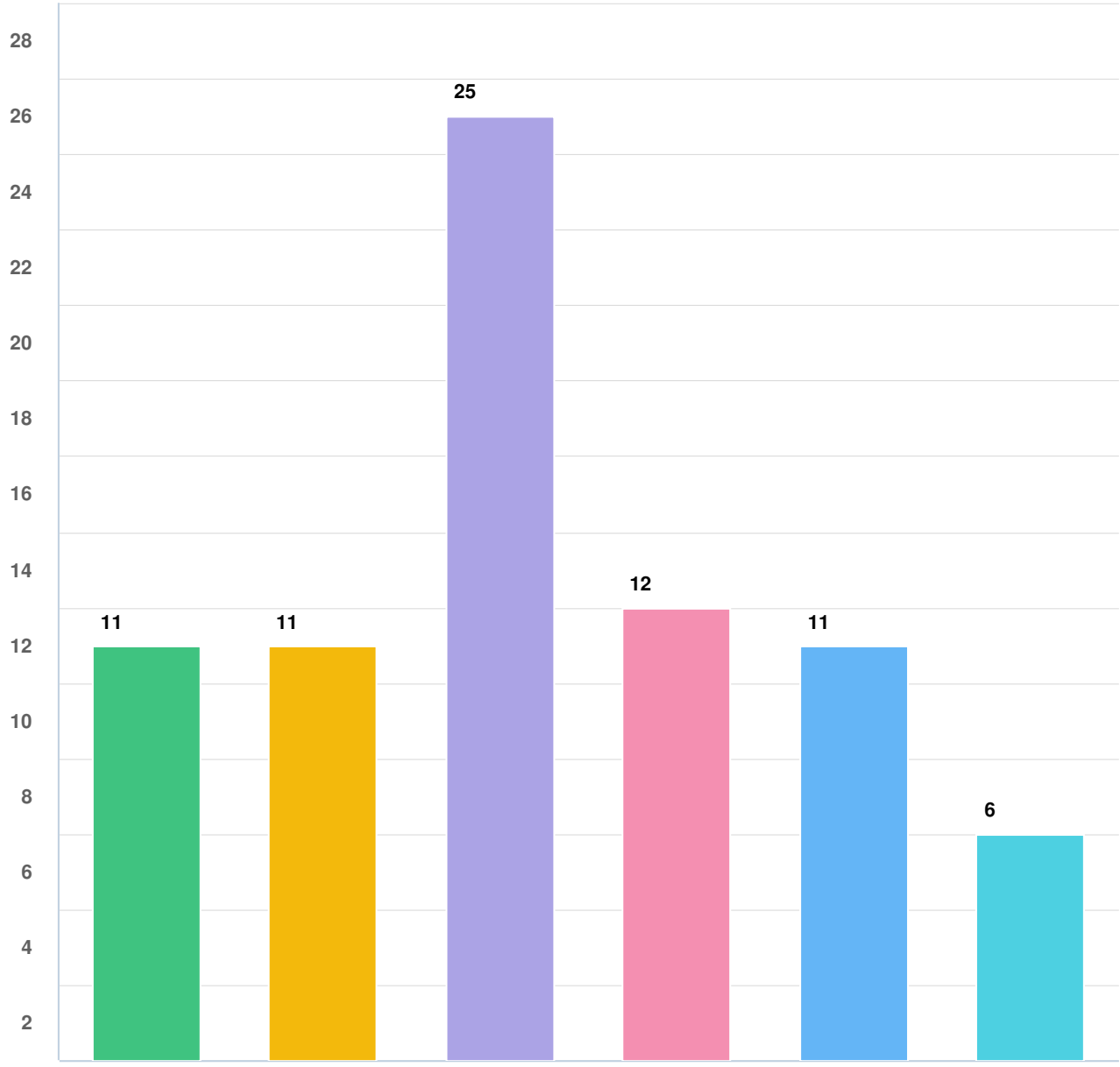
Question options

Very safe | Somewhat safe | Neutral | Somewhat unsafe | Very unsafe

Optional question (270 response(s), 9 skipped)

Question type: Dropdown Question

Select the top reasons you feel somewhat unsafe driving in a motorized vehicle



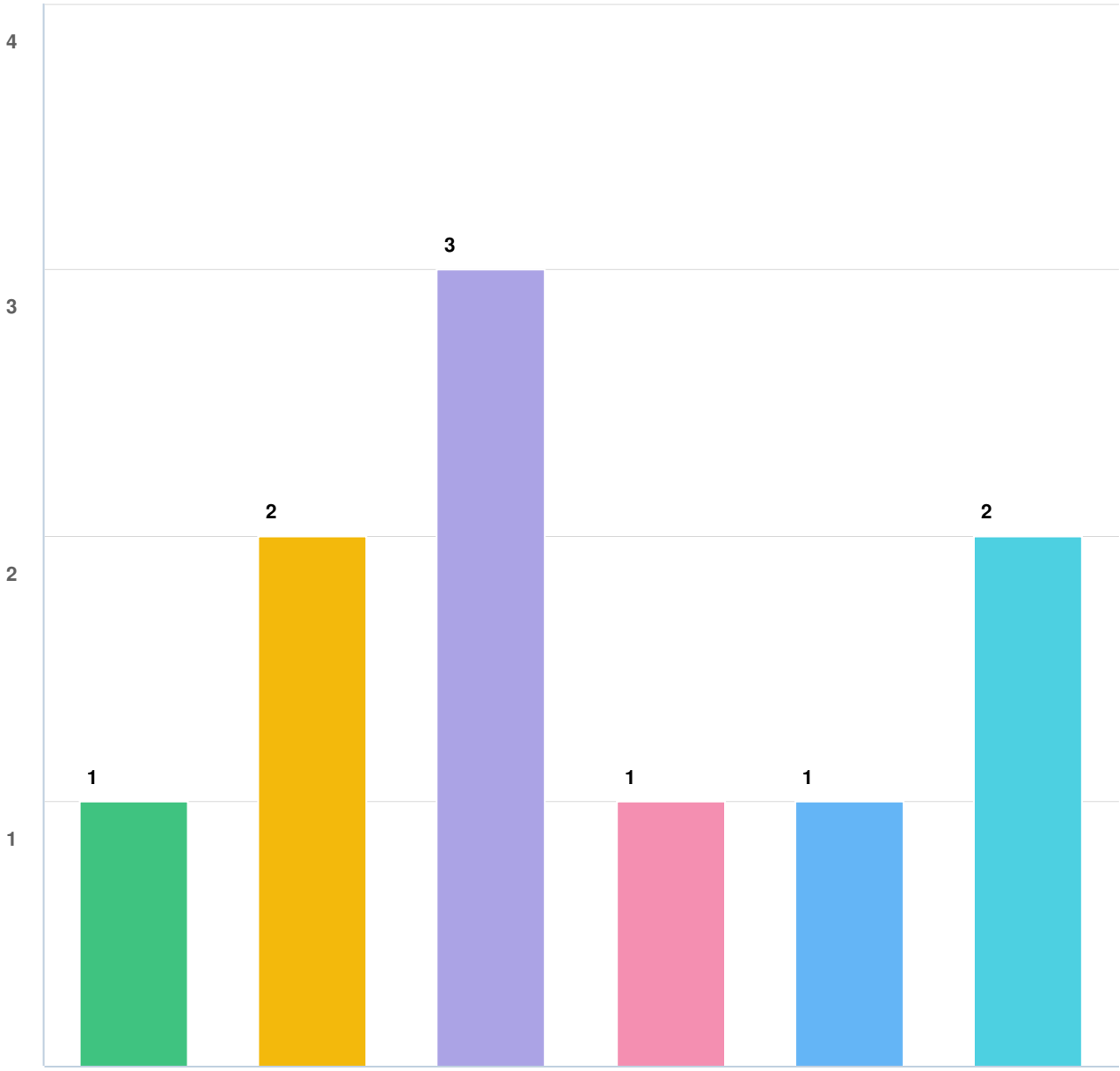
Question options

- Traffic/congestion (e.g. Too many cars, people, or bicycles in regular route etc.)
- Infrastructure Design (e.g. not enough safety features or separation, poor drainage, steep slope, slippery when wet etc.)
- Surface condition (e.g. significant cracking, potholes)
- Operational Issue (e.g. snow or ice not cleared, debris frequently not cleared)
- Poor connectivity (e.g. Bike lanes ending abruptly, sidewalks missing, curb cuts not available for mobility devices, roads frequently closed etc.)
- Other (please specify)

Optional question (29 response(s), 250 skipped)

Question type: Checkbox Question

Select the top reasons you feel very unsafe driving in a motorized vehicle



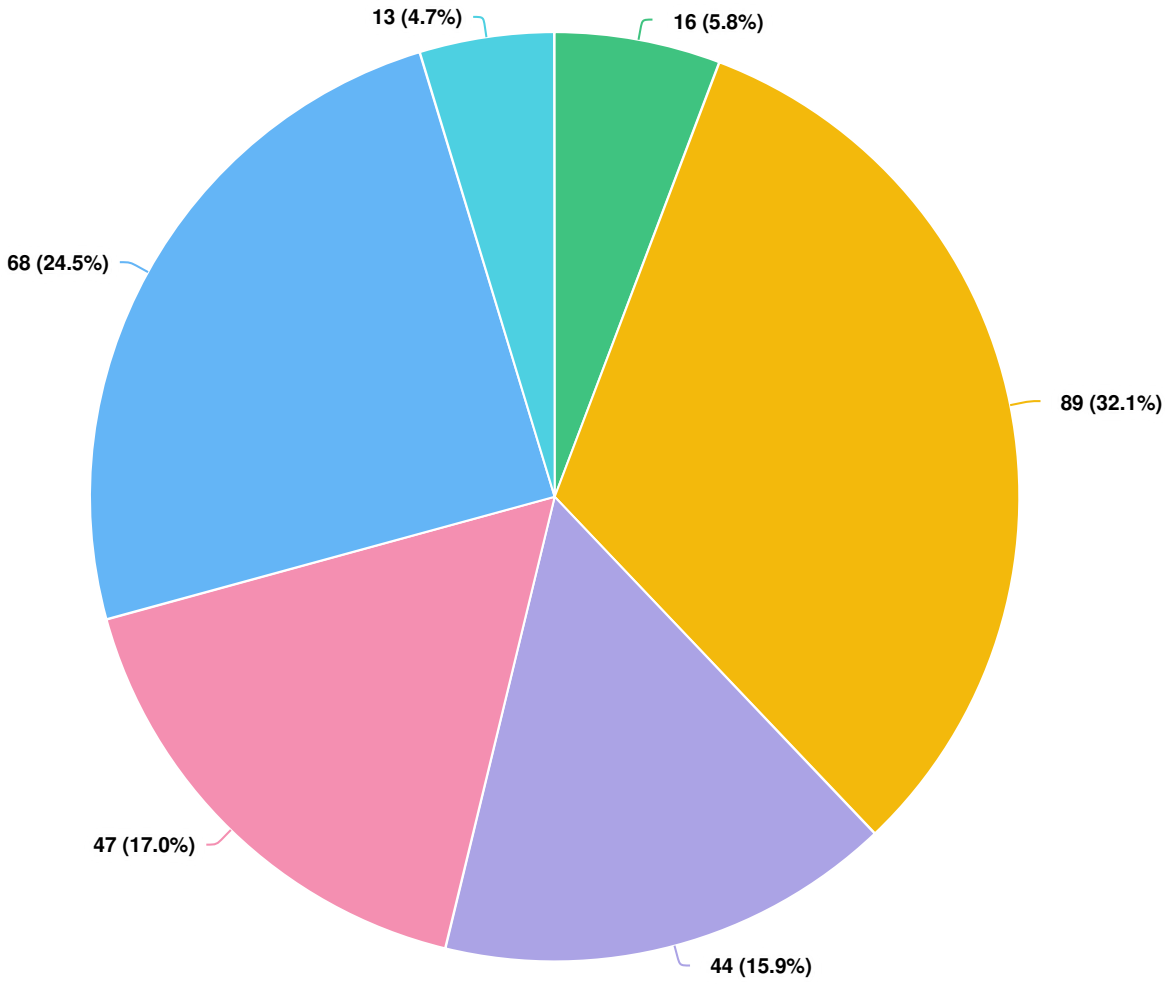
Question options

- Traffic/congestion (e.g. Too many cars, people, or bicycles in regular route etc.)
- Infrastructure Design (e.g. not enough safety features or separation, poor drainage, steep slope, slippery when wet etc.)
- Surface condition (e.g. significant cracking, potholes)
- Operational Issue (e.g. snow or ice not cleared, debris frequently not cleared)
- Poor connectivity (e.g. Bike lanes ending abruptly, sidewalks missing, curb cuts not available for mobility devices, roads frequently closed etc.)
- Other (please specify)

Optional question (3 response(s), 276 skipped)

Question type: Checkbox Question

How often do you ride as a passenger in a motorized vehicle? (i.e. car, motorcycle, etc.)



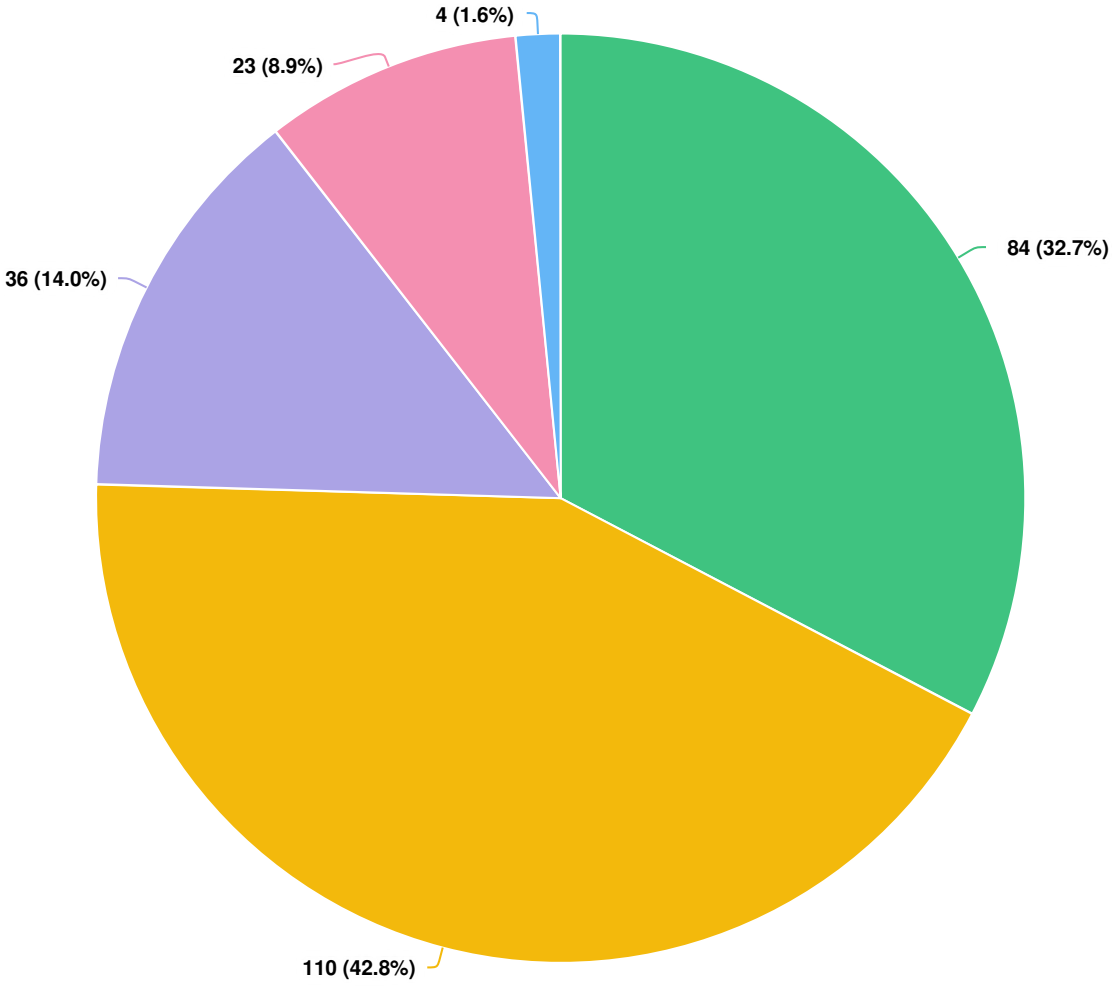
Question options

Every day · A few times a week · About once a week · A few times a month · Rarely · Never

Optional question (277 response(s), 2 skipped)

Question type: Dropdown Question

How safe do you feel using the roads while riding as a passenger in a motorized vehicle?



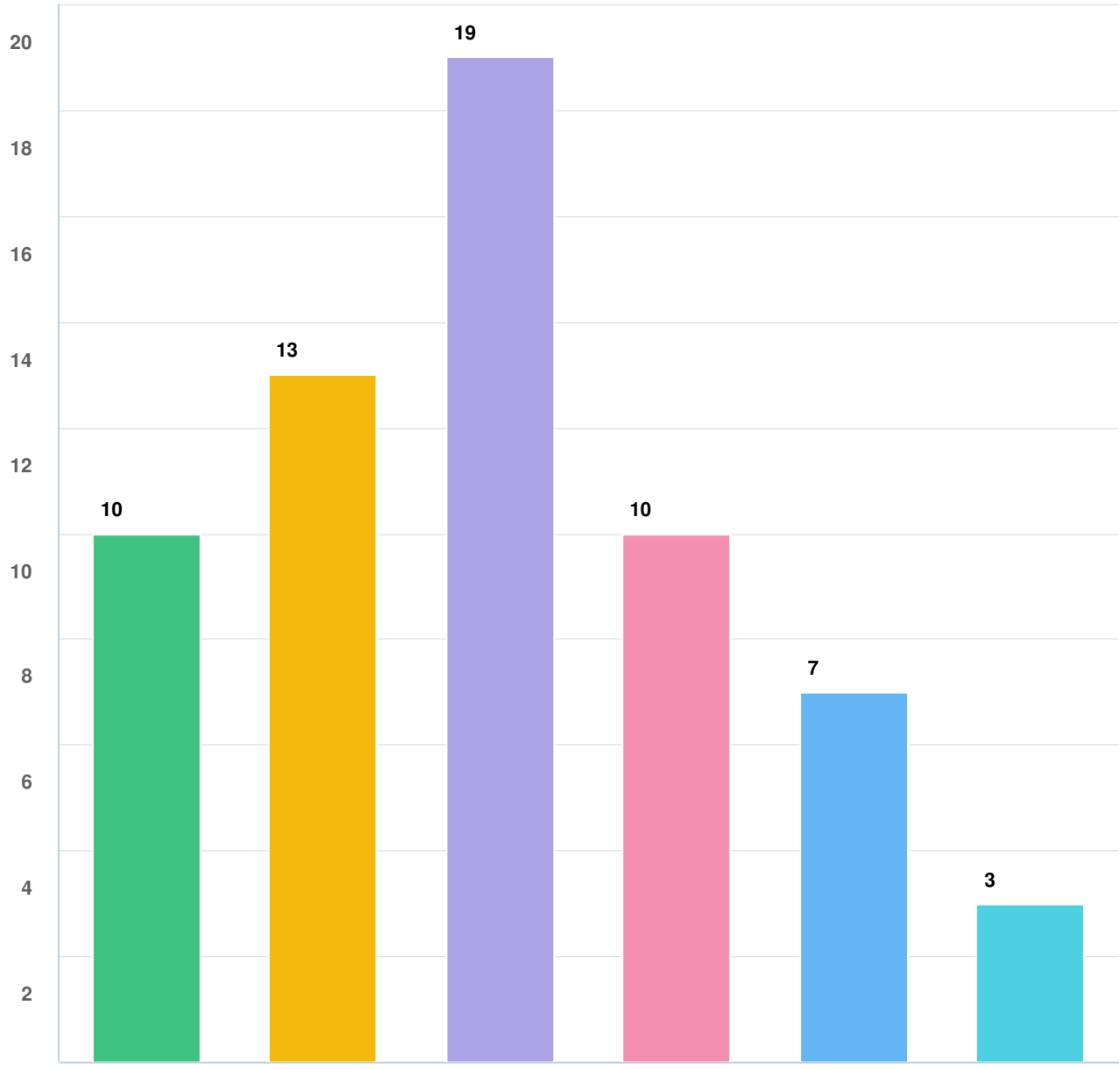
Question options

Very safe | Somewhat safe | Neutral | Somewhat unsafe | Very unsafe

Optional question (257 response(s), 22 skipped)

Question type: Dropdown Question

Select the top reasons you feel somewhat unsafe riding as a passenger in a motorized vehicle



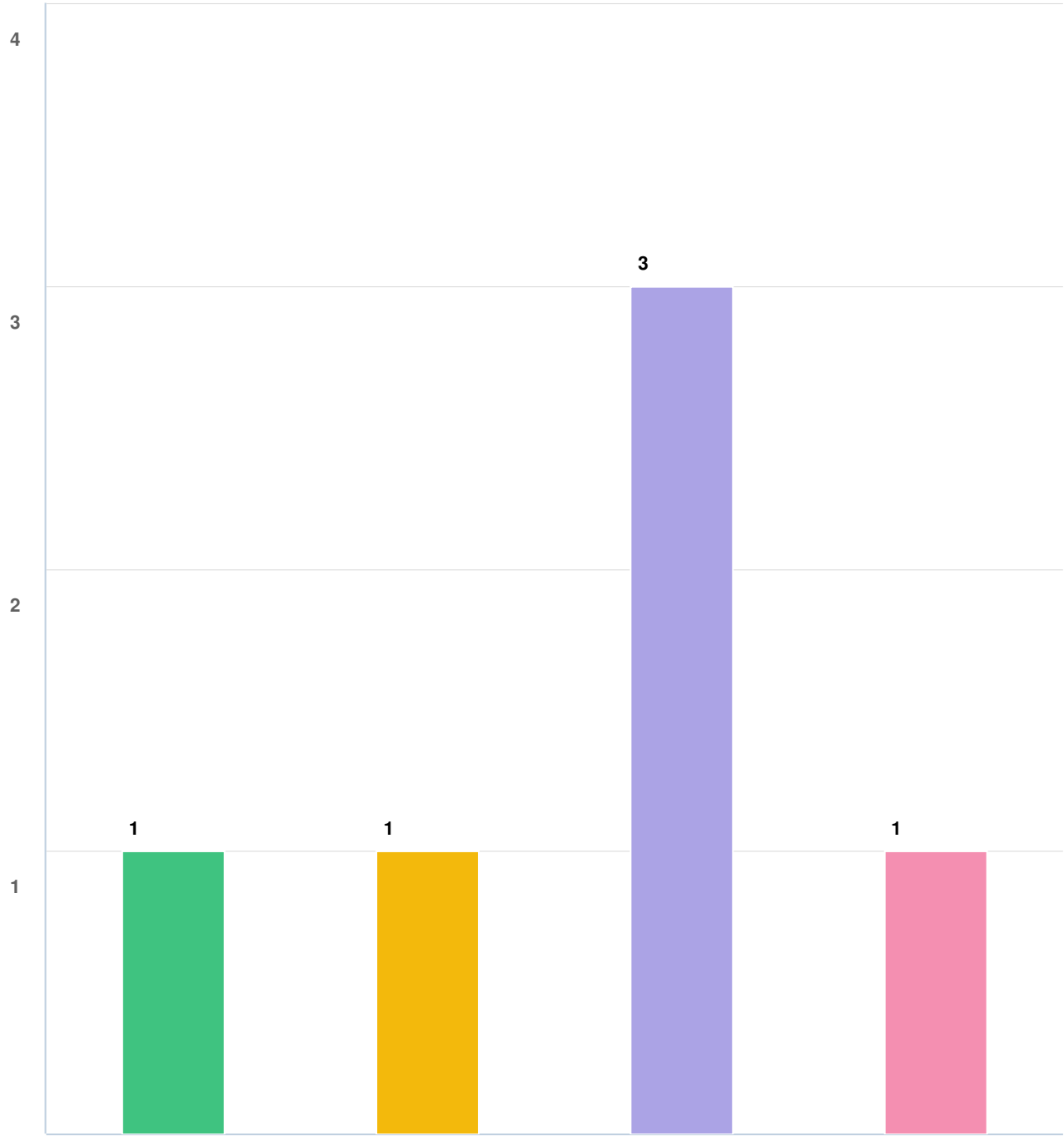
Question options

- Traffic/congestion (e.g. Too many cars, people, or bicycles in regular route etc.)
- Infrastructure Design (e.g. not enough safety features or separation, poor drainage, steep slope, slippery when wet etc.)
- Surface condition (e.g. significant cracking, potholes)
- Operational Issue (e.g. snow or ice not cleared, debris frequently not cleared)
- Poor connectivity (e.g. Bike lanes ending abruptly, sidewalks missing, curb cuts not available for mobility devices, roads frequently closed etc.)
- Other (please specify)

Optional question (23 response(s), 256 skipped)

Question type: Checkbox Question

Select the top reasons you feel very unsafe riding as a passenger in a motorized vehicle



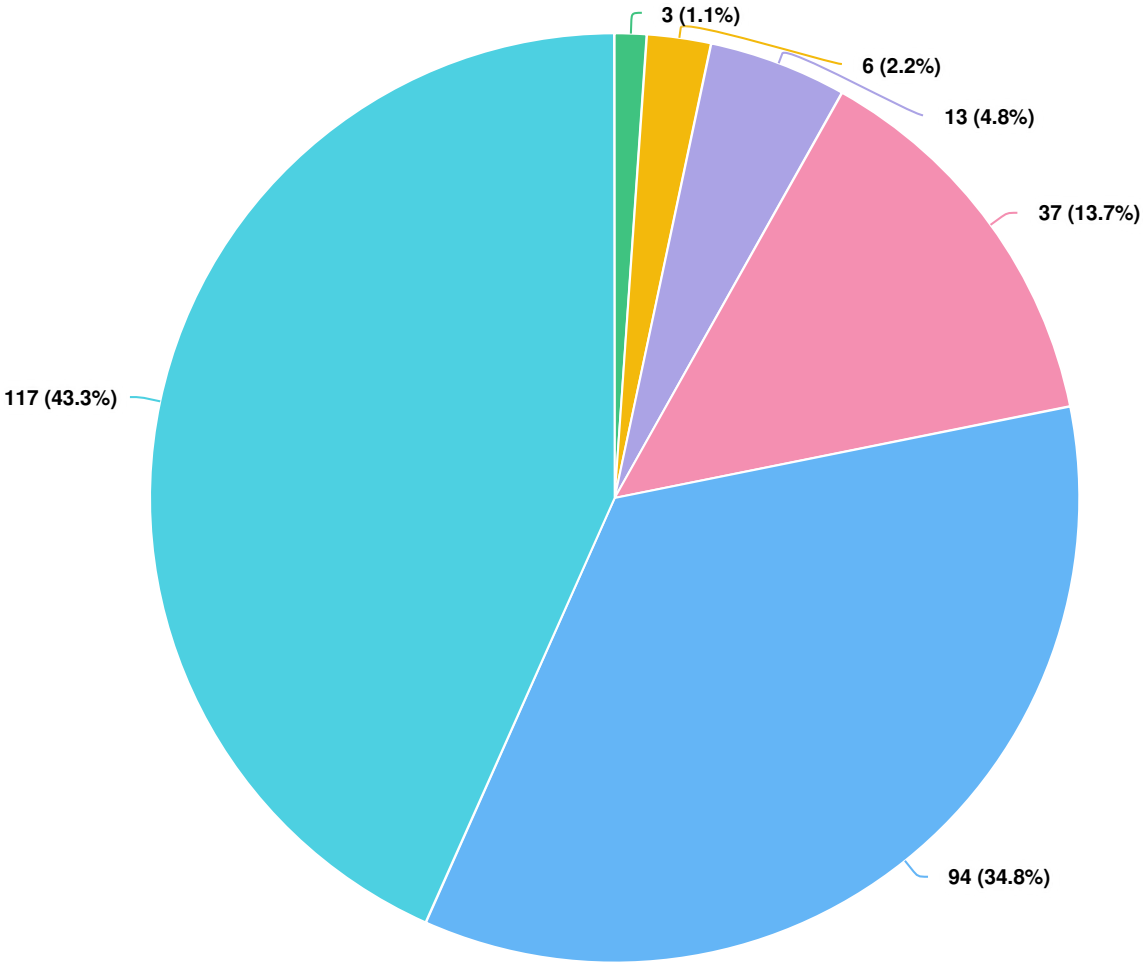
Question options

- Traffic/congestion (e.g. Too many cars, people, or bicycles in regular route etc.)
- Infrastructure Design (e.g. not enough safety features or separation, poor drainage, steep slope, slippery when wet etc.)
- Surface condition (e.g. significant cracking, potholes)
- Other (please specify)

Optional question (4 response(s), 275 skipped)

Question type: Checkbox Question

How often do you cycle through rural areas?



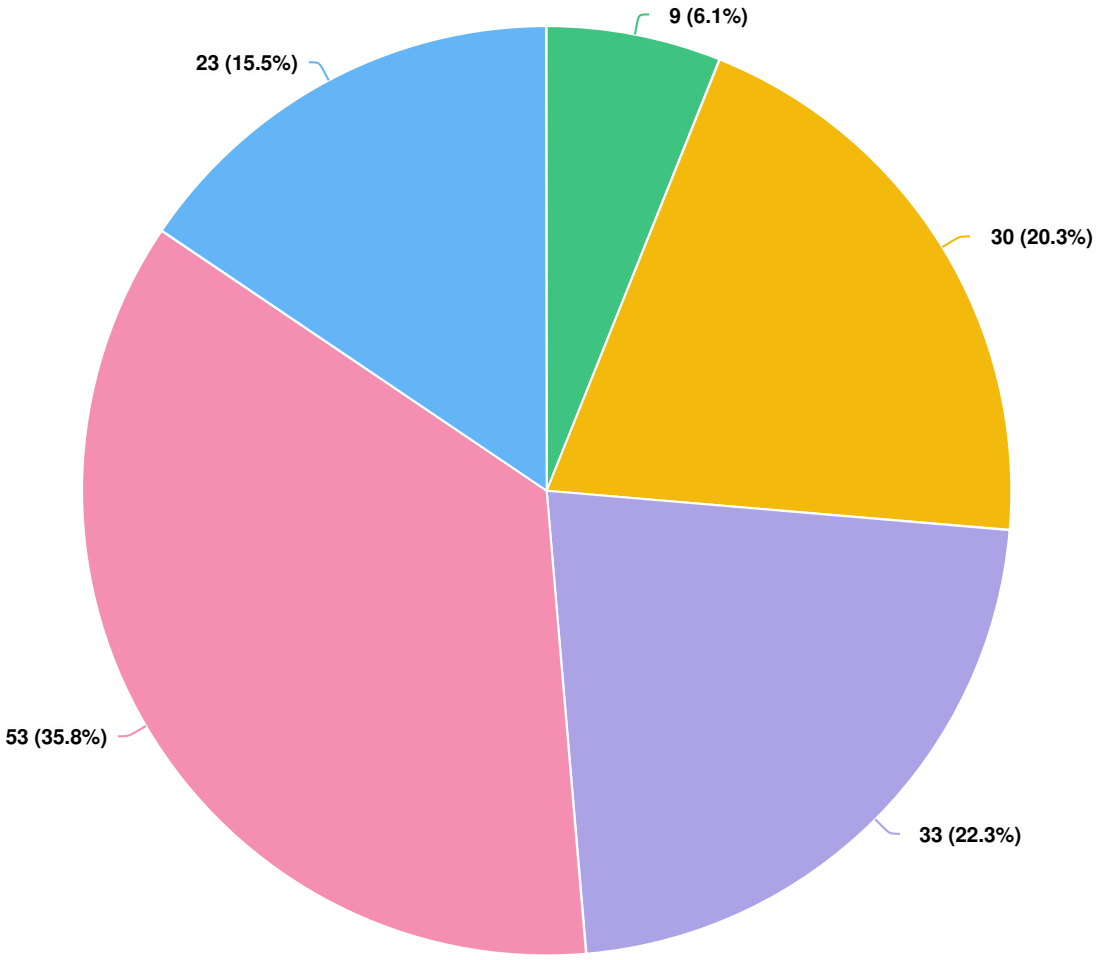
Question options

Every day | A few times a week | About once a week | A few times a month | Rarely | Never

Optional question (270 response(s), 9 skipped)

Question type: Dropdown Question

How safe do you feel while cycling through a rural area?



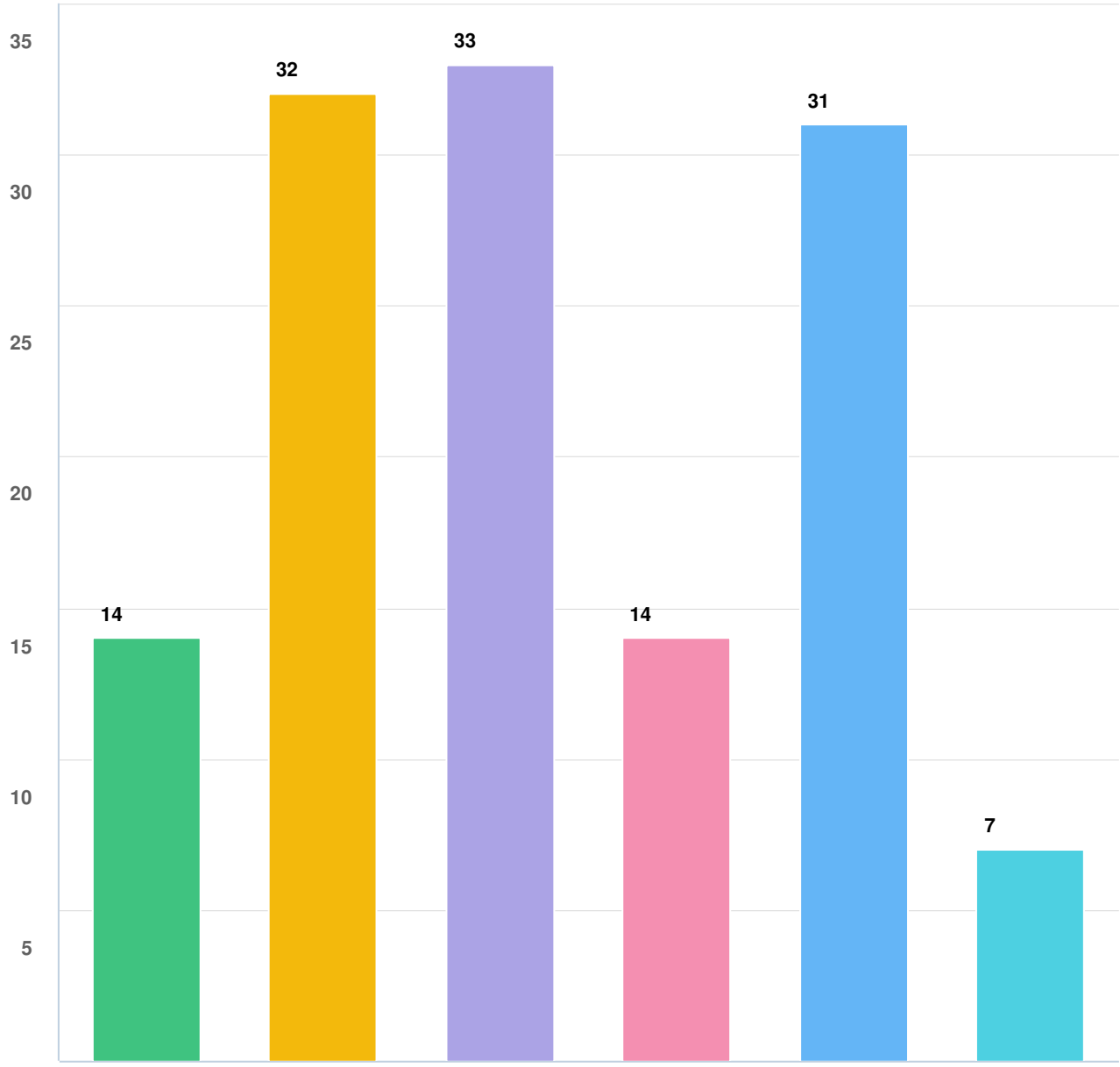
Question options

Very safe | Somewhat safe | Neutral | Somewhat unsafe | Very unsafe

Optional question (148 response(s), 131 skipped)

Question type: Dropdown Question

Select the top reasons you feel somewhat unsafe cycling through a rural areas



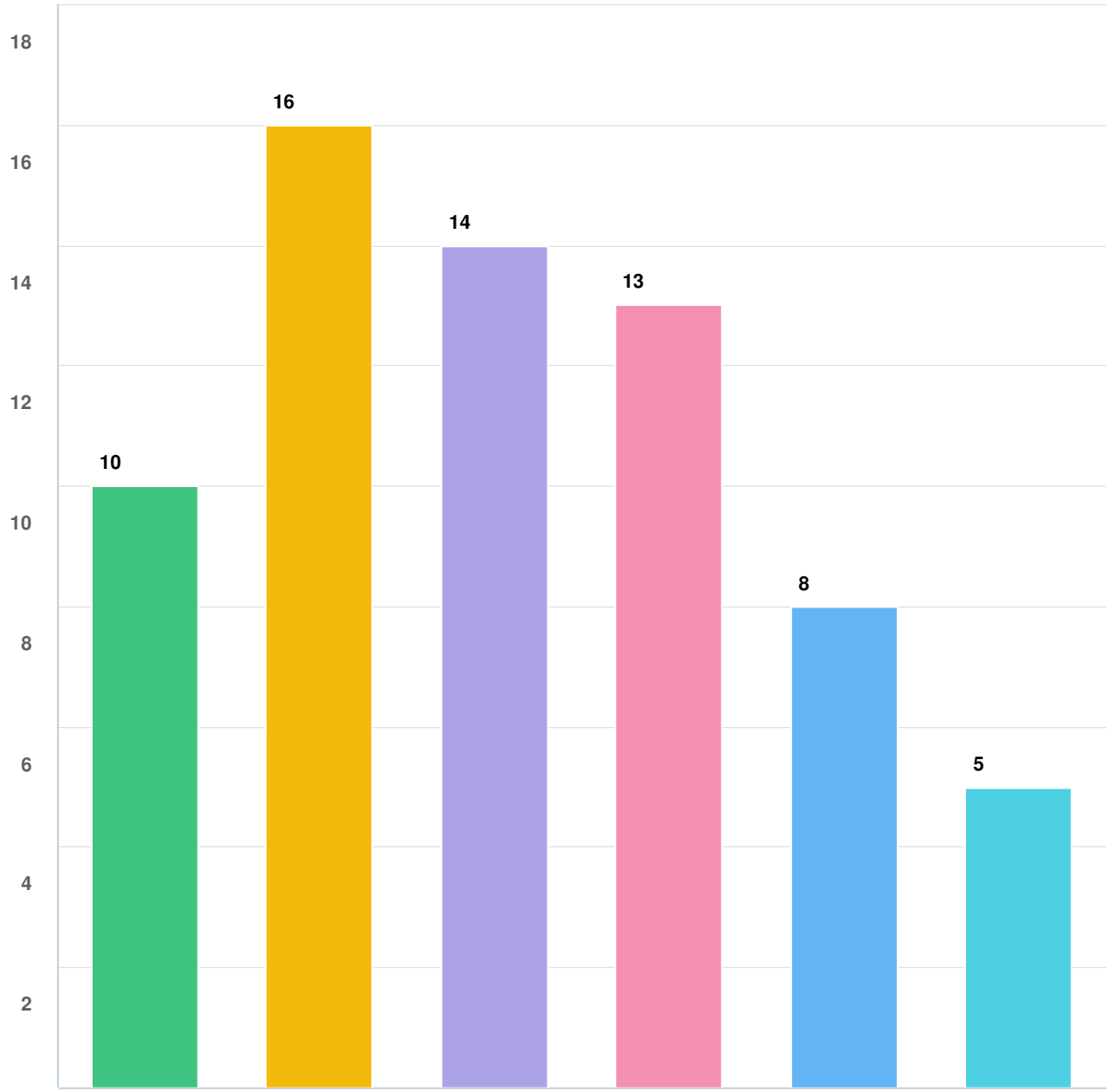
Question options

- Traffic/congestion (e.g. Too many cars, people, or bicycles in regular route etc.)
- Infrastructure Design (e.g. not enough safety features or separation, poor drainage, steep slope, slippery when wet etc.)
- Surface condition (e.g. significant cracking, potholes)
- Operational Issue (e.g. snow or ice not cleared, debris frequently not cleared)
- Poor connectivity (e.g. Bike lanes ending abruptly, sidewalks missing, curb cuts not available for mobility devices, roads frequently closed etc.)
- Other (please specify)

Optional question (53 response(s), 226 skipped)

Question type: Checkbox Question

Select the top reasons you feel very unsafe cycling through a rural areas



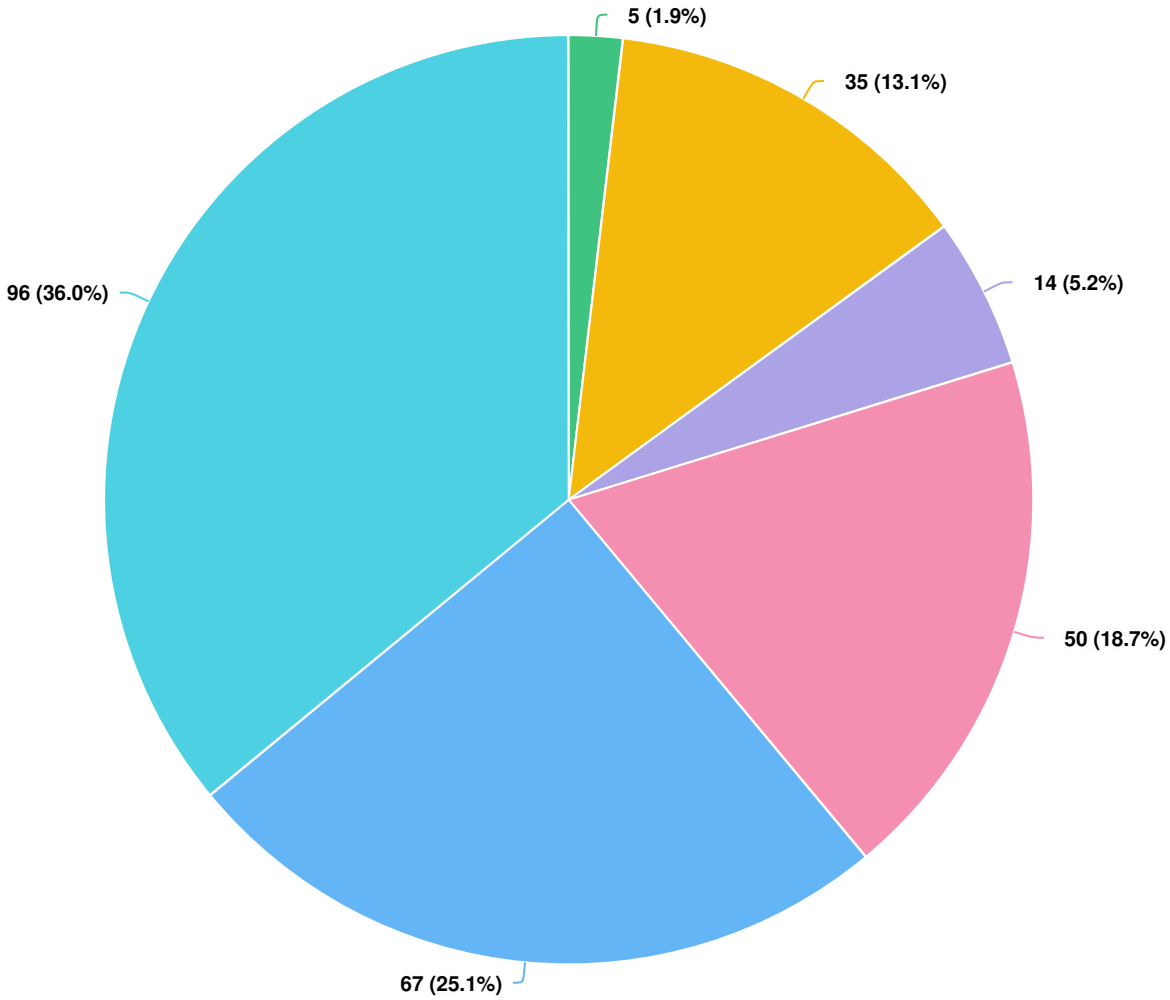
Question options

- Traffic/congestion (e.g. Too many cars, people, or bicycles in regular route etc.)
- Infrastructure Design (e.g. not enough safety features or separation, poor drainage, steep slope, slippery when wet etc.)
- Surface condition (e.g. significant cracking, potholes)
- Poor connectivity (e.g. Bike lanes ending abruptly, sidewalks missing, curb cuts not available for mobility devices, roads frequently closed etc.)
- Operational Issue (e.g. snow or ice not cleared, debris frequently not cleared)
- Other (please specify)

Optional question (23 response(s), 256 skipped)

Question type: Checkbox Question

How often do you cycle through urban areas?



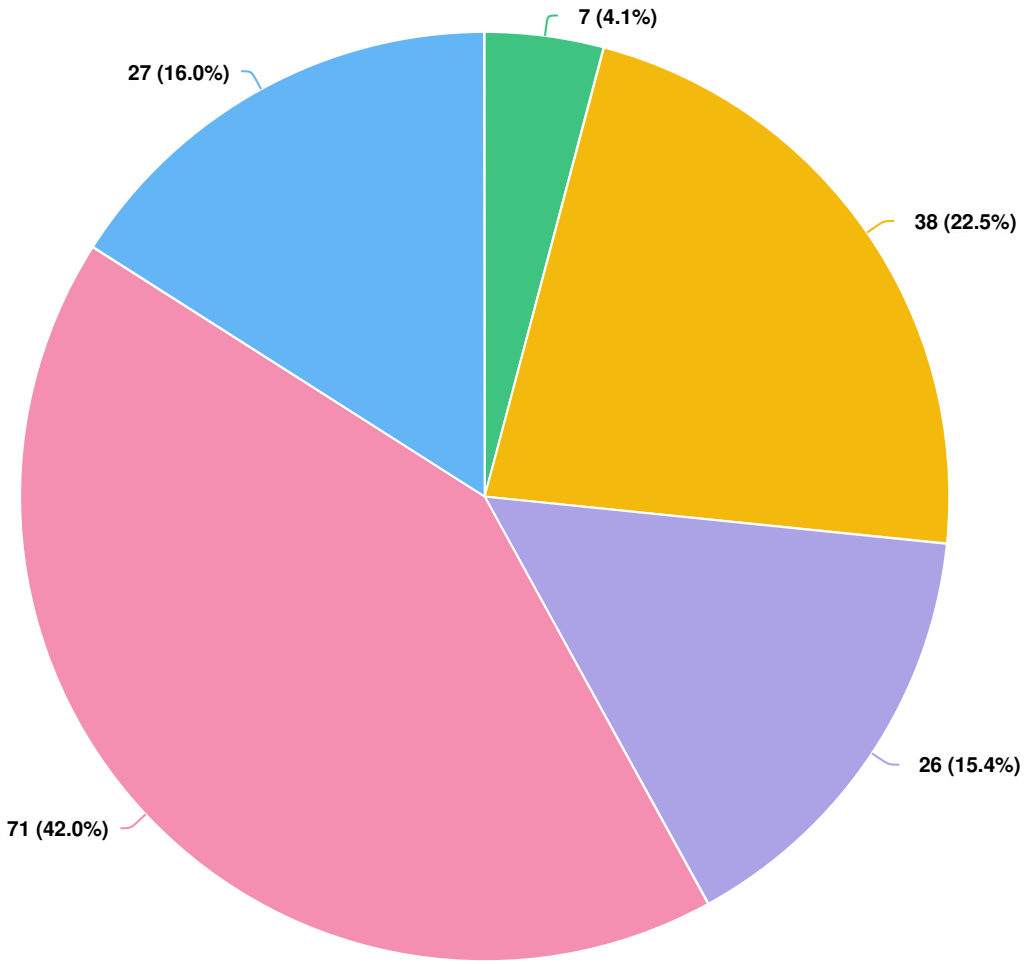
Question options

Every day | A few times a week | About once a week | A few times a month | Rarely | Never

Optional question (267 response(s), 12 skipped)

Question type: Dropdown Question

How safe do you feel while cycling through a urban area?



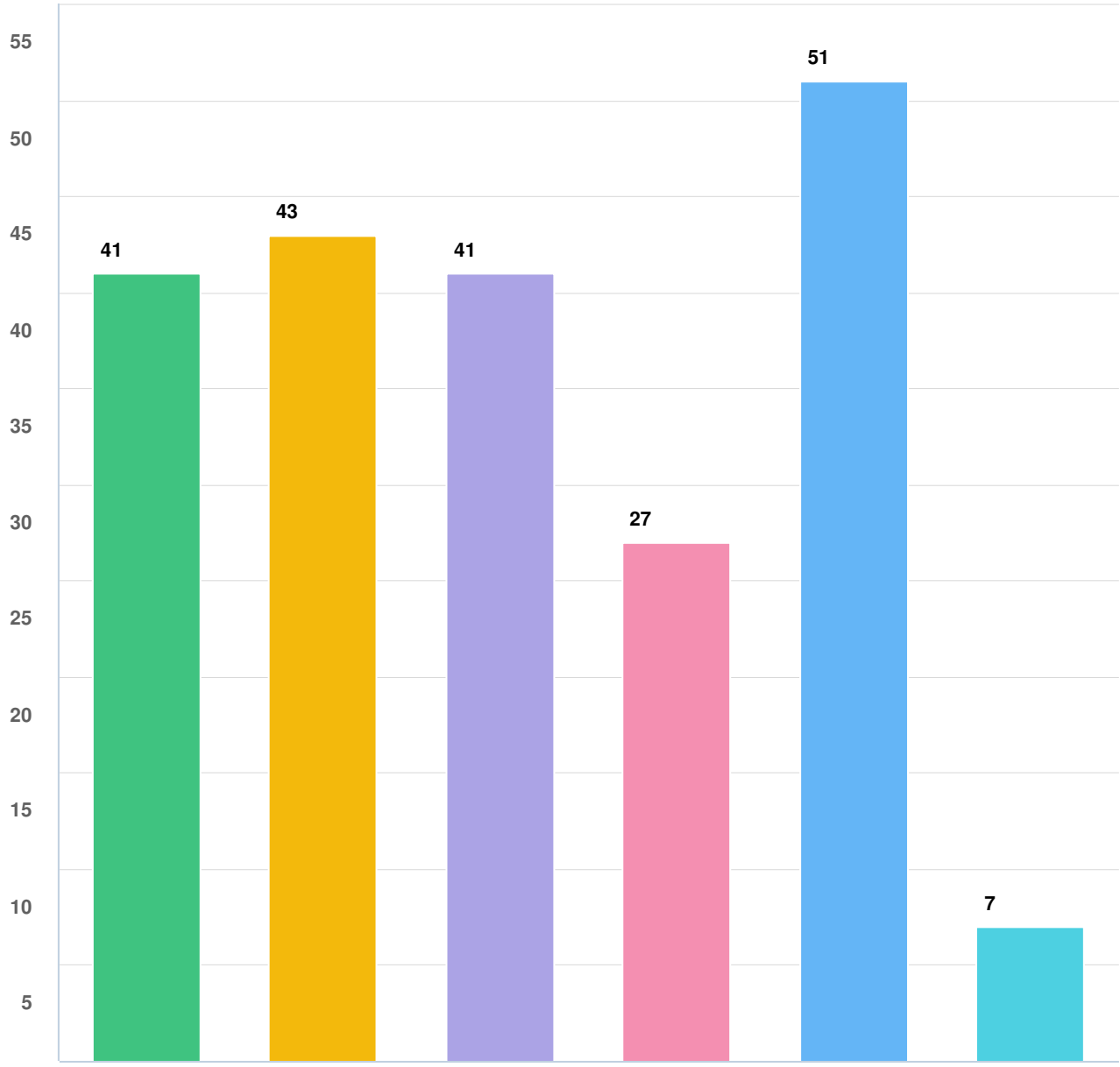
Question options

Very safe | Somewhat safe | Neutral | Somewhat unsafe | Very unsafe

Optional question (169 response(s), 110 skipped)

Question type: Dropdown Question

Select the top reasons you feel somewhat unsafe cycling through a urban areas



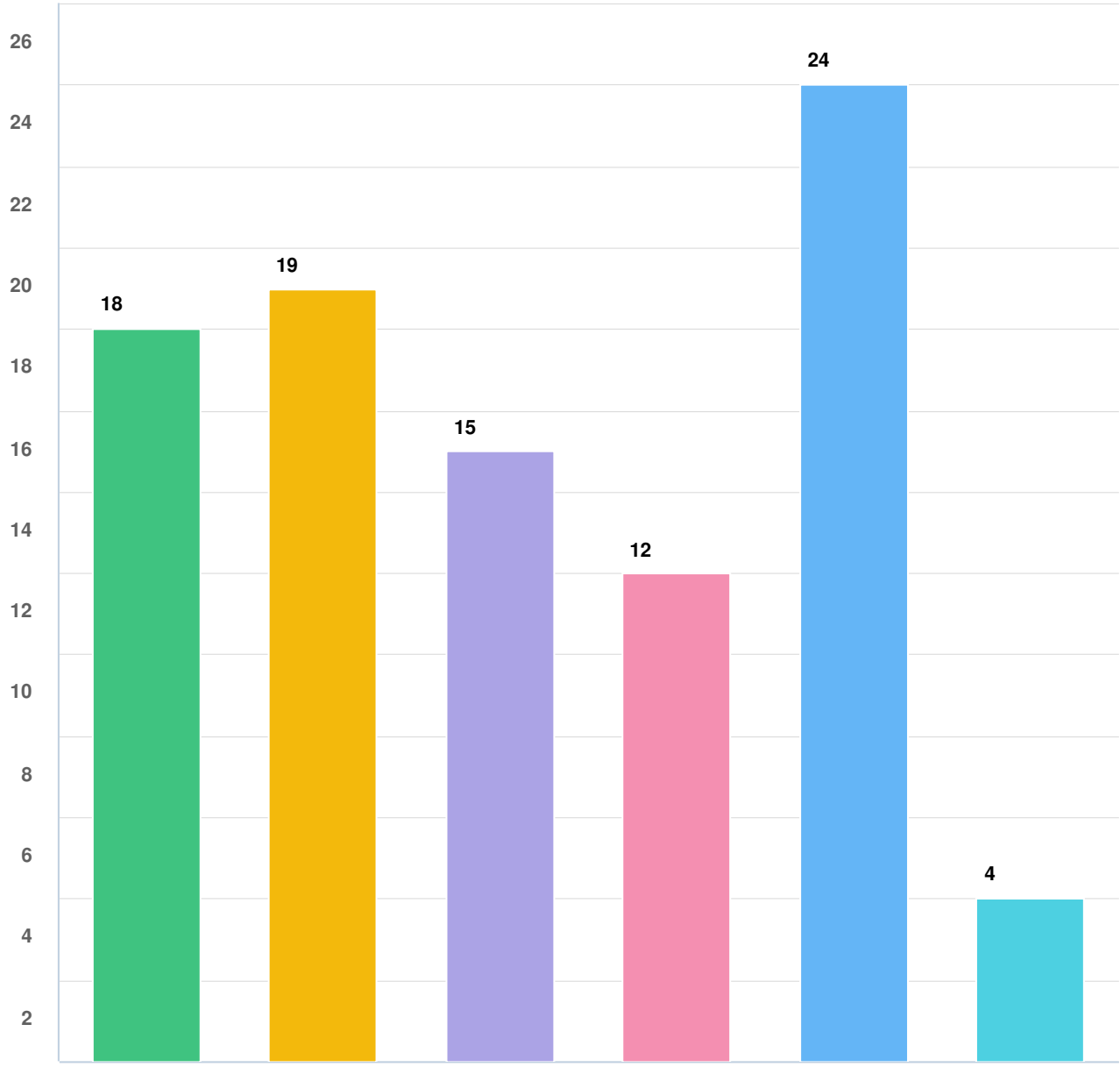
Question options

- Traffic/congestion (e.g. Too many cars, people, or bicycles in regular route etc.)
- Infrastructure Design (e.g. not enough safety features or separation, poor drainage, steep slope, slippery when wet etc.)
- Surface condition (e.g. significant cracking, potholes)
- Operational Issue (e.g. snow or ice not cleared, debris frequently not cleared)
- Poor connectivity (e.g. Bike lanes ending abruptly, sidewalks missing, curb cuts not available for mobility devices, roads frequently closed etc.)
- Other (please specify)

Optional question (71 response(s), 208 skipped)

Question type: Checkbox Question

Select the top reasons you feel very unsafe cycling through a urban areas



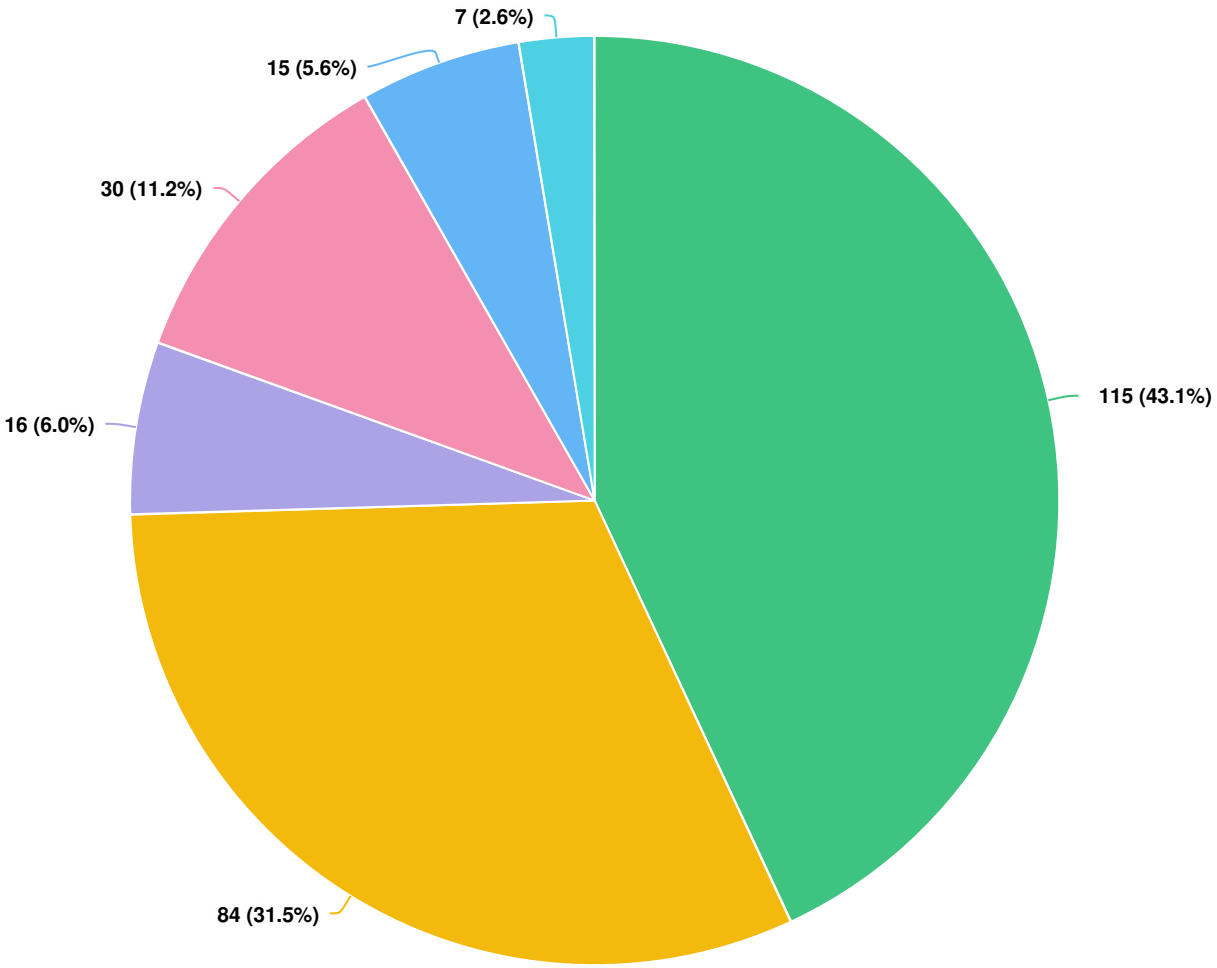
Question options

- Traffic/congestion (e.g. Too many cars, people, or bicycles in regular route etc.)
- Infrastructure Design (e.g. not enough safety features or separation, poor drainage, steep slope, slippery when wet etc.)
- Surface condition (e.g. significant cracking, potholes)
- Operational Issue (e.g. snow or ice not cleared, debris frequently not cleared)
- Poor connectivity (e.g. Bike lanes ending abruptly, sidewalks missing, curb cuts not available for mobility devices, roads frequently closed etc.)
- Other (please specify)

Optional question (27 response(s), 252 skipped)

Question type: Checkbox Question

How often do you walk using sidewalks or multi-use trails?



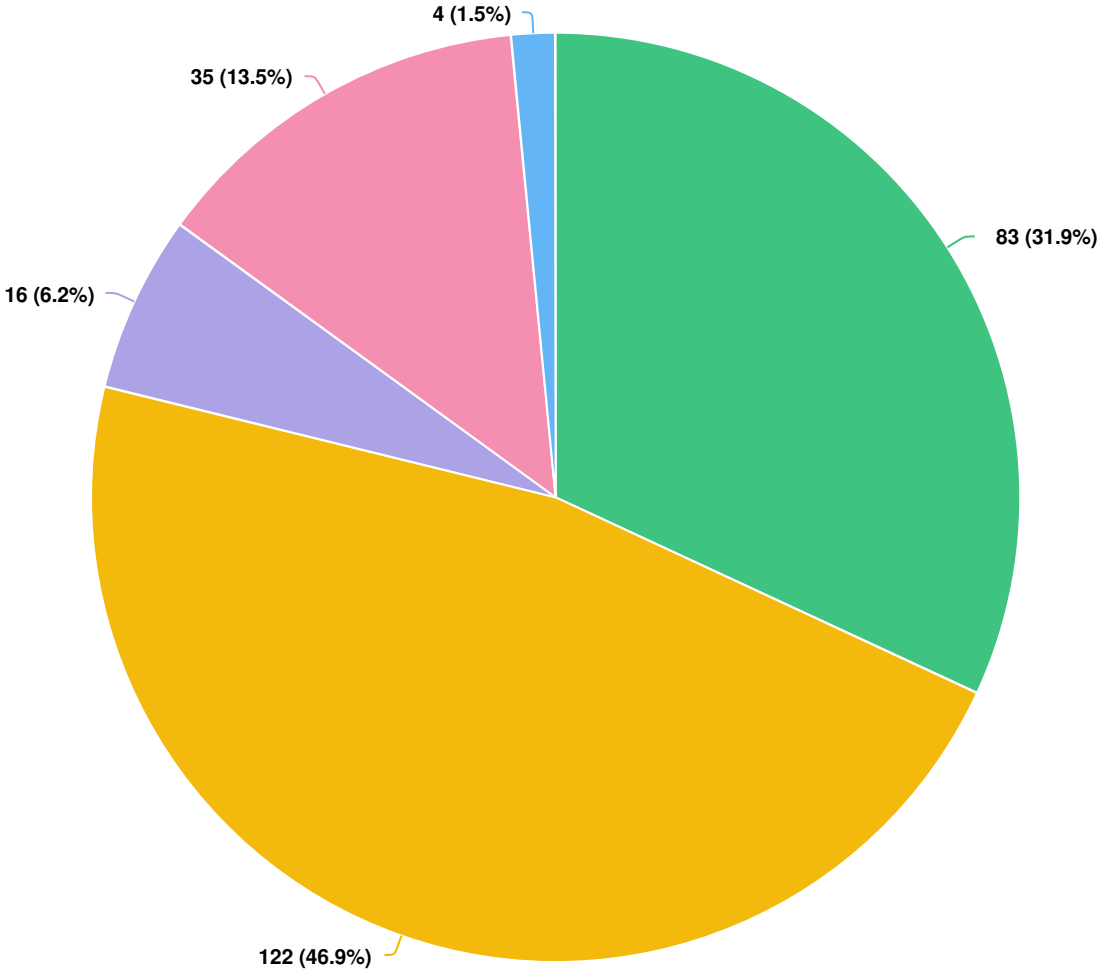
Question options

Every day | A few times a week | About once a week | A few times a month | Rarely | Never

Optional question (267 response(s), 12 skipped)

Question type: Dropdown Question

How safe do you feel while walking on sidewalks or multi-use trails?



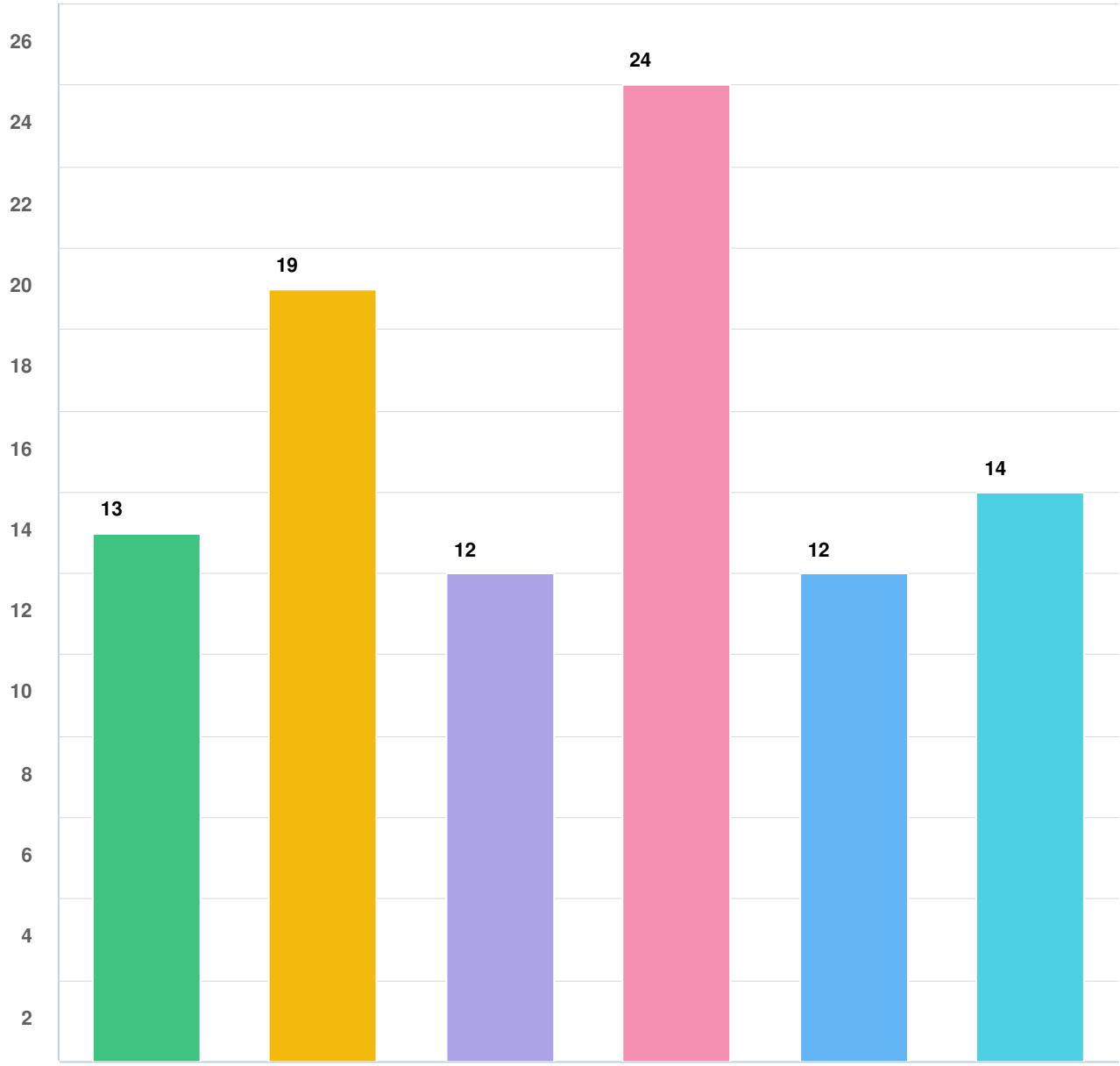
Question options

Very safe | Somewhat safe | Neutral | Somewhat unsafe | Very unsafe

Optional question (260 response(s), 19 skipped)

Question type: Dropdown Question

Select the top reasons you feel somewhat unsafe walking on sidewalks or multi-use trails



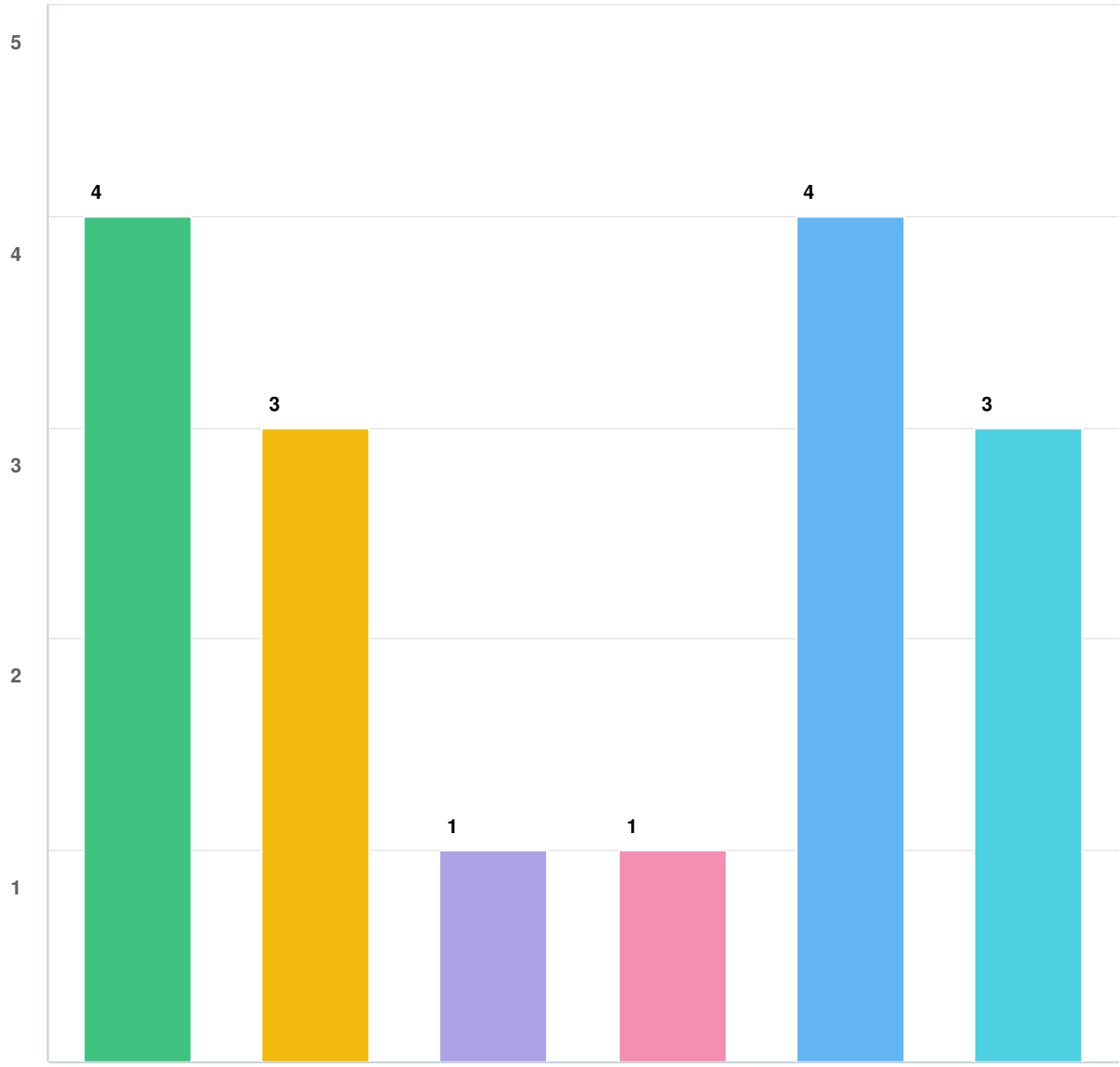
Question options

- Traffic/congestion (e.g. Too many cars, people, or bicycles in regular route etc.)
- Infrastructure Design (e.g. not enough safety features or separation, poor drainage, steep slope, slippery when wet etc.)
- Surface condition (e.g. significant cracking, potholes)
- Operational Issue (e.g. snow or ice not cleared, debris frequently not cleared)
- Poor connectivity (e.g. Bike lanes ending abruptly, sidewalks missing, curb cuts not available for mobility devices, roads frequently closed etc.)
- Other (please specify)

Optional question (35 response(s), 244 skipped)

Question type: Checkbox Question

Select the top reasons you feel very unsafe walking on sidewalks or multi-use trails



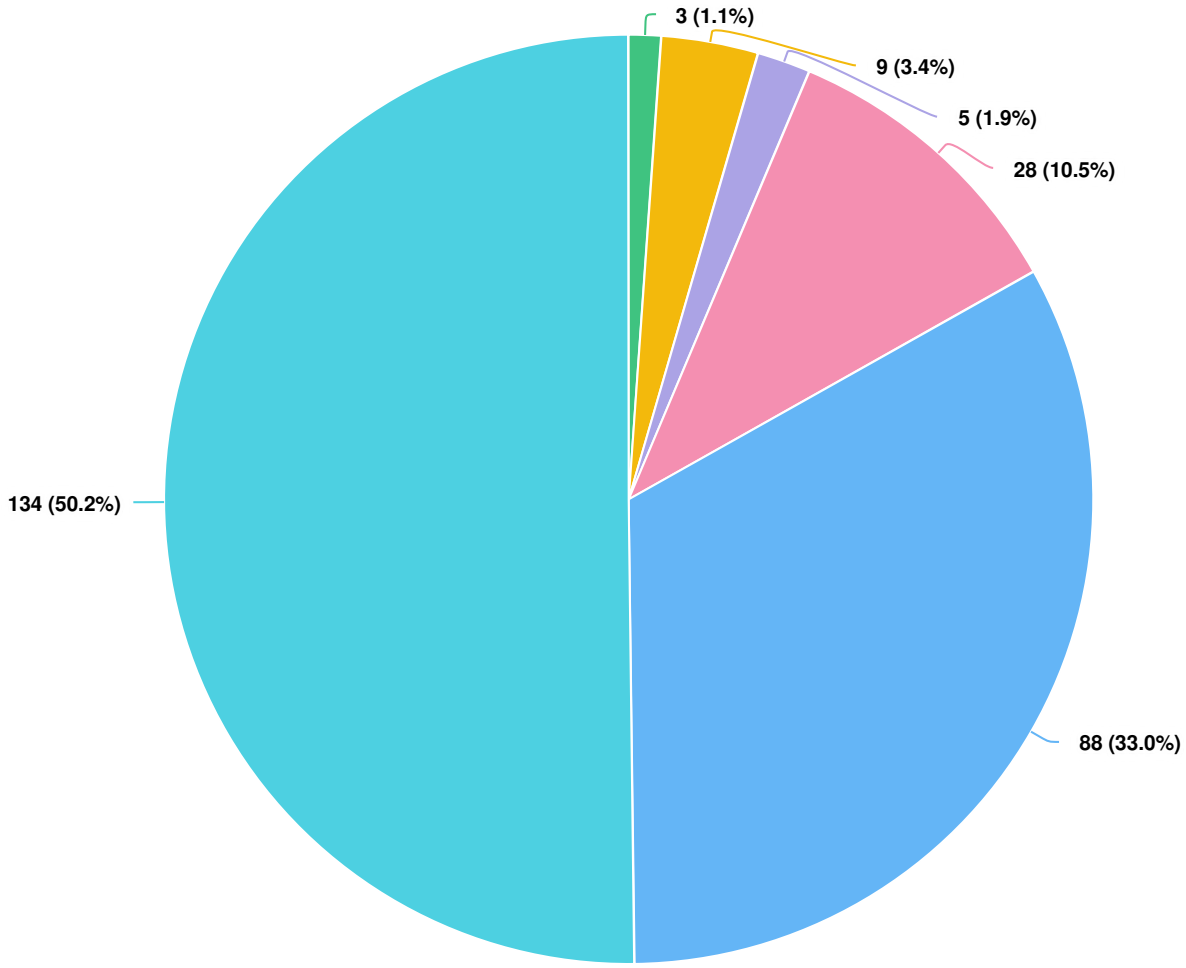
Question options

- Traffic/congestion (e.g. Too many cars, people, or bicycles in regular route etc.)
- Infrastructure Design (e.g. not enough safety features or separation, poor drainage, steep slope, slippery when wet etc.)
- Surface condition (e.g. significant cracking, potholes)
- Operational Issue (e.g. snow or ice not cleared, debris frequently not cleared)
- Poor connectivity (e.g. Bike lanes ending abruptly, sidewalks missing, curb cuts not available for mobility devices, roads frequently closed etc.)
- Other (please specify)

Optional question (4 response(s), 275 skipped)

Question type: Checkbox Question

How often do you ride public transportation?



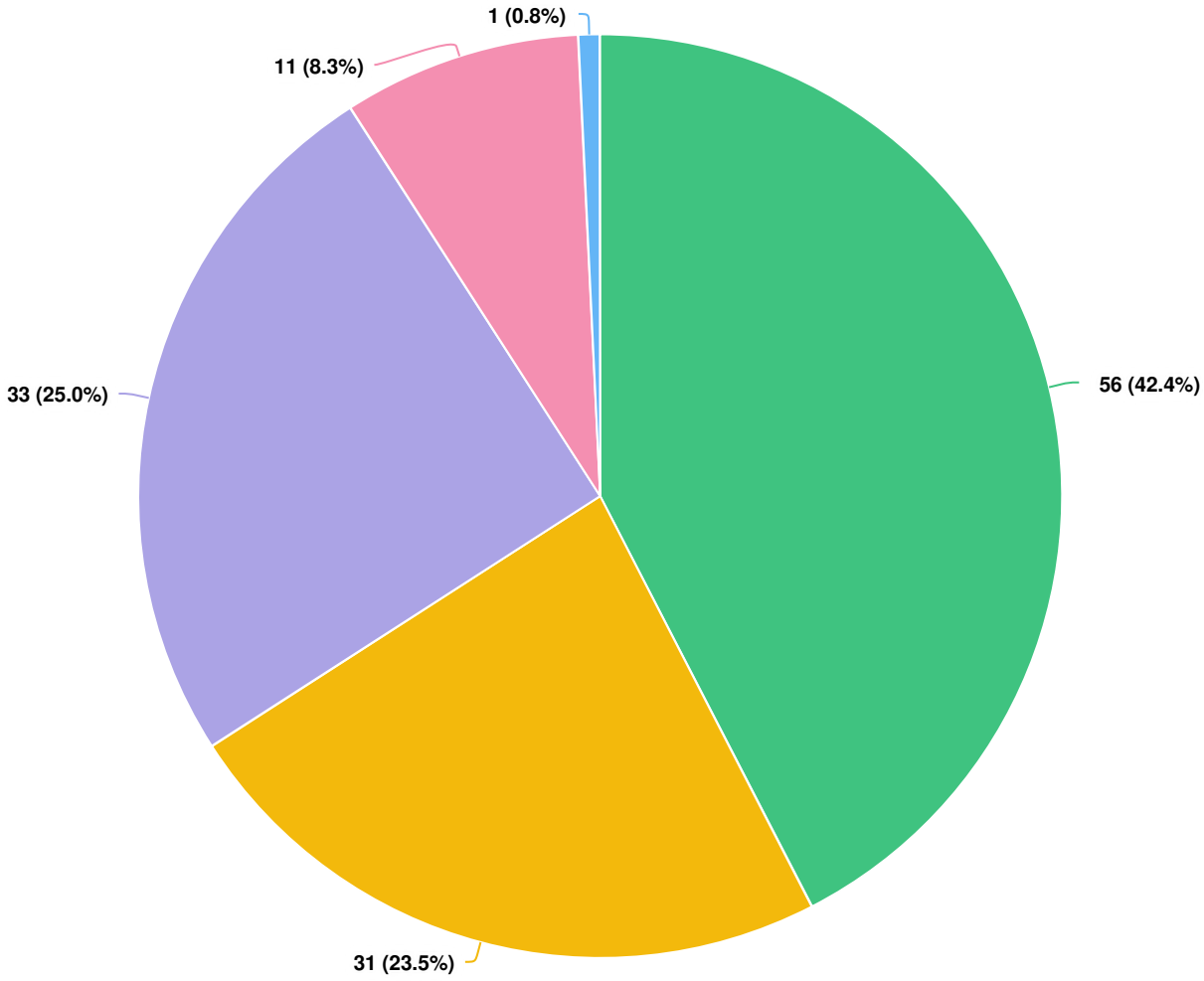
Question options

Every day | A few times a week | About once a week | A few times a month | Rarely | Never

Optional question (267 response(s), 12 skipped)

Question type: Dropdown Question

How safe do you feel using the roads while riding public transportation?



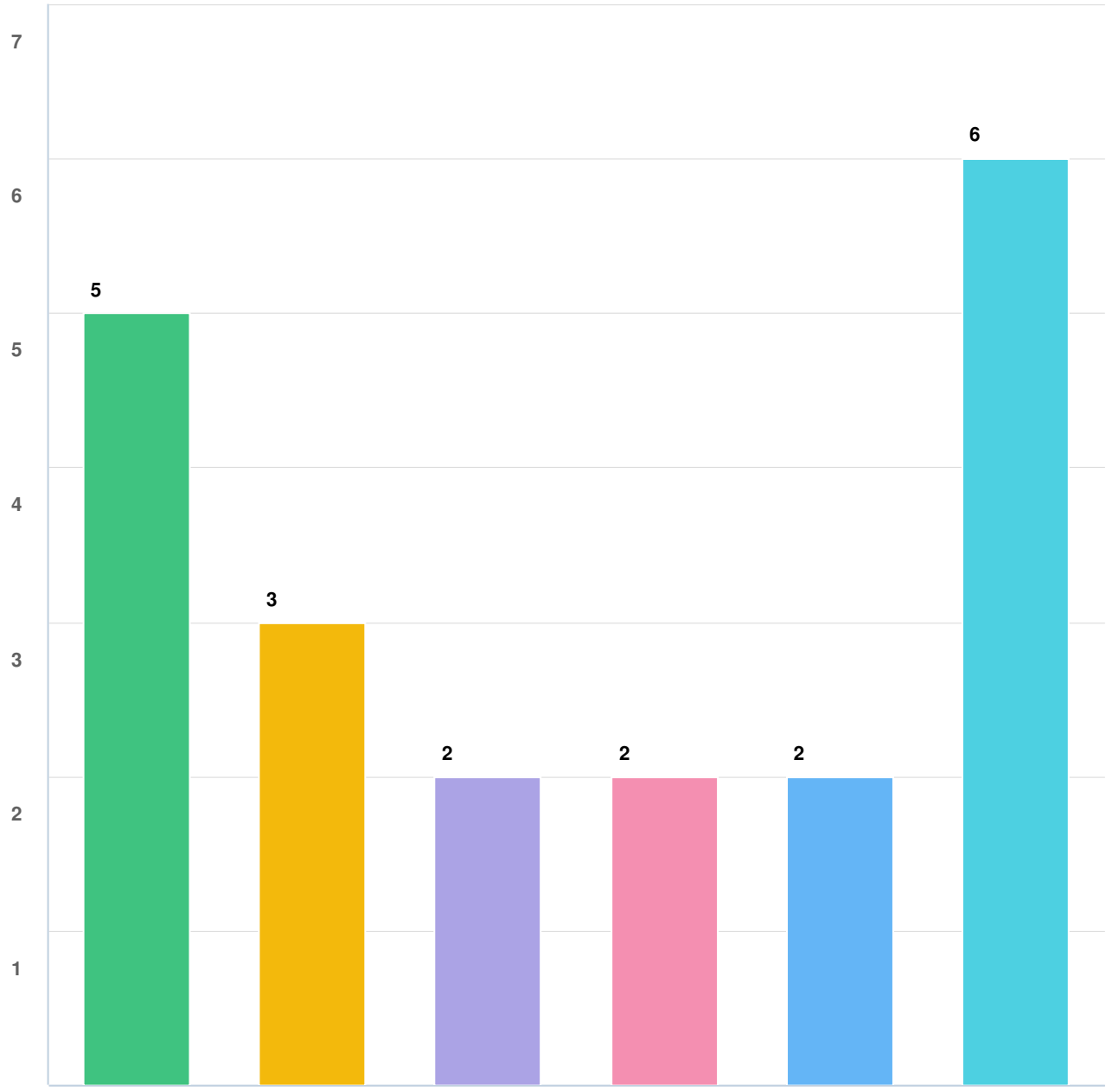
Question options

Very safe | Somewhat safe | Neutral | Somewhat unsafe | Very unsafe

Optional question (132 response(s), 147 skipped)

Question type: Dropdown Question

Select the top reasons you feel somewhat unsafe riding public transportation



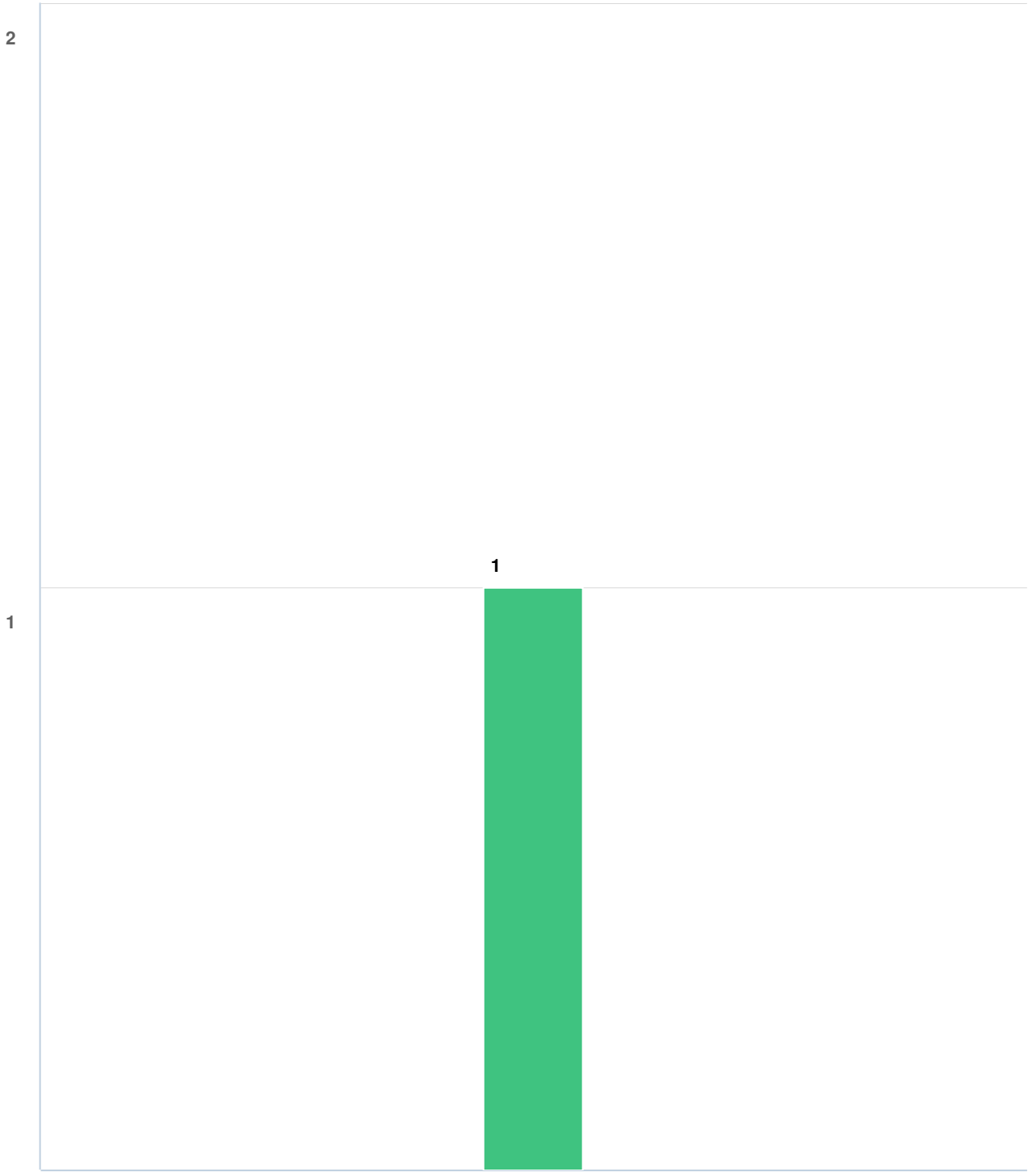
Question options

- Traffic/congestion (e.g. Too many cars, people, or bicycles in regular route etc.)
- Infrastructure Design (e.g. not enough safety features or separation, poor drainage, steep slope, slippery when wet etc.)
- Surface condition (e.g. significant cracking, potholes)
- Poor connectivity (e.g. Bike lanes ending abruptly, sidewalks missing, curb cuts not available for mobility devices, roads frequently closed etc.)
- Operational Issue (e.g. snow or ice not cleared, debris frequently not cleared)
- Other (please specify)

Optional question (10 response(s), 269 skipped)

Question type: Checkbox Question

Select the top reasons you feel very unsafe riding public transportation



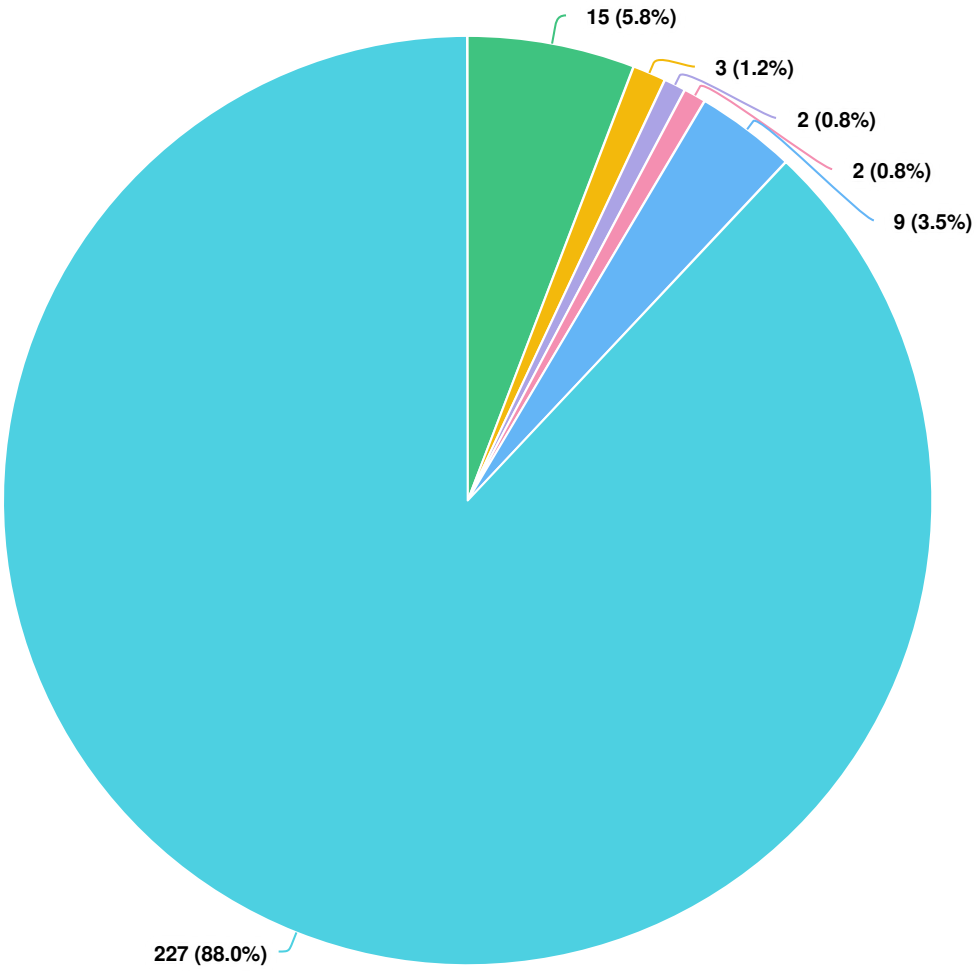
Question options

- Surface condition (e.g. significant cracking, potholes)

Optional question (1 response(s), 278 skipped)

Question type: Checkbox Question

How often do you use a mobility device?



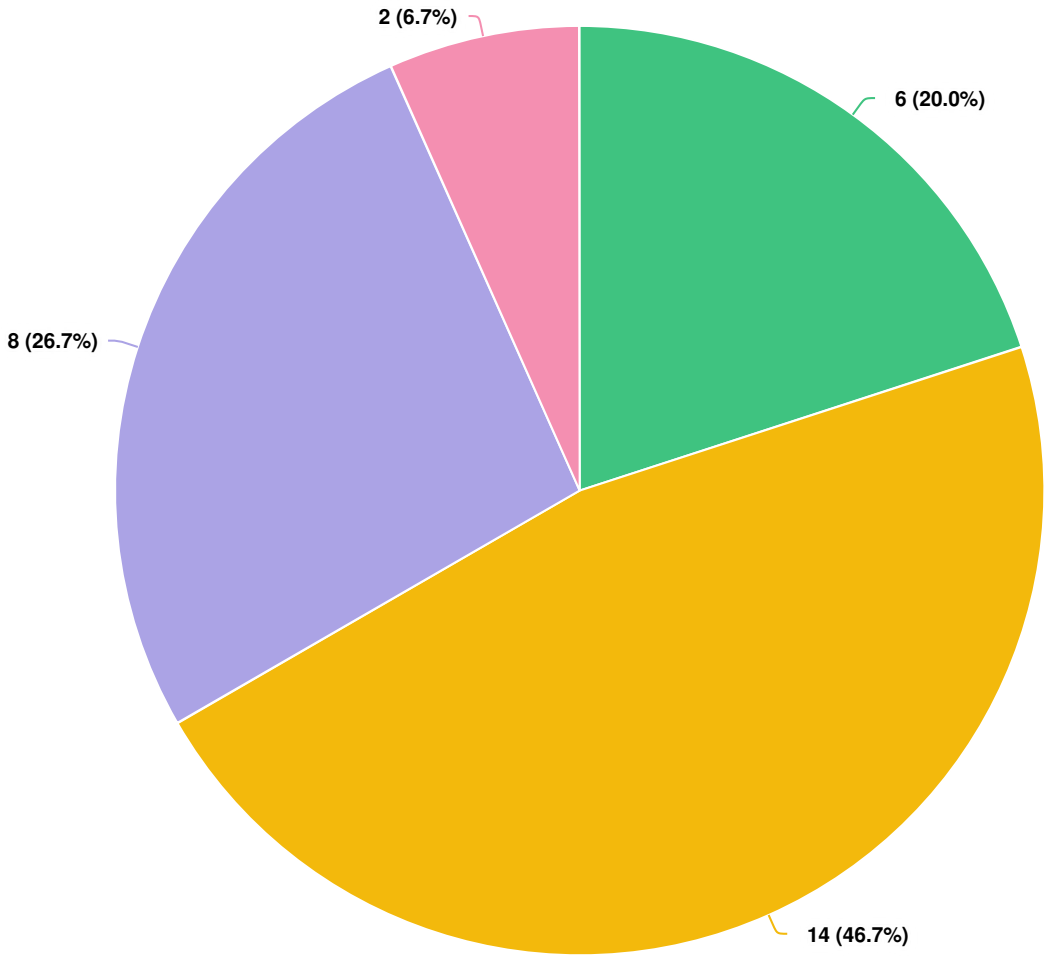
Question options

Every day | A few times a week | About once a week | A few times a month | Rarely | Never

Optional question (258 response(s), 21 skipped)

Question type: Dropdown Question

How safe do you feel using a mobility device on the City's transportation network? (including sidewalks, public transportation etc.)



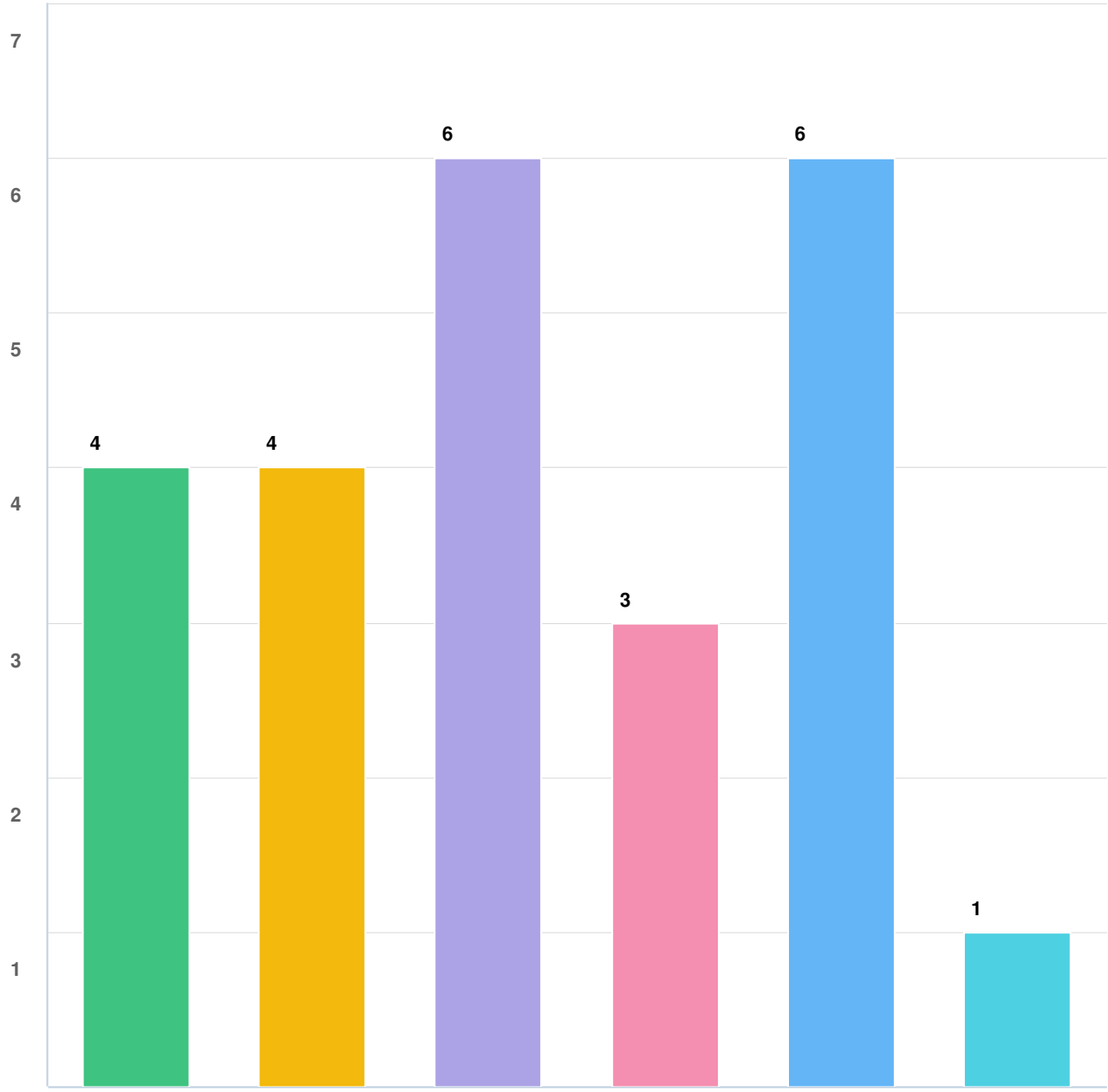
Question options

Somewhat safe Neutral Somewhat unsafe Very unsafe

Optional question (30 response(s), 249 skipped)

Question type: Dropdown Question

Select the top reasons you feel somewhat unsafe using a mobility device



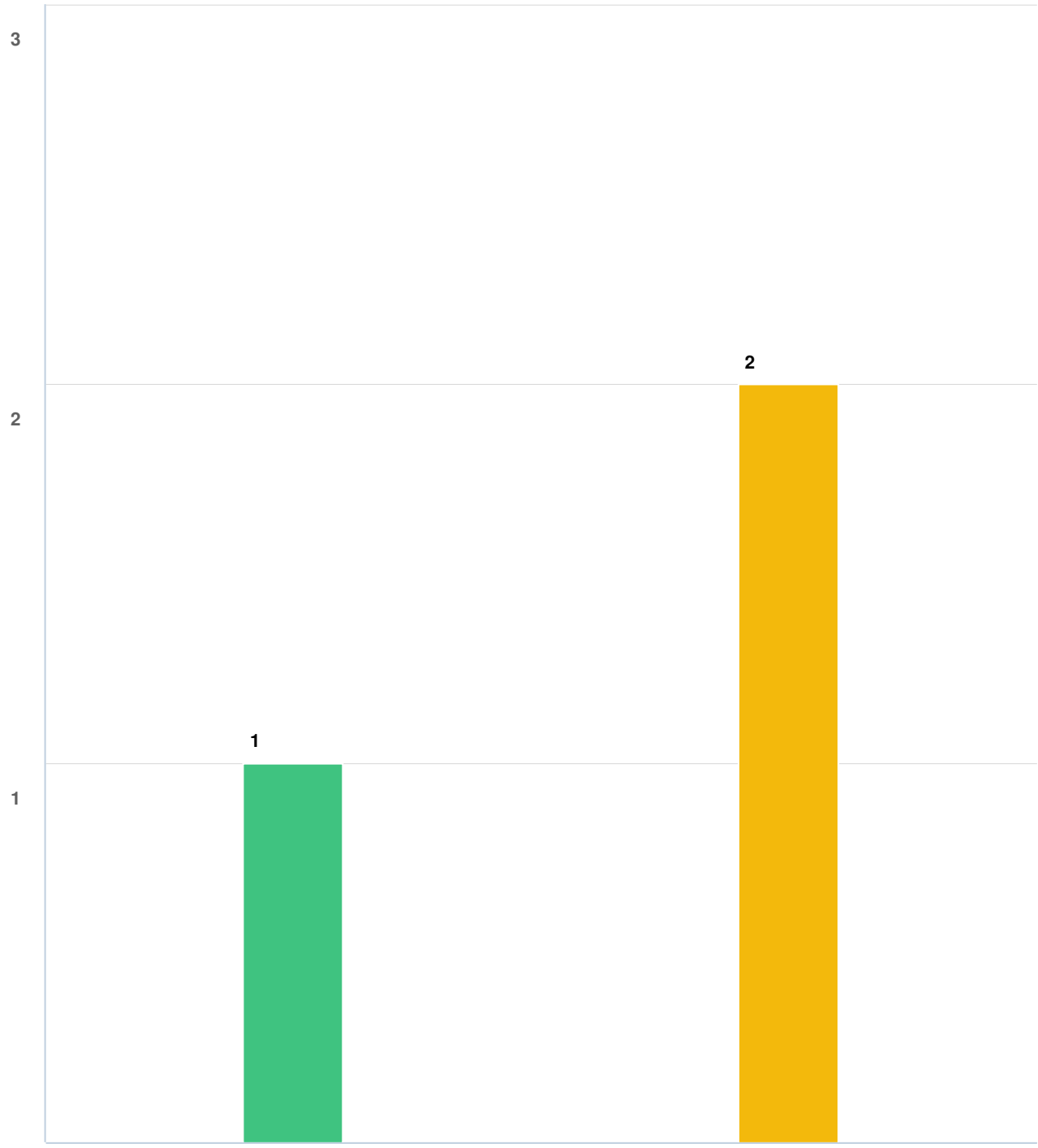
Question options

- Traffic/congestion (e.g. Too many cars, people, or bicycles in regular route etc.)
- Infrastructure Design (e.g. not enough safety features or separation, poor drainage, steep slope, slippery when wet etc.)
- Surface condition (e.g. significant cracking, potholes)
- Poor connectivity (e.g. Bike lanes ending abruptly, sidewalks missing, curb cuts not available for mobility devices, roads frequently closed etc.)
- Operational Issue (e.g. snow or ice not cleared, debris frequently not cleared)
- Other (please specify)

Optional question (8 response(s), 271 skipped)

Question type: Checkbox Question

Select the top reasons you feel very unsafe using a mobility device



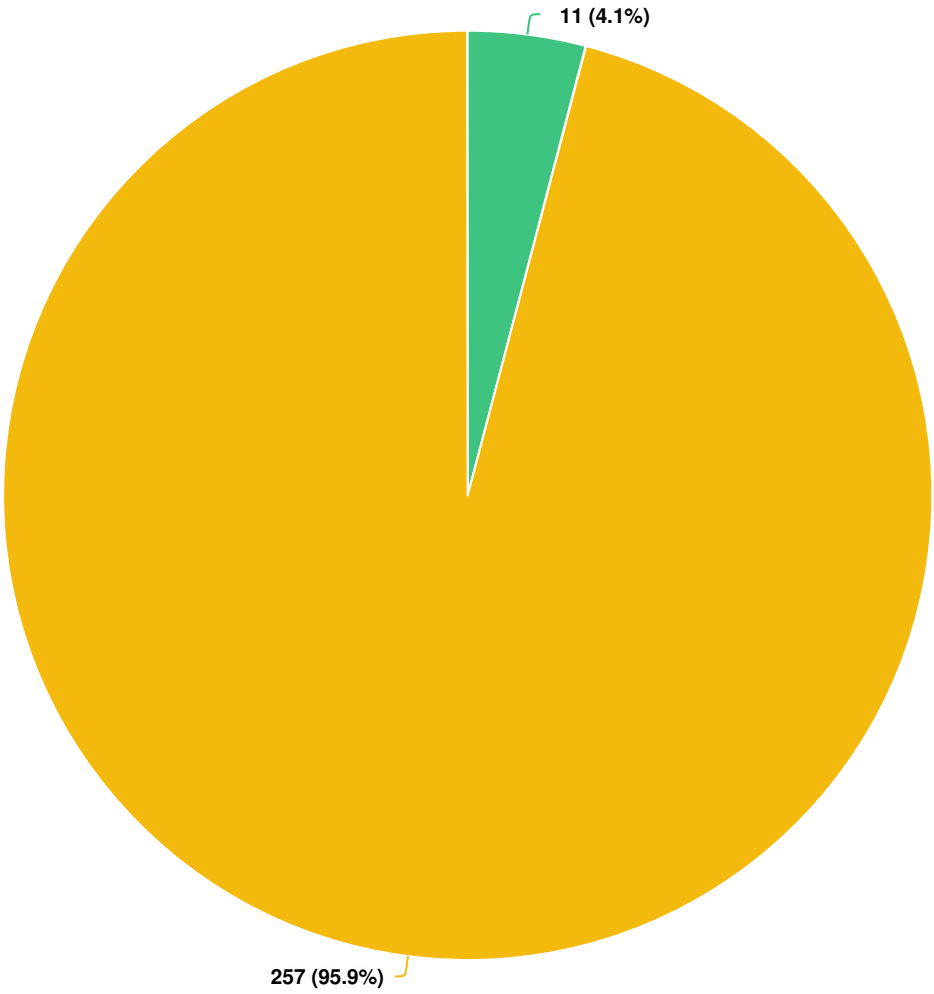
Question options

- Surface condition (e.g. significant cracking, potholes)
- Operational Issue (e.g. snow or ice not cleared, debris frequently not cleared)

Optional question (2 response(s), 277 skipped)

Question type: Checkbox Question

Do you use another mode of transportation?



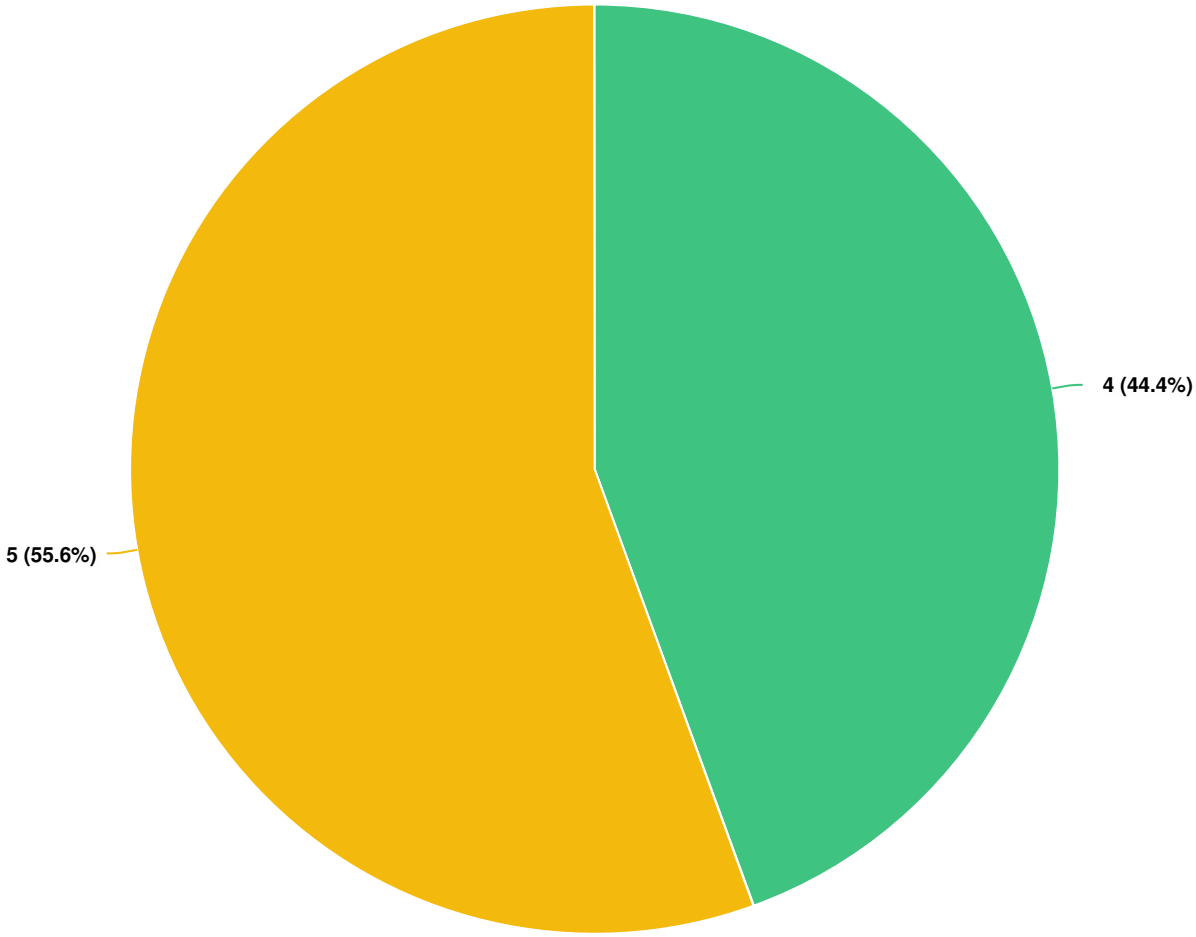
Question options

Yes No

Optional question (268 response(s), 11 skipped)

Question type: Dropdown Question

How often do you use that mode of transportation?



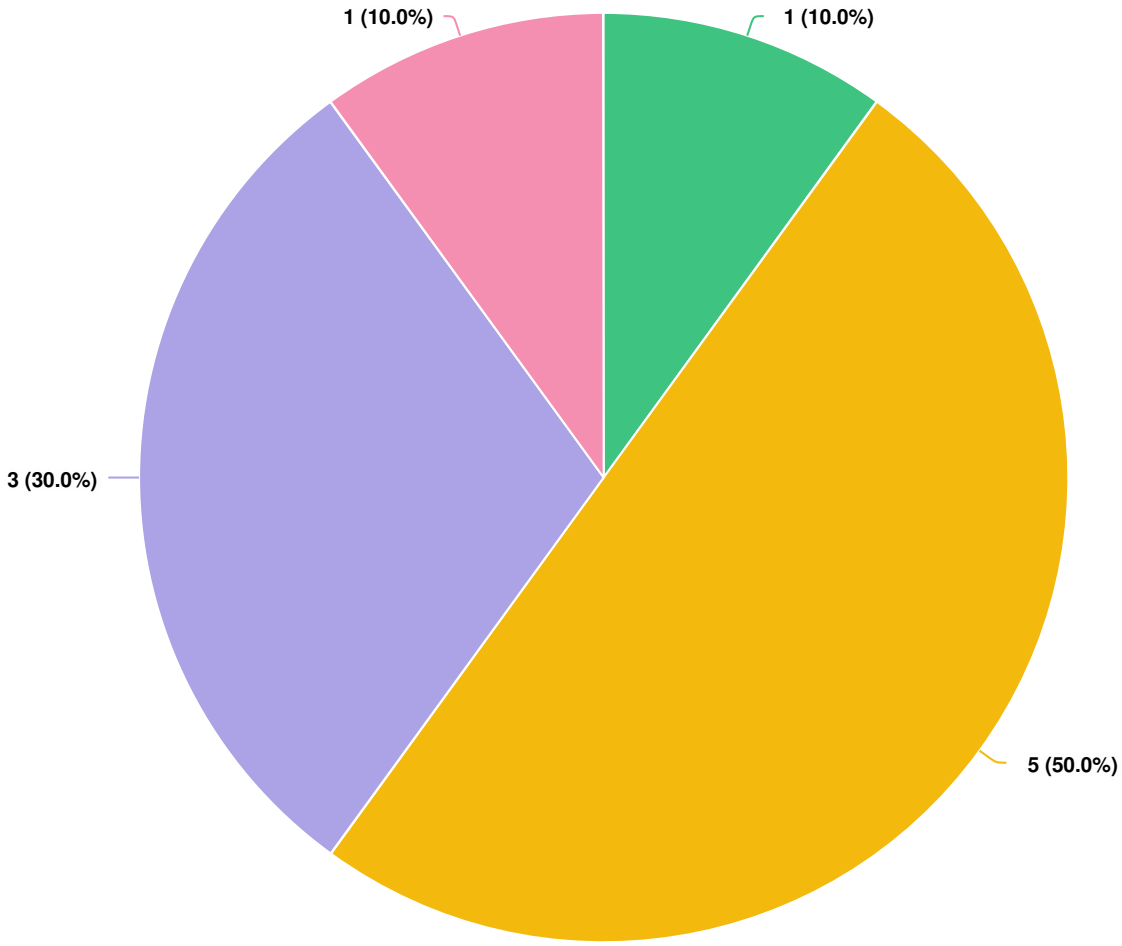
Question options

Every day A few times a week

Optional question (9 response(s), 270 skipped)

Question type: Dropdown Question

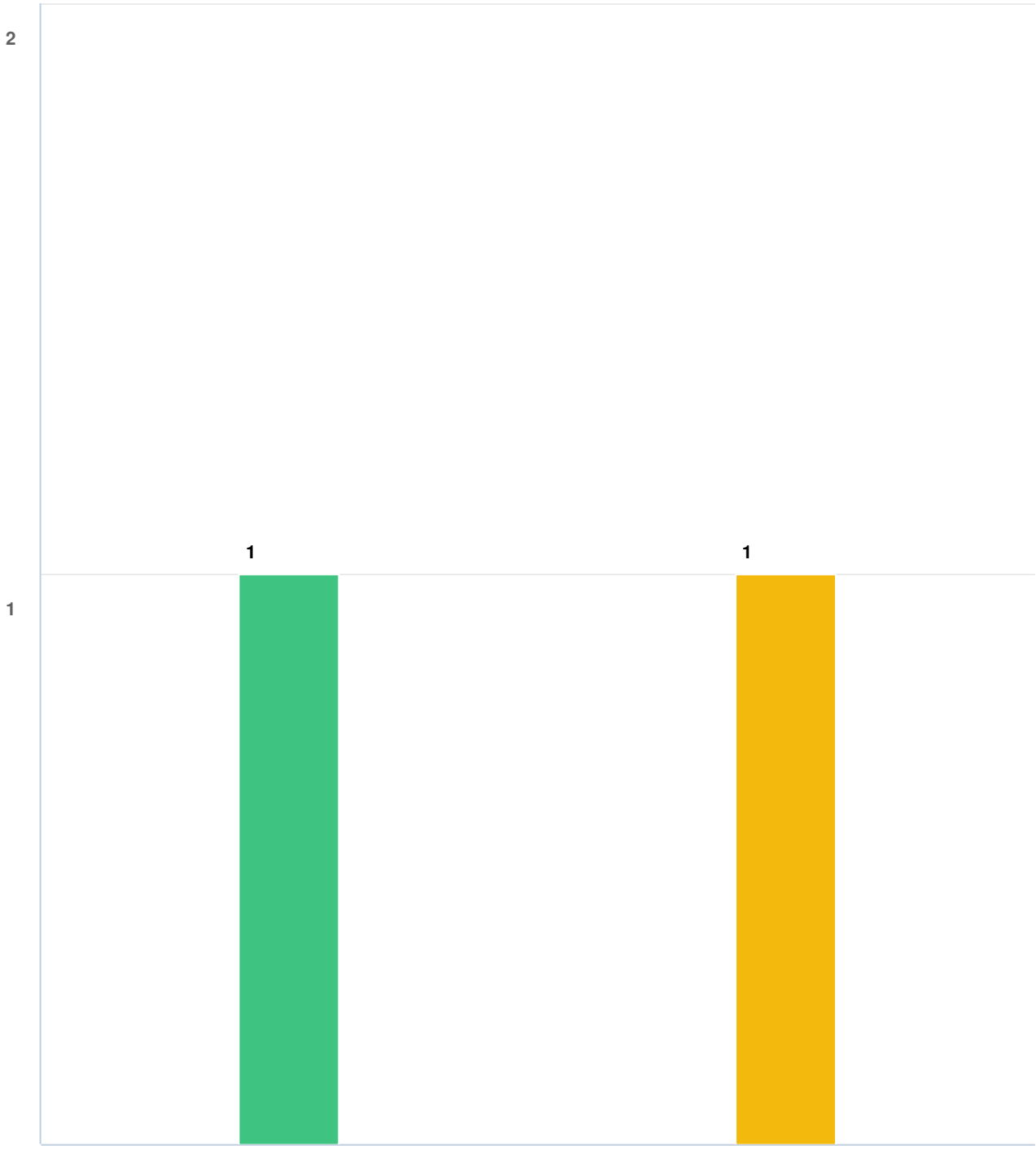
How safe do you feel using that mode of transportation on the road network?



Optional question (10 response(s), 269 skipped)

Question type: Dropdown Question

Select the top reasons you feel somewhat unsafe using that mode of transportation



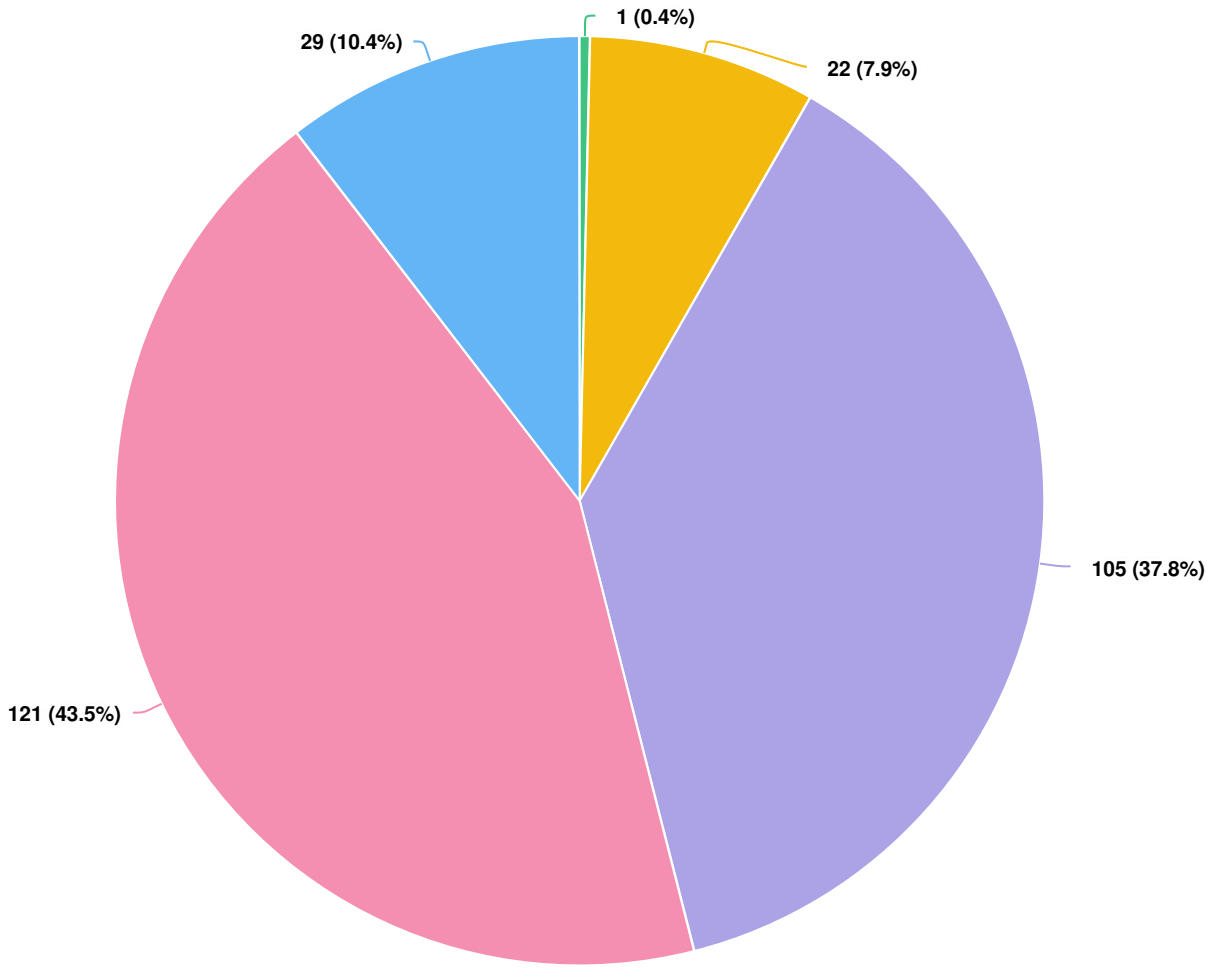
Question options

- Infrastructure Design (e.g. not enough safety features or separation, poor drainage, steep slope, slippery when wet etc.)
- Surface condition (e.g. significant cracking, potholes)

Optional question (1 response(s), 278 skipped)

Question type: Checkbox Question

Based on the images above, how would you rate the surface condition (quality) of the roads in Hamilton?



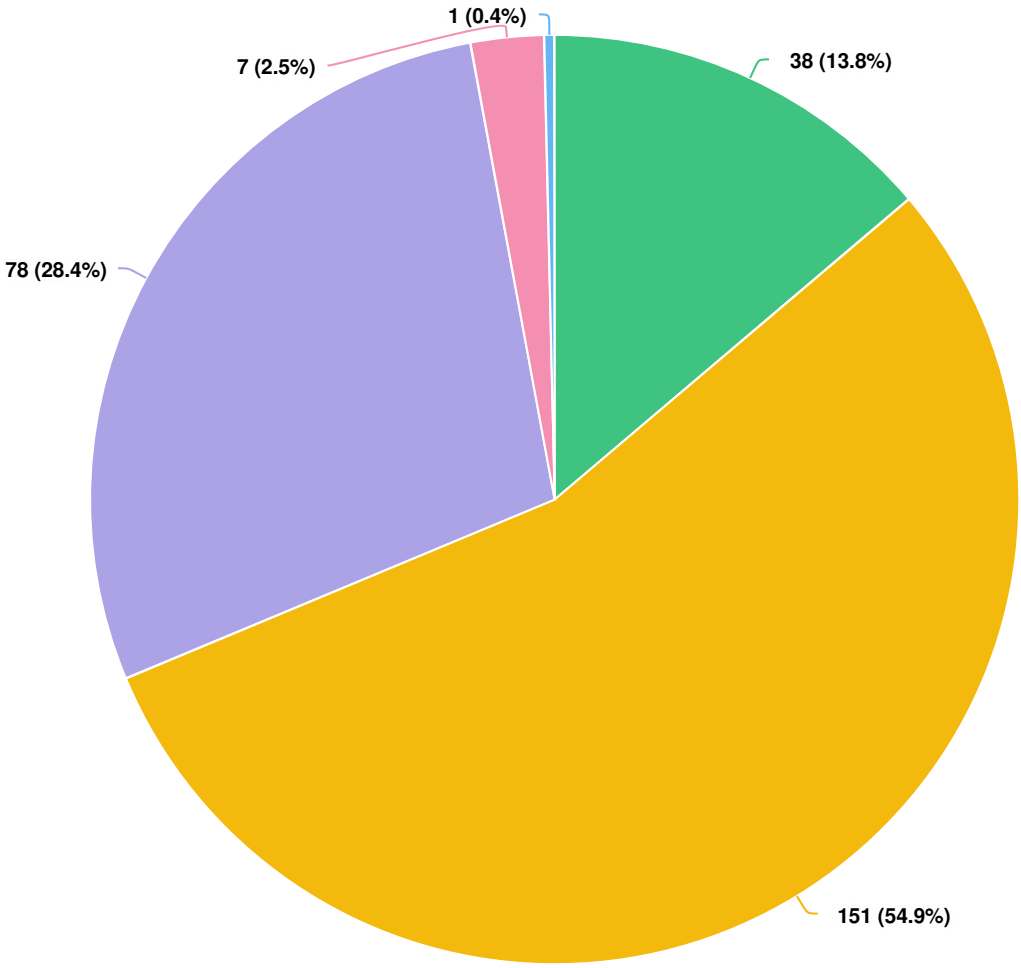
Question options

Very Good Good Fair Poor Very poor

Optional question (278 response(s), 1 skipped)

Question type: Dropdown Question

Based on the images above, what minimum surface condition (quality) of the roads would you like to see?



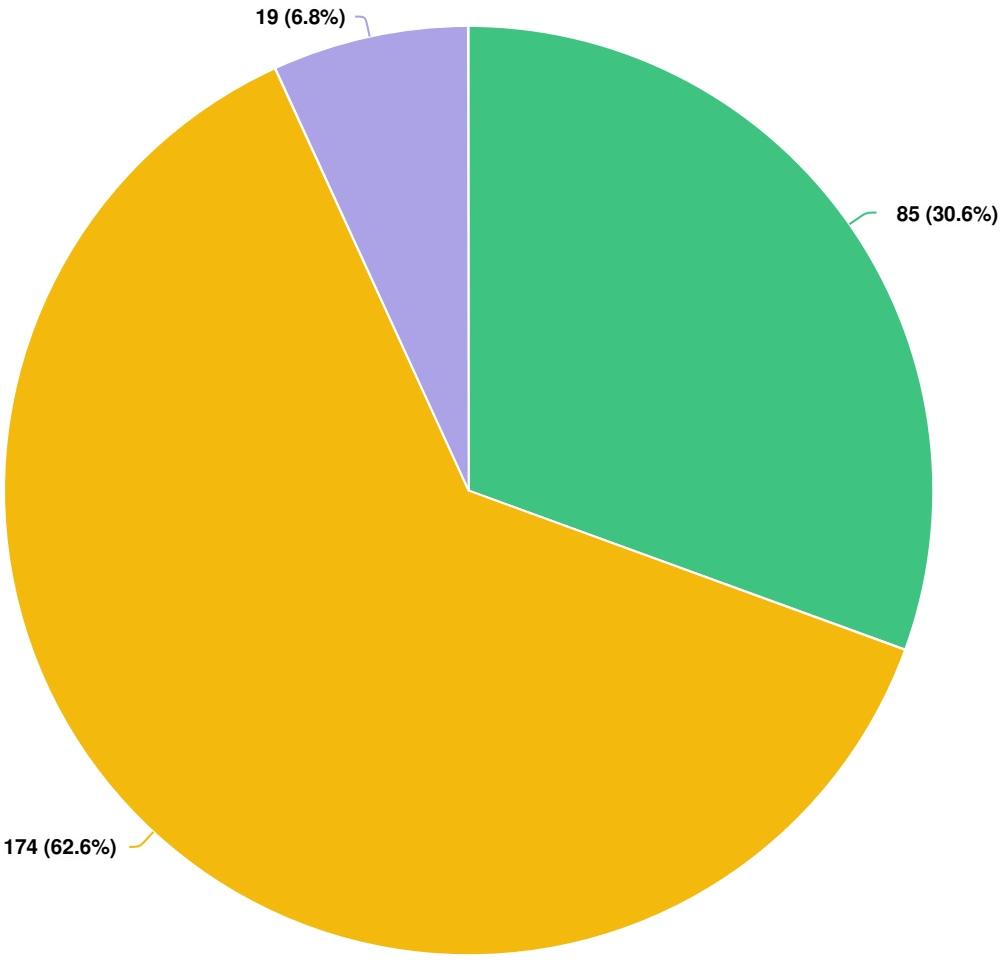
Question options

Very Good Good Fair Poor Very Poor

Optional question (275 response(s), 4 skipped)

Question type: Dropdown Question

Based on the images above, how would you rate the surface condition (quality) of the sidewalks in Hamilton?



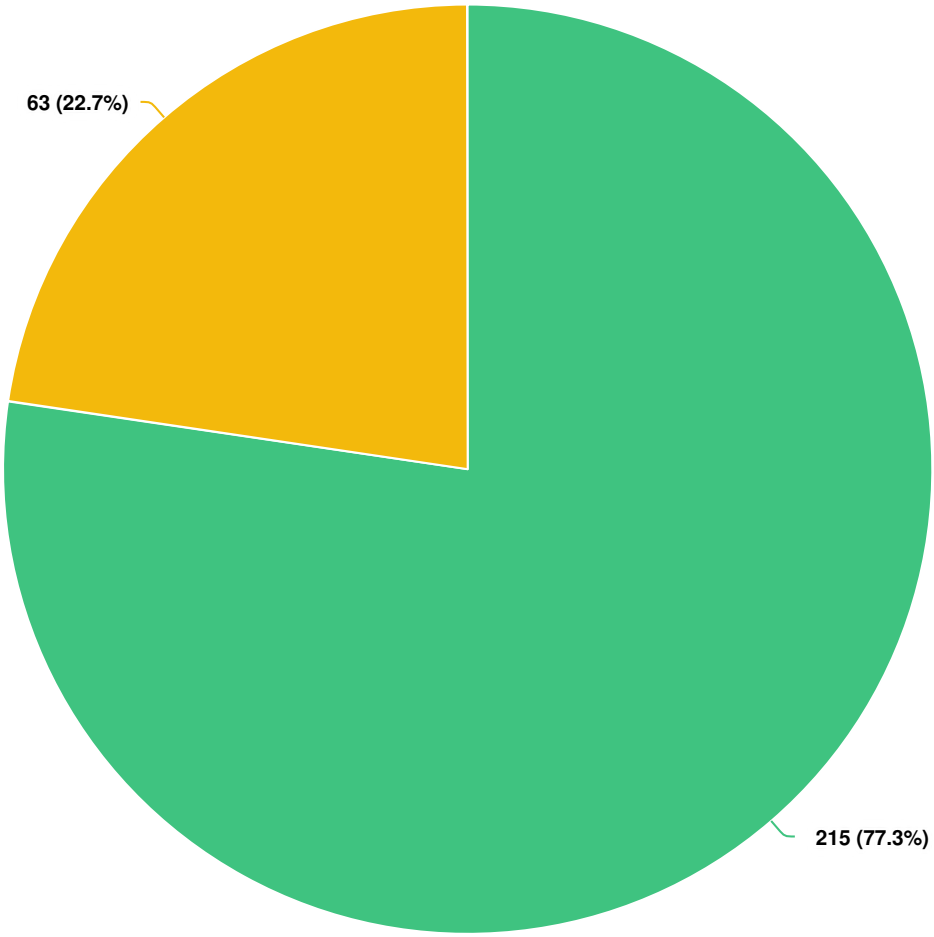
Question options

Good Fair Poor

Optional question (278 response(s), 1 skipped)

Question type: Dropdown Question

Based on the images above, what minimum surface condition (quality) of the sidewalks would you like to see?



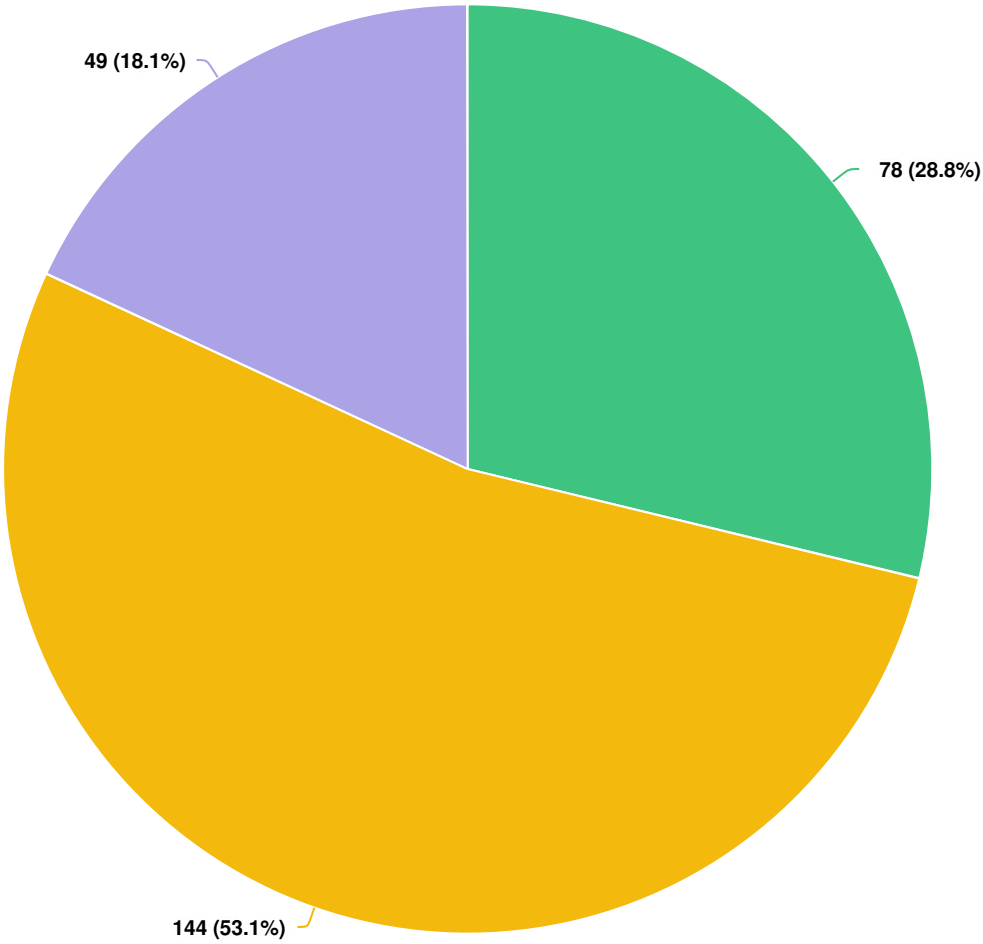
Question options

Good Fair

Optional question (278 response(s), 1 skipped)

Question type: Dropdown Question

Based on the images above, how would you rate the surface condition (quality) of the bike lanes in Hamilton?



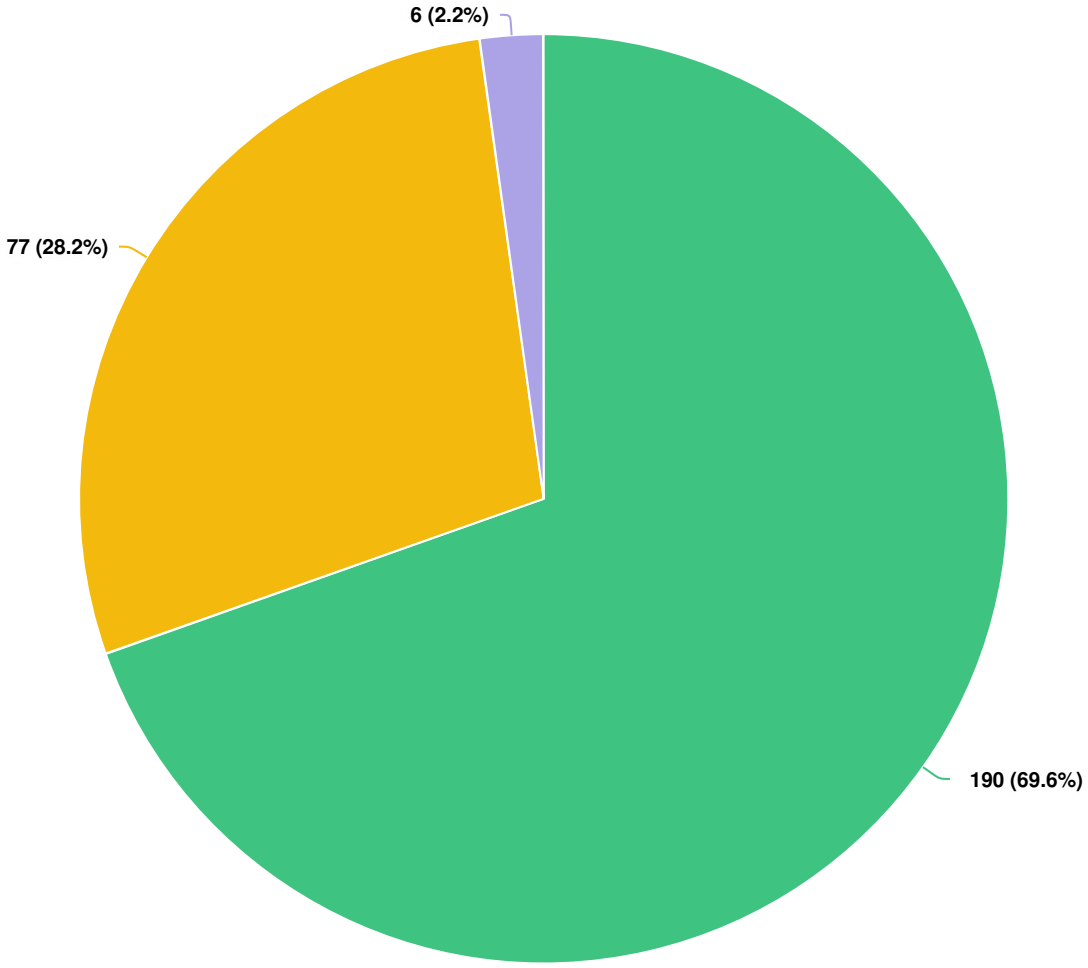
Question options

Good Fair Poor

Optional question (271 response(s), 8 skipped)

Question type: Dropdown Question

Based on the images above, what minimum surface condition (quality) of the bike lanes would you like to see?



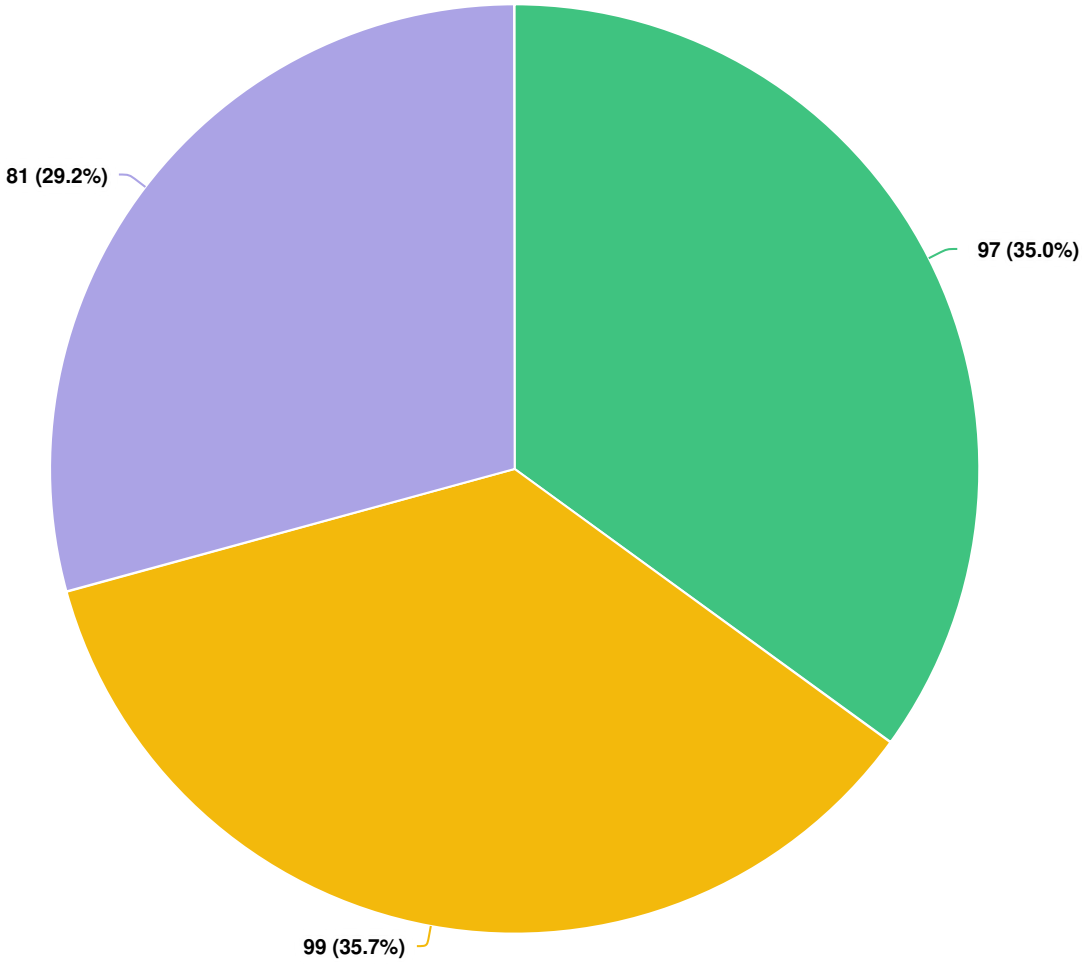
Question options

Good Fair Poor

Optional question (273 response(s), 6 skipped)

Question type: Dropdown Question

How do you feel about traffic or congestion in Hamilton?



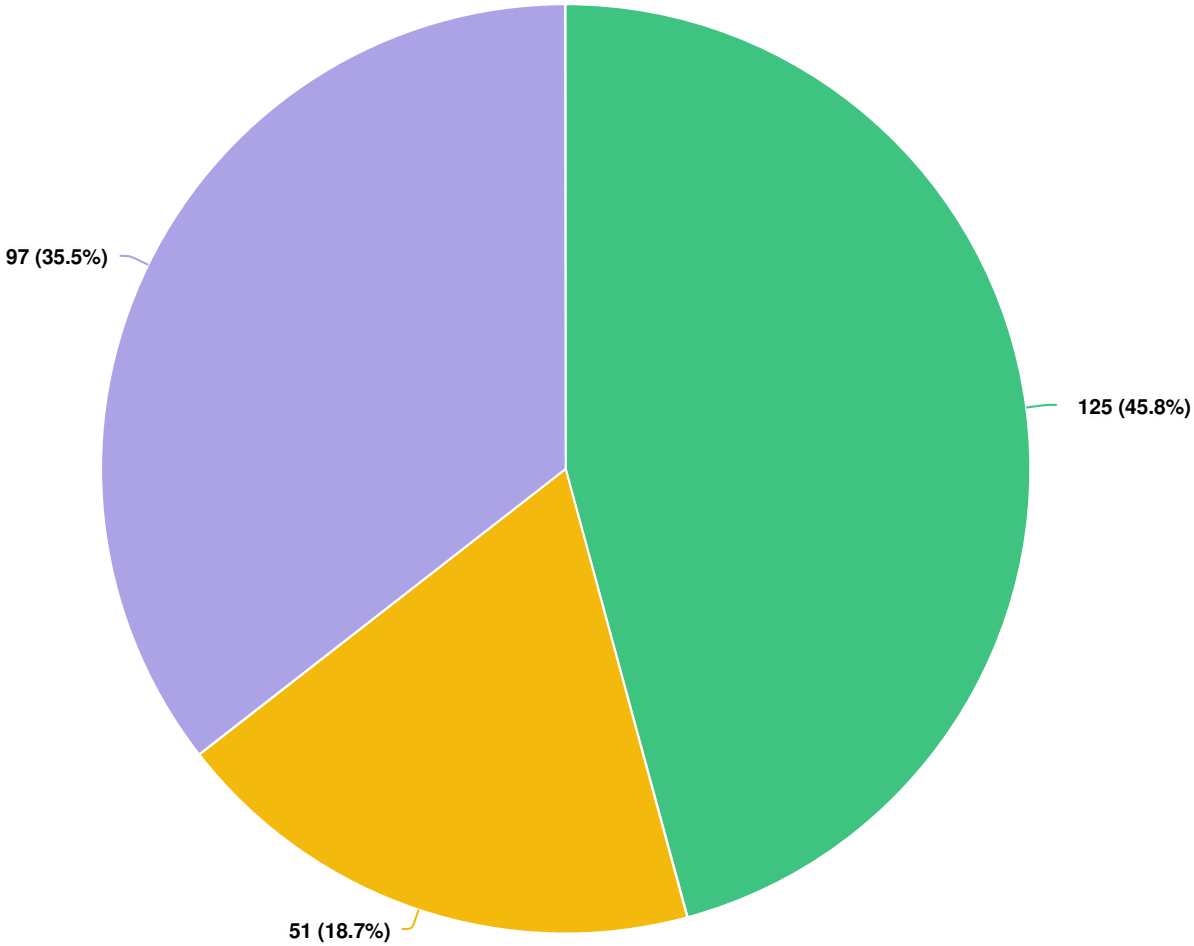
Question options

Traffic levels are acceptable
Neutral
Traffic levels are unacceptable

Optional question (277 response(s), 2 skipped)

Question type: Dropdown Question

How is your commute affected if one of the escarpment access routes is closed due to construction or a collision?



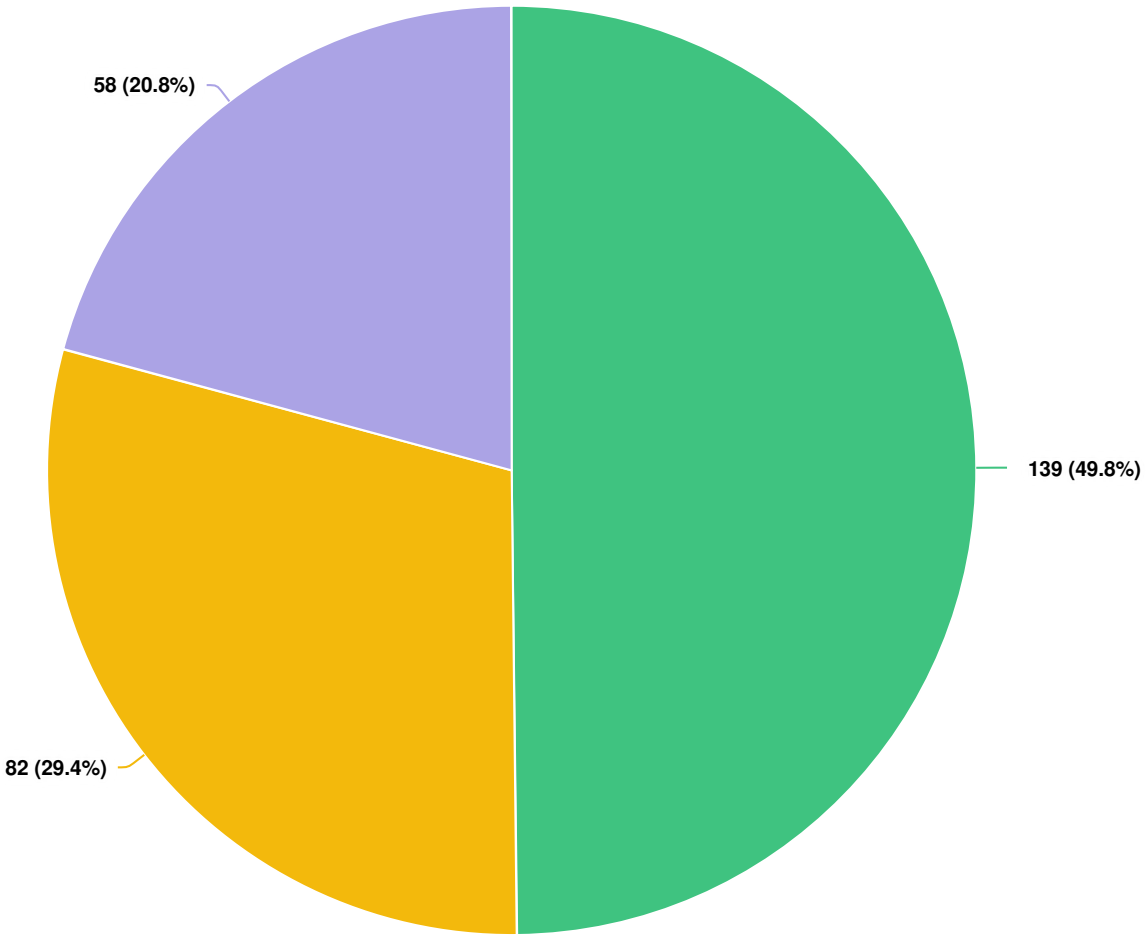
Question options

- My commute is not affected by escarpment access closures.
- Neutral
- My commute is affected by escarpment access closures.

Optional question (273 response(s), 6 skipped)

Question type: Dropdown Question

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



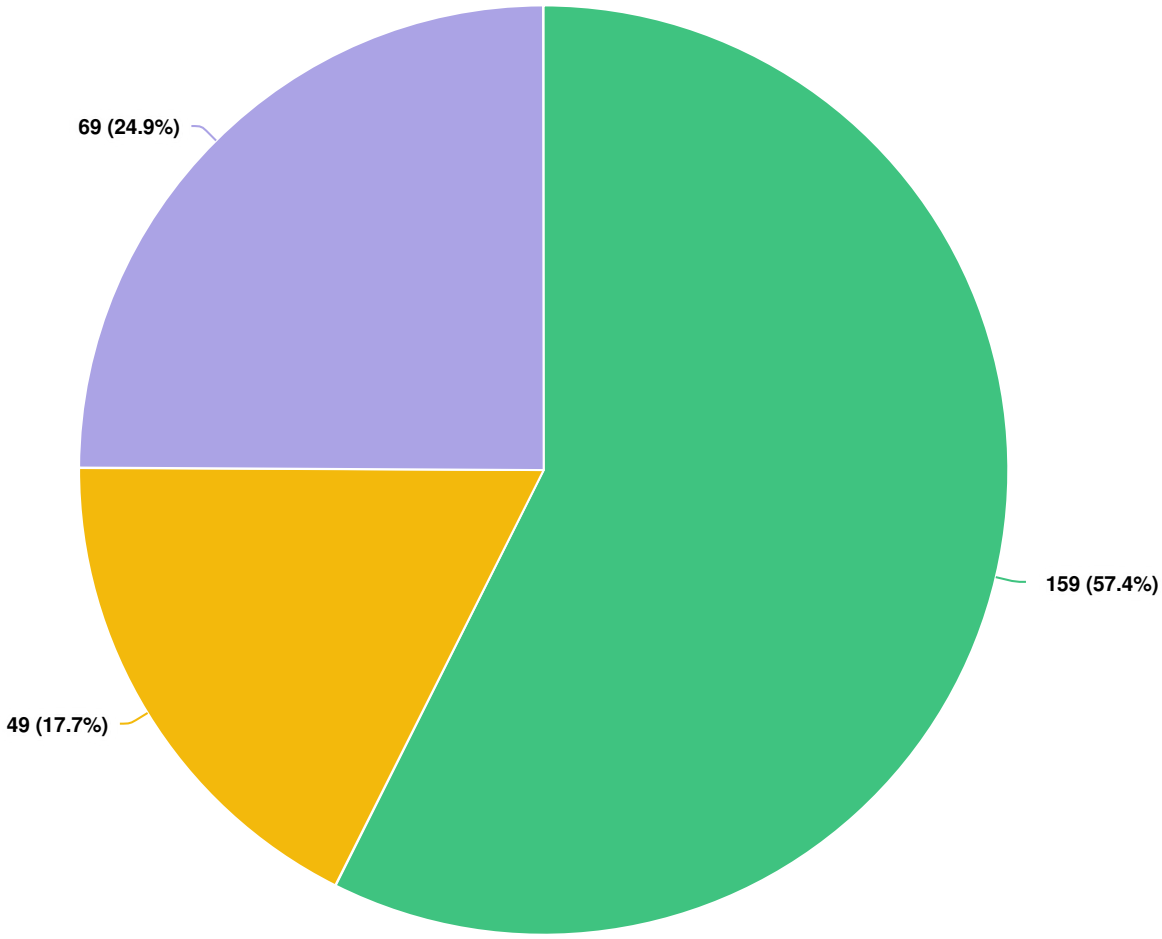
Question options

Yes, I think there is ample notice of road work. Neutral No, I do not think there is ample notice of road work.

Optional question (279 response(s), 0 skipped)

Question type: Dropdown Question

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



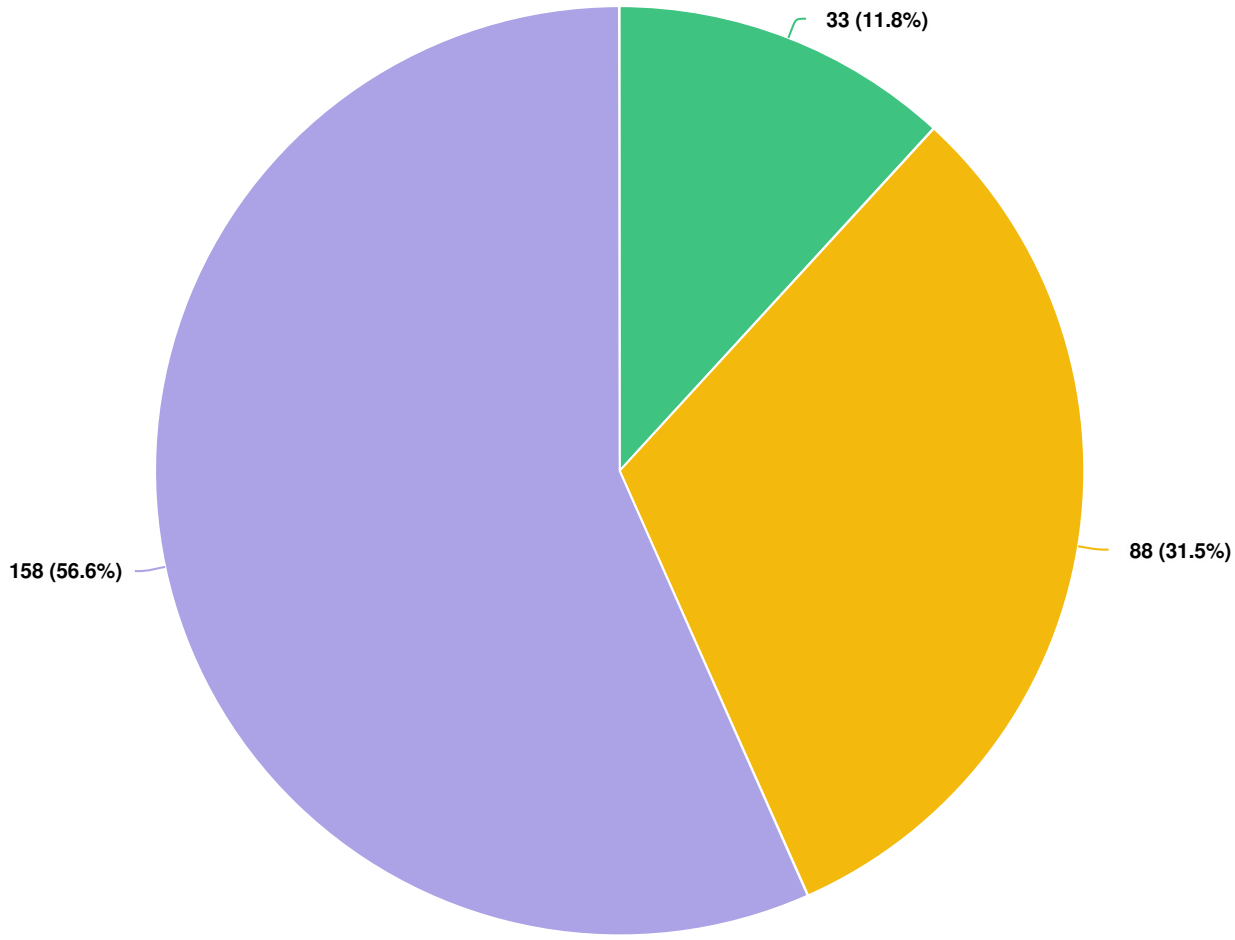
Question options

- Yes, I think the roads are plowed in a reasonable amount of time.
- Neutral
- No, I do not think the roads are plowed in a reasonable amount of time.

Optional question (277 response(s), 2 skipped)

Question type: Dropdown Question

Do you think potholes are fixed in a timely manner?



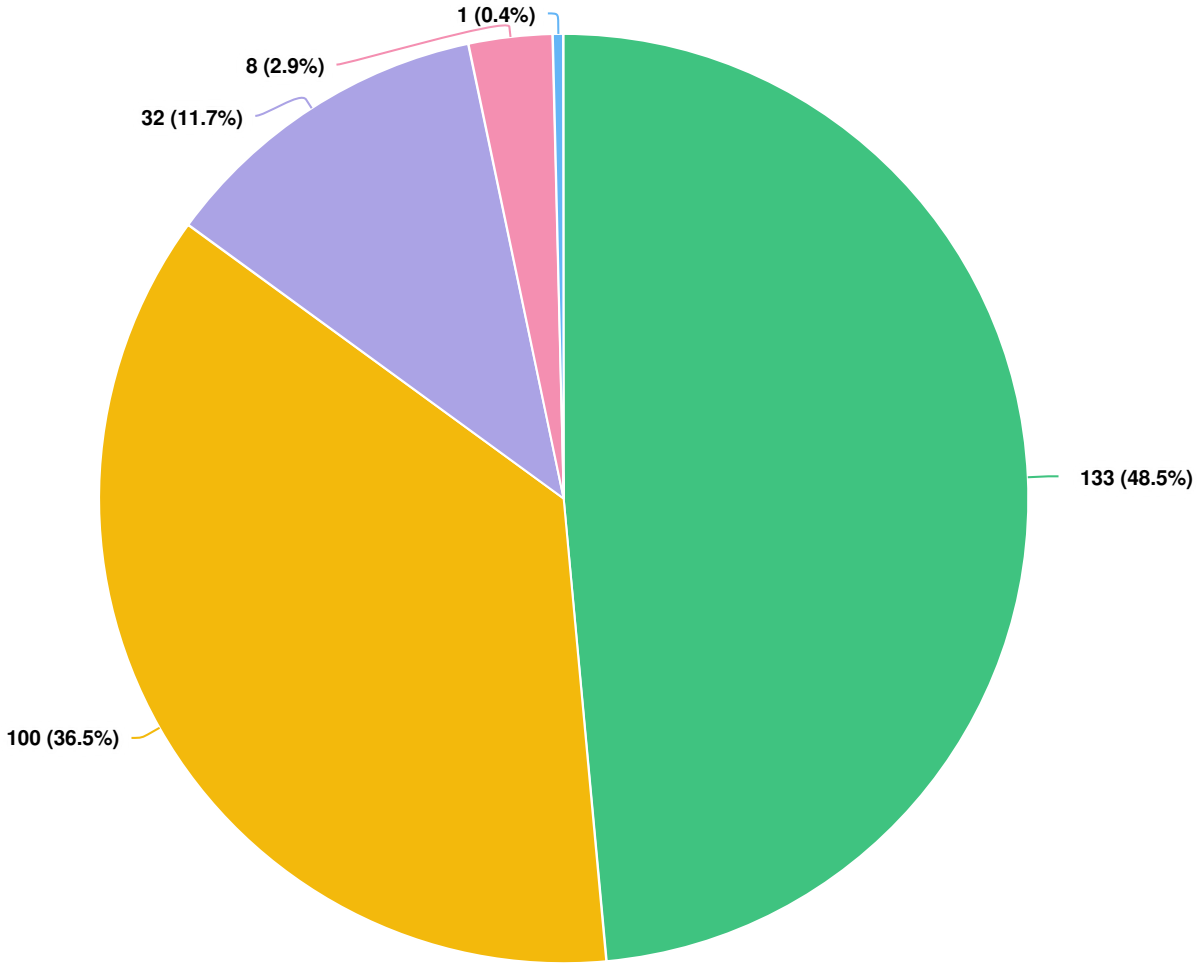
Question options

Yes, I think potholes are fixed in a timely manner. Neutral No, I do not think potholes are fixed in a timely manner

Optional question (279 response(s), 0 skipped)

Question type: Dropdown Question

Do you believe Hamilton's bridges and culverts are generally safe to travel over?



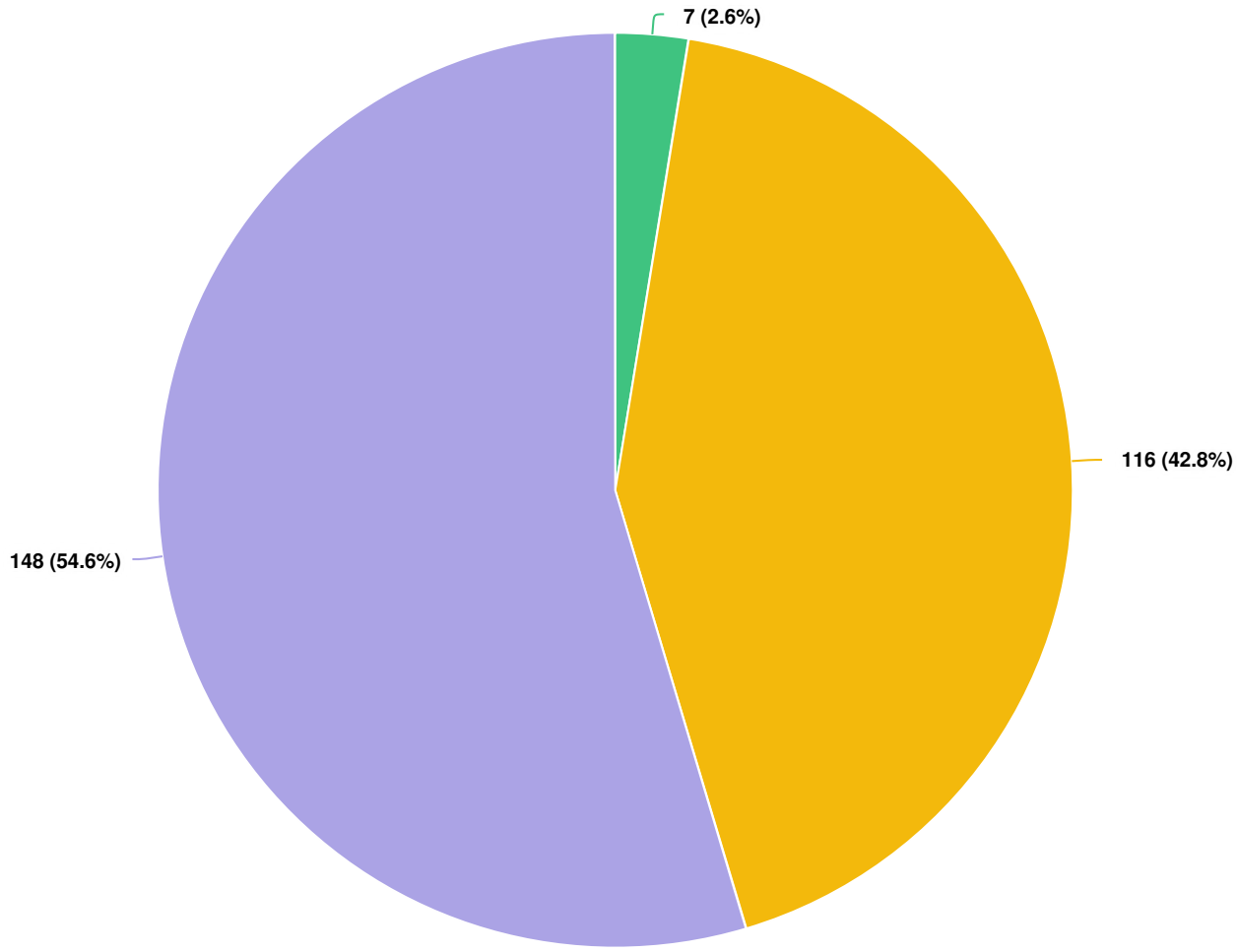
Question options

Very safe | Somewhat safe | Neutral | Somewhat Unsafe | Very Unsafe

Optional question (274 response(s), 5 skipped)

Question type: Dropdown Question

When traveling over the bridges and culverts in Hamilton do you feel they are generally in good condition?



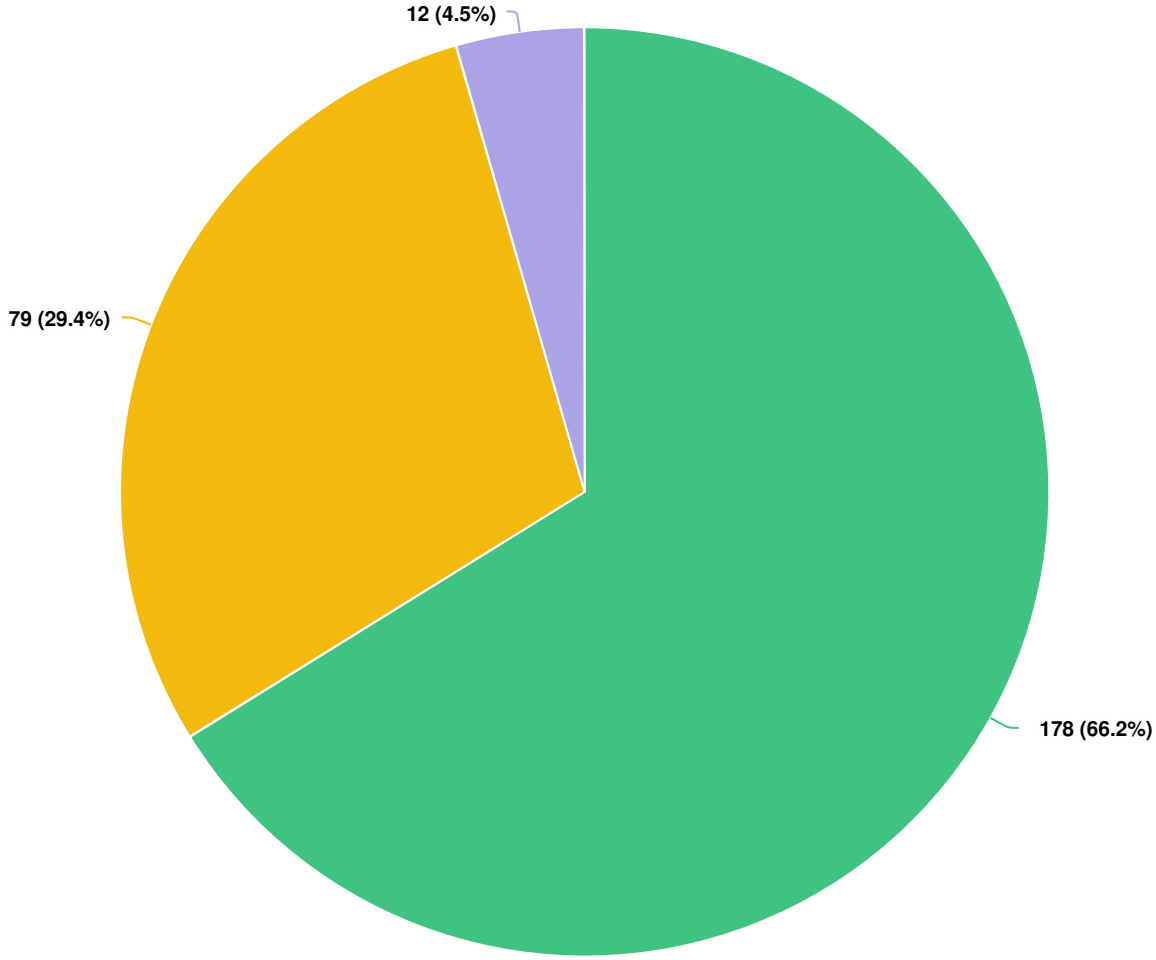
Question options

Poor Fair Good

Optional question (271 response(s), 8 skipped)

Question type: Dropdown Question

When traveling over the bridges and culverts in Hamilton do you feel there are traffic impacts leading up to the bridge?



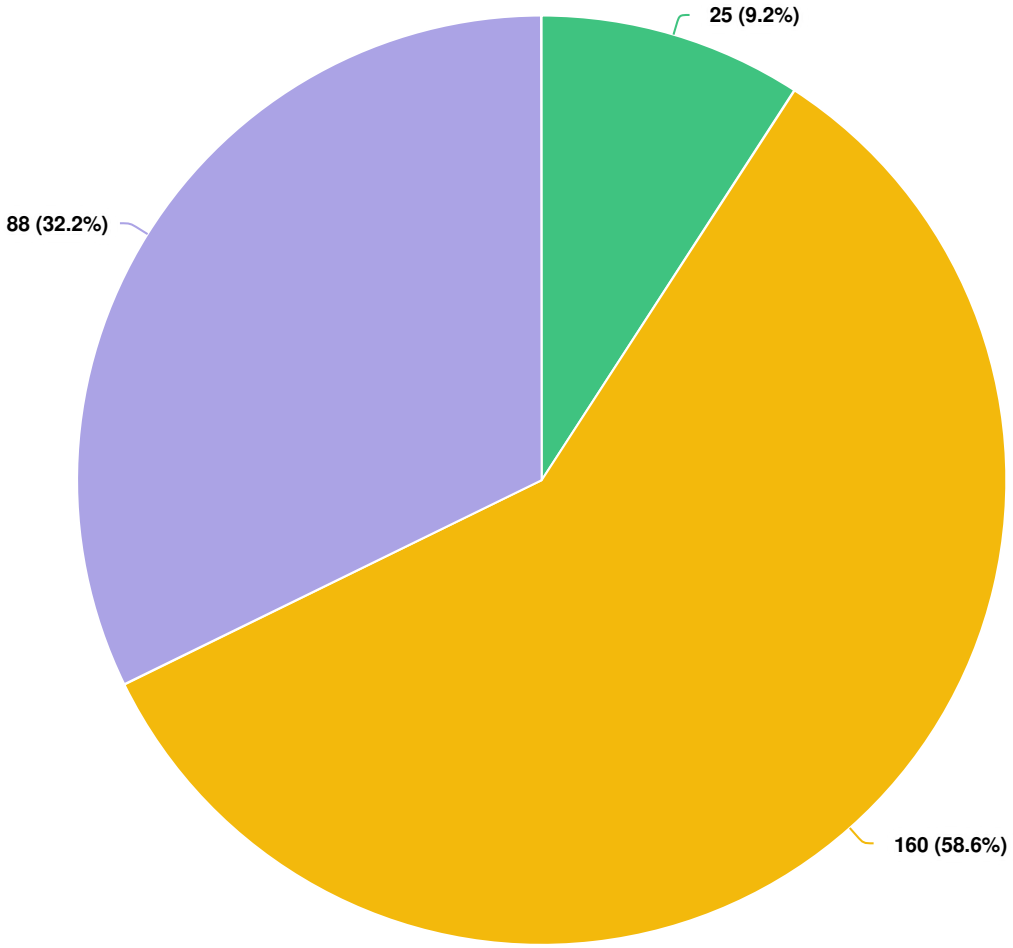
Question options

- Traffic levels are acceptable
- Traffic does affect my travel some of the time
- There are significant traffic issues around bridges/culverts

Optional question (269 response(s), 10 skipped)

Question type: Dropdown Question

Are there bridges (pedestrian and/or vehicular) that are currently closed that you would typically use if they were not closed?



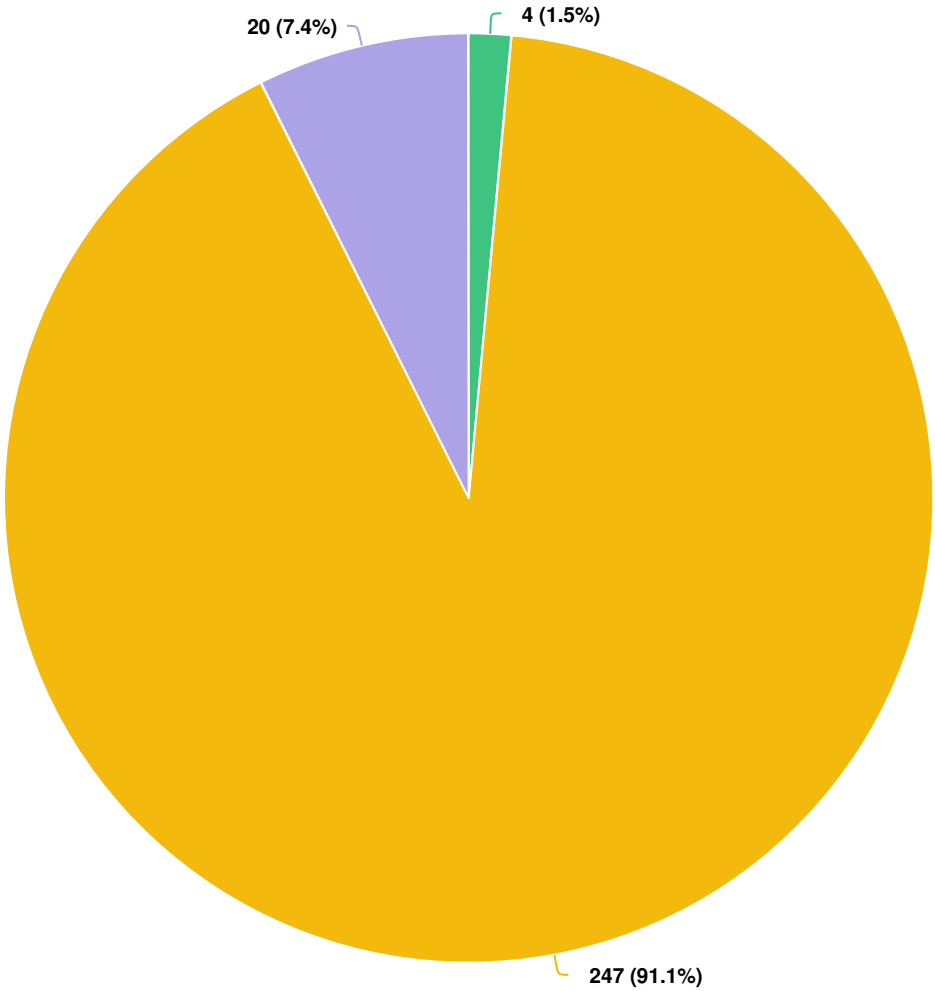
Question options

Yes No Not sure

Optional question (273 response(s), 6 skipped)

Question type: Dropdown Question

Are there any bridges or culverts that you do not use due to either height or weight restrictions?



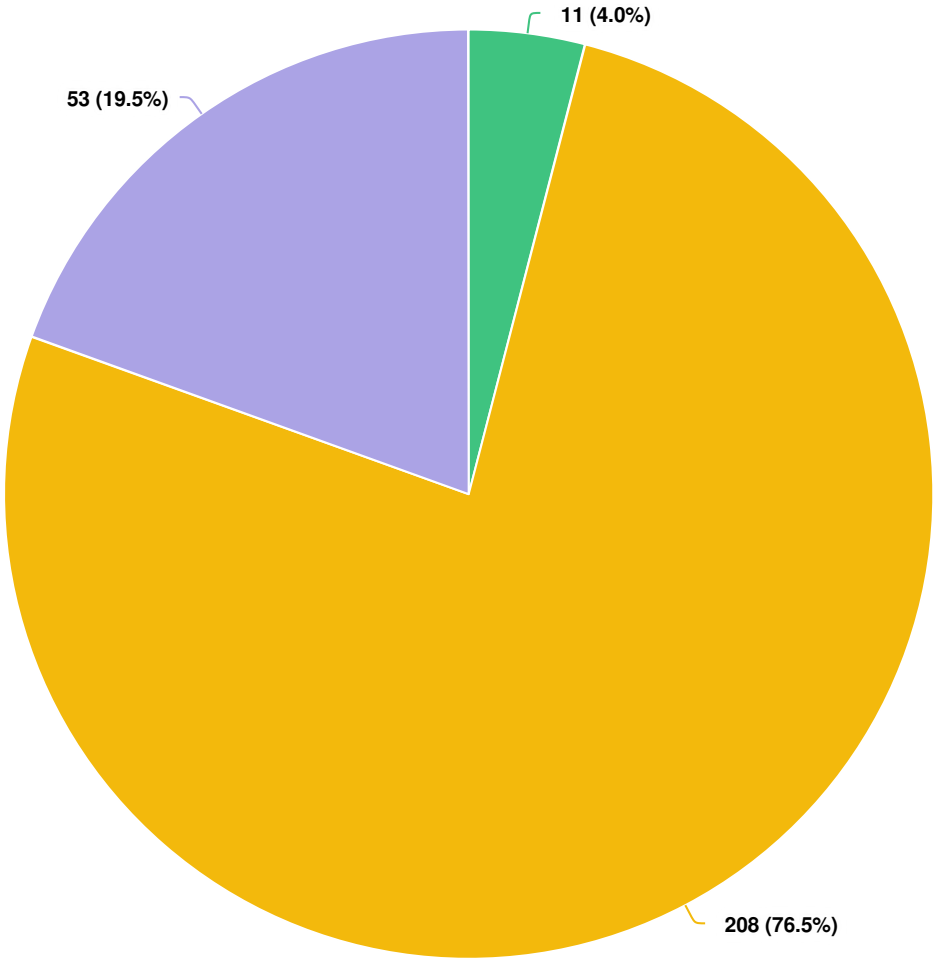
Question options

Yes No Not sure

Optional question (271 response(s), 8 skipped)

Question type: Dropdown Question

Do you know of any culverts that are either partially or completely blocked?



Question options

Yes No Not sure

Optional question (272 response(s), 7 skipped)

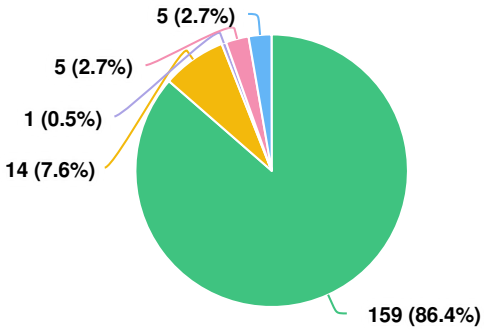
Question type: Dropdown Question

ENGAGEMENT TOOL: SURVEY TOOL

Asset Management - Drinking water, Stormwater and Wastewater

Visitors 227	Contributors 183	CONTRIBUTIONS 184

How would you best describe yourself?



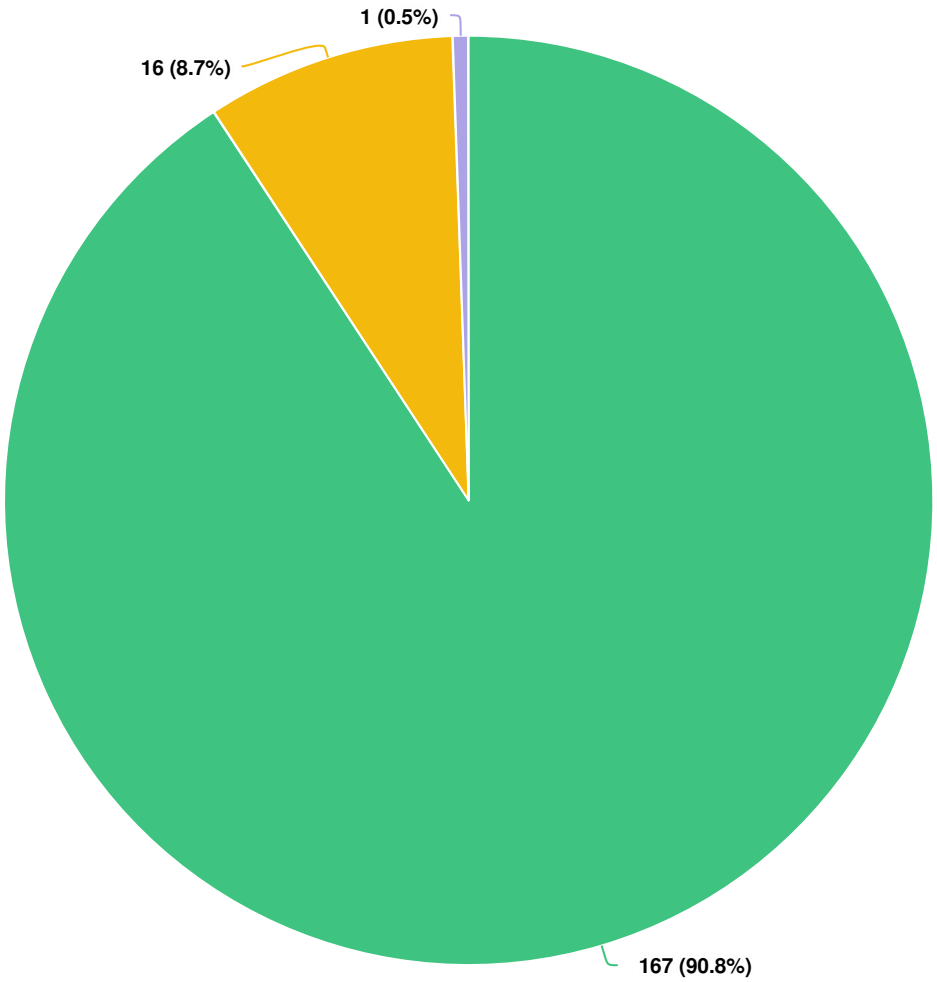
Question options

- I live in Hamilton
- I live in Hamilton and I also run a Hamilton-based business
- I don't live in Hamilton, but I run a Hamilton-based business
- I work in Hamilton (but I live somewhere else)
- Other (please specify)

Mandatory Question (184 response(s))

Question type: Dropdown Question

Are you connected to Hamilton's municipal water network?



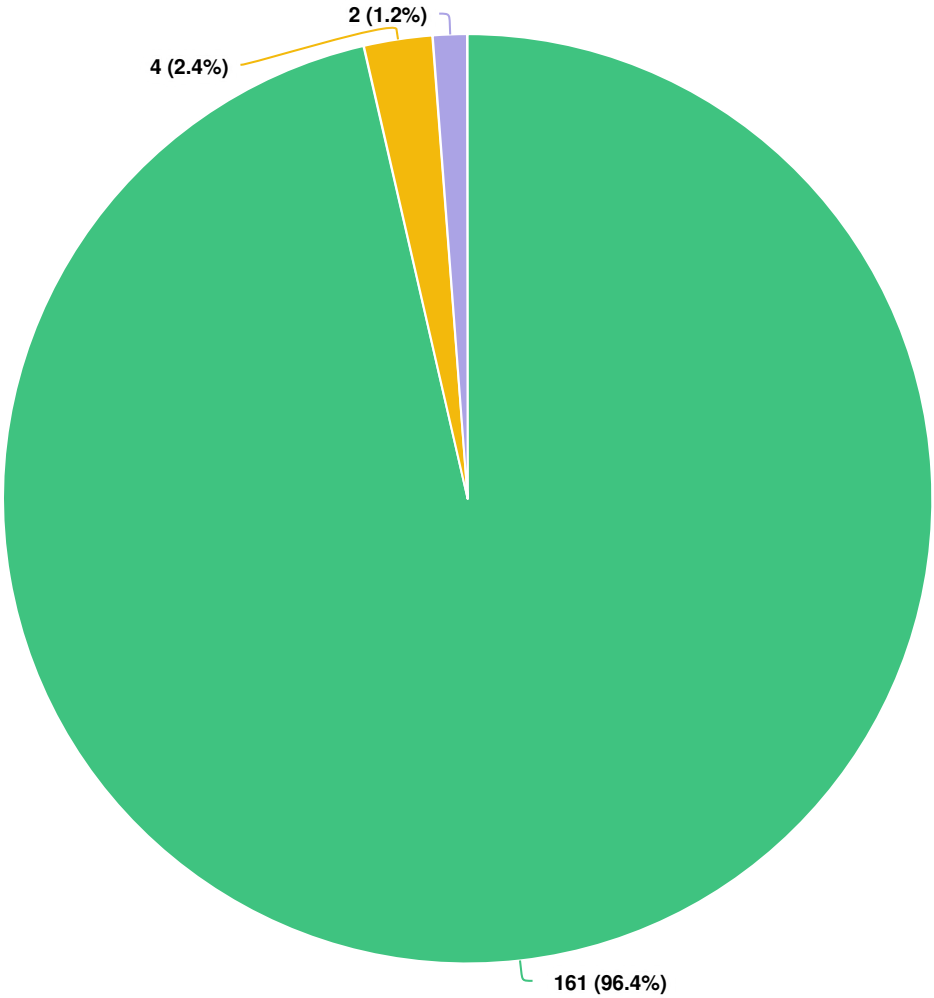
Question options

Yes No Not sure

Mandatory Question (184 response(s))

Question type: Dropdown Question

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



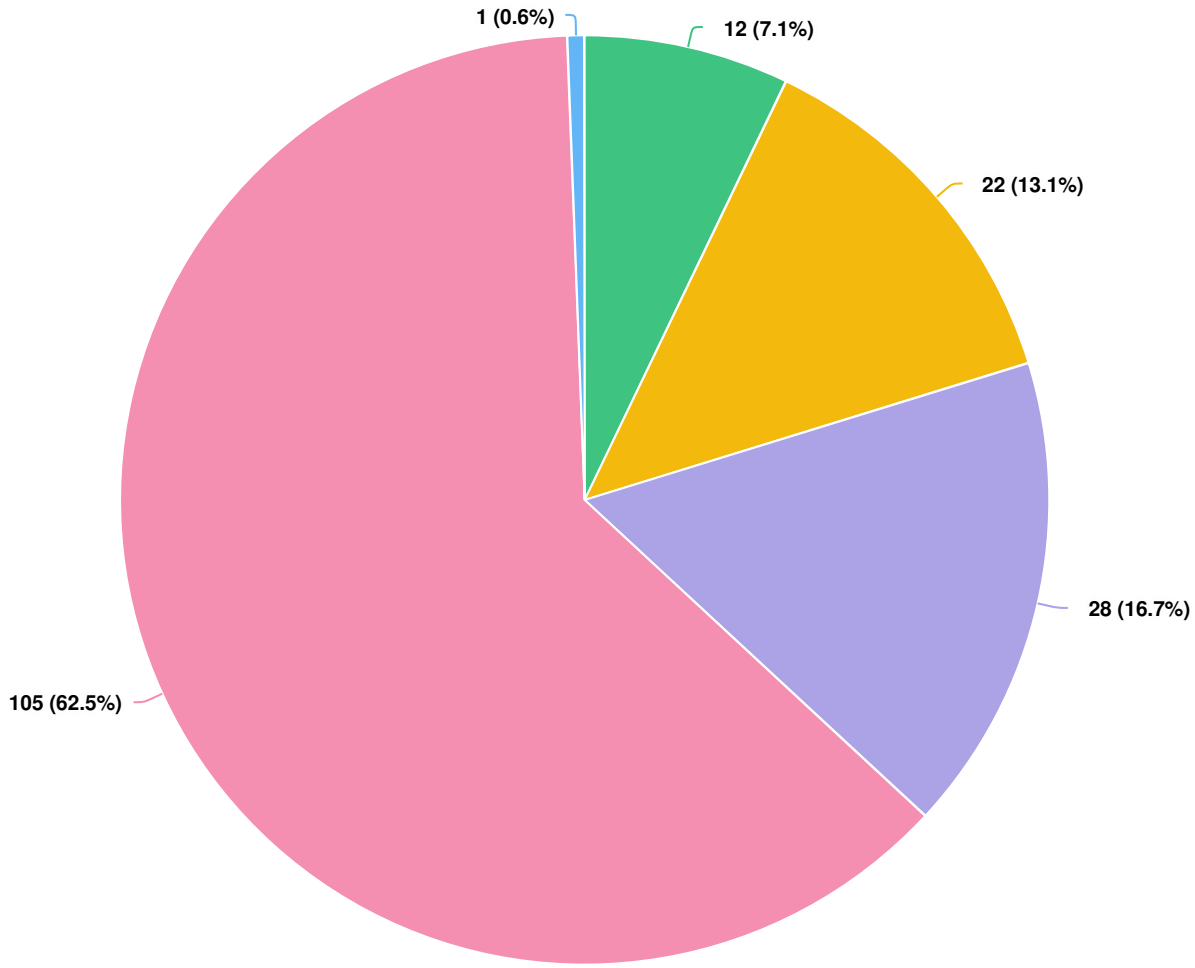
Question options

Yes No Not sure

Optional question (167 response(s), 17 skipped)

Question type: Dropdown Question

Does your drinking water from the tap ever have an unusual taste or odor?



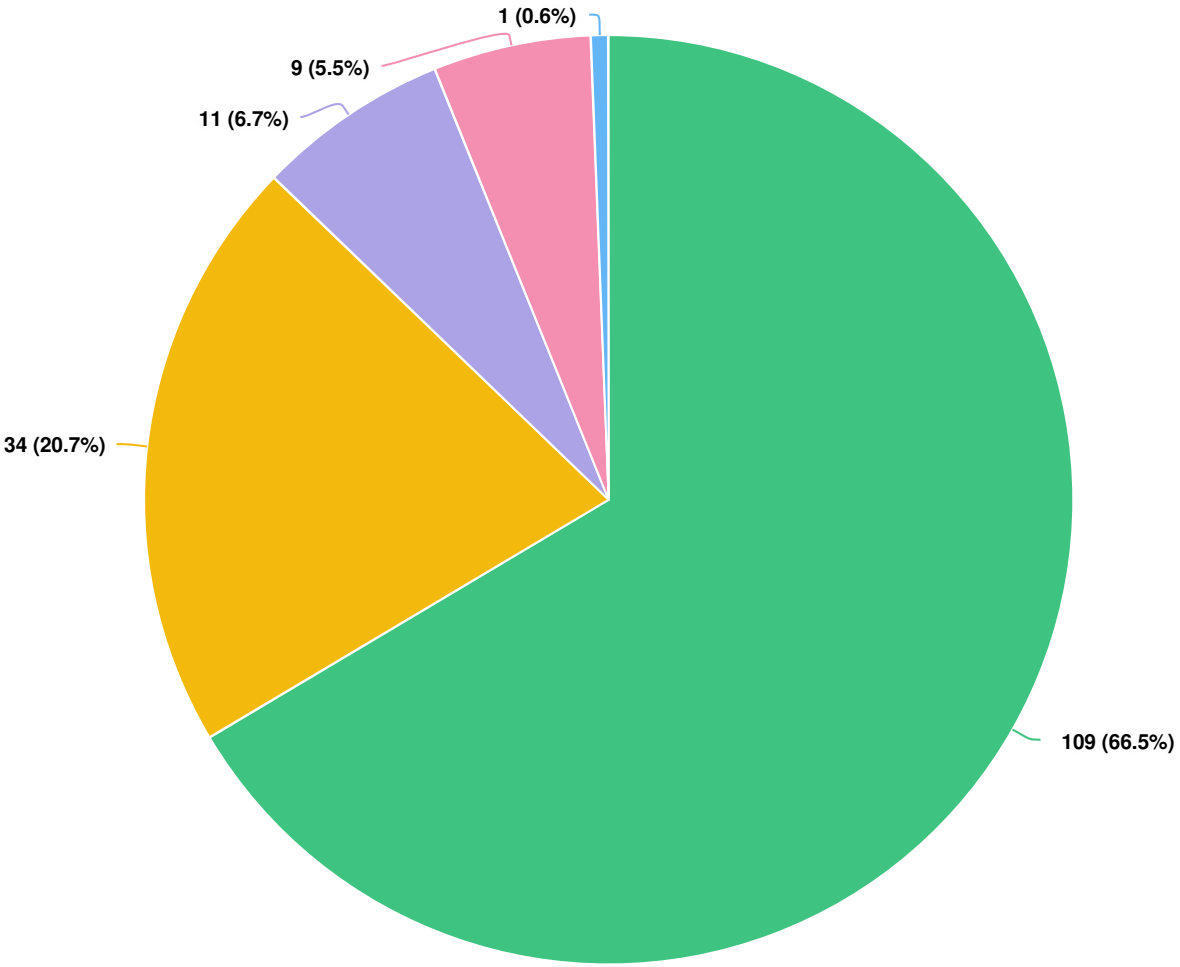
Question options

Unusual taste Unusual odour Both Neither Other (please specify)

Optional question (168 response(s), 16 skipped)

Question type: Dropdown Question

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



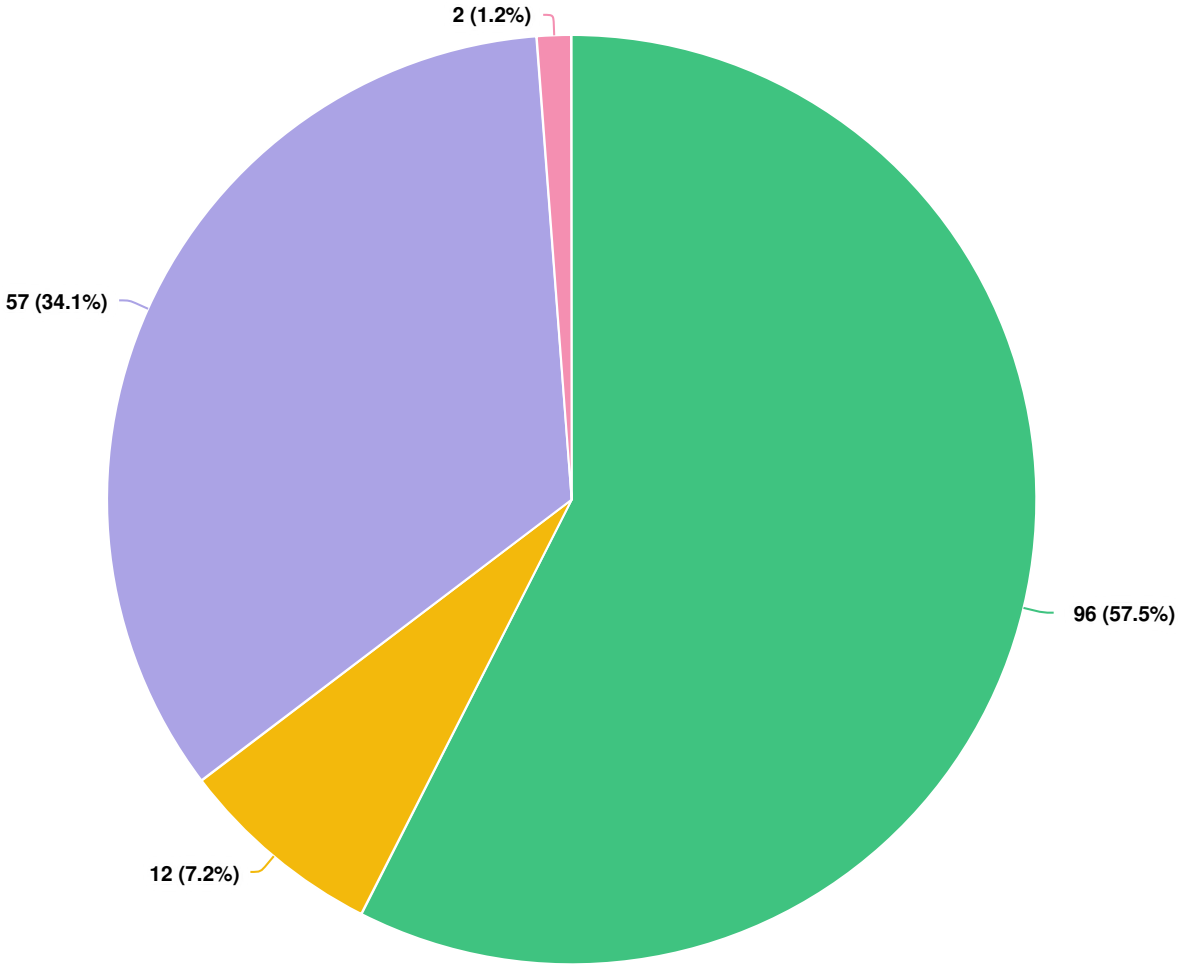
Question options

Very safe | Somewhat safe | Neutral | Not very safe | Not safe at all

Optional question (164 response(s), 20 skipped)

Question type: Dropdown Question

What is your preferred type of drinking water?



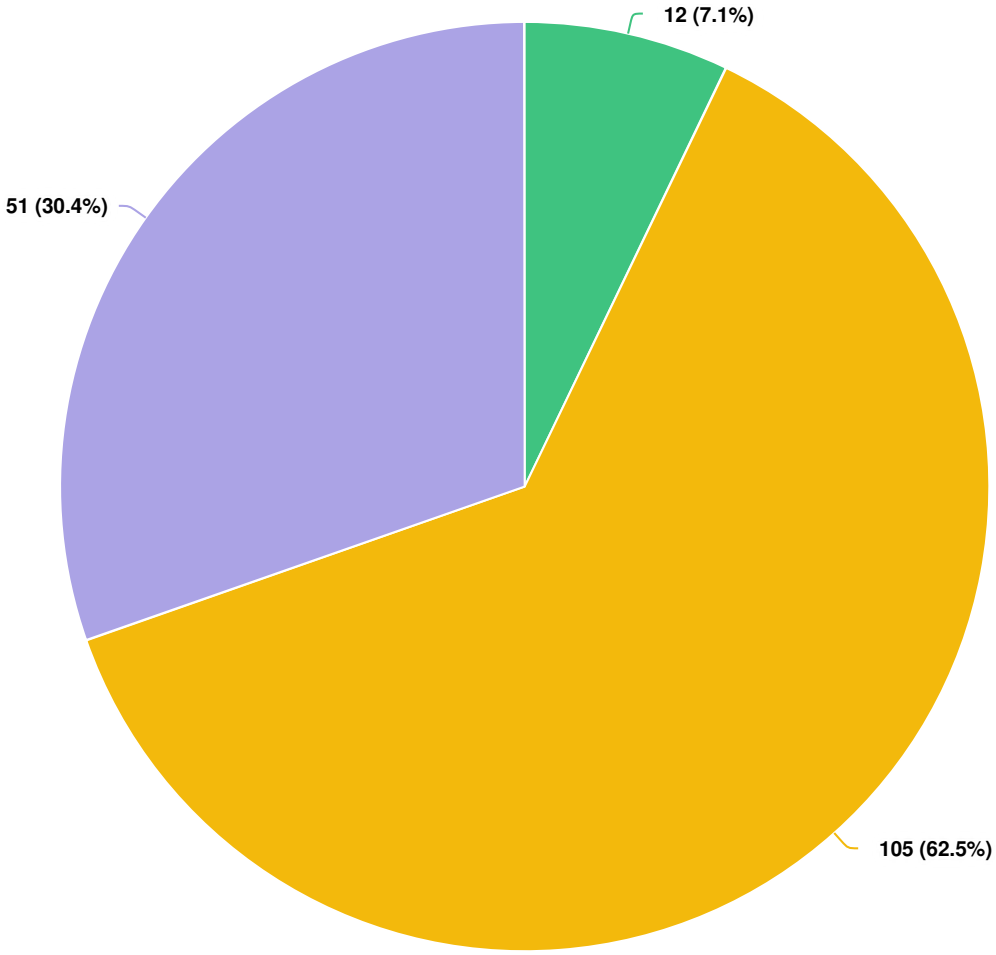
Question options

- Tap water
- Bottled water
- Filtered water (through fridge filtration, brita, reverse osmosis, etc.)
- Other (please specify)

Optional question (167 response(s), 17 skipped)

Question type: Dropdown Question

Do you know if your water is currently supplied to your residence by a lead service pipe?



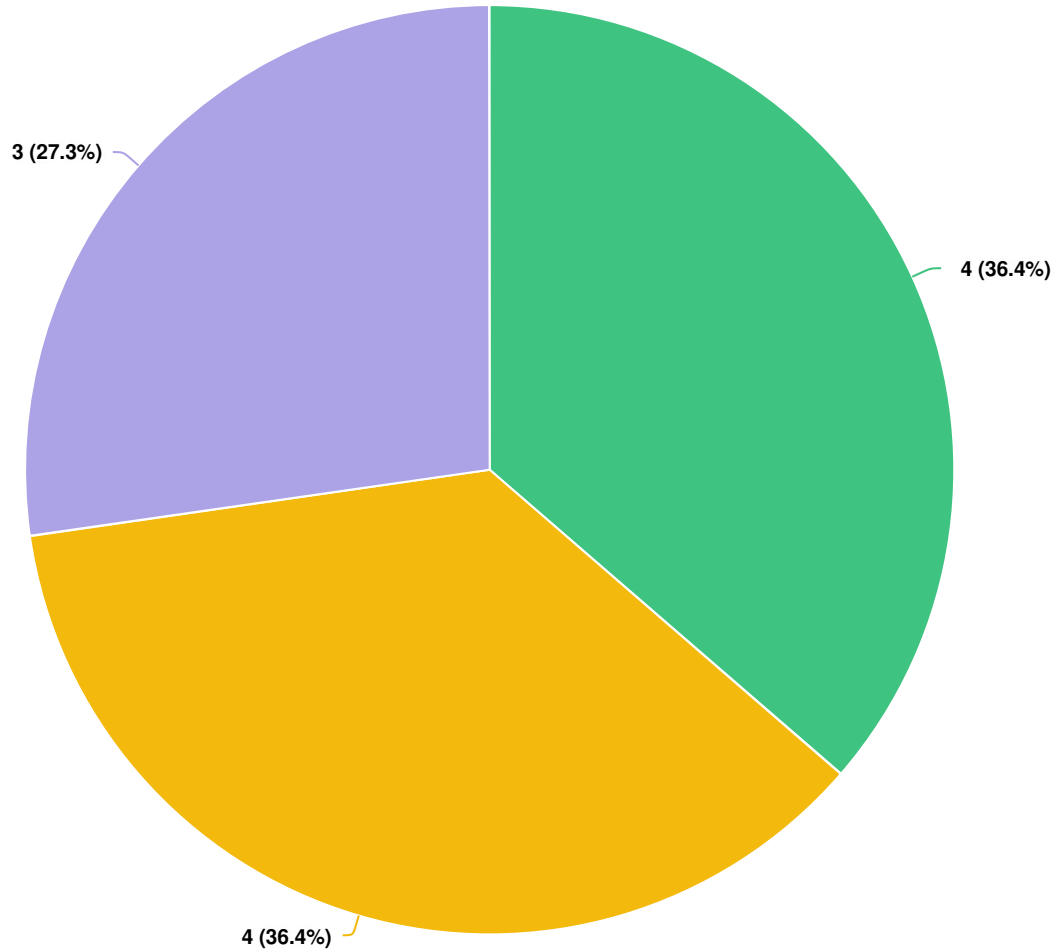
Question options

Yes No Not sure

Optional question (168 response(s), 16 skipped)

Question type: Dropdown Question

Do you anticipate switching it over?



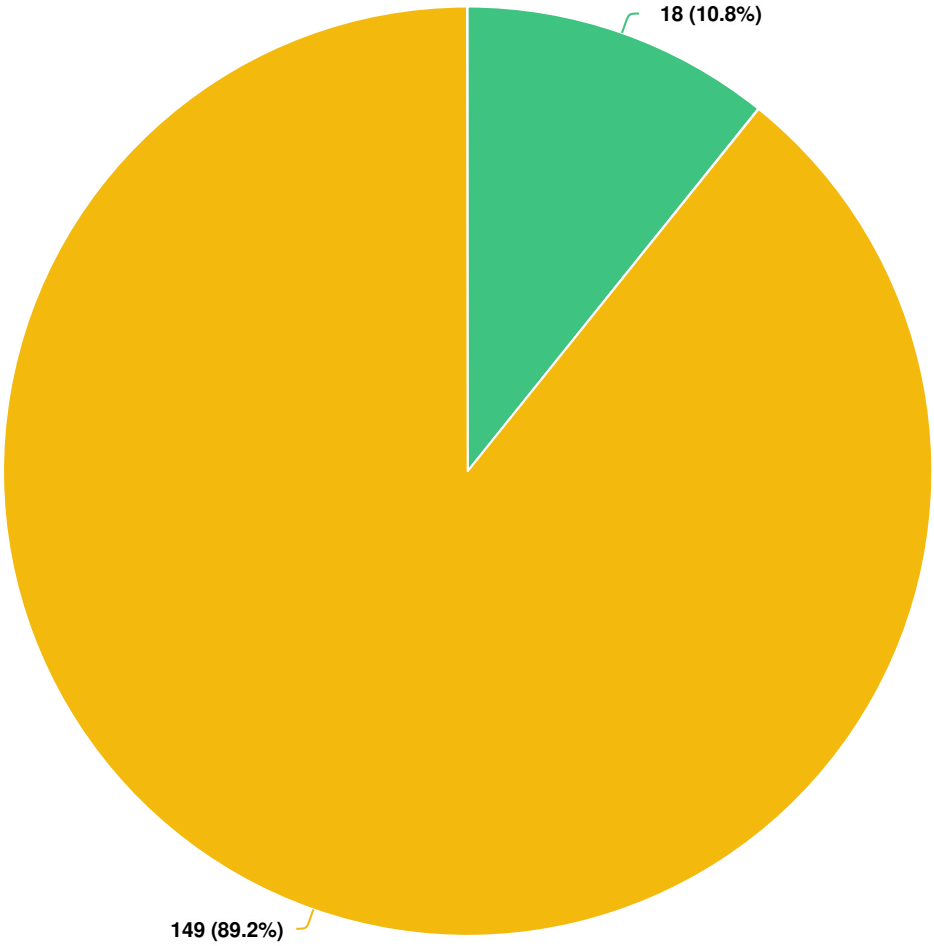
Question options

Yes, in 2022 Yes, within the next 3 years No plans to change it

Optional question (11 response(s), 173 skipped)

Question type: Dropdown Question

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



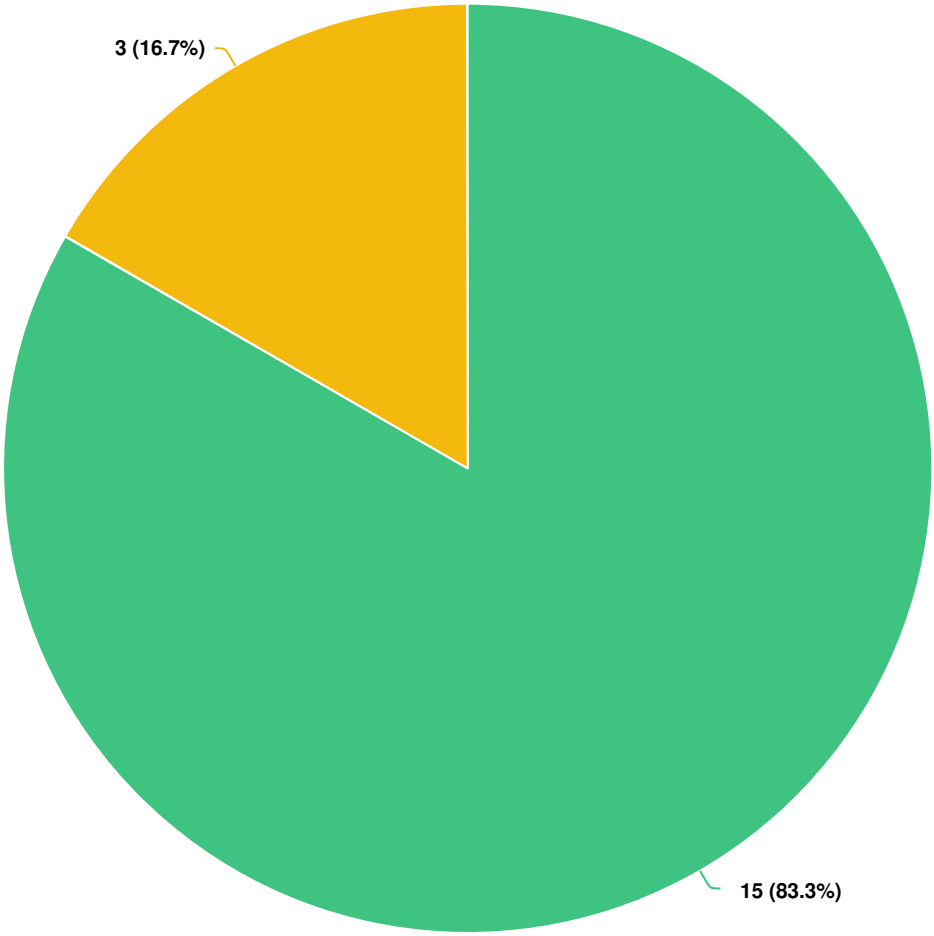
Question options

Yes No

Optional question (167 response(s), 17 skipped)

Question type: Dropdown Question

Do you feel the City responded quickly to resolve the issue in a timely manner?



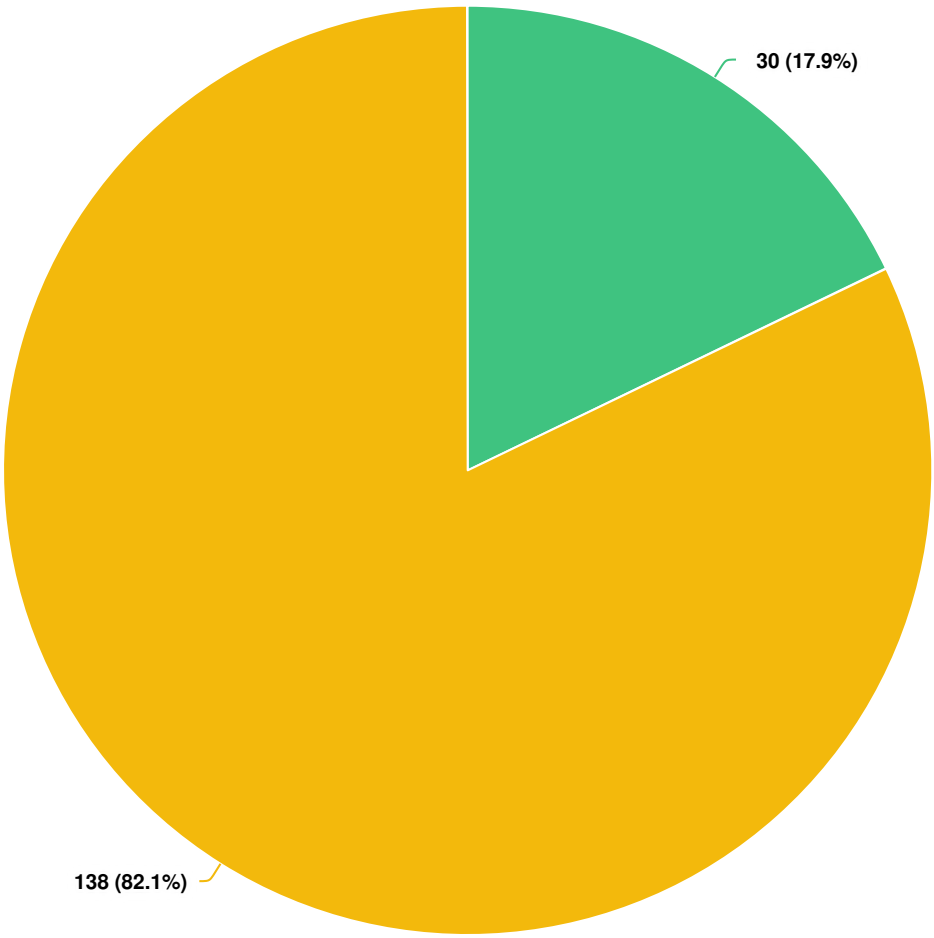
Question options

Yes No

Optional question (18 response(s), 166 skipped)

Question type: Dropdown Question

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



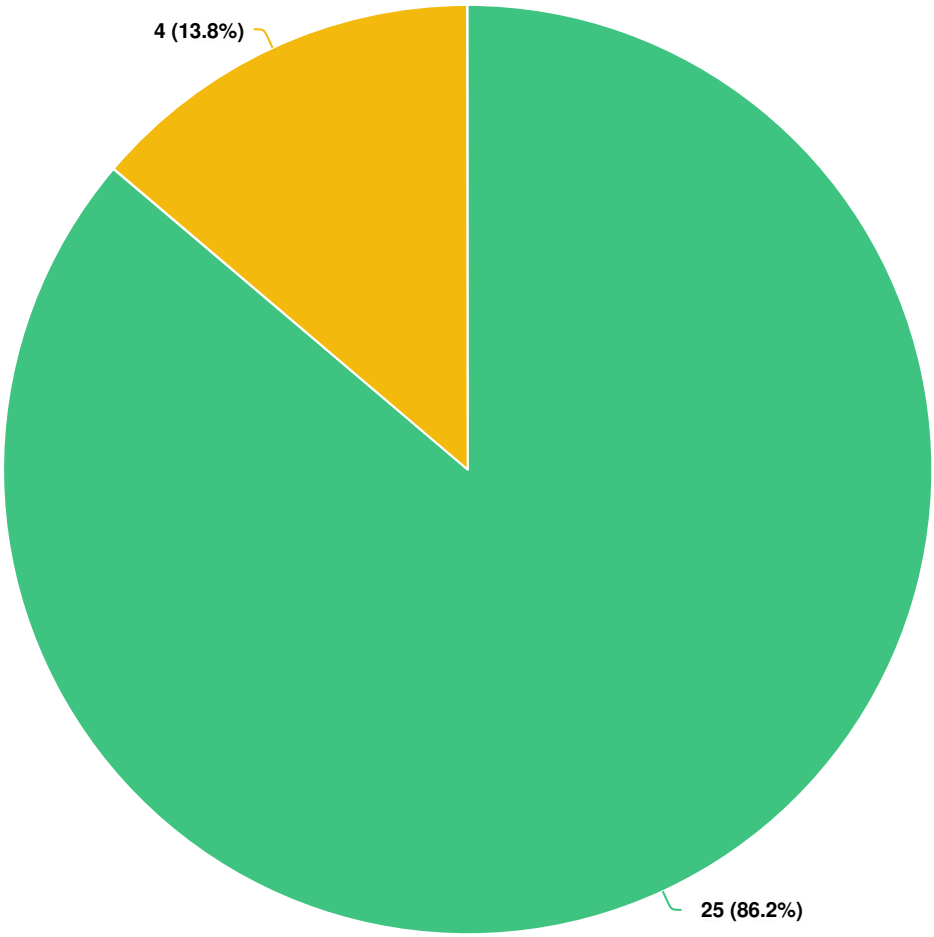
Question options

Yes No

Optional question (168 response(s), 16 skipped)

Question type: Dropdown Question

Did the City provide you with enough notice?



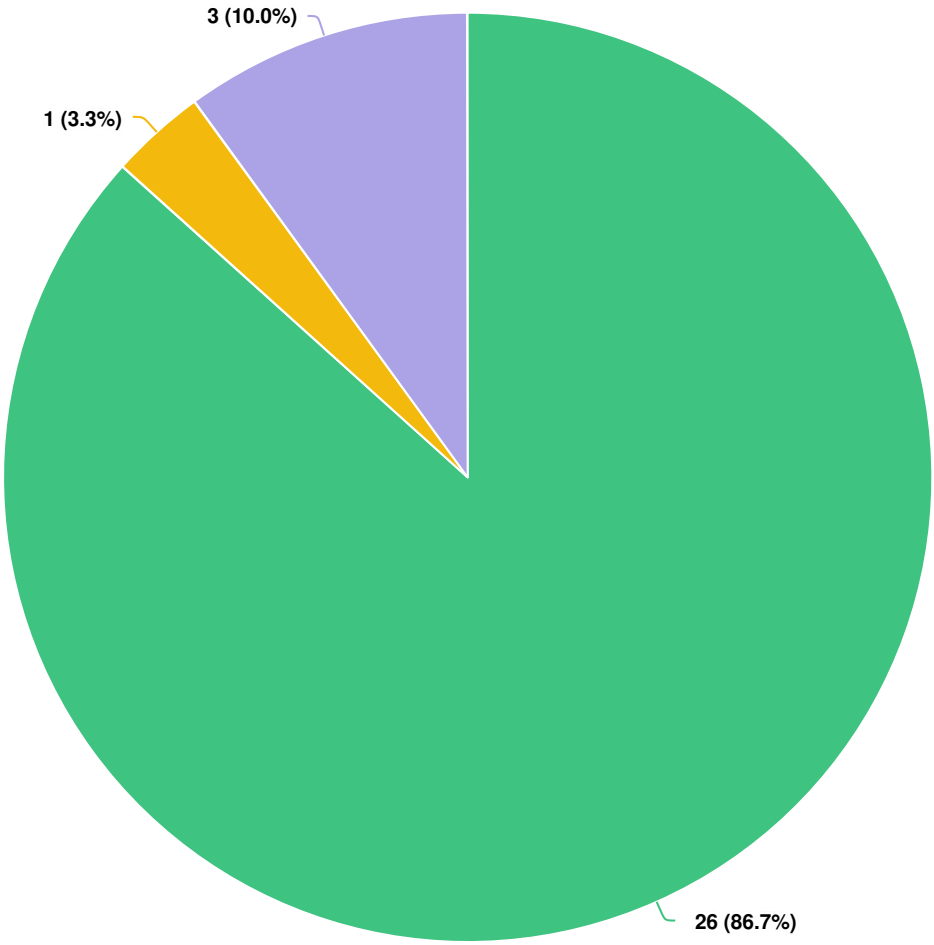
Question options

Yes No

Optional question (29 response(s), 155 skipped)

Question type: Dropdown Question

Did the City complete the work in the timeline outlined in the notice?



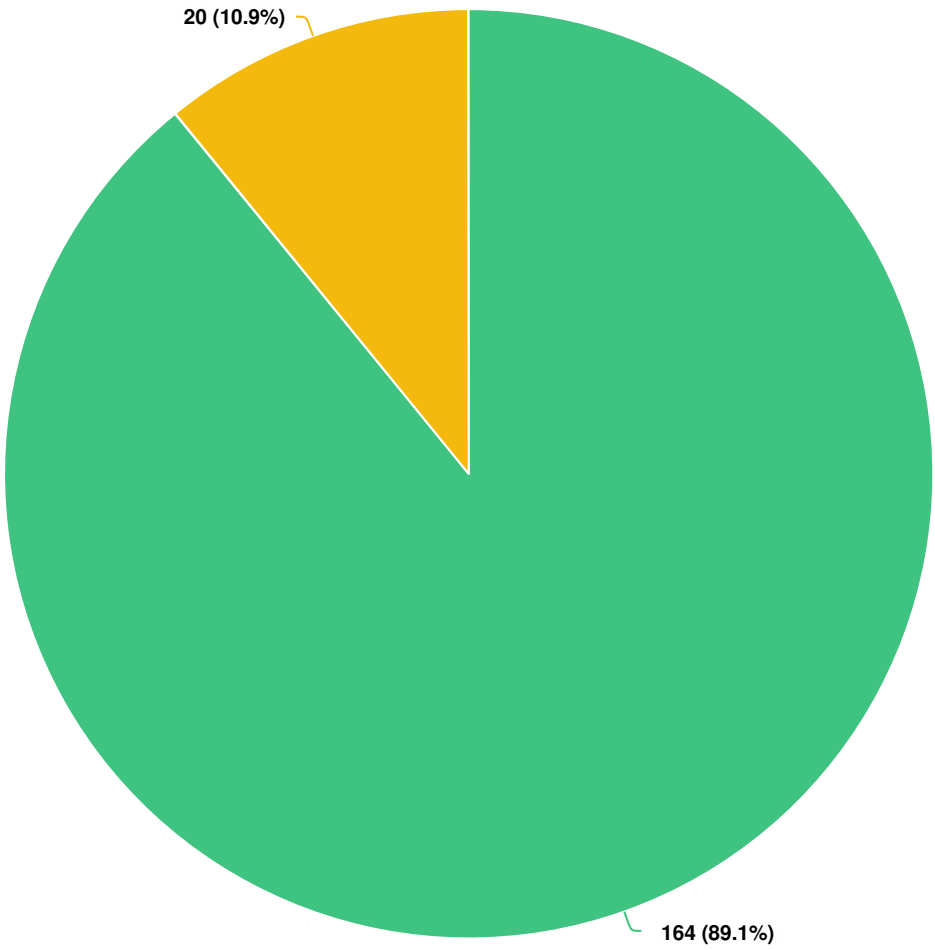
Question options

Yes No Not sure

Optional question (30 response(s), 154 skipped)

Question type: Dropdown Question

Are you connected to Hamilton's sanitary wastewater service or do you have a private septic system?



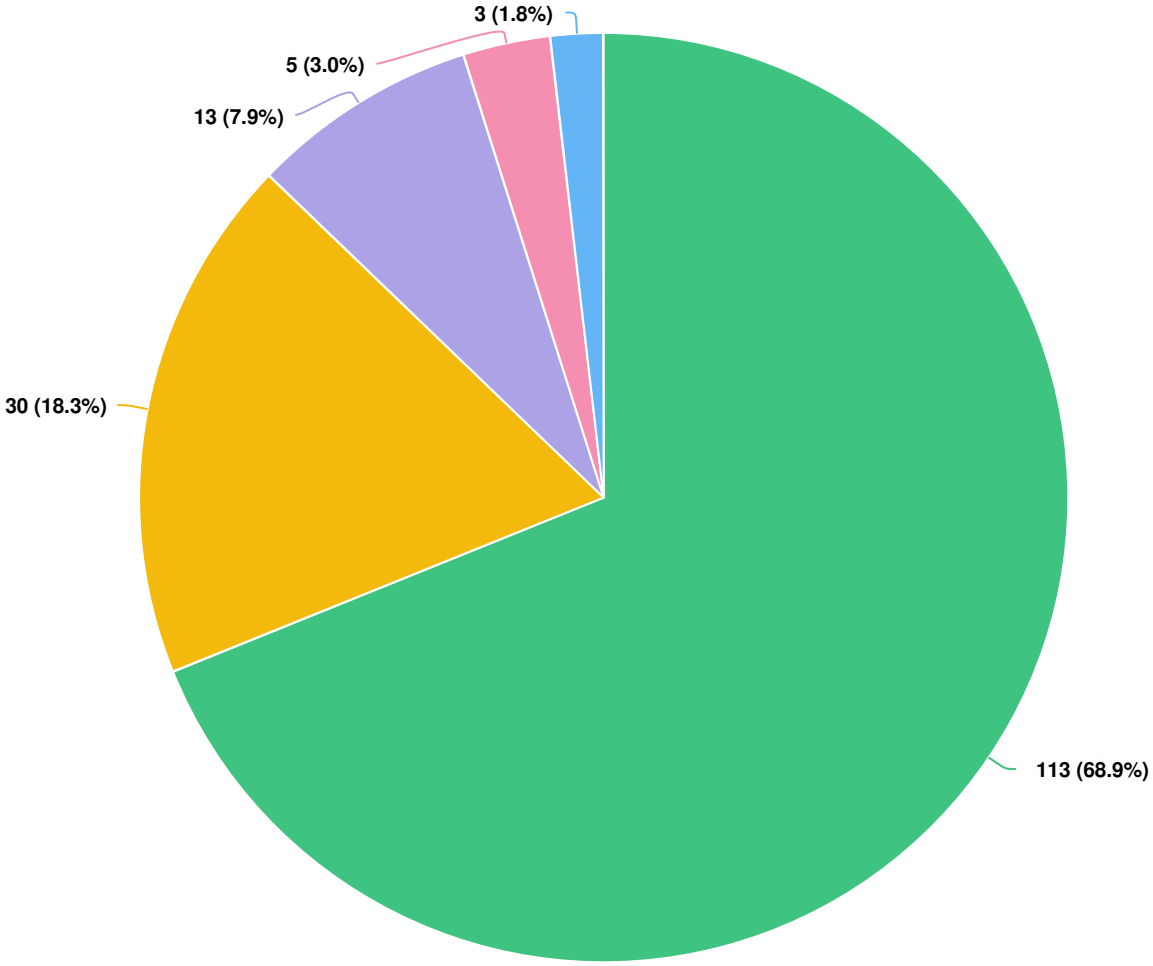
Question options

- I am connected to Hamilton's sanitary wastewater service
- I have a private system like a septic tank

Mandatory Question (184 response(s))

Question type: Dropdown Question

How satisfied are you with the sanitary wastewater services you receive from Hamilton?



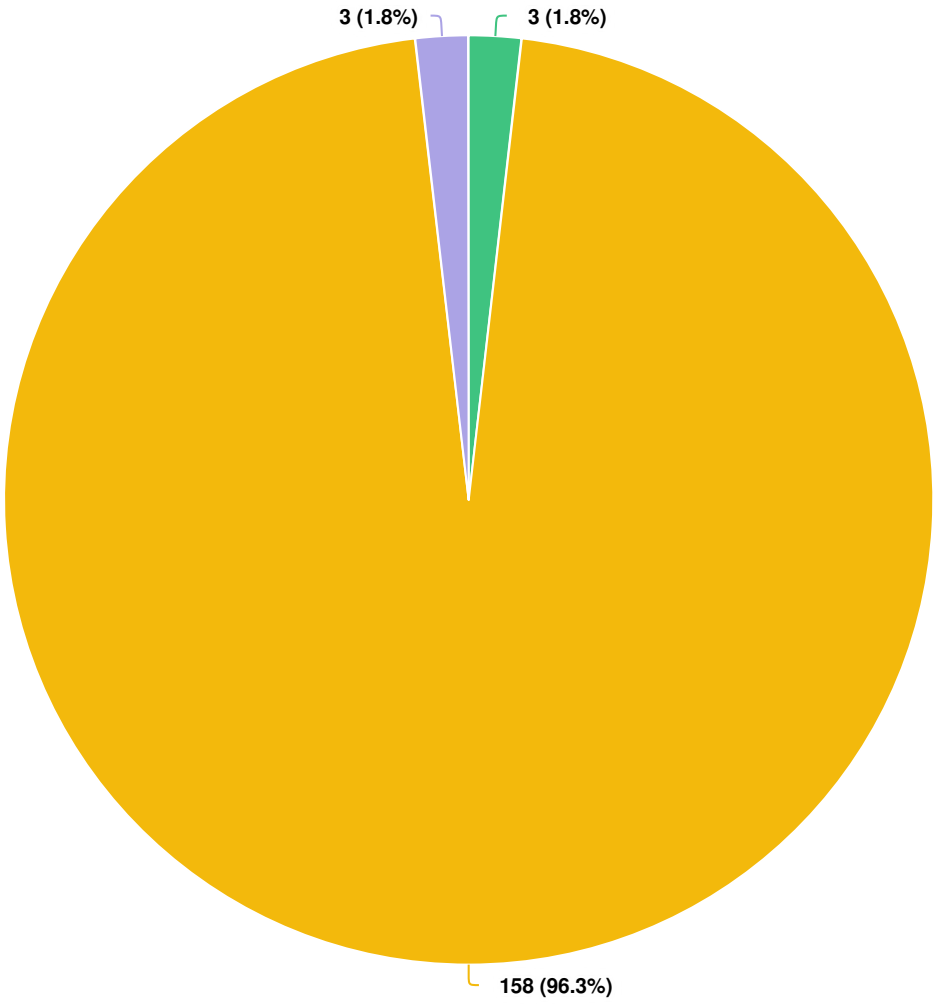
Question options

Very satisfied | Somewhat satisfied | Neutral | Somewhat unsatisfied | Very unsatisfied

Optional question (164 response(s), 20 skipped)

Question type: Dropdown Question

In the last 12 months have you had a sewer back up on your property due to city owned infrastructure?



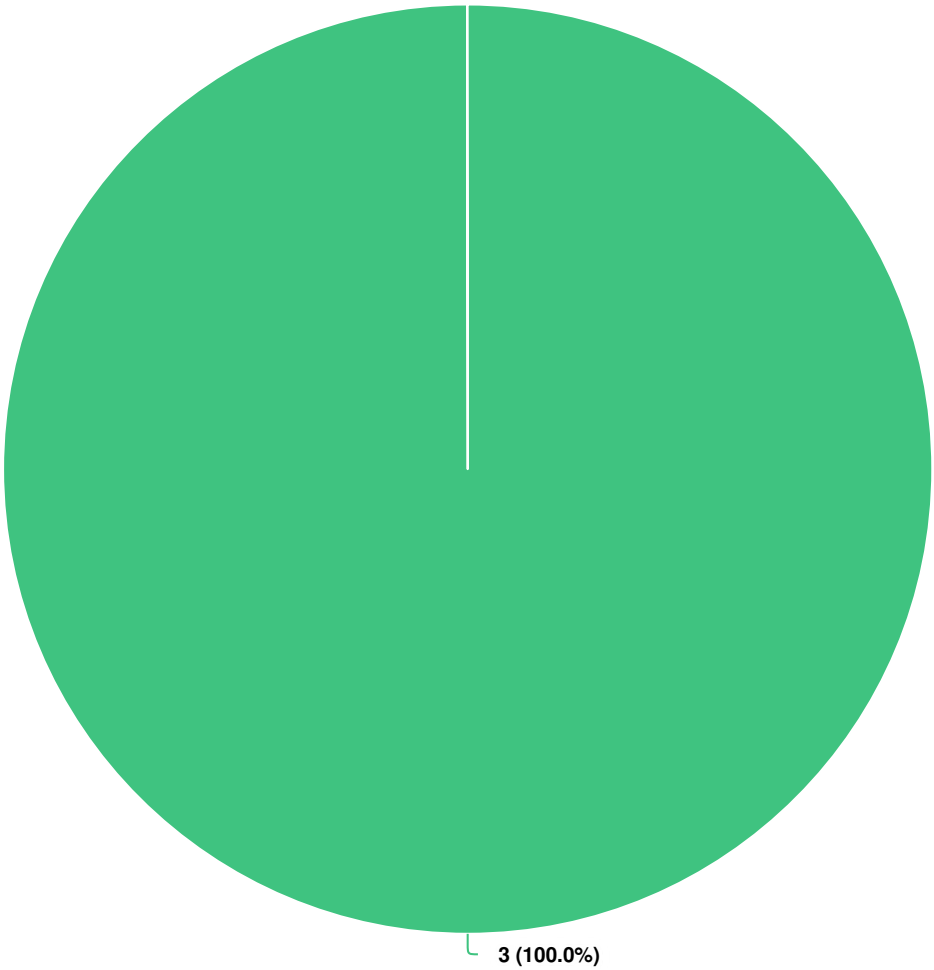
Question options

Yes No Not sure

Optional question (164 response(s), 20 skipped)

Question type: Dropdown Question

Do you feel the City responded quickly to resolve the issue in a timely manner?



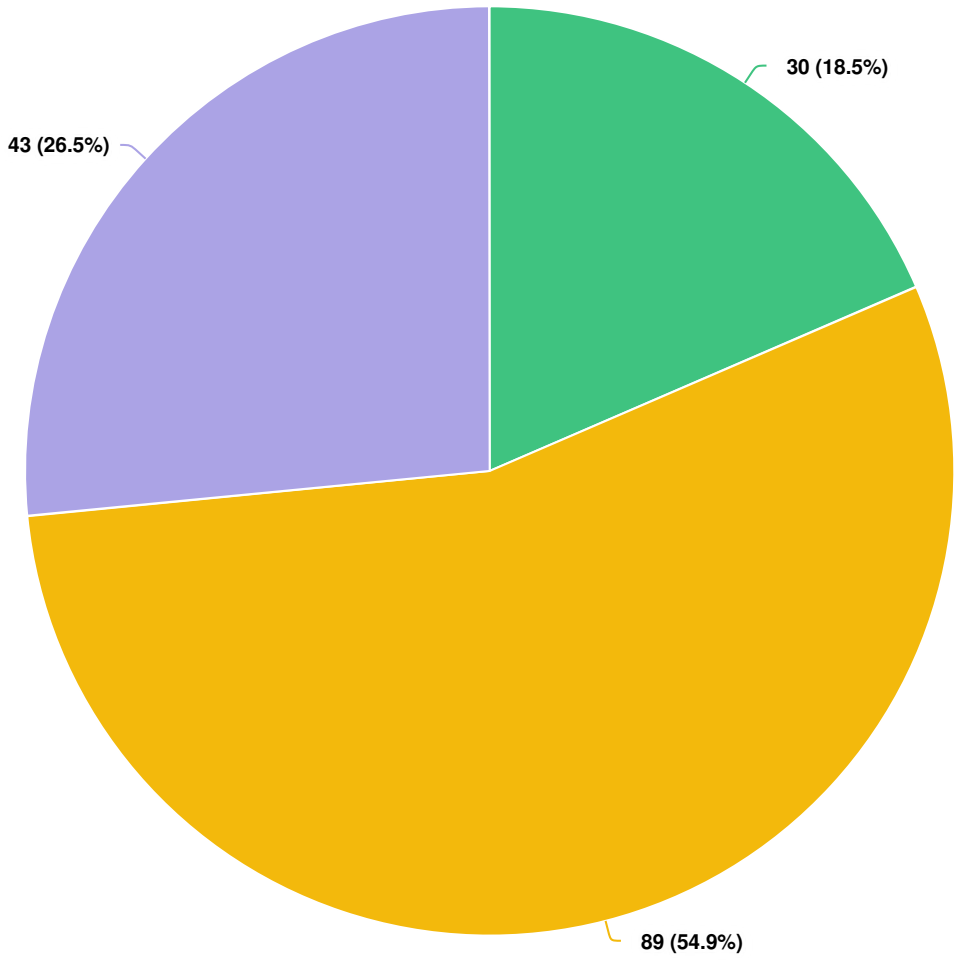
Question options

No

Optional question (3 response(s), 181 skipped)

Question type: Dropdown Question

Do you have a backwater valve?



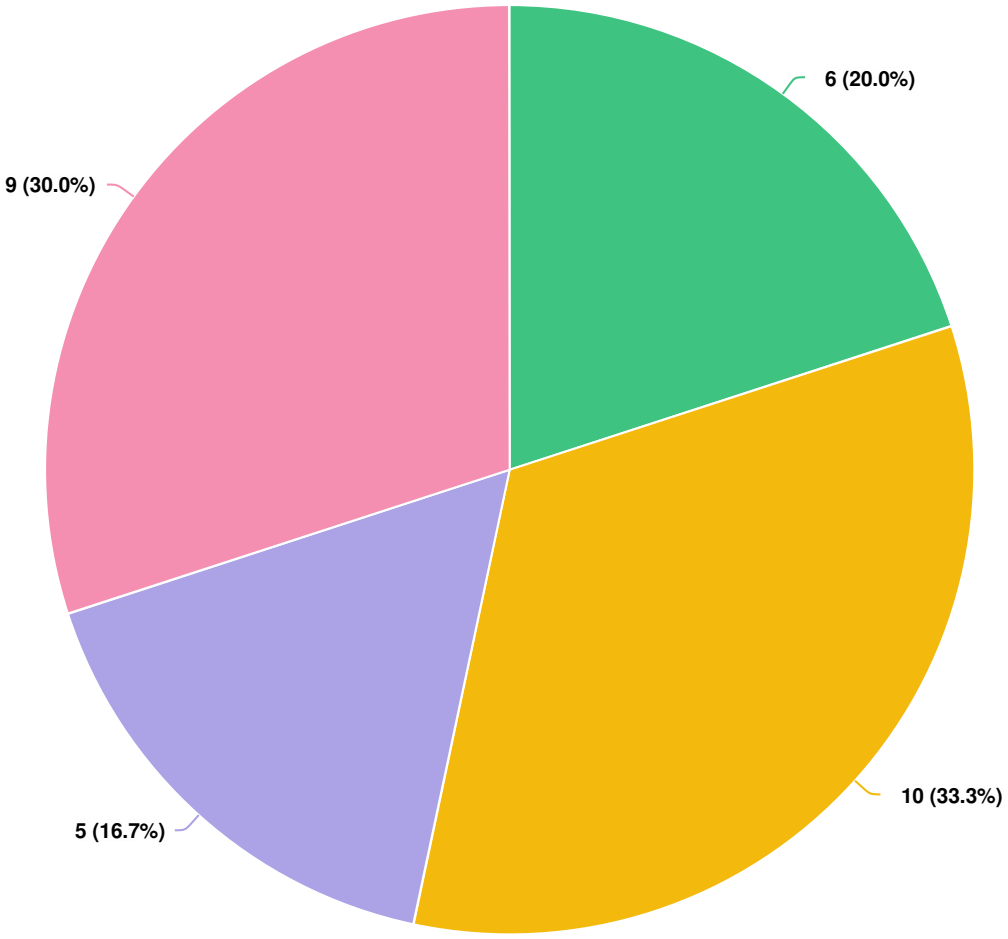
Question options

Yes No Not sure

Optional question (162 response(s), 22 skipped)

Question type: Dropdown Question

How often do you maintain/clean your backwater valve?



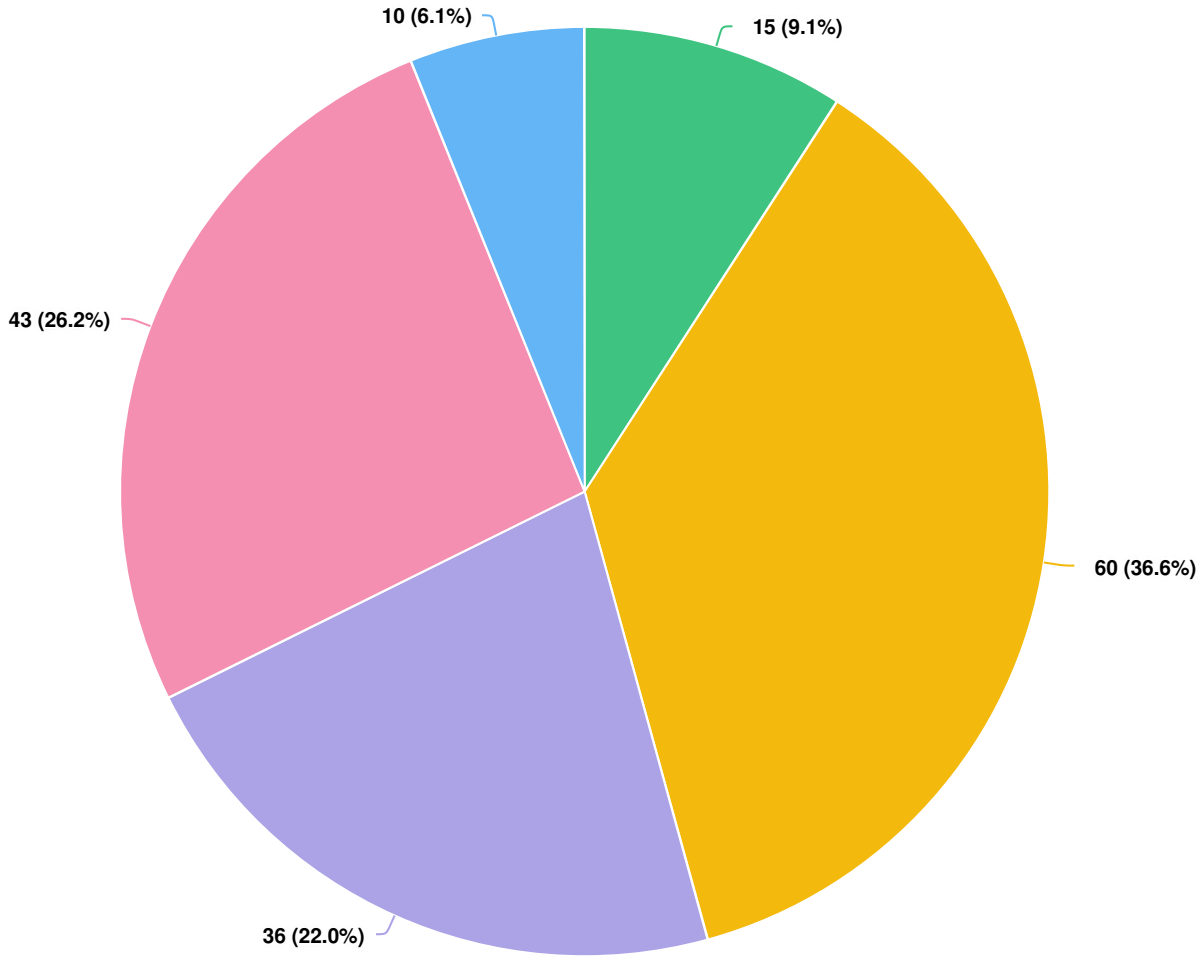
Question options

Two or more time per year Once per year Once every few years Never

Optional question (30 response(s), 154 skipped)

Question type: Dropdown Question

Are you concerned about having a sewer back up on your property?



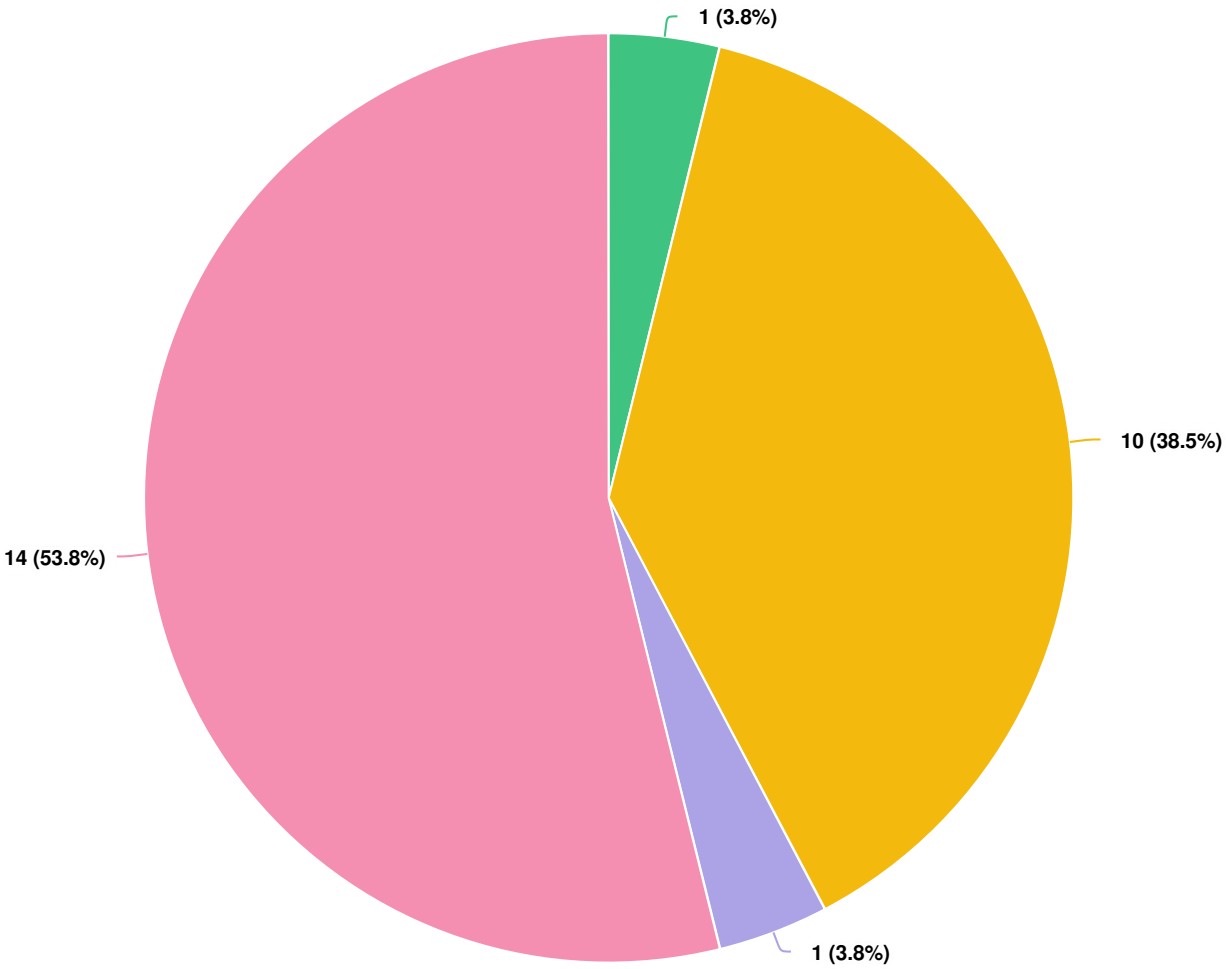
Question options

Very concerned | Somewhat concerned | Neutral | Not very concerned | Not concerned at all

Optional question (164 response(s), 20 skipped)

Question type: Dropdown Question

Why are you somewhat concerned?



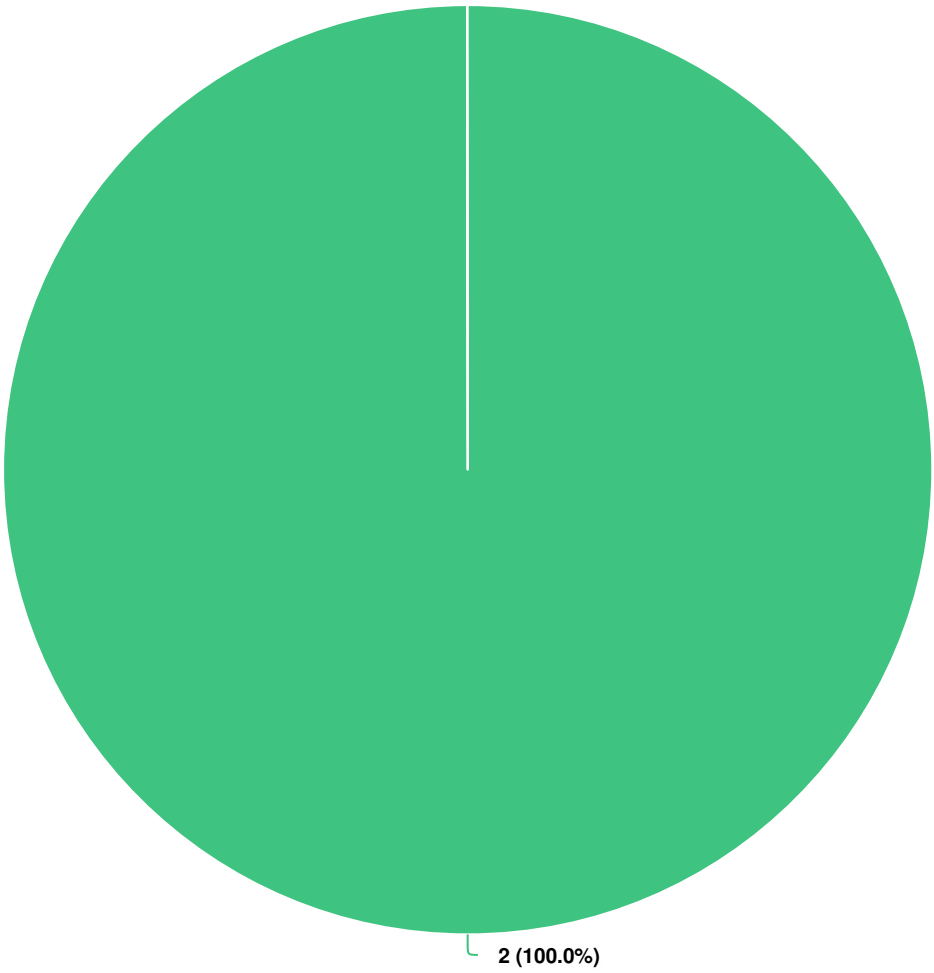
Question options

Had issues previously | Aging infrastructure | Neighbour has had issues | Other (please specify)

Optional question (26 response(s), 158 skipped)

Question type: Dropdown Question

Why are you very concerned?



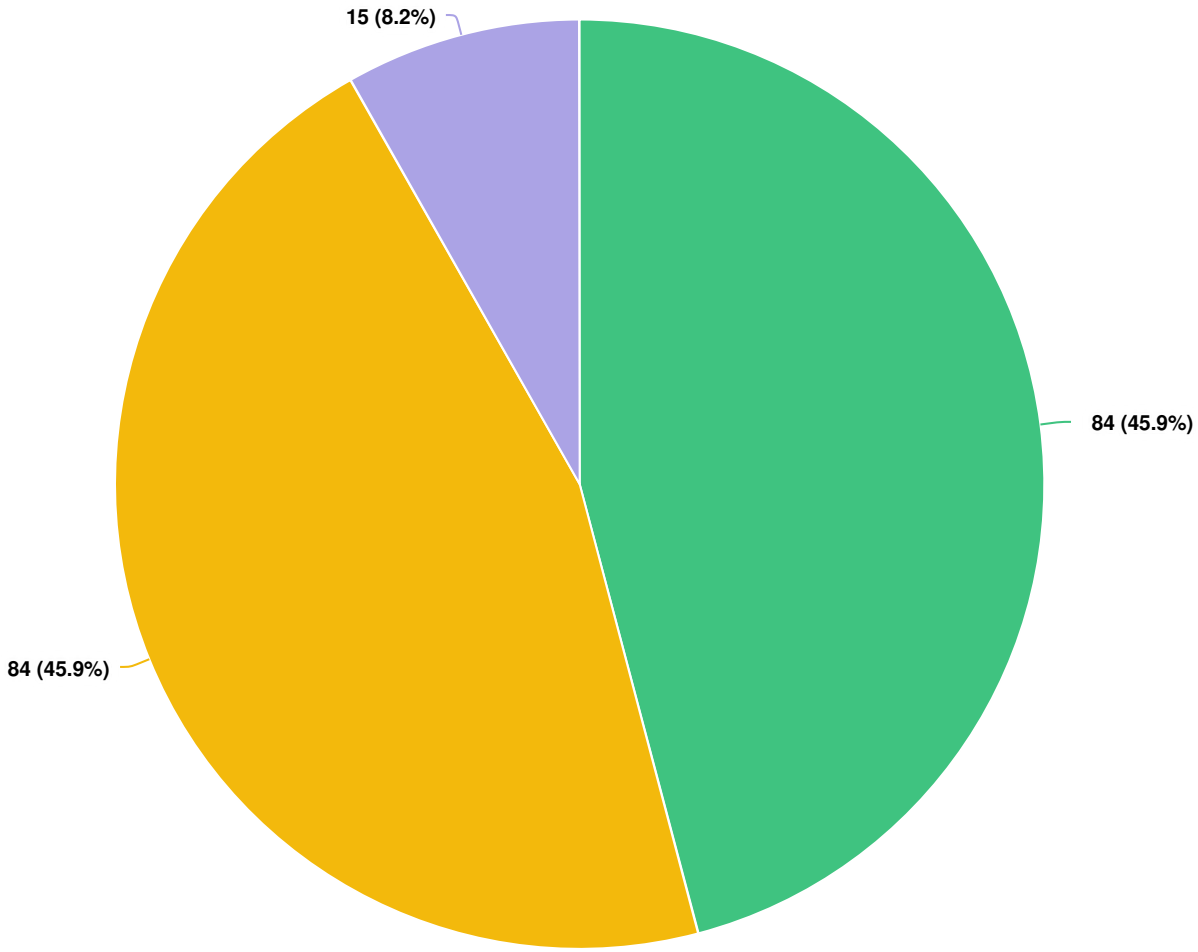
Question options

- Other (please specify)

Optional question (2 response(s), 182 skipped)

Question type: Dropdown Question

Have you ever noticed odour issues anywhere in the City related to wastewater services?



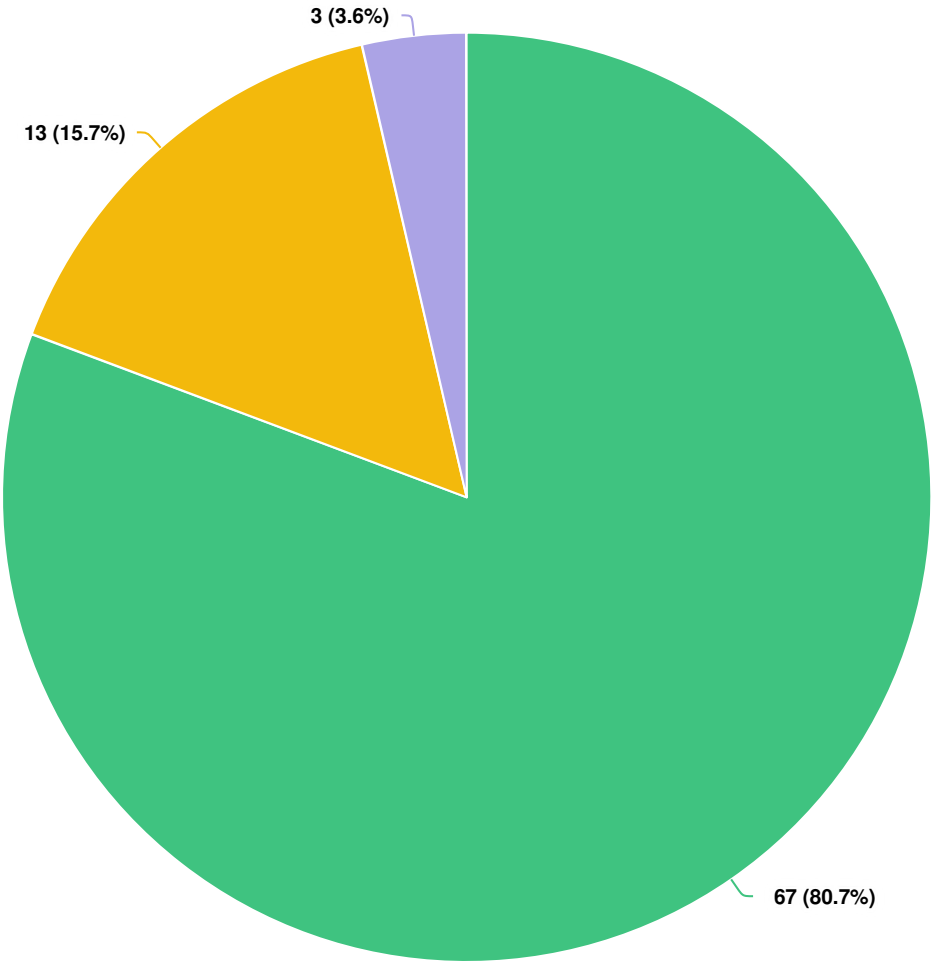
Question options

Yes No Not sure

Optional question (183 response(s), 1 skipped)

Question type: Dropdown Question

How often have these issues occurred?



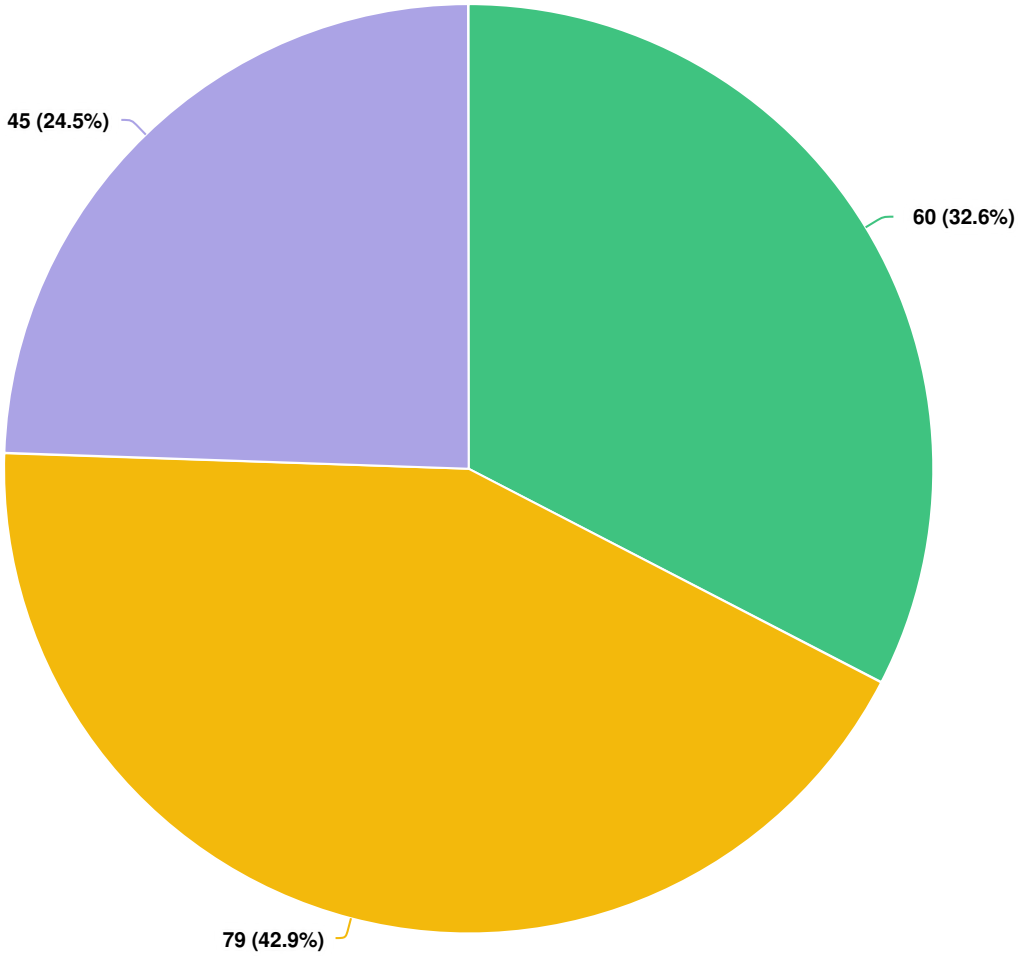
Question options

Two or more time per year Once per year Once every few years

Optional question (83 response(s), 101 skipped)

Question type: Dropdown Question

Do you feel that Hamilton behaves responsibly when returning wastewater back to the environment?



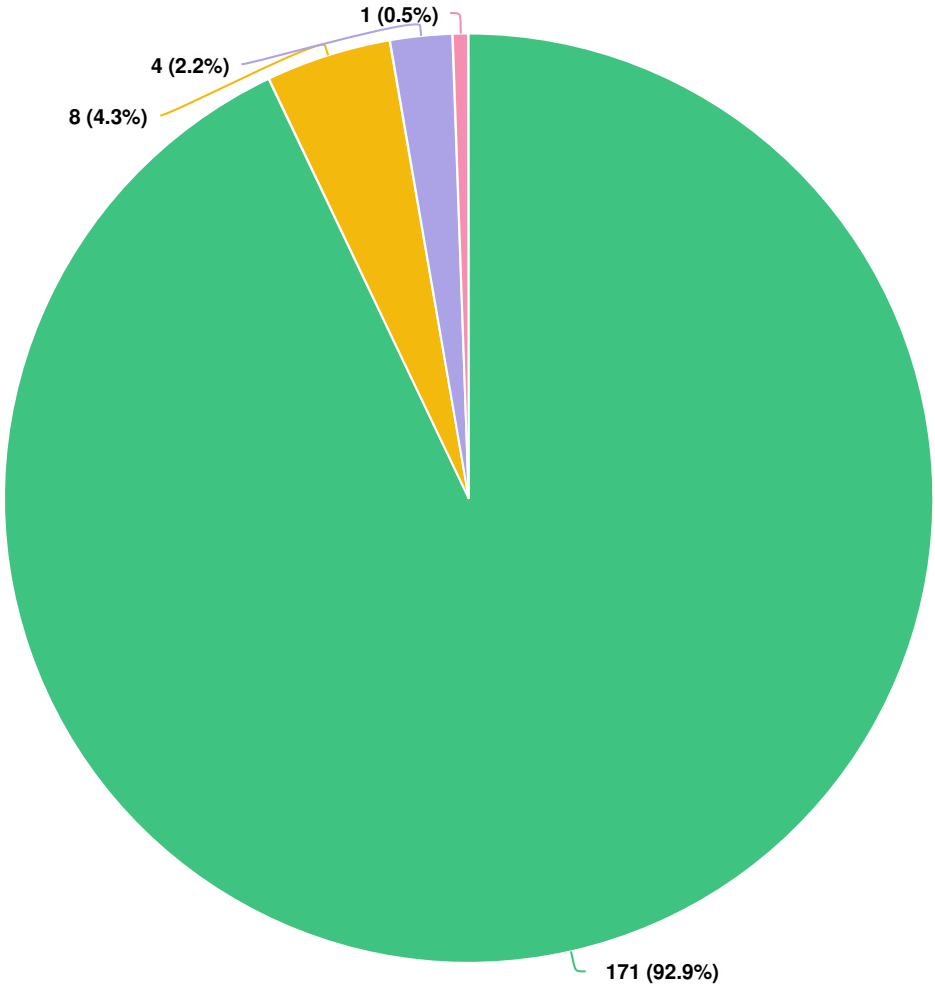
Question options

Yes No Not sure

Optional question (184 response(s), 0 skipped)

Question type: Dropdown Question

In the last 12 months how often have you had to delay or cancel travel due to roads being flooded or closed due to too much water?



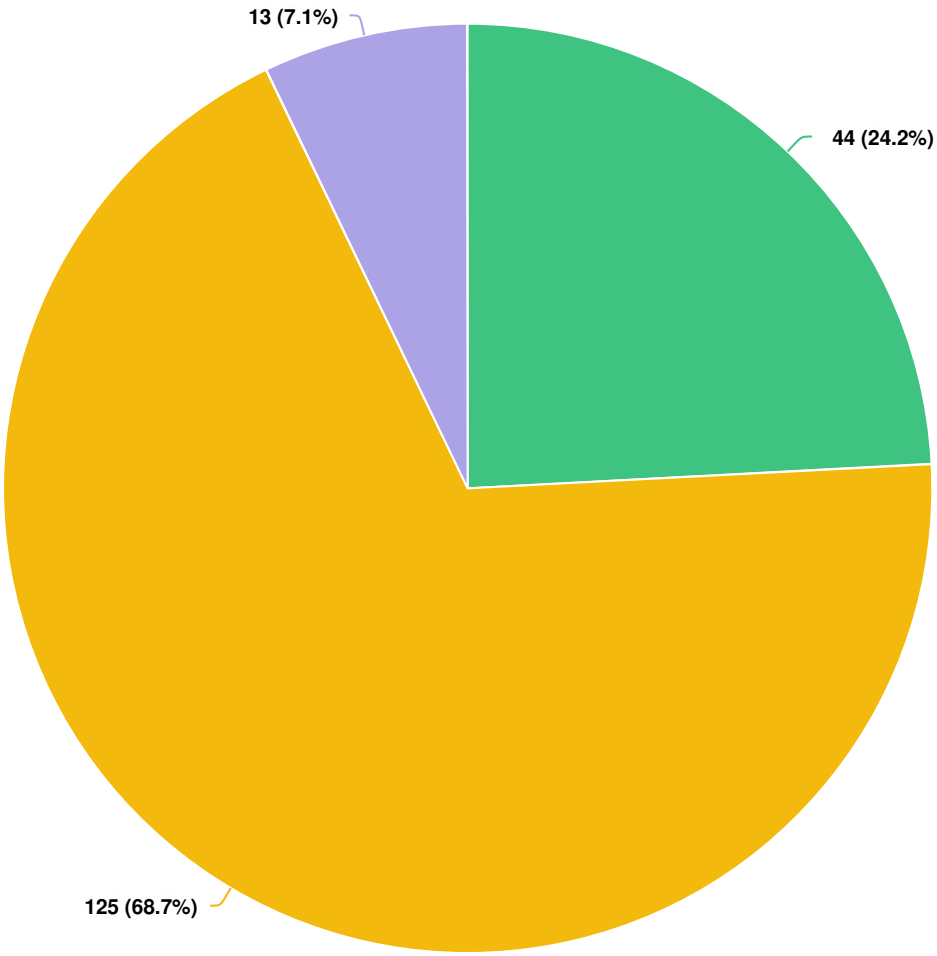
Question options

Never | Once a year | Less than 5 times a year | More than 5 times a year

Mandatory Question (184 response(s))

Question type: Dropdown Question

Do you have a sump pump?



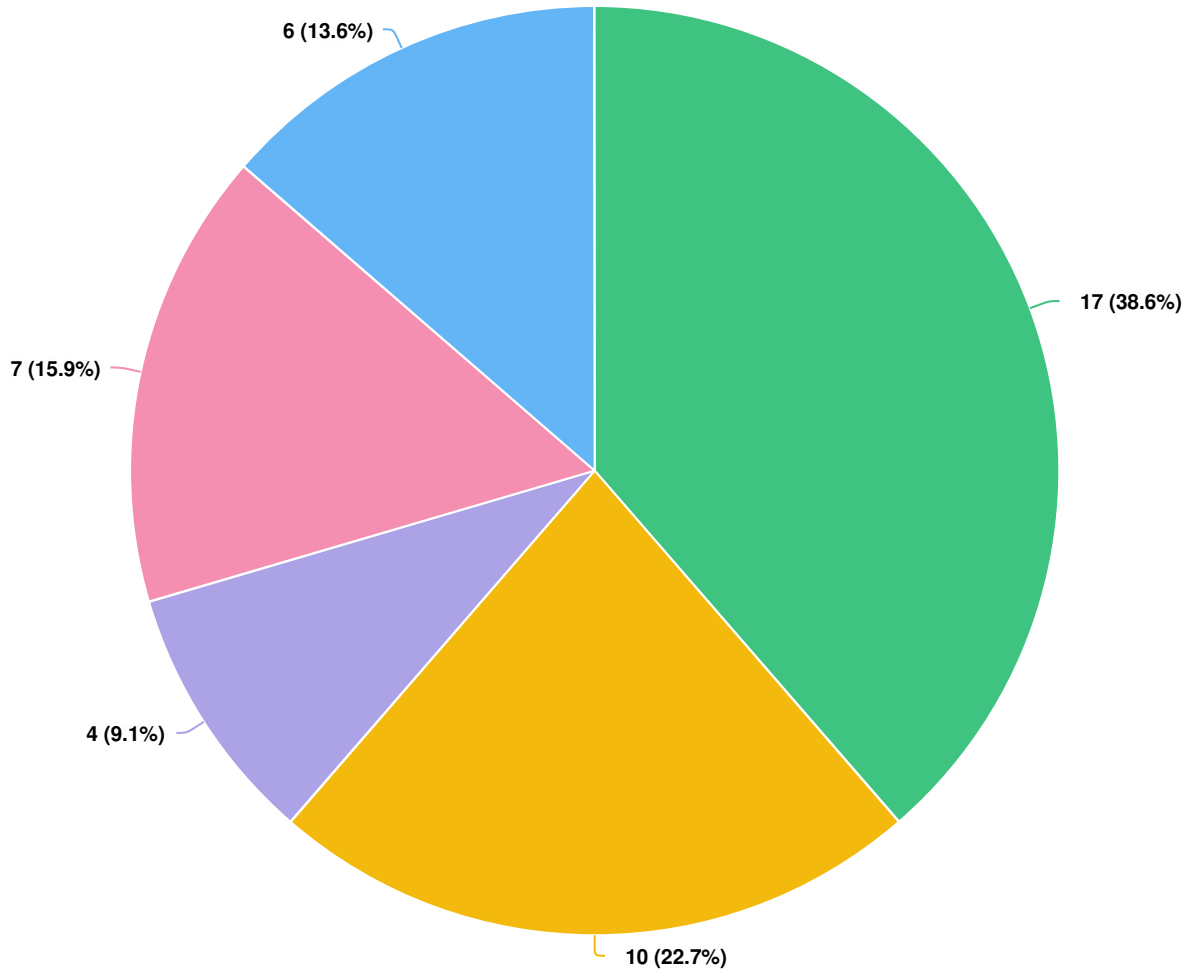
Question options

Yes No Not sure

Optional question (182 response(s), 2 skipped)

Question type: Dropdown Question

During heavy rainfall how often would you say your sump pump runs on average?



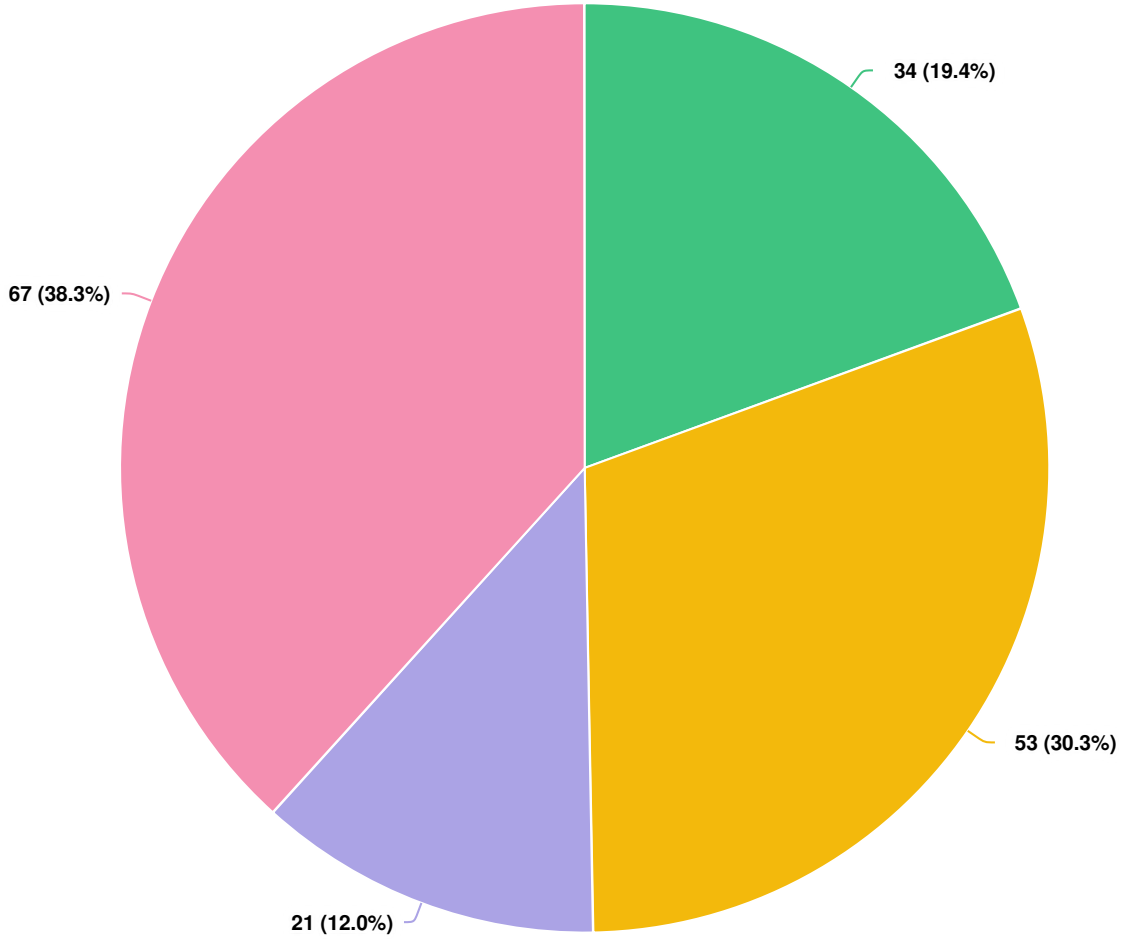
Question options

I don't notice it
Less than 30 minutes
Less than an hour
Between one and three hours
Seems like it's always on

Optional question (44 response(s), 140 skipped)

Question type: Dropdown Question

Does your property have a buried sewer, municipal drain or ditch?



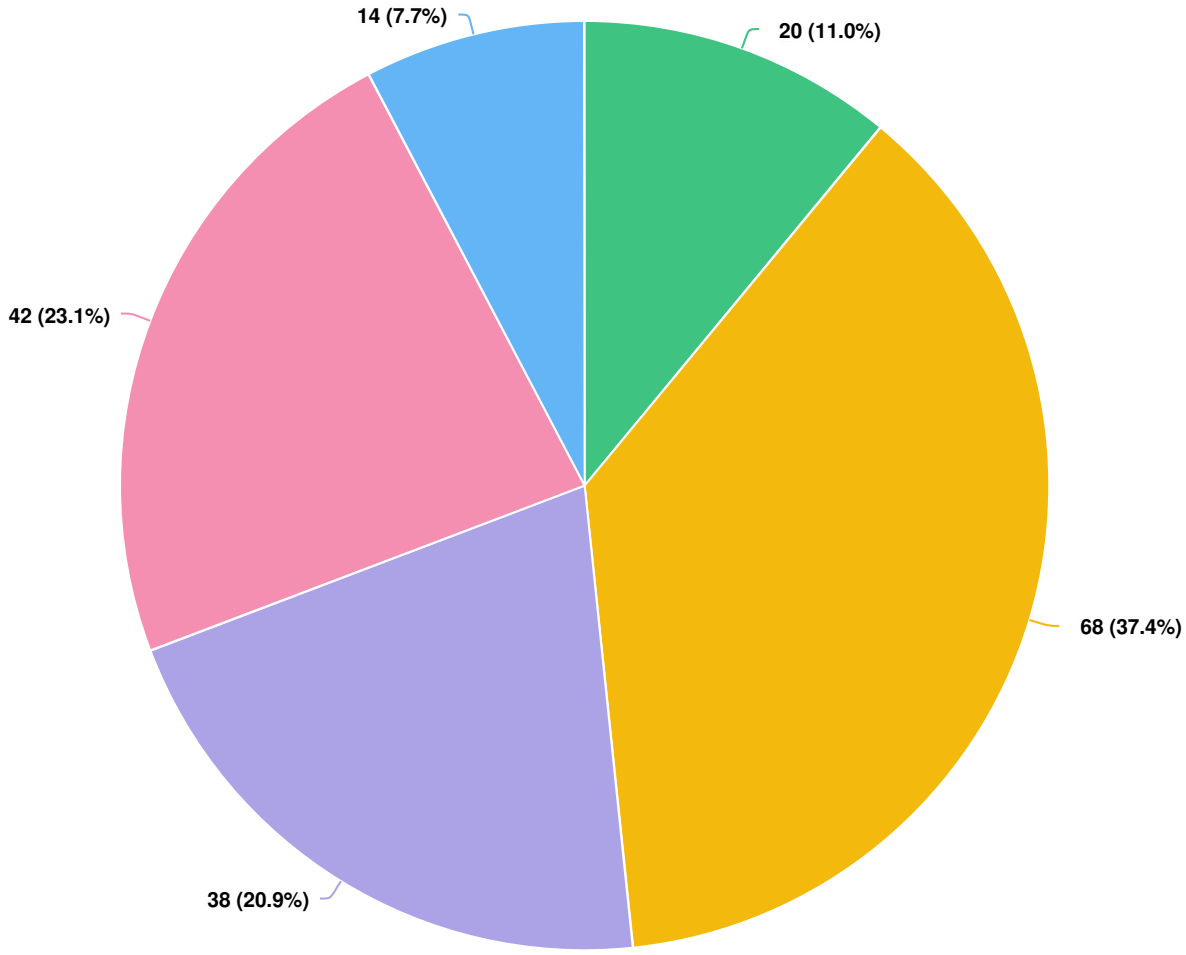
Question options

Municipal drain Buried sewer Ditch Not sure

Optional question (175 response(s), 9 skipped)

Question type: Dropdown Question

Are you concerned about flooding on your residential property, business, or local roads?



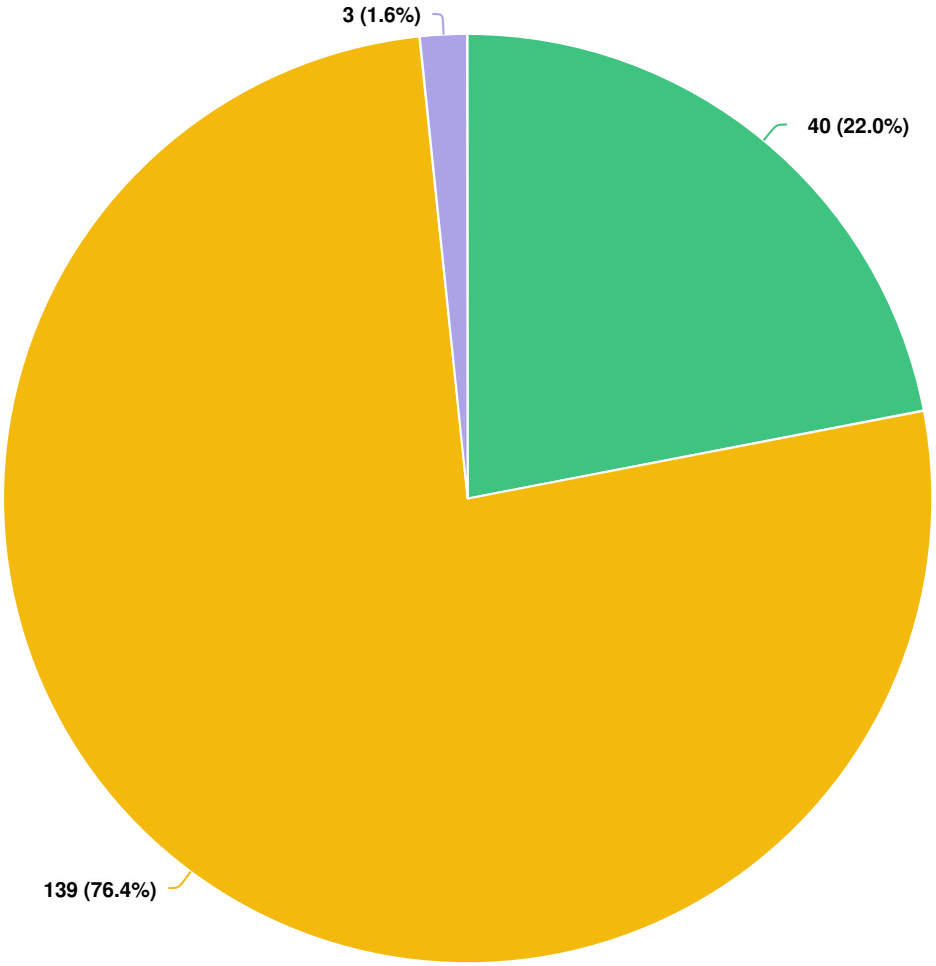
Question options

Very concerned | Somewhat concerned | Neutral | Not very concerned | Not concerned at all

Optional question (182 response(s), 2 skipped)

Question type: Dropdown Question

Have you personally experienced flooding impacts on your property?



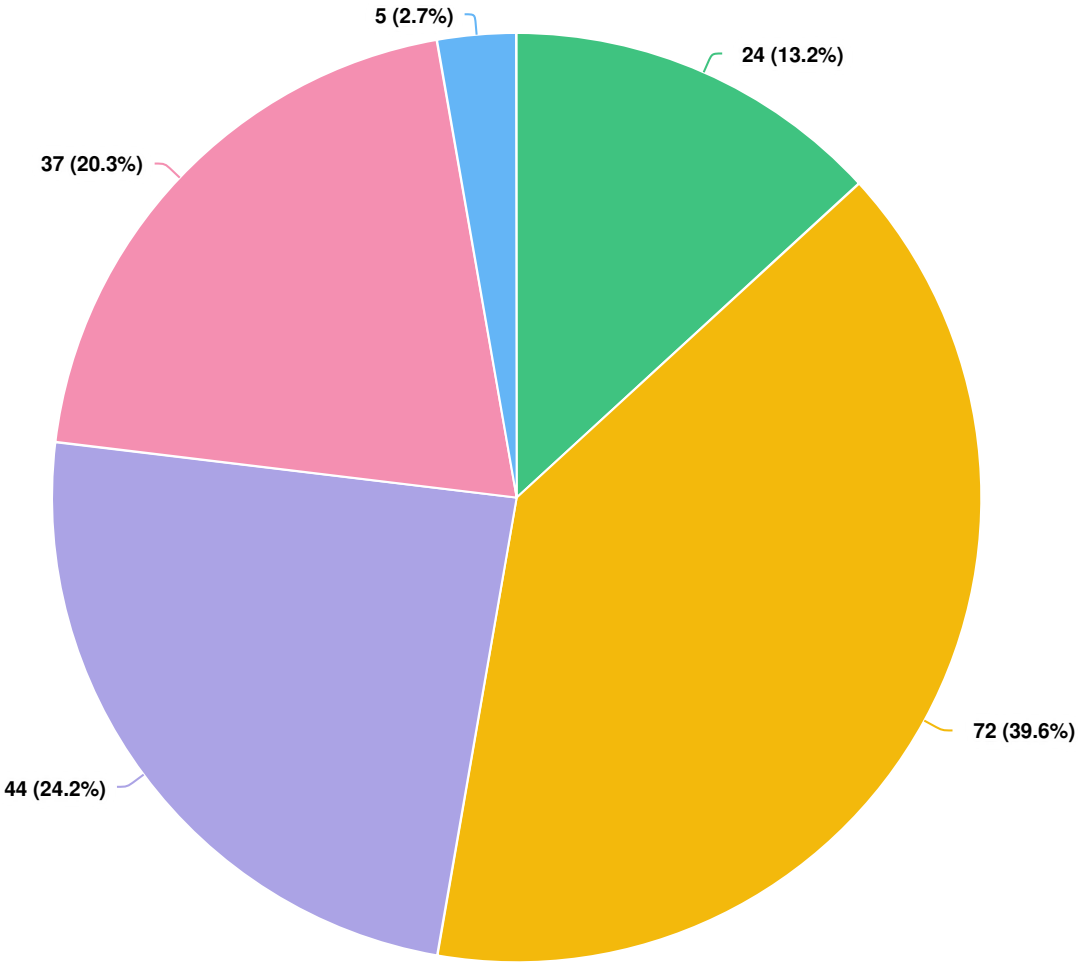
Question options

Yes No Not sure

Optional question (182 response(s), 2 skipped)

Question type: Dropdown Question

In the event of citywide flooding due to a significant storm, how confident are you that the City of Hamilton will respond quickly and help residents and businesses recover?



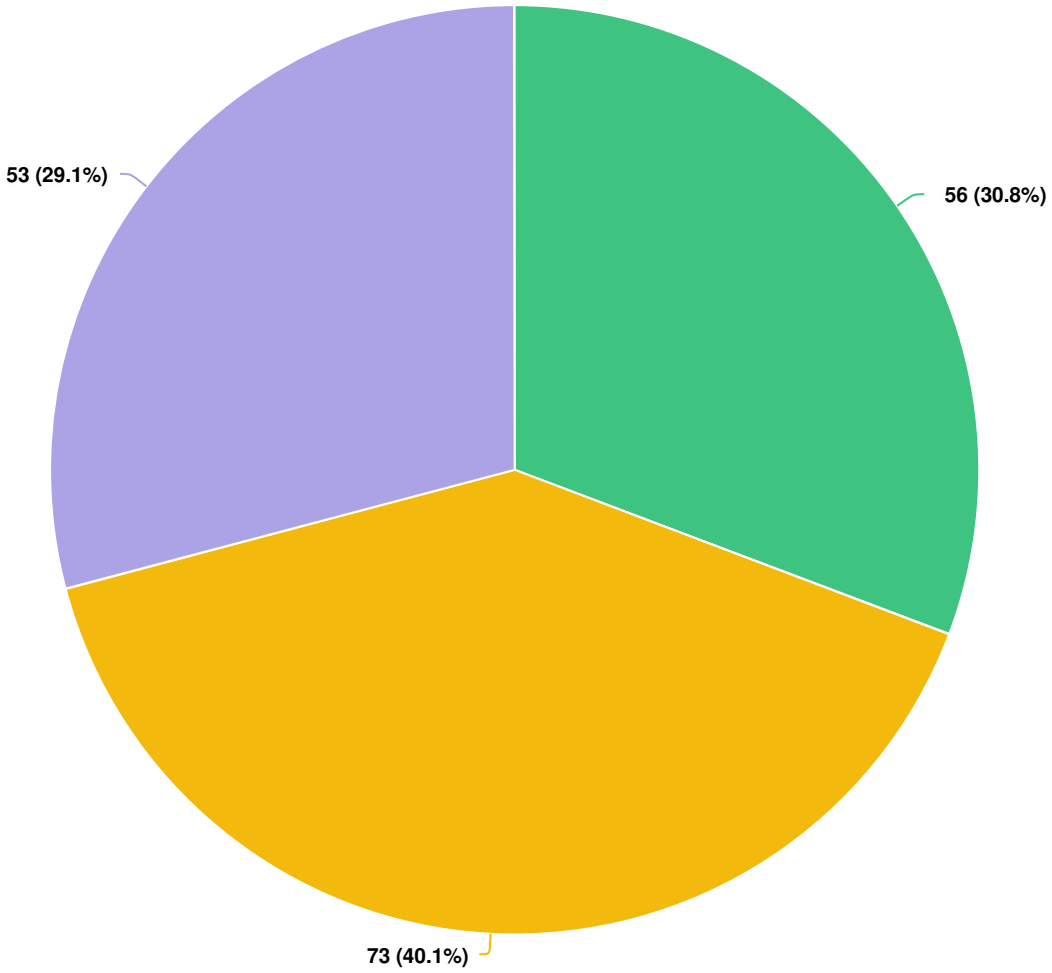
Question options

Very confident | Somewhat confident | Neutral | Not very confident | Not confident at all

Optional question (182 response(s), 2 skipped)

Question type: Dropdown Question

Do you feel that Hamilton behaves responsibly when returning stormwater back to the environment?



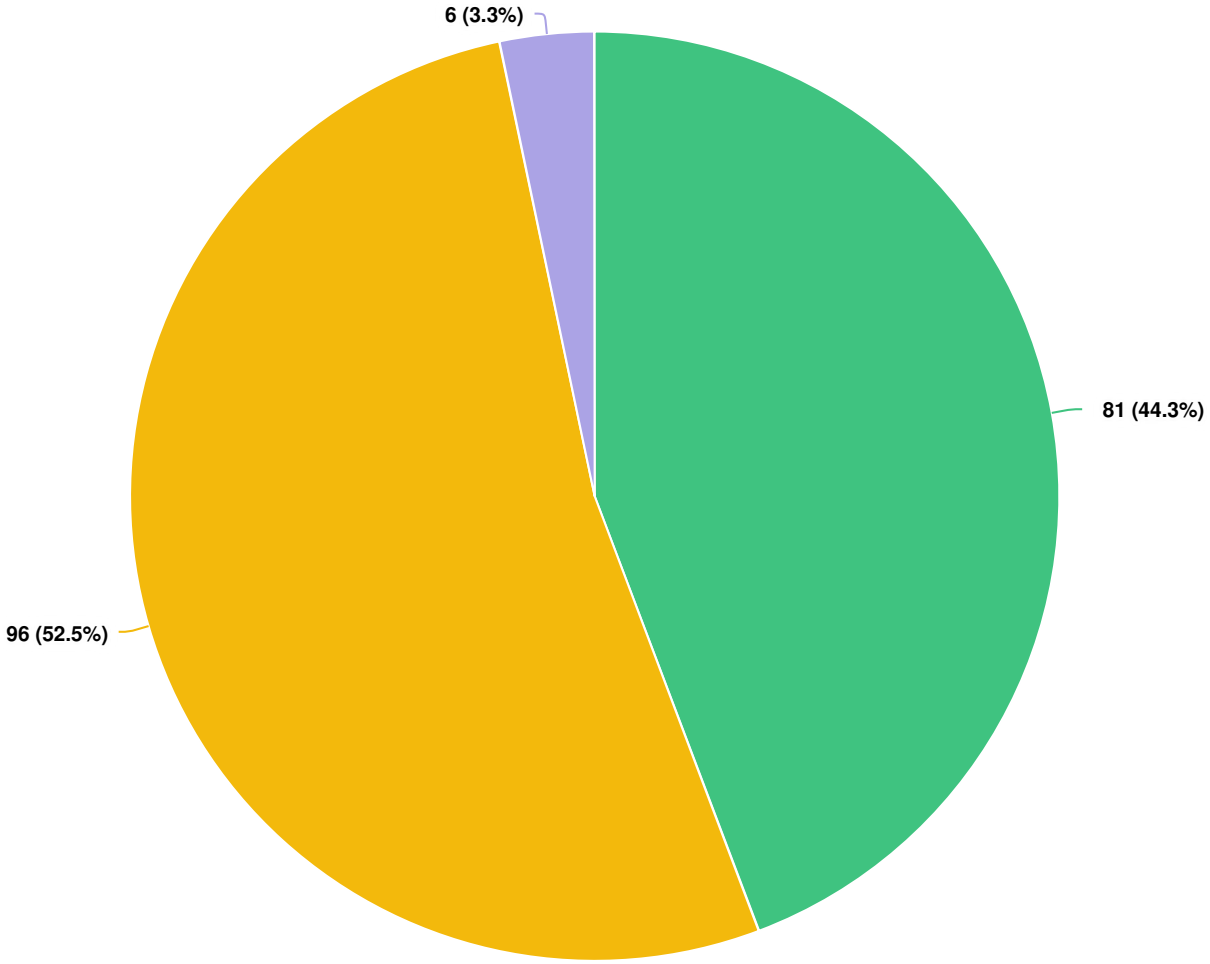
Question options

Yes No Not sure

Optional question (182 response(s), 2 skipped)

Question type: Dropdown Question

Have you or are you in the process of completing a project on your property to reduce stormwater runoff (e.g. rain barrel, downspout disconnection, permeable pavement etc.)?



Question options

Yes No Not sure

Optional question (183 response(s), 1 skipped)

Question type: Dropdown Question

2022

Transportation Asset Management Plan

Hamilton

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TRANSPORTATION ASSET MANAGEMENT PLAN

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1.0 TRANSPORTATION INTRODUCTION

The purpose of this Asset Management Plan (AM Plan) is to identify the intended asset management (AM) programs for assets delivering the City of Hamilton's Transportation services. The City of Hamilton (the City) will identify these programs based on its understanding of the current service level requirements, and the current ability of the network to meet those requirements.

For a high level summary of the assets covered in this AM Plan refer to Table 3. For detailed summaries of assets, please refer to Table 5 and Table 31. As shown, the core Transportation assets included in this plan have a total replacement value of **$6.68B**.

1.0 INTRODUCTION

1.1 SCOPE

The infrastructure assets covered by this AM Plan include assets which are part of the City's overall transportation system. At this time, this AM Plan includes road linear and engineered structure assets, which were considered core assets under Ontario Regulation 588/17 (O.Reg. 588/17).

In addition, as mentioned in Section 6.2 of the AMP Overview, these AM Plans were completed using the Federation of Canadian Municipalities (FCM) approach to asset management in partnership with the Institute of Public Works Engineering Australasia (IPWEA) and NAMS (National Asset Management System) Canada framework for asset management to fulfill the O.Reg. 588/17 timeline and requirements. It is important to note that this is the first iteration of the Transportation AM Plan completed by the Corporate Asset Management (CAM) office using this framework for asset management, and so this plan differs greatly from the 2014 Asset Management Plan. The majority of data in this plan is the data available as of December 2021 - January 2022.

Before July 1st, 2025, this plan will be updated to include the proposed service level requirements for these assets in accordance with the O.Reg. 588/17.

The intent of the AM Plans are also to respond to the findings of the City Auditor. On June 16, 2021 the Office of the City Auditor presented the Roads Value for Money Audit (AUD21006) report to the Audit, Finance and Administration Committee. The audit report identified 25 recommendations, 7 of which relate directly to Asset Management.

1.2 SUPPLEMENTARY INFORMATION

The AM Plan is to be read with other City planning documents. This should include the Strategic Asset Management Policy (SAMP) along with other key planning documents including:

- Asset Management Plan Overview;
- The City of Hamilton Urban & Rural Official Plans;
- Transportation Master Plan;
    - Cycling Master Plan;
    - Pedestrian Mobility Plan
- Hamilton Complete Streets Design Guidelines;
- Truck Route Master Plan.

Key stakeholders in the preparation and implementation of this AM Plan are shown in section 5 of the AMP Overview.

1. INTRODUCTION

1.3 LEGISLATIVE REQUIREMENTS

There are many legislative requirements relating to the management of Transportation assets. The most significant legislative requirements that impact the delivery of transportation services are outlined in Table 1. These requirements are considered throughout the report, and where pertinent, are included in the levels of service measurements.

Table 1: Legislative Requirements

LEGISLATION	REGULATION	REQUIREMENT
Highway Traffic Act, R.S.O. 1990, c.H.8	**O. Reg. 472/10: Standards for Bridges**	Mandatory standards, procedures and guidelines for design, inspections, construction and rehabilitiation. Mandates OSIM biennial inspections.
	O. Reg. 104/97: Standards for Bridges	Prescribes that every bridge shall be kept safe and in good repair.
Ontario Municipal Act	**O.Reg. 239/02: Minimum Maintenance Standards for Municipal Highways**	Prescribes mandatory timelines for bridge & culvert deck repair and rehabilition.
Ontario Municipal Act	**O.Reg. 239/02: Minimum Maintenance Standards for Municipal Highways**	Assists municipal governments with being responsible and accountable and gives power and duties for the purpose of providing good government. Regulation defines Technical Levels of Service and response times for winter maintenance, pothole repair etc.
Environmental Protections Act, R.S.O. 1990, c. E.19	**O.Reg. 406/19: On-Site and Excess Soil Management** **O.Reg. 675/98: Classification and Exemption of Spills and Reporting of Discharges**	To provide protection and conservation of the natural environment. O.Reg. 406/19 Provides rules for soil management and excess quality standards. O.Reg. 657/98: Defines the City''s mandatory duty as an owner or controller to clean up a spilled pollutant it is responsible for. The City must do everything practicable to prevent and eliminate the negative effects from a spill,

1.0 INTRODUCTION

Table 1: Legislative Requirements		
LEGISLATION	**REGULATION**	**REQUIREMENT**
		including restore the natural environment to its original state. This is enforceable by the Minister of the Environment and Conservation and Parks.
Highway Traffic Act, R.S.O. 1990, c.H.8	**R.R.O. 1990, Reg. 615: Signs** **O.Reg. 398/19: Automated Speed Enforcement** **O.Reg 402/16: Pedestrian Crossover Signs** **R.R.O. 1990, Reg. 619: Speed Limits**	Provides instructions for all matters related to highway traffic within Ontario.
Accessibility for Ontarians with Disabilities Act, 2005, S.O. 2005, c.11	**Part IV.1 Design of Public Spaces Standards (Accessibility Standards for the Build Environment)**	An Ontario law mandating that organizations must follow standards to become more accessible to people with disabilities. Accessible transportation and public spaces ensure that people can move around their communities.
Drainage Act, R.S.O. 1990, c. D.17		Provides a procedure for the construction, improvement and maintenance of drainage works.
Railway Safety Act, 1995, c. 32	**Grade Crossing Regulations**	Regulations and requirements for public and private crossings, filing a railway crossing agreement, sightlines, blocked crossings, train whistling.

1.0 INTRODUCTION

Table 1: Legislative Requirements

LEGISLATION	REGULATION	REQUIREMENT
Electricity Act, 1998, SO 1998, c. 15		Ensure the adequacy, safety, sustainability and reliability of electricity supply in Ontario through responsible planning and management of electricity resources, supply and demand. Applies to street lighting, traffic signal infrastructure and all other electrically connected City assets.

1. INTRODUCTION

1.4 ASSET HIERARCHY

An asset hierarchy provides a framework for structuring data in an information system to assist in collection of data, reporting information and making decisions. As outlined in Section 6.5 of the AMP Overview, the City's functional hierarchy includes the strategic, tactical, asset class, and asset levels used for asset planning and financial reporting as well as service planning and delivery.

O.Reg. 588/17 defines core transportation assets as road, bridge and culvert assets. However, the City's functional hierarchy groups assets based on their function to the transportation network. The City has used the asset service hierarchy described in Table 2 to determine which additional assets should be reported in this Transportation AM Plan.

The strategic levels are defined in Section 6.5 of the AMP Overview, and the service areas included in this report are defined in Table 2 below. The service area hierarchies used in this report which outline the included assets are defined in Table 2 and Table 30.

Currently this plan includes assets related to the following service areas: Road Linear, Engineered Structures, and Administration because they relate to the core assets defined in O.Reg. 588/17. Transit assets have not yet been included in this plan because they are not considered a core asset per O.Reg. 588/17 and will be included in future iterations of this plan.

Table 2: Asset Service Area Hierarchy

STRATEGIC LEVEL	SERVICE AREA	FUNCTIONAL RESPONSIBILITIES
Transportation	Road Linear	The transportation distribution network for the safe, accessible, and efficient movement of people, goods, and services across the City. Includes road pavement, active transportation, and traffic assets.
	Engineered Structures	Physical structural support of the transportation distribution network such as bridges, major culverts, and retaining walls.

1. INTRODUCTION

1.5 OVERALL SUMMARY OF TRANSPORTATION ASSETS

The overall summary of transportation assets is shown in Table 3. It is evident that transportation assets have a total replacement value of **$6.68B** and are in an average of **Fair** condition. In addition, the average age of these assets is **25 years** with **49%** of useful life remaining. However, the overall data confidence for the transportation service area is **low to medium**, and so these numbers may change drastically in future iterations of the plan. Data confidence is explained throughout the report and is defined in Section 7.2.2 of the AMP Overview.

Table 3: Summary Of Assets Covered By This Plan
***Weighted Average**

SERVICE AREA	REPLACEMENT VALUE	AVERAGE AGE (% RSL)	AVERAGE OCI/BCI	AVERAGE EQUIVALENT CONDITION
Road Linear	$5.15 B	16 years (45%)	63.8*	3-Fair*
Data Confidence	Low	Low	Medium	Medium
Engineered Structures	$1.53 B	33 years (51%)	72.7	2-Good*
Data Confidence	Medium	Medium	Medium	Medium
TOTAL	$6.68 B	25 years (49%)	N/A	3-Fair*
Data Confidence	***Low***	***Low***	***Medium***	***Medium***

2022

ROADS ASSET MANAGEMENT PLAN

Hamilton

Roads Service Area

Description

Assets within the road linear service area are built to enable safe, effective and efficient transportation within the City. They are built to enable a safe, accessible and efficient transportation system for the movement of people, goods and services within the City. The road linear service area is separated into Road Pavement, Active Transportation and Traffic.

Replacement Value **$5.2 Billion**

Average Asset Condition

Did you know?

- Hamilton has over 69 thousand traffic signs and nearly 45 thousand streetlights it needs to monitor to ensure safe travel.
- On average Hamilton will assume 10 km of new roads annually over the next 10 years

Critical Asset Summary

Critical Assets	Quantity	Replacement Cost	Average Condition	Stewardship Measures
Roads	**6,548 km**	**$3.9 billion**	**Fair**	**96%** of MMS potholes were repaired within mandatory time-lines in 2021
Sidewalks	**2,501 km**	**$563 million**	**Good**	All sidewalks are inspected **Annually**
Signalized Intersections	**659 Intersection**	**$103 million**	**Poor**	All Signalized intersections are Inspected **Annually**

Data Confidence

Financial Facts

Hamilton will acquire **$124 million** dollars worth of assets over the next 10 years.

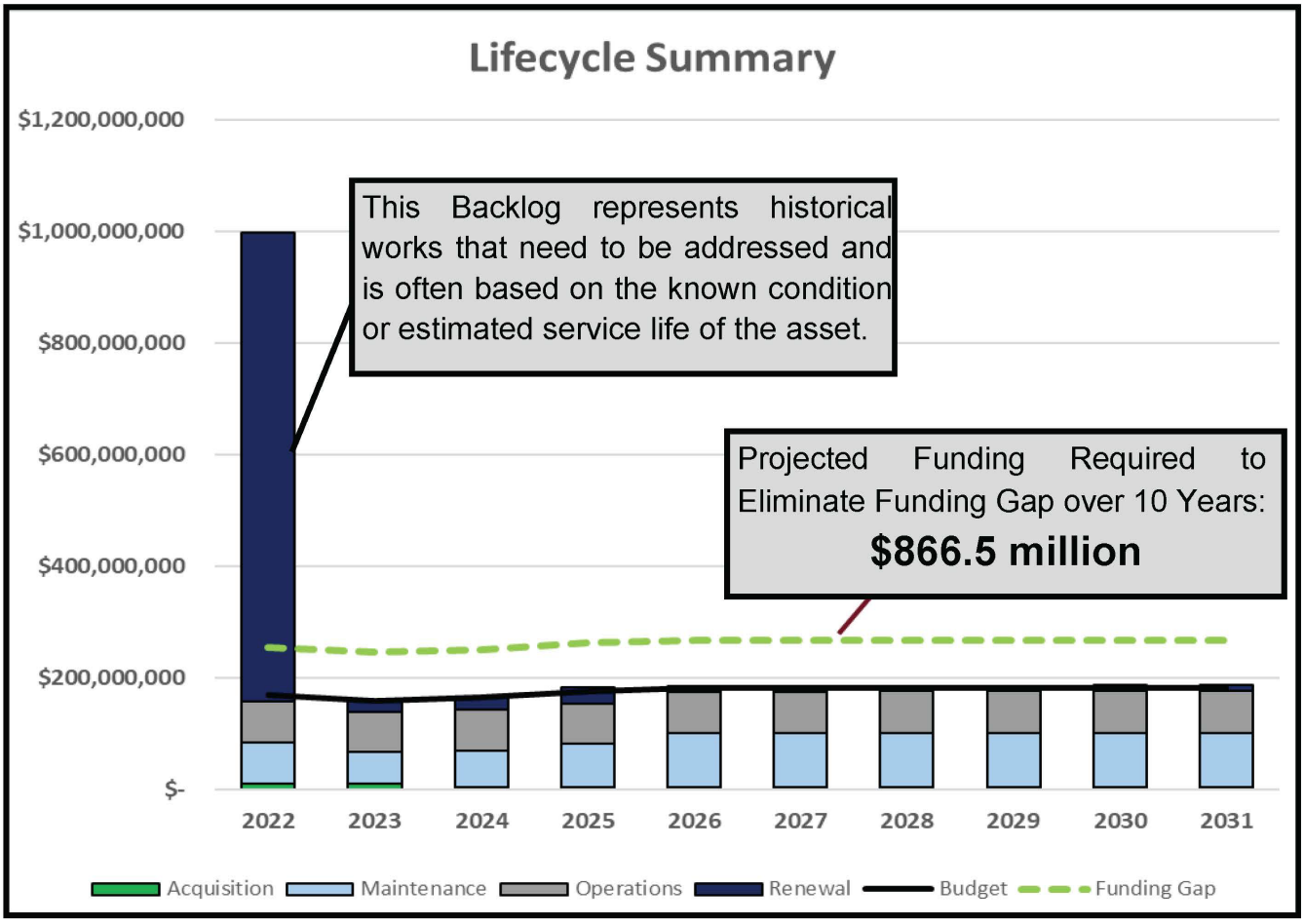
Hamilton will invest **$1.6 billion** to operate & maintain Road assets over

Did you know?

- Hamilton patrols each road weekly to proactively locate and repair problems
- Hamilton proactively inspects all of its 2,500 km's of sidewalks annually to look for and repair defects.

Financial Indicators

Type of Indicator	Measurement	Explanation
Asset Renewal Funding Ratio	**13.8%** (Target should be 90—110%)	The ratio demonstrates the rate which the city renews its Road network assets
10 Year O&M Forecast	**66.3%** (Target should be 100 %)	The **%** of funding allocated compared to what needs to be spent
Annual Infrastructure Gap	**$87 million**	The difference between what is spent and what should be spent



2.0 ROAD LINEAR

Assets within the road linear service area are built to enable safe, effective and efficient transportation within the City. Ultimately, these assets support broader communities' benefits such as agriculture, education, healthcare and the economy. These assets serve the various needs of the pedestrians, cyclists, emergency vehicles, agricultural vehicles, heavy transportation, and commuters and have been acquired by the City over multiple decades and vary greatly in design, construction material, expected life and purpose.

The road linear service area has been broken down into three (3) categories for this section of the AM Plan: Road Pavement, Active Transportation and Traffic, and are defined below:

- **Road Pavement** - refers to the road pavement broken down by the functional class of the road since pavement designs and levels of service differ based on the functional class.
- **Active Transportation** – describes infrastructure which facilitates human-powered forms of travel.
- **Traffic Network** – refers to assets which contribute to traffic control and safety in the right of way (ROW).

The asset class hierarchy outlining assets included in this section is shown below in Table 4.

Table 4: Asset Class Hierarchy

SERVICE AREA	ROAD LINEAR			
ASSET CLASS	**ROAD PAVEMENT**	**ACTIVE TRANSPORTATION**	**TRAFFIC NETWORK**	**ADMINISTRATION**
Asset	Expressway	ROW Bicycle Lanes	Signalized Intersections & Mid-block Crossings	Yards
	Urban Arterial Major	Sidewalks (including ROW Multi-Use Pathways)	Traffic Signs	Vehicles
	Urban Arterial Minor		Guide Rails	
	Urban Collector		Noise Walls & Fencing	
	Urban Local		Pedestrian Crossovers	
	Rural Arterial		Streetlight Luminaires	
	Rural Collector		Streetlight Poles	

2.0 ROAD LINEAR

Table 4: Asset Class Hierarchy				
SERVICE AREA	**ROAD LINEAR**			
ASSET CLASS	**ROAD PAVEMENT**	**ACTIVE TRANSPORTATION**	**TRAFFIC NETWORK**	**ADMINISTRATION**
	Rural Local		Traffic Medians	
	Assumed Alleyways			

2.0 ROAD LINEAR

2.1 BACKGROUND

The information in this section is intended to give a snapshot in time of the current state of the road linear service area by providing a detailed summary and analysis of existing inventory information as of January 2022 including age profile, condition methodology, condition profile, and asset usage and performance for each of the assets, and will provide the necessary background for the remainder of the plan.

2.1.1 Detailed Summary of Assets

Table 5 displays the detailed summary of assets for the road linear service area. The sources for this data are a combination of data included in the City's database information. It is important to note that inventory information does change often, and that this is a snapshot of information available as of January 2022. The replacement values for all assets were calculated based on unit costs provided and are based on a combination of internally developed estimating sheets and market values. The average Overall Condition Index (OCI) was calculated from the last 2019 assessment to encompass maintenance improvements and are deteriorated to the end of 2021. The average OCI is weighted by lane length.

It is evident that the City owns approximately **$5.15B** in road assets which are on average in **Fair** condition. Assets are an average of **16 years** in age which is **45%** of the average remaining service life (RSL). For most assets this means that the City should be completing preventative, preservation and minor maintenance activities per the inspection reports as well as operating activities (e.g. inspection, cleaning) to prevent any premature failures.

The Corporate Asset Management (CAM) Office acknowledges that some works and projects are being completed on an ongoing basis and that some of the noted deficiencies may already be completed at the time of publication. In addition, the assets included below are assets that are assumed and in service at the time of writing. Finally, it is possible that there are assets that may not be owned by Public Works which may be considered wastewater assets which may be missing from this inventory. This has been identified as a continuous improvement Item in Table 29.

2.0 ROAD LINEAR

Table 5: Detailed Summary of Assets for Road Linear Service Area
***Weighted Average**

ASSET CATEGORY	NUMBER OF ASSETS	REPLACEMENT VALUE	AVERAGE AGE (% RSL)	AVERAGE OCI	AVERAGE EQUIVALENT CONDITION
ROAD PAVEMENT (INCL CURBS)*					
Expressway	133.05 km	$101.20 M	18 years (49%)	74.50	2-Good
Urban Arterial Major	974.79 km	$671.09 M	33 years (6%)	64.37	3-Fair
Urban Arterial Minor	393.91 km	$287.44 M	32 years (8%)	63.08	3-Fair
Urban Collector	826.23 km	$617.02 M	31 years (12%)	60.38	3-Fair
Urban Local	2,015.43 km	$1.541 B	29 years (18%)	60.69	3-Fair
Rural Arterial	180.44 km	$117.43 M	No data	69.38	3-Fair
Rural Collector	1,196.51 km	$449.76 M	No data	68.88	3-Fair
Rural Local	797.28 km	$199.78 M	24 years (32%)	63.96	3-Fair
Data Confidence	High	Low	Very Low	Medium	Medium
Assumed Alleyways	30 km	$2.272 M	No data	N/A	3-Fair
Data Confidence	Low	Low	Very Low	N/A	Medium
SUBTOTAL	**6,548 km**	**$3.987 B**	**28 years (21%)**	**63.78***	**3-Fair***
Data Confidence	**High**	**Low**	**Very Low**	**Medium**	**Medium**

ACTIVE TRANSPORTATION NETWORK**				
ASSET CATEGORY	**NUMBER OF ASSETS**	**REPLACEMENT VALUE**	**AVERAGE AGE (% RSL)**	**AVERAGE EQUIVALENT CONDITION**
Sidewalks	2,501 km	$563.21 M	15 years (69%)	2-Good
Data Confidence	Medium	Low	Very Low	Medium
On-Street Bicycle Lanes	244 km	$25.2 M	4 years (88%)	1-Very Good
Data Confidence	Low	Low	Very Low	Very Low
	SUBTOTAL	$588.41 M	10 years (23%)	2-Good*
	Data Confidence	Low	Very Low	Medium

TRAFFIC NETWORK***				
Guide Rails	151.14 km	$12.92 M	No Data	No Data
Data Confidence	Medium	Low	Very Low	Very Low
Noise Wall & Fencing	43.03 km	$18.65 M	26 years (47%)	3-Fair
Data Confidence	High	Medium	Medium	Medium
PXO	280	$4.2 M	4 years (75%)	2-Good
Data Confidence	High	Medium	Medium	Low
Signalized Intersection and mid-block (incl Cameras, Radios)	659	$103.26 M	36 years (0%)	4-Poor
Data Confidence	Very High	Low	High	Low
Signs (incl Dynamic Speed Sign, Flashers)	69,317	$50.65 M	7 years (51%)	3-Fair
Data Confidence	Medium	Low	Very Low	Very Low
Streetlight Luminaire	45,272	$45.27 M	6 years (72%)	2-Good
Data Confidence	High	Medium	High	High
Streetlight Pole	21,075	$94.84 M	29 years (43%)	1-Very Good
Data Confidence	High	Medium	Medium	High
Traffic Medians	No Data	No Data	No Data	No Data
Data Confidence	Very Low	Very Low	Medium	Very Low
	SUBTOTAL	$329.79 M	18 years (36%)	3-Fair*
	Data Confidence	Low	Medium	Medium

3.0 ROAD LINEAR

ADMINISTRATION				
ASSET CATEGORY	**NUMBER OF ASSETS**	**REPLACEMENT VALUE**	**AVERAGE AGE (% RSL)**	**AVERAGE EQUIVALENT CONDITION**
Vehicles	403	$62.82 M	8 years (20%)	3-Fair
Data Confidence	High	Medium	High	Low
Yards	16	$180.06 M	No Data	No Data
Data Confidence	Medium	Low	Very Low	Very Low
	SUBTOTAL	$242.82 M	8 years (20%)	3-Fair*
	Data Confidence	Low	Medium	Low
	TOTAL	**$5.15B**	**16 years (45%)**	**3-Fair***
	Data Confidence	Low	Low	Medium

Historically, age data has not been collected for many assets, and is therefore shown to be low confidence on average, but staff have begun to collect this data as new assets are installed (e.g. bicycle lanes). In addition, it was found that some created inventories, and replacement value repositories are not maintained regularly (e.g. guide rails). A process to collect and update data should be investigated and has been identified as a continuous improvement item in Table 29. In addition, unknown quantity assets will also be captured in future inspection programs. Improving inventory information for assets with lower confidence have been noted in Table 29.

It was found while assessing the inventory data that asset owners are typically inspecting road linear assets through the Minimum Maintenance Standards (MMS) regulation, and these inspections could be altered to encompass additional data collection and condition information, which has been identified as a continuous improvement item in Table 29, and may assist with improving the data confidence issues posed above.

Finally, the functional class designation for road pavements requires investigation as it has been identified that there are some roads that may have changed functional classes since this data was originally created. With the adoption of the new Truck Master Plan, some functional classes may change. A Road Classification and Right of Way study is currently being undertaken to review the functional classes, but this has been noted in Table 29 continuous improvement plan.

Please refer to the AMP Overview for a detailed description of data confidence.

2.1.2 Asset Condition Grading

Condition is the preferred measurement for planning lifecycle activities to ensure assets reach their expected useful life. Since condition scores are reported using different scales and ranges depending on the asset, Table 6 below shows how each rating was converted to a standardized 5-point condition category so that the condition could be reported consistently across the AM Plan. A continuous improvement item identified in Table 29, is to review existing internal condition assessments and ensure they are revised to report on the same 5-point scale with equivalent descriptions.

2.0 ROAD LINEAR

TABLE 6: CONDITION CONVERSION TABLE

EQUIVALENT CONDITION GRADING CATEGORY	CONDITION DESCRIPTION	% REMAINING SERVICE LIFE	OCI RESULT	SIDEWALK INSPECTION	NOISE WALL, FENCING CONDITION ASSESSMENT RESULT	STREETLIGHT POLE CONDITION ASSESSMENT RESULT
1-Very Good	The asset is new, recently rehabilitated, or very well maintained. Preventative maintenance required only.	>79.5%	86 – 100	No deficiencies	N/A	1-Very Good
2-Good	The asset is adequate and has slight defects and shows signs of some deterioration that has no significant impact on asset's usage. Minor/preventative maintenance may be required.	69.5% – 79.4%	71 – 85	MMS deficiencies = 0 and <= 10 Non-MMS deficiencies	Good	2-Good
3-Fair	The asset is sound but has minor defects. Deterioration has some impact on asset's usage. Minor to significant maintenance is required.	39.5% - 69.4%	56 – 70	MMS deficiencies = 0 and >10 Non-MMS deficiencies	Fair	3-Fair
4-Poor	Asset has significant defects and deterioration. Deterioration has an impact on asset's usage. Rehabilitation or major maintenance required in the next year.	19.5% -39.4%	41 – 55	MMS deficiencies>0 and =<10 Non-MMS deficiencies	Poor	4-Poor
5-Very Poor	Asset has serious defects and deterioration. Asset is not fit for use. Urgent rehabilitation or closure required.	<19.4%	0 - 40	MMS deficiencies>0 and >10 Non-MMS deficiencies	N/A	5-Very Poor

The following conversion assumptions were made:

- For assets where a condition assessment was not completed, but age information was known, the condition was based on the % of remaining service life.
- OCI Result conversion was based on ranges provided by a consultant;
- Sidewalk inspections collect deficiencies that are identified as MMS or non-MMS deficiencies. Since MMS is a legislated inspection, these defects are treated as more severe than non-MMS. In future this inspection program methodology should be revised to output a condition score.
  For noise walls and fencing the condition assessment is on a 3-point condition scale ranging from Good to Poor, which could not be converted to a 5-point condition scale at this time.

The background information for road pavement is included below and includes an age profile, the condition methodology used, the condition profile, and asset usage and performance.

2.1.3 Road Pavement

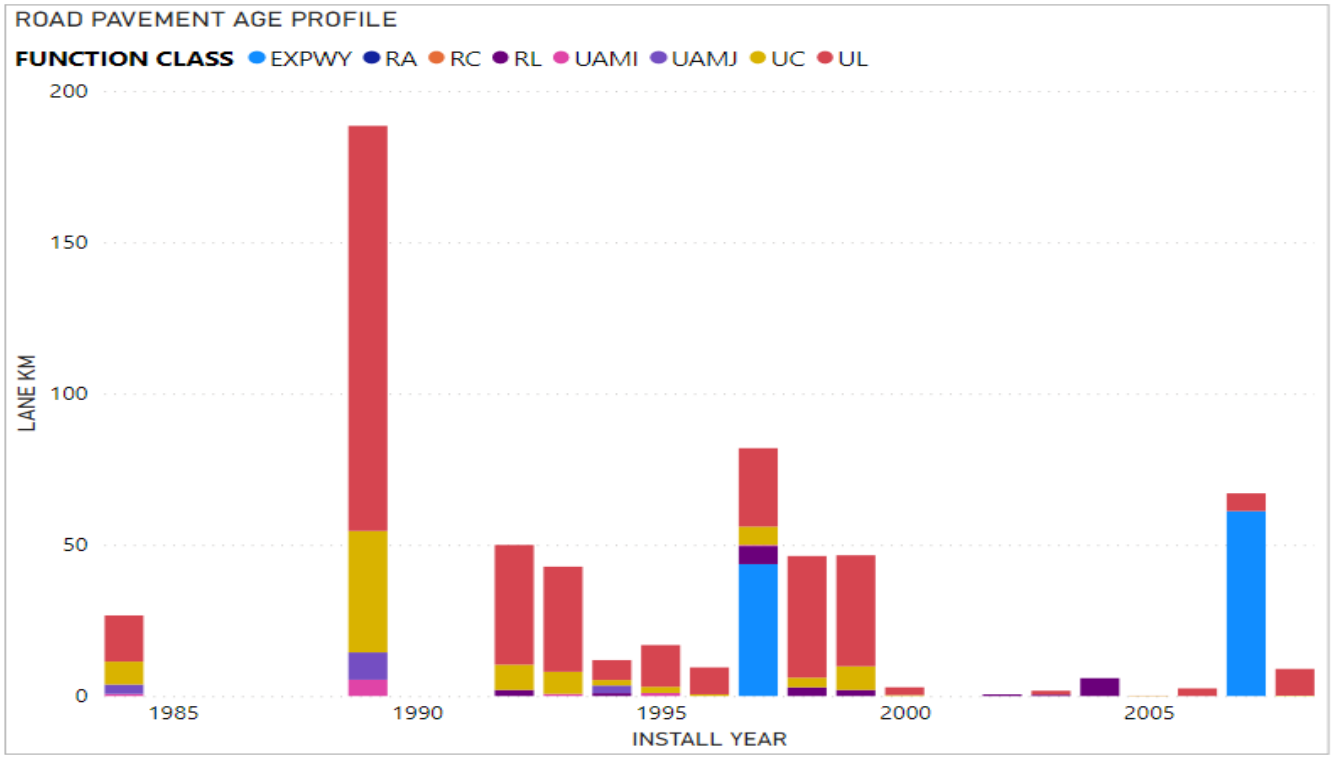
2.1.3.1 Age Profile

The age of an asset is an important consideration in the asset management process as it can be used for planning purposes as typically assets have an ESL where they can be planned for replacement.

The age profile for the road pavement asset class is shown in Figure 1. Age data for road pavement has historically not been collected, and so the figure below only represents approximately 9% of the City lane kms. The data confidence associated with this data is therefore very low and as such, it is difficult to make any age-based conclusions. However, it is evident that the City's expressways were constructed in 1997 (Lincoln M. Alexander Parkway) and 2007 (Red Hill Valley Parkway).

It has been identified as a continuous improvement item in Table 29 to improve the process for adding construction dates into the PMS to improve the completeness of this data over time.

Figure 1: Road Pavement Age Profile



2.1.3.2 Condition Methodology

Condition assessments for road pavement does not have a provincial standard. As such, it's largely dependent on the municipality's discretion for what methodology is used to determine the pavement condition index (PCI).

At the time of writing this AM Plan, the City of Hamilton is using a metric called Overall Condition Index (OCI) which is a function of a weighted calculation using a calculated Roughness Index (RI) and calculated Surface Condition Index (SCI). The RI is a calculated value that represents the overall roughness of the pavement and the SCI is a calculated value that represents the overall distresses identified in the pavement. The City will be completing a condition assessment of the entire road network beginning in 2022 and into 2023. The asset inspection frequency will be completed based on the function class of the road as shown in Table 7**.** As stated in section 2.1.2, often because condition assessment programs differ between assets there are different condition score outputs and standards which have been converted to the 5-point AM Plan scale as shown in Table 6.

2.0 ROAD LINEAR

Table 7: Inspection and Condition Information			
ASSET	**INSPECTION FREQUENCY**	**LAST INSPECTION**	**CONDITION SCORE OUTPUT**
Expressways & Arterial Roads	2-year cycle	2019	Overall Condition Index (OCI)
Collector & Local Roads	4-year cycle		

One of the recommendations of the 2021 Roads Value for Money Audit was to investigate the way the City is calculating the condition of the road pavement. At this time, the City is investigating altering the condition assessment methodology to explore more representative methodologies which has been identified in Table 29 in the continuous improvement section.

The City is currently working with a consultant to investigate the following:

- Altering the RI and SCI weighting in the existing OCI calculation;
- Altering the way RI and SCI are calculated (e.g. how many data inputs should be considered for SCI? What is the conversion scale for RI?);
- Adding an additional Structural Adequacy Index (SAI) to the OCI calculation to output a score similar to what some municipalities refer to as Pavement Quality Index (PQI); and
- Cost implications with incorporating SAI into road pavement inspection. Potentially start by requiring this factor for major functional classes or road segments with heavy truck traffic.

Therefore, the data confidence associated with road pavement has been brought down to a Medium confidence level since the City is investigating improving the current methodology, but recognizes that the existing OCI values may be used as an indicator of overall condition for many roadways for intervention planning.

In addition, the City is also currently developing a preservation strategy to use the OCI to determine what intervention actions are recommended to take place on the road. At this time, this table is still in draft form, and has not yet been formally adopted. Therefore, it is an example of the intervention strategies that are currently being investigated and have been used in this AM Plan to project potential forecasts in section 2.7.2. The draft table showing possible interventions based on the road material is shown below in Table 8.

4.0 ROAD LINEAR

Table 8: Draft Intervention Strategies					
	OCI RANGE				
	1-VERY GOOD 86 - 100	2-GOOD 71 - 85	3-FAIR 56 - 70	4-POOR 41 - 55	5-VERY POOR 0 - 40
Treatment Category	Candidate for localized preventive maintenance	Candidate for generalized preventative maintenance	Candidate for minor rehabilitation	Candidate for major rehabilitation	Candidate for reconstruction
Material	**Potential Intervention**				
Asphalt Concrete	crack sealing	crack sealing, surface treatment	minor resurfacing “shave and pave”, major pothole repair	reduce asphalt to granular or concrete base, repair base, and repave	full replacement including base
Brick	remove and replace small area of paving stones	remove and replace small area of paving stones	remove and replace small area of paving stones	remove, regrade, and replace small area of paving stones	full replacement including base
Composite	crack sealing	crack sealing, surface treatment	minor resurfacing “shave and pave”, major pothole repair	reduce asphalt to granular or concrete base, repair base, and repave	full replacement including base
Gravel	n/a	blade surface, add material and compact	cut, add material, and shape road	cut, add material, and shape road	cut, add material, shape road, and construct ditches
Open Graded Cold Mix	crack sealing	crack sealing, surface treatment	single surface treatment without ditching	double surface treatment with ditching	surface treated reconstruction
Portland Cement Concrete	joint sealing	joint sealing, localized patching	diamond grinding, asphalt overlay	slab replacement	reconstruction
Surface Treated	patching/padding	patching/padding	single surface treatment without ditching	double surface treatment with ditching	pulverize and double surface treatment with ditching

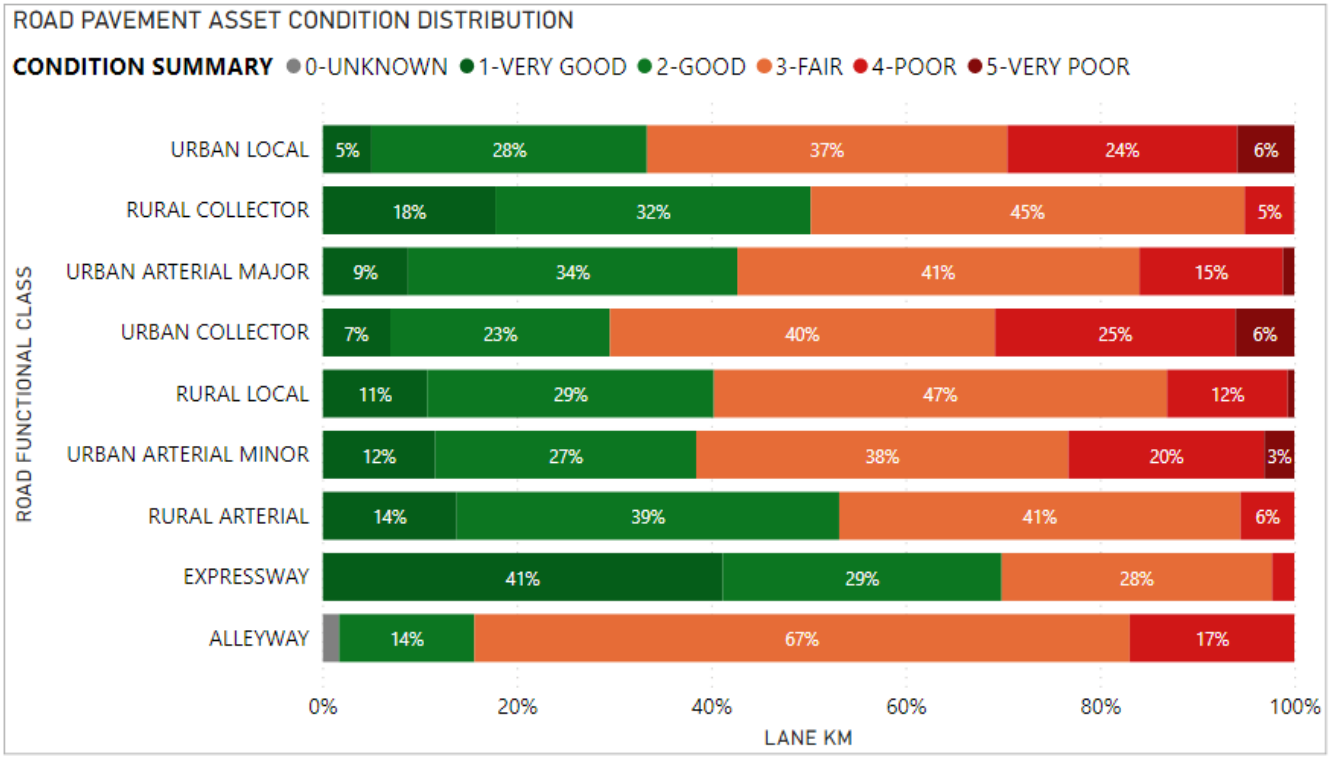
5.0 ROAD LINEAR

2.1.3.3 Asset Condition Profile

The condition profile of the City's assets is shown in Figure 2. As mentioned in section 2.1.2, the original condition grades were converted to a standardized condition category for report consistency.

The graph below is distributed by lane km of the road network. It is evident that the City's road network is in Fair condition, but expressways are kept at an average Good condition. As explained in Section 2.1.1, the data confidence for this condition profile is currently medium.

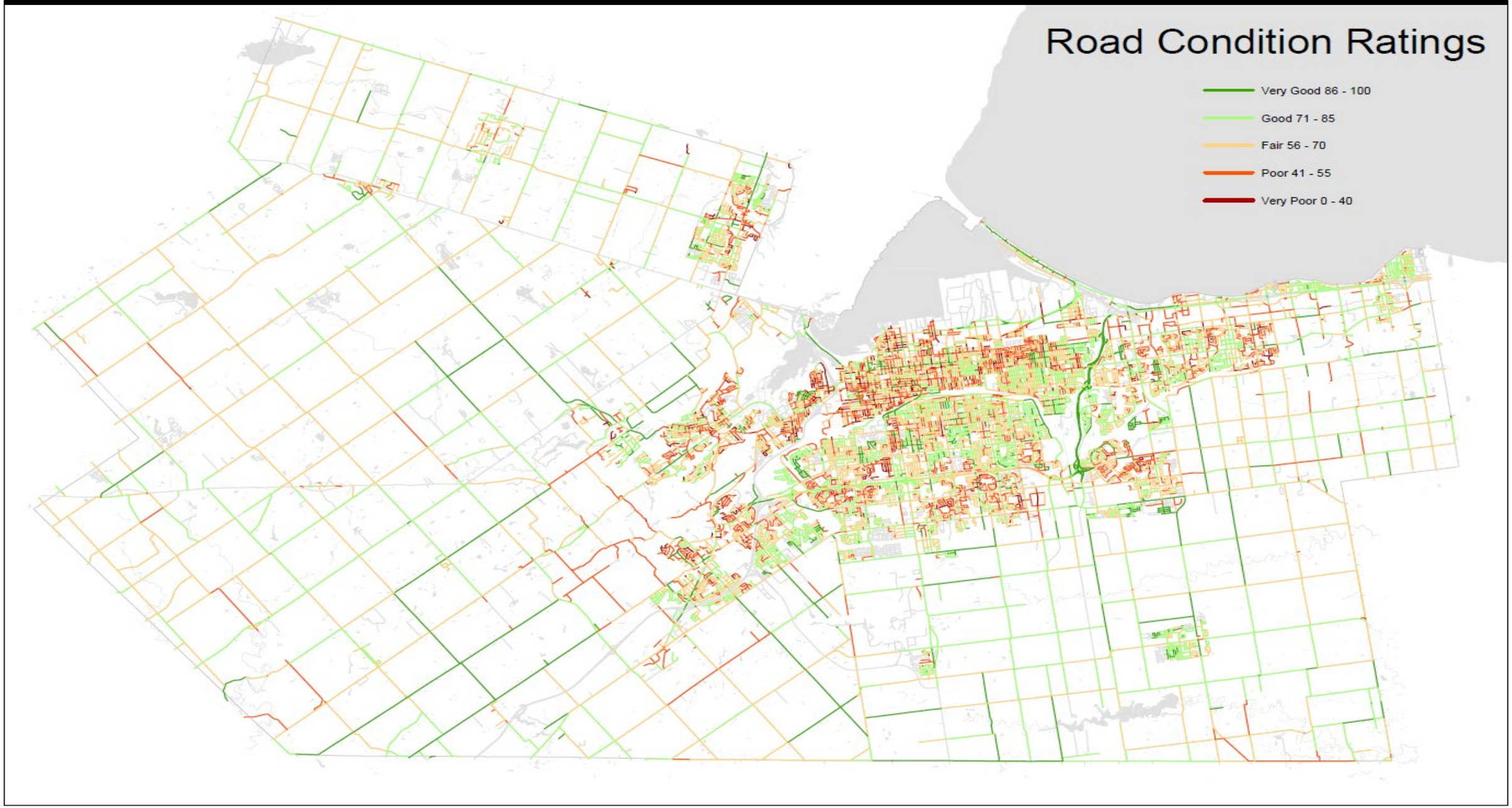
Figure 2: Road Pavement Asset Condition Distribution



In addition, Figure 3 shows a map of the City by OCI. Although the City has kept roads on average in Fair condition. Areas of the City may experience roads at a lower condition than the average. It is clear based on Figure 3 that the lower City is an area where renewal activities should be prioritized as many of the poor major arterial roads have many segments that show Poor condition.

6.0 ROAD LINEAR

Figure 3: Map of Hamilton Roads by Condition. For Online Map Click Here.



7.0 ROAD LINEAR

2.1.3.4 Asset Usage and Performance

Assets are generally provided to meet design standards where available. However, there are often insufficient resources to address all known deficiencies.

The largest performance issues with road pavement involve disrupted network connectivity and very poor condition significantly affecting road performance. The known service performance deficiencies in Table 9 were identified using staff input.

Table 9: Known Service Performance Deficiencies

ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Road Pavement	**Urban Major Arterial Roads Various Locations**	Very Poor Condition	Road segment identified as Very Poor during the road condition assessment
	York Road at CN Rail	Drainage near outlet causing erosion.	Sinkhole causing drainage and erosion issues. Will be fixed in 2022.
	1759 Safari Road	Road Closed	Road flooded. Waiting on approval to replace culverts (Roads) and raise the road (Engineering)
	Wilson St	One-Way Street	Currently there is a mismatch in programming between the Wilson Street scope elements: two-way conversion versus reconstruction. The road is planned to be converted from one way to two way in 2023.

The background information for active transportation is included below and includes an age profile, the condition methodology used, the condition profile, and asset usage and performance.

2.1.4 Active Transportation

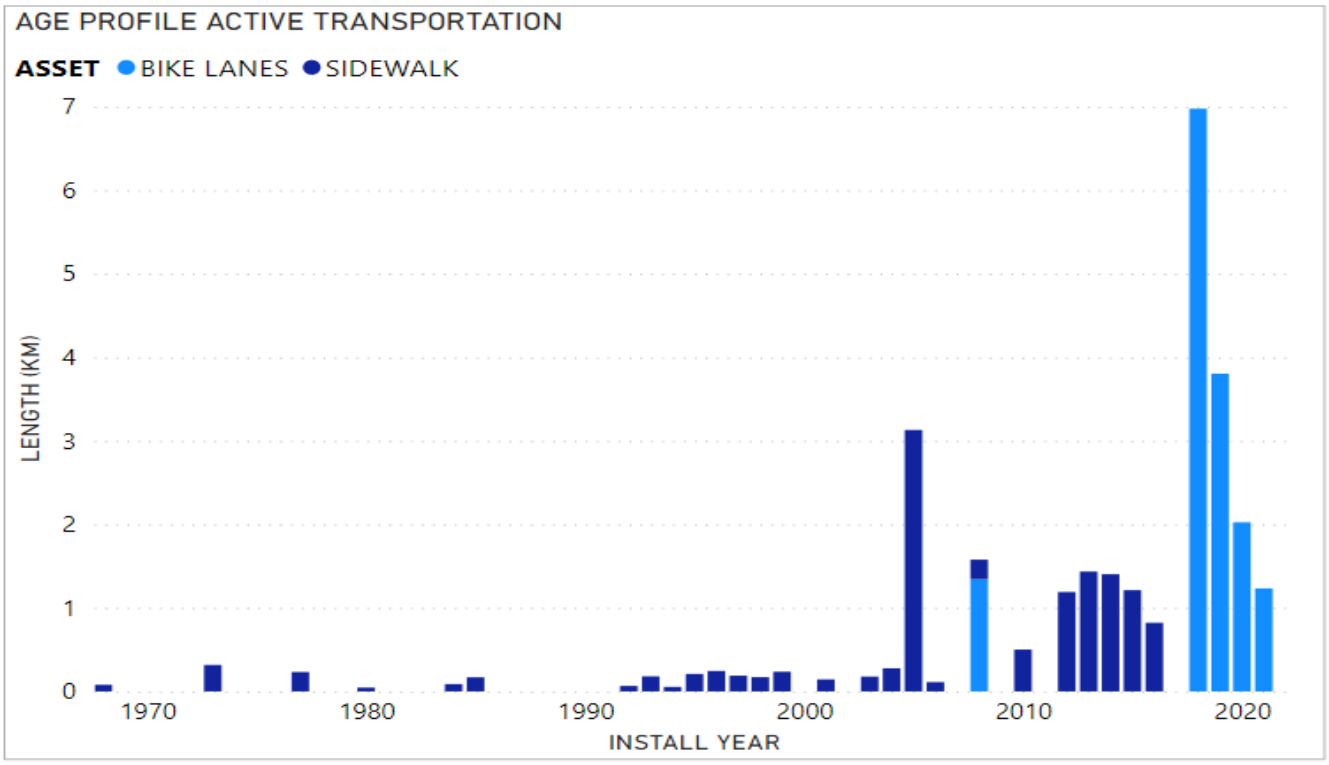
2.1.4.1 Age Profile

The age of an asset is an important consideration in the asset management process as it can be used for planning purposes as typically assets have an ESL where they can be planned for replacement.

The age profile of active transportation assets are shown in Figure 4. Similar to road pavement, age information for sidewalks and bicycle lanes has not historically been collected. It is estimated that the City only has age data for around 1% of City sidewalks, and 12% of bicycle lanes. As such, the data confidence for age data is very low for these assets. The sidewalk data could

normally be extrapolated from road pavement, but as stated, the data completeness for road pavement is also at a very low status. However, the City has begun inputting age data for new bicycle lane assets which is evident in the spikes in bicycle lane data from 2018-2021. This is a continuous improvement item to improve the process for documenting road pavement construction dates which should also encompass new sidewalks and bicycle lanes.

Figure 4: Age Profile Active Transportation



2.1.4.2 Condition Methodology

Sidewalks are heavily regulated through the MMS but there is not yet a standard for inspections for bicycle lanes. Table 10 below summarizes the inspection information for these assets.

It is important to note that the City is exceeding the MMS requirement for sidewalk inspections, completing them annually instead of on a 16-month cycle. A continuous improvement item identified in Table 29 is to have the annual sidewalk inspections output a condition grade as part of the inspection as well as to collect missing asset information where possible.

For ROW bicycle lanes, the MMS inspection requirements are typically the same as for roads excluding snow clearing/sweeping requirements, and currently the City considers these assets at the same level of service as road pavement. However, ROW bicycle lanes inspections may need to be investigated more specifically as bicycles can require a different level of service than motor vehicles. A suggested continuous improvement item identified in Table 29 is to incorporate

specific criteria for bicycle lane inspections into the road pavement inspections or to establish an inspection program once the asset reaches a certain age.

As stated in section 2.1.2, often because condition assessment programs differ between assets there are different condition score outputs and standards which have been converted to the 5-point AM Plan scale as shown in Table 6.

Table 10: Inspection Information

ASSET	REQUIRED INSPECTION FREQUENCY	INSPECTION FREQUENCY	LAST INSPECTION	INSPECTION STANDARDS	CONDITION SCORE OUTPUT
Sidewalk	16 months	Annual	2021	O.Reg 239/02: Minimum Maintenance Standard	Number of deficiencies MMS and non-MMS
ROW Bicycle Lanes	Currently considered as part of road pavement	Currently considered as part of road pavement	Currently considered as part of road pavement	Currently considered as part of road pavement	Assumed based on age.

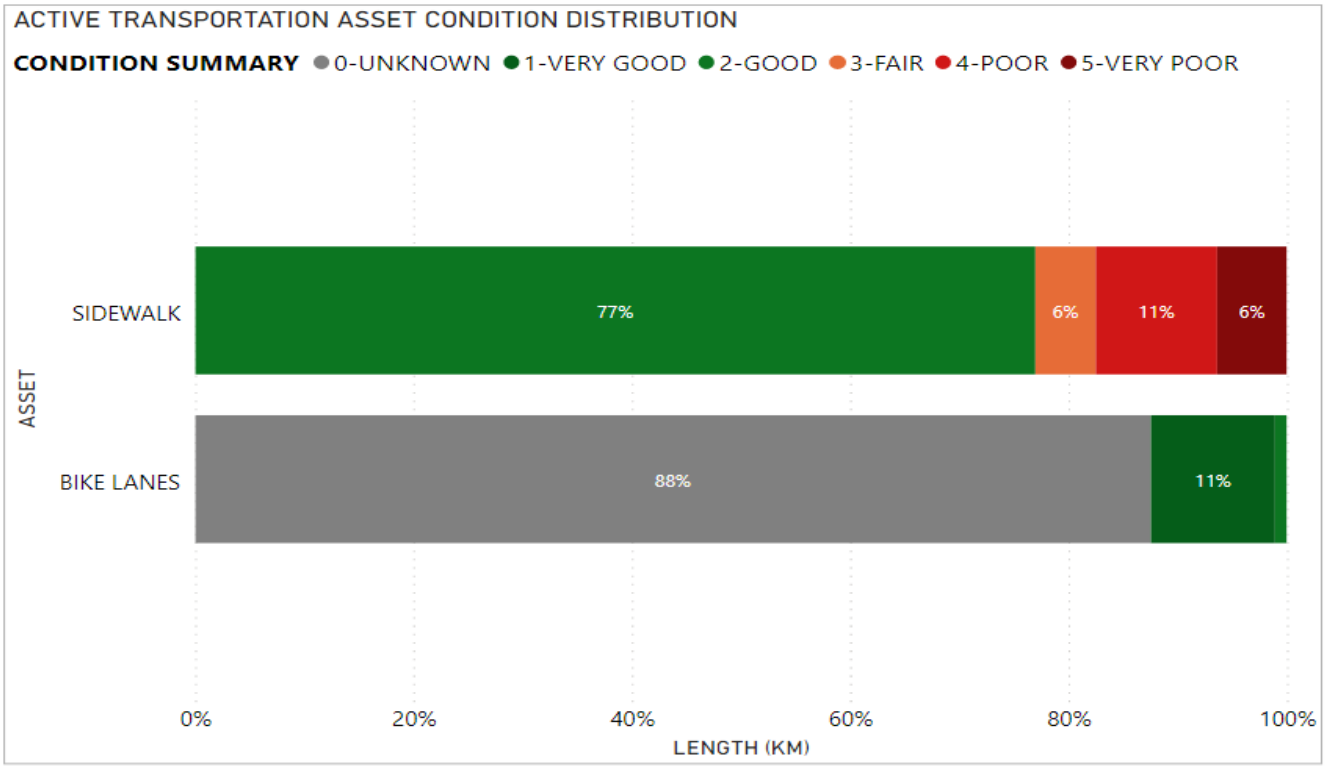
2.1.4.3 Asset Condition Profile

The condition profile of the City's assets is shown in Figure 5. As mentioned in Section 2.1.2, the original condition grades were converted to a standardized condition category for report consistency.

As stated in Table 10, the sidewalk condition is based on the number of MMS & Non-MMS deficiencies, and is considered a medium confidence level, but this methodology should be refined in future AM Plans. Based on this condition methodology, sidewalks are typically in Good condition.

Since the age information was missing for bicycle lanes, and there is no inspection program, the majority of the bike lanes condition is unknown. Since this is typically a newer asset, it is anticipated the condition of this asset is likely in Good to Fair condition. However, the condition of bicycle lanes can also depend on the condition of the road pavement and should be investigated further.

Figure 5: Active Transportation Asset Condition Distribution



2.1.4.4 Asset Usage and Performance

Assets are generally provided to meet design standards where available. However, there are often insufficient resources to address all known deficiencies.

Service deficiencies with the Active Transportation network typically involve disruptions in connectivity. The City is identifying areas in the active transportation network to improve connectivity and the service deficiencies in Table 11 were identified using staff input.

Table 11: Known Service Performance Deficiencies

ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Sidewalks	Winona Road (Hwy 8 to Barton Street) Stonechurch Road (Upper Red Hill Pkwy to Anchor Road) Nebo Road (Rymal Road to Stonechurch Road) Frances Avenue (Grays Road to Teal)	Sidewalk gap	No sidewalk alongside road in areas where pedestrians frequent.

Table 11: Known Service Performance Deficiencies			
ASSET	**LOCATION**	**SERVICE DEFICIENCY**	**DESCRIPTION OF DEFICIENCY**
	Barton St (Lake Avenue to Grays Road) Various Business Parks		
Bicycle Lanes	Various Locations (e.g. Victoria Avenue, John Street North)	Infrastructure Design	Bicycle lane ends abruptly.
	Lawrence Road	Deteriorating Shoulder	Deteriorating shoulder preventing bicycle lanes from being added.

The background information for traffic network assets is included below and includes an age profile, the condition methodology used, the condition profile, and asset usage and performance.

2.1.5 Traffic Network

2.1.5.1 Age Profile

The age of an asset is an important consideration in the asset management process as it can be used for planning purposes as typically assets have an ESL where they can be planned for replacement.

The age profile of most of the traffic network assets are shown in Figure 6. Streetlight poles and luminaires were separated from the remainder of the traffic network for legibility of the graph since the magnitude of quantities were vastly different and can be found in Figure 7.

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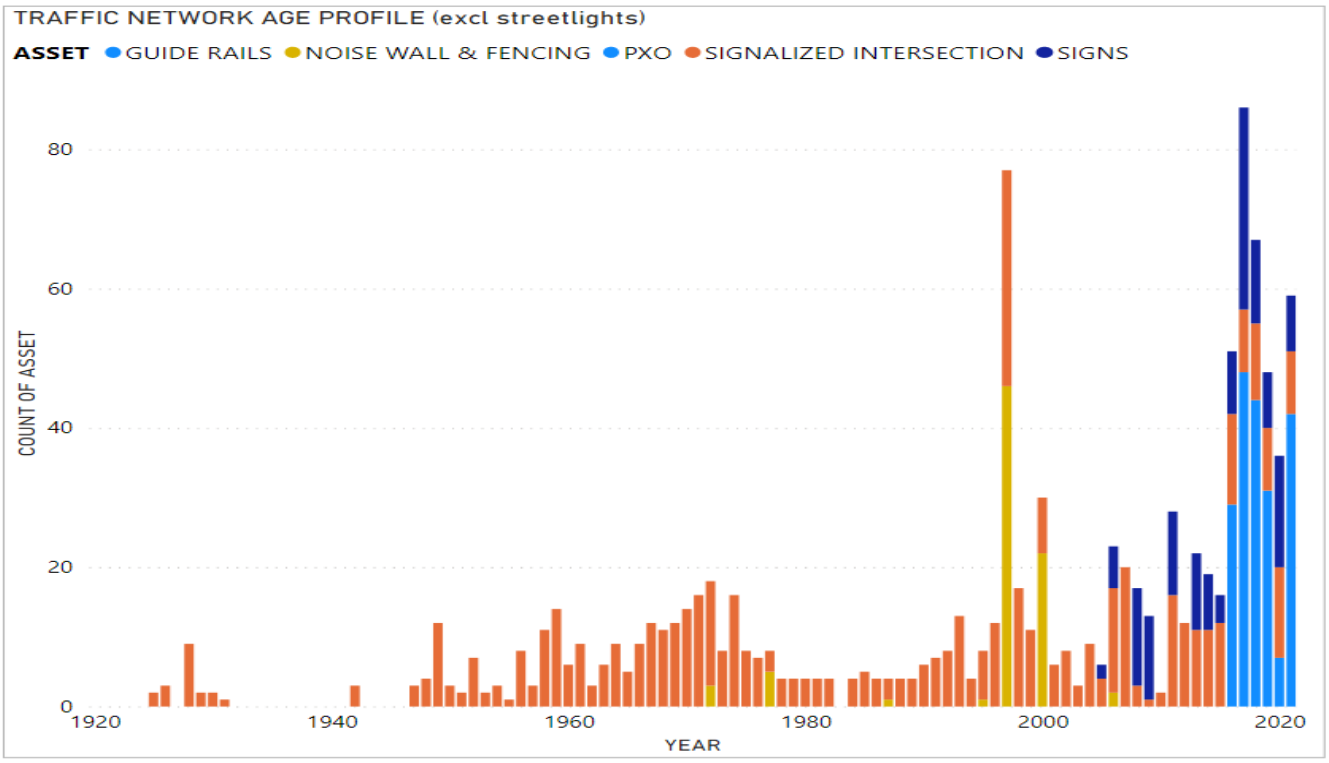
Figure 6: Traffic Network Age Profile



GUIDE RAILS

Currently, there is no age data associated with guide rails in the inventory database. When the road pavement age data confidence is improved, many guide rails ages could be estimated based on the age of the road. As previously stated, the road pavement age data is also at a very low confidence level.

NOISE WALL & FENCING

Currently, age data for 72% of assets is included in the Geographic Information System (GIS) database. Since this data was created during a formal inventorying process, the accuracy of the collected data is high, but since it only represents 72% of the dataset, the overall data confidence is medium for these assets. The spike in the installation of noise walls in 1997 is due to the construction of the Lincoln M Alexander Parkway, but with an ESL of 50 years, replacement will likely not be required until 2047.

PEDESTRIAN CROSSWALK (PXO)

Based on the profile above, pedestrian crosswalks are typically a new asset added over the last 5 years. Therefore, the accuracy in the available age data is high. However, there is currently age data in the GIS database for only 72% of the assets, and so it is considered an overall medium data confidence level.

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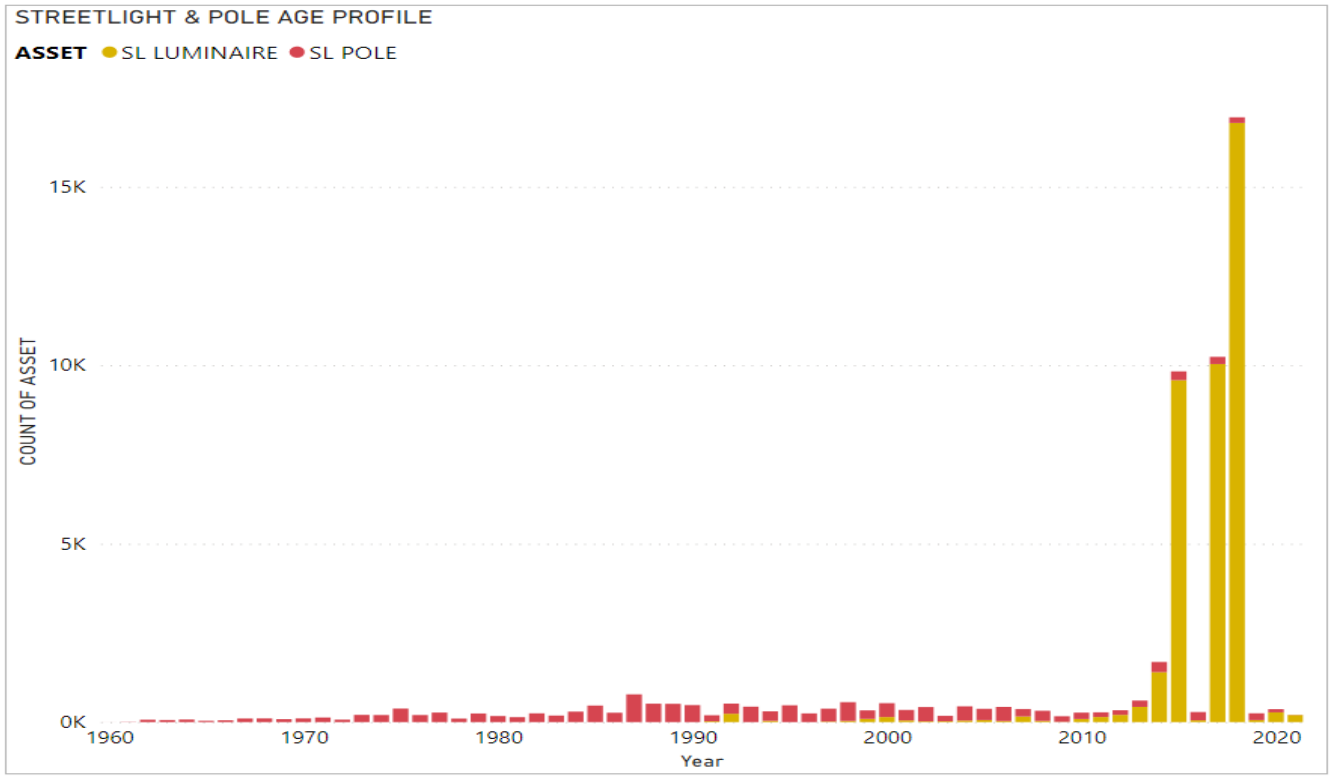
SIGNALIZED INTERSECTIONS

There are no significant spikes in installation dates for signalized intersections, and assets have been added steadily since 1925. However, it is shown to be an aging asset since approximately 66% of assets are beyond the ESL of 20 years. Currently, 95% of age data was populated in the internal database, but there has not yet been a determination on the accuracy of the data. As such, these are currently assumed to be a high confidence level, but this may change as data continues to be verified. This data suggests that many signalized intersections should be planned for renewal over the next 10 years.

TRAFFIC SIGNS

It is evident that very minimal age data exists for signs in the GIS database, resulting in the age profile being considered very low confidence. However, since signs are typically removed and replaced often, age data often is typically not a reliable indicator of condition. Signs can deteriorate based on many factors including weather, vehicular accident, graffiti. etc. They are also typically a low value asset that can be replaced with internal staff at a low cost.

Figure 7: Streetlight & Pole Age Profile



STREETLIGHT LUMINAIRES

It is evident that there is a spike in luminaire installations in 2015, 2017, and 2018. This is because the City has been converting high pressure sodium (HPS) luminaries into light emitting diode (LED) luminaires to improve energy efficiency City-wide and is in accordance with our

climate change goals. These dates also correspond with the first large scale inventory and condition assessments completed for streetlights in 2016. Since LED luminaries typically have an ESL of 20 years, these assets will not require replacement until 2035. However, since there is a spike in installations, the City should plan for a large-scale replacement at this time.

STREETLIGHT POLES

Streetlight poles are typically within the ESL of 50 years, with only 4% of assets exceeding the ESL and no spike associated with these assets. Since a formal inventory was completed, the City is confident in the accuracy of the collected age data. However, approximately 30% of assets do not have age data populated in the GIS database and therefore, the age data is considered to be a medium confidence level.

2.1.5.2 Condition Methodology

A table showing inspection information including frequency, required standards, and condition score outputs from these inspections are shown below in Table 12. As stated in Section 2.1.2, often because condition assessment programs differ between assets there are different condition score outputs and standards which have been converted to the 5-point AM Plan scale as shown in Table 6.

Table 12: Inspection Information

ASSET	REQUIRED INSPECTION FREQUENCY (MMS)	INSPECTION FREQUENCY	LAST INSPECTION	INSPECTION STANDARDS	CONDITION SCORE OUTPUT
Noise Walls & Fencing	N/A	Ad Hoc	2013	N/A	3-point scale
Signalized Intersection	16 months	Annually	2021	OTM Traffic Manual & MMS	N/A, assumed based on age
Pedestrian Crossover (PXO)	16 months	Annually	2021	OTM Traffic Manual & MMS	N/A, assumed based on age.
Guide Rails	N/A	Ad Hoc	2013	N/A	N/A, no age data
Traffic Signs	16 months	Annually	2021	OTM Traffic Manual & MMS	N/A, assumed based on age
Streetlight Poles	N/A	Every 3 to 8 years depending on current	2021	Residual Strength of Deteriorated Light Poles in	5-point scale

Table 12: Inspection Information					
ASSET	REQUIRED INSPECTION FREQUENCY (MMS)	INSPECTION FREQUENCY	LAST INSPECTION	INSPECTION STANDARDS	CONDITION SCORE OUTPUT
		condition rating		the City of Hamilton Report	
Luminaires	16 months	Annually	2021	OTM Traffic Manual & MMS	N/A, assumed based on age/operating hours.

As shown above, most traffic network assets are regulated through the MMS and the City is typically completing internal inspections on a cycle exceeding the MMS. If an MMS requirement is present, the City tracks these activities as part of the technical levels of service using the balanced scorecard referenced in the AMP Overview and are presented in Table 21. The City does complete inspections per the MMS, but often these inspections do not output a condition score. If a condition score was not outputted, the asset's condition was estimated based on age and was given a low or very low confidence level in condition as a result depending on the availability of age data. Investigating adding condition scores to these inspections has been identified as a continuous improvement item in Table 29.

Some assets do not have inspection programs that are legislated, but the City may complete condition assessments on these assets if they are deemed to be required (i.e. noise walls & fencing, streetlight poles). Although a noise wall & fencing condition assessment was completed in 2013, the data is almost 10 years old and has therefore been reduced to a medium confidence. A condition assessment is currently being completed on these assets. Streetlight poles assessments are completed on a regular cycle and 88% of assets had condition data available and so they have a high confidence level as a result. The only traffic network asset that does not yet have a regular inspection or condition assessment program are guide rails which are typically reactively inspected after a vehicular accident. An inventory was completed on guide rails in 2013, but a condition score was not output during the inspection. Investigating completing a guide rail condition assessment has been identified as a continuous improvement item in Table 29.

2.1.5.3 Asset Condition Profile

The condition profile of the City's assets is shown in Figure 8. As mentioned in Section 2.1.2, the original condition grades were converted to a standardized condition category for report consistency.

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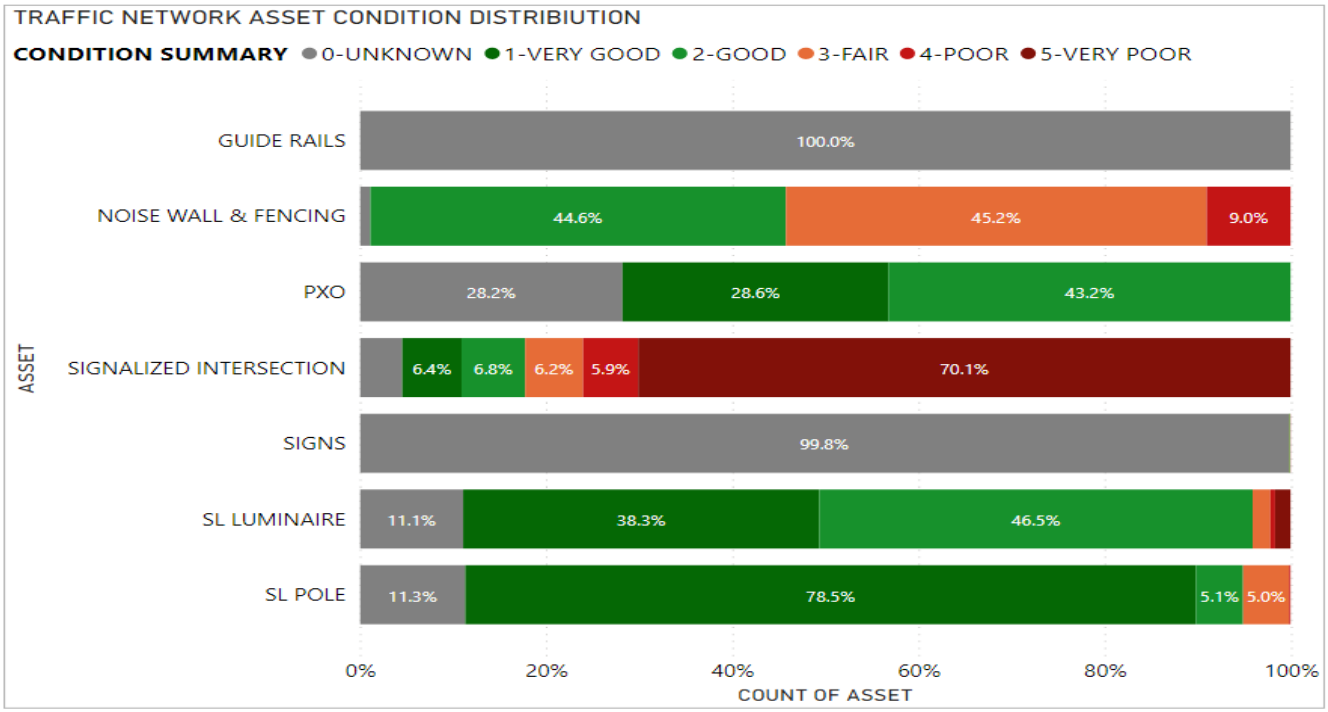
Figure 8: Traffic Network Asset Condition Distribution



SIGNALIZED INTERSECTION

Since signalized intersections are an aging asset, and at this time the condition is based on age, these assets are shown to be in average Poor condition. This does not necessarily reflect reality as age data does not represent upgrades that may have occurred on these assets, and also doesn't yet encompass the results from the inspection program.

PEDESTRIAN CROSSWALKS (PXO)

Pedestrian Crosswalks (PXO) are also based on age and are shown to be in Good condition as they are a new asset. However, as previously mentioned, the City does complete inspections on these assets to ensure they are in working order.

STREETLIGHT POLES & LUMINAIRES

Streetlight poles were evaluated based on the 5-point scale produced from the latest condition assessment and luminaires were evaluated based on age/operating hours. No condition information was provided for luminaires from this assessment because they are new assets, but as previously mentioned, these are inspected per MMS. Currently approximately 87% of poles have been assessed for condition and therefore, there is a high data confidence associated with this asset.

NOISE WALLS & FENCING

Based on the data below, noise walls and fencing are shown to be in overall Fair condition. Since this data is based on a snapshot in time from 2013, this data is a medium confidence level, and a condition assessment is currently being completed for these assets in 2022.

GUIDE RAILS & TRAFFIC SIGNS

As previously stated, although there are inspections completed for the majority of assets, these inspection programs do not yet output an overall condition score. In addition, many of the traffic network assets have low confidence age data and therefore, the condition of these cannot be estimated based on the estimated service life. For example, guide rails were not able to be evaluated for condition based on age based data, and signs were evaluated for condition on an extremely small sample size. It is a continuous improvement item to incorporate a condition output in the annual traffic sign inspection and to investigate the creation of a guide rail condition assessment.

2.1.5.4 Asset Usage and Performance

Assets are generally provided to meet design standards where available. However, there are often insufficient resources to address all known deficiencies.

The largest performance issues with traffic network assets involve assets not functioning as intended.

The service deficiencies in Table 13 were identified using staff input.

Table 13: Known Service Performance Deficiencies

ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
PXO	Various Locations powered with solar panels	Outage	Solar panel does not receive enough solar light energy or battery storage is too small and does not turn on
Guide Rails	Various Locations	Old Design	Many guide rails are from old design standards and should be replaced to new design standards.

2.1.6 Administration

At this time, administration assets such as facilities and vehicles have been included in the AM Plan in a very limited capacity to ensure the replacement value has been encompassed since these assets are assisting in the delivery of the transportation service. More details related to these assets will be included in future iterations of the plan.

2.2 LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how the City plans to manage these assets at the agreed levels of service and at the accepted lifecycle costs.

2.2.1 Acquisition Plan

Acquisition reflects new assets that did not previously exist or works which will upgrade or improve an existing asset beyond its current capacity. They may result from growth, demand, legal obligations or social or environmental needs. Transportation assets can either be donated through development agreements to the City or through the construction of new assets which are mostly related to population growth.

CURRENT PROJECT DRIVERS – 10 YEAR PLANNING HORIZON

The City prioritizes capital projects based on various drivers to help determine ranking for project priorities and investment decisions. As part of future AM Plans, the City will be continuing to develop its understanding of how projects are prioritized and ensures that multiple factors are being considered to drive investment decisions in the next iteration of the AM Plan. These drivers will include legal compliance, risk mitigation, O&M impacts, growth impacts, health and safety, reputation and others. These drivers should be reviewed during each iteration of the AM Plan to ensure they are appropriate and effective in informing decision making.

SELECTION CRITERIA

Proposed acquisition of new assets and upgrade of existing assets are identified from various sources such as community requests, proposals identified by strategic plans or partnerships with others. Potential upgrade and new works should be reviewed to verify that they are essential to the City's needs. Proposed upgrade and new work analysis should also include the development of a preliminary renewal estimate to ensure that the services are sustainable over the longer term. Verified proposals can then be ranked by priority and available funds and scheduled in future works programs.

SUMMARY OF FUTURE DONATED ASSET ACQUISITION COSTS

Forecast acquisition asset costs are summarized in Figure 11 and show the cumulative effect of asset assumptions over the next 10-year planning period.

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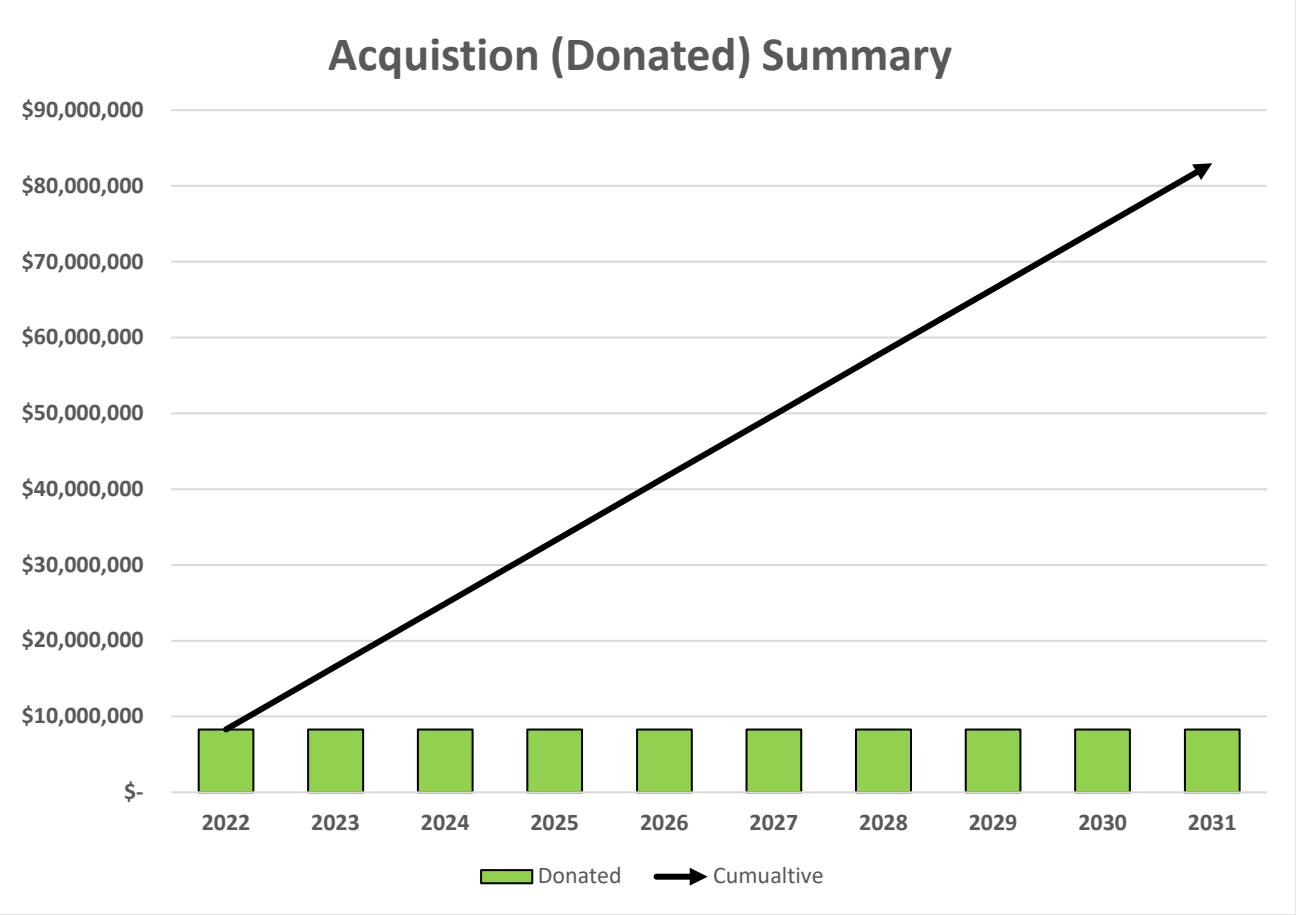
Figure 9: Acquisition (Donated) Summary
All Figures Are In 2021 Dollars.



Annually on average, the City assumes over **$8,300,000** of donated transportation assets through subdivision agreements or other development agreements. These assets include approximately **10 km's** of roads, **1,000** road safety signs, **100** streetlights and multiples traffic apparatuses. The City is reviewing its donated asset assumption process to ensure that it proactively understands what assets are being donated annually to ensure they are appropriately planned for. This will allow multiple departments across the City to plan for the assets properly such as:

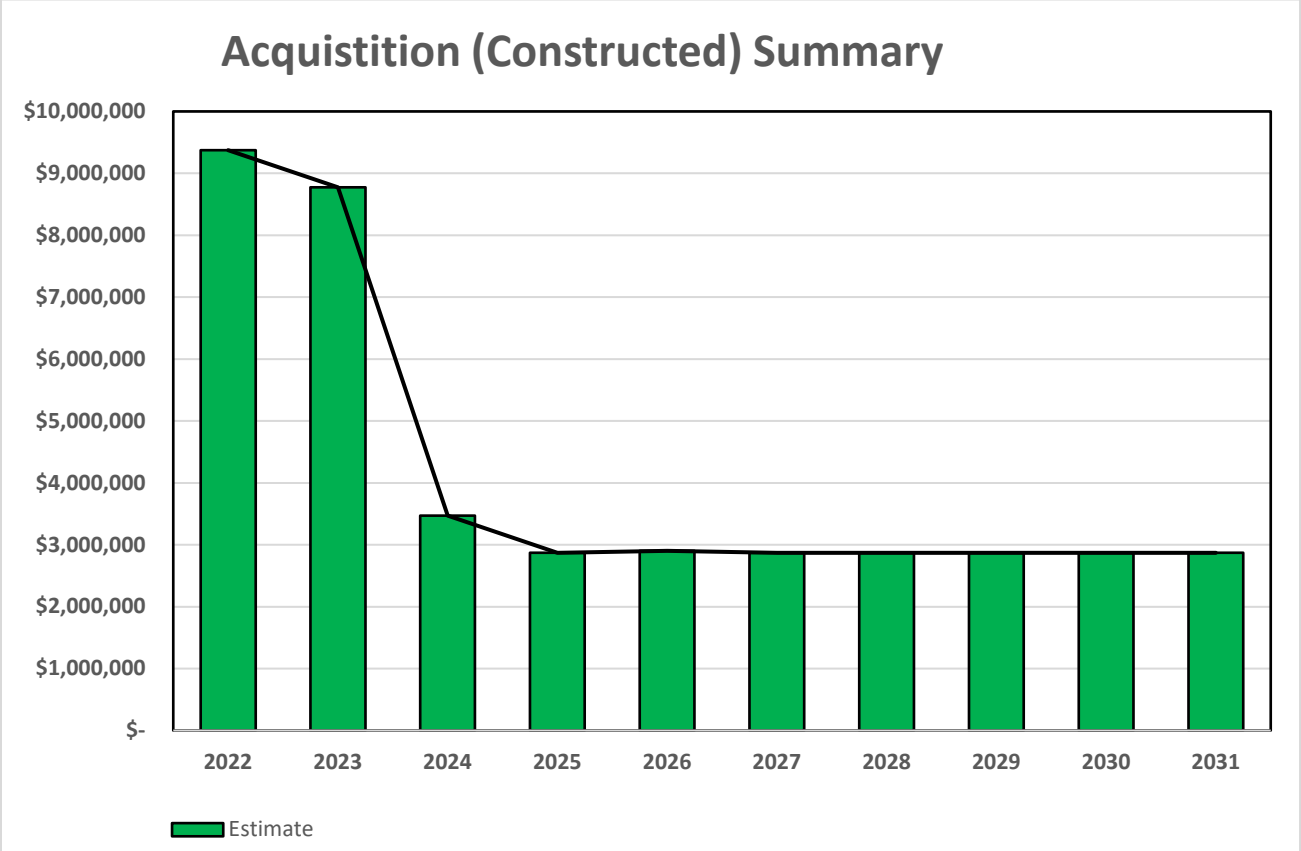
- AM to forecast the long-term needs and obligations of the assets
- Operations and maintenance can include the assets in their planned activities (inspections, legislative compliance activities)
- Finance can ensure that assets are properly captured and recognized appropriately (Audited Financial Statements, TCA process, Provincial reporting such as the FIR)

The City will need to ensure the required data is updated frequently and to a single source to ensure that all the departments have access to the data they require in a timely manner. Once transportation assets are assumed, the City then becomes the stewards of these assets and is

responsible for all ongoing costs for the asset's operation, continued maintenance, inevitable disposal and their likely renewal.

Construction costs are often only **10-15 %** of an asset's whole life costs. When development assets are donated to the City, they then becomes obligated to fund the remaining costs. Over the next ten-year planning period the City anticipates receiving **$83,000,000** of donated assets which, would then obligate the City to fund the remaining costs over the donated assets ESL.

Figure 10: Acquisition (Constructed) Summary
All Figure Values Are Shown In 2021 Dollars.



Over the next 10 Year planning period the City will acquire approximately **$41,597,000** of constructed assets which can either be new assets which did not exist before or expansion of assets when they are to be replaced. Major acquisition expenditures over the next ten years include:

- **$4.5 million** for traffic signal modernization
- **$6 million** for durable pavement markings
- **$6.83 million** for AM system implementations and
- **$2.5 million** dollar for the infill street lighting program

The majority of the constructed assets costs peak between 2022-2024 and after that there is only minimal construction of assets. The lack of acquired assets from 2025-2031 is due to a

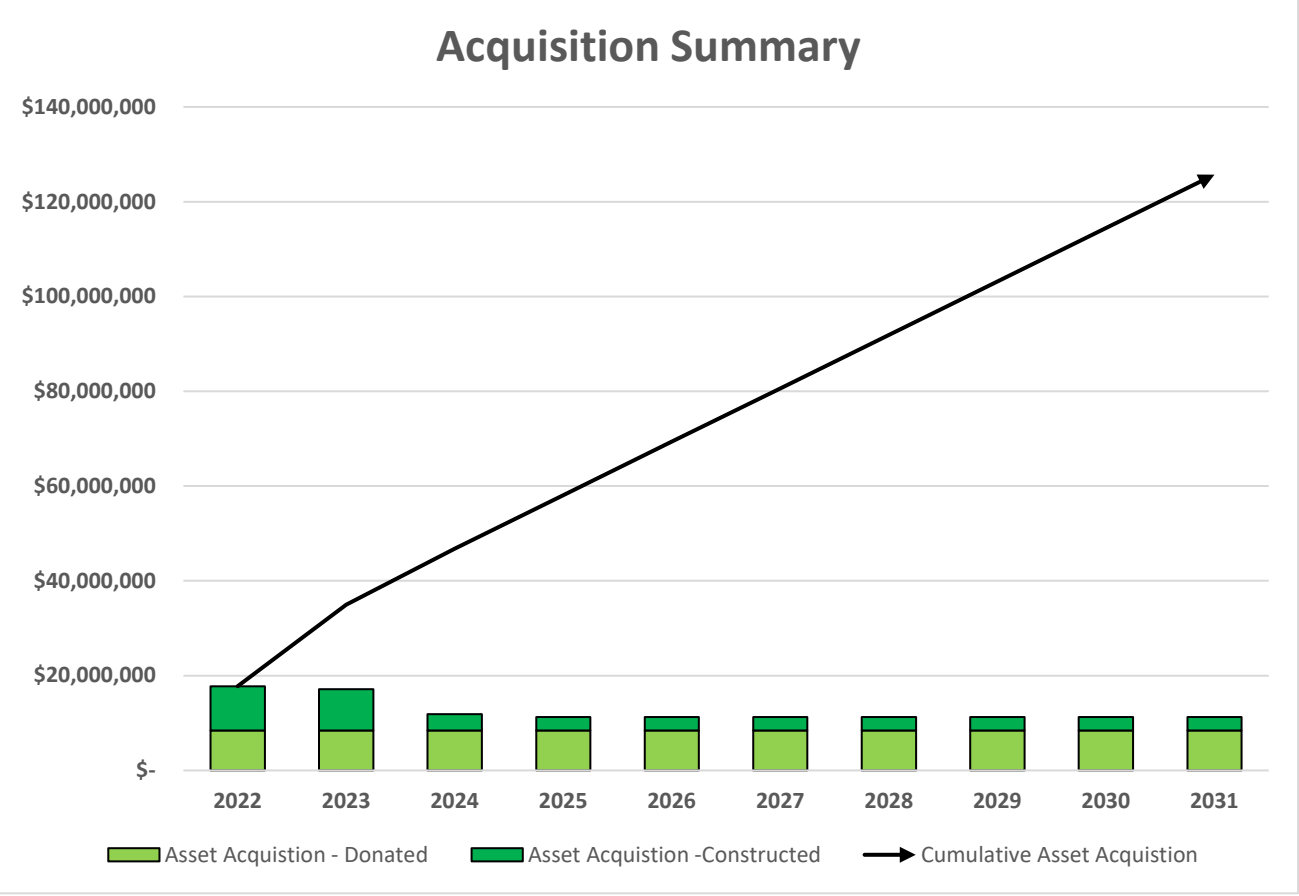
2.0 ROAD LINEAR

lack of data and limited forecasting ability at this time and not from the likelihood of actual construction projects. As AM knowledge, practices and abilities mature within the City then in all likelihood there will be significant projects with equally significant costs that will appear within the later years of the 10-year planning horizon.

The City has sufficient budget for its planned constructed acquisitions at this time however this does not address future asset needs that may need to be constructed to ensure service levels are maintained over the long term. With competing needs for resources across the entire city there will be a need to investigate tradeoffs and design options to further optimize asset decisions and ensure intergenerational equity can be achieved.

Hamilton will continue to monitor its constructed assets annually and update the AM Plan when new information becomes available.

Figure 11: Acquisition Summary
All Figure Values Are Shown In 2021 Dollars.



When Hamilton commits to constructing new assets, the municipality must be prepared to fund future operations, maintenance and renewal costs. Hamilton must also account for future depreciation when reviewing long term sustainability. When reviewing the long-term impacts of asset acquisition, it is useful to consider the cumulative value of the acquired assets being taken

on by Hamilton. The cumulative value of all acquisition work, including assets that are constructed and contributed shown in Figure 5.4.2. above.

Over the next 10 Year planning period Hamilton will acquire approximately **$124,000,000** of Road network assets.

Hamilton has sufficient budget for its planned constructed acquisitions at this time. It will become critical to understand that through the construction or assumption of new assets, the City will be committing to funding the ongoing operations, maintenance and renewal costs which are very significant. Hamilton will need to address how to best fund these ongoing costs as well as the costs to construct the assets while seeking the highest level of service possible.

Future AM Plans will focus on improving the understanding of Whole Life Costs and funding options. However, at this time the plan is limited on those aspects. Expenditure on new assets and services will be accommodated in the long-term financial plan but only to the extent that there is available funding.

2.2.2 Operations and Maintenance Plan

Operations include all regular activities to provide services. Daily, weekly, seasonal and annual activities are undertaken by staff to ensure the assets perform within acceptable parameters and to monitor the condition of the assets for safety and regulatory reasons. Examples of typical operational activities include snow clearing, street sweeping, road patrol, grading/dust control, sign or road inspections, utility costs and the necessary staffing resources to perform these activities.

Some of the major operational investments over the next 10 years include:

- **$45 million** allocated for support from Engineering Services Division
- **$7.2 million** allocated for Geotechnical Investigation Program
- **$11.9 million** allocated for Vision Zero operational initiatives

Maintenance should be viewed as the ongoing management of deterioration. The purpose of planned maintenance is to ensure that the correct interventions are applied to assets in a proactive manner and to ensure it reaches its intended useful life. Maintenance does not significantly extend the useful life of the asset but allows assets to reach their intended useful life by returning the assets to a desired condition.

Examples of typical maintenance activities include pothole repairs, surface treatments, crack sealing, signal repairs, equipment repairs along with appropriate staffing and material resources required to perform these activities.

Major maintenance projects the City plans to continuously manage over the next 10 years include:

- **$17.5 million** allocated for asphalt repair as part of the LINC rehabilitation
- **$27.9 million** allocated for Arterial Asset Preservation Program
- **$26 million** allocated for asphalt preventative maintenance & improvement

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Proactively planning maintenance significantly reduces the occurrence of reactive maintenance which is always linked to a higher risk to human safety and higher financial costs. The City needs to plan and properly fund its maintenance to ensure the transportation network is reliable and can achieve the desired level of service.

Major investments in road maintenance over the planning horizon are costly but necessary to ensuring roads can achieve their intended useful life. Below is a table of major planned maintenance for **2022 – 2024.**

Table 14: Major Maintenance Projects

YEAR	2022-2024 PLANNED MAJOR MAINTENANCE PROJECTS	BUDGET (M)
2022	Sections of Scenic Drive and on Concession Street	$10
	Asphalt preventative program	$2.3
	Strathearne – Mohawk to Chateau Crt.	$1.9
	Clairmont Access – Inverness to Main Street.	$2.5
	Other Maintenance Projects	$16
2023	Asphalt preventative program	$2.5
	Sections of Upper Wentworth	$2.1
	Clairmont Access – Inverness to Main Street.	$2.5
	Other Maintenance Projects	$8.8
2024	Asphalt repair – Section of the LINC	$2.0
	Sections of Strathearne	$3.3
	Various Roads (Pinelands, Teal, Greensfield)	$2.7
	Other Maintenance Projects	$15.8

From **2025 – 2031** the City will invest an additional **$340.1 million** for various projects across the City. These investments for maintenance are intended to allow these assts to reach their estimated service life and minimize reactive maintenance costs. It should be acknowledged that these forecasted costs do not yet fully include the recommended works that need to be undertaken to ensure the entire inventory of assets will achieve their desired service lives and level of service.

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Deferred maintenance (i.e. works that are identified for maintenance activities but unable to be completed due to available resources) will be included in the infrastructure risk management plan in future iterations once those works have been identified and prioritized.

The major lifecycle activities per asset with their accompanying 2021 costs (if known) are shown below in Table 15.

Table 15: Operation And Maintenance Summary

ASSET	LIFECYCLE STAGE	LIFECYCLE ACTIVITY	FREQUENCY	2021 COST	UNIT
Road Pavement	Maintenance	Repair	Ad Hoc/Per MMS	$1,100,000	per year
	Operation	Patrol	Per MMS	$692,000	per year
	Operation	Snow Clearing	Per MMS/Council LOS	$22,200,000	per year
	Operation	Sweeping	Ad Hoc/Council LOS	$2,100,000	per year
	Maintenance	Pothole Repair	Per MMS	$2,955,000	per year
	Maintenance	Crack Sealing	Ad Hoc	$100,000	per year
	Maintenance	Surface Treatment	Ad Hoc	$1,590,000	per year
	Maintenance	Bonded Wearing Course	Ad Hoc	$1,590,000	per year
	Maintenance	Ditching	Ad Hoc	$618,000	per year
	Maintenance	Culvert Rehabilitation (<3M)	Ad Hoc	$724,000	per year
	Maintenance	CB Cleaning	Once every 3 years, and as required	$752,000	per year
	Maintenance	Shoulder Rehabilitation	Ad Hoc	$158,000	per year
	Operation	Pavement Marking Inspection	Annual	Unknown	

Table 15: Operation And Maintenance Summary					
ASSET	**LIFECYCLE STAGE**	**LIFECYCLE ACTIVITY**	**FREQUENCY**	**2021 COST**	**UNIT**
Bicycle Lane	Operation	Snow Removal	Per MMS	Not tracked separate from road pavement	
	Operation	Sweeping	Ad Hoc/Council LOS	Not tracked separate from road pavement	
	Maintenance	Pothole Repair	Per MMS	Not tracked separate from road pavement	
	Maintenance	Crack Repair	Ad Hoc	Not tracked separate from road pavement	
	Maintenance	Barrier Repair	Ad Hoc	Not tracked separate from road pavement	
	Operation	Signal Inspection	18 months	Not tracked separate from road pavement	
	Maintenance	Signal Repair	Ad Hoc	Not tracked separate from road pavement	
	Maintenance	Sign Repair	18 months	Not tracked separate from road pavement	
	Operation	Sign Inspection	Ad Hoc	Not tracked separate from road pavement	
	Operation	Lane Inspection	Ad Hoc	Not tracked separate from	

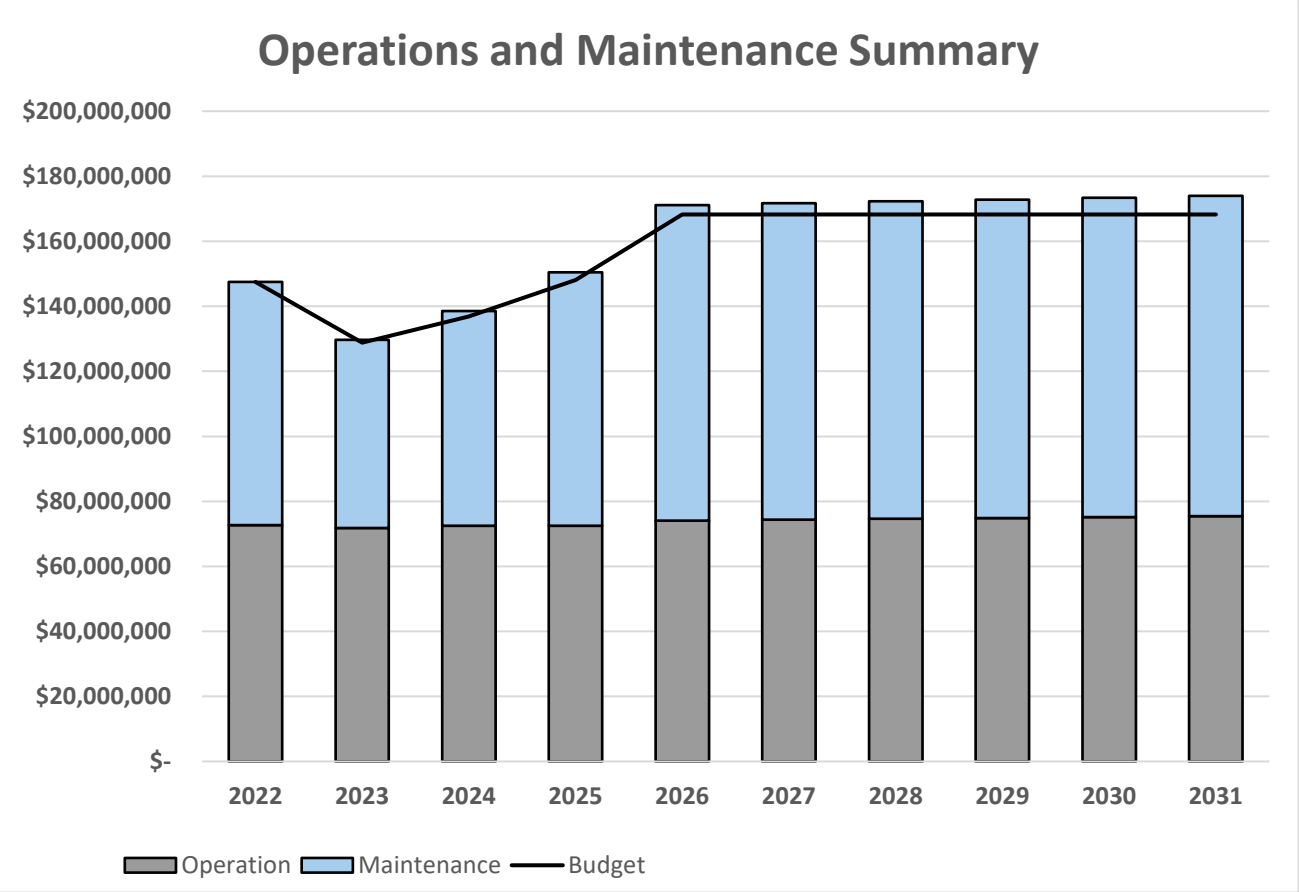
Table 15: Operation And Maintenance Summary					
ASSET	**LIFECYCLE STAGE**	**LIFECYCLE ACTIVITY**	**FREQUENCY**	**2021 COST**	**UNIT**
				road pavement	
Sidewalk	Operation	Snow Clearing	Per MMS / Council LOS	$1,955,000	per year
	Operation	Inspection	Annually	$80,000	per year
	Maintenance	General Repair	Per MMS / Ad Hoc	$6,100,000	per year
Guide Rail	Maintenance	Repair	Ad Hoc	$400,000	per year
Signalized Intersection	Operation	Inspection	Annually	$170,400	per year
	Maintenance	Repair	Ad Hoc	$1,507,000	per year
Luminaires	Maintenance	HPS Re-lamping	Annual	$37,500	per year
	Maintenance	MH Re-lamping	3 year cycle	$60,000	per cycle
	Maintenance	Arm Maintenance/Rewires	Annual	$30,000	per year
	Operation	Energy	Annual	$3,300,000	per year
	Operation	Night Patrol	Annual	$12,250	per year
Streetlight Poles	Maintenance	MVA Replacements	annual	$100,000	per year
	Maintenance	Painting & Straightening	annual	$30,000	per year
Dynamic Speed Signs	Operation	Installation / Removal	Monthly	$157,000	Per year
Traffic Sign	Operations	Inspection	Annually	$230,000	Per year
Pedestrian Crossover	Operations	Inspection	Annually	Not tracked separately	

Table 15: Operation And Maintenance Summary					
ASSET	LIFECYCLE STAGE	LIFECYCLE ACTIVITY	FREQUENCY	2021 COST	UNIT
				from traffic signals	
Noise Wall & Fencing	Maintenance	Repair	Ad Hoc	$80,000	Per year

Assessment and priority of reactive maintenance is undertaken by staff using experience and judgement.

Forecast operations and maintenance costs vary in relation to the total value of the asset registry. When additional assets are acquired, the future operations and maintenance costs are forecast to increase. When assets are disposed of the forecast operation and maintenance costs are reduced. Figure 12 shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget.

Figure 12: Operations and Maintenance Summary
All Figure Values Are Shown In 2021 Dollars.



The forecast costs include all costs from both the capital and operating budget. Asset managment focuses on how taxpayer or ratepayer dollars are invested by lifecycle activities and not by budget allocation since both budgets contain various lifecycle activities, they must both be consolidated for the AM Plans.

The forecast of operations and maintenance costs are increasing steadily over time and it is clear, the City has insufficient budget to achieve all of the works required to ensure that assets will be able to achieve their estimated service life at the desired level of service. It is anticipated that at the current budget levels there will be insufficient budget to address all operating and maintenance needs over the 10-year planning horizon. The graph above illustrates that without increased funding or changes to lifecycle activities there is a significant shortage of funding which will lead to:

- Higher cost reactive maintenance;
- Possible reduction to the availability of the assets;
- Impacts to private property; and,
- Increased financial and reputational risk

This shortfall is primarily due to the significant number of assets that are donated through subdivision agreements annually. Adding additional assets over time significantly impacts the operational and maintenance resources required to sustain the expected or mandatory level of service. It should be noted that a significant amount of operational and maintenance expenditures are mandatory due to legislative requirements and cannot simply be avoided or deferred.

As the City continues to develop condition profiles and necessary works are identified based on their condition, it is anticipated this operation and maintenance forecasts will increase significantly. Where maintenance budget allocations will result in a lesser level of service, the service consequences and risks have been identified and are highlighted in the Risk Section 2.6. Future iterations of this plan will provide a more thorough analysis of operations and maintenance costs including types of expenditures for training, mandatory certifications, insurance, staffing costs and requirements, equipment and maintenance activities.

2.2.3 Renewal Plan

Renewal is major works which does not increase the assets design capacity but restores, rehabilitates, replaces, or renews an existing asset to its original service potential. Works over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional future operations and maintenance costs

Asset renewals are typically undertaken to either ensure the assets reliability or quality will meet the service requirements set out by the City. Renewal projects are often triggered by service quality failure and can often be prioritized by those that have the highest consequence of failure, have high usage, have high operational and maintenance costs and other deciding factors.

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in Table 16 and are based on estimated design life for this iteration. Future iterations of the plan

will focus on the Lifecycle approach to ESL which can vary greatly from design life. Asset useful lives were last reviewed in 2022 however they will be reviewed annually until their accuracy reflects the City's current practices.

Table 16: Useful Lives of Assets

ASSET (SUB)CATEGORY	USEFUL LIFE (YEARS)
Road Pavement	35
Sidewalk	50
Bicycle Lanes	35
Noise Walls & Fencing	50
Signs	15
Streetlight Pole	50
Streetlight Luminaire	20
Signalized Intersection	20
Pedestrian Crossover (PXO)	15
Guide Rails	30
Vehicles	9.5

The estimates for renewals in this AM Plan were based on the register method which utilizes the data from the City's asset registry to analyse all available lifecycle information and then determine the optimal timing for renewals.

RENEWAL RANKING CRITERIA

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing a bridge that has a load limit), or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. condition of a culvert).[1]

[1] IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.

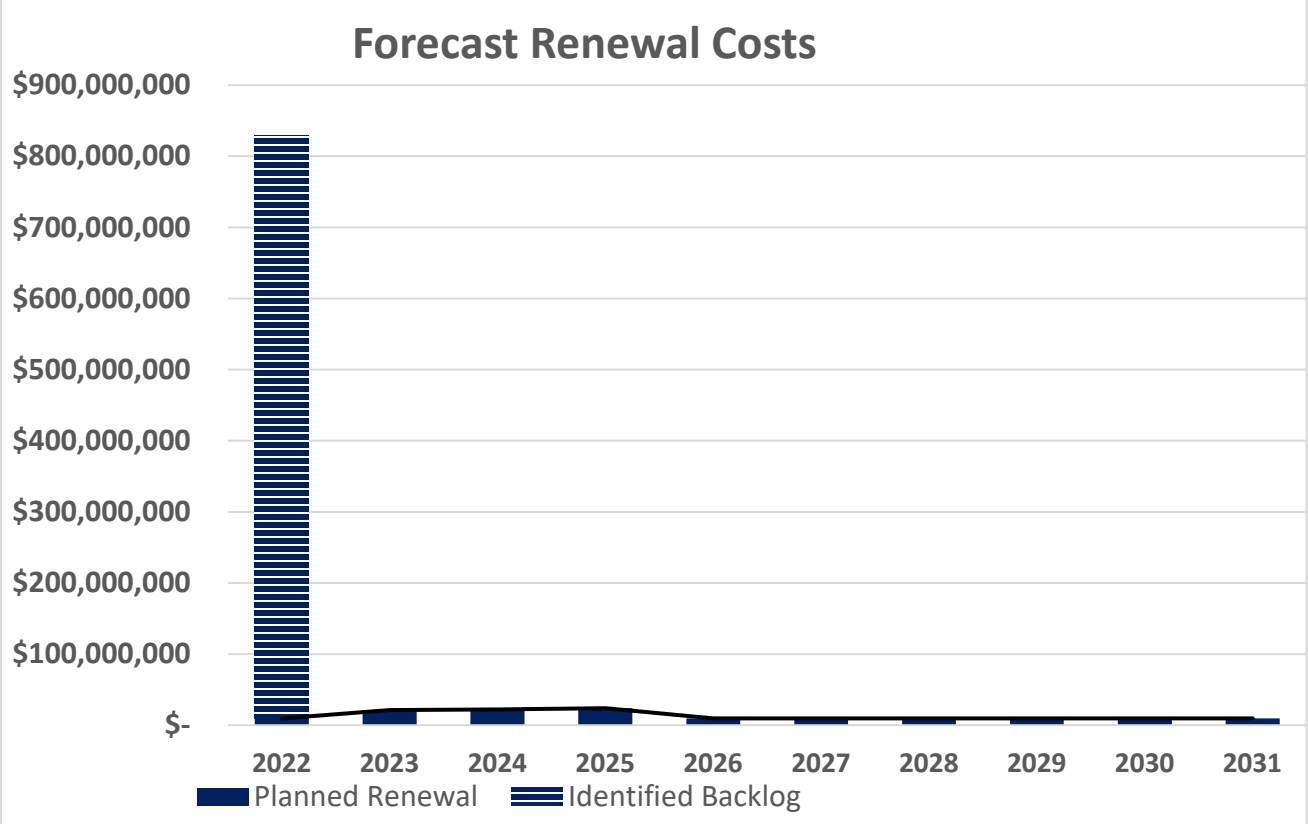
It is possible to prioritize renewals by identifying assets or asset groups that:

- Have a high consequence of failure,
- Have high use and subsequent impact on users would be significant,
- Have higher than expected operational or maintenance costs, and
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.[2]

SUMMARY OF FUTURE RENEWAL COSTS

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in Figure 13.

Figure 13: Forecast Renewal Costs
All Figure Values Are Shown In 2021 Dollars.



The significant amount highlighted in 2022 represents the cumulative backlog of deferred work needed to be completed that has been either identified through its current estimated condition or age per Table 6 when condition was not available. This back log represents nearly

[2] Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

$820,000,000 of deferred works that have accumulated over multiple decades and for and have created a significant backlog of necessary works.

Deferred renewals (assets identified for renewal and not funded) are included and identified within the risk management plan. Prioritization of these projects will need to be funded and managed over time to ensure renewal occurs at the optimal time.

There is sufficient budget to support the planned projects only. Without additional funding the backlog will remain and continue to grow as future projects outside of the 10-year planning horizon continue to move forward into the 10-year scope. Continued deferrals of projects will lead to significantly higher operational and maintenance costs and will affect the availability of services in the future.

The expected renewal works over the 10-year planning horizon include **$9.75 million** dollars in **2022** for road sections such as Marion Street and Dundas Street as well as **$1 million** for sidewalk renewals across the City. In **2023** the City will invest **$3.3 million** to renew Arvin Avenue as well as **$5.7 million** renewing sections of Barton Street, **$3.5 million** for select sections of Cannon Street and **$1 million** on sidewalk renewals. **2024** will see the City invest **$4.4 million** to renew Scenic Drive from Chateau Court to Upper Paradise Road, **$4.5 million** for sections of Mohawk Road, streetlights as well as sections of roads along Mohawk Road.

Deferring renewals create risks of higher financial costs, decreased availability, and decreased satisfaction with asset performance. Ultimately, continuously deferring renewals works ensures Hamilton will not achieve intergenerational equality. If Hamilton continues to push out necessary renewals, there is a high risk that future generations will be unable to maintain the level of service the customers currently enjoy. It will burden future generations with significant costs that inevitably they will be unable to sustain.

Properly funded and timely renewals will ensure the assets perform as expected and it is recommended to continue to analyze asset renewals based on criticality and availability of funds for future AM Plans.

2.2.4 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. At the time of writing this AM Plan, there were no road assets identified for disposal.

At this time the City does not separate its disposal costs and activities and combines them with its renewal planning. This has been identified as a continuous improvement and will be separated out for the next iteration for the AM Plan.

SUMMARY OF ASSET FORECAST COSTS

The financial projections from this asset plan are shown in Figure 14. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

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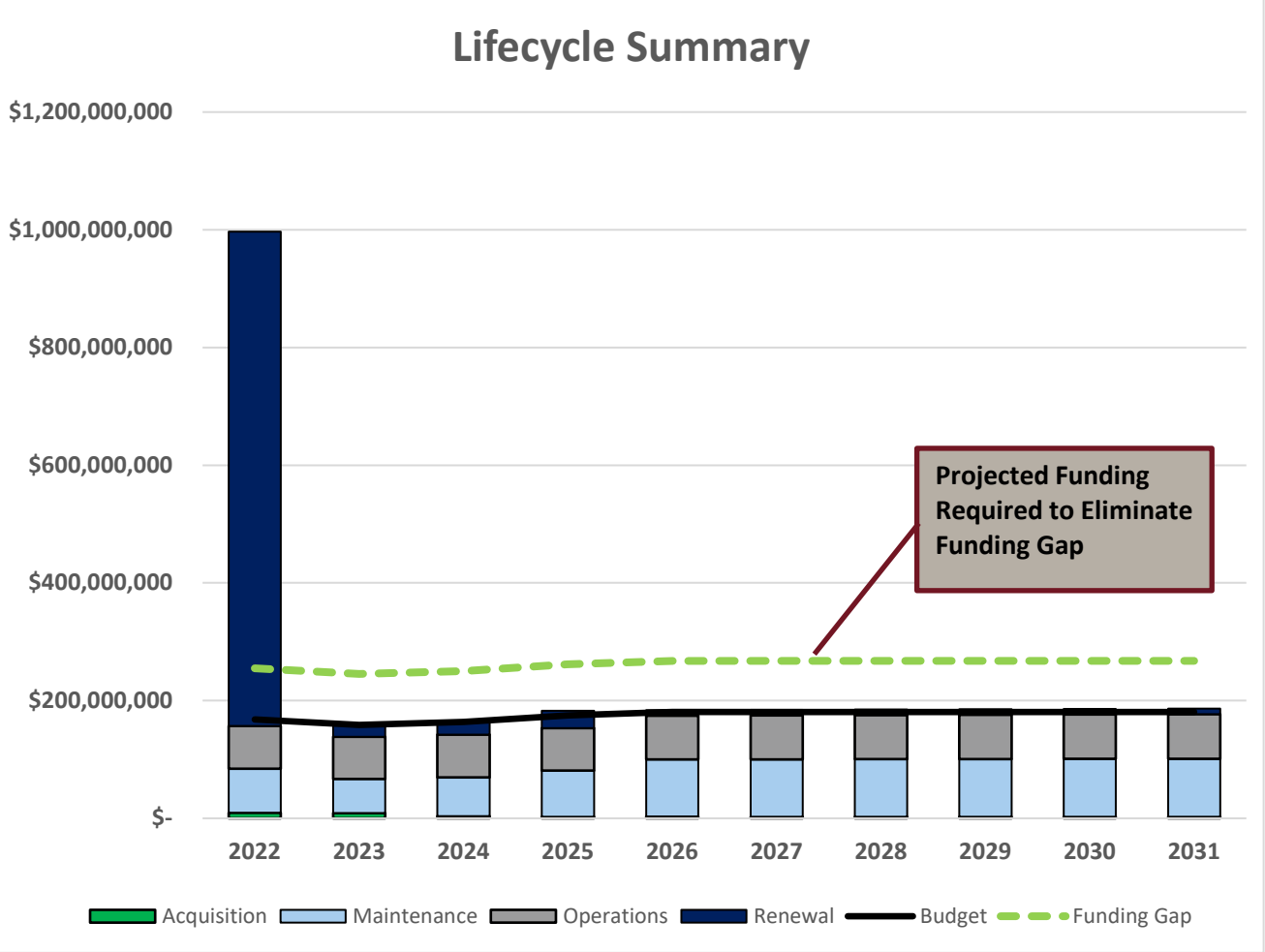
The bars in the graphs represent the forecast costs needed to minimize the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.

Figure 14: All Figure Values Are Shown In 2021 Dollars.



There is sufficient budget to address most of the planned operational and maintenance activities for the planning period. However, with the assumption of assets and their increased costs over time then there may be impacts to the service itself. Without some adjustment to available funds or other lifecycle management decisions there will be insufficient budget to address all planned lifecycle activities.

Hamilton currently has insufficient budget to address the large backlog of renewal work projected by the plan over the 10 year horizon When deferring of renewals occurs Hamilton runs the risk of higher cost reactive maintenance, service interruptions, decreased satisfaction, harm to its reputation along with other risk costs such as legal fees. Deferring renewals is not the optimal

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recommendation and Hamilton would benefit from seeking out long term financing strategies to enable a more rapid renewal plan.

Without sufficient funding the City has little option but to defer these necessary lifecycle activities. Deferring important lifecycle activities is never recommended. The City will benefit from allocating sufficient resources to developing its long-term financial plan to ensure that over time the City can fully fund the necessary lifecycle activities. Funding these activities helps to ensure the assets are compliant, safe and effectively deliver the service the customers need and desire.

Renewing at a greater rate and increasing major maintenance projects would allow Hamilton to mitigate ever decreasing road conditions proactively. With over 6,400 km's of roads to manage it is imperative that Hamilton optimize its renewal and major maintenance planning so that over time, high cost reactive maintenance will be avoided or deferred to a later date.

The lack of funding allocated for the backlog of renewals and the necessary lifecycle activities creates an additional issue which is intergenerational equity. Each year the City defers necessary lifecycle activities it pushes the ever-increasing financial burden on to future generations. It is imperative the City begin addressing the lack of consistent and necessary funding to ensure that intergenerational equity will be achieved. Over time, allocating sufficient funding on a consistent basis ensures that future generations will be able to enjoy the same standards being enjoyed today.

Over time the City will continue to improve its lifecycle data, and this will allow for informed choices as how best to mitigate those impacts and how to address the funding gap itself. This gap in funding future plans will be refined over the next 3 years and improve the confidence and accuracy of the forecasts

2.3 MANDATORY O.REG. 588/17 LEVELS OF SERVICE

As previously mentioned, the City is developing this AM Plan in accordance with O.Reg. 588/17 requirements. Table 4 in O.Reg. 588/17 identifies specific metrics that must be reported in the AM Plan for road assets for the purposes of comparison amongst municipalities. These metrics are required to be reported, and so they have been separated from the municipally defined levels of service described in Section 2.4. These metrics are divided into community and technical levels of service.

2.3.1 O.Reg. 588/17 Community Levels of Service

The community levels of service that the City is required to report on in order to meet the provincial level of service requirement are reported below:

Scope
Description, which may include maps, of the road network in the municipality and its level of connectivity.

Different areas of the City have different levels of connectivity. The City is made up of six (6) communities: Hamilton, Stoney Creek, Dundas, Glanbrook, Ancaster, Flamborough. All communities have major routes connecting these communities from east to west and north to south.

EAST AND WEST

In the lower City, Main Street/Queenston Road and King Street are one way streets which become two lanes at various points and are 2 to 5 lanes wide and traverse the entire lower City providing the major connectivity route from east to west for vehicular traffic connecting Dundas to Stoney Creek. In Stoney Creek, Main Street East connects to Queenston Road at Strathearne Avenue, and in Dundas, Main Street West branches out to Osler Drive. In the west end of the City, these connect the City to the 403 East Bound and West Bound, and in the east end of the City, these connect to the Red Hill Valley Parkway allowing access to the Queen Elizabeth Way (QEW). This is the route that the future Light-Rail Transit (LRT) will be following, which will be elaborated on when Transit is added to this AM Plan. The 403 East and West connect to Hwy 6 North and South which connect the other communities to Flamborough and Glanbrook.

In addition, the Cannon Street cycle track provides the east to west urban bicycle connectivity in the lower City from Britannia Avenue to York Boulevard to Plains Road West.

In the upper City, the Lincoln M. Alexander Parkway (The Linc) provides the major east to west connection connecting upper Stoney Creek to Ancaster. The westbound Linc connects the City to the 403 East and 403 West, and the eastbound route eventually becomes the Red Hill Valley Pkwy which connects the north and south at the east end of the City also providing access to the QEW. The 403 East and West connect to Hwy 6 which connects the other communities to Flamborough and Glanbrook.

NORTH AND SOUTH

In terms of north and south connections, the City has a unique connectivity issue in the form of the Niagara escarpment which creates a major elevation change separating Hamilton into the lower City and the upper City (sometimes referred to as the Mountain). There are eighteen (18) accesses including major ones such as Claremont, Sherman, Kenilworth, Jolly Cut, Queen Street, and Wilson Street that allow the lower City access to the upper City. Closures associated with these accesses can create major connectivity issues City wide. Unfortunately, since the escarpment itself requires maintenance activities to reduce or treat erosion of the escarpment face, which may create road closure situations, this creates a unique connectivity problem requiring planning and sometimes affecting the level of service. The Niagara escarpment is considered a natural asset, which falls under the non-core asset umbrella, and will be addressed in future plans.

The Red Hill Valley Parkway also provides a north to south connection on the east end of the City connecting upper Stoney Creek to lower Stoney Creek.

In addition, the Bay Street cycle track provides the north to south urban bicycle connectivity in the lower City, and the new Keddy Access Trail along the Claremont Access provides the major urban bike route connectivity from upper City to the lower City.

Figure 15 shows the Hamilton road network colour coded by functional class.

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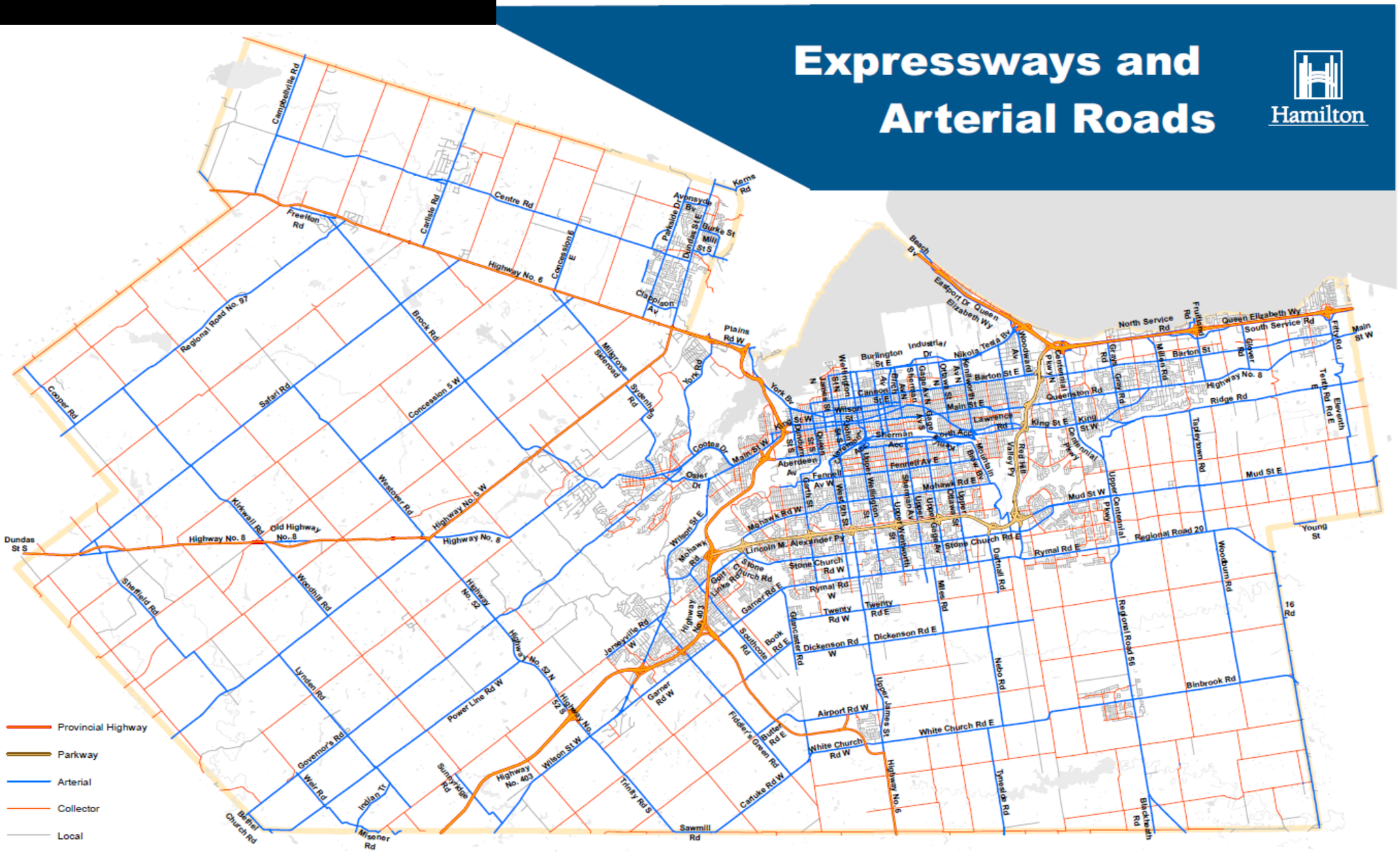
Figure 15: Expressways and Arterial Roads



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Quality

1. Description or images that illustrate the different levels of road class pavement condition.

Table 17 shows photos taken from the last inspection of each road functional class for each OCI condition range. It is evident from this table that different functional road classes may output different OCI scores even when the pavement visually appears to be in different condition. For instance, an expressway segment may output a similar OCI value to an Urban Local road segment even if the expressway visually appears to have less surface distresses. This is because vehicles travel faster over the expressway which emphasizes the Roughness Index described in Section 2.1.3.2. In addition, it is evident that there are no photos of the expressway functional class in Very Poor condition and this is because the City does not allow these segments to reach Very Poor condition because they are considered a critical asset, and they are kept in average Good condition.

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Table 17: OCI Ranges and Condition Descriptions

Condition Category	OCI Range	Condition Description	Functional Class							
			Expressway	Urban Arterial Major	Urban Arterial Minor	Urban Collector	Urban Local	Rural Arterial	Rural Collector	Rural Local
Very Good	86 - 100	The road is well maintained, in good condition, new or recently rehabilitated.								
		Road generally shows little to no surface distresses, with good rideability.	OCI =100	OCI = 91	OCI = 93	OCI = 88	OCI = 91	OCI = 88	OCI = 91	OCI =87
			Candidate for localized preventive maintenace							
Good	71 – 85	The road is adequate. It is acoeptable and generally within the mid-stage of its expected service life.								
		Road generally shows some low severity surface distresses, with fair to good rideability.	OCI = 78	OCI = 76	OCI = 81	OCI = 77	OCI = 76	OCI = 81	OCI = 83	OCI = 77
			Candidate for generalized preventative maintenance							
Fair	56 – 70	The road requires attention. It shows signs of deterioration and some elements exhibit deficiencies.								
		Road generally shows low to moderate surface distresses, with poor to good rideability.	OCI = 67	OCI = 65	OCI = 64	OCI = 63	OCI = 62	OCI = 66	OCI = 65	OCI = 63
			Candidate for minor rehabilitation							
Poor	41 – 55	There is an increasing potential for the road condition to affect the service it provides. The road is approaching the end of its service life, the condition is below the standard and a large portion of the road surface exhibits significant deterioration.								
		Road generally shows moderate to severe surface distresses over a large portion of the surface area, with	OCI = 54	OCI = 49	OCI = 49	OCI = 50	OCI = 45	OCI = 51	OCI = 48	OCI = 48
			Candidate for major rehabilitation							
Very Poor	0 – 40	The road is near or beyond its expected service life and shows widespread signs of advanced deterioration.	N/A							
		Road generally shows moderate to severe distresses over most of the surface area, with very poor to fair	OCI = N/A	OCI =36	OCI = 35	OCI = 31	OCI = 23	OCI = 38	OCI = 36	OCI = 30
			Candiate for reconstruction							

2.3.2 O.Reg. 588/17 Technical Levels of Service

In addition, there are technical levels of service that the City is required to report on in order to meet the provincial level of service requirement. These quantitative metrics are reported below in Table 18. A map of the road network by OCI is shown in Figure 3 located in Section 2.1.3.3.

Table 18: Technical Levels of Service

SERVICE ATTRIBUTE	TECHNICAL LEVELS OF SERVICE	MEASURE
Scope	Number of lane-kilometres of each of arterial roads, collector roads and local roads as a proportion of square kilometres of land area of the municipality.	Expressway: 0.1 Arterial: 1.4 Collector: 1.8 Local: 2.4
Quality	1. For paved roads in the municipality, the average pavement condition index value.	OCI: 63.78 (Fair)
	2. For unpaved roads in the municipality, the average surface condition (e.g. excellent, good, fair or poor).	OCI: 47.46 (Poor)

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2.4 MUNICIPALLY DEFINED LEVELS OF SERVICE

Levels of service are measures for what the City provides to its customers, residents, and visitors. Service levels are best described as the link between providing the outcomes the community desires, and the way that the City provides those services. Service levels defined in three ways, customer values, customer levels of service and technical levels of service which are outlined in this section. An explanation for how these were developed is provided in Section 7.5 of the AMP Overview.

2.4.1 Customer Values

Customer values are what the customer can expect from their tax dollar in "customer speak" which outline what is important to the customer, whether they see value in the service, and the expected trend based on the 10-year budget. These values are used to develop the level of service statements.

To develop these customer values, as stated in the AMP Overview, a Customer Engagement Survey was released in January 2022 on the Engage Hamilton platform. The survey received 279 submissions and contained 24 questions related to road asset service delivery. The survey results can be found in Appendix "A" in the AMP Overview. While these surveys were used to establish customer values and customer performance measures, it's important to note that the number of survey respondents only represents a small portion of the population. The future intent is to release this survey on a regular basis to measure the trends in customer satisfaction and ensure that the City is providing the agreed level of service as well as to improve the marketing strategy to receive more responses. This has been noted in Table 29 in the continuous improvement section.

Table 19: Customer Values

SERVICE OBJECTIVE:

CUSTOMER VALUES	CUSTOMER SATISFACTION MEASURE	CURRENT FEEDBACK	EXPECTED TREND BASED ON PLANNED BUDGET (10-YEAR HORIZON)
Road, sidewalk, and bicycle lanes should be kept in good condition.	Annual Customer Engagement Survey	Survey respondents feel the roads are in Poor to Very Poor condition and sidewalks and bicycle lanes are in Fair condition.	Slight decrease

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Table 19: Customer Values

SERVICE OBJECTIVE:

CUSTOMER VALUES	CUSTOMER SATISFACTION MEASURE	CURRENT FEEDBACK	EXPECTED TREND BASED ON PLANNED BUDGET (10-YEAR HORIZON)
Any road deficiencies should be repaired quickly.	Annual Customer Engagement Survey	Many survey respondents felt potholes should be repaired more quickly.	Maintain
Roads and sidewalks should be cleared quickly after a snowfall.	Annual Customer Engagement Survey	Many survey respondents felt roads were cleared in a reasonable amount of time after a snow event.	Maintain
Roads should feel safe to travel on.	Annual Customer Engagement Survey	Most survey respondents felt safe using the roads in a motor vehicle but did not feel safe cycling in urban areas.	Maintain
Good connectivity should be maintained.	Annual Customer Engagement Survey	Many survey respondents are affected during an escarpment access closure (36%). The City should continue proactively completing preventative maintenance on the escarpment face.	Slight decrease

2.4.2 Customer Levels of Service

Ultimately customer performance measures are the measures that the City will use to assess whether it is delivering the level of service the customers desire. Customer level of service measurements relate to how the customer feels about the City's road linear assets in terms of their quality, reliability, accessibility, responsiveness, sustainability and over course, their cost. The City will continue to measure these customer levels of service to ensure a clear understanding on how the customers feel about the services and the value for their tax dollars.

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The Customer Levels of Service are considered in terms of:

Condition	How good is the service? What is the condition or quality of the service?
Function	Is it suitable for its intended purpose? Is it the right service?
Capacity/Use	Is the service over or under used? Do we need more or less of these assets?

In Table 20 under each of the service measures types (Condition, Function, Capacity/Use) there is a summary of the performance measure being used, the current performance, and the expected performance based on the current budget allocation.

Table 20: Customer Levels of Service

TYPE OF MEASURE	LEVEL OF SERVICE STATEMENT	SOURCE	PERFORMANCE MEASURE	CURRENT PERFORMANCE	EXPECTED TREND BASED ON PLANNED BUDGET
Condition	Ensure transportation network assets are kept in safe and acceptable repair, and issues are resolved in a timely manner.	Annual Customer Engagement Survey	53.9% of survey respondents rate road surface condition as Poor or Very Poor.	Unsatisfied	Maintain
			62.6% of survey respondents rate the surface condition of sidewalks as Fair.	Unsatisfied	Maintain
			53.1% of survey respondents rate the surface condition of bicycle lanes as Fair.	Unsatisfied	Maintain
			78.5% of survey respondents feel safe using the roads in a motorized vehicle	Fairly Satisfied	Maintain
			58.1% of survey respondents felt unsafe cycling on urban roads	Unsatisfied	Maintain
			78.8% of survey respondents felt safe using sidewalks or multi-use trails	Fairly Satisfied	Maintain
			56.6% of survey respondents thought potholes were not fixed in a reasonable amount of time	Unsatisfied	Maintain
			Confidence levels	Medium	
		Road Inspection Report	Average condition of expressway	Good	Maintain
			Average overall road network condition	Fair	Slight Decrease
			Confidence levels	Medium	
		Annual Sidewalk Inspection	Average sidewalk condition	Good	Maintain
			Confidence levels	Medium	
Function	Ensure good traffic flow and connectivity are maintained.	Annual Customer Engagement Survey	70.7% of survey respondents felt traffic congestion was acceptable or neutral in the City	Satisfied	Slight Decrease
			79.2% of survey respondents felt there is ample notice for road work or were neutral	Satisfied	Maintain
			57.4% of survey respondents thought roads were plowed in a reasonable amount of time after a significant snow event	Satisfied	Maintain
			Confidence levels	Medium	
Capacity	Ensure transportation network is providing and encouraging multi-modal transportation	Annual Customer Engagement Survey	94.6% of survey respondents drive in a motorized vehicle at least once a week	Very Frequently	Unknown
			8.1% of survey respondents cycle through rural areas at least once a week	Infrequently	Unknown
			20.2% of survey respondents cycle through urban areas at least once a week	Somewhat Infrequently	Unknown
			80.6% of survey respondents walk using sidewalks or multi-use trails at least once a week	Frequently	Unknown
			Confidence levels	Medium	

2.4.1 Technical Levels of Service

Technical levels of service are operational or technical measures of performance, which measure how the City plans to achieve the desired customer outcomes and demonstrate effective performance, compliance and management. The metrics should demonstrate how the City delivers its services in alignment with its customer values; and should be viewed as possible levers to impact and influence the Customer Levels of Service. The City will measure specific lifecycle activities to demonstrate how the City is performing on delivering the desired level of service as well as to influence how customer perceive the services they receive from the assets.

Technical service measures are linked to the activities and annual budgets covering Acquisition, Operation, Maintenance, and Renewal. Asset owners and managers create, implement and control technical service levels to influence the service outcomes.[3]

Table 21 shows the activities expected to be provided under the current 10 year Planned Budget allocation and the Forecast activity requirements being recommended in this AM Plan.

Table 21: Technical Levels of Service

LIFECYCLE ACTIVITY	LEVEL OF SERVICE STATEMENT	ACTIVITY MEASURE	CURRENT PERFORMANCE*	TARGET**	RECOMMENDED PERFORMANCE ***
Operation	Ensure transportation network assets are kept in safe and acceptable repair, and issues are resolved in a timely manner.	% road patrol compliance to MMS standards	95.05%	100%	100%
		% of Monthly Street Light Inspections Completed to Council Approved Standards	100%	100%	100%
		% of sidewalk inspections completed annually	100%	100%	100%
		# Signal Inspections Completed to MMS Standards	672	550	100%
		# of Annual Signal Conflict Monitor Inspections Completed to MMS Standards	399	250	100%
		% of sign inspections completed on time to MMS Standards	85.42%	100%	100%

[3] IPWEA, 2015, IIMM, p 2|28.

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Table 21: Technical Levels of Service

LIFECYCLE ACTIVITY	LEVEL OF SERVICE STATEMENT	ACTIVITY MEASURE	CURRENT PERFORMANCE*	TARGET**	RECOMMENDED PERFORMANCE ***
		# 2021 on-road fatal injury traffic collisions	16	0	0
		Budget	$72,263,296		$73,497,640
Maintenance*	Ensure transportation network assets are kept in safe and acceptable repair, and issues are resolved in a timely manner.	Overall Road OCI	63.78	65	65
		% potholes repaired to MMS standards	95.92%	100%	100%
		% of pavement surface cracks repaired to MMS standards	100%	100%	100%
		% of sidewalks repaired to MMS standards	100%	100%	100%
		% of shoulder drop offs repaired to MMS standards	100%	100%	100%
		% of surface discontinuities repaired to MMS standards	95.83%	100%	100%
		% Signal Deficiencies Addressed to MMS Standards	98.36%	100%	100%
		% signs repaired on time to MMS Standards	74.96%	100%	100%
		Budget	**$84,807,304**		**$87,275,976**

Note: * Current activities related to Planned Budget.
**** Current internal target**
***** Expected performance related to forecast lifecycle costs.**

It is important to monitor the service levels regularly as circumstances can and do change. Current performance is based on existing resource provision and work efficiencies. It is acknowledged changing circumstances such as technology and customer priorities will change over time.

At this time, the technical levels of service focus on operations and maintenance lifecycle activities and are typically measuring how the City is performing in accordance with the MMS. It is evident that the City is typically meeting these standards with a few exceptions. However, customer preferences and expectations do not always match minimum legislated requirements, which is discussed in Section 2.4.2.

A future continuous improvement item is to add additional level of service metrics which measure technical levels of service at other lifecycle stages (i.e. acquisition, renewal, disposal), as well as ensure the performance measurements are in line with customer values. In addition, as the City's asset management maturity increases, and with the implementation of the Enterprise Asset Management (EAM) project mentioned in the AMP Overview, the City will also have more capacity to measure additional metrics.

In addition, the Alleyway Management Strategy adopted in November 2019 explains that the City currently delivers a low level of service (LOS) for these assets which involves not including alleyways in capital renewals and only completing operational activities on a reactive basis. The Strategy also identified medium and high LOS scenarios which have broken down the lifecycle management strategies by a defined hierarchy class based on usage. The City has continued to deliver alleyways on a low LOS scenario, but should investigate improving the LOS for the A and B hierarchy classes defined in the Strategy as well as incorporate technical levels of service for this asset if it is adopted. This has been identified as a continuous improvement item in Table 29.

2.4.2 Level of Service Summary

At this time, the City's technical metrics for the road linear service area is based on the MMS. It is evident per Table 21 that the City is typically meeting these standards with a few exceptions. However, customer preferences and expectations do not always match minimum legislated requirements, which is discussed below.

CONDITION

Based on Table 20 above, survey respondents were unsatisfied with the condition of the road network, even though at this time the City is currently maintaining the road network at a Fair condition per the current level of service, and is only one point (64 out of 65) away from achieving the technical target. This shows there is currently a mismatch between the City and the customer as to the level of service that is expected with respect to road condition. Although, it is important to note that as discussed in Section 2.1.3.2, the City is revising the OCI model, and these condition values may change.

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Furthermore, per Figure 3, many sections on the main arterial roads on Main and King St which act as the main connection between the lower City from west to east and east to west are shown to be in poor to very poor condition. The City typically maintains expressways at an average Good condition because they are major transportation routes, and so the City should investigate identifying these major arterial roads as critical assets and increasing the minimum average condition for these roads.

In addition, it was shown that many survey respondents have concerns with the number of potholes they experience while driving on the road network and think they should be repaired faster. Although the City repaired approximately 96% of potholes per the MMS size and depth within the required timeframe based on the functional class, it appears that customers may expect a higher level of service than the minimum requirement.

Therefore, it is imperative that the City investigate improving the level of service with respect to road condition and maintenance, and provide customers with the necessary information on the additional cost and resources required to improve the level of service, and whether they are interested in paying more for this higher level of service.

FUNCTION

Based on Table 20, most survey respondents felt that roads were cleared in a reasonable amount of time after a snowfall. However, survey respondents who felt unsafe using sidewalks or multi-use trails with or without a mobility device cited an operational issue as the reason why they felt unsafe. Although the City has recently contracted out a service to clear sidewalks downtown, at this time, most sidewalks are not cleared by the City and are cleared by property owners.

Therefore, expectations and the monetary amount required to increase this level of service must be communicated clearly to the public, and technical metrics associated with snow clearing should be added to the balanced scorecard.

CAPACITY

Based on Table 20, many survey respondents felt unsafe cycling on urban roads and the most common reason was infrastructure design. Since the City is working towards improving the active transportation network, and survey respondents feel unsafe due to infrastructure design, the usage of bicycle lanes likely could be increased if more safety features were added.

The City should also investigate providing separation in areas where it does not exist, and increasing cycling route connectivity, and communicating the monetary amount required to increase this level of service. In addition, technical metrics associated with bicycle lanes should be added to the balanced scorecard to ensure the City levels of service are matching customer values.

2.5 FUTURE DEMAND

The ability for the City to be able to predict future demand for services enables the City to plan ahead and identify the best way of meeting the current demand while being responsive to inevitable changes in demand. Demand will inevitably change over time and will impact the needs and desires of the community in terms of the quantity of services (assumption of assets due to development growth) and types of service required (alternative pavement options or traffic calming devices)

Demand is defined as the desire customers have for assets or services and that they are willing to pay for. These desires are for either new assets/services or current assets.

Since demand is not yet an extensive requirement in O.Reg. 588/17 for the July 1st, 2022 deadline, this section is not as robust as some other sections of the report, but is an obligation for the report by July 1st, 2025, and will be expanded on in future iterations of the report.

2.5.1 Demand Drivers

For the road linear service area, the key drivers are population change, climate change, and customer preferences and expectations. A future continuous improvement item is to identify additional demand drivers.

In addition, the City is moving towards a “Complete Streets” model, and is currently developing a Complete, Livable, Better (CLB) Streets Design Manual, which will likely affect future demand. The intent is to build streets that are safer for all road users including pedestrians, cyclists, transit users, drivers, and people of all ages and abilities.

2.5.2 Demand Forecasts

The high level present position and projections for demand drivers that may impact future service delivery and use of assets have been identified and documented in Table 22. At this time, specific projections have not been calculated and will be updated in the 2025 AM Plan per the timelines stated in the AMP Overview. In addition, growth projections have been shown in the AMP Overview.

2.5.3 Demand Impact and Demand Management Plan

The impact of demand drivers that may affect future service delivery and use of assets are shown in Table 22.

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Demand management practices can include non-asset solutions, insuring against risks, and managing failures.

Opportunities identified to date for demand management are shown in Table 22. Climate change adaptation is included in Table 23. Further opportunities will be developed in future revisions of this AM Plan, as identified in Table 29 in the continuous improvement section.

Table 22: Demand Management Plan

DEMAND DRIVER	CURRENT POSITION	PROJECTION	IMPACT ON SERVICES	DEMAND MANAGEMENT PLAN
Customer Preferences and Expectations	The City is responsible for sidewalks along transit routes and city owned property.	The level of service may increase in the future.	Increased costs to deliver service. May require more staffing.	Service may be contracted out, property taxes would reflect new levels of service.
Regulations	Status quo soil management regulations.	Soil management regulation changes Jan 2022	Increased costs, Increased oversight, Possible fines	Staff training; Implement tracking tool; Hire new staff to track soil; Repurpose soil

2.5.4 Asset Programs to Meet Demand

The new assets required to meet demand may be acquired, donated or constructed. At this time there approximately 100 km of road planned over the 10-year planning horizon. Acquiring new assets would commit the City to ongoing operations, maintenance and renewal costs for the period that the service provided from the assets is required.

2.5.5 Climate Change Adaptation

The impacts of climate change may have a significant impact on the assets we manage and the services they provide. In the context of the Asset Management Planning process climate change can be considered as both a future demand and a risk.

Climate change impacts on assets will vary depending on the location and the type of services provided, as will the way in which those impacts are responded to and managed.[4]

As a minimum the City must consider how to manage our existing assets given potential climate change impacts for our region.

[4] IPWEA Practice Note 12.1 Climate Change Impacts on the Useful Life of Infrastructure

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Risk and opportunities identified to date are shown in Table 23. This is a continuous process and will be updated in the 2025 AM Plan per the timelines outlined in the AMP Overview.

Table 23: Managing the Impact of Climate Change on Assets and Services

CLIMATE CHANGE DESCRIPTION	PROJECTED CHANGE	POTENTIAL IMPACT ON ASSETS AND SERVICES	MANAGEMENT
GHG Emissions	Increased GHG emissions due to increased demand for transportation.	Increased GHG emissions contribute to climate change.	Investigate opportunities to change the modal split; Invest in sustainable transportation so that the increase in transportation demand will not be predominately single use occupancy vehicles.
Storm Events	Increased frequency of large storm events which may overwhelm the stormwater system.	Delays in transportation network may occur if road asset is flooded in large storm event.	Prioritize replacements; Planning for sufficient funds to implement plans; Model stormwater network to ensure capacity; Investigate problem areas.

Additionally, the way in which the City constructs new assets should recognize that there is opportunity to build in resilience to climate change impacts. Building resilience can have the following benefits:

- Assets will withstand the impacts of climate change;
- Services can be sustained; and
- Assets that can endure may potentially lower the lifecycle cost and reduce their carbon footprint

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Table 24 summarizes some asset climate change resilience projects the City is currently pursuing.

Table 24: Building Asset Resilience to Climate Change

PROJECT	PROJECT DESCRIPTION	CLIMATE CHANGE IMPACT	BUILD RESILIENCE IN NEW WORKS
LAMP Project	LED street lighting retrofit, 38,874 street lights converted to LED	Older light bulbs lead to wasted energy which increases GHG emissions.	To increase the number of new and existing high-performance state-of-the-art assets that improve energy efficiency and adapt to a changing climate
Complete Liveable Better Streets Manual	Following the approval of the City-Wide Transportation Master Plan (2017) prepare the Complete Liveable Better Streets Manual for designing and construction of future roadways in the City.	Continued emphasis on single occupancy vehicles will lead to an increase in GHG emissions.	To change the modal split and investigate strategies so that more trips are taken by active and sustainable transportation than single use occupancy vehicles
Roadway Redesign	Through various construction projects - existing roadways are designed to prioritize multi-modal transportation such as transit, cycling and walking.		
Vision Zero	Vision Zero encourages active modes of transportation by addressing road safety for vulnerable road users of all ages and abilities – reducing Hamilton's contribution to climate change and encouraging a healthy lifestyle.		
Bicycle Boulevard (Neighbourhood Greenways) Program	To upgrade existing bicycle infrastructure with improved protection measures for cycle tracks and at intersections at strategic locations.		
Hatt Street Bikeway	Implementation of bike lanes on Hatt Street from John Street to Baldwin Street		

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Table 24: Building Asset Resilience to Climate Change			
PROJECT	**PROJECT DESCRIPTION**	**CLIMATE CHANGE IMPACT**	**BUILD RESILIENCE IN NEW WORKS**
Frid Street Extension - Chatham to Longwood	New 3 lane roadway with bike lanes. 2019 DC Background Study Item -124 - 95% Growth		
On Street Bike Facilities	To create and improve cycling infrastructure through the implementation and maintenance of on and off road paths, lanes, signed routes and cycling infrastructure.		
Hunter Street Cycle Track	Install planned bicycle lanes with barrier curb (MacNab to Catharine), related signal works, and resurfacing (James to Catharine).		
Bike Lane Maintenance	Maintenance of bike lanes with in the City to (total of 206.5km of bikes lanes) to encourage the use of non vehicular transportation which reduces GHG emission		
Continued emphasis on single occupancy vehicles will lead to an increase in GHG emissions.	To change the modal split and investigate strategies so that more trips are taken by active and sustainable transportation than single use occupancy vehicles		

The impact of climate change on assets is a new and complex discussion and further opportunities will be developed in future revisions of this AM Plan.

2.6 RISK MANAGEMENT

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2018 as: 'coordinated activities to direct and control with regard to risk'[5].

The City is developing and implementing a formalized risk assessment process to identify risks associated with service delivery and to implement proactive strategies to mitigate risk to tolerable levels. The risk assessment process identifies credible risks associated with service delivery and will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

The risk assessment process identifies credible risks, the likelihood of those risks occurring, and the consequences should the event occur. The City utilizes two risk assessment methods to determine risk along with subject matter expert opinion to inform the prioritization. Hamilton is further developing its risk assessment maturity with the inclusion of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable in the next iteration of the plan.

2.6.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarized in Table 25. Failure modes may include physical failure, collapse or essential service interruption.

Table 25: Critical Assets

CRITICAL ASSET(S)	FAILURE MODE	IMPACT
Expressway/Major Arterial Roads	Physical Failure, Essential Service Interruption	Injury Service Interruption Financial Reputational
Signalized Intersections	Essential Service Interruption	Service Interruption Financial Injury

[5] ISO 31000:2009, p 2

By identifying critical assets and failure modes an organization can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

2.6.2 Risk Assessment

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

An assessment of risks associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment costs of implementing the selected treatment plan is shown in Table 6.2. It is essential that these critical risks and costs are reported to management. Additional risks will be developed in future iterations of the plan and is identified in Table 29 in the Continuous Improvement Section the plan.

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Table 26: Risks And Treatment Plans
Note * The Residual Risk Is The Risk Remaining After The Selected Risk Treatment Plan Is Implemented.

SERVICE OR ASSET AT RISK	WHAT CAN HAPPEN	RISK RATING	RISK TREATMENT PLAN	RESIDUAL RISK *	TREATMENT COSTS
Road Pavement Line Markings	Faded, not repainted	High	Regular line marking inspections. Hire contractor for line marking services.	Low	$100,000
Solar Powered PXOs	Batteries can drain out of charge, beacons do not light up due to undersized solar panel.	Very High	Install large solar panels & batteries or hard-wire to electrical grid power source.	Medium / Low	$4,500/Unit
Regulatory / Warning Signs	Sign can go missing and left unreplaced	High	Continue road patrol. Create location based asset registry. Report monitored daily	Low	$50,000

2.6.3 Infrastructure Resilience Approach

The resilience of our critical infrastructure is vital to the ongoing provision of services to customers. To adapt to changing conditions the City needs to understand its capacity to 'withstand a given level of stress or demand', and to respond to possible disruptions to ensure continuity of service. An example would be how the transportation network operates during times of peak usage (3 busiest days of the year). We do not currently measure our resilience in service delivery and this will be included in the next iteration of the AM Plan.

Resilience covers the capacity of the City to withstand any service disruptions, act appropriately and effectively in a crisis, absorb shocks and disturbances as well as adapting to ever changing conditions. Resilience is built on aspects such as response and recovery planning, financial capacity, climate change risk, assessment and crisis leadership.

2.6.4 Service and Risk Trade-Offs

The decisions made in AM Plans are based on the objective to achieve the optimum benefits from the available resources. At this time, the City does not have sufficient data to present risks and tradeoffs. This information will be presented in the 2025 AM Plans regarding proposed levels of service per the timelines outlined in the AMP Overview.

2.7 FINANCIAL SUMMARY

This section contains the financial requirements resulting from the information presented in the previous sections of this AM Plan. Effective asset and financial management will enable the City to ensure its Transportation network provides the appropriate level of service for the City to achieve its goals and objectives. Reporting to stakeholders on service and financial performance ensures the City is transparently fulfilling its stewardship accountabilities.

Long-Term financial planning (LTFP) is critical for the City to ensure the networks lifecycle activities such as renewals, operations, maintenance, and acquisitions can happen at the optimal time. The City is under increasing pressure to meet the wants and needs of its customer while keeping costs at an affordable level and maintaining its financial sustainability.

Without funding asset activities properly for its Transportation network; the City will have difficult choices to make in the future which will include options such as higher costs reactive maintenance and operational costs, reduction of service and potential reputational damage.

Aligning the LTFP with the AM Plan is critical to ensure the all of the networks needs will be met while the City is finalizing a clear financial strategy with measurable financial targets. The financial projections will be improved as the discussion on desired levels of service and asset performance matures.

2.7.1 Sustainability of Service Delivery

There are two key indicators of sustainable service delivery that are considered within the AM Plan for this service area. The two indicators are the:

- asset renewal funding ratio (proposed renewal budget for the next 10 years / forecast renewal costs for next 10 years); and,
- medium term forecast costs/proposed budget (over 10 years of the planning period).

ASSET RENEWAL FUNDING RATIO

Asset Renewal Funding Ratio[6] **13.84%**

The Asset Renewal Funding Ratio is used to determine if the City is accommodating asset renewals in an **optimal** and **cost effective** manner from a timing perspective and relative to financial constrains, the risk the City is prepared to accept and targeted service levels it wishes to maintain. The target renewal funding ratio should be ideally between **90% - 110%** over the entire planning period. A low indicator result generally indicates that service levels are achievable however the expenditures are below this level because the City is reluctant to fund the necessary work or prefers to maintain low levels of debt.

Over the next ten (10) years the City expects to have **13.84%** of the funds required for the optimal renewal of assets. This is a significantly low number and should be addressed through this plan

[6] AIFMM, 2015, Version 1.0, Financial Sustainability Indicator 3, Sec 2.6, p 9.

in the next iteration. By only having sufficient funding to renew **13.84%** of the required assets in the appropriate timing it will inevitably require difficult trade off choices that could include:

- A significant reduction of the level of service and availability of assets;
- Increased complaints and reduced customer satisfaction;
- Substantially increased reactive maintenance and renewal costs; and,
- Damage to the City's reputation and risk of fines or legal costs.

The lack of renewal resources will be addressed in future AM Plan's while aligning the plan to the LTFP. This will allow staff to develop options and long-term strategies to address the renewal rate. The City will review its renewal allocations once the entire inventory has been confirmed and amalgamated.

The Asset Renewal Funding Ratio is an important indicator and illustrates that over the next 10 years we expect to have **13.84 %** of the funds required for the optimal renewal of assets.

MEDIUM TERM – 10 YEAR FINANCIAL PLANNING PERIOD

This AM Plan identifies the forecast operations, maintenance and renewal costs required to provide an agreed level of service to the community over a 10 year period. This provides input into 10 year financial and funding plans aimed at providing the required services in a sustainable manner.

This forecast work can be compared to the proposed budget over the first 10 years of the planning period to identify any funding shortfall.

The forecast operations, maintenance and renewal costs over the 10 year planning period is **$257,153,344** on average per year. Over time as improved information becomes available it is anticipated to see this number increase. In future AM Plans, staff will connect the operational and maintenance needs to the forecasts, and this will result in a significantly higher cost than is outlined here.

The proposed (budget) operations, maintenance and renewal funding is **$170,496,096** on average per year giving a 10 year funding shortfall of **$86,657,240** per year or **$866,572,400** over the 10 year planning period. This indicates that **66.3%** of the forecast costs needed to provide the services documented in this AM Plan are accommodated in the proposed budget. Note, these calculations exclude acquired assets (if any).

Providing sustainable services from infrastructure requires the management of service levels, risks, forecast outlays and financing to achieve a financial indicator of approximately **1.0** for the first years of the AM Plan and ideally over the 10 year life of the Long-Term Financial Plan.

2.7.2 Forecast Costs (Outlays) For the Long-Term Financial Plan

Table 27 shows the forecast costs (outlays) required for consideration in the 10 year long-term financial plan.

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Providing services in a financially sustainable manner requires a balance between the forecast outlays required to deliver the agreed service levels with the planned budget allocations in the operational and capital budget. The City will begin developing its long-term financial plan (LTFP) to incorporate both the operational and capital budget information and help align the LTFP to the AM Plan which is critical for effective asset management planning.

A gap between the forecast outlays and the amounts allocated in the financial plan indicates further work is required on reviewing service levels in the AM Plan (including possibly revising the long-term financial plan).

The City will manage the 'gap' by continuing to develop this AM Plan to provide guidance on future service levels and resources required to provide these services in consultation with the community. Options to manage the gap include reduction and closure of low use assets, increased funding allocations, reduce the expected level of service, utilize debt based funding over the long term, adjustments to lifecycle activities, improved renewals and multiple other options or combinations of options.

These options will be explored in the next AM Plan and the City will provide analysis and options for Council to consider going forward.

Table 27: Forecast Costs (Outlays) For the Long-Term Financial Plan
Forecast Costs Are Shown In 2021 Dollar Values.

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL
2022	$9,304,000	$72,686,000	$74,809,000	$839,707,968	0
2023	$8,775,000	$71,777,288	$57,922,292	$ 21,080,000	0
2024	$3,470,000	$72,531,608	$66,058,608	$ 22,310,000	0
2025	$2,870,000	$72,478,296	$77,972,296	$ 29,391,000	0
2026	$2,900,000	$74,059,984	$97,085,152	$ 9,580,000	0
2027	$2,870,000	$74,342,424	$97,367,592	$ 9,580,000	0
2028	$2,870,000	$74,624,120	$97,649,288	$ 9,580,000	0
2029	$2,870,000	$74,905,808	$97,930,976	$ 9,580,000	0
2030	$2,870,000	$75,187,496	$98,212,664	$ 9,580,000	0
2031	$2,870,000	$75,469,192	$98,494,360	$ 9,580,000	0

2.7.3 Funding Strategy

The proposed funding for assets is outlined in the City's operational budget and 10 year capital budget.

These operational and capital budgets determines how funding will be provided, whereas the AM Plan typically communicates how and when this will be spent, along with the service and risk consequences. Future iterations of the AM plan will provide service delivery options and alternatives to optimize limited financial resources.

2.7.4 Valuation Forecasts

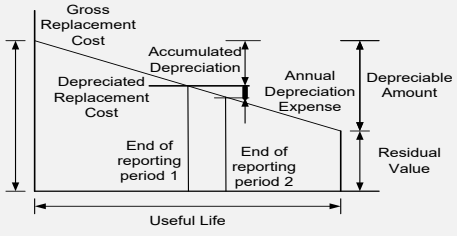
Asset values are forecast to increase as additional assets are added into service.

Additional assets will add to the operations and maintenance needs in the longer term. Additional assets will also require additional costs due to future renewals. Any additional assets will also add to future depreciation forecasts. Any disposals of assets would decrease the operations and maintenance needs in the longer term and removes the high costs renewal obligations. At this time, it is not possible to separate the disposal costs from the renewal or maintenance costs however this will be improved for the next iteration of the plan.

2.7.5 Asset Valuations

The best available estimate of the value of assets included in this AM Plan are shown below. The assets are valued at estimated replacement costs:

Replacement Cost (Current/Gross)	**$5,135,000,000**
Depreciable Amount	**$5,135,000,000**
Depreciated Replacement Cost[7]	**$3,211,000,000**
Depreciation	**$ 130,980,000**



[7] Also reported as Written Down Value, Carrying or Net Book Value.

The current replacement cost is the most common valuation approach for specialized infrastructure assets. The methodology includes establishing a comprehensive asset registry, assessing replacement costs (based on market pricing for the modern equivalent assets) and useful lives, determining the appropriate depreciation method, testing for impairments, and determining remaining useful life.

As the City matures its asset data, it is highly likely that these valuations will fluctuate significantly over the next 3 years and they should increase over time based on improved market equivalent costs

2.7.6 Key Assumptions Made in Financial Forecasts

In compiling this AM Plan, it was necessary to make some assumptions. This section details the key assumptions made in the development of this AM plan and should provide readers with an understanding of the level of confidence in the data behind the financial forecasts.

Key assumptions made in this AM Plan are:

- Operational forecasts are based on current budget allocations and are the basis for the projections for the 10-year horizon and do not address other operational needs not yet identified;
- Maintenance forecasts are based on current budget allocations and do not identify asset needs at this time. It is solely based on planned activities;
- 1.47% p.a. has been added to maintenance forecasts to accommodate for donated assets assumed over the 10-year planning horizon; and,
- 1.42 % p.a has been added to operational forecasts to accommodate for donated assets assumed over the 10-year planning horizon.

2.7.7 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AM Plan are based on the best available data. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is defined in the AMP Overview.

Table 28: Data Confidence Assessment for Data Used in Am Plan

DATA	CONFIDENCE ASSESSMENT	COMMENT
Demand drivers	Low	Growth Demand Driver data is considered high confidence while other drivers require further investigation. All drivers require annual monitoring
Growth projections	Low	Population Data is of high confidence. Current growth projection will need to be vetted and improved.

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Table 28: Data Confidence Assessment for Data Used in Am Plan		
DATA	**CONFIDENCE ASSESSMENT**	**COMMENT**
Acquisition forecast	Medium	Currently based on 2019 DC study and SME opinion. Improvement to the model is required and identified in the continuous improvement section of the AM Plan
Operation forecast	Low	Currently budget based and requires future improvement to ensure allocation is accurate
Maintenance forecast	Low	Currently budget based and requires future improvement to ensure allocation is accurate
Renewal forecast - Asset values	Low	Valuation will need to be reviewed as they are mixture of historical costs and future based estimates of replacement costs.
- Asset useful lives	Low	Based on SME opinion. Continuous improvement required to ensure data is vetted and ensure it aligns with Hamilton's actual practices
- Condition modelling	Medium	Mixture of assessment methods. Requires standardization along with predictable timelines for assessments
Disposal forecast	Low	Current disposal information is rolled into renewal. Continuous improvements are required to ensure accurate data is available.

The estimated confidence level for and reliability of data used in this AM Plan is considered to be a **Low -Medium** confidence level.

2.8 PLAN IMPROVEMENT AND MONITORING

2.8.1 Status of Asset Management Practices[8]

ACCOUNTING AND FINANCIAL DATA SOURCES

This AM Plan utilizes accounting and financial data. The sources of the data are:

- 2022 Capital & Operating Budgets;
- 2021 Tender Documents (various);
- Asset Management Data Collection Templates;
- Audited Financial Statements and Government Reporting (FIR, TCA etc);
- Financial Exports from internal financial systems; and,
- Historical cost and estimates of budget allocation based on SME experience.

ASSET MANAGEMENT DATA SOURCES

This AM Plan also utilizes asset management data. The sources of the data are:

- Data extracts from various city applications and management software;
- Asset Management Data Collection Templates;
- Tender documents, subdivision agreements and projected growth forecasts as well as internal reports;
- Condition assessments;
- Subject matter Expert Opinion and Anecdotal Information; and,
- Reports from the mandatory biennial inspection, operational & maintenance activities internal reports.

2.8.2 Improvement Plan

It is important that the City recognize areas of the AM Plan and planning processes that require future improvements to ensure both effective asset management and informed decision making. The tasks listed below are essential to improving the AM Plan and the City's ability to make evidence based and informed decisions. These improvements span from improved lifecycle activities, improved financial planning and to plans to physically improve the assets.

The Improvement plan table 29 below highlights proposed improvement items that will require further discussion and analysis to determine feasibility, resource requirements and alignment to current workplans. Future iterations of this AM Plan will provide updates on these improvement plans.

[8] ISO 55000 Refers to this as the Asset Management System

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Table 29: Improvement Plan
***p.a – per annum**

TASK	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TIMELINE
1.	Review OCI Methodology and provide recommendations for best practice.	Chief Road Official, Consultant	**$3,000** Internal staff time	**1 year** 2022
2.	Improve annual engagement survey process to optimize engagement and respondents.	CAM, TOM, Communications	**$7,500** (Annual) **$30,000** (Total) Internal staff time	**4 Years** 2022-2025
3.	Review current demand drivers and identify additional drivers to be utilized within the plan.	CAM, TOM, Economic Development, Environmental Services	**$3,000** Internal staff time	**Annually**
4.	Standardize and develop risk management knowledge along with supporting documentation.	CAM, TOM, Continuous Improvement & Quality	**$12,500** (Annual) **$25,000** (Total)	**2 Years** 2022-2023
5.	Integrate condition data collection into routine inspections for various assets such as sidewalks, bicycle lanes, traffic signs, and traffic signals.	CAM, TOM	**$10,000** (Annual) **$20,000** (Total) Internal Staff Time	**2 Years** (2022-2023)
6.	Review and verify data from various systems such as Hansen and GIS before importing into EAM.	TOM, Engineering Services	**$17,500** (Annual) **$35,000** (Total) Internal Staff Time	**2 Years** (2022-2023)
7.	Standardize condition assessment outcomes and timed deliverables for future condition assessments.	TOM, CAM, Engineering Services	**$6,000 p.a.** **$18,000** (Total) Internal Staff Time	**3 Years** (2022-2024)
8.	Review and verify functional classes for roads.	Transportation Planning, CAM	**$5,000 p.a.** **$10,000 total** Internal Staff time	**2 Years** (2022-2023)

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Table 29: Improvement Plan
***p.a – per annum**

TASK	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TIMELINE
9.	Revisit level of service for assumed alleyways.	Chief Road Official, TOM, CAM	**$5,000 p.a.** **$10,000 total** Internal Staff time	**2 Years** (2022-2023)
10.	Complete guide rail condition assessment.	TOM, CAM	**$150,000 p.a** **$450,000 total** Internal Staff time, tender process, consultant	**3 Years** (2022-2024)
11.	Review Balanced Scorecard reporting and ensure data and assumptions are consistent with ministry and City reporting and develop additional technical metrics.	Chief Road Official, TOM, CAM	**$5,000 p.a.** **$25,000** total Internal Staff time	**5 Years** (2022-2026)
12.	Develop a Long-Term Financial Plan to connect the budgeting process to the AM planning process.	CAM, TOM, Finance	**$15,000 p.a** **$60,000 Total** Internal Staff Time	**4 Years** (2022-2025)
13.	Improve asset replacement costs by vetting with current market prices instead of historical costs/estimates or internal models.	CAM, TOM, Finance	**$10,000 p.a.**	**Annual**
14.	Review Capital planning process and categorize projects by lifecycle activities.	CAM, TOM, Finance, Engineering Services	**$4,000 p.a.**	**Annual**
15.	Identify transportation assets in other divisions and incorporate into next AM Plan.	CAM, Chief Road Official, TOM	**$10,000 p.a.** **$30,000 Total** Internal Staff Time	**3 Years** (2022-2024)
16.	Improve process for collecting and inputting inventory data into databases.	Chief Road Official, TOM, Continuous Improvement,	**$5,000 p.a.** **$15,000 total** Internal Staff time	**3 Years** (2022-2023)

Table 29: Improvement Plan
***p.a – per annum**

TASK	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TIMELINE
		Engineering Services		
17.	Separate disposal costs and renewal activities	CAM, TOM, Finance, Engineering Services	**$10,000 p.a. $30,000 Total** Internal Staff Time	**3 Years** (2022-2024)
18.	Analyze operational budget to improve AM allocations for lifecycle activities.	CAM, TOM, Finance, Engineering Services	**$10,000 p.a. $40,000 Total** Internal Staff Time	**4 Years** (2022-2025)
19.	Analyze maintenance activities to identify future needs and recommended actions.	CAM, TOM, Finance, Engineering Services	**$6,000 p.a. $24,000 Total** Internal Staff Time	**4 Years** (2022-2025)
20.	Develop Renewal forecasting prioritization to optimize resources and ensure level of services can be maintained.	CAM, TOM, Finance, Engineering Services	**$10,000 p.a. $30,000 Total** Internal Staff Time	**3 Years** (2022-2024)

2.8.3 Monitoring and Review Procedures

This AM Plan will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets as a result of budget decisions.

The AM Plan will be reviewed and updated on a regular basis to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, acquisition and asset disposal costs and planned budgets. These forecast costs and proposed budget will be incorporated into the Long-Term Financial Plan once completed.

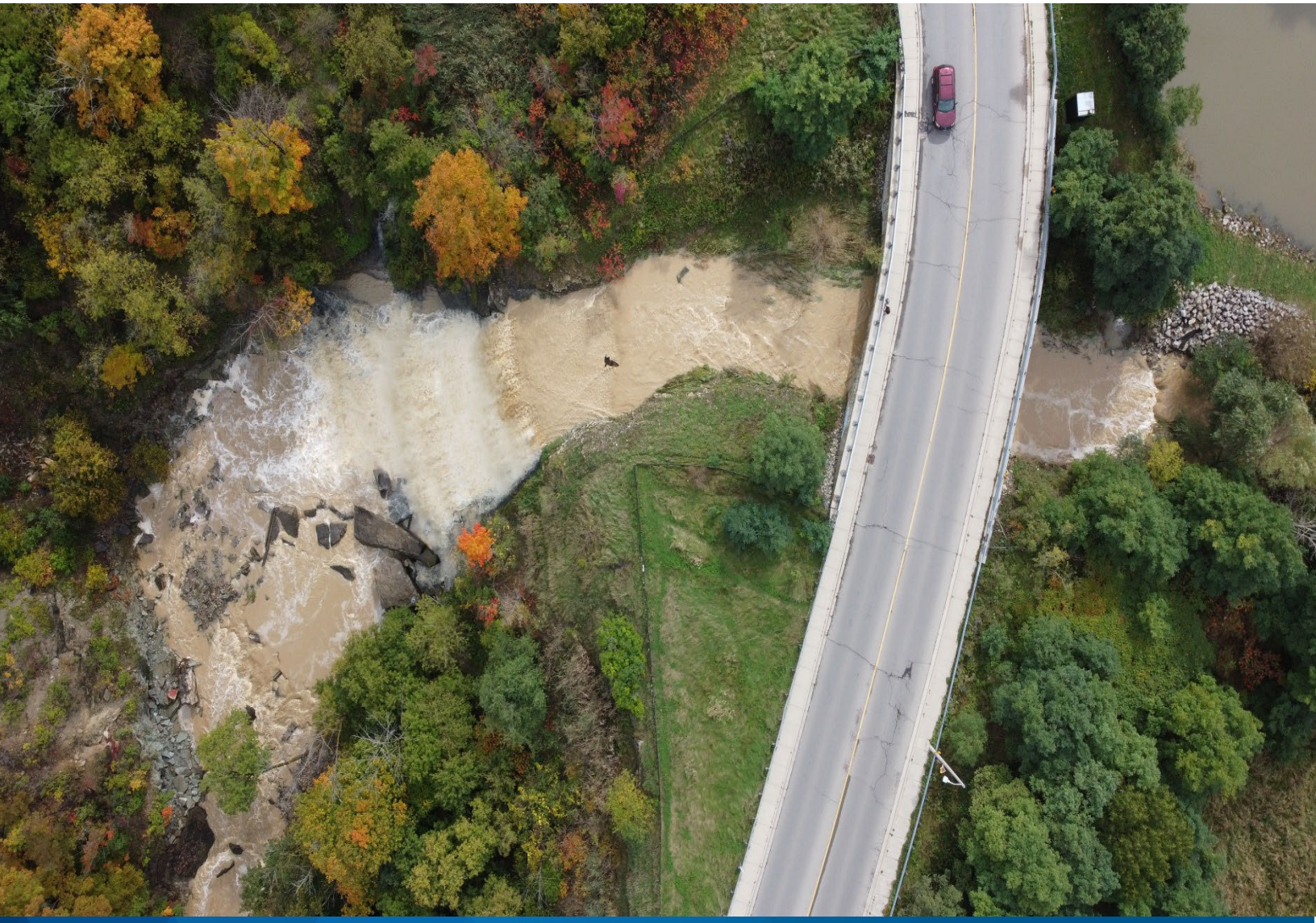
2.8.4 Performance Measures

The effectiveness of this AM Plan can be measured in the following ways:

- The degree to which the required forecast costs identified in this AM Plan are incorporated into the long-term financial plan;
- The degree to which the 1-10 year detailed works programs, budgets, business plans and corporate structures consider the 'global' works program trends provided by the AM Plan;
- The degree to which the existing and projected service levels and service consequences, risks and residual risks are incorporated into the Strategic Planning documents and associated plans; and
- The Asset Renewal Funding Ratio achieving the Organizational target (this target is often 90 – 100%).

2022

Engineered Structures Asset Management Plan



Hamilton

Engineered Structures Service Area

Description

Engineered structures are built to enable a safe, accessible and efficient transportation system for the movement of people, goods and services within the City, and include bridges, major culverts, retaining walls, and overhead sign support structures.

Replacement Value 1.5 Billion

Average Asset Condition

Did you know?

- Hamilton has over 9.6 km's of bridge decking that is part of the road network
- Every day drivers take 1.6 million trips across Hamilton's bridges and the most travelled are the expressway bridges
- Over the next ten years Hamilton will be constructing 3 new bridges

Critical Asset Summary

Critical Assets	Quantity	Replacement Cost	Average Condition	Stewardship Measures
Bridges	166	$ 1.3 billion	Good	All bridge are inspected **Biennially**
Culverts	233 **Major Culverts**	$167 million	Good	All culverts are inspected **Biennially**
Overhead Sign Structures	46	$6.1 million	Good	OSSS's are inspected on a **4-year Cycle**

Data Confidence

Very Low — Very High

Financial Facts

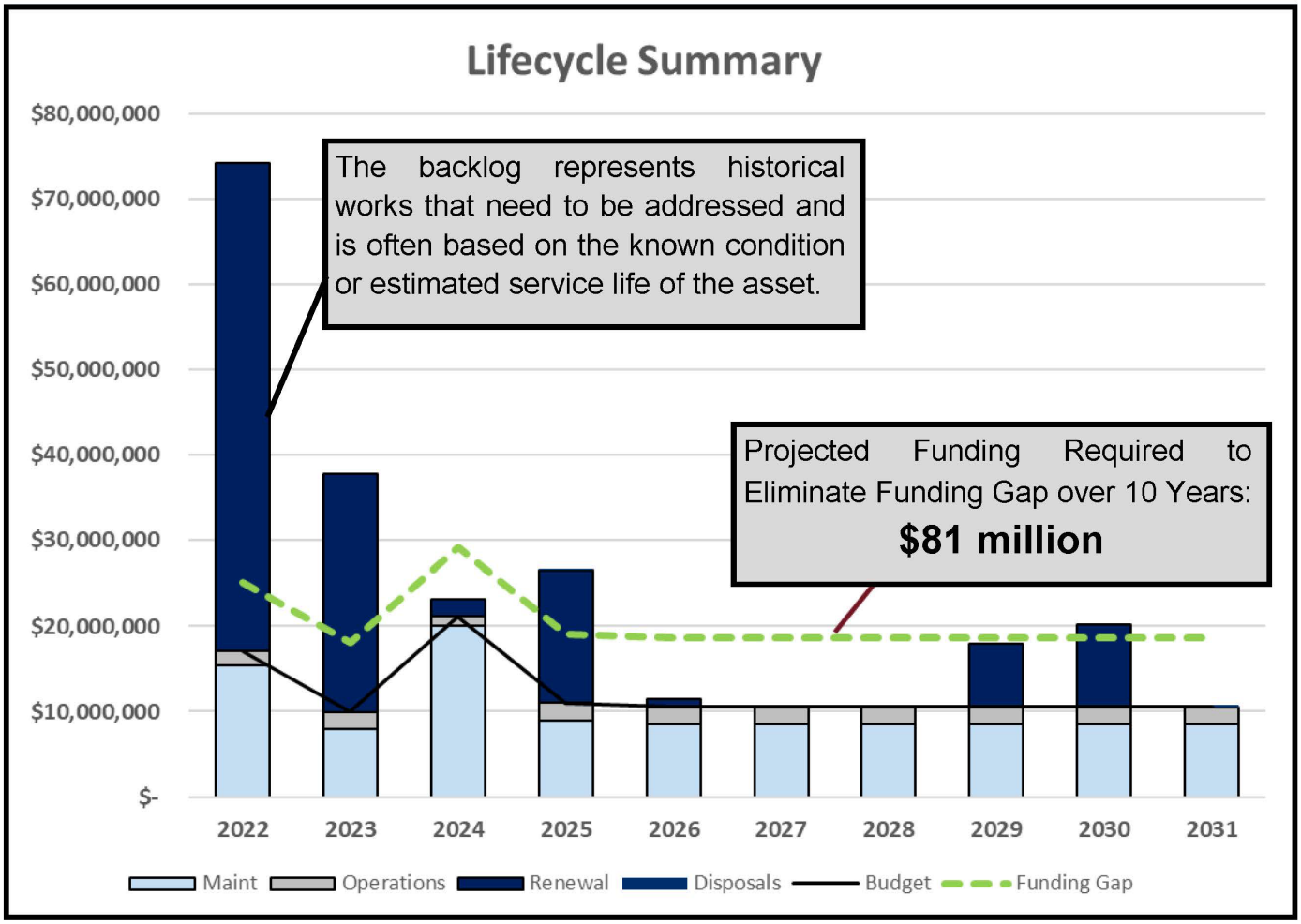
- Hamilton will invest **$122 million** to operate & maintain engineered structures over the next ten years (2022— 2031).
- Hamilton spends **$310 thousand** annually inspecting Bridge and Culverts (>3m) to ensure they are safe for travel and use.

Did you know?

- It is a Provincial obligation for Hamilton to inspect all of its bridges and culverts (>3m) biennially to ensure they are safe.
- Hamilton is disposing 9 of its substandard Overhead Sign Support Structures in 2023.

Financial Indicators

Type of Indicator	Measurement	Explanation
Asset Renewal Funding Ratio	**32.9%** (Target 90—110% on Average)	The ratio demonstrates the rate which the city renews its Engineered structure assets
10 Year O&M Forecast	**66.7%** (Target should be 100 %)	The **%** of funding allocated compared to what needs to be spent
Annual Infrastructure Gap	**$8.1 million**	The difference between what is spent and what should be spent



3.0 ENGINEERED STRUCTURES

Engineered structures are built to enable a safe, accessible and efficient transportation system for the movement of people, goods and services within the City. These assets support broader communities' benefits such as agriculture, education, healthcare, and the economy. These structures serve the various needs of the pedestrians, cyclists, emergency vehicles, agricultural equipment, commercial trucks, and commuter vehicles. These assets have been acquired by the City over multiple decades and they vary greatly in design, construction material, expected life and purpose.

Engineered structure assets include a variety of structures , and for this iteration of the AM Plan, include the assets below in the service area asset hierarchy in Table 30. Minor culverts (< three (3) metre span) are included in the Stormwater section of the Water Works AM Plan.

The service area asset hierarchy outlining assets included in this section is shown below in Table 30. It is important to note that engineered structures is both a service area and an asset class in this AM Plan.

SERVICE AREA	ENGINEERED STRUCTURES
ASSET CLASS	ENGINEERED STRUCTURES
Asset	Bridges Major Culverts > 3m Major and Minor Retaining Walls Overhead Sign Support Structures (OSSS)

3.0 ENGINEERED STRUCTURES

3.1 BACKGROUND

The information in this section is intended to give a snapshot in time of the current state of the engineered structures service area by providing a detailed summary and analysis of existing information as of December 2021, and will provide the necessary background for the remainder of the report. At this time, this section of the AM Plan encompasses engineered structures in the right of way (ROW) which contribute to the Transportation service. However, there are other engineered structures outside of the ROW throughout the City which are not included in this plan because the data was not available at the time of writing the report. This has been identified in Table 50 in the continuous improvement section.

3.1.1 Detailed Summary of Assets

Table 31 displays the detailed summary of assets for the engineered structures service area.

The City owns approximately **$1.53 billion** of engineered structure assets which are, on average to be considered in **Good** condition. The average age of the assets is **33** years which is approximately halfway through their remaining service life (RSL). For most assets this means that the City should be completing preventative and minor maintenance activities per the inspection reports as well as operating activities (e.g. inspection, cleaning) to prevent any premature failures and high cost reactive maintenance. It is anticipated that as the data confidence increases for these assets that the total replacement cost will also increase. Please refer to the AMP Overview for a detailed description of data confidence.

The Corporate Asset Management department acknowledges that some works and projects are being completed on an ongoing basis and that some of the noted deficiencies may already be completed at the time of publication. In addition, the assets included below are assets that are assumed and in service at the time of writing. Table 31 summarizes the information available as of December 2021.

3.0 ENGINEERED STRUCTURES

Table 31: Detailed Summary of Assets for Engineered Structures Service area
***Weighted Average**

ASSET CATEGORY	NUMBER OF ASSETS	REPLACEMENT VALUE	AVERAGE AGE (% RSL)	AVERAGE BCI / SSR	AVERAGE EQUIVALENT CONDITION
ENGINEERED STRUCTURES					
Bridges	166	$1265.1 M	43 years (43%)	74.7	2-Good
Data Confidence	Medium	Medium	Medium	Medium	Medium
Major Culverts	233	$167.41 M	47 years (38%)	71.2	2-Good
Data Confidence	Medium	Medium	Medium	Medium	Medium
Overhead Sign Supports	46	$6.11	20 years (67%)	94.0	2- Good
Data Confidence	Very High	High	Low	N/A	Very High
Major Retaining Walls	511	$95.85 M	23 years (62%)	N/A	3-Fair
Data Confidence	Medium	High	Low	N/A	Medium
Minor Retaining Walls	No Data	No Data	No Data	No Data	No Data
Data Confidence	Very Low	Very Low	Very Low	Very Low	Very Low
TOTAL	**956**	**$1.534 B**	**33 years (51%)**	**72.7 (BCI)**	**2-Good***
Data Confidence	**Medium**	**Medium**	**Medium**	**Medium**	**Medium**

4.0 ENGINEERED STRUCTURES

BRIDGES & MAJOR CULVERTS

Since the amalgamation in 2001, the City acquired bridge and major culvert assets which were not documented in a formal inventory. For the last 20 years, the City has been creating an inventory of right of way (ROW) bridges and culverts as well as completing condition assessments on these assets. While the City adds these “orphaned” bridges and culverts into the inventory whenever they are found, it is still possible that there are bridges or culverts in the City that have not been located which are typically found in old, low traffic ROWs. In addition, there are brand new assets in developments that may not get entered into the inventory immediately due to gaps in the transfer of assets process. Therefore, the City has identified the need to establish a new process to update inventory data when assets are replaced, or new assets are acquired and have identified this as a continuous improvement item in Table 50 of the report.

It was also confirmed during the writing of the report that there are City owned bridge and culvert assets outside of the right of way in other asset classes (e.g. Parks, Golf Courses, etc.) that are not evaluated as part of the OSIM inspections conducted by Engineering Services. These assets are managed by other groups in the City and will be added to the AM Plans in future. It is important to note that these missing assets should be encompassed under core assets per O.Reg. 588/17, but the data was not available at the time of writing the report. As a result, data confidence has been identified as medium for bridge and major culvert assets. This has also been noted in Table 50 in the continuous improvement section of the report.

RETAINING WALLS

The major retaining walls inventory has previously been of a low data confidence, and the City has been working over the last decade to improve the confidence. In 2013, the City started completing inspections, but only encompassed the known retaining walls at the time (approximately 170). In 2015, the City continued inspections on additional located retaining walls (approximately 310). These assets included private assets because the City was unaware of ownership and have been working to confirm ownership on these assets. The retaining walls included in this report are assets that the City has assumed (511). Over the last few years, the City has located more major retaining walls and have completed condition assessments from an ad hoc perspective. In 2021, an inspection was completed on critical retaining walls and more retaining walls have been located, which have not yet been encompassed in this report. As a result, major retaining walls have a medium data confidence because new retaining wall assets have been identified in the most recent assessment, and the City is continuing to find new assets. These items have been noted in Table 50 in the continuous improvement section of the report. At this time, minor retaining walls data is not available, and repairs are typically done on a reactive basis.

A common issue the City encounters with retaining walls is that residents may unknowingly build retaining walls in the ROW. When properties exchange ownership, property owners may assume these were City-built structures and expect the City to repair these structures. Retaining walls less than 600mm do not require a permit and so this is often an issue with minor retaining walls where, as mentioned above, the City does not have a formal inventory. This creates a situation

where the City could be expected to complete reactive repairs on private retaining walls because there is no ownership documentation. The City should therefore investigate creating an inventory of minor retaining walls, confirm ownership of existing minor retaining walls, investigate adding retaining walls <600mm to building permit requirements, and potentially investigate an operational change where Road Patrol staff are instructed to look for newly constructed retaining walls. These items have been noted in Table 50 in the Continuous Improvement section of the report.

OVERHEAD SIGN SUPPORT STRUCTURES (OSSS)

OSSS also typically have a very high to high data confidence excluding the age fields which have low to very low data populated.

3.1.2 Asset Condition Grading

Condition is the measurement of the City's engineered structures health and informs the City of their ability to perform their intended function. Condition information is critical to actively managing the preservation of these structures as it will inform which operational and maintenance activities are optimal as well as the structures renewal schedule. By continuously monitoring the condition it allows the City to proactively plan for lifecycle activities over the long term and ensure these structures are resilient and future friendly.

Condition is the preferred measurement for planning lifecycle activities to ensure assets deliver the agreed upon levels of service and reach their expected useful life. Depending on the type of asset; condition scores are reported using various scales and ranges. Table 32, details how each rating was converted to a standardized condition category so that the condition could be reported consistently across the AM Plans.

5.0 ENGINEERED STRUCTURES

Table 32: Condition Grading System

EQUIVALENT CONDITION GRADING	CONDITION DESCRIPTION	% REMAINING SERVICE LIFE	BRIDGE CONDITION INDEX (BCI)	RETAINING WALL CONDITION	SIGN SUPPORT RATING (SSR)
1- Very Good	The asset is new, recently rehabilitated, or very well maintained. Preventative maintenance required only.	>79.5%	80.5 – 100	N/A	94.5 – 100
2- Good	The asset is adequate and has slight defects and shows signs of some deterioration that has no significant impact on asset's usage. Minor/preventative maintenance may be required.	69.5% – 79.4%	70.5 – 80.4	Good	74.5 – 94.4
3- Fair	The asset is sound but has minor defects. Deterioration has some impact on asset's usage. Minor to significant maintenance is required.	39.5% - 69.4%	59.5 – 70.4	Fair	40.5 – 74.4
4- Poor	Asset has significant defects and deterioration. Deterioration has an impact on asset's usage. Rehabilitation or major maintenance required in the next year.	19.5% -39.4%	50.1 – 59.4	Poor	20.5 – 40.4
5- Very Poor	Asset has serious defects and deterioration. Asset is not fit for use. Urgent rehabilitation or closure required.	<19.4%	0 – 50.0	N/A	0 – 20.4

The following conversion assumptions were made:

- For assets where a condition assessment was not completed, but age information was known, the condition was based on the % of remaining service life;
- For bridges and major culverts (>3m) results of the inspection are used to develop a Bridge Condition Index (BCI) for each structure which is on a 0-100 number scale. This is originally on a 3-point condition scale (Good to Poor) per the MTO[9], but has been converted to a 5-point condition scale (Very Good to Very Poor). It is important to note that the index is used to plan maintenance and repairs and does not indicate the safety of a bridge;
- For OSSS, the results of the inspection are to develop a Structural Support Rating (SSR) which is also on a 0-100 number scale, which was originally on a 4-point condition scale (Excellent to Poor)[10] but has been converted to a 5-point scale (Very Good to Very Poor) for this AM Plan; and,
- For retaining walls, the condition assessment is on a 3-point condition scale ranging from Good to Poor, which could not be converted to a 5-point condition scale at this time.

3.1.3 Age Profile

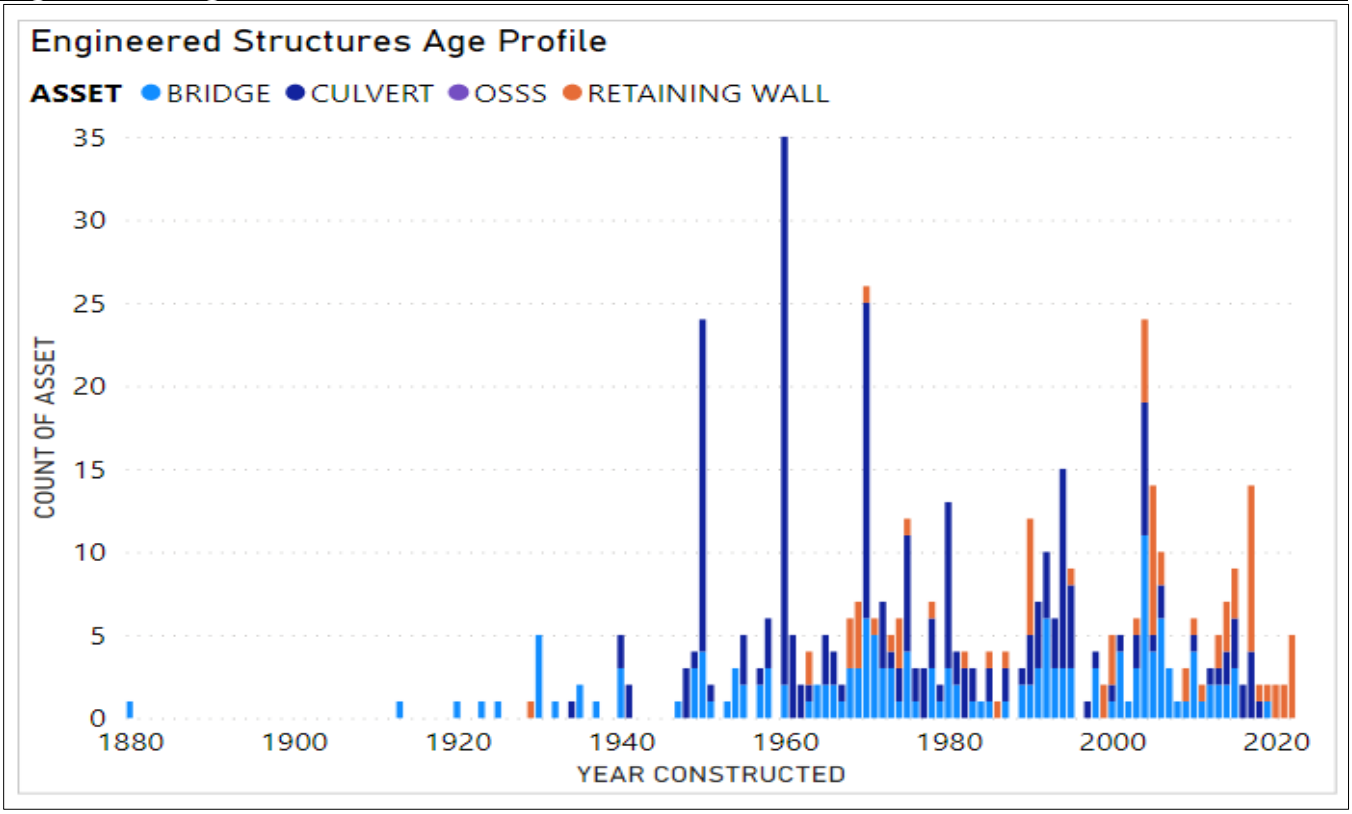
The age of an asset is an important consideration in the asset management process as it can be used for planning purposes as typically assets have an estimated service life where they can be planned for replacement. As a result, age can be used as an indicator of condition when condition data is not available. Per Table 32, when condition data is not available for these assets, the condition has been estimated based on age.

The age profile for engineered structures are shown in Figure16. An analysis of the age profile is provided below for each asset.

[9] MTO, 2015
[10] Ministry of Transportation, 2002

3.0 ENGINEERED STRUCTURES

Figure 16: Engineered Structures Profile



BRIDGES

The average age for a bridge in the City is estimated to be 43 years, and with an estimated service life (ESL) of 75 years. This means on average there is 43% of service life remaining. It is important to note that the ESL is not the design life of the structure, and operations and maintenance activities largely determine if the structures reach the ESL before requiring major rehabilitation. Since the City has not had the resources to complete all operating activities on all bridges, some bridges may not reach the anticipated ESL, emphasizing the importance of the regular inspection program.

Per Figure 16, the oldest bridge in the City was constructed in 1880. This bridge is a pedestrian rail trail bridge and no longer supports vehicular traffic. There are no significant peaks with respect to bridge installation years.

As previously stated, during City amalgamation the City acquired many new bridges and culverts with varying degrees of inventory information. For bridges that have drawings associated with them, the age information is high confidence, but many bridges are estimated, and so although bridge age information has been populated, overall, the age data is of medium confidence.

MAJOR CULVERTS

The average age for a culvert in the City is 47 years, and with an estimated service life (ESL) of 75 years, this means on average there is 37% of service life remaining.

Per Figure 16 above, it is evident that peak culvert installations occurred between 1950 and 1970, peaking during 1960. With an average estimated service life of 75 years, there may be a spike in culvert renewals in 2035, which should be recognized during financial forecasting. This iteration of the AM Plan includes a ten (10) - year forecast horizon however this will be extended out further in the next iteration.

Similar to above, many culverts' construction dates have been estimated, but have been populated where drawings are available. It is important to note that installation years, where unknown, are assumed by approximate decade and so the installation years indicated in this figure are accurate to +/- ten (10) years . As a result, although age information has been populated it is overall of a medium data confidence level.

OVERHEAD SIGN SUPPORT STRUCTURES

At this time, age data was not available for overhead sign support structures. This has been identified as a continuous improvement item in Table 50. However, it is estimated that on average these assets are 20 years old since these assets are predominately on the Lincoln M. Alexander Parkway and the Red Hill Valley Parkway which were built 25 and 15 years ago respectively.

Typically, the asset's estimated service life is 60 years, which means most structures have 67% of remaining service life, however design standards have changed for many of the older structures, and so these will be replaced when inspections indicate critical components are beginning to corrode, emphasizing the importance of regular inspections. In addition, some assets are being proactively disposed as discussed in Section 3.2.4.

RETAINING WALLS

Currently there is minimal age data for major retaining walls with only 17% of assets having age information and unknown data accuracy and so it is considered to be of low data confidence. This has been identified as a continuous improvement item in Table 50.

Based on this minimal information, the average age for major retaining walls is 23 years, with an estimated service life of 60 years. This results in an average 62% of service life remaining.

As previously mentioned, there is currently no data available for minor retaining walls.

3.1.4 Asset Condition Methodology

Engineered structures are heavily regulated through the Ministry of Transportation (MTO) and there are required formal condition assessments that are legislated for each of the asset types with different inspection methodologies, manuals, frequencies, and condition scoring as shown in Table 33.

3.0 ENGINEERED STRUCTURES

Table 33: Inspection and Condition Information
***Data in report is 2019/2020 as that was the data available at the time of writing**

ASSET	INSPECTION FREQUENCY	RECOMMENDED CYCLE	LAST INSPECTION	INSPECTION STANDARDS	CONDITION SCORE OUTPUT
Bridges, Major Culverts	Two (2) -year cycle	Two (2) - year cycle	2020 / 2021*	Ontario Structural Inspection Manual	Bridge Condition Index (BCI)
Overhead Sign Support Structures	Four (4) -year cycle	Two (2) - year cycle (Older aluminum supports)	2019	Ontario Sign Support Inspection Manual (OSSIM)	Sign Support Rating (SSR)
		Four (4) - year cycle (Newer steel and aluminum hybrid supports)	2019		
Major Retaining Walls	Ad Hoc	Two (2) - year cycle	2013, 2015, 2021	Ontario Structural Inspection Manual	3-Point Scale (Good, Fair, Poor)

BRIDGES & MAJOR CULVERTS

For bridges, and major culverts (>three (3) metres), condition assessments are conducted on a two (2) -year cycle using the Ontario Structure Inspection Manual (OSIM) and the City completes inspections annually on half the inventory to achieve the mandatory two (2)-year cycle. For the purposes of this report, the condition of the structure is based on the Bridge Condition Index (BCI) calculated based on the inspection. The formula for BCI is as follows:

$$BCI = \frac{Current\ Value}{Replacement\ Value} \times 100$$

The current value is a weighted sum of element costs and the replacement value is the sum of all element costs. Since this formula is based on unit costs for various elements of the bridge, the BCI is an indicator of condition based on financial factors and does not indicate the safety of the structure. For example, a structure can have a low BCI, but be considered safe because the major elements are functioning as intended, or a BCI can be high, but have a critical element which is deficient making the bridge unsafe. This issue is especially common with major culverts where there are typically few elements and so any deficiencies in the structure can greatly affect the BCI score. The safety of the structure is determined by the bridge engineer consultant during the biennial inspections.

3.0 ENGINEERED STRUCTURES

During the OSIM inspection, the bridge engineer consultant identifies key performance deficiencies for bridge and major culvert elements and provides recommendations. The City works with the bridge engineer to investigate those deficiencies to determine the safety of the structure. In addition, the City uses factors in addition to the BCI to forecast bridge replacements/repairs. These include the BCU (Bridge Criticality and Urgency) and the element criticality scores. These scores are calculated using a series of criteria established by an external consultant, Stantec, through the Bridge Management System (BMS) software that the City uses to plan repairs and maintenance. The City requests reports from the consultant on a regular basis to update risk modelling and budget forecasting. The City uses these reports as a starting point for planning purposes.

For railway structures, rail authorities (i.e. CPR, CNR) complete their own assessments using their own standards, but do not provide these results to the City. For shared structures with another municipality, the City receives annual updates as to shared costs if the other municipality is considered the primary owner.

A continuous improvement item is to document the process for forecasting bridge & major culvert repairs. In addition, as part of the OSIM inspections, the City does not currently receive an overall summary report identifying the bridge consultant's methodology and overall OSIM findings. The City does receive updated inventory data, forecasted works, and a report outlining priority repairs. However, an overall summary report identifying key findings is a suggested continuous improvement item as it consolidates the bridge consultant's assumptions and provides the City with referenceable action items beyond a database input. These have been identified as continuous improvement items in Table 50.

RETAINING WALLS

In 2018, retaining walls were encompassed into the OSIM by the MTO with a recommended 2-year inspection cycle. Since then the City has been working to add more major retaining walls into the inventory to improve the program. The City completed a condition assessment for critical retaining walls in 2021. However, as a result of COVID-19 and lack of resourcing, the City has not yet achieved the 2018 requirement to complete major retaining walls' condition assessments on a 2-year cycle. Condition data in this report is a combination of condition assessment information from 2013 – 2020, but more major retaining walls have potentially been located during the 2021 inspection which have not yet been encompassed in this report. The retaining walls included in this report are assets that the City has assumed (511), and the data confidence for condition is medium as a result. The condition output is on a 3-point scale of Good, Fair, and Poor following guidelines in the OSIM Manual. Where condition data was unknown, and age data was known, the City has based the condition on ESL.

Therefore, the City is working on investigating completing all major retaining walls on a two (2) - year cycle to follow recommendations from the OSIM. This has been identified as a continuous improvement item in Table 50.

OVERHEAD SIGN SUPPORT STRUCTURES

Overhead sign support structures (OSSS) are to be inspected on either a two or four-year cycle depending on the type of sign support per the Ontario Sign Support Inspection Manual (OSSIM)[11]. Currently, the City is inspecting all supports on a four (4) - year cycle, however, the City is intending on disposing of all older supports in 2022.

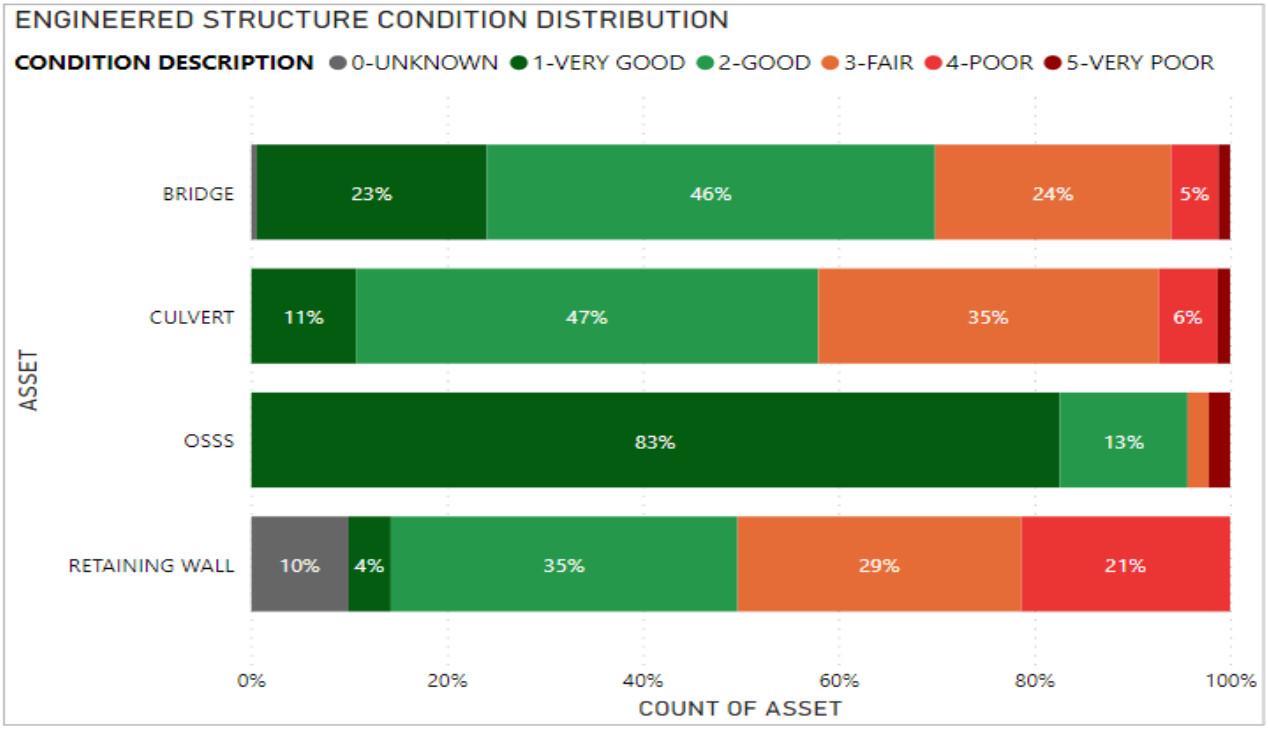
The reason these older supports require more frequent inspection is because design standards have changed for OSSS, and critical elements of the support may not reach the ESL. Since the supports are difficult to repair on site and require a full removal of the structure to repair, a disposal or full replacement is typically more cost effective.

3.1.5 Asset Condition Profile

The condition profile of the City's assets is shown in Figure 17. As mentioned in Section 3.1.2, the original condition grades were converted to a standardized condition category for report consistency.

It is important to note that the condition profile is a snapshot in time from when the condition assessments were completed, and there have been assets which have been replaced since these assessments were completed.

Figure 17: Engineered Structure Condition Distribution



[11] MTO, 2020

3.0 ENGINEERED STRUCTURES

BRIDGES

The average condition of the City's bridges are considered 'Good' and range from 43 to 100 on the BCI condition scale. Very poor bridges may show cracking, delamination, railing issues, scaling and other deficiencies which can pose hazards to vehicle and pedestrians and affect load carrying capacity. Two (2) bridges are considered in Very Poor condition ratings. Current service performance deficiencies are identified in Section 3.1.6.

There is one (1) pedestrian bridge which was recently located in an old right of way and has not yet been encompassed in the City's OSIM inspection. Therefore, it is shown to have an Unknown condition because it cannot be estimated based on service life as the construction year is also unknown. This bridge has a closed status at the time of writing this report and will be assessed in the next OSIM inspection.

The data accuracy is considered very high because a condition assessment was completed, however the data completeness is unknown because there are assets outside of the ROW missing from the inventory. As a result, the data confidence is estimated to be at a medium level.

For more information on how the condition affects the use of the bridge, please refer to Section 3.1.6.

CULVERTS

The average condition for major culverts is considered 'Good' with an average BCI score of 71 and range from 11 to 100 on the BCI condition scale. Typical deficiencies are related to guard rail/barriers and undermining. As previously mentioned, major culverts typically have few elements and so any deficiencies in the structure can greatly affect the BCI score even though the structure may be safe to cross, and so often a poor BCI score does not affect the usage of the structure. However, the culvert with a BCI of 11 was replaced in 2020.

Similar to bridges, the data accuracy is considered very high because a condition assessment was completed, however the data completeness is unknown because there are assets outside of the ROW missing from the inventory. As a result, the data confidence is at a medium level.

For more information on how the condition affects the use of the culvert, please refer to Section 3.1.6

OVERHEAD SIGN SUPPORT STRUCTURES

The average SSR condition rating for overhead sign support structures is 94.02, which is considered 'Good' and structures range from 0 to 100, with the majority in 'Very Good' condition. Typical deficiencies include loose bolts, catwalk requiring removal, broken clamps, missing cover plates, and missing drain holes. The data completeness and accuracy are considered very high for these assets.

One (1) OSSS was given a Very Poor rating which is considered a performance deficiency. Current service performance deficiencies are identified in Section 3.1.6.

RETAINING WALLS

Major retaining walls are currently evaluated on a 3 - point scale from Good to Poor. Currently, 17% of known major retaining walls identified in the inventory do not have condition ratings. Typical deficiencies with poor retaining walls have settlement issues and excessive deformations. As previously explained in Section 3.1.4, the City is investigating completing these condition assessments on a biennial cycle as per the OSIM, which will encompass these unknown asset conditions.

If age data was available, these unknown assets were estimated based on ESL, but 10% of assets did not have age data available and therefore are shown to be in unknown condition. The condition data is considered to be medium data confidence for these assets because the condition data is out of date for many assets as previously discussed in Section 3.1.4.

3.1.6 Asset Usage and Performance

Assets are generally provided to meet design standards where available. However, there are often insufficient resources to address all known deficiencies.

The largest performance issues with engineered structures involve disrupted network connectivity and condition. Table 34 below identifies bridges or major culverts where the bridge status is currently identified as closed, a loading restriction exists, or the very poor condition status should be investigated. A closed bridge status refers to a bridge or major culvert which is not open to vehicular or pedestrian traffic. For the purposes of this report, very poor condition is a BCI <50.0, and for OSSS, SSR <20.4.

The below service deficiencies in Table 34 were identified from the most recent inspection reports as well as staff input. Since some assets have been rehabilitated since the last inspection, the table below may not show all of the very poor condition of bridges & culverts identified in Figure 17.

Table 34: Known Service Performance Deficiencies

ASSET	ASSET NO	LOCATION	TYPE	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Bridge	33	Foxden Road, Flamborough	Pedestrian	Closed Status, Loading Restriction	Bridge is located on a closed ROW. Maximum 10 tonnes, but bridge is closed. Will be considered for disposal.

3.0 ENGINEERED STRUCTURES

Table 34: Known Service Performance Deficiencies

ASSET	ASSET NO	LOCATION	TYPE	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
	331	Birch Avenue, Hamilton	Rail - Decommissioned	Closed Status	Retired CPR asset which was purchased and will be disposed.
	476	Formerly Hall Road, Glanbrook	Pedestrian	Closed Status	Bridge is located on an old ROW. Hall Rd was relocated with a new bridge. This bridge is being considered for disposal.
	457	Bailey Bridge – Valley Inn Road	Pedestrian	Temporary Closed Status	Under Construction in 2021, re-opened in 2022
	248	Spencer Creek Bridge, Dundas	Vehicular	Temporary Closed Status	Under Construction
	427	Pedestrian Pass – Haldibrook Road, Glanbrook	Pedestrian	Very Poor Condition	Bridge is on a boundary road and maintained by Haldimand Region, and the City is responsible for 50%. City will follow up.
	297	Cotton Mill Bridge, Hamilton	Vehicular	Loading Restriction	Maximum 54 tonnes, signage in place
	346	Carlisle Bridge, Flamborough	Vehicular	Loading Restriction	Maximum 16 tonnes, signage in place
Culvert	19	Norman Rd, Flamborough	Vehicular	Loading Restriction	Maximum 15 tonnes, signage in place
OSSS	OS050	Industrial Drive Wilcox Street Local Access	Cantilever – Non-Standard	Very Poor Condition	Impact damage, severed arms and missing sign board

BRIDGES

Currently five (5) bridges are closed. Two (2) bridges are closed due to construction, which were previously identified to be in Very Poor condition. While a bridge being under construction is a temporary service deficiency, it is an interruption of service and so it has been included in this table. The three (3) other bridges which are closed and not under construction are being considered for disposal. In addition, three (3) vehicular bridges have loading restrictions at this time.

The City recognizes that a continuous improvement action is required to investigate the boundary agreement for Bridge 31 to ensure that its lifecycle activities are being appropriately budgeted. Additionally, Schedule 29 By-Law which details which bridges have load restrictions requires updating. Staff provided up to date loading restrictions for this AM Plan.

MAJOR CULVERTS

One (1) major culvert has a loading restriction.

OSSS

As previously mentioned, one (1) OSSS was given a very poor condition rating during the inspection. In response it was made safe and is under consideration for disposal.

3.1.7 Asset Specific Information

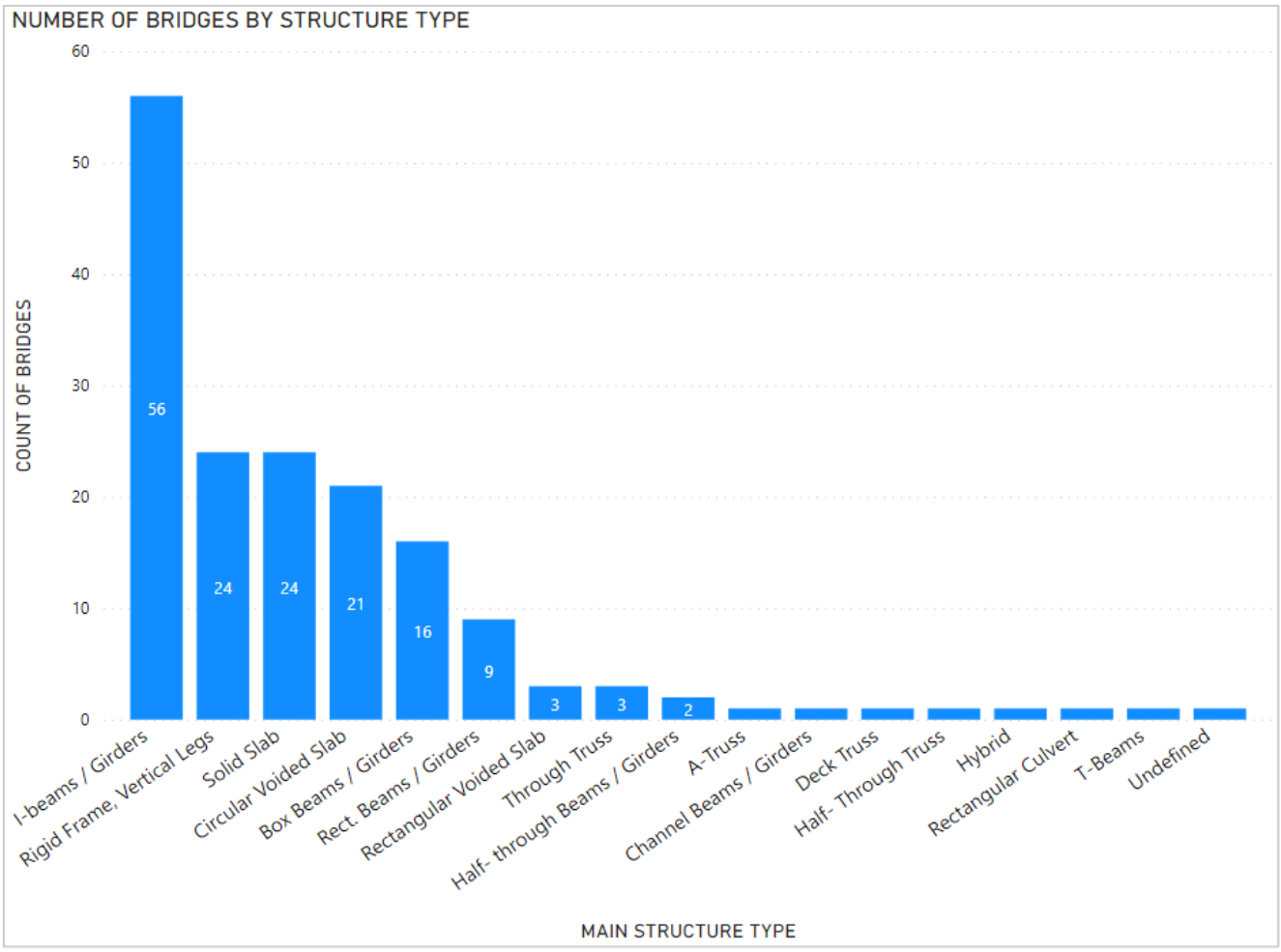
To assist with the analysis and provide some context to readers of the report, pertinent asset specific information is presented below. Different structures have different maintenance requirements and so it is imperative for the City to be aware of the different types of structures in our inventory to ensure the effective lifecycle management of these assets can be undertaken.

BRIDGES

Figure 18 shows the different bridge structure types which exist in the City. The most common bridge is an I-beam/Girder bridge, an example is shown in Figure 19.

3.0 ENGINEERED STRUCTURES

Figure 18: Bridges by Structure Type



3.0 ENGINEERED STRUCTURES

Figure 19: Example of an I-Beam / Girder Bridge on York Blvd

CULVERTS

Figure 20 shows the different major culvert structure types which the City is responsible for. The most common major culvert is a rectangular culvert, an example is shown in Figure 21.

3.0 ENGINEERED STRUCTURES

Figure 20: Major Culverts by Structure Type

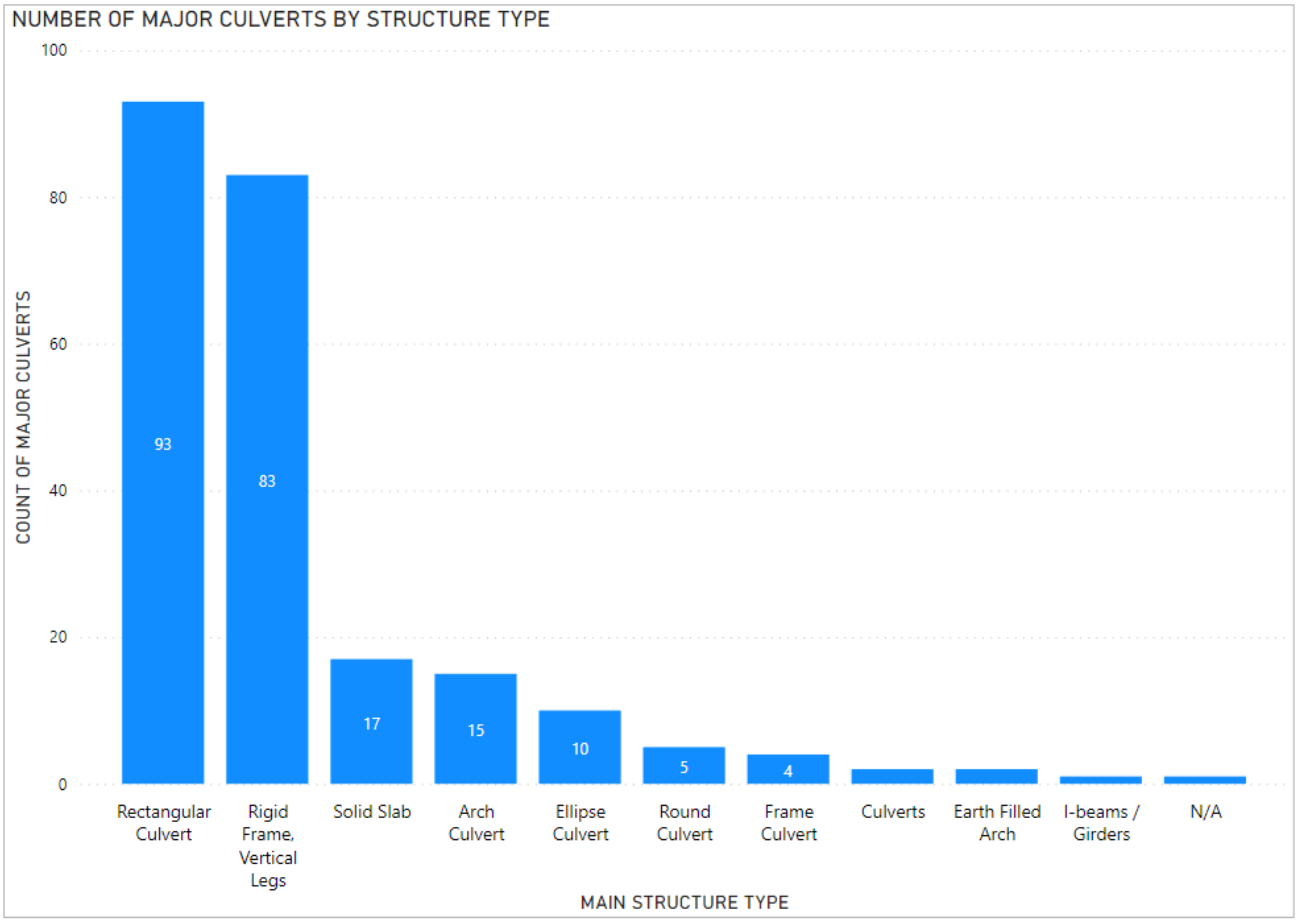


Figure 21: Example of a Culvert

3.0 ENGINEERED STRUCTURES

RETAINING WALL

At this time, it is difficult to effectively group the types of retaining walls in the City inventory and a continuous improvement item has been actioned to improve the data quality. An image of a retaining wall in the City is shown below (Figure 22).

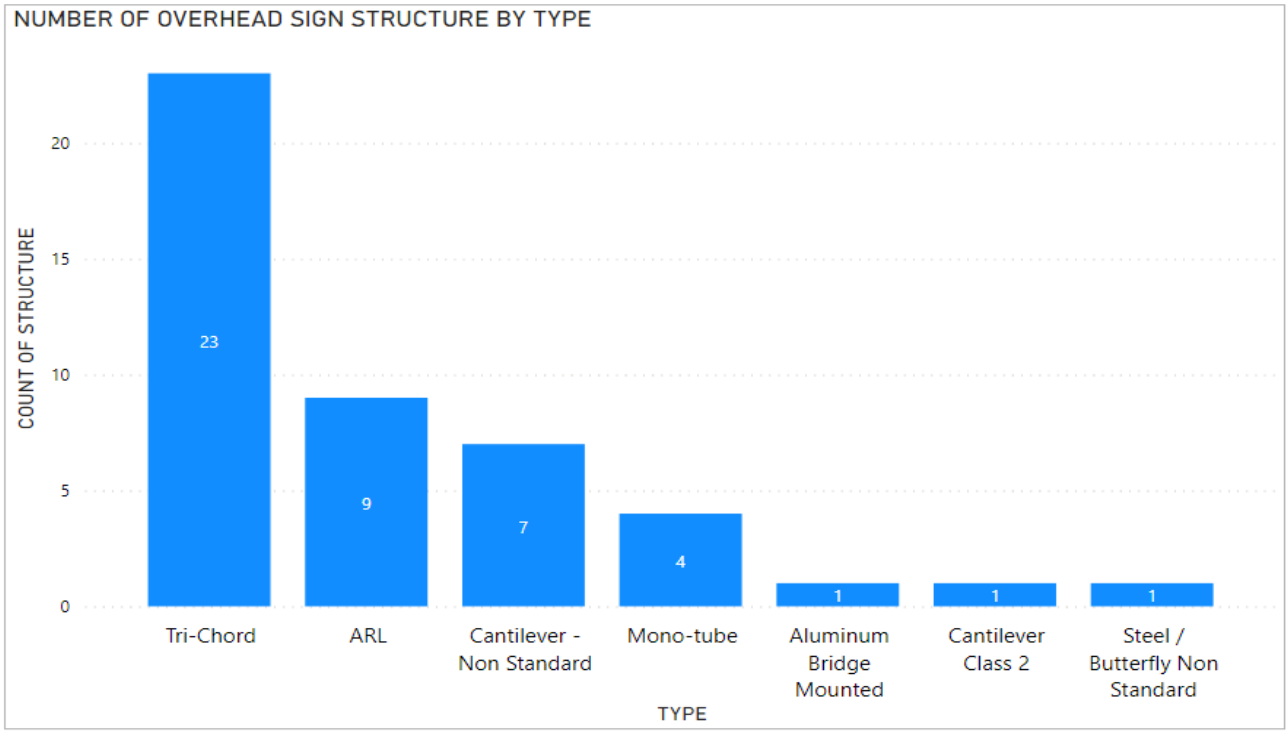
Figure 22: Example of a Major Retaining Wall on James St South

OSSS

Figure 23 shows the different types of overhead sign support structures which exist in the City with the most common support type being a tri-chord structure.

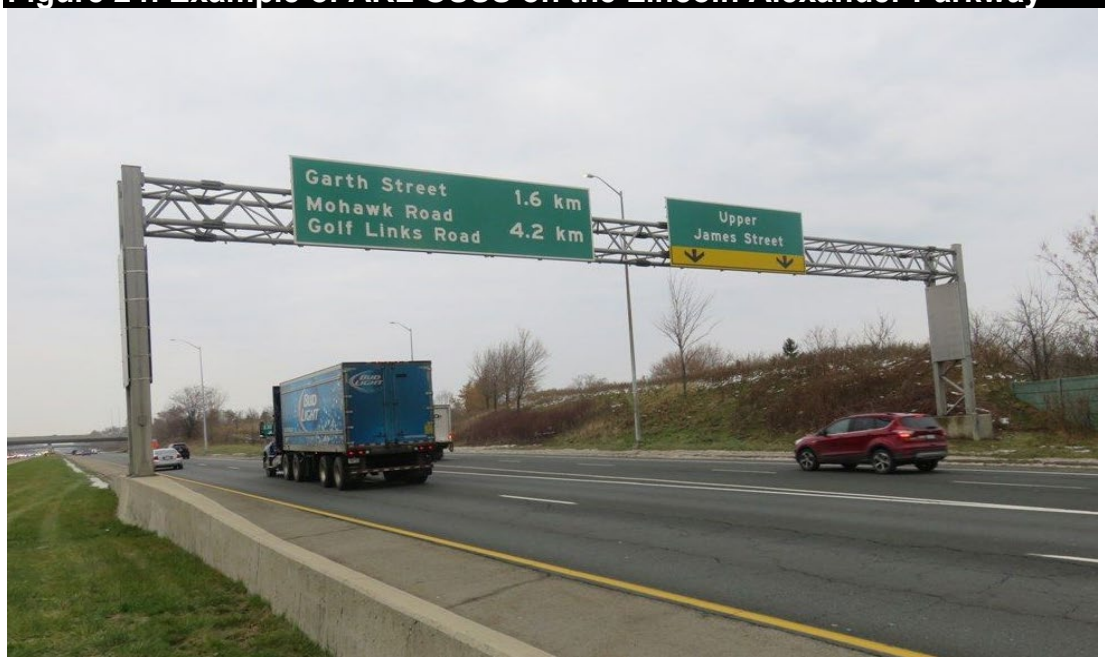
3.0 ENGINEERED STRUCTURES

Figure 23: Overhead Sign Support Structure by Type



The older sign support referenced in Section 3.1.4 which requires more frequent inspection applies to the Aluminum Rectangular Leg (ARL) structure type shown below in Figure 24. These older aluminium structures are common on the Lincoln M Alexander Parkway, and all nine (9) of these structures are scheduled for disposal in 2022 as shown in Table 38.

Figure 24: Example of ARL OSSS on the Lincoln Alexander Parkway



3.2 LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how the City plans to manage these assets at the agreed levels of service at the accepted lifecycle costs.

3.2.1 Acquisition Plan

Acquisition reflects new assets that did not previously exist or works which will upgrade or improve an existing asset beyond its current capacity. They may result from growth, demand, social or environmental needs. Assets are donated to the City through development agreements or through the City constructing assets to meet broader program or community needs.

SELECTION CRITERIA

Proposed acquisition of new assets, and upgrade of existing assets, are identified from various sources such as community requests, proposals identified by strategic plans, growth, or partnerships with others. Potential upgrade and new works should be reviewed to verify that they are essential to the entities needs. Proposed upgrade and new work analysis should also include the development of a preliminary renewal estimate to ensure that the services are sustainable over the longer term. Verified proposals can then be ranked by priority and available funds and scheduled in future works programs.

CURRENT ACQUISITIONS

At this time Hamilton has bridge construction projects planned for Waterdown Road, Sam Lawrence ROW bridge and a pedestrian bridge at limedridge across the LINC. At the time of writing this report there was limited availability of some information and so there may be other planned bridge projects not yet acknowledged within this AM Plan. Hamilton will seek to consolidate its bridge information across multiple divisions for the next iteration of the AM Plan.

SUMMARY OF FUTURE ASSET ACQUISITION COSTS

When the City commits to acquiring new assets, they must be prepared to fund future operations, maintenance, disposal, and renewal costs. They must also account for future depreciation when reviewing long term sustainability. The City will continue to monitor this annually and update the AM plan when new information becomes available.

3.2.2 Operations and Maintenance Plan

The City's operational and maintenance activities are centered on ensuring that engineered structures are consistently considered in good working order. Daily, weekly, seasonal, and annual activities are undertaken by staff to ensure the assets perform within acceptable parameters and to monitor the condition of the assets for safety and regulatory reasons.

OPERATIONS: This lifecycle activity includes regular actions to ensure the ongoing availability of the service such as winter mitigation, regulatory condition inspections, bridge cleaning, monitoring climate events and drain cleaning.

3.0 ENGINEERED STRUCTURES

MONITOR CLIMATE EVENTS

As part of the City's road network, these assets are monitored on a consistent basis for events that can affect the use of the assets. The City regularly monitors weather/climate risks that may require the public to be updated as to the condition and usability of the assets. Staff respond to events such as washouts, flooding, extreme freezing, and regular seasonal weather conditions.

WINTER MITIGATION FOR THE ROAD NETWORK

The Province provides a minimum standard for winter operations such as snow plowing, mitigation efforts (e.g. salt, ice prevention and treatment), monitor for closure events and posting temporary warning signs when necessary. Winter road work for bridges and culverts are integrated with all other road network assets as they are considered part of the overall transportation network.

BRIDGE/CULVERT CLEANING

Bridge or Culvert cleaning occurs in the spring after winter maintenance activities such as salting/sanding/spraying have ceased for the season. The winter maintenance treatments (chlorides) need to be cleaned from the roadway surfaces, expansion joints, bearing seats and other components to minimize the deterioration of these structural elements and maximum the useful service life of the assets.

REGULATORY COMPLIANCE & CONTINUOUS MONITORING

Through legislation, the Province provides standards of care for bridge and culvert assets as well as the timing for biennial inspection to be performed by qualified engineers. The biennial inspection informs the AM Plan with bridge and culvert renewal data and itemizes suggested minor and major planned maintenance activities that will allow these structures to achieve their intended useful live. On average The City invests **$525 thousand** annually to inspect its engineered structures and ensure their safety and inform the City of recommended planned maintenance activities.

MAINTENANCE: This lifecycle activity should be viewed as the ongoing management of deterioration. The purpose of planned maintenance is to ensure that the correct interventions are applied to assets in a proactive manner and to ensure it reaches its intended useful life. Maintenance does not significantly extend the useful life of the asset but allows assets to reach their intended useful life by returning the assets to a desired condition.

Proactively planning maintenance significantly reduces the occurrence of reactive maintenance which is always linked to a higher risk to human safety and higher financial costs. The City needs to plan and properly fund its maintenance to ensure the engineered structures are reliable and achieve their desired level of service.

Maintenance includes all actions necessary for retaining an asset as near as practicable to the appropriate service condition and includes activities such as approach repairs, deck repairs, joint repairs, erosion control, handrail repairs, surface sealing or gabion basket repairs . Examples of typical operations and maintenance activities with their accompanying 2021 costs (if known) are shown in Table 35.

3.0 ENGINEERED STRUCTURES

Table 35: 2022-2024 Planned Maintenance		
YEAR	**MAINTENANCE**	**BUDGET (M)**
2022	#403 – Southcote – Garner	$3.0
	#404 – Harrison Road	$1.4
	#159 – Regional Road 56	$1.3
	Other Maintenance Projects	$9.3
2023	#126 – Regional Road 56	$1.3
	#189 – Regional Road 56	$0.9
	Other Maintenance Projects	$5.7
2024	#451 – Highway 5 East	$4.9
	#329 – Burlington St East	$3.6
	#330 – Birch Ave.	$7.0
	Other Maintenance Projects	$4.6

From **2025** to **2031** the City will invest an additional **$60 million** for various maintenance projects across the City. These investments are intended to allow these assets to reach their estimated service life and minimize reactive maintenance costs. It should be acknowledged that these forecasted costs do not fully include the recommended works that need to be undertaken to ensure the entire inventory of assets will achieve their desired services lives and level of service.

Currently unit costs associated with these activities are mostly unknown, which is a future continuous improvement item presented in Table 50 in the Continuous Improvement section. In addition, there is no dedicated funding for OSSS other than for condition assessments and this concern has also been identified in the continuous improvement section.

Table 36: Lifecycle Activities				
ASSET	**LIFECYCLE STAGE**	**LIFECYCLE ACTIVITY**	**FREQUENCY**	**2021 COST**
Bridges, Major culverts (>3m)	Operation	Cleaning	Annually	Unknown
		Inlet/Outlet Cleaning	After rain event	Unknown
		Drain Cleaning	Annually	Unknown
		Animal Control	Ad Hoc	Unknown

3.0 ENGINEERED STRUCTURES

Table 36: Lifecycle Activities

ASSET	LIFECYCLE STAGE	LIFECYCLE ACTIVITY	FREQUENCY	2021 COST
		OSIM Inspection	2 - year cycle	$300,000 per annum
	Maintenance	Material Repairs (Steel, Concrete, Timber)	Ad Hoc	Unknown
		Bridge Surface Repair	Ad Hoc	Unknown
		Expansion Joint Repair	Ad Hoc	Unknown
		Railing Repair	Ad Hoc	Unknown
		Route and Seal	Ad Hoc	Unknown
		Painting	Ad Hoc	Unknown
		Component Maintenance (Bearing, Cathodic Protection)	Ad Hoc	Unknown
		Erosion Control	Ad Hoc	Unknown
		Minor Component Replacement (Railing, Bearing)	Ad Hoc	Unknown
Retaining Wall	Operation	Graffiti Control	Ad Hoc	Unknown
		OSIM Inspection (>2m)	2 - year cycle	Included above.
		Non-OSIM Inspection (<2m)	Ad Hoc	Unknown
	Maintenance	Material Repair (Concrete, Wood, Steel, Masonry)	Ad Hoc	Unknown
		Gabion Basket Repair	Ad Hoc	Unknown
Overhead Sign Support Structures	Operation	Inspection	2- or 4 - year cycle	$149,950

At this time, many operational and maintenance activities are not being completed on all bridges/culverts at the suggested interval due to budget and resourcing constraints. When operational and maintenance activities are not completed in a timely and consistent manner it may lead to high cost reactive maintenance, a greater risk to public safety and reputational damage to the City.

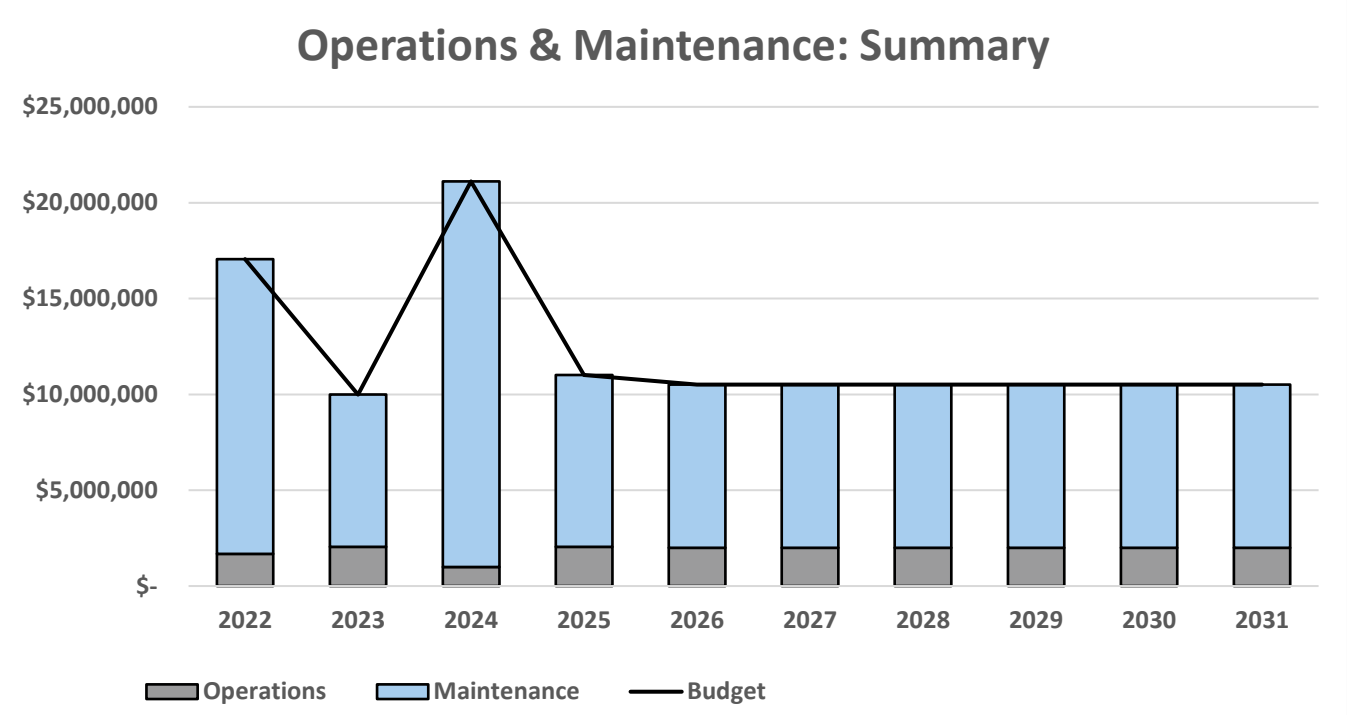
When the City completes the necessary operational and maintenance activities, high cost reactive repairs can be prevented. For example, cleaning drains at the appropriate time annually will lead to less erosion of piers and this will ensure the assets reach their estimated service life. This need has been identified as a risk in the Section 3.6. Currently, assessment and priority of reactive maintenance is undertaken by staff using subject matter expert experience and judgement. Any reactive repairs are completed by City staff. The City is investigating options to add necessary resources as well as retaining a contractor to complete these operational and maintenance activities.

The City does complete the regulated inspections for Bridges and Culverts and is meeting its regulatory responsibilities for those assets.

SUMMARY OF FORECAST OPERATIONS AND MAINTENANCE COSTS

Forecast operations and maintenance costs are expected to vary in relation to the total value of the asset registry. If additional assets are acquired, the future operations and maintenance costs are forecast to increase. If assets are disposed of, the forecast operation and maintenance costs are expected to decrease. Figure 25 shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget.

Figure 25: Operations and Maintenance Summary
All figure values are shown in 2021 dollars.



The forecast costs include all costs from both the capital and operating budget. Asset management focuses on how taxpayer or ratepayer dollars are invested by lifecycle activities and not by budget allocation since both budgets contain various lifecycle activities, they must both be consolidated for the AM Plans.

The City is providing sufficient budget for planned operation and maintenance works only. It is clear from the analysis of recommended works needing completion, the City has insufficient budget to achieve all of the works required to ensure that assets will be able to achieve their estimated service life at the desired level of service. The City will address the operational and maintenance shortfalls and forecasted costs for the next iteration of the plan as there was insufficient data to develop reliable forecasts at the time of writing this report.

As the City continues to develop condition profiles and necessary works are identified based on their condition, it is anticipated this operation and maintenance forecasts will increase significantly. Where maintenance budget allocations will result in a lesser level of service, the service consequences and risks have been identified and are highlighted in the Risk Section 3.6. Future iterations of this plan will provide a much more thorough analysis of operations and maintenance costs including types of expenditures for training, mandatory certifications, insurance, staffing costs and requirements, equipment and maintenance activities

3.2.3 Renewal Plan

Renewal is major works which does not increase the assets design capacity but restores, rehabilitates, replaces, or renews an existing asset to its original service potential. Works over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional future operations and maintenance costs.

Engineered structure renewals are typically undertaken to either ensure the assets reliability or quality will meet the service requirements set out by the City. Renewal projects are often triggered by service quality failure and can often be prioritized by those that have the highest consequence of failure, have high usage, have high operational and maintenance costs and other deciding factors.

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in Table 37, and are based on estimated design life for this iteration. Future iterations of the plan will focus on the Lifecycle approach to estimated service life which can vary greatly from design life. Asset useful lives were last reviewed in 2022 and will be reviewed in 2023.

Table 37: Useful Lives Assets

ASSET (SUB)CATEGORY	USEFUL LIFE
Bridges	75 years
Major Culverts (>3m)	75 Years
Retaining Walls	60 Years
Overhead Sign Support Structures	60 Years

3.0 ENGINEERED STRUCTURES

The estimates for renewals in this AM Plan were based on the register method which utilizes the detailed listing of The City's asset inventory and all available lifecycle information to determine the optimal timing for renewals.

RENEWAL RANKING CRITERIA

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing a bridge that has a load limit); or,
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. condition of a culvert). [12]

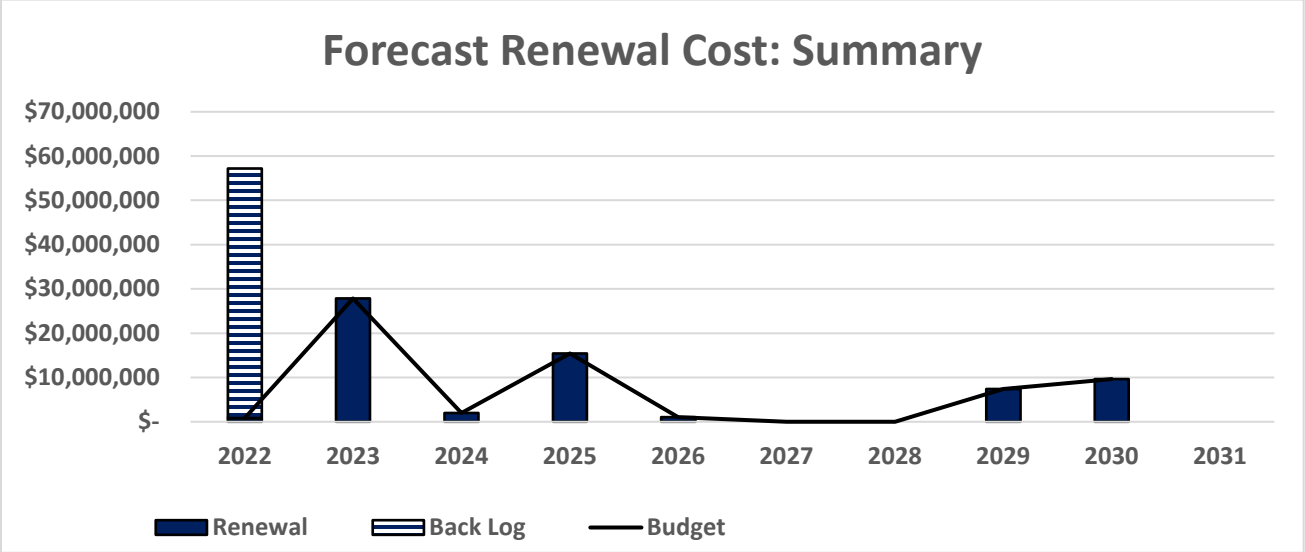
It is possible to prioritize renewals by identifying assets or asset groups that:

- Have a high consequence of failure;
- Have high use and subsequent impact on users would be significant;
- Have higher than expected operational or maintenance costs; and,
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service. [13]

SUMMARY OF FUTURE RENEWAL COSTS

Forecast renewal costs are projected to increase over time if the asset inventory increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in Figure 26.

Figure 26: Forecast Renewal Costs
All Figure Values Are Shown In 2021 Dollars.



[12] IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.
[13] Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

The forecasted renewal costs are age based for this iteration of the AM Plan and as such there is a significant backlog of renewal work listed. For the next AM Plan, the City will be moving to a condition-based approach for its renewal planning as it provides a more accurate picture to manage these assets.

Deferring renewals create risks of higher financial costs, decreased availability, and decreased satisfaction with asset performance. Ultimately, continuously deferring renewals works ensures The City will not achieve intergenerational equality. If the City continues to push out necessary renewals, there is a high risk that future generations will be unable to maintain the level of service the customers currently enjoy. It will burden future generations with such significant costs that inevitably they will be unable to sustain them.

Properly funded and timely renewals will ensure the assets perform as expected and it is recommended to continue to analyze asset renewals based on criticality and availability of funds for future AM Plans.

3.2.4 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, possible closure of service, decommissioning, disposal of asset materials, or relocation. Disposals will occur when an engineered structure reaches the end of its useful life. The end of its useful life can be determined by factors such as excessive operation and maintenance costs, regulatory changes, obsolesce or demand for the structure has fallen.

Assets identified for possible decommissioning and disposal are shown in Table 38. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in Table 38. Any costs or revenue gained from asset disposals is included in future iterations of the plan and the long-term financial plan.

At this time there are three (3) disposals planned over the ten-year planning horizon for bridges and major culverts, and nine (9) disposals are planned for OSSS. Bridge 33 will change ownership and as such alleviates the City from the responsibilities of ongoing lifecycle costs. Bridge 476 will be programed for disposal over the planning period and will also eliminate many ongoing operational and maintenance costs along with the significant renewal costs required to keep the bridge in working condition.

Table 38: Assets Identified for Disposal

ASSET	REASON FOR DISPOSAL	TIMING	DISPOSAL COSTS	OPERATIONS & MAINTENANCE ANNUAL SAVINGS
Bridge 033 Foxden Rd	Change of Ownership	By 2025	$50,000	$4,000

3.0 ENGINEERED STRUCTURES

Table 38: Assets Identified for Disposal

ASSET	REASON FOR DISPOSAL	TIMING	DISPOSAL COSTS	OPERATIONS & MAINTENANCE ANNUAL SAVINGS
Bridge 476 Formerly Hall Rd	Bridge at end of useful life and it is not essential	By 2031	$200,000	$4,500
Bridge 331 Birch Ave	Retired CPR asset which was purchased and will be disposed.	By 2024	$135,000	$3,100
9 OSSS (ARL) structures along the Linc	Asset Deficiencies require removal	By 2023	$425,000	$35,000

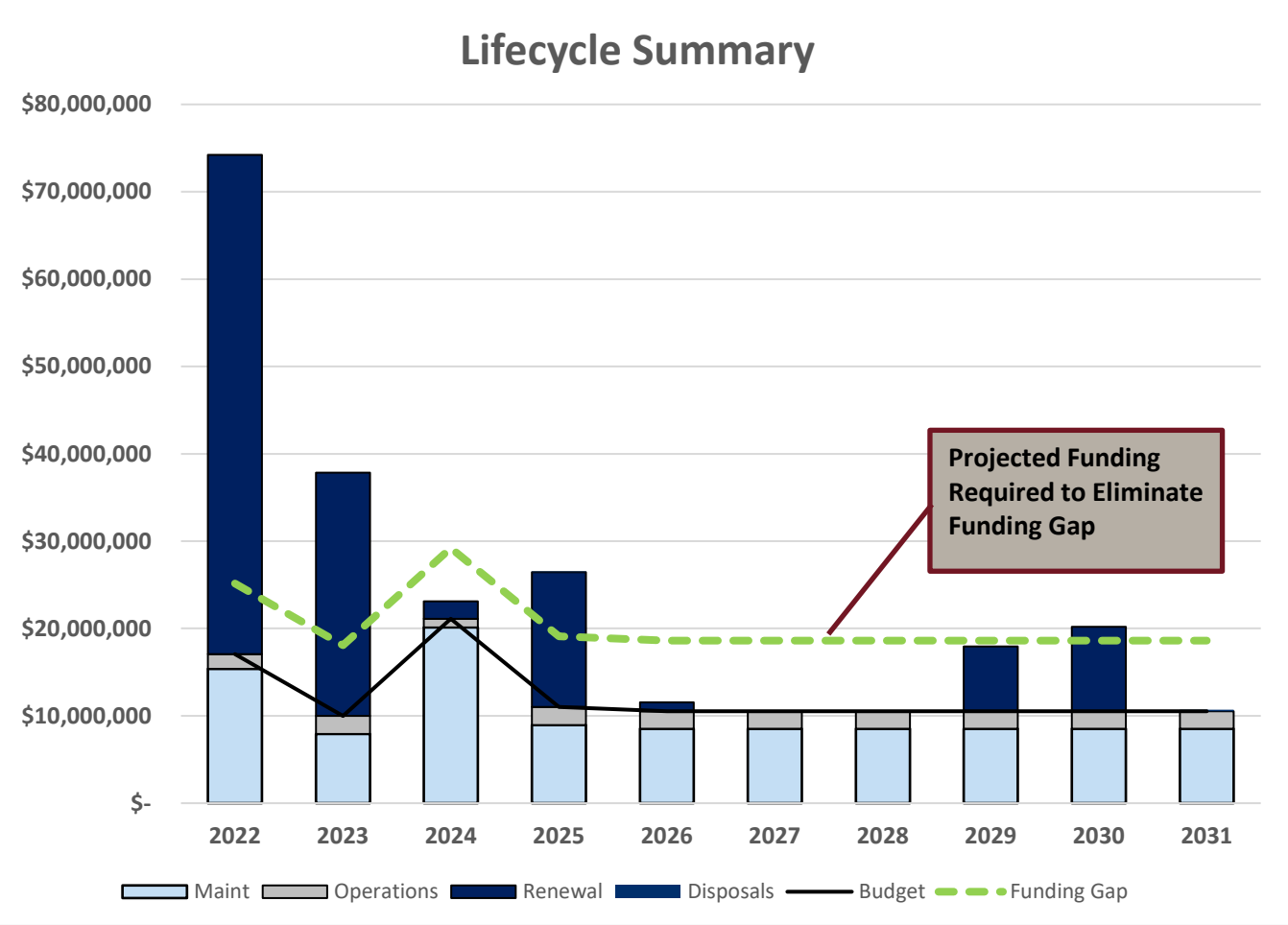
SUMMARY OF ASSET FORECAST COSTS

The financial projections from this asset plan are shown in Figure 27. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

The bars in the graph represent the forecast costs needed to minimize the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.

3.0 ENGINEERED STRUCTURES

Figure 27: Lifecycle Summary
All figure values are shown in 2021 dollars.



The City has allocated budget planned for operational and maintenance activities requirements over the 10-year planning horizon however there is insufficient budget to complete the necessary renewal works nor is there sufficient budget to complete all the recommended operational and maintenance works. When deferring either operations, maintenance or renewal works occur, the City runs the risk of significantly higher reactive costs, service interruptions, decreased satisfaction, harm to its reputation along with other risk costs such as legal fees.

Without sufficient funding the City has little option but to defer these necessary lifecycle activities. Deferring important lifecycle activities is never recommended. The City will benefit from allocating sufficient resources to developing its long-term financial plan to ensure that over time the City can fully fund the necessary lifecycle activities. Funding these activities helps to ensure the assets are compliant, safe, and effectively deliver the service the customers need and desire.

The lack of funding allocated for the backlog of renewals and the necessary lifecycle activities creates an additional issue which is intergenerational equity. Each year the City defers necessary lifecycle activities it pushes the ever-increasing financial burden on to future generations. It is imperative the City begin addressing the lack of consistent and necessary

funding to ensure that intergenerational equity will be achieved. Over time, allocating sufficient funding on a consistent basis ensures that future generations will be able to enjoy the same standards being enjoyed today.

Over time the City will continue to improve its lifecycle data and this will allow for informed choices as how best to mitigate those impacts and how to address the funding gap itself. This gap in funding in future plans will be refined over the next 3 years and improve the confidence and accuracy of the forecasts.

3.3 MANDATORY BRIDGE & CULVERT LEVELS OF SERVICE

As previously mentioned, the City is developing this AM Plan to be in accordance with O.Reg. 588/17 requirements. Table 5 in O.Reg. 588/17 identifies specific metrics that must be reported in the AM Plan for Bridges and Culverts. These metrics are divided into community and technical levels of service. Since core assets only encompass bridges and culverts, there are not mandatory O.Reg. 588/17 levels of service for OSSS or retaining walls.

3.3.1 O.Reg. 588/17 Community Levels of Service

Per Table 5 in O.Reg. 588/17, there are community levels of service that the City is required to report on in order to meet the provincial level of service requirement. These qualitative metrics are reported below.

SCOPE

1. Description of the traffic that is supported by municipal bridges (e.g., heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, cyclists).

City bridges are designed in accordance with the standard and requirements of the Bridge Design Code at the time of construction. The City owns three (3) types of bridges: Vehicular, Railway, and Pedestrian bridges.

- Vehicular bridges or culverts have been designed to carry heavy transport vehicles, motor vehicles, emergency vehicles, pedestrians, mobility aids, and cyclists wherever possible;
- Railway bridges have been designed for railway usage only and do not support other vehicular types. However, some previous rail bridges have been converted to pedestrian (e.g. Rail Trail); and,
- Pedestrian bridges or culverts have been designed to carry pedestrians, mobility aids, cyclists, and maintenance vehicles.

The City is actively pursuing opportunities to offer multi-modal transportation options and continues to invest in pedestrian and cycling connectivity through the rehabilitation and new construction of pedestrian bridges as explained in Section 3.2.3.

QUALITY

2. *Description or images of the condition of bridges and how this would affect use of the bridges.*

Photos of bridges within the indicated BCI range are shown in Figure 28. Bridge assets range in BCI from 43 to 100. The description of each BCI range can be found in Table 32. High criticality bridges show cracking, delamination, railing issues, scaling and other deficiencies which can pose vehicle/pedestrian hazards, and affect load carrying capacity.

Typically, if a bridge is in Very Good to Poor condition the asset continues to operate and provide service to the public with operations and maintenance activities being completed on the asset in accordance with the OSIM findings. Depending on the findings of an inspection the usage may be modified such as changing a vehicular bridge into a pedestrian bridge. If the bridge is deemed unsafe for pedestrian and vehicular access, the structure will be closed

with clear signage prohibiting the use of the bridge and the asset will be evaluated for renewal or disposal.

If the asset reaches Very Poor status, the bridge is closed immediately while the City assesses the safety of the structure, and determines what reactive repair, rehabilitation or disposal actions to take. If a bridge is closed, it is considered a service performance deficiency. Current service performance deficiencies are identified in Section 3.1.6. An image of a bridge in the 5 condition categories are shown below in Figure 28.

6.0 ENGINEERED STRUCTURES

Figure 28: Bridge Conditions

CONDITION	ELEVATION	UNDERSIDE (SOFFIT)
Very Good		
Good		
Fair		
Poor		
Very Poor		

3. *Description or images of the condition of culverts and how this would affect use of the culverts.*

Photos of culverts within the indicated BCI range are shown in Figure 29. Major culvert assets range in BCI from 11 to 100. The description of each BCI range can be found in Table 32. High criticality culverts have deficiencies such as undermining foundation, corrosion, spalling and delamination.

Typically, if a culvert is in Very Good to Poor condition the asset continues to operate and provide service to the public with operations and maintenance activities being completed on the asset in accordance with the OSIM findings. Depending on the findings of an inspection the usage may be modified such as changing a vehicular culvert into a pedestrian culvert. If the culvert is deemed unsafe for pedestrian and vehicular access, the structure will be closed with clear signage prohibiting the use of the culvert and the asset will be evaluated for renewal or disposal.

If the asset reaches Very Poor status, the culvert is closed immediately while the City assesses the safety of the structure and determines what reactive repair, rehabilitation or disposal actions to take and is considered a service performance deficiency. Current service performance deficiencies are identified in Section 3.1.6.

Images of culverts from very good *to very poor condition* based on the BCI value is shown in Figure 29.

6.0 ENGINEERED STRUCTURES

Figure 29: Major Culvert Conditions

Condition	Elevation	Inside (Barrel)
Very Good		
Good		
Fair		
Poor		
Very Poor		

3.3.2 O.Reg. 588/17 Technical Levels of Service

In addition, there are technical levels of service that the City is required to report on in order to meet the provincial level of service requirement. These quantitative metrics are reported in Table 39.

Table 39: Technical Levels of Service

SERVICE ATTRIBUTE	TECHNICAL LEVELS OF SERVICE	MEASURE
Scope	Percentage of bridges in the municipality with loading or dimensional restrictions.	2.4%
Quality	1. For bridges in the municipality, the average bridge condition index value.	74.7
	2. For structural culverts in the municipality, the average bridge condition index value.	71.2

The Scope service attribute contains information related to loading or dimensional restrictions. Currently four (4) bridges have loading restrictions which are included under service performance deficiencies in Table 34.

The quality service attribute contains information related to the Bridge Condition Index (BCI) which is explained in Section 3.1.2.

3.4 MUNICIPALLY DEFINED LEVELS OF SERVICE

Levels of service are measures for what the City provides to its customers, residents, and visitors. Service levels are best described as the link between providing the outcomes the community desires, and the way that The City provides those services. Service levels defined in three ways, customer values, customer levels of service and technical levels of service which are outlined in this section. An explanation for how these were developed is provided in Section 7.5 of the AMP Overview.

3.4.1 Customer Values

Customer values are what the customer can expect from their tax dollar in “customer speak” which outline what is important to the customer, whether they see value in the service, and the expected trend based on the 10-year budget. These values are used to develop the level of service statements.

To develop these customer values, as stated in the AMP Overview, a Customer Engagement Survey was released in January 2022 on the Engage Hamilton platform. The survey received 279 submissions and contained 6 questions related to bridge and major culvert service delivery. The survey results can be found in Appendix A in the AMP Overview. While these surveys were used to establish customer values and customer performance measures, it’s important to note that the number of survey respondents only represents a small portion of the population.

The future intent is to release this survey on a regular basis to measure the trends in customer satisfaction and ensure that the City is providing the agreed level of service as well as improve the marketing strategy to receive more responses. This has been noted in Table 50 in the Continuous Improvement section.

Table 40: Customer Values

CUSTOMER VALUES	CUSTOMER SATISFACTION MEASURE	CURRENT FEEDBACK	EXPECTED TREND BASED ON PLANNED BUDGET (10-YEAR HORIZON)
Bridges feel safe to cross	Annual Customer Engagement Survey	Survey respondents generally feel that bridges are safe to travel over. There are some comments with respect to increasing maintenance on bridges/culverts.	Expected to maintain trend
Bridge is open when they want to use it	Annual Customer Engagement Survey	Survey respondents generally feel that bridges are open when they want to use them, however, there were a few comments on the Dundas Hwy 8 bridge being closed.	Expected to maintain trend

Table 40: Customer Values			
CUSTOMER VALUES	**CUSTOMER SATISFACTION MEASURE**	**CURRENT FEEDBACK**	**EXPECTED TREND BASED ON PLANNED BUDGET (10-YEAR HORIZON)**
Culverts operate appropriately and are free from blockages	Annual Customer Engagement Survey	Survey respondents generally feel that there aren't culverts that are frequently blocked.	Expected to maintain trend

3.4.2 Customer Levels of Service

Ultimately customer performance measures are the measures that the City will use to assess whether it is delivering the level of service the customers desire. Customer level of service measurements relate to how the customer feels about the City's engineered structures in terms of their quality, reliability, accessibility, responsiveness, sustainability and over course, their cost. The City will continue to measure these customer levels of service to ensure a clear understanding on how the customers feel about the services and the value for their tax dollars.

The Customer Levels of Service are considered in terms of:

Condition	How good is the service? What is the condition or quality of the service?
Function	Is it suitable for its intended purpose? Is it the right service?
Capacity/Use	Is the service over or under used? Do we need more or less of these assets?

7.0 ENGINEERED STRUCTURES

In Table 41 under each of the service measures types (Condition, Function, Capacity/Use) there is a summary of the performance measure being used, the current performance, and the expected performance based on the current budget allocation.

Table 41: Customer Levels of Service

TYPE OF MEASURE	LEVEL OF SERVICE	SOURCE	PERFORMANCE MEASURE	CURRENT PERFORMANCE	EXPECTED TREND BASED ON PLANNED BUDGET
Condition	Ensure engineered structures are kept in safe and good repair.	Annual Customer Engagement Survey	97.4% of survey respondents feel bridges are generally in Fair condition or better.	Satisfied	Maintain Satisfied
			85% of survey respondents feel bridges and culverts are somewhat safe to very safe to travel over.	Fairly Satisfied	Maintain Fairly Satisfied
			Confidence levels	Medium	
		OSIM Inspection Report	Average Condition of Bridges	Good	Slight Decrease
			Average Condition of Major Culverts	Good	Slight Decrease
			Average Condition of Retaining Walls	Fair	Slight Decrease
			Confidence levels	High	
		SSIG Report	Average Condition of Overhead Sign Support Structures	Good	Maintain Good
			Confidence levels	High	
Function	Ensure engineered structures are meeting program needs.	Annual Customer Engagement Survey	76.5% of survey respondents don't know of any culverts that are partially or completely blocked.	Fairly Satisfied	Maintain Fairly Satisfied
			90.8% of survey respondents indicate there are no bridges that are currently closed they would typically use.	Very Satisfied	Maintain Very Satisfied
			Confidence levels	Medium	
		Staff Input	Bridges along major transportation routes are generally open.	Good	Slight Decrease
		Staff Input	Overhead Sign Support Structures along major transportation routes are in service.	Good	Maintain Good
			Confidence levels	Low	
Capacity	Ensure engineered structures' usage is within design capacity.	Annual Customer Engagement Survey	98.5% of survey respondents don't have concerns with bridges' height or weight restrictions.	Very Satisfied	Maintain Very Satisfied
			66.2% of survey respondents generally feel traffic levels leading up to bridges are acceptable.	Satisfied	Slight Decrease
			Confidence levels	Medium	
		Staff Input	Open bridges are used frequently.	Unknown	
			Confidence levels	Low	

3.4.3 Technical Levels of Service

Technical levels of service are operational or technical measures of performance, which measure how the City plans to achieve the desired customer outcomes and demonstrate effective performance, compliance and management. The metrics should demonstrate how effectively The City delivers its services in alignment with its customer values; and should be viewed as possible levers to impact and influence the Customer Levels of Service. The City will measure specific lifecycle activities to demonstrate how the City is performing on delivering the desired level of service as well as to influence how customers perceive the services they receive from the assets.

Technical service measures are linked to the activities and annual budgets covering Acquisition, Operation, Maintenance, and Renewal. Asset owners and managers create, implement and control technical service levels to influence the service outcomes

Table 42 shows the activities expected to be provided under the current plan with targets and recommended performance.

Table 42: Technical Levels of Service

LIFECYCLE ACTIVITY	PURPOSE OF ACTIVITY	ACTIVITY MEASURE	CURRENT PERFORMANCE *	TARGET **	RECOMMENDED PERFORMANCE ***
Acquisition	Ensure engineered structures are meeting program needs.	Number of planned pedestrian bridge new or improvement projects	1	N/A	N/A
Operation	Ensure engineered structures are kept in safe and good repair.	Percentage of legislated inspections completed for bridges > 3m	110	190	N/A
		Number of bridges with loading restrictions	4	4	4
Maintenance		% of bridge deck spalls repaired to	100%	100%	100%

Table 42: Technical Levels of Service					
LIFECYCLE ACTIVITY	PURPOSE OF ACTIVITY	ACTIVITY MEASURE	CURRENT PERFORMANCE *	TARGET **	RECOMMENDED PERFORMANCE ***
		MMS standards			
		Number of culverts with known flooding/channel blockage issues	24	0	0
		Number of bridges in Very Poor condition	2	0	0
		Number of culverts in Very Poor condition	2	0	0

It is important to monitor the service levels regularly as circumstances can and do change. Current performance is based on existing resource provision and work efficiencies. It is acknowledged changing circumstances such as technology and customer priorities will change over time.

3.4.4 Level of Service Summary

At this time, the City's technical metrics for the engineered structures service area is based on OSIM and MMS requirements. It is evident per Table 42 that the City is typically meeting these standards. The explanation below is intended to explain how the customer and technical levels of service relate to each other.

CONDITION

Based on the customer performance measures, survey respondents felt that bridges and culverts were in Fair or better condition which was deemed to be considered satisfied. The majority also felt that bridges were a minimum of somewhat safe to cross. When comparing this to the technical levels of service, the City has completed 100% of MMS requirements and has completed the legislated inspections. This suggests that the activities that the City is performing meets the customer expectations of the service.

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FUNCTION

Survey respondents appeared to be satisfied with the function of bridges and culverts. The majority of survey respondents were not aware of any blocked culverts and most did not find that there were bridges that were closed that they typically used. Those who identified that there was a bridge they wanted to use that was closed, were typically referring to bridges which were closed due to construction and are temporary service deficiencies. This suggests that the activities that the City is performing meets the customer expectations of the service.

CAPACITY

Most survey respondents did not have any concerns with bridge height or weight restrictions, and many felt traffic levels leading up to a bridge were acceptable. Currently there are four (4) bridges with weight restrictions, but since currently most survey respondents are not concerned with these restrictions it suggests the level of service for those bridges meets program needs.

3.5 FUTURE DEMAND

The ability for the City to be able to predict future demand for services enables the City to plan ahead and identify the best way of meeting that demand while being responsive to changes in demand. Demand will inevitably change over time and will impact the needs and desires of the community in terms of the quantity of services (more bridges to growing communities) and types of service required (larger bridges for increased traffic volumes).

Demand is defined as the desire customers have for assets or services and that they are willing to pay for. These desires are for either new assets/services or current assets.

Since demand is not yet an extensive requirement in O.Reg. 588/17 for the July 1st, 2022 deadline, this section is not as robust as some other sections of the report, but is an obligation for the report by July 1st, 2025, and will be expanded on in future iterations of the report.

3.5.1 Demand Drivers

For the engineered structures service area, the key drivers are population change, climate change, and customer preferences and expectations. A future continuous improvement item is to identify additional demand drivers since this was not the focus of this AM Plan.

3.5.2 Demand Forecasts

The high level present position and projections for demand drivers that may impact future service delivery and use of assets have been identified and documented in Table 43. These projections are based on the Greater Golden Horseshoe projections and the Development Charges Background Study.

Growth projections have been shown in the AMP Overview.

3.5.3 Demand Impact and Demand Management Plan

The impact of demand drivers that may affect future service delivery and use of assets are shown in Table 43.

Demand for new services will be managed through a combination of managing and/or upgrading of existing assets and providing new assets to meet demand and demand management. Demand management practices can include non-asset solutions, management of risks and failure mitigation.

Opportunities identified to date for demand management are shown in Table 43. Climate change adaptation is included in Table 44. Further opportunities will be developed in future revisions of this AM Plan, as identified in Table 50 in the Continuous Improvement Section.

Table 43: Demand Management Plan

DEMAND DRIVER	CURRENT POSITION	PROJECTION	IMPACT ON SERVICES	DEMAND MANAGEMENT PLAN
Customer preferences and expectations	Bridges prioritize vehicular traffic.	Bridges will need to begin to prioritize multi-modal traffic as well as LRT.	Ensure enough space in the bridge ROW to accommodate multi-modal traffic.	Complete Transportation Master Plans: Plan for redesign or upgrade of bridges and culverts to accommodate additional space required.
Population Change	573,000 (2021)	636,080 (2031)	Increased population will increase demand on transportation network.	Complete Transportation Master Plans; Redesign or upgrade bridges and culverts to accommodate increased traffic; Invest in sustainable transportation so that the increase in transportation demand will not be predominately single use occupancy vehicles.
Employment Population Change	192,704 (2019 - Excluding Work from Home)	244,839 (2031 – Excluding Work from Home)	Increased commuters may increase demand on transportation network.	Complete Transportation Master Plans; Plan for redesign or upgrade bridges and culverts to accommodate increased traffic; Invest in sustainable transportation so that the increase in transportation demand will not be predominately single use occupancy vehicles.

3.5.4 Asset Programs to Meet Demand

The new assets required to meet demand may be acquired, donated or constructed. At this time there are no plans for new assets over the ten (10) - year planning horizon. Acquiring new assets would commit the City to ongoing operations, maintenance and renewal costs for the period that the service provided from the assets is required.

3.5.5 Climate Change Adaptation

The impacts of climate change may have a significant impact on the assets we manage and the services they provide. In the context of the asset management planning process, climate change can be considered as both a future demand and a risk.

Climate change impacts on assets will vary depending on the location and the type of services provided, as will the way in which those impacts are responded to and managed.[14]

As a minimum the City must consider how to manage our existing assets given potential climate change impacts for our region.

Risk and opportunities identified to date are shown in Table 44. This is a continuous process and will be updated in the 2025 AM Plans per the timelines outlined in the AMP Overview.

Table 44: Managing the Impact of Climate Change on Assets and Services

CLIMATE CHANGE DESCRIPTION	PROJECTED CHANGE	POTENTIAL IMPACT ON ASSETS AND SERVICES	MANAGEMENT
Storm Events	Increased frequency of large storm events which may overwhelm the stormwater system.	Deck height of bridges may need to be raised requiring a redesign. Culverts may need to be resized. Delays in transportation network may occur if road asset is flooded in large storm event or if damage occurs to bridge/culvert asset requiring repairs.	Draft culvert standards policy: Redesign or upsize existing culverts and bridges when renewals occur; Prioritize replacements; Planning for sufficient funds to implement plans; Model stormwater network to ensure capacity; Investigate problem areas.
GHG Emissions	Increased GHG emissions due to increased demand for transportation.	Increased GHG emissions contribute to climate change	Investigate opportunities to change the modal split; Invest in sustainable transportation so that the increase in transportation demand will not be predominately single use occupancy vehicles.

[14] IPWEA Practice Note 12.1 Climate Change Impacts on the Useful Life of Infrastructure

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Additionally, the way in which the City constructs new assets should recognize that there is opportunity to build in resilience to climate change impacts. Building resilience can have the following benefits:

- Assets will withstand the impacts of climate change;
- Services can be sustained; and,
- Assets that can endure may potentially lower the lifecycle cost and reduce their carbon footprint.

Table 45 summarizes some asset climate change resilience projects the City is currently pursuing.

Table 45: Building Asset Resilience to Climate Change

PROJECT	PROJECT DESCRIPTION	CLIMATE CHANGE IMPACT	BUILD RESILIENCE IN NEW WORKS
Strathcona Pedestrian Bridge	Installation of multi-use trail connecting crossing over CN lands to connect Locke St. to the Waterfront Trail.	Due to increased demand for transportation infrastructure, it is anticipated there will be more vehicles in the road network. If these vehicles are mostly single occupancy vehicles, GHG emissions will increase in the City.	To change the modal split and investigate strategies so that more trips are taken by active and sustainable transportation than single use occupancy vehicles.
Pedestrian Bridge Replacement & Repair Program	Repair or replace pedestrian bridges within our parks that are in poor condition.	Due to increased demand for transportation infrastructure, it is anticipated there will be more vehicles in the road network. If these vehicles are mostly single occupancy vehicles, GHG emissions will increase in the City.	To change the modal split and investigate strategies so that more trips are taken by active and sustainable transportation than single use occupancy vehicles.
Stormwater Infrastructure Upgrades	Ongoing work on upgrading stormwater infrastructure (e.g. bridges, culverts, etc.) to increase capacity	It is anticipated that larger storm events will happen more frequently affect water levels under bridges and capacity levels of culverts.	To improve the City's climate resiliency by designing future assets to mitigate their vulnerability to extreme weather, minimizing future damages, and take advantage of opportunities i.e. grants.

The impact of climate change on assets is a new and complex discussion and further opportunities will be developed in future revisions of this AM Plan.

3.6 RISK MANAGEMENT

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2018 as: 'coordinated activities to direct and control with regard to risk'[15].

The City is developing and implementing a formalized risk assessment process to identify risk associated with service delivery and to implement proactive strategies to mitigate risk to tolerable levels. The risk assessment process identifies credible risks associated with service delivery and will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

The risk assessment process identifies credible risks, the likelihood of those risks occurring, and the consequences should the event occur. For its bridge and culvert assets, the City utilizes two risk assessment methods to determine risk along with subject matter expert opinion to inform the prioritization.

Since the City is further developing its risk assessment maturity with the inclusion of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable in the next iteration of the plan.

Risk Assessment is not yet an extensive requirement in O.Reg. 588/17 for the July 1st, 2022 deadline. As a result, this section is not as robust as some other sections of the report, but is an obligation for the report by July 1st, 2025, and will be expanded on in future iterations of the report.

3.6.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarized in Table 46. Failure modes may include physical failure, collapse or essential service interruption.

[15] ISO 31000:2009, p 2

Table 46: Critical Assets		
CRITICAL ASSET(S)	**FAILURE MODE**	**IMPACT**
High Criticality Bridges/Major Culverts	Collapse	Injury Service Interruption Financial Reputational Environmental
High Criticality Bridges/ Major Culverts	Major Blockage	Service Interruption Financial Injury Reputational Environmental

By identifying critical assets and failure modes, an organization can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

3.6.2 Risk Assessment

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

An assessment of risks associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings and will be identified in the Infrastructure Risk Management Plan in future iterations. The residual risk and treatment costs (if available) of implementing the selected treatment plan is shown in Table 47. It is essential that these critical risks and costs are reported to management. Additional risks will be developed in future iterations of the plan and is identified in Table 50 in the Continuous Improvement Section the plan.

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Table 47: Risks and Treatment Plans
Note * The Residual Risk Is The Risk Remaining After The Selected Risk Treatment Plan Is Implemented.

SERVICE OR ASSET AT RISK	WHAT CAN HAPPEN	RISK RATING	RISK TREATMENT PLAN	RESIDUAL RISK *	TREATMENT COSTS
Bridge & Culvert	Pier damage due to vehicular collision	Very High	Installed crash attenuators, sand barrels, signage Maintain regular inspection of roadside.	High	TBD
Bridge & Culvert	Concrete deck damage due to water infiltration from potholes.	Very High	Biennial inspections; Road Patrol Inspection; Complete operational activities on bridges & culverts either internally or contractually.	Medium	$310,000 Annually
Bridge & Culvert	Collapse of bridge due to stress from overweight vehicle.	High	Coordinate overweight permits with Hamilton Police & MTO. Adequate signage. Request enforcement, weight scales.	Medium	TBD
Bridge & Culvert	Pier erosion due to drainage system not being maintained	High	Complete operational activities on bridges & culverts either internally or contractually.	Low	TBD
Unassumed Bridge & Culvert	Bridge or culvert fails due to no maintenance or inspection program, and City is liable because ownership unclear	High	Confirm ownership and responsibility of asset. Add assets to OSIM program.	Low	TBD
Unassumed Minor Retaining Wall	Retaining wall fails due to no maintenance or inspection program, and City is liable because ownership unclear	High	Create inventory of retaining walls and confirm ownership; Internal inspection program for owned assets.	Medium	TBD

3.6.3 Infrastructure Resilience Approach

The resilience of our critical infrastructure is vital to the ongoing provision of services to customers. To adapt to changing conditions the City needs to understand its capacity to 'withstand a given level of stress or demand', and to respond to possible disruptions to ensure continuity of service. An example would be how engineered structures operate during their peak usage. We do not currently measure our resilience in service delivery and this will be included in the next iteration of the AM Plan.

Resilience covers the capacity of the City to withstand any service disruptions, act appropriately and effectively in a crisis, absorb shocks and disturbances as well as adapting to ever changing conditions. Resilience is built on aspects such as response and recovery planning, financial capacity, climate change, risk assessment and crisis leadership.

3.6.4 Service and Risk Trade-Offs

The decisions made in AM Plans are based on the objective to achieve the optimum benefits from the available resources. The City does not have sufficient data to present risks and tradeoffs. This information will be presented in the 2025 AM Plans regarding Proposed Levels of Service per the timelines outlined in the AMP Overview.

3.6.5 Financial Summary

This section contains the financial requirements resulting from the information presented in the previous sections of this AM Plan. Effective asset and financial management will enable the City to ensure its engineered structures provide the appropriate level of service for the City to achieve its goals and objectives. Reporting to stakeholders on service and financial performance ensures the City is transparently fulfilling its stewardship accountabilities.

Long-Term financial planning (LTFP) is critical for the City to ensure its engineered structures lifecycle activities such as renewals, operations, maintenance, and acquisitions can happen at the optimal time. The City is under increasing pressure to meet the wants and needs of its customer while keeping costs at an affordable level and maintaining its financial sustainability.

Without funding asset activities properly for its engineered structures, the City will have difficult choices to make in the future which will include options such as higher costs reactive maintenance and operational costs, reduction of service and potential reputational damage.

The City will be seeking to incorporate its engineered structures into the LTFP. Aligning the LTFP with the AM Plan is critical to ensure the engineered structures needs will be met while the City is finalizing a clear financial strategy with measurable financial targets. The financial projections will be improved as the discussion on desired levels of service and asset performance matures.

3.6.6 Sustainability of Service Delivery

This AM Plan focuses on two key financial indicators of sustainable service delivery that are considered within the AM Plan for this service area. These indicators are used to monitor and assess financial performance over the planning period. The two indicators are the:

- asset renewal funding ratio (proposed renewal budget for the next ten (10) - years / forecast renewal costs for next ten (10) - years); and,
- medium term forecast costs/proposed budget (over 10 years of the planning period).

ASSET RENEWAL FUNDING RATIO

Asset Renewal Funding Ratio[16] **32.86%**

The Asset Renewal Funding Ratio is used to determine if the City is accommodating asset renewals in an **optimal** and **cost effective** manner from a timing perspective and relative to financial constrains, the risk the City is prepared to accept and service levels it wishes to maintain. Ideally the target renewal funding ratio should be ideally between **90% - 110%** over the entire planning period. A low indicator result generally indicates that service levels are achievable however the expenditures are below this level because the City is reluctant to fund the necessary work or prefers to maintain low levels of debt.

Over the next ten (10) years the City expects to have **32.86%** of the funds required for the optimal renewal of assets. By only having sufficient funding to renew **32.86%** of the required assets in the appropriate timing it will inevitably require difficult trade off choices that could include:

- A reduction of the level of service and availability of assets
- Increased complaints and reduced customer satisfaction
- Increased reactive maintenance and renewal costs and,
- Damage to the City's reputation and risk of fines or legal costs

The historical lack of renewal funding resources will be addressed in future AM Plan's while aligning the plan to the LTFP. This will allow staff to develop options and long-term strategies to address the renewal rate. The City will review its renewal allocations once the entire inventory has been confirmed and amalgamated.

The Asset Renewal Funding Ratio is an important indicator and illustrates that over the next 10 years we expect to have **32.86 %** of the funds required for the optimal renewal of assets.

MEDIUM TERM – TEN (10) - YEAR FINANCIAL PLANNING PERIOD

This AM Plan identifies the forecast operations, maintenance and renewal costs required to provide an agreed level of service to the community over a ten (10) – year period. This provides input into ten (10) - year financial and funding plans aimed at providing the required services in a sustainable manner.

[16] AIFMM, 2015, Version 1.0, Financial Sustainability Indicator 3, Sec 2.6, p 9.

This forecast work can be compared to the proposed budget over the first ten (10) - years of the planning period to identify any funding shortfall.

The forecast operations, maintenance and renewal costs over the ten (10) - year planning period is **$24,281,410** on average per year. Over time as improved information becomes available it is anticipated to see this number increase. In future AM Plans, staff will connect the operational and maintenance needs to the forecasts, and this will result in a significantly higher cost than is outlined here.

The proposed (budget) operations, maintenance and renewal funding is **$16,186,100** on average per year giving a ten (10) - year funding shortfall of **$8,095,310** per year or **$80,953,100** in total over the ten year planning period. This indicates that **66.66%** of the forecast costs needed to provide the services documented in this AM Plan are accommodated in the proposed budget. Note, this calculation excludes acquired assets (if any).

Providing sustainable services from infrastructure requires the management of service levels, risks, forecast outlays and financing to achieve a financial indicator of approximately one (1.0) for the first years of the AM Plan and ideally over the ten (10) - year life of the Long-Term Financial Plan.

3.6.7 Forecast Costs (Outlays) for the Long-Term Financial Plan

Table 48 shows the forecast costs (outlays) required for consideration in the ten (10)-year long-term financial plan.

Providing services in a financially sustainable manner requires a balance between the forecast outlays required to deliver the agreed service levels with the planned budget allocations in the operational and capital budget. The City will begin developing its long-term financial plan (LTFP) to incorporate both the operational and capital budget information and help align the LTFP to the AM Plan which is critical for effective asset management planning.

A gap between the recommended forecast outlays and the amounts allocated in the operational and capital budgets indicates further work is required on reviewing service levels in the AM Plan.

The City will manage the ‘gap’ by continuing to develop this AM Plan to provide guidance on future service levels and resources required to provide these services in consultation with the community. Options to manage the gap include reduction and closure of low use assets, increased funding allocations, reduce the expected level of service, utilize debt based funding over the long term, adjustments to lifecycle activities, improved renewals and multiple other options or combinations of options.

These options will be explored in the next AM Plan and the City will provide analysis and options for Council to consider going forward.

Table 48: Forecast Costs (Outlays) For the Long-Term Financial Plan
Forecast Costs Are Shown In 2021-Dollar Values.

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL
2022	0	$1,670,000	$15,377,000	$57,168,028	
2023	0	$2,050,000	$7,938,000	$27,841,490	$425,000
2024	0	$1,000,000	$20,110,000	$2,014,039	$135,000
2025	0	$2,050,000	$8,960,000	$15,442,533	$50,000
2026	0	$1,987,000	$8,526,500	$1,030,651	
2027	0	$1,987,000	$8,526,500	$0	
2028	0	$1,987,000	$8,526,500	$0	
2029	0	$1,987,000	$8,526,500	$7,416,129	
2030	0	$1,987,000	$8,526,500	$9,665,233	
2031	0	$1,987,000	$8,526,500	$0	$200,00

3.6.8 Funding Strategy

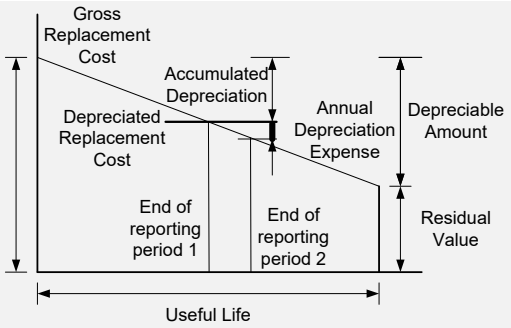
The proposed funding for assets is outlined in the City's operational budget and ten (10) - year capital budget.

These operational and capital budgets determine how funding will be provided, whereas the AM Plan typically communicates how and when this will be spent, along with the service and risk consequences. Future iterations of the AM Plan will provide service delivery options and alternatives to optimize limited financial resources.

3.6.9 Asset Valuations

The best available estimate of the value of assets included in this AM Plan are shown below. The assets are valued at estimated replacement costs:

Replacement Cost (Current/Gross)	$1,543,540,541
Depreciable Amount	$1,543,540,541
Depreciated Replacement Cost[17]	$ 775,648,704
Depreciation	$ 20,953,100



The current replacement cost is the most common valuation approach for specialized infrastructure assets such as engineered structures. The methodology includes establishing a comprehensive asset registry, assessing replacement costs (based on market pricing for the modern equivalent assets) and useful lives, determining the appropriate depreciation method, testing for impairments, and determining remaining useful life.

As the City matures its asset data, it is highly likely that these valuations will fluctuate significantly over the next 3 years and they should increase over time based on improved market equivalent costs.

3.6.10 Valuation Forecast

Asset values are forecast to increase as projections improve and can be validated as market pricing. The net valuations will increase significantly despite some assets being programmed for disposal that will be removed from the register over the 10-year planning horizon.

Any additional assets will add to the operations and maintenance needs in the longer term and would also require additional costs due to future renewals obligations. Any additional assets will also add to future depreciation forecasts. Any disposals of assets would decrease the operations and maintenance needs in the longer term and removes the high costs renewal obligations.

Currently there are bridges planned to be acquired acquired within the 10-year planning horizon however with limited availability of data it cannont be accurately projected at this point. This will be improved for the next iteration of the AM Plan.

[17] Also reported as Written Down Value, Carrying or Net Book Value.

3.6.11 Key Assumption Made in Financial Forecasts

In compiling this AM Plan, it was necessary to make some assumptions. This section details the key assumptions made in the development of this AM Plan, and should provide readers with an understanding of the level of confidence in the data behind the financial forecasts.

Key assumptions made in this AM Plan are:

- Operational forecasts are based on current budget allocations and are the basis for the 10-year horizon projections;
- Maintenance forecasts are based on current budget allocations and do not identify asset needs at this time. It is solely based on planned activities; and,
- Replacement costs were based on historical costing and engineer estimates. They were also made without costing what the asset would be replaced with in the future.

3.6.12 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AM Plan are based on the best available data. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is classified on a A - E level scale[18] in accordance with Table in the AMP overview.

The estimated confidence level for and reliability of data used in this AM Plan is shown in Table 49.

Table 49: Data Confidence for Data Used in The AM Plan

DATA	CONFIDENCE ASSESSMENT	COMMENT
Demand Drivers	Low	Growth Demand Driver data is considered high confidence. Other drivers will require further investigation, and all require annual monitoring.
Growth Projections	Low	Population Data is of high confidence.
Acquisition Forecast	High	None planned within the ten (10) -Year horizon. The City will continue to monitor growth projections annually for acquisitions.
Operation Forecast	Medium	Future costs have been extrapolated from existing budget allocations and projected out by system growth modelling.
Maintenance Forecast	High	Maintenance activities are informed by the Bridge Condition Assessments.

[18] IPWEA, 2015, IIMM, Table 2.4.6, p 2|71.

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Table 49: Data Confidence for Data Used in The AM Plan		
DATA	**CONFIDENCE ASSESSMENT**	**COMMENT**
Renewal Forecast - Asset Values	Low	Valuations will need to be updated to ensure the City has accurate costs to replace.
- Asset Useful Lives	Medium	Subject matter expert opinion and Bridge Condition Inspection modelling.
- Condition Modelling	Medium	Biennial Engineer Inspection informs the model. Will review modelling.
Disposal Forecast	Medium	Formalized process and priorities are being developed

The estimated confidence level for and reliability of data used in this AM Plan is considered to be a **Medium** confidence level.

3.7 PLAN IMPROVEMENT & MONITORING

3.7.1 Status of Asset Management Practices

ACCOUNTING AND FINANCIAL DATA SOURCES

This AM Plan utilizes accounting and financial data. The sources of the data are:

- 2021 Capital & Operating Budget;
- 2021 Tender Documents (various);
- Asset Management Data Collection templates;
- Audited Financial Statements and Government Reporting (FIR, TCA etc);
- Financial Exports from internal financial systems; and,
- Historical cost and estimates of budget allocation based on SME experience.

ASSET MANAGEMENT DATA SOURCES

This AM Plan also utilizes asset management data. The sources of the data are:

- Data extracts from various city applications and management software;
- Asset Management Data Collection Templates;
- Tender documents, subdivision agreements and projected growth forecasts as well as internal reports;
- Condition assessments;
- Subject matter Expert Opinion and Anecdotal Information; and,
- Reports from the mandatory biennial inspection, operational & maintenance activities internal reports.

3.7.2 Improvement Plan

It is important that the City recognize areas of the AM Plan and planning process that require future improvements to ensure effective asset management and informed decision making. The tasks listed below are essential to improving the plans and the City's ability to make evidence based and informed decisions. These improvements span from improved lifecycle activities, improved financial planning and to plans to physically improve the assets.

The Improvement Plan Table 50 below highlights proposed improvement items that will require further discussion and analysis to determine feasibility, resource requirements and alignment to current workplans. Future iterations of this AM Plan will provide updates on these improvement plans.

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Table 50: Improvement Plan

#	TASK	RESPONSIBILITY	RESOURCES REQUIRED	TIMELINE
1.	Complete update of major retaining wall inventory and confirm ownership.	CAM, Engineering Services,	$80,000 per annum $240,000 Total Tender Process Internal staff time	3 Years 2022 - 2024
2.	Complete condition assessment for older aluminum supports on a two-year cycle per the OSSIM.	CAM, Engineering Services,	$40,000 per annum Total Tender Process Internal staff time	3 Years 2022 - 2023
3.	Develop a Long-Term Financial Plan to connect the budgeting process to AM planning and ensure sustainable funding is achieved.	CAM, Engineering Services, Finance	$15,000 per annum $60,000 Total Internal Staff Time	4 Years 2022-2025
4.	Complete a lifecycle needs assessment to ensure funding gap is accurate and current and ensure funding requirements are understood.	CAM, Engineering Services, Finance, TOM	$40,000 per annum $120,000 Total Internal staff time	3 Years 2022 - 2024
5.	Incorporate missing bridges, major culverts and other engineered structures from other asset classes (e.g. Parks, Cemeteries, Golf Courses) into future AM Plan. This is to ensure inventory is accurate and all regulatory obligations are being met.	CAM, Engineering Services, Finance, TOM, Parks, Cemeteries, Recreation	$20,000 per annum $60,000 Total Internal staff time	3 Years 2022 - 2024
6.	Create inventory of minor retaining walls, confirm ownership, investigate operational change, and incorporate findings into AM Plan.	CAM, Engineering Services	$125,000 (Annual) $250,000 (Total) Tender Process Internal staff time	3 Years 2022 - 2024
7.	Update Age data for Retaining Walls and OSSS.	CAM, Engineering Services	$2,000 (Annual) $6,000 Total Internal staff time	3 Years 2022-2024
8.	Review Condition Assessment deliverables for engineered structures and align with AM practices.	CAM, Engineering Services	$4,000 (Annual) $8,000 (Total) Internal staff time	2 Years 2022 - 2023
9.	Review operating & maintenance activities and procedures for bridges, and options for contracting out services.	CAM, Engineering Services	$5,000 Internal staff time	Annually
10.	Develop new process to update data when Engineered Structure assets are replaced or new assets are acquired.	CAM, Engineering Services Continuous improvement,	$2,000 (Annual) $6,000 Total Internal staff time	3 Years 2022-2024
11.	Update Replacement Costs based on Market Pricing information and O&M Costs based on actual costs.	CAM, Engineering Services, TOM	$3,500 (Annual) Internal staff time	Annually (Perpetual)
12.	Review assets recommended for renewal and ensure planned forecasts and replacement costs are updated with type of asset it would be replaced with.	CAM, Engineering Services	$3,000 p.a. $6,000 Total Internal Staff Time	2 Years 2022-2023
13.	Review and update Schedule 29 By law to capture updated bridge & culvert load restrictions.	Engineering Services, Clerks	$1,500 p.a. $3,000 Total Internal Staff Time	2 Years 2022-2023
14.	Improve annual engagement survey process to optimize engagement and respondents.	CAM, Engineering Services, Communications	$7,500 (Annual) $37,500 (Total) Internal staff time	5 Years 2022-2027
15.	Improve demand driver knowledge and identify additional drivers to be utilized within the plan.	CAM, Engineering Services, Economic Development, Environmental Services	$3,000 Internal staff time	Annually
16.	Develop and improve risk management knowledge along with supporting documentation.	CAM, Engineering Services, Continuous Improvement	$12,500 (Annual) $25,000 (Total)	2 Years 2022-2023
17.	Investigate renewal needs for bridges with boundary agreements and incorporate into budget.	CAM, Engineering Services	$3,000 p.a. $6,000 Total Internal Staff Time	2 Years 2022-2023
18.	Investigate O&M activities and funding allocation for OSSS	CAM, TOM	$3,000 per annum $6,000 Total Internal Staff Time	2 Years 2022-2023

3.7.3 Monitoring and Review Procedures

This AM Plan will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets as a result of budget decisions.

The AM Plan will be reviewed and updated on a regular basis to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, acquisition and asset disposal costs and planned budgets. These forecast costs and proposed budget will be incorporated into the Long-Term Financial Plan once completed.

3.7.4 Performance Measures

The effectiveness of this AM Plan can be measured in the following ways:

- The degree to which the required forecast costs identified in this AM Plan are incorporated into the long-term financial plan;
- The degree to which the 1-10-year detailed works programs, budgets, business plans and corporate structures consider the 'global' works program trends provided by the AM Plan;
- The degree to which the existing and projected service levels and service consequences, risks and residual risks are incorporated into the Strategic Planning documents and associated plans; and,
- The Asset Renewal Funding Ratio achieving the Organisational target (this target is often 90 – 100%).

4.0 REFERENCES

- Ministry of Transportation. (2002, May 8). *Sign Support Guidelines.* Retrieved from http://www.bv.transports.gouv.qc.ca/mono/1116014.pdf
- MTO. (2015, August 18). *Bridge repairs.* Retrieved from Ministry of Transportation: http://www.mto.gov.on.ca/english/highway-bridges/ontario-bridges.shtml
- MTO. (2020). *Ontario Sign Support Inspection Manual.* St. Catharines: Ontario Ministry of Transportation.
- IPWEA, 2006, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
- IPWEA, 2015, 3rd edn., 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
- IPWEA, 2008, 'NAMS.PLUS Asset Management', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/namsplus.
- IPWEA, 2015, 2nd edn., 'Australian Infrastructure Financial Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/AIFMM.
- IPWEA, 2020 'International Infrastructure Financial Management Manual', Institute of Public Works Engineering Australasia, Sydney
- IPWEA, 2018, Practice Note 12.1, 'Climate Change Impacts on the Useful Life of Assets', Institute of Public Works Engineering Australasia, Sydney
- IPWEA, 2012, Practice Note 6 Long-Term Financial Planning, Institute of Public Works Engineering Australasia, Sydney, https://www.ipwea.org/publications/ipweabookshop/practicenotes/pn6
- IPWEA, 2014, Practice Note 8 – Levels of Service & Community Engagement, Institute of Public Works Engineering Australasia, Sydney, https://www.ipwea.org/publications/ipweabookshop/practicenotes/pn8
- ISO, 2014, ISO 55000:2014, Overview, principles and terminology
- ISO, 2018, ISO 31000:2018, Risk management – Guidelines

2022
Waterworks Asset Management Plan

Hamilton

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WATERWORKS ASSET MANAGEMENT PLAN

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1.0 INTRODUCTION

WATERWORKS INTRODUCTION

The purpose of this Asset Management Plan (AM Plan) is to identify the intended asset management (AM) programs for assets delivering the City of Hamilton's Waterworks services. The City of Hamilton (City) will identify these programs based on the City's understanding of the current service level requirements, and the current ability of the network to meet those requirements. Before July 1, 2025 this plan will be updated to include the proposed service level requirements.

The infrastructure assets covered by this Asset Management Plan (AM Plan) include assets which are part of the City's Waterworks network. At this time, this AM Plan includes Water, Wastewater and Stormwater assets, which were considered Core Assets under Ontario Regulation 588/17 (O.Reg. 588/17).

For a high level summary of the assets covered in this AM Plan refer to Table 5. For detailed summaries of assets, please refer to Table 8, Table 35 and Table 60.

The infrastructure assets included in this plan have a total replacement value of $14.7 billion as shown in Table 5.

1.1 Scope

The infrastructure assets covered by this AM Plan include assets which are part of the City of Hamilton's Waterworks system. At this time, this AM Plan includes water, wastewater, and stormwater assets, which are considered core assets under Ontario Regulation 588/17 (O.Reg. 588/17).

In addition, as mentioned in Section 6.2 of the AMP Overview, these AM Plans were completed using the Federation of Canadian Municipalities (FCM) approach to asset management in partnership with the Institute of Public Works Engineering Australasia (IPWEA) and National Asset Management System (NAMS) Canada template and philosophy, and also fulfill the O.Reg. 588/17 timeline and requirements. It is important to note that this is the first iteration of the Waterworks AM Plan completed by the Corporate Asset Management (CAM) office using this framework for asset management, and as such this plan differs greatly from the 2014 Asset Management Plan. The majority of data in this plan is the data available as of January 2022.

Before July 1st, 2025, this plan will be updated to include the proposed service level requirements for these assets in accordance with the O.Reg 588/17.

1.0 INTRODUCTION

1.2 Supplementary Information

The AM Plan is to be read with other City planning documents. This should include the Strategic Asset Management Policy (SAMP) along with other key planning documents including:

- Asset Management Plan Overview;
- W/WW/SW City Wide Master Plan;
- Development Charge background study

Key stakeholders in the preparation and implementation of this AM Plan are shown in section 5 of the AMP Overview.

1.0 INTRODUCTION

1.3 Legislative Requirements

Table 1: Water Legislative Requirements

LEGISLATION	REGULATIONS	PURPOSE
Safe Drinking Water Act, 2002	**O. Reg. 205/18: Municipal Residential Drinking Water Systems in Source Protection Areas**	This act recognizes that the people of Ontario are entitled to expect their drinking water to be safe and controls the regulation of drinking water systems and drinking water testing.
	O. Reg. 453/07: Financial Plans	
	O. Reg. 229/07: Service of Documents	
	O. Reg. 188/07: Licensing of Municipal Drinking Water Systems	
	O. Reg. 242/05: Compliance and Enforcement	
	O. Reg. 128/04: Certification of Drinking Water System Operators and Water Quality Analysts	
	O. Reg. 248/03: Drinking Water Testing Services	
	O. Reg. 172/03: Definitions of 'Deficiency' and 'Municipal Drinking Water System'	
	O. Reg. 171/03: Definitions of Words and Expressions Used in the Act	
	O. Reg. 170/03: Drinking Water Systems	
	O. Reg. 169/03: Ontario Drinking Water Quality Standards	

1.0 INTRODUCTION

Table 1: Water Legislative Requirements

LEGISLATION	REGULATIONS	PURPOSE
Clean Water Act 2006	**O. Reg. 288/07 Source Protection Committees**	The purpose of the Act is to protect existing and future sources of drinking water.
	O. Reg. 287/07: General	
	O. Reg. 284/07: Source Protection Areas and Regions	
	O. Reg. 231/07: Service of Documents	
	O. Reg. 288/07 Source Protection Committees	
Ontario Water Resources Act	**O.Reg 450/07 Charges for Industrial and Commercial Water Users**	
	O.Reg 387/04 Water Taking and Transfer	
	R.R.O. 1990, Reg. 903: Wells	
	O.Reg 450/07 Charges for Industrial and Commercial Water Users	
Canadian Environmental Protection Act		An Act respecting pollution prevention and the protection of the environment and human health in order to contribute to sustainable development
Canada Water Act		An Act to provide for the management of the water resources of Canada, including research and the planning and implementation of programs relating to the conservation, development and utilization of water resources

1.0 INTRODUCTION

Table 1: Water Legislative Requirements		
LEGISLATION	**REGULATIONS**	**PURPOSE**
2020 Watermain disinfection procedure	**This watermain disinfection procedure is a supporting document for Ontario legislation and regulations related to Drinking Water.** **Part of O.Reg. 170/03**	For watermains, including temporary watermains, that are added to, modified, re-aligned, replaced or extended within a Drinking Water System, Operating Authorities shall ensure that the requirements of ANSI/AWWA Standard C651 are followed as modified by this procedure.
Drinking Water Quality Management Standard	**The DWQMS sets out a framework for the operating authority and the owner of a drinking water system to develop a QMS that is relevant and appropriate for the system.** **The DWQMS contains elements of both the ISO 9001 standard with respect to management systems and the hazard analysis and critical control points (HACCP) standard with respect to product safety. The DWQMS also incorporates the HACCP approach to risk assessment and reflects the multi-barrier approach for drinking water safety.**	The DWQMS approach emphasizes the importance of: ▪ A proactive and preventative approach to management strategies that identify and manage risks to public health Establishing and documenting management procedures ▪ Clearly identifying roles and responsibilities ▪ continual improvement of your management system

1.0 INTRODUCTION

Table 2: Wastewater Legislative Requirements	
LEGISLATION	**PURPOSE**
Environmental Protection Act	Environmental legislation aimed at preventing pollution and protecting the environment and human health.
Clean Water Act, 2006	The purpose of this Act is to protect existing and future sources of drinking water.
Fisheries Act	The purpose of this Act is to provide a framework for the proper management and control of fisheries and the conservation and protection of fish and fish habitat, including by preventing pollution.
MECP Design Guidelines	Guidelines for the design, disinfection, and evaluation of sewage works.
Ontario Water Resources Act	To provide for the conservation, protection and management of Ontario's waters and for their efficient and sustainable use, in order to promote Ontario's long-term environmental, social and economic well-being

Table 3: Stormwater Legislative Requirements	
LEGISLATION	**PURPOSE**
Drainage Act, R.S.O. 1990, c. D.17	Provides a procedure whereby the municipality may, provide a legal outlet for surface and subsurface waters from a landowner.
Ontario Water Resources Act, R.S.O. 1990, c. O.40	To provide for the conservation, protection and management of Ontario's waters and for their efficient and sustainable use, in order to promote Ontario's long-term environmental, social and economic well-being
Canadian Environmental Protection Act, 1999	An Act respecting pollution prevention and the protection of the environment and human health in order to contribute to sustainable development
Fisheries Act	The purpose of this Act is to provide a framework for the proper management and control of fisheries and the conservation and protection of fish and fish habitat, including by preventing pollution.
Species at Risk Act (S.C. 2002, c. 29)	An act to protect wildlife species at risk, and/or provide for the recovery of wildlife species at risk.

1.0 INTRODUCTION

Table 3: Stormwater Legislative Requirements	
LEGISLATION	**PURPOSE**
Environmental Protection Act, R.S.O. 1990, c. E.19	Environmental legislation aimed at preventing pollution and protecting the environment and human health.
Endangered Species Act, 2007, S.O. 2007, c. 6	An Act with identifies and protects species at risk and promotes stewardship activities for these species.

1.4 Asset Hierarchy

An asset hierarchy provides a framework for structuring data in an information system to assist in collection of data, reporting information and making decisions. As outlined in Section 6.5 of the AMP Overview, the City's functional hierarchy includes the strategic service area, asset class, and asset levels used for asset planning and financial reporting as well as service planning and delivery.

The strategic levels are defined in Section 6.5 of the AMP Overview, and the service areas included in this report are defined in Table 4 below. The service area hierarchies used in this report which outline the included assets are defined in Table 2 and Table 3 in the AMP Overview.

Currently this plan includes assets related to the following service areas: Water, Wastewater, Stormwater, and Administration because they relate to the core assets defined in O.Reg. 588/17.The asset service hierarchy is shown is Table 1.

Table 4: Asset Service Area Hierarchy

Strategic Level	Service Area	Functional Responsibilities
Waterworks	**Water**	Supply and distribution of clean, safe drinking water to all properties within Hamilton that are connected to the municipal supply. This includes all support activities that are performed in order to achieve this service. Separated into linear, vertical, and administrative assets.
	Wastewater	Collect and treat wastewater from all properties within Hamilton that are connected to municipal sewers. Include all support activities that are performed in order to achieve this service. Separated into linear, vertical, and administrative assets.
	Stormwater	Collect, monitor, and transmit storm and surface water within Hamilton either to the natural environment, or to a wastewater treatment facility. Separated into linear, vertical, and administrative assets.

1.0 INTRODUCTION

1.5 Overall Summary of Assets

For the purposes of this AM Plan, the asset categories are defined using the O.Reg. 588/17 definitions as follows:

- Water assets - relate to the collection, production, treatment, storage, supply or distribution of drinking water;
- Wastewater assets - relate to the collection, transmission, treatment or disposal of wastewater, including any wastewater asset that from time to time manages stormwater; and,
- Stormwater assets relate to the collection, transmission, treatment, retention, infiltration, control or disposal of stormwater.

The overall summary of waterworks assets is shown in Table 5. Waterworks assets have a total replacement value of **$14.7B** and are in an average of **Fair** condition. In addition, the average age of these assets is **29 years** with **54%** of useful life remaining. However, the overall data confidence for the waterworks strategic level is **low to medium**, and so these numbers may change drastically in future iterations of the plan. Data confidence is explained throughout the report and is defined in Section 7.2.2 of the AMP Overview.

Table 5: Summary of Assets

ASSET CATEGORY	REPLACEMENT VALUE	AVERAGE AGE (% RSL)	AVERAGE EQUIVALENT CONDITION
Water	$4.25B	34 years (45%)	3-Fair
Data Confidence	Low	Medium	Low
Wastewater	$7.25B	30 years (34%)	3-Fair
Data Confidence	Low	Medium	Medium
Stormwater	$3.14B	22 years (73%)	2-Good
Data Confidence	Low	High	Medium
TOTAL	**$14.7B**	**29 years (54%)**	**3-Fair**
Data Confidence	**Low**	**Medium**	**Medium**

1.0 INTRODUCTION

2022

Water Asset Management Plan

Hamilton

WATER SERVICE AREA

Description

The water network distributes drinking water to its customers across the City and its objective is to deliver safe, clean drinking water on demand to all connections 24 hours a day. These assets involve assets related to the collection, production, treatment, storage, supply or distribution of drinking water.

Replacement Value **$4.3 Billion**

Average Asset Condition

Did You Know?

- In 2021, the Woodward WTP treated and distributed approximately **78,000 ML** for **569,000** customers which is equivalent to **39 billion, 2-litre bottles** at a rate of **$0.004 a bottle** for a house-hold that uses 1000-litres of water per month.
- The population is expected to increase to **636,000 by 2031** and so plant upgrades are being completed to improve capacity and perfor-mance.

Critical Asset Summary

Critical Assets	Quantity	Replacement Cost	Condition	Stewardship Measures
Water Treatment Plant	1	$1.0 billion	Poor	**# of instances Chlorine is below/ above target at the WTP** **8**
Pump Station	18	$125.3 million	Good	**Inspection Frequency** **Weekly**
Wells & Well Stations	8 wells 6 stations	$21.9 million	Fair Good	**# Drinking Water Advisories** **0**
Watermain	2,129 km	$1.6 billion	Fair	**Emergency breaks repaired within 2 days** **100%**

Data Confidence

VERY HIGH | MEDIUM | VERY LOW

FINANCIAL FACTS

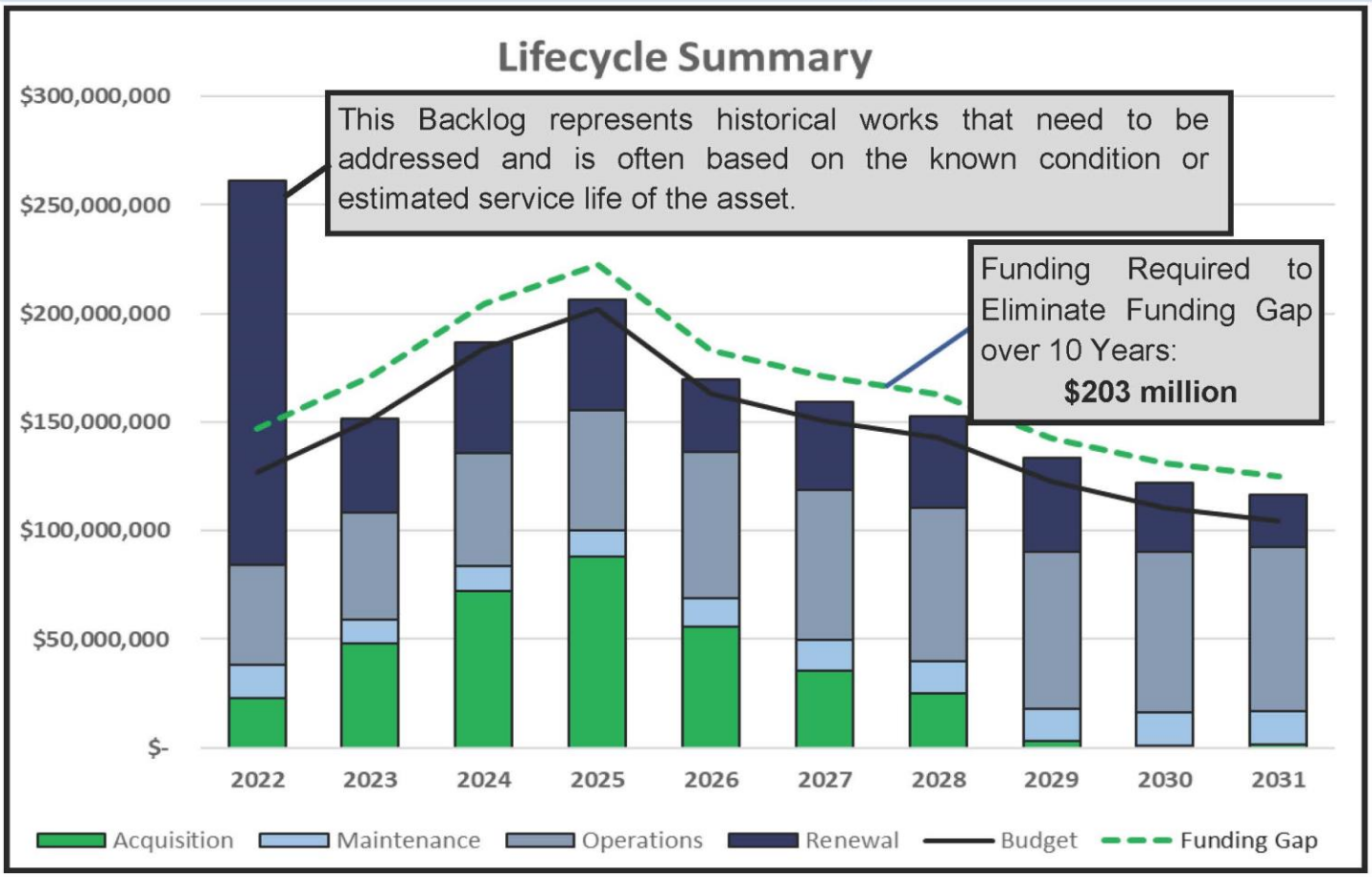
- Hamilton will receive **$512 million** dollars worth of assets over the next 10 years.
- Hamilton will invest on average **$769 million** to operate, maintain Water assets over the next ten years.

DID YOU KNOW?

- The City completes condition assessments on critical trunk watermain to reduce the chance of a critical watermain break.
- The City has a loan program to replace lead water services throughout the City.

FINANCIAL INDICATORS

Type of Indicator	Measurement	Explanation
Asset Renewal Ratio	**74.9%**	This ratio demonstrates the rate the city renews its Water Assets.
10 Year O&M Forecast	**84.5%**	The % of funding allocated compared to what needs to be spent.
Annual Infrastructure Gap	**$20 million**	The difference between what is being spent and what should be spent.



2.0 WATER ASSETS

The water network distributes water to its customers across the City and its objective is to deliver safe, clean drinking water on demand to all connections 24 hours a day, seven days a week. Clean water supports residents, businesses such as restaurants and public institutions such as schools and hospitals. The water system provides direct benefit and value to its customers whether they are residential, commercial or industrial customers as well as providing a larger Public Health benefit to the community.

Water assets relate to the collection, production, treatment, storage, supply or distribution of the drinking water service. For this iteration of the AM Plan, water assets include linear and vertical assets.

Vertical assets are assets which can only occupy one site and are typically within a building or a facility which may be comprised of multiple components. Linear assets are assets which traverse multiple sites and are often defined by length and also encompass components that are considered part of the linear network.

The asset hierarchy outlining assets included in this section is shown below in Table 6.

TABLE 6: ASSET CLASS HIERARCHY

VERTICAL ASSETS	LINEAR ASSETS	ADMINISTRATIVE
Water Treatment Plant	Trunk Watermain	Facilities (included in WTP)
Booster Stations	Local Watermain	Vehicles
Underground Reservoirs	Water Services	Lab Equipment
Elevated Water Towers	Hydrants	SCADA
Wells & Well Stations	Major (>400mm) Valves	
Water Filling Stations	Minor (<400mm) Valves	
	Water Meters	
	Sampling Stations	

2.0 WATER ASSETS

2.1 BACKGROUND

This AM Plan is intended to communicate the requirements for the sustainable delivery of services through the management of assets, compliance with regulatory requirements and required funding to provide the appropriate levels of service over the 2022 – 2031 planning period. The assets covered by this plan include the major components required to deliver effective water services to the City's customers.

The City acquired significant amounts of water network assets through amalgamation in 2001. These aging assets were included into the City's water inventory and were in varied condition when acquired. Once amalgamated, any aging assets or deficient assets became the responsibility of Hamilton Water and created several new challenges that needed to be taken into consideration and planned for.

The information in the water section of the plan is intended to give a snapshot in time of the current state of the water asset class by providing the necessary background, detailed summary and analysis of existing information.

The City currently operates and maintains five (5) drinking water systems and subsystems as listed below in Table 7. The largest system is the Hamilton System which is made up of two subsystems; Woodward and Fifty Road. The Woodward subsystem draws its water from Lake Ontario and serves the majority of the City's population, and the Fifty Road subsystem distributes water from the Town of Grimsby. In addition, there are four (4) systems which draw water from the ground using drinking water wells & well stations.

For the purposes of this report all water assets are presented together as they contribute to the overall drinking water service, but these systems and subsystems may be referenced. For a map of these systems, please refer to Map 1.

Table 7: Drinking Water Systems and Subsystems

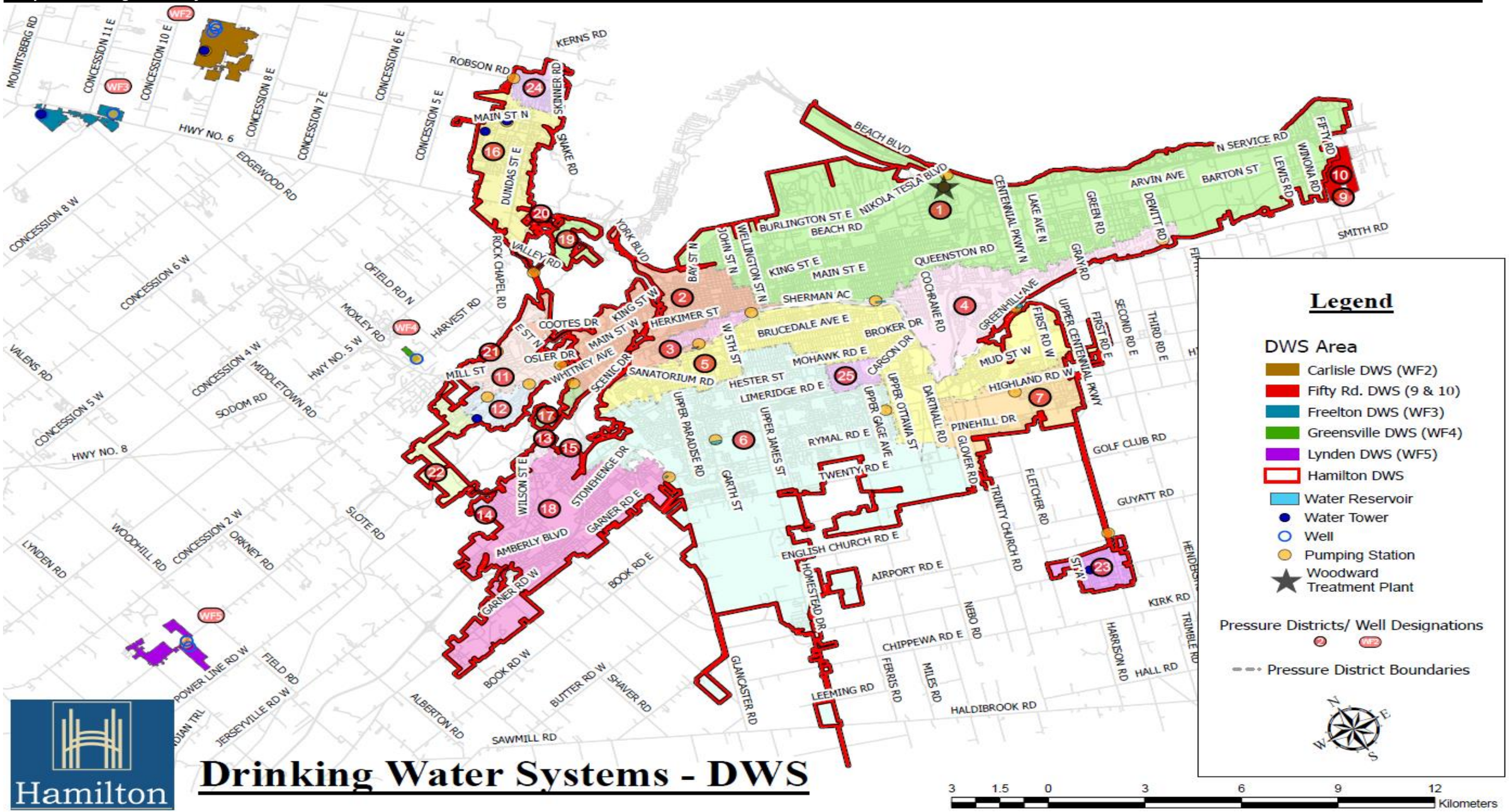
Drinking Water System/Subsystem	Population Served	Water Source
Hamilton System / Woodward Subsystem	569,353 (2021 Census)	Lake Ontario
Hamilton System / Fifty Road Subsystem	201	Town of Grimsby
Freelton System	804	Ground water
Greensville System	108	Ground water

2.0 WATER ASSETS

Table 7: Drinking Water Systems and Subsystems		
Drinking Water System/Subsystem	**Population Served**	**Water Source**
Carlisle System	1833	Ground water
Lynden System	393	Ground water

2.0 WATER ASSETS

Map 1: Drinking Water Systems



2.1.1 Detailed Summary of Assets

Table 8 below displays the detailed summary of assets for the water asset class. At the time of writing, no inventory data was available for water chambers, and so they are not encompassed in this iteration of the AM Plan. In addition, it is possible that there are assets that may not be owned by Public Works which may be considered drinking water assets which may be missing from this inventory. This has been identified as a Continuous Improvement Item in Table 32.

The City owns approximately **$4.25B** in water assets which are on average in **Fair** condition. Overall, assets are an average of **34 years** in age which is **45%** of the average overall remaining service life (RSL). The data below is a combination of data from various sources as there is not yet an asset registry containing all inventory information in one data source. Examples of data sources which were used for this iteration of the Core AM Plans are stated in the AMP Overview. The lack of an asset registry is a continuous improvement item in Table 32. The City must plan to complete a detailed review of this data and create data standards in order to improve overall data quality.

For most assets, Fair condition means that the City should be planning to complete minor to moderate maintenance activities to ensure the assets reach their intended useful lives since assets begin to experience deterioration affecting asset usage at this stage as indicated in Table 8.

2.0 WATER ASSETS

Table 8: Detailed Summary of Assets
***Weighted Average**

ASSET CATEGORY	NUMBER OF ASSETS	REPLACEMENT VALUE	AVERAGE AGE (% RSL)	AVERAGE EQUIVALENT CONDITION
VERTICAL ASSETS				
Water Treatment Plant (incl Admin Facilities)	1	$1.00B	91 years (0%)	4-Poor
Data Confidence	High	Low	Medium	Very Low
Well Station	6	$17.15M	30 years (51%)	2-Good
Data Confidence	High	Medium	High	Medium
Production Wells	8	$4.783M	32 years (57%)	3-Fair
Data Confidence	High	Medium	High	Low
Underground Reservoir	12	$305.2M	53 years (30%)	2-Good
Data Confidence	High	Low	High	Medium
Booster Stations	18	$125.3M	40 years (33%)	2-Good
Data Confidence	High	Low	High	Medium
Elevated Tower	6	$28.54M	24 years (52%)	2-Good
Data Confidence	High	Low	High	Medium
Filling Station	2	$681.7K	18 years (64%)	2-Good
Data Confidence	High	Low	High	Medium
	SUBTOTAL	**$1.48B**	**41 years (33%)**	**3-Fair***
	Data Confidence	**Low**	**High**	**Medium**
LINEAR ASSETS				
Trunk Watermain (>=450mm)	185.54 km	$281.42M	60 years (36%)	3-Fair
Data Confidence	High	Medium	Medium	Low
Local Watermain (<450mm)	1,943.65 km	$1.347B	44 years (45%)	3-Fair
Data Confidence	High	Medium	Medium	Low
Water Service	146,276	$643.61M	25 years (69%)	2-Good
Data Confidence	Medium	Low	Medium	Low
Water Meter	157,596	$66.98M	13 years (48%)	3-Fair
Data Confidence	High	Low	Very High	Low
Hydrants (incl Automatic Flushing Units)	13,724	$164.69M	26 years (68%)	2-Good
Data Confidence	Very High	Medium	Medium	Low
Major Valves (>=400mm)	1,376	$103.38M	22 years (71%)	2-Good
Data Confidence	Medium	Low	Medium	Low
Minor Valves (>400mm)	21,383	$131.11M	21 years (71%)	2-Good
Data Confidence	Medium	Low	Medium	Low
Sampling Station	33	$264K	3 years (94%)	1-Very Good
Data Confidence	High	Medium	Medium	Low
Chambers	No Data	No Data	No Data	No Data
Data Confidence	Very Low	Very Low	Very Low	Very Low
	SUBTOTAL	**$2.74B**	**27 years (62%)**	**3-Fair***
	Data Confidence	**Medium**	**Medium**	**Low**
Administrative				
Vehicles	144	$12.47M	7 years (28%)	3-Fair
Data Confidence	High	Medium	High	Low
Lab Equipment (incl IT)	N/A	$3.45M	8 years (63%)	3-Fair
Data Confidence	High	Medium	Medium	Low
SCADA	N/A	$15.0M	N/A	N/A
Data Confidence	N/A	Very Low	N/A	N/A
	SUBTOTAL	**$30.9M**	**7 years (52%)**	**3-Fair***
	Data Confidence	**Medium**	**Medium**	**Low**
	TOTAL	**$4.25B**	**34 years* (45%)***	**3-Fair***
	Data Confidence	**Low**	**Medium**	**Low**

2.0 WATER ASSETS

The City has one (1) Water Treatment Plant (WTP) which services the majority of the population through the Woodward subsystem as shown in Table 7. The Woodward WTP has several complex processes that run throughout several facilities but has been simplified into one (1) asset for ease of reporting for this first iteration of the AM Plan. A Continuous Improvement item in Table 32 is to improve the reporting for the WTP for future iterations of the AM Plan to provide more details on the specific processes it undertakes. The WTP is the single largest value water asset in the City and has been estimated at **$1.0B** with a low data confidence level due to the complexity of the plant.

The data confidence for vertical assets is typically high due to the asset's locations being above ground and able to be visually confirmed easily. The confidence is not yet considered Very High due to multiple data sources which showed conflicting quantities and registry information. There has been a continuous improvement item identified to confirm data across all data sets and unify the data into a single source for future reference.

Due to the lack of current data, the complexity of vertical assets and the low frequency of asset replacements, it is difficult to achieve a high data confidence for replacement cost for this iteration of the plan. Future plans will improve on the current replacement cost values, and so the data confidence is considered low for these assets. Age, condition information and data confidence are presented in Section 2.2.4.

For linear assets, the data confidence for number of assets is considered to be high because of active data management. However, these assets are typically more challenging to confirm as they are generally buried infrastructure that cannot simply be visually verified (excluding hydrants and sampling stations). Due to these limitations there are some assets such as water services where the quantities are of a lesser confidence. The number of water meters should be almost equal to the number of services, and so it is estimated that there are approximately 11,000 water services not documented in the system. This is not an asset that historically was tracked and monitored consistently. Staff are actively working on confirming these connections and these are being added to the system as the data is collected. In addition, water meter data has a few known scenarios in ICI & multi-residential properties that would inflate the number of assets.

Linear assets are replaced much more frequently than vertical assets and as such the replacement costs generally have a higher confidence level and are often close to the approximate market rates. However, improving asset replacement costs by updating current market prices regularly instead of historical costs/estimates or internal models has been identified as a Continuous Improvement Item in Table 32.

The City has included its administrative assets (e.g. vehicles, laboratory equipment, software and administrative facilities) in a limited capacity for this iteration of the AM Plan so that the replacement costs are beginning to be recognized in the report. These assets contribute to the overall drinking water service; however, these have not yet been completed at a detailed level and will be encompassed in more detail before the 2025 iteration of the plan. It is important to

note that the administrative facilities for the Waterworks Strategic Level are encompassed in the replacement cost of the WTP.

Please refer to the AMP Overview Section 7.2.2 for a detailed description of data confidence.

2.1.2 Asset Condition Grading

Condition refers to the physical state of the water assets and are a measure of the physical integrity of these assets or components and is the preferred measurement for planning lifecycle activities to ensure assets reach their expected useful life. Since condition scores are reported using different scales and ranges depending on the asset, Table 9 below shows how each rating was converted to a standardized 5-point condition category so that the condition could be reported consistently across the AM Plan. A continuous improvement item identified in Table 32, is to review existing internal condition assessments and ensure they are revised to report on the same 5-point scale with equivalent descriptions.

2.0 WATER ASSETS

TABLE 9: CONDITION GRADING EQUIVALENT

EQUIVALENT CONDITION GRADING	CONDITION DESCRIPTION	% REMAINING SERVICE LIFE	WATERMAIN (TRUNK /LOCAL)	VERTICAL ASSETS CONDITION RATING
1 Very Good	The asset is new, recently rehabilitated, or very well maintained. Preventative maintenance required only.	>79.5%	Total Breaks = 0, Default to % RSL	1-Very Good
2 Good	The asset is adequate but has slight defects and some deterioration. Deterioration has no significant impact on asset's usage. Minor maintenance may be required in addition to preventative maintenance.	69.5% – 79.4%	Total Breaks = 0, Default to % RSL	2-Good
3 Fair	The asset is sound but has minor defects. Deterioration is beginning to have an impact on asset's usage. Minor to significant maintenance is required.	39.5% - 69.4%	Breaks in 5 years = 0 AND Total Breaks > 0, OR % RSL (worse score)	3-Fair
4 Poor	Asset has significant defects and deterioration. Deterioration has an impact on asset's usage. Rehabilitation or major maintenance required in the next year.	19.5% -39.4%	Breaks in 5 years > 0 OR % RSL (worse score)	4-Poor
5 Very Poor	Asset has serious defects with significant defects and deterioration. Asset is not fit for use. Urgent rehabilitation or closure required.	<19.4%	Breaks in 5 years > 3 OR or % RSL (worse score)	5-Very Poor

The following conversion assumptions were made:

- Water Treatment Plant (WTP) condition was based on subject expert opinion based on the condition descriptions provided above;
- Watermain condition for both trunk and local were based on a combination of breaks and age;
- Vertical assets' Level 2 Condition Assessments are based on a 5-point scale which was considered equivalent to the AM Plan 5-point scale; and,
- For assets where a condition assessment was not completed or a final condition score was not assigned, but age information was known, the condition was based on the % of remaining service life.

2.1.3 Vertical

The background information for water vertical assets is included below and includes an age profile, the condition methodology used, the condition profile, and asset usage and performance.

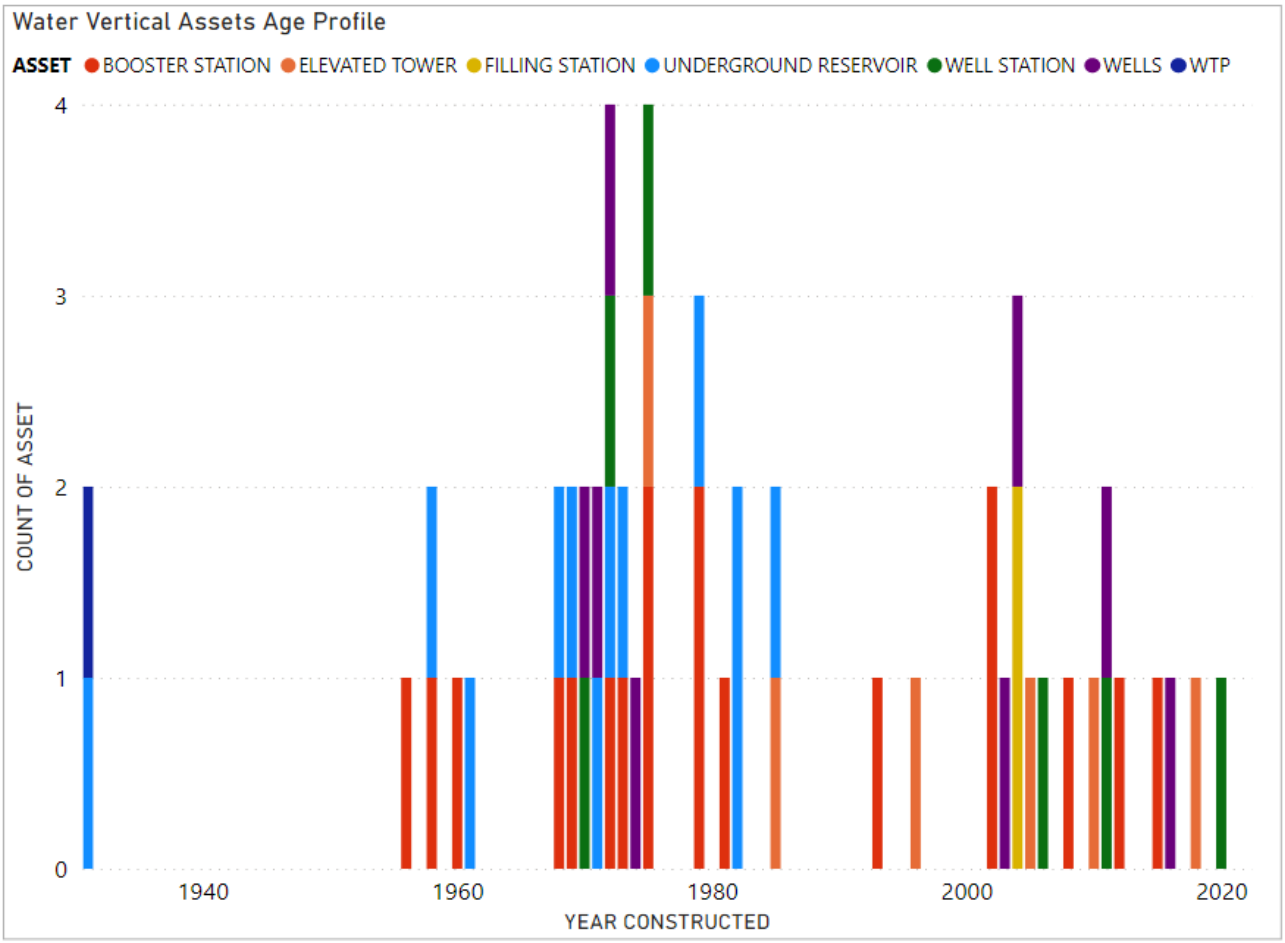
2.1.3.1 Age Profile

The age of an asset is an important consideration in the asset management planning process especially for assets that will not receive a typical condition grading through inspections. Some lower cost or lower criticality assets can be planned for renewal based on age as a proxy for condition or until other condition methodologies are established. It should be noted that if a water assets' condition is based on age, it is typically considered to be of a lower confidence level.

The age profile of the water vertical assets is shown in Figure 1. An analysis of the age profile is provided below. For vertical assets, the data confidence for age is typically high because this information was collected using an inventory process.

2.0 WATER ASSETS

Figure 1: Water Vertical Assets Age Profile



WATER TREATMENT PLANT (WTP)

The City's Water Treatment Plant (WTP) is approximately 91 years old which exceeds the design life (60 years) of the original plant. This however does not reflect the significant upgrades that have been completed over the lifecycle of the plant which have extended the life of the plant well past its design life. Future iterations of the AM Plan will ensure that the WTP is analyzed more fulsomely to ensure the City is better able to analyze the plants estimated service life. The age data confidence is considered medium because there are many assets as part of the WTP and this is only representing the initial construction date.

BOOSTER STATIONS

The majority of booster stations in the City were constructed from 1955 – 1980. The estimated service life (ESL) of a booster station is estimated to be 60 years. Three (3) booster stations are currently beyond their ESL and an additional three (3) stations will exceed their ESL in the next ten years. After an asset has reached its ESL it should be monitored with an increased

frequency to ensure the asset is performing as expected and to determine if the ESL for the asset type should be extended.

ELEVATED TOWERS

Elevated towers are a relatively new asset compared to other vertical water assets, with the oldest asset being constructed in 1975. The ESL of an elevated tower is 50 years, and so the oldest asset is approaching its ESL, but has been assessed as being in good condition from the last condition assessment.

UNDERGROUND RESERVOIR

The oldest reservoir in the City was built in 1931, had a major upgrade in 2012 and was reported to be in good condition per the last condition assessment. The second oldest reservoir which is approaching its ESL had a major upgrade in 2017 and was also reported to be in good condition per the last condition assessment. The remainder of the assets were built from 1961 – 1985. The ESL for a reservoir has been estimated at 75 years, and so while these assets will not reach their ESL in the next 10 years, condition assessments should continue so that preventative work can be completed to avoid reactive repairs on this aging piece of infrastructure.

WELL & WELL STATION

Typically, wells are drilled before or during the construction of a well station which explains why they are not always constructed at the same time in Figure 1. Historically, these assets have been reported together, but have been separated in the report because they are distinct assets with different ESLs. In addition, some well stations are serviced by two (2) wells. Wells and well stations are generally newer pieces of infrastructure with the oldest well and station being constructed in 1970. Wells' ESL are considered to be 75 years, while the well station ESL is typically considered to be 60 years. Therefore, the oldest well station is beyond its ESL, but had a major upgrade completed in 2014, and no other well station is beyond its ESL.

FILLING STATION

The City has two (2) filling stations which were constructed in 2004 and had major upgrades in 2011. It is estimated that filling stations have an ESL of 50 years, and so based on age, it is not anticipated that these will require any major work in the next 10 years.

2.1.3.2 Condition Methodology

For treatment plants, there is no formal condition assessment process, and for the purposes of this report the condition has been identified by subject matter experts at the City based on various available condition information as well as the condition descriptions presented in Table 10. Condition assessments for various components have been completed on the plant as deemed necessary. However, a formal condition assessment program should be identified by process on a pre-determined cycle. This has been identified as a continuous improvement item in Table 32.

2.0 WATER ASSETS

For other vertical assets, the City typically undertakes three (3) different levels of condition assessments for vertical assets as indicated in a 2015 Technical Memorandum completed by CH2M Hill as defined below in Table 10. Historically, the City had a target of 10 years for vertical assets, but it was recommended to complete Level 1 inspections regularly to prioritize Level 2 inspections. However, the City has not fully implemented this approach, and has focused on completing Level 2 inspections.

Table 10: Condition Descriptions

INSPECTION LEVEL	DESCRIPTION	TARGET FREQUENCY	ACTUAL FREQUENCY
1	High level inspection at the facility level for stated lifecycle categories and is used to inform the Level 1 risk assessment and the lifecycle analysis.	1 to 2 years	N/A
2	More detailed condition grade assessed at the assembly level and is used to inform the Level 2 risk assessment and as a more detailed input to the lifecycle analysis. Data captured through a formalized asset inspection, typically conducted by external resources.	Dependent on Level 1 findings, or target of 10 years.	17-year cycle
3	Detailed investigation, where shown to be cost-effective.	Undertaken as required	N/A

A combination of six (6) Level 2 condition assessments for water & wastewater vertical assets are completed annually excluding the treatment plants. Typically, this is an even distribution resulting in three (3) Level 2 condition assessments being completed annually for water vertical assets, which means on average vertical assessments are completed on an approximate 17-year cycle. However, sometimes more or less water assets are included depending on priority. The priority assets have been identified by staff using information from audits completed in 2003 and 2012 as well as staff input. At this time, the process for selection is not formally documented, and so this has been identified as a continuous improvement item. Another continuous improvement item would be to achieve the Level 2 condition assessments on vertical assets on a minimum 10-year cycle if Level 1 assessments continue to not occur to ensure that the City is aware of upcoming forecast requirements, which is approximately another five (5) assessments per year.

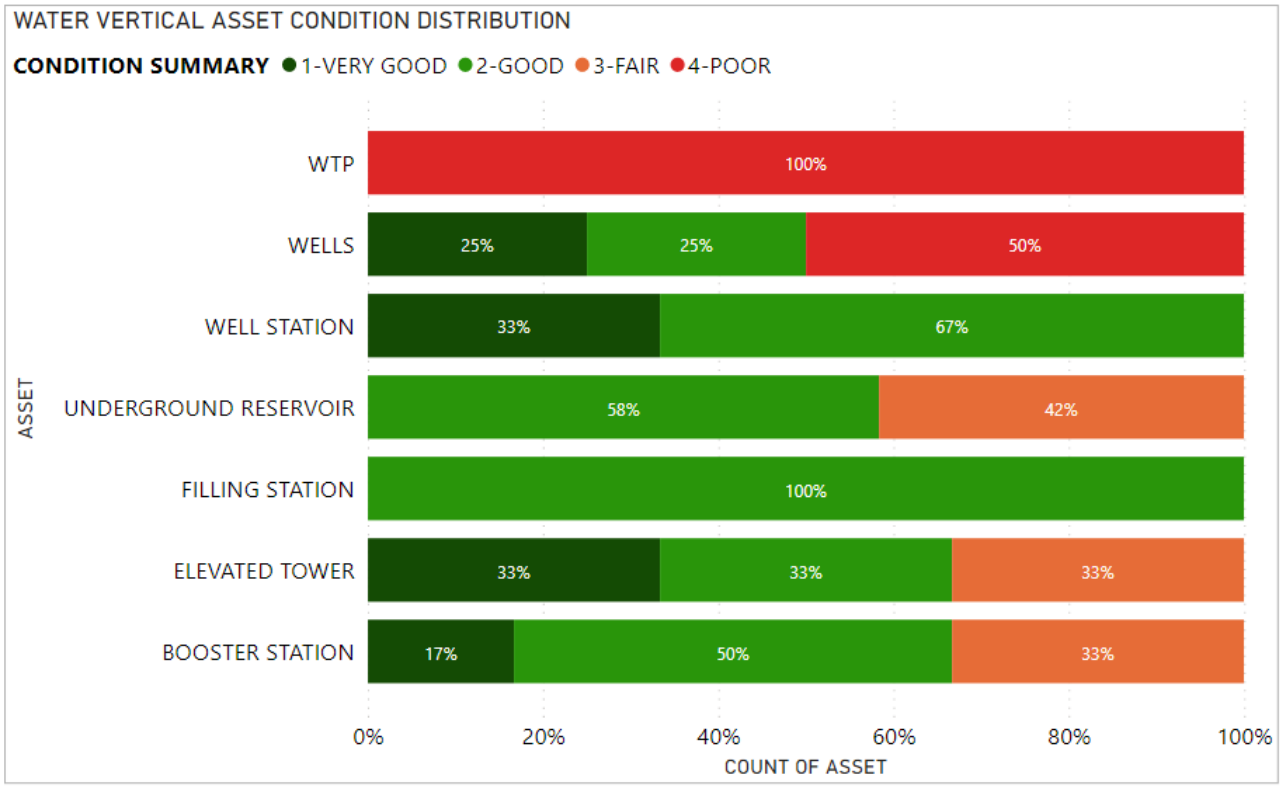
While wells do have an assessment program, the program does not output a condition score and so wells' condition have been reported based on age. This has been identified as a continuous improvement item in Table 32.

Finally, condition assessments should begin on any new facility within a determined timeline after being constructed, possibly 10-15 years into its lifecycle. These have been identified as continuous improvement items in Table 32.

2.1.3.3 Asset Condition Profile

The condition profile of the City's assets is shown in Figure 2. As mentioned in Section 1.1.2, the original condition grades were converted to a standardized condition category for report consistency.

Figure 2: Water Vertical Asset Condition Distribution



WATER TREATMENT PLANT

Based on subject area experts and the descriptions provided in Table 9, overall, the WTP is considered to be in overall Poor condition.

The Woodward Water Treatment Plant has component processes of varying ages and states of repair. Within the last 15 years a number of new or rehabilitated processes have been

constructed including new corrosion control and fluoride buildings, reconstruction of the filter building structure and significant improvements to the highlift building and associated assets. Several other processes have significant deterioration and are approaching or are at the end of their useful life. These include the chlorination building, the intake structures, components of the pre-treatment and filtration processes, high lift pump impellers and the clearwell. A capital project is currently in the proposal development phase to address many of these issues. Construction is anticipated to begin in 2025.

A condition assessment program should be implemented to proactively identify areas of concern to avoid the WTP from reaching a very poor condition level.

As stated previously, the WTP is a complex asset, and so the condition rating is currently at a low confidence level because there are a lot of components to consider. The plant is composed of five (5) major processes: Low Lift, Pre-Treatment, Filtration, Treatment, and High Lift. At this time, some components in these processes are considered to be in good to poor condition. The poor condition rating is due to some key deficiencies that are affecting the performance of the plant from the operator's perspective. Since the WTP is the most expensive water asset, there is significant expenditure required to bring this asset up to an acceptable condition.

OTHER VERTICAL ASSETS

Based on the most recent condition assessments, vertical assets are typically in good condition. As stated in Section 1.1.2, the frequency at which these inspections occur should be investigated further as they do not match the target frequencies. As a result of the frequency of inspections, the data confidence associated with the condition of these assets is medium.

Since condition assessments are completed on booster stations, these booster stations are known to be in good to fair condition, and a major upgrade was completed on one (1) of these stations in 2017. However, over the next 10 years, an additional three (3) booster stations will exceed their ESL, which shows the importance of completing condition assessments on these assets regularly and performing upgrades and preventative operations and maintenance activities so that these assets reach their ESL without major reactive repairs.

In addition, wells are inspected but the inspections do not output a final score. Therefore, the conditions of wells have been estimated based on age and so it is likely the Poor condition wells shown above are in better condition. This has been identified as a continuous improvement item in Table 32.

2.1.3.4 Asset Usage and Performance

Assets are generally provided to meet design standards where available. However, there are often insufficient resources to address all known deficiencies.

The largest performance issues with vertical water assets involve degradation of components. The service deficiencies in Table 11 below were identified using staff input.

Table 11: Known Service Performance Deficiencies			
ASSET	**LOCATION**	**SERVICE DEFICIENCY**	**DESCRIPTION OF DEFICIENCY**
Reservoir	Scenic	Leaks	Leaking expansion joints which require replacement. Project currently underway.
Booster Station	Garner	Electrical upgrades required	Electrical system is beyond service life and requires replacement.
Reservoir	Various	Upgrade required	Many reservoirs have common inlet/outlet and no mixing capability causing issues with chlorine residual.
WTP	Chlorine Building	Structural Deficiency	Structural deficiencies requiring attention.
WTP	Filter Underdrains	Deficiency	Upgrades are required.
WTP	Backwash System	Poor Performance	Upgrades may be required.
WTP	Sedimentation Tanks	Settlement Issues	Settlement issues may reduce capacity at plant, upgrades may be required.

2.1.4 Linear

The background information for water linear assets is included below and includes an age profile, the condition methodology used, the condition profile, and asset usage and performance.

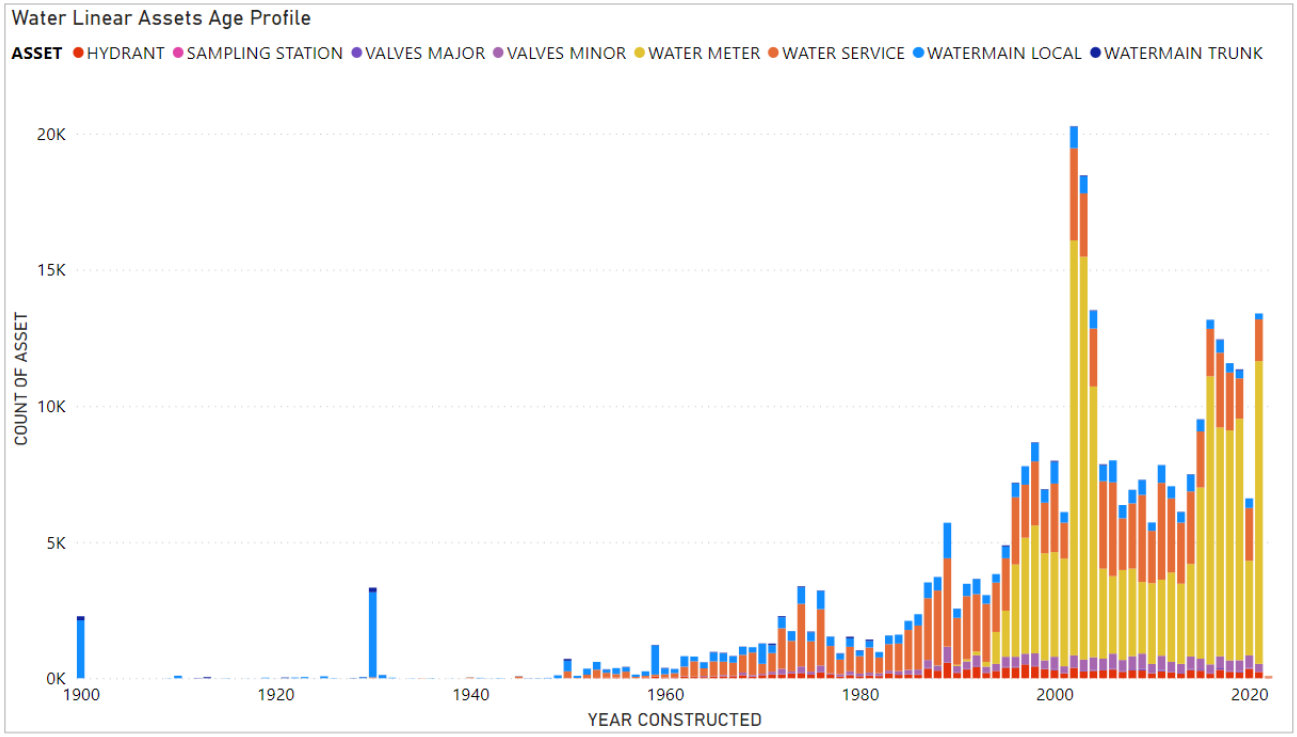
2.1.4.1 Age Profile

The age of an asset is an important consideration in the asset management process as it can be used for planning purposes as typically assets have an estimated service life where they can be planned for replacement.

The age profile of the water linear assets are shown in Figure 3. An analysis of the age profile is provided below for each asset.

2.0 WATER ASSETS

Figure 3: Water Linear Assets Age Profile



There are common years where asset age is typically assumed when age is unknown. This typically includes decade and mid-decade, and so large spikes may occur in 1900, 1930, 1950, 1955 etc.

WATERMAIN

For legibility of the graph, the water linear assets have been shown since 1900. There are a small number of trunk and local watermain segments that predate 1900 with the earliest installation date being 1860, indicating that local and trunk watermains are the oldest linear water assets in the City.

The average age for trunk and local watermain in the City is 60 and 44 years respectively. With an average estimated service life (ESL) of 94 and 80 years, on average there is 36% and 45% of service life remaining respectively. The condition of watermains is partially based on age. The age data confidence for watermain is considered to be Medium as this information is typically populated, but the accuracy of the data appears to contain assumptions based on the spikes by decade.

WATER SERVICE

Based on Figure 3, water services have typically been installed gradually over time with no significant spikes. This data is considered to be medium confidence with 72% of data populated with unknown accuracy. As this data set is large, 40,000 records do not have age data, which is significant, and should be investigated. For the known data, water services are 25 years old and

with an ESL of 80 years there is approximately 69% of service life remaining. The condition of the water services has been estimated based on age.

WATER METER

Based on Figure 3, water meters are a relatively new asset, with assets typically installed after 1994, which is mostly consistent with the ESL of 25 years for these assets. The data confidence for this asset is very high with most records being populated for age, and the accuracy is also likely high because these assets are attached to billing. The average age of these assets is 13 years indicating that on average 48% of service life is remaining. However, the oldest meter in the database was installed in 1977, and approximately 6700 water meters are beyond the ESL of 25 years, and so the City should investigate replacing these old meters. The condition of the water meters has been estimated based on age.

MAJOR / MINOR VALVES

Valves are another asset without any associated spikes. These assets are on average 22 years old, and with an ESL of 75 years there is 71% of useful life remaining. This data is considered to be at a medium confidence level with 74% of data populated resulting in approximately 6000 valves without associated age data and unknown accuracy.

HYDRANT

Hydrants are another asset without any significant spikes. Hydrants were typically installed after 1951. There are three (3) hydrants installed in the 1930s and 1940s which should be investigated as they are beyond the ESL of 80 years. On average these assets are 26 years old which means there is typically 68% of service life remaining. The data confidence for hydrants are considered to be medium as this information is typically populated, although the source of this data may be estimated.

SAMPLING STATION

Since there are only 33 sampling stations, it is difficult to view these in Figure 3. However, this asset is generally new with an average age of 3 years which means the asset typically has 94% of useful life remaining. The age data confidence for sampling stations is considered to be medium as this information is likely accurate because these assets are new, but only 76% of age information is populated.

2.1.4.2 Condition Methodology

The inspection frequency and condition score output for each linear asset is found below in Table 12. An analysis for each asset is found below.

2.0 WATER ASSETS

Table 12: Inspections and Condition Information		
ASSET	**INSPECTION FREQUENCY**	**CONDITION SCORE OUTPUT**
Trunk Watermain	Based on priority	None, used age and breaks
Local Watermain	None	None, used age and breaks
Hydrants	Annual	None, used age
Major Valves	1-year cycle	None, used age
Minor Valves	3-year cycle	None, used age
Water Services	Ad Hoc	None, used age
Water Meters	Ad Hoc	None, used age

Due to limitations associated with asset location and pressurized pipes, linear asset conditions are typically based on estimated service life as explained below.

WATERMAIN

Watermains cannot easily have CCTV inspections completed like gravity mains because the pipes are under pressure, and so the pipes would have to be temporarily taken out of service to complete the inspections. In addition, there are not maintenance holes for watermains, and so finding access points to insert a CCTV camera can also be a challenge and CCTV cameras can only traverse a maximum length. There are condition assessment options for watermains where technology can be inserted into a pressurized pipe for an indeterminate length, but these methodologies are often cost prohibitive network wide and are only completed on critical assets such as trunk watermains.

In 2008, a desktop analysis was completed on the watermains in the network where a criticality score was assigned to each pipe segment. Inspections are prioritized based on these scores. Since pipes are different materials and sizes, different technologies and methodologies must be used which include electromagnetic (Pipe Diver (concrete), See Snake (metal)), ultrasonic, and acoustic (SmartBall, Sahara) inspections. Since 2011, the City has been completing inspections on trunk watermains, and to date has completed 44.5 km which is 24% of the trunk system. The City completes approximately 6km of trunk main inspections a year resulting in it taking 31 years to complete assessments on all trunk watermains. The target frequency is 10 to 15 years.

This suggests that the City should investigate increasing the amount of trunk watermain inspected by at least another 6km annually to meet this target. This has been identified as a continuous improvement item in Table 32. In addition, historically these inspections have not produced a final condition score and have been used to locate areas of concern to take the required action to prevent breaks. Another continuous improvement item is to investigate assigning a score to these lengths of watermain based on the output from these condition assessments. The City also collects data on soil and outside cast iron conditions at opportunistic times to predict the condition of surrounding infrastructure and has done so at 30 locations across the City. This could be used to assist with developing a condition score as well.

Therefore, although the City does complete assessments on critical watermains, there is not yet a process to convert these assessments into a condition score. For the purposes of estimating condition, watermain condition is based on a combination of ESL and number of breaks per Table 12.

It's important to note that age-based conditions are not necessarily representative of the actual condition of the pipe, and as previously mentioned, completing condition assessments of the network is cost prohibitive. Therefore, the City is investigating a new watermain condition model which involves multiple criteria (e.g. age, breaks, soil type, c-factor, pipe deterioration curve etc.) to improve the condition profile for the next iteration of the report.

WATER SERVICES

No condition program exists at this time, and condition was estimated on age.

VALVES

Major and minor valves are inspected and exercised on a varied cycle depending on size. If during a valve inspection, a valve has been determined to have failed, valves may be repaired on site. If a repair cannot be done, minor valves may be replaced on-site and major valves would be put onto a replacement schedule. For the purposes of estimating condition, the valve conditions are based on estimated remaining service life as shown in Table 12.

WATER METERS

Water meters are typically located within private property and cannot be inspected regularly. For the purposes of estimating condition, the water meter conditions are based on estimated remaining service life as shown in Table 12.

HYDRANTS

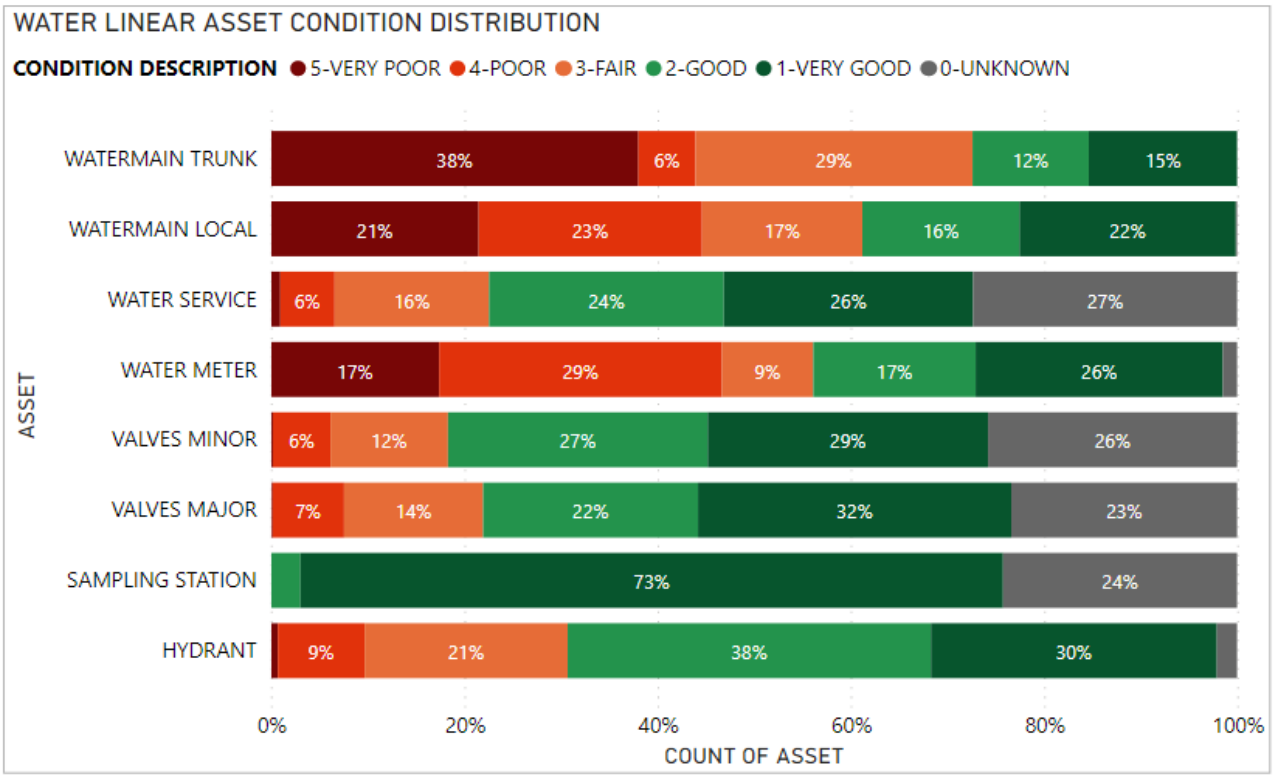
Hydrants have legislated inspections which must occur annually. However, these inspections are typically to ensure the assets are in working order but are not currently formal condition

assessments which output a condition score. A future continuous improvement item is to incorporate a condition score into these inspections which has been identified in Table 32 in the Continuous Improvement section. For the purposes of estimating condition, the hydrant conditions are based on estimated remaining service life as shown in Figure 3 although based on the inspections all hydrants are in good working order.

2.1.4.3 Asset Condition Profile

The condition profile of the City's assets is shown in Figure 4. As mentioned in Section 1.1.2, the original condition grades were converted to a standardized condition category for report consistency.

Figure 4: Asset Condition Profile



WATERMAIN

Per Figure 4 above, trunk and local watermain are in an average of Fair condition. As mentioned in Section 1.1.2, although there is a condition assessment program using electromagnetic, ultrasonic, or acoustic methodologies for 24% of trunk watermain, there is not yet a process for outputting a condition rating from this number. As a result, the information above for both trunk and local watermain is based on a combination of age and number of breaks per Table 12. The City prioritizes breaks over age for renewals, but for this analysis both were considered as

number of breaks was determined to be too conservative of an estimate of poor condition watermain. For planning purposes, it is important to consider the ESL of the pipe material.

However, there are limitations to this approach. It is evident in Figure 4 above that 38% of trunk watermains are shown to be in Very Poor condition but this does not necessarily reflect reality. The results of the completed condition assessments have shown that the trunk watermains which have been assessed typically do not have extensive distresses. As a result, the condition is at a low data confidence level.

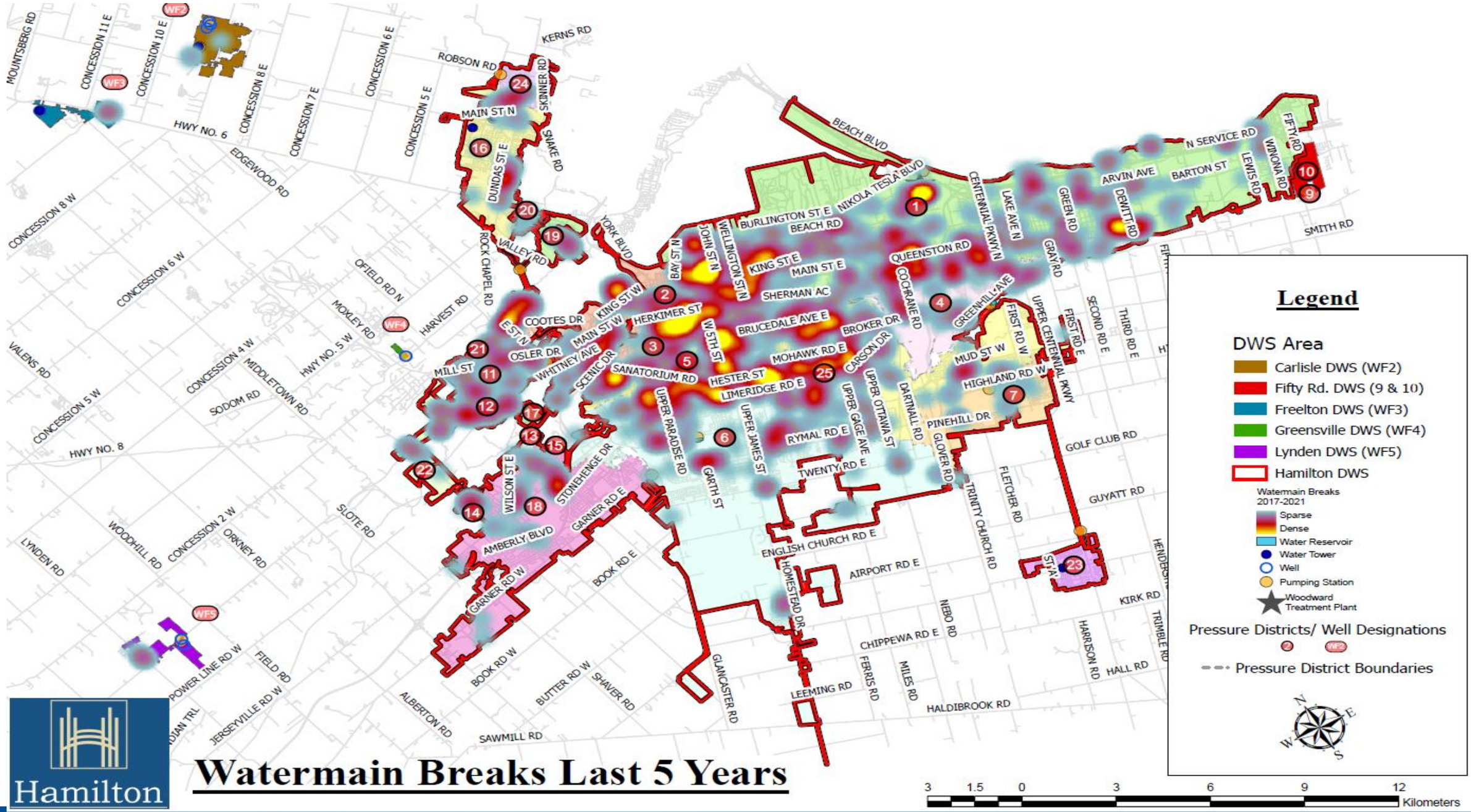
Map 2 below shows a heat map of watermain breaks over the 5 years. This figure is a snapshot in time and does not necessarily represent the condition of the entire network, but it is evident that watermain breaks have been occurring City wide. However, there is a concentration of breaks occurred in areas with older infrastructure especially in the upper city north of Limeridge Road and the lower city west of Wellington Street North, with a few pockets in Dundas and Stoney Creek. These areas should be investigated further for renewals. This figure shows that the City has been experiencing watermain breaks in areas with older infrastructure. There are limitations to this map because it does not show the type of break which can be due to a variety of factors unrelated to the condition of the pipe (e.g. temperature, breaks at the joint). However, since breaks is the main indicator of condition that the City uses to plan renewals, this map does show that there could be a relationship between age, location and the ability to predict breaks, and all of these can be indicators of condition for watermain.

OTHER LINEAR ASSETS

The remaining linear assets' conditions are estimated based on age where known. The majority of these assets are shown to be in good condition excluding water meters which are in fair condition. This shows that most assets are within their ESL and so the City should continue preventative operations and maintenance activities. The City is currently moving toward using a Smart Meter process, and so it is likely worthwhile to delay replacing some water meters until this program is fully implemented. In addition, as indicated in Section 2.1.1.6, many of these assets including valves, hydrants, and sampling stations have inspection programs which do not yet output overall condition scores, which should be investigated.

2.0 WATER ASSETS

Map 2: Watermain Breaks Last 5 Years



2.1.4.4 Asset Usage and Performance

Assets are generally provided to meet design standards where available. However, there are often insufficient resources to address all known deficiencies.

The largest performance issues with water involve issues with water quality and service disruptions.

The below service deficiencies in Table 13 were identified from the most recent inspection reports as well as staff input.

Table 13: Known Service Performance Deficiencies

ASSET	LOCATION	SERVICE DEFICIENCY	DESCRIPTION OF DEFICIENCY
Watermain	Various Locations farther from Water Treatment Plant	Low chlorine residuals	Due to climate change, Lake Ontario is staying warmer into the year and customers are using less water to irrigate their properties. When low residuals are confirmed, the event is logged and the watermain is flushed.
Watermain / Storage	Various Locations especially areas with unlined cast iron watermain and pressure district boundaries	Fire Flow Deficiencies (Low Pressure)	Areas of the system have lower fire flow and/or pitot pressure readings than optimal and require additional investigation.
Fire Hydrants	Various Locations	Substandard fire hydrant	Hydrant is substandard, includes 2-port, lead port, no secondary valve, no breakaway flange.
Watermain	Pressure District Boundaries	Target Pressure Deficiencies	Pressure is too low or too high and not at City target.
Large Valves	Various Locations	Poor Condition	Some large valves are broken in an open position and require replacement.

Table 13: Known Service Performance Deficiencies			
ASSET	**LOCATION**	**SERVICE DEFICIENCY**	**DESCRIPTION OF DEFICIENCY**
Water Treatment Plant	Chlorine level	Renewal activities will allow for the reduction of chlorine and reduce costs associated with renewing carbon filters	High chlorine use increased the renewal timing for high cost carbon filters. The renewal project will ensure these high cost items last significantly longer

2.1.5 Administrative

Administrative assets are assets which contribute to the water service but are not water assets. These include vehicles, laboratory equipment, software and administrative facilities. Administrative facilities replacement costs have been incorporated as part of the WTP cost.

As previously mentioned, the City has included these assets in a limited capacity so that the replacement costs are incorporated in the report since these assets contribute to the overall drinking water service, however, these have not yet been completed at a detailed level because they are not defined as part of the O.Reg. 588/17 definition of a water asset. These will be encompassed in more detail before the 2025 iteration of the plan.

2.2 LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how the City plans to manage and operate the assets at the agreed levels of service while managing life cycle costs.

2.2.1 Acquisition Plan

Acquisition reflects new assets that did not previously exist or works which will upgrade or improve an existing asset beyond its current capacity. They may result from growth, demand, legal obligations and social or environmental needs. Water assets are generally donated to the City through development agreements process directly related to growth.

CURRENT PROJECT DRIVERS – 10 YEAR PLANNING HORIZON

Hamilton Water currently prioritizes capital projects as per the drivers listed below. These drivers help to determine a ranking priority for projects and ensure that multiple factors are being considered to drive investment decisions. These drivers should be reviewed each iteration of the AM Plan to ensure they are appropriate and effective in informing decision making.

Table 14: Drivers for 10 Year Planned Projects

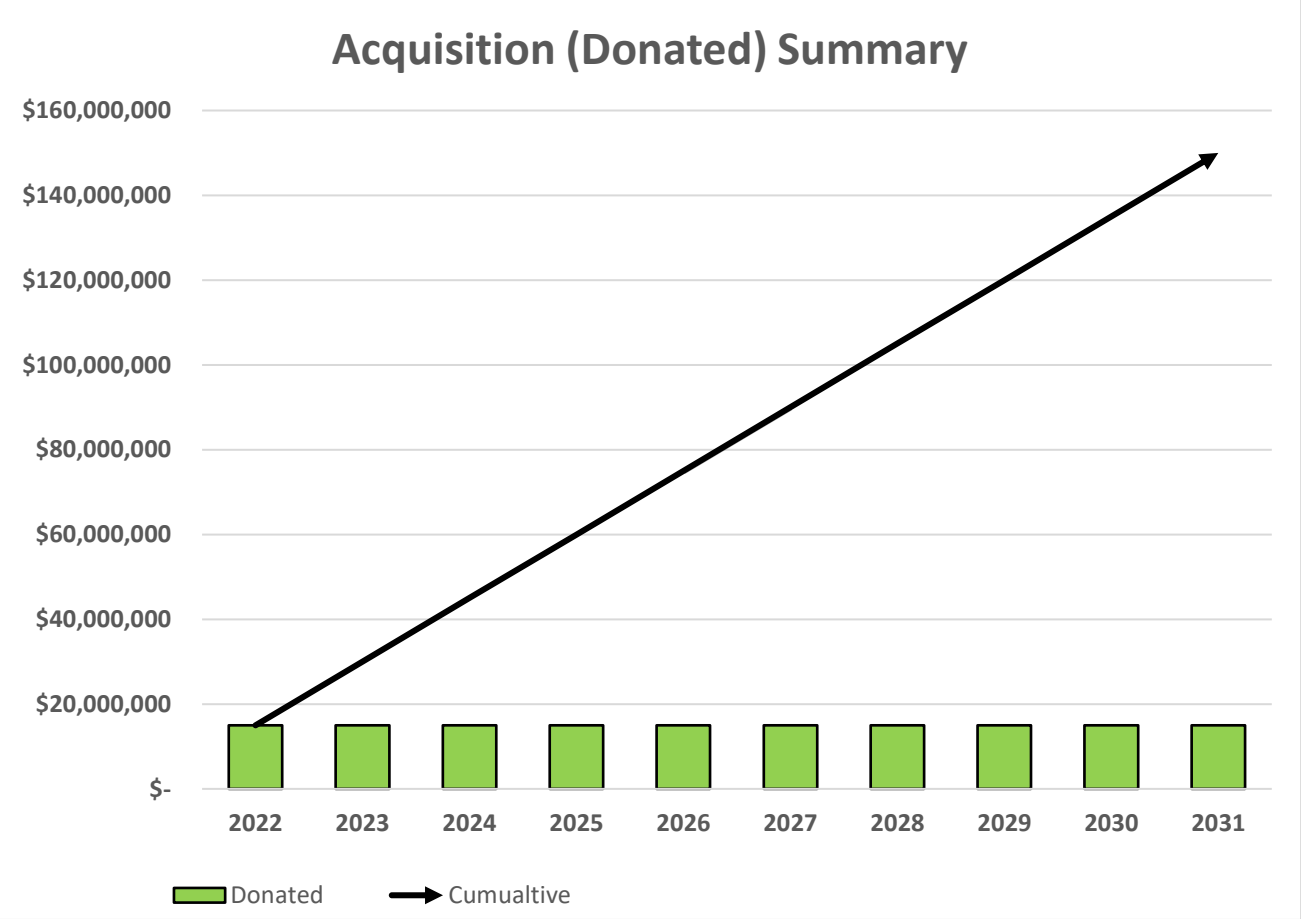
DRIVER	% OF PLANNED PROJECTS (10 YEAR HORIZON)
Legal Compliance	20%
Coordination, Funding, Budgeting	25%
Risk Mitigation	25%
Health and Safety	10%
Operating and Maintenance Impacts	10%
Development Growth	10%
Total	**100%**

2.0 WATER ASSETS

Forecast acquisition asset costs are summarized in Figure 5 and shown relative to the proposed acquisition budget.

DONATED ASSETS

Figure 5: Acquisition (Donated) Summary
All figures are in 2021 dollars.



Annually on average, the City assumes over **$15,000,000** of donated Water assets through subdivision agreements or other development agreements. These assets annually on average include **9 km's** of watermains, **1,500** new water service connections and water meters, **63** valves and **50** fire hydrants. The City is reviewing its donated asset assumption process to ensure that it proactively understands what assets are being donated annually and can ensure they are planned for properly. This will allow multiple departments to plan for the assets properly such as:

- AM to forecast the long-term needs and obligations of the assets;
- Operations and maintenance can include the assets in their planned activities (inspections, legislative compliance activities); and,
- Finance can ensure that assets are properly captured and recognized appropriately (Audited Financial Statements, TCA process, Provincial reporting such as the FIR).

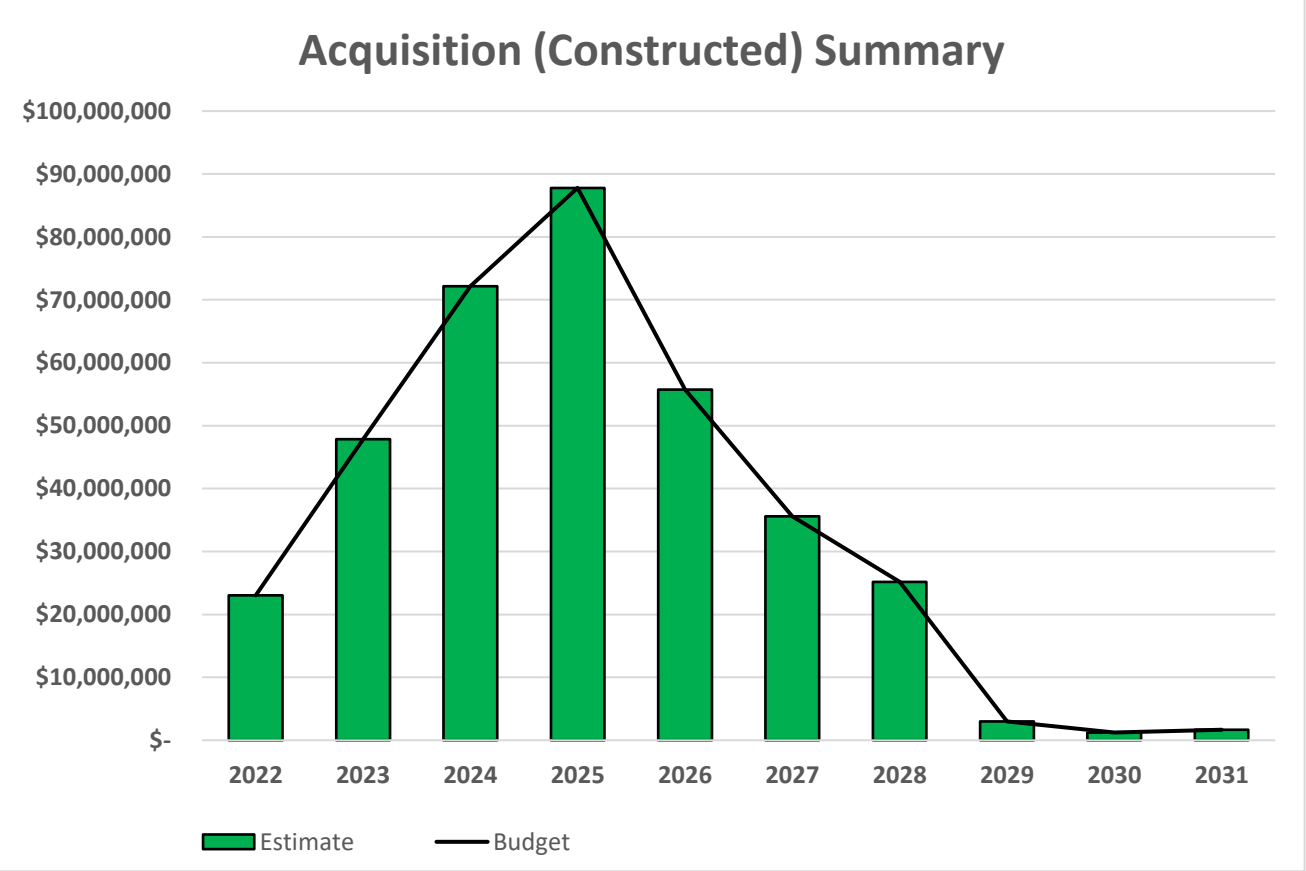
2.0 WATER ASSETS

Once the Water assets are assumed, Hamilton Water then becomes the stewards of these assets and is responsible for all ongoing costs for the asset's operation, continued maintenance, inevitable disposal and their likely renewal.

Construction costs are often only **10-15 %** of an asset's whole life costs. When development assets are donated to Hamilton, then the City becomes obligated to fund the remaining whole life costs. Over the next ten-year planning period the City anticipates receiving **$150,000,000** of donated assets which, would then obligate ratepayers to fund the remaining lifeycle costs over the donated assets ESL.

The City has internal design standards, inspection practices as well as assessment which are intended to ensure the assets that are being donated to the City through subdivision agreements are in excellent condition before assumption. The City should continue to review its assumption process to ensure that the City is receiving high quality and appropriately sized donated assets to defer lifecycle activities as much as possible.

Figure 6: Acquisition (Constructed) Summary
All figure values are shown in 2021 dollars.



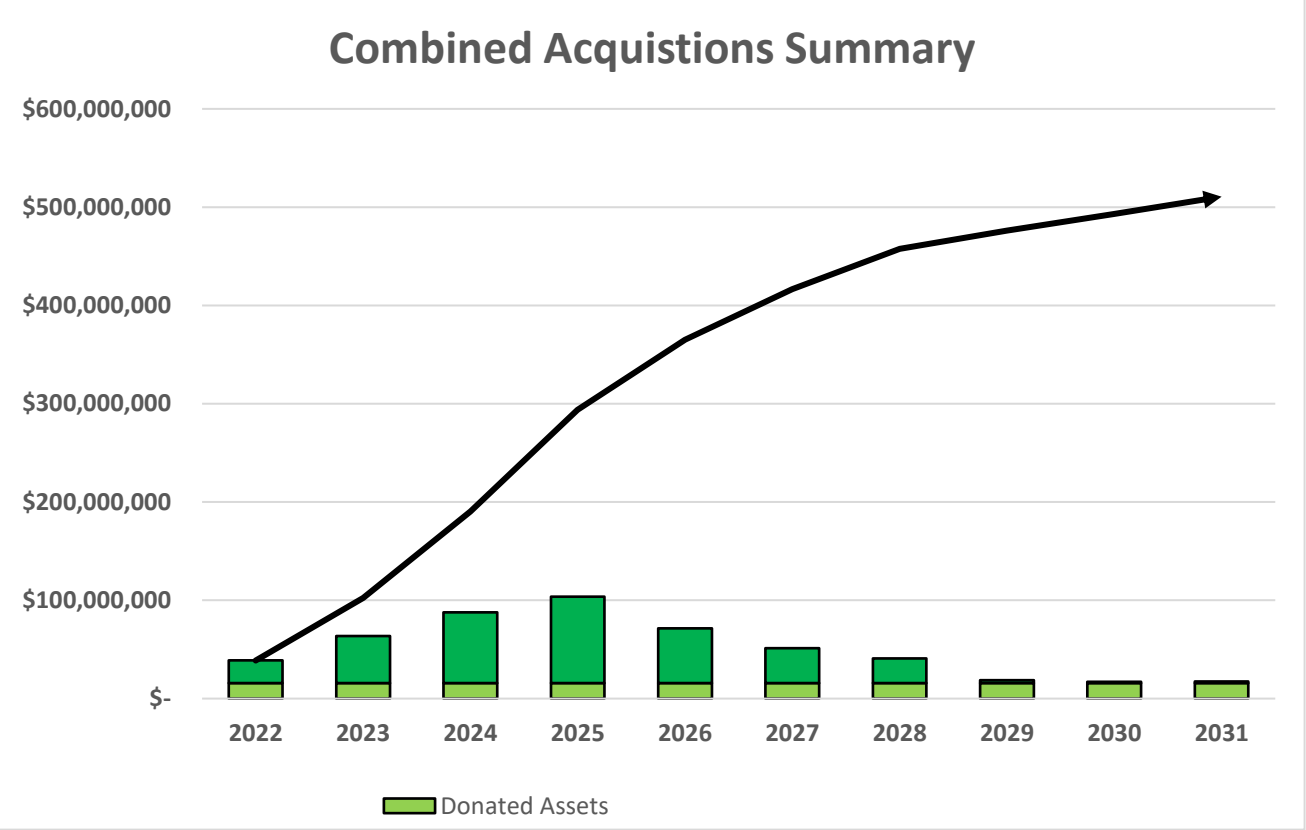
When the City commits to new assets, the municipality must be prepared to fund future operations, maintenance and renewal costs. The City must also account for future depreciation when reviewing long term sustainability. When reviewing the long-term impacts of asset

acquisition, it is useful to consider the cumulative value of the acquired assets being taken on by the Entity. The cumulative value of all acquisition work, including assets that are constructed and contributed shown in Figure 7.

Over the next 10 Year planning period the City will construct approximately **$361,174,000** of constructed assets which can either be new assets which did not exist before or expansion of assets when they are to be replaced . Major acquisition expenditures over the next ten years include:

- **$24 million** for Reservoir works, **$43** million for Water Meter Installations
- **$54 million** for Pumping Stations upgrades
- **$146** million dollar expansion to the Water Treatment Plant.

Figure 7: Combined Acquisition Summary
All figure values are shown in 2021 dollars.



SUMMARY OF ASSET FORECAST COSTS

Over the next ten (10) – years, the City expects to acquire nearly **$512 Million** dollars of water assets.

The City has sufficient budget for its planned constructed acquisitions at this time. It will become critical to understand that through the construction or assumption of new assets, the City will be

committing to funding the ongoing operations, maintenance and renewal costs which are very significant. The City will need to address how to best fund these ongoing costs as well as the costs to construct the assets while seeking the highest level of service possible.

Future AM Plans will focus on improving the understanding of Whole Life costs and funding options however at this time the plan is limited on those aspects. Expenditure on new assets and services will be accommodated in the long-term financial plan but only to the extent that there is available funding.

2.2.2 Operations and Maintenance Plan

Operations include all regular activities to provide services. Daily, weekly, seasonal, and annual activities are undertaken by staff to ensure the assets perform within acceptable parameters and to monitor the condition of the assets for safety and regulatory reasons. Examples of typical operational activities include cleaning, sample collection, quality testing, inspections, utility costs and the necessary staffing resources to perform these activities.

Maintenance should be viewed as the ongoing management of deterioration. The purpose of planned maintenance is to ensure that the correct interventions are applied to assets in a proactive manner and to ensure it reaches its intended useful life. Maintenance does not significantly extend the useful life of the asset but allows assets to reach their intended useful life by returning the assets to a desired condition.

Proactively planning maintenance significantly reduces the occurrence of reactive maintenance which is always linked to a higher risk to human safety and higher financial costs. The City needs to plan and properly fund its maintenance to ensure the engineered structures are reliable and achieve their desired level of service.

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating. Examples of typical maintenance activities include pipe repairs, service repairs, pump maintenance, equipment repairs along with appropriate staffing and material resources.

Some of the major maintenance projects Hamilton plans to undertake over the next 10 years include:

- **$56 million** allocated for Road Cut restoration program
- **$24.5 million** allocated for reactive maintenance (water valves, hydrants etc)
- **$2.5 million** allocated for Water Utility structure works

Assessment and priority of reactive maintenance is undertaken by staff using experience and judgement

2.2.3 Vertical

The major operating and maintenance lifecycle activities per vertical asset with their accompanying 2021 costs (if known) are shown below in Table 15.

Table 15: Vertical - Operations and Maintenance Summary

ASSET	LIFECYCLE STAGE	LIFECYCLE ACTIVITY	2021 ANNUAL COST
Water Treatment Plant	Operation	Inspection, Optimization, Preventative measures	$6,671,284
		Calibration & Verification	$89,794
	Maintenance	Preventative Maintenance	$16,457
		Reactive Maintenance	$396,372
Booster Stations	Operations	Inspections, Preventative measures	$8,371,077
		Calibration & Verification	$54,758
	Maintenance	Preventative Maintenance	$15,078
		Reactive Maintenance	$111,349
PRV Chambers	Operation	Preventative Operations	$15,827
Reservoirs & Towers	Operations	Inspections. Preventative measures	$387,461
		Calibration & Verification	$17,595
	Maintenance	Preventative Maintenance	$2,415
		Reactive Maintenance	$23,450
Wells	Operations	Inspections, Preventative measures	$89,301
		Calibration & Verification	$26,840
	Maintenance	Preventative Maintenance	$14,874
		Reactive Maintenance	$55,198
		Total Annual Cost	**$16,359,130**

The above table was created by categorizing work order descriptions into lifecycle activities, but the work order descriptions did not always provide a clear distinction regarding the purpose of the activities. Therefore, it is likely there are some errors in the above table for how the amounts are allocated especially regarded preventative and reactive maintenance allocations. However, the total annual cost is accurate for what was spent on vertical assets for operations and

maintenance activities in total. This is a continuous improvement item which will be addressed through the EAM project, which is described in the AMP Overview.

2.2.4 Linear

The major operating and maintenance lifecycle activities per linear asset with their accompanying 2021 costs (if known) are shown below in Table 16.

Figure 16: Linear - Operations and Maintenance Summary

ASSET	LIFECYCLE STAGE	LIFECYCLE ACTIVITY	FREQUENCY	2021 COST	UNIT
Watermain	Operation	Flushing	Annual	$59.00	per unit
	Maintenance	Repair Program	Ad Hoc	$10,000	per unit
Water Service	Operation	Inspection	Ad Hoc	$59.00	per unit
	Maintenance	Repair Program	Ad Hoc	$800.00	per unit
		Reactive Maintenance	Ad Hoc	$2,500	per unit
Water Meters >38mm	Operation	Testing/ Calibration	5-year cycle	$250,000	per year
	Maintenance	Repair			
Hydrants	Operation	Flushing	Annual	$59.00	per unit
		Automatic Flushing Unit Inspection	Biannual	$118.00	per unit
		Hydrant Flow	3 year cycle	$195,000.00	per year
		Hydrant Code	Annually	$195,000.00	per year
		Painting	Every 5 Years	$160,000.00	per year
	Maintenance	Repair Program	Ad Hoc	$1,000.00	per unit
		Reactive Maintenance	Ad Hoc	$9,000.00	per unit
Valves	Operation	Exercising & Inspection <400mm	3 year cycle	$59.00	per unit

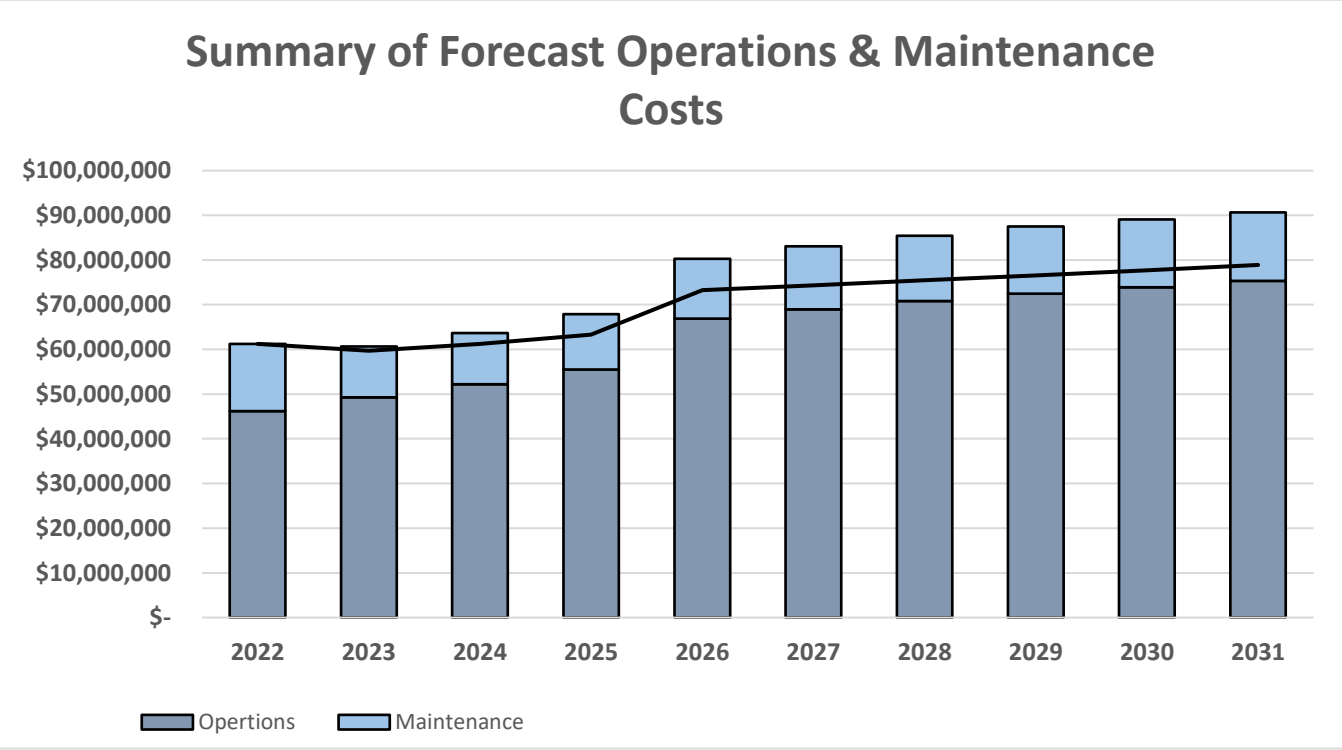
2.0 WATER ASSETS

Figure 16: Linear - Operations and Maintenance Summary

ASSET	LIFECYCLE STAGE	LIFECYCLE ACTIVITY	FREQUENCY	2021 COST	UNIT
		Exercising & Inspection >400mm	Annually	$59.00	per unit
	Maintenance	Repair Program	Ad Hoc	$500.00	per unit
		Reactive Maintenance (<400mm)	Ad Hoc	$8,000.00	Per Unit

Forecast operations and maintenance costs vary in relation to the total value of the asset registry. When additional assets are acquired, the future operations and maintenance costs are forecast to increase. When assets are disposed of the forecast operation and maintenance costs are reduced. Figure 8 shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget.

Figure 8: Summary of Forecast Operations and Maintenance Costs



The forecast of operations and maintenance costs are increasing steadily over time and it is clear, the City has insufficient budget to achieve all of the works required to ensure that assets will be able to achieve their estimated service life at the desired level of service. It is anticipated that at the current budget levels there will be insufficient budget to address all operating and maintenance needs over the 10-year planning horizon. The graph above illustrates that without increased funding or changes to lifecycle activities there is a significant shortage of funding which will lead to:

- Higher cost reactive maintenance;
- Possible reduction to the availability of the assets;
- Impacts to private property; and,
- Increased financial and reputational risk.

The shortfall is primarily due to the significant number of assets that are donated through subdivision agreements annually and insufficient funding allocations over an extended period of time. Every year that Hamilton adds additional assets without properly funding the necessary lifecycle activities, staff's ability to sustain the assets to expected or mandatory level of service can be significantly impacted. It should be noted that there are mandatory operational and maintenance expenditures due to legislative requirements and cannot and should not simply be avoided or deferred.

The forecast costs include all costs from both the Capital and Operating budget. Asset management focuses on how taxpayer or ratepayer dollars are invested by lifecycle activities and not by budget allocation since both budgets contain various lifecycle activities, they must both be consolidated for the AM Plans.

As the City continues to develop condition profiles and necessary works are identified based on their condition, it is anticipated operation and maintenance forecasts will increase significantly. Where budget allocations will result in a lesser level of service, the service consequences and risks will be identified and are highlighted in the Risk Section 2.6.

Deferred maintenance (i.e. works that are identified for maintenance activities but unable to be completed due to available resources) will be included in the infrastructure risk management plan for the next iteration.

Future iterations of this plan will provide a much more thorough analysis of operations and maintenance costs including types of expenditures for training, mandatory certifications, insurance, staffing costs and requirements, equipment and maintenance activities.

2.2.5 Renewal Plan

Renewal is major works which does not increase the assets design capacity but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Works over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional future operations and maintenance costs.

2.0 WATER ASSETS

Asset renewals are typically undertaken to either ensure the assets reliability or quality will meet the service requirements set out by the City. Renewal projects are often triggered by service quality failure and can often be prioritized by those that have the highest consequence of failure, have high usage, have high operational and maintenance costs and other deciding factors.

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in Table 17 and are based on estimated design life for this iteration. Future iterations of the plan will focus on the Lifecycle approach to ESL which can vary greatly from design life. Asset useful lives were last reviewed in 2022 however they will be reviewed annually until their accuracy reflects the City's current practices.

TABLE 17: Useful Life of Assets

ASSET (SUB)CATEGORY	EXPECTED USEFUL LIFE
Water Mains	80
Hydrants	50
Services	80
Booster Stations	60
Water Treatment Plant	60
Sampling Stations	50
Water Towers	50
SCADA System	15
Water Meters	25
Wells	75
Well Pumping Stations	60
Valves	80
Vehicles	7 or 8

The estimates for renewals in this AM Plan were based on the register method which utilizes the detailed listing of Hamilton's asset inventory and all available lifecycle information to determine the optimal timing for renewals.

RENEWAL RANKING CRITERIA

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing a bridge that has a load limit); or,
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. condition of a culvert).[1]

Future methodologies will be developed to optimize and prioritize renewals by identifying assets or asset groups that:

- Have a high consequence of failure;
- Have high use and subsequent impact on users would be significant;
- Have higher than expected operational or maintenance costs; and,
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.[2]

The ranking criteria used to determine priority of identified renewal proposals is detailed in Table 18.

TABLE 18: Renewal Priority Ranking Criteria

CRITERIA	WEIGHTING
Regulatory / Legal Compliance	20%
Co-ordination – Funding and Budgeting	25%
Risk Mitigation	25%
Health & Safety (Users & Staff)	10%
Lifecycle Impacts (Operations & Maintenance)	10%
Demand Driver (Growth)	10%
Total	**100%**

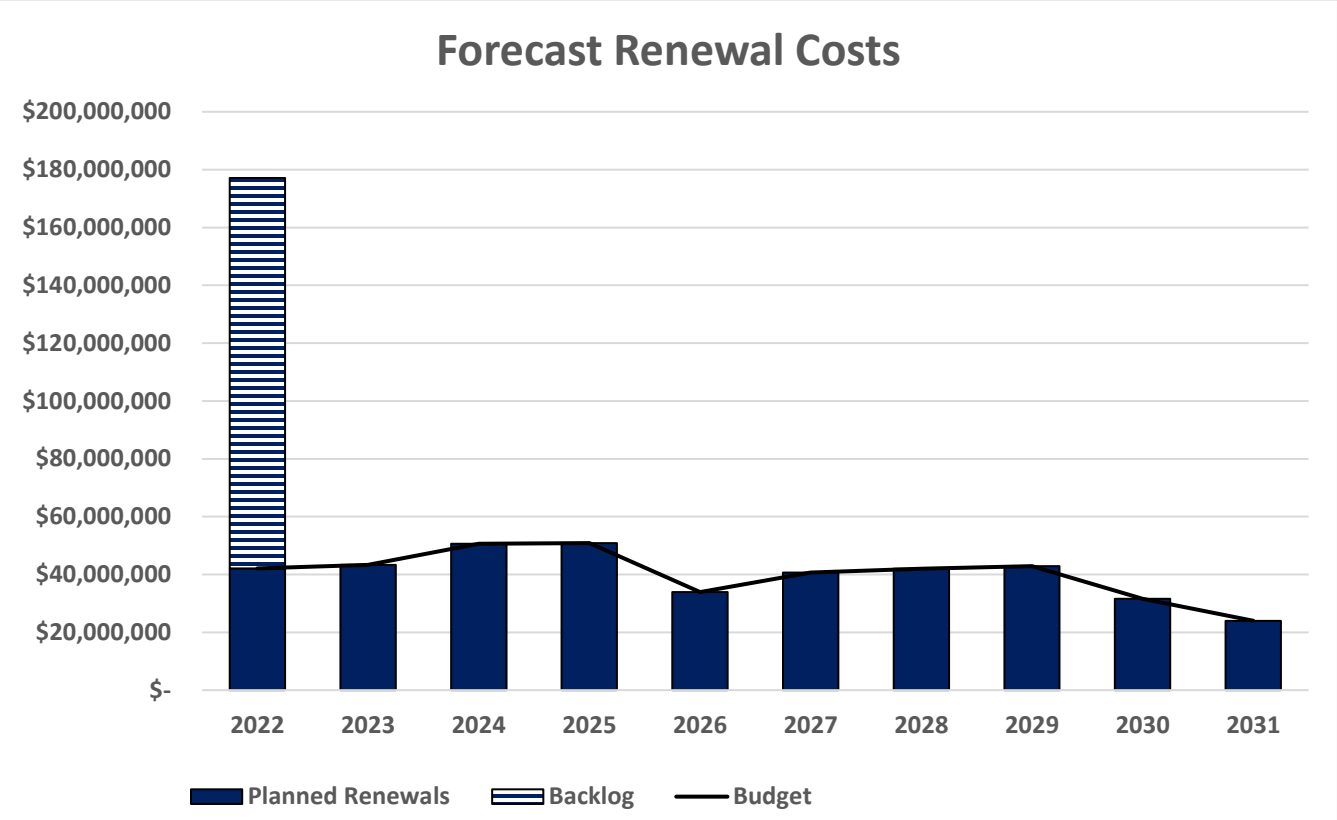
SUMMARY OF FUTURE RENEWAL COSTS

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in Figure 19.

[1] IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.
[2] Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

2.0 WATER ASSETS

Figure 19: Forecast Renewal Costs
All figure values are shown in 2021 dollars.



The significant amount highlighted in 2022 represents the cumulative backlog of deferred work to be completed that has been either identified through its current estimated condition or age per Table 9 when condition was not available. Deferred renewal (assets identified for renewal and not scheduled) are included and identified within the risk management plan. Prioritization of these projects will need to be managed over time to ensure these can be addressed and that future renewals can occur at the optimal time.

There is only sufficient budget to support the planned projects at this time and without additional funding the backlog will remain and future projects outside of the 10-year planning horizon will continue to move forward into the 10-year scope. Continued deferrals of projects will lead to significantly higher operational and maintenance costs and will affect the availability of services in the future.

Forecasted renewals over the ten (10) – year planning horizon include select watermain replacements, water treatment plant renewals and water meter replacements. In 2022 the City will invest nearly $43.0 million to renewal assets such as **$5.3 million** for watermain structural relining, **$4.3 million** for water meter renewals and over **$7.1 million** for watermain renewals in sections of Burlington road, Concession & Mountain Brow and various other locations. In 2023 the City will invest **$43.3 million** to renew assets such as **$6.2 million** for watermain relining, **$10.0 million** renewing watermain along Barton from Sherman to Ottawa and an additional **$4.3 million** in water meter replacements. In 2024, the City will invest nearly **$15.6 million** in

watermain renewals with **$6.0 million** of that being allocated to Upper Centennial from Rymal to Mud. It will also invest **$6.4 million** to renew the Chlorine Chemical Building at the Water treatment plant.

Other major renewals over the 10 year planning horizon includes over **$200** Million of renewal initiatives at the water treatment plant as well as plant works at 2 booster stations, annual watermain lining, valve replacements, SCADA Components, lab improvements as and focused work on multiple reservoirs.

Deferring renewals create risks of higher financial costs, decreased availability, and decreased satisfaction with asset performance. Ultimately, continuously deferring renewals works ensures Hamilton will not achieve intergenerational equality. If Hamilton continues to push out necessary renewals, there is a high risk that future generations will be unable to maintain the level of service the customers currently enjoy. It will burden future generations with such significant costs that inevitably they will be unable to sustain them.

Properly funded and timely renewals will ensure the assets perform as expected and it is recommended to continue to analyze asset renewals based on criticality and availability of funds for future AM Plans.

2.2.6 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, possible closure of service, decommissioning, disposal of asset materials, or relocation. Disposals will occur when an asset reaches the end of its useful life. The end of its useful life can be determined by factors such as excessive operation and maintenance costs, regulatory changes, obsolesce or demand for the structure has fallen.

Assets identified for possible decommissioning and disposal are shown in Table 20. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in Table 20. Any costs or revenue gained from asset disposals is included in future iterations of the plan and the long-term financial plan.

TABLE 20: Assets Identified for Disposal

ASSET	REASON FOR DISPOSAL	TIMING	DISPOSAL COSTS	OPERATIONS & MAINTENANCE ANNUAL SAVINGS
Chlorine Building	End of Life	2028	$500,000	Undetermined
Greenhill Booster Station	End of Life	2029-2030	$800,000	Undetermined

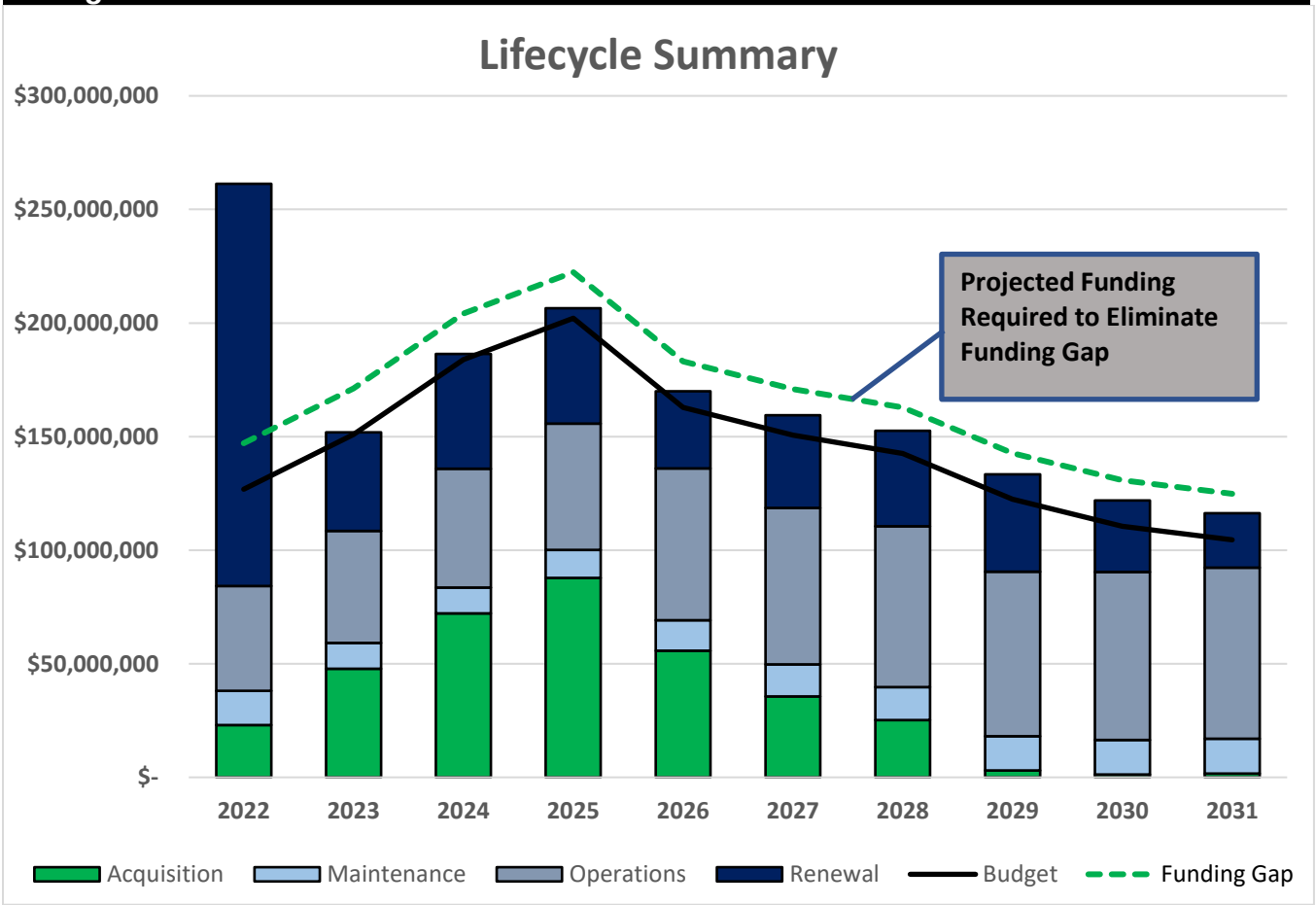
SUMMARY OF ASSET FORECAST COSTS

2.0 WATER ASSETS

The financial projections from this AM Plan are shown in Figure 9. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

The bars in the graphs represent the forecast costs needed to minimize the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.

Figure 9: Lifecycle Summary
All figure values are shown in 2021 dollars.



Currently there is insufficient budget to address the large backlog of renewal work projected by the plan. There is sufficient budget to address ongoing operational and maintenance needs for most of the planning period however with the assumption of assets over time and their increased costs there may be impacts to the service itself as illustrated by Figure 9. Without some adjustment to available funds or other lifecycle management decisions there will be insufficient budget to address all planned lifecycle activities.

2.0 WATER ASSETS

Allocating sufficient resources is imperative to managing asset throughout their lifecycle. This can include funding for lifecycle activities, sufficient staffing, increased asset knowledge, improved planning, contracted services, additional equipment or vehicles to ensure that Hamilton is optimizing its lifecycle approach.

Without sufficient funding the City has little option but to defer these necessary lifecycle activities. Deferring important lifecycle activities is never recommended. The City will benefit from allocating sufficient resources to developing its long-term financial plan to ensure that over time the City can fully fund the necessary lifecycle activities. Funding these activities helps to ensure the assets are compliant, safe and effectively deliver the service the customers need and desire.

The lack of funding allocated for the backlog of renewals and the necessary lifecycle activities creates an additional issue which is intergenerational equity. Each year the City defers necessary lifecycle activities it pushes the ever-increasing financial burden on to future generations. It is imperative the City begin addressing the lack of consistent and necessary funding to ensure that intergenerational equity will be achieved. Over time, allocating sufficient funding on a consistent basis ensures that future generations will be able to enjoy the same standards being enjoyed today.

Over time the City will continue to improve its lifecycle data, and this will allow for informed choices as how best to mitigate those impacts and how to address the funding gap itself. This gap in funding future plans will be refined over the next 3 years and improve the confidence and accuracy of the forecasts.

2.3 MANDATORY O. REG. 588/17 LEVELS OF SERVICE

As previously mentioned, the City is developing this AM Plan to be in accordance with O.Reg 588/17 requirements. Table 1 in O.Reg. 588/17 identifies specific metrics that must be reported in the AM Plan for water assets. These metrics are required to be reported and have been separated from the municipally defined levels of service described in Section 2.4. These metrics are divided into community and technical levels of service and are detailed below.

2.3.1 Mandatory O. Reg. 588/*17* Community Levels of Service

Per Table 1 in O. Reg. 588/17, there are community levels of service that the City is required to report on in order to meet the provincial level of service requirement. These metrics are required to be reported, and so they have been separated from the customer levels of service described in Section 2.4.2. These qualitative metrics are reported below.

Scope

1. Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal water system.

Most properties within the City's urban area are connected to the municipal drinking water system. These urban properties include residential, industrial, commercial and institutional uses. Communities not within the urban area may be part of a water system with a communal well or may use their own private well.

As stated in Section 2.1, the City currently operates and maintains five (5) different drinking water systems. The largest system is the the Hamilton drinking water system which is made up of two subsystems; Woodward and Fifty Road. The Woodward subsystem draws its water from Lake Ontario and serves the majority of the the City's population, and the Fifty Road subsystem distributes water from the Town of Grimsby. In addition, there are four (4) systems which draw water from the ground using drinking water wells. A map of the subsystems can be found in MAP 1.

2. Description, which may include maps, of the user groups or areas of the municipality that have fire flow.

Most properties within the City's urban area are connected to the Hamilton drinking water system which includes fire flow. Urban properties include residential, industrial, commercial and institutional uses. It is important to note that there are areas where fire flow deficiencies may exist within the urban system which will be investigated in future iterations of this AM Plan.

Rural areas in the City which are not part of the Hamilton system typically do not have fire flow and would be serviced using rural fire fighting techniques. The Hamilton Fire Department has received "Superior Tanker Shuttle" accreditation by Fire Underwriter Survey (FUS) for the non-hydrant areas in the City, which is considered as equivalent to hydrant protection. But this will be further investigated in the future Emergency Services AM Plan.

Reliability
1. Description of boil water advisories and service interruptions.

The City did not have any boil water advisories (BWA) in 2021, however, the City did lift a longstanding drinking water advisory (DWA) in the Lynden system in 2021. The residents of Lynden had been under a precautionary drinking water advisory since September 2011 due to lead contamination from the communal well. The City drilled a new well, built a new treatment facility in Lynden which was commissioned in 2020, and completed other system improvements to the linear assets.

After the treated water from the new facility passed all required testing for a full year, City Public Health Services advised that the DWA could be lifted.

2.3.2 Mandatory O. Reg. 588/17 Technical Levels of Service

In addition, per Table 5 in O. Reg. 588/17, there are technical levels of service that the City is required to report on in order to meet the provincial level of service requirement. These quantitative metrics are reported below.

Table 21: Mandatory Technical Levels of Service

SERVICE ATTRIBUTE	TECHNICAL LEVELS OF SERVICE	MEASURE
Scope	**1**. Percentage of properties connected to the municipal water system.	90.4% of 162,308 properties
	2. Percentage of properties where fire flow is available.	89.7% of 162,308 properties
Reliability	**1**. The number of connection-days* per year where a boil water advisory notice is in place compared to the total number of properties connected to the municipal water system.	0 connection days of 146,857 connected properties
	2. The number of connection-days* per year due to water main breaks compared to the total number of properties connected to the municipal water system.	1,305** connection days of 146,857 connected properties

*Connection-days are defined as “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”.

**261 breaks, and assumed 30 properties multiplied by 0.167 days (four (4) hours) to resolve each break

2.0 WATER ASSETS

Service interruptions typically occur due to an unplanned watermain break or due to planned maintenance. Typically, these events are resolved within ten (10) hours. In addition, the City implemented a full-scale leak detection program in 2021 which proactively finds watermain leaks in the system which may not be obvious (e.g. leaks in areas with good soil drainage) and schedules these break repairs. It is estimated that this is a cost avoidance for the City of $530,000 annually in water treatment costs.

2.4 MUNICIPALLY DEFINED LEVELS OF SERVICE

Levels of service are measures for what the City provides to its customers, residents, and visitors.

Service levels are best described as the link between providing the outcomes the community desires, and the way that the City provides those services. Service levels are defined in three ways, customer values, customer levels of service and technical levels of service which are outlined in this section.

2.4.1 Customer Values

Customer values are what the customer can expect from their tax dollar in “customer speak”. These values are used to develop level of service statements.

Customer Values indicate:

- what aspects of the service is important to the customer;
- whether they see value in what is currently provided; and,
- the likely trend over time based on the current budget provision.

To develop these customer values, as stated in the AMP Overview, a Customer Engagement Survey was released in January 2022 on the Engage Hamilton platform. The survey received 184 submissions and contained 17 questions related to drinking water service delivery. The survey results can be found in Appendix “A” in the AMP Overview. While these surveys were used to establish customer values and customer performance measures, it’s important to note that the number of survey respondents only represents a small portion of the population.

The future intent is to release this survey on an annual basis to measure the trends in customer satisfaction and ensure that the City is providing the agreed level of service as well as to improve the marketing strategy to receive more responses. This has been noted in Table 32 in the Continuous Improvement section.

TABLE 22: Customer Values
SERVICE OBJECTIVE:

CUSTOMER VALUES	CUSTOMER SATISFACTION MEASURE	CURRENT FEEDBACK	EXPECTED TREND BASED ON PLANNED BUDGET
Water is safe to drink	Annual Customer Engagement Survey	Survey respondents generally feel that the water in Hamilton is somewhat safe to drink or better.	Expected to Maintain
Water looks and tastes good	Annual Customer Engagement Survey	There have been a significant portion of survey respondents who have experienced drinking water which had an unusual colour and/or odour.	Expected to Maintain
Water is available when I need it	Annual Customer Engagement Survey	The majority of survey respondents did not have an unplanned service interruption in the last year.	Expected to Maintain
Water coming out of the tap is a good pressure.	N/A	No feedback at this time via the survey, but pressure complaints were received and are documented in the technical levels of service and will be added to future surveys.	

2.4.2 Customer Levels of Service

Ultimately customer performance measures are the measures that the City will use to assess whether it is delivering the level of service the customers desire. Customer level of service measurements relate to how the customer feels about the City's water network in terms of their quality, reliability, accessibility, responsiveness, sustainability and over course, it's cost. The City will continue to measure these customer levels of service to ensure a clear understanding on how the customers feel about the services and the value for their rate dollars.

2.0 WATER ASSETS

The Customer Levels of Service are considered in terms of:

Condition	How good is the service? What is the condition or quality of the service?
Function	Is it suitable for its intended purpose? Is it the right service?
Capacity/Use	Is the service over or under used? Do we need more or less of these assets?

In Table 23 under each of the service measures types (Condition, Function, Capacity/Use) there is a summary of the performance measure being used, the current performance, and the expected performance based on the current budget allocation.

2.0 WATER ASSETS

Table 23: Customer Levels of Service

TYPE OF MEASURE	LEVEL OF SERVICE	SOURCE	PERFORMANCE MEASURE	CURRENT PERFORMANCE	EXPECTED TREND BASED ON PLANNED BUDGET
Condition	Provide reliable drinking water services with minimal service interruptions.	Annual Customer Engagement Survey	89.2% of survey respondents have not experienced an unplanned service interruption in the last year	Fairly Satisfied	Slight Decrease
			83.3% of survey respondents that have had an unplanned service interruption indicate the issue was resolved in a timely manner	Fairly Satisfied	Maintain Fairly Satisfied
		Confidence levels			
	Ensure water assets are kept in acceptable repair.	Condition Assessment Report	Condition of WTP	Poor	
		Confidence levels			
		Condition Assessment Report	Average condition of booster stations	Good	
		Confidence levels			
			Average condition of Wells	Fair	
		Condition Assessment Report	Average condition of Well Stations	Good	
		Confidence levels			
		Condition Assessment Report	Average Condition of Storage	Good	
		Confidence levels			
		Estimated based on age and breaks	Estimated condition of trunk watermain	Fair	
		Estimated based on age and breaks	Estimated condition of local watermain	Fair	
		Confidence levels		Medium	
		Confidence levels			
Function	Provide safe and palatable drinking water.	Annual Customer Engagement Survey	87.2% of survey respondents feel that drinking water is somewhat safe to drink or better.	Fairly Satisfied	Maintain Fairly Satisfied
			37.5% of survey respondents have a lead service or are unsure if they have a lead service.	Unsatisfied	Maintain Unsatisfied
			36.9% of survey respondents have experienced tap water that has an unusual odour and/or colour	Unsatisfied	Maintain current level
		Confidence levels			
Capacity	Ensure drinking water is accessible and the design capacity supports fire protection.	Annual Customer Engagement Survey	57.5% of survey respondents drink unfiltered tap water	Satisfied	Maintain current level
			90.8% of survey respondents are connected to Hamilton's municipal network.	High	Maintain current level
		Confidence levels			

2.4.3 Technical Levels of Service

Technical levels of service are operational or technical measures of performance, which measure how the City plans to achieve the desired customer outcomes and demonstrate effective performance, compliance and management. The metrics should demonstrate how effectively Hamilton delivers its services in alignment with its customer values; and should be viewed as possible levers to impact and influence the Customer Levels of Service. Hamilton will measure specific lifecycle activities to demonstrate how Hamilton is performing on delivering the desired level of service as well as to influence how customer perceive the services they receive from the assets.

Technical service measures are linked to the activities and annual budgets covering Acquisition, Operation, Maintenance, and Renewal.

Service and asset managers plan, implement and control technical service levels to influence the service outcomes.[3]

Table 24 shows the activities expected to be provided under the current 10 year planned budget allocation, and the forecast activity requirements being recommended in this AM Plan.

[3] IPWEA, 2015, IIMM, p 2|28.

2.0 WATER ASSETS

Table 24: Technical Levels of Service

LIFECYCLE ACTIVITY	PURPOSE OF ACTIVITY	ACTIVITY MEASURE	CURRENT PERFORMANCE (2021)*	TARGET	RECOMMENDED PERFORMANCE **
Operation	Ensure water assets are kept in acceptable repair.	% Completion Flow & Code Annual Program % of plan	95%	100%	100%
		% Completion of valve inspections & exercising for annual program % of Plan	99%	100%	*100 %*
	Provide safe and palatable drinking water.	# of instances Chlorine is below/above target concentration at the WTP	8	0	0
		# of instances Fluoride is below/above target concentration at the WTP	3	0	0
		# of instances Orthophosphate is below/above target concentration at the WTP	12	0	0
		# Water Quality Complaints	558	No Data	No Data
		% of Water Quality Complaints investigated by City	100%	100%	100%
		% of Water Quality Complaints Requiring Intervention	46%	No Data	No Data
		Number Confirmed AWQIs	11	0	0
		Budget			
Maintenance	Provide reliable drinking water services with minimal service interruptions.	% of emergency above hydrant inspection / repairs completed within 15 days	100%	100%	100%
		% of scheduled above hydrant inspection / repairs completed within 45 days	98.29%	100%	100%
		% of emergency watermain repairs within 2 days	100%	100%	100%
		% of emergency valve repairs/replacement/installation/cleaning within 2 days	*100%*	100%	100%
		% of emergency water service line repairs/replacement/cleaning within 2 days	95.125%	100%	100%
		# Low pressure complaints	252	No Data	No Data
	Ensure water assets are kept in acceptable repair.	# Emergency watermain breaks	177	No Data	No Data
		# Scheduled watermain breaks	84	No Data	No Data
		Budget			
Renewal	Provide reliable drinking water services with minimal service interruptions.	% of emergency hydrant replacement within 2 days	*100*	100%	100%
		% of scheduled hydrant replacement within 70 days	79.3%	100%	100%
	Ensure water assets are kept in acceptable repair.	Length (km/yr) CIPP watermain rehabilitation	*5*	No Data	No Data
		Length (km) watermain replaced	*4*	No Data	No Data

Note: * Current activities related to Planned Budget.
***** Expected performance related to forecast lifecycle costs.***

It is important to monitor the service levels regularly as circumstances can and do change. Current performance is based on existing resource provision and work efficiencies. It is acknowledged changing circumstances such as technology and customer priorities will change over time.

At this time, many of the existing technical metrics do not have a target. These metrics should be improved to include a target to be in line with SMART objectives identified in the AMP Overview.

As the City's asset management maturity increases, and with the implementation of the EAM project mentioned in the AMP Overview in Section 7.2.3, the City will also have more capacity to measure additional metrics. In addition, the City should investigate the BIMA scorecard further to ensure data and assumptions are consistent with ministry and City reporting.

2.4.4 Level of Service Summary

At this time, the City's technical metrics for Water assets are typically based on meeting regulatory and legislative requirements include Environmental Compliance Agreements (ECAs). It is evident per Table 24 that the City is typically meeting these standards with a few exceptions. However, customer preferences and expectations do not always match minimum legislated requirements, which is discussed below. As mentioned in Section 2.4.2, while these surveys were used to establish customer values and customer performance measures, it's important to note that the number of survey respondents currently only represents a small portion of the population.

CONDITION

The majority of survey respondents had not had an unplanned service interruption, and if a service interruption did occur, they were typically satisfied with the time it took to resolve the issue. This indicates that customers are very satisfied at this time with the condition of the assets. When this is compared to the technical metrics, the City is typically meeting the targets for resolving planned and emergency interruptions within 2 days, however, typically issues are resolved with 4 hours, and so these metrics should be revised to reflect the levels of service the City is providing.

FUNCTION

The majority of survey respondents indicated that they thought the City drinking water was safe, which was considered to be very satisfied. However, some survey respondents were unsatisfied with the palatability of the water and experienced water with an unusual colour or odour. Per the technical levels of service, the City investigated 100% of the 558 water quality complaints received by residents, but only identified 11 adverse water quality incidents (ADWQIs), meaning most of these complaints were not out of compliance. The City will investigate adding additional metrics to quantify the reason for these complaints to ensure the cause for complaints is properly quantified which has been identified as a continuous improvement item in Table 32.

Some survey respondents also reported that they had lead water services, which can pose a health risk. The City has been actively contacting customers that likely have a lead service, and offers a loan program to assist customers with getting these service lines replaced, and should investigate quantifying this as a technical metric, which has been identified as a continuous improvement item in Table 32.

CAPACITY

At this time, there were not any key findings associated with the water capacity with respect to customer levels of service, but the majority of survey respondents were shown to be connected to the municipal wastewater system, which is expected.

However, the City could consider adding additional sampling stations to improve the ability to test for AWQIs throughout the water network, which has been identified as a continuous improvement item in Table 32.

2.5 FUTURE DEMAND

The ability for the City to be able to predict future demand for services enables the City to plan ahead and identify the best way of meeting the current demand while being responsive to inevitable changes in demand. Demand will inevitably change over time and will impact the needs and desires of the community in terms of the quantity of services (more communities connecting to the service) and types of service required (larger facilities to process increased volumes).

Demand is defined as the desire customers have for assets or services and that they are willing to pay for. These desires are for either new assets/services or current assets.

Since demand is not yet an extensive requirement in O.Reg 588/17 for the July 1st, 2022 deadline, this section is not as robust as some other sections of the report, but is an obligation for the report by July 1st, 2025, and will be expanded on in future iterations of the report.

2.5.1 Demand Drivers

For water, the key drivers are population change, climate change, legislative requirements and customer preferences and expectations. A future continuous improvement item is to identify additional demand drivers.

2.5.2 Demand Forecasts

The high level present position and projections for demand drivers that may impact future service delivery and use of assets have been identified and documented in Table 25. At this time, specific projections have not been calculated and will be updated in the 2025 AM Plan per the timelines stated in the AMP Overview. Growth projections have been shown in the AMP Overview.

2.5.3 Demand Impact and Demand Management Plan

The impact of demand drivers that may affect future service delivery and use of assets are shown in Table 25.

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Demand management practices can include non-asset solutions, insuring against risks, and managing failures.

Opportunities identified to date for demand management are shown in Table 25 while climate change adaptation is separately addressed in Table 26. Further opportunities will be developed in future revisions of this AM Plan, as identified in Table 32 in the Continuous Improvement Section.

2.0 WATER ASSETS

Table 25: Demand Management Plan

DEMAND DRIVER	CURRENT POSITION	PROJECTION	IMPACT ON SERVICES	DEMAND MANAGEMENT PLAN
Population Change	573,000 (2021)	636,080 (2031)	Greater production capacity at WTP	Increase budget due to increased costs for treatment. New staff may be required for legislative compliance. Investigate possible plant upgrades where required. Adjust budgets, long-term financial plan, and AM Plan.
Population Change	573,000 (2021)	636,080 (2031)	Not enough storage to accommodate change. New storage sites may be required.	Investigate need for new water towers or reservoirs. Adjust budgets, long-term financial plan, and AM Plan
Population Change	573,000 (2021)	636,080 (2031)	More watermain required.	Investigate need for new samplings stations and storage. New staff may be required for legislative compliance. Adjust budgets, long-term financial plan, and AM Plan.
Technological Changes	Standard water meters installed.	Smart meters to be installed.	Not enough staff to accommodate change, equipment purchase is required.	New staff may be required for legislative compliance. Adjust budgets, long-term financial plan, and AM Plan.

2.5.4 Asset Programs to Meet Demand

The new assets required to meet demand may be acquired, donated or constructed. Additional assets are discussed in Section 2.2.1.

Acquiring new assets will commit the City to ongoing operations, maintenance and renewal costs for the period that the service provided from the assets is required. These future costs are identified and considered in developing forecasts of future operations, maintenance and renewal costs for inclusion in the long-term financial plan.

2.5.5 Climate Change Adaptation

The impacts of climate change may have a significant impact on the assets we manage and the services they provide. In the context of the asset management planning process, climate change can be considered as both a future demand and a risk.

Climate change impacts on assets will vary depending on the location and the type of services provided, as will the way in which those impacts are responded to and managed.[4]

As a minimum the City must consider how to manage our existing assets given potential climate change impacts for our region.

Risk and opportunities identified to date are shown in Table 4.5.1. This is a continuous process and will be updated in the 2025 AM Plan per the timelines outlined in the AMP Overview.

TABLE 26: Managing the Impact of Climate Change on Assets and Services

CLIMATE CHANGE DESCRIPTION	PROJECTED CHANGE	POTENTIAL IMPACT ON ASSETS AND SERVICES	MANAGEMENT
Global temperatures increase.	Lake Ontario's temperature will continue to increase.	More difficult for the City to maintain chlorine residuals since chlorine reacts faster at higher temperatures. Pipe corrosion increases at higher temperature.	Continue regular testing for water quality. Conduct a study to verify the optimal chlorination strategy for the Woodward subsystem.
Increased Severe Storms Causing High Lake Water Turbidity	More events or prolonged events of high turbidity raw water.	Reduced treatment capacity to ensure adequate disinfection.	Monitoring of weather forecasts and adjusting storage levels accordingly.

[4] IPWEA Practice Note 12.1 Climate Change Impacts on the Useful Life of Infrastructure

2.0 WATER ASSETS

TABLE 26: Managing the Impact of Climate Change on Assets and Services			
CLIMATE CHANGE DESCRIPTION	**PROJECTED CHANGE**	**POTENTIAL IMPACT ON ASSETS AND SERVICES**	**MANAGEMENT**
			Real-time monitoring of turbidity and adjusting treatment processes accordingly. Upgrading treatment processes to more effectively treat high turbidity water.
Global Temperatures Increase	Increased internal building temperatures	Heat sensitive equipment such as VFDs at risk of damage resulting in reduced pumping capacity, increased maintenance & repair costs.	Manage HVAC to maintain acceptable temperature levels.
Global Temperatures Increase	Drought Conditions	Increase demand on water supply may impact storage levels for firefighting. Water Taking restrictions may imposed by Provincial Government.	Outdoor Water use restrictions. Expansion of treatment/supply capabilities to meet projected demands.
Increased Polar Vortex Events	Extreme Cold for Prolonged Periods of Time	Extreme cold and frost can lead to an increase of frozen water service lines and an increase in watermain breaks.	Continue to install water assets to the standard highlighted by the City of Hamilton.

2.0 WATER ASSETS

Additionally, the way in which the City constructs new assets should recognize that there is opportunity to build in resilience to climate change impacts. Building resilience can have the following benefits:

- Assets will withstand the impacts of climate change;
- Services can be sustained; and
- Assets that can endure may potentially lower the lifecycle cost and reduce their carbon footprint

Table 27 summarizes some asset climate change resilience projects the City is currently pursuing.

Table 27: Building Asset Resilience to Climate Change

PROJECT	PROJECT DESCRIPTION	CLIMATE CHANGE IMPACT	BUILD RESILIENCE IN NEW WORKS
Water Distribution Leak Detection Project	Purchase of leak detection equipment. Reduction of pumping and reduction in water plan production.	Leaks in the water distribution system lead to wasted energy at the WTP which increases GHG emissions and increases draw on source water.	To increase the number of new and existing high performance state-of-the-art assets that improve energy efficiency and adapt to a changing climate.
Booster Station Upgrades	Upgrades increasing energy efficiency of equipment at various stations.	Old technology at facilities leads to wasted energy which increases GHG emissions.	To increase the number of new and existing high performance state-of-the-art buildings that improve energy efficiency and adapt to a changing climate.
New Lynden Water System	All new building, well, and reservoir including energy efficient equipment.	Old technology at facilities leads to wasted energy which increases GHG emissions.	To increase the number of new and existing high performance state-of-the-art buildings that improve energy efficiency and adapt to a changing climate.

2.0 WATER ASSETS

Table 27: Building Asset Resilience to Climate Change			
PROJECT	**PROJECT DESCRIPTION**	**CLIMATE CHANGE IMPACT**	**BUILD RESILIENCE IN NEW WORKS**
Woodward Water Treatment Facility – Phase 1	Upgrades increasing energy efficiency of equipment at the WTP.	Old technology at facilities leads to wasted energy which increases GHG emissions.	To increase the number of new and existing high performance state-of-the-art buildings that improve energy efficiency and adapt to a changing climate.
AMI Implementation	Install Advanced Metering Infrastructure (AMI) technology on all water meters sized 38mm and above and all water meters located within Hamilton's well based systems.	Currently these meters are read manually which creates GHG emissions from the vehicular travel to the site. And also delays in identifying and resolving meter and billing issues.	To increase the number of new and existing high performance state-of-the-art assets that improve energy efficiency and adapt to a changing climate.
Anti-stagnation Valve Program	Implementation of anti-stagnation valves in the water distribution system to reduce flow and energy cost from the water stations. Decrease in energy consumption at water stations.	Old technology at facilities leads to wasted energy which increases GHG emissions.	To increase the number of new and existing high performance state-of-the-art assets that improve energy efficiency and adapt to a changing climate.
Service Depth Standards	New standards for service depth of frozen services from 1.6m to 1.8m this requires watermain depths to be lowered to 1.8m as well.	Climate change will increase extreme weather causing colder climates which means more watermain breaks due to colder temps.	To improve Hamilton's climate resiliency by decreasing our vulnerability to extreme weather, minimizing future damages, take advantage of opportunities, and better recover from future damages.

2.0 WATER ASSETS

Table 27: Building Asset Resilience to Climate Change			
PROJECT	**PROJECT DESCRIPTION**	**CLIMATE CHANGE IMPACT**	**BUILD RESILIENCE IN NEW WORKS**
Children's Water Festival	Support and Coordination of the annual Children's Water Festival. Educate children about importance of water quality and conservation.	The City is a steward of the infrastructure built and needs to ensure future generations are educated about climate change's effects on our infrastructure.	To ensure all our work promotes equity, diversity, health and inclusion and improves collaboration and consultation with all marginalized groups, including local Indigenous Peoples.
Master Plan Update	Identify infrastructure needs related to growth. Guiding policy item related to GHG emission reduction.	The City is a steward of the infrastructure built and needs to ensure future generations are educated about climate change's effects on our infrastructure.	To improve Hamilton's climate resiliency by decreasing our vulnerability to extreme weather, minimizing future damages, take advantage of opportunities, and better recover from future damages.

The impact of climate change on assets is a new and complex discussion and further opportunities will be developed in future revisions of this AM Plan.

2.6 RISK MANAGEMENT

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2018 as: 'coordinated activities to direct and control with regard to risk[5].

The City is developing and implementing a formalized risk assessment process to identify risk associated with service delivery and to implement proactive strategies to mitigate risk to tolerable levels. The risk assessment process identifies credible risks associated with service delivery and will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

The risk assessment process identifies credible risks, the likelihood of those risks occurring, and the consequences should the event occur. The City is further developing its risk assessment maturity with the inclusion of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable in the next iteration of the plan.

2.6.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarized in Table 28. Failure modes may include physical failure, collapse or essential service interruption.

Table 28: Critical Assets

Critical Asset(s)	Failure Mode	Impact
Water Treatment Plant	Essential Service Interruption	Water not available for customers.
Wells/Reservoirs	Contamination	Water not available for customers. Boil or drinking water advisory may be issued.
Well & Booster Stations	Essential Service Interruption	Water not available for customers.
Critical Trunk Watermain	Essential Service Interruption / Surrounding asset damage	Water not available for customers, and critical route disrupted.

[5] ISO 31000:2009, p 2

Table 28: Critical Assets		
Critical Asset(s)	**Failure Mode**	**Impact**
SCADA	System failure	Water not available for customers.

By identifying critical assets and failure modes the City can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

2.6.2 Risk Assessment

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

An assessment of risks associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a ‘financial shock’, reputational impacts, or other consequences.

Critical risks are those assessed with ‘Very High’ (requiring immediate corrective action) and ‘High’ (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment costs of implementing the selected treatment plan is shown in Table 6.2. It is essential that these critical risks and costs are reported to management. Additional risks will be developed in future iterations of the plan and is identified in Table 32 in the Continuous Improvement Section of the plan.

TABLE 29: Risks and Existing Controls			
SERVICE OR ASSET AT RISK	**WHAT CAN HAPPEN**	**RISK RATING**	**EXISTING CONTROLS**
Booster Station	Power failure at station causing service interruption.	Very High	Back-up generators installed at stations, or capability for a mobile generator to provide back-up power. Routine maintenance on electrical switchgear and load testing of generator.
Well Station	Equipment failure causing service interruption or contamination.	Very High	Regular station checks and verification by operators.
Critical Trunk Watermain	Breakage	High	Condition Assessment. Construction Controls. Pump control.
Reservoir	Contamination	High	Routine cleaning and internal inspections. Soil Testing. Water Quality Testing.
SCADA	Cyber attack	Very High	Weekly, monthly checks. IT Security protection.
Service Pipes	Lead contamination	High	Lead sampling program with accompanying service pipe replacements and orthophosphate treatment for corrosion control.

2.6.3 Infrastructure Resilience Approach

The resilience of our critical infrastructure is vital to the ongoing provision of services to customers. To adapt to changing conditions, the City needs to understand its capacity to 'withstand a given level of stress or demand', and to respond to possible disruptions to ensure continuity of service.

Resilience has been considered within the planning, operations, and maintenance programs for the City's water systems for more than two decades. Resilience is a consideration in the Master Planning process for the water system, within project staging and construction approvals, and within operations and maintenance programs. Staff are well trained and standard operating procedures are in place to mitigate service disruptions and significant emergencies. An example would be how Water assets operate during their peak usage. We do not currently measure our resilience in service delivery and will be included in the next iteration of the AM Plan.

Resilience covers the capacity of the City to withstand any service disruptions, act appropriately and effectively in a crisis, absorb shocks and disturbances as well as adapting to ever changing conditions. Resilience is built on aspects such as response and recovery planning, financial capacity, climate change risk assessment and crisis leadership.

2.6.4 Service and Risk Trade-Offs

The decisions made in AM Plans are based on the objective to achieve the optimum benefits from the available resources. At this time, the City does not have sufficient data to present risks and tradeoffs. This information will be presented in the 2025 AM Plan regarding Proposed Levels of Service per the timelines outlined in the AMP Overview.

2.7 FINANCIAL SUMMARY

This section contains the financial requirements resulting from the information presented in the previous sections of this AM Plan. Effective asset and financial management will enable the City to ensure its water network provides the appropriate level of service for the City to achieve its goals and objectives. Reporting to stakeholders on service and financial performance ensures the City is transparently fulfilling its stewardship accountabilities.

Due to legislative requirements, Hamilton Water has an existing long-term financial plan that has been the basis for its capital programming and outline some operational needs. AM will seek to improve on existing data and ensure it aligns to the Asset Management Plan. Long-Term financial planning (LTFP) is critical for the City to ensure the networks lifecycle activities such as renewals, operations, maintenance and acquisitions can happen at the optimal time. The City 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 for its water network; the City will have difficult choices to make in the future which will include options such as higher cost reactive maintenance and operational costs, reduction of service and potential reputational damage.

The City will be seeking to incorporate its water network asset planning into a corporate wide LTFP. Aligning the LTFP with the AM Plan is critical to ensure the all of the networks needs will be met while the City is finalizing a clear financial strategy with measurable financial targets. The financial projections will be improved as the discussion on desired levels of service and asset performance matures.

2.7.1 Sustainability of Service Delivery

There are two key indicators of sustainable service delivery that are considered in the AM Plan for this service area. The two (2) indicators are the:

- asset renewal funding ratio (proposed renewal budget for the next ten (10) – years / forecast renewal costs for next ten (10) – years); and,
- medium term forecast costs/proposed budget (over ten (10) – years of the planning period).

ASSET RENEWAL FUNDING RATIO

Asset Renewal Funding Ratio[6] **74.86%**

The Asset Renewal Funding Ratio is used to determine if the City is accommodating asset renewals in an **optimal** and **cost effective** manner from a timing perspective and relative

[6] AIFMM, 2015, Version 1.0, Financial Sustainability Indicator 3, Sec 2.6, p 9.

to financial constraints, the risk the City is prepared to accept and service levels it wishes to maintain. Ideally the target renewal funding ratio should be between **90% - 110%** over the entire planning period. A low indicator result generally indicates that service levels are achievable however the expenditures are below this level because the City is challenged to fund the necessary work or has historical preferences or constraints that prevent Hamilton from utilizing additional debt.

Over the next ten (10) years the City expects to have **74.86%** of the funds required for the optimal renewal of assets. By only having sufficient funding to renew **74.86%** of the required assets in the appropriate timing it will inevitably require difficult trade off choices that could include;

- a reduction of the level of service and availability of assets;
- increased complaints and reduced customer satisfaction;
- increased reactive maintenance and renewal costs; and,
- damage to the City's reputation and risk of fines or legal costs.

The lack of renewal resources has been noted in previous reports and plans and will also be addressed in future AM Plan's while aligning the plan to the LTFP. This will allow staff to develop options and long-term strategies to address the renewal rate. The City will review its renewal allocations once the entire inventory has been confirmed and amalgamated.

MEDIUM TERM – TEN (10) – YEAR FINANCIAL PLANNING PERIOD

This AM Plan identifies the forecast operations, maintenance and renewal costs required to provide an agreed level of service to the community over a 10 year period. This provides input into 10 year financial and funding plans aimed at providing the required services in a sustainable manner. As the City continues to develop condition profiles and necessary works are identified based on their condition, it is anticipated operation and maintenance forecasts will increase significantly.

This forecast work can be compared to the proposed budget over the first 10 years of the planning period to identify any funding shortfall.

The forecast operations, maintenance and renewal costs over the 10 year planning period is **$130,654,616** on average per year.

The proposed (budget) operations, maintenance and renewal funding is **$110,381,096** on average per year giving a ten (10) – year funding shortfall of **$20,273,520** per year or **$202,735,200 in total** over the ten (10) – year planning period. This indicates that **84.48%** of the forecast costs needed to provide the services documented in this AM Plan are accommodated in the proposed budget. Note, these calculations exclude acquired assets.

Funding an annual funding shortfall or funding 'gap' of **$20,273,520** per year cannot be addressed in a single year and has not been incorporated as identified within this plan into any existing plan or budget. The gap will require vetting, planning and resources to begin to incorporate gap management into the future budgets. This gap will need to be

managed over time to reduce it in a sustainable manner and limit financial shock to customers. Options for managing the gap include;

- Financing strategies – increased funding, block funding for specific lifecycle activities, long term debt utilization
- Adjustments to lifecycle activities – increase/decrease maintenance or operations, increase/decrease frequency of renewals, limit acquisitions or dispose of underutilized assets
- Influence level of service expectations or demand drivers

These options and others will allow Hamilton to ensure the gap is managed appropriately and ensure the level of service outcomes the customers desire.

Providing sustainable services from infrastructure requires the management of service levels, risks, forecast outlays and financing to achieve a financial indicator of approximately 1.0 for the first years of the AM Plan and ideally over the 10 year life of the Long-Term Financial Plan.

2.7.2 Forecast Costs (Outlays) For the Long-Term Financial Plan

Table 30 shows the forecast costs (outlays) required for consideration in the 10 year long-term financial plan.

Providing services in a financially sustainable manner requires a balance between the forecast outlays required to deliver the agreed service levels with the planned budget allocations in the operational and capital budget. The City will begin developing its long-term financial plan (LTFP) to incorporate both the operational and capital budget information and help align the LTFP to the AM Plan which is critical for effective asset management planning.

A gap between the recommended forecast outlays and the amounts allocated in the operational and capital budgets indicates further work is required on reviewing service levels in the AM Plan.

The City will manage the ‘gap’ by continuing to develop this AM Plan to provide guidance on future service levels and resources required to provide these services in consultation with the community. Options to manage the gap include reduction and closure of low use assets, increased funding allocations, reduce the expected level of service, utilize debt based funding over the long term, adjustments to lifecycle activities, improved renewals and multiple other options or combinations of options. These options will be explored in the next AM Plan and the City will provide analysis and options for Council to consider going forward.

2.0 WATER ASSETS

Table 30: Forecast Costs (Outlays) for the Long-Term Financial Plan
Forecast Costs are shown in 2021 Dollar Values

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL	TOTAL
2022	$23,015,000	$46,185,012	$15,045,000	$42,105,000	$440,000	$126,790,016
2023	$47,855,000	$48,752,168	$10,950,000	$43,340,000	0	$150,897,168
2024	$72,142,496	$50,768,096	$10,450,000	$50,620,000	0	$183,980,592
2025	$87,788,000	$52,865,984	$10,450,000	$50,860,000	$150,000	$202,113,984
2026	$55,728,000	$62,828,804	$10,450,000	$33,889,540	0	$162,896,352
2027	$35,568,000	$63,907,272	$10,450,000	$40,709,632	0	$150,634,912
2028	$25,143,000	$65,007,304	$10,450,000	$42,029,792	0	$142,630,096
2029	$3,007,667	$66,129,344	$10,450,000	$42,894,000	0	$122,481,008
2030	$1,232,667	$67,273,816	$10,450,000	$31,609,000	0	$110,565,480
2031	$1,664,167	$68,441,184	$10,450,000	$23,999,990	0	$104,555,344

2.7.3 Funding Strategy

The proposed funding for assets is outlined in the City's operational budget and ten (10) – year capital budget.

These operational and capital budgets determine how funding will be provided, whereas the AM Plan typically communicates how and when this will be spent, along with the service and risk consequences. Future iterations of the AM Plan will provide service delivery options and alternatives to optimize limited financial resources.

2.7.4 Valuation Forecasts

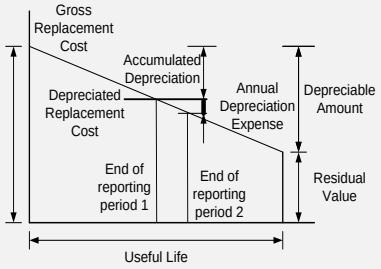
Asset values are forecast to increase as projections improve and can be validated as market pricing. The net valuations will increase significantly despite some assets being programmed for disposal that will be removed from the register over the ten (10) – year planning horizon.

Any additional assets will add to the operations and maintenance needs in the longer term and would also require additional costs due to future renewals obligations. Any additional assets will also add to future depreciation forecasts. Any disposals of assets would decrease the operations and maintenance needs in the longer term and removes the high costs renewal obligations.

2.7.5 Asset Valuations

The best available estimate of the value of assets included in this AM Plan are shown below. The assets are valued at estimated replacement costs:

Replacement Cost (Current/Gross)	4,250,000,000
Depreciable Amount	4,250,000,000
Depreciated Replacement Cost[7]	$2,133,500,000
Depreciation	$ 52,487,500



The current replacement cost is the most common valuation approach for specialized infrastructure assets such as infrastructure water assets. The methodology includes establishing a comprehensive asset registry, assessing replacement costs (based on market pricing for the modern equivalent assets) and useful lives, determining the

[7] Also reported as Written Down Value, Carrying or Net Book Value.

appropriate depreciation method, testing for impairments, and determining remaining useful life.
As the City matures its asset data, it is highly likely that these valuations will fluctuate significantly over the next three (3) years and they should increase over time based on improved market equivalent costs.

2.7.6 Key Assumptions Made in Financial Forecasts

In compiling this AM Plan, it was necessary to make some assumptions. This section details the key assumptions made in the development of this AM Plan and should provide readers with an understanding of the level of confidence in the data behind the financial forecasts.

Key assumptions made in this AM Plan are:

- Operational forecasts are based on current budget allocations and are the basis for the projections for the 10-year horizon and do not address other operational needs not yet identified;
- Maintenance forecasts are based on current budget allocations and do not identify all asset needs at this time. It is solely based on planned activities;
- 1% p.a. has been added to maintenance forecasts to accommodate for donated assets assumed over the 10-year planning horizon;
- 1.31 % p.a has been added to operational forecasts to accommodate for donated assets assumed over the 10-year planning horizon; and,
- Replacement costs were based on historical costing and engineering estimates. They were also made without determining what the asset would be replaced with in the future.

2.7.7 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AM Plan are based on the best available data. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is defined in the AMP Overview.

2.0 WATER ASSETS

The estimated confidence level for and reliability of data used in this AM Plan is shown in Table 31.

Table 31: Data Confidence Assessment for Data used in AM Plan

DATA	CONFIDENCE ASSESSMENT	COMMENT
Demand drivers	Medium	Further investigation is required to better understand demand drivers
Growth projections	Medium	Current growth projections will need to be vetted an improved. Continuous improvements are required and identified
Acquisition forecast	Medium	Currently based on 2019 DC study and SME opinion. Continuous improvements are required and identified
Operation forecast	Medium	Currently budget based and requires future improvement to ensure allocation is accurate
Maintenance forecast	Medium	Currently budget based and requires future improvement to ensure allocation is accurate
Renewal forecast - Asset values	Medium	Currently budget based and requires future improvements to further identify specifi needs
- Asset useful lives	Low	Based on SME opinion. Continuous improvement required to ensure data is vetted and ensure it aligns with Hamilton's actual practices
- Condition modelling	Low	Mixture of assessment methods. Requires standardization along with predictable timelines for assessments
Disposal forecast	Low	Current disposal information is rolled into renewal. Continuous improvements are required to ensure accurate data is available.

The estimated confidence level for and reliability of data used in this AM Plan is considered to be a **Medium** confidence level.

2.8 PLAN IMPROVEMENT AND MONITORING

2.8.1 Status of Asset Management Practices[8]

ACCOUNTING AND FINANCIAL DATA SOURCES

This AM Plan utilizes accounting and financial data. The sources of the data are:

- 2022 Capital & Operating Budgets;
- 2021 Tender Documents (various);
- Asset Management Data Collection Templates;
- Audited Financial Statements and Government Reporting (FIR, TCA etc);
- Financial Exports from internal financial systems; and,
- Historical cost and estimates of budget allocation based on SME experience.

ASSET MANAGEMENT DATA SOURCES

This AM Plan also utilizes asset management data. The sources of the data are:

- Data extracts from various City applications and management software
- Asset Management Data Collection Templates;
- Tender documents, subdivision agreements and projected growth forecasts as well as internal reports;
- Condition assessments;
- Subject matter expert opinion and anecdotal information; and,
- Reports from the mandatory biennial inspection, operational & maintenance activities internal reports.

2.8.2 Improvement Plan

It is important that Hamilton recognize areas of the AM Plan and planning process that require future improvements to ensure the effective management of the water network assets and inform decision making. The tasks listed below are essential to improving the plans and Hamilton's ability to make evidence based and informed decisions. These improvements span from improved lifecycle activities, improved financial planning, improve data quality and to plans to physically improve the assets. The Improvement plan in table 32 highlights proposed improvement items that will require further discussion and analysis to determine feasibility, resource requirements and alignment to current workplans. Future iterations of this AM Plan will provide updates on these improvement plans.

[8] ISO 55000 Refers to this as the Asset Management System

2.0 WATER ASSETS

Table 32: Improvement Plan
***p.a – per annum**

TASK	TASK	RESPONSIBILITY	RESOURCES REQUIRED	DRAFT TIMELINE
1	Collect and confirm data from databases before it goes into EAM including spatial referencing and possible Collector Apps.	**Hamilton Water**	**$40,000 p.a. $120,000 Total** Internal Staff Time	**3 Years** (2022-2024)
2	Develop a Long-Term Financial Plan to connect the budgeting process to the AM planning process.	**CAM, Hamilton Water, Finance**	**$15,000 p.a $60,000 Total** Internal Staff Time	**4 Years** (2022-2025)
3	Standardize condition assessments for critical watermains & establish more frequent timeline to complete.	**CAM, Infrastructure Renewal**	**$10,000** Internal Staff Time	**2 Years** (2022-2023)
4	Plan condition assessments for vertical assets on a regular cycle	**CAM, Hamilton Water**	**$11,000** Internal Staff Time	**1 Year** (2022)
5	Complete condition assessments on WTP.	**CAM, Hamilton Water**	**$250,000 Total** Internal Staff, Tender Process Specialty Assessor	**3 Years** (2022-2024)
6	Integrate collection of condition data into routine inspections for hydrants, wells and valves.	**CAM, Hamilton Water**	**$20,000** Internal Staff Time	**2 Years** (2022-2023)
7	Review & improve condition assessment assumptions for local watermain.	**CAM, Hamilton Water**	**$6,000 p.a.** Internal Staff Time	**2 Years** (2022-2023)
8	Standardize condition assessment outcomes and timed deliverables.	**CAM, Hamilton Water**	**$6,000 p.a.** Internal Staff Time	**3 Years** (2022-2024)
9	Improve annual engagement survey process to optimize engagement and respondents.	**CAM, Hamilton Water, Communications**	**$35,000** Internal Staff Time	**4 Years** (2022-2025)

2.0 WATER ASSETS

Table 32: Improvement Plan
***p.a – per annum**

TASK	TASK	RESPONSIBILITY	RESOURCES REQUIRED	DRAFT TIMELINE
10	Identify additional risks and identify trade-offs for what cannot be achieved.	**CAM, Hamilton Water**	**$5,000** Internal Staff Time	**Annual**
11	Improve data confidence levels for asset register.	**CAM, Hamilton Water**	**10,000 p.a. $50,000 Total** Internal Staff Time	**5 Years** (2022-2026)
12	Improve Growth projection data and modelling for next AM Plan iteration.	**CAM, Hamilton Water, Economic Development**	**$6,000 p.a.** Internal Staff Time	**2 Years** (2022-2023)
13	Develop and implement an annual demand review process to ensure sufficient knowledge is available to inform future planning.	**CAM, Hamilton Water, Economic Development**	**$35,000 Total** Internal Staff Time	**2 Years** (2022-2023)
14	Analyze operational budget to improve AM allocations for lifecycle activities.	**CAM, Hamilton Water, Finance**	**$10,000 p.a. $30,000 Total** Internal Staff Time	**3 Years** (2022-2024)
15	Analyze maintenance activities to identify future needs and recommended actions.	**CAM, Hamilton Water,**	**$10,000 p.a. $40,000 Total** Internal Staff Time	**4 Years** (2022-2025)
16	Develop Renewal forecasting prioritization to optimize resources and ensure level of services can be maintained.	**CAM, Hamilton Water,**	**$6,000 p.a. $44,000 Total** Internal Staff Time	**4 Years** (2022-2025)
17	Review Useful Life assumptions to ensure they align with actual Hamilton practices.	**CAM, Hamilton Water,**	**$8,000 p.a. $16,000 Total** Internal Staff Time	**2 Years** (2022-2023)
18	Review disposal costs and separate from renewal costs.	**CAM, Hamilton Water,**	**$10,000 p.a. $40,000 Total** Internal Staff Time	**4 Years** (2022-2025)
19	Review BIMA Scorecard reporting and ensure data and	**CAM, Hamilton Water,**	**$2,500 p.a. $5,000 Total**	**2 Years** (2022-2023)

Table 32: Improvement Plan
***p.a – per annum**

TASK	TASK	RESPONSIBILITY	RESOURCES REQUIRED	DRAFT TIMELINE
	assumptions are consistent with ministry and City reporting and investigate additional technical metrics (e.g. water quality and lead complaints)	**Continuous Improvement**	Internal Staff Time	
20	Investigate need for additional sampling stations.	**CAM, Hamilton Water**	**$2,400 p.a.** **$4,800 Total** Internal Staff Time	**2 Years** (2022-2023)
21	Further develop vertical asset knowledge for future iterations of AM Plans.	**CAM, Hamilton Water,**	**$50,000 p.a.** **$150,000 p.a.** Internal Staff Time, Tender Process	**3 Years** (2022-2024)
22	Improve asset replacement costs by vetting with current market prices instead of historical costs/estimates or internal models.	**CAM, Hamilton Water, Finance**	**$30,000 p.a.** **$90,000 Total** Internal Staff Time	**3 Years** (2022-2024)
23	Identify water assets in other divisions and incorporate into next AM Plan.	**CAM, Hamilton Water,**	**$10,000 p.a.** **$30,000 Total** Internal Staff Time	**3 Years** (2022-2024)
24	Ensure new technical metrics are considering different lifecycle stages (e.g. acquisition, disposal)	**CAM, Hamilton Water,**	**$2,000 p.a** **$6.000 Total** Internal Staff Time	3 Years (2022-2024)

2.8.3 Monitoring and Review Procedures

This AM Plan will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets as a result of budget decisions.

The AM Plan will be reviewed and updated on a regular basis to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, acquisition and asset disposal costs and planned budgets. These forecast costs and proposed budget will be incorporated into the Long-Term Financial Plan once completed.

2.8.4 Performance Measures

The effectiveness of this AM Plan can be measured in the following ways:

- The degree to which the required forecast costs identified in this AM Plan are incorporated into the long-term financial plan;
- The degree to which the 1-10 year detailed works programs, budgets, business plans and corporate structures consider the 'global' works program trends provided by the AM Plan;
- The degree to which the existing and projected service levels and service consequences, risks and residual risks are incorporated into the Strategic Planning documents and associated plans;
- The Asset Renewal Funding Ratio achieving the Organisational target (this target is often 90 – 100%).

2022
Wastewater Asset Management Plan

Hamilton

WASTEWATER SERVICE AREA

Description

The wastewater network collects wastewater from its customers across the City and conveys it for treatment before it is returned to the natural watercourse. These assets relate to the collection, transmission, treatment or disposal of wastewater, including any wastewater asset that from time to time manages stormwater.

Replacement Value $7.3 Billion

Average Asset Condition

Did You Know?

- In 2021, the Woodward and Dundas WWTPs together collected and treated approximately **76,200 ML** for **510,000** customers which is equivalent to **16 billion** toilet flushes.
- The population is expected to increase to **636,000 by 2031** and so plant upgrades are being completed to improve capacity and performance.

Critical Asset Summary

Critical Assets	Quantity	Replacement Cost	Condition	Stewardship Measures
Wastewater Treatment Plant	2	$3.2 billion	Fair	**# of bypasses at Woodward WWTP in 2021** **23**
Pump Station	71	$181.2 million	Fair	**% completed monthly inspections in 2021** **92.12%**
CSO Tanks	9	$222.9 million	Fair	**# of CSO tank overflow events in 2021** **27**
Gravity Main	1,798 km	$2.4 billion	Good	**Length of sewermain lined in 2021** **22.3 km**

Data Confidence

VERY HIGH | MEDIUM | VERY LOW

FINANCIAL FACTS

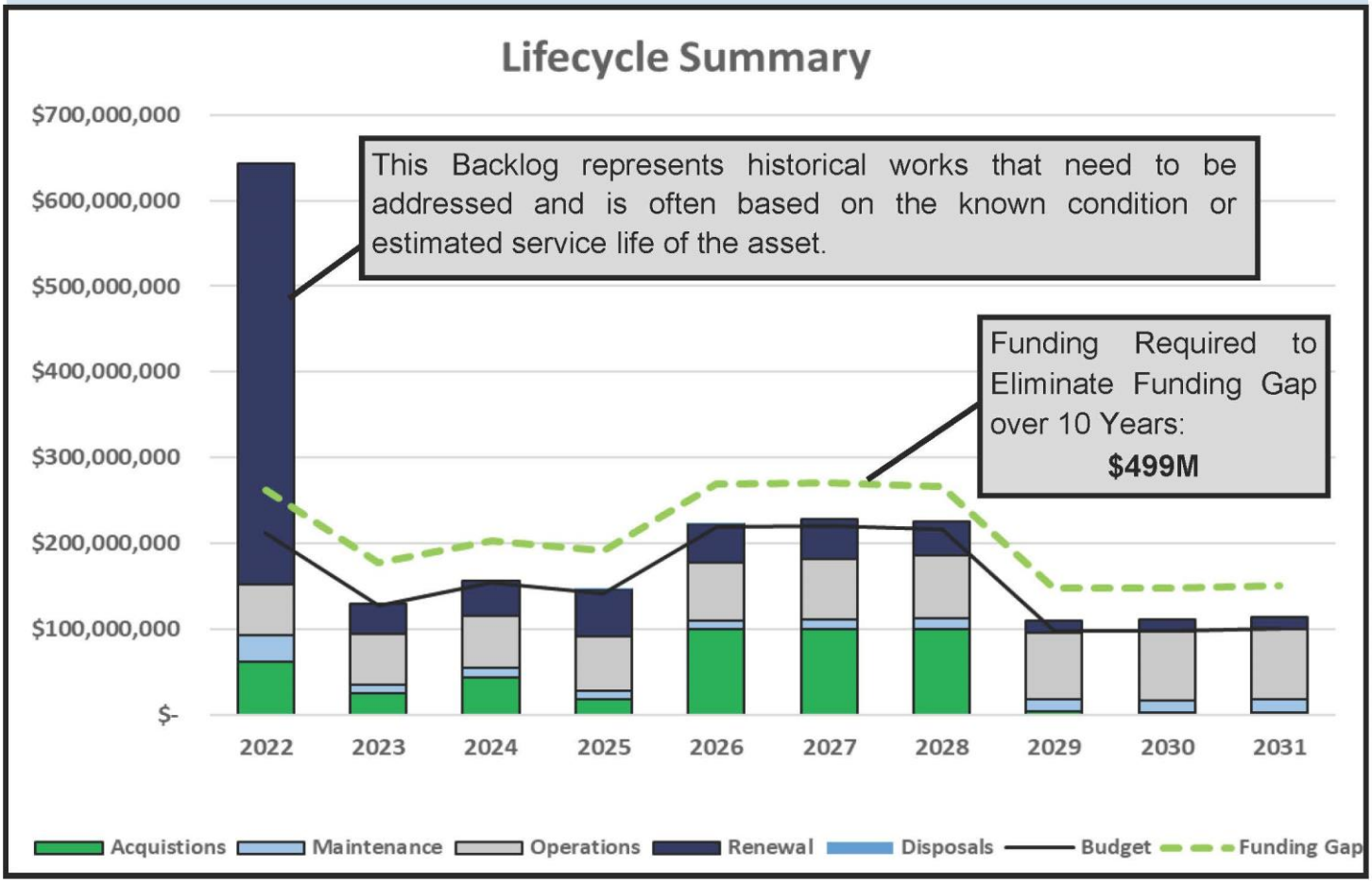
- Hamilton will receive **$440 million** dollars worth of assets over the next 10 years.
- Hamilton will invest on average **$838 million** to operate, maintain wastewater assets over the next ten years.

DID YOU KNOW?

- The City completes condition assessments on critical sewermain to reduce the chance of a critical mainline failure.
- CSO Tanks hold wastewater during heavy rain events to avoid backups and bypasses.

FINANCIAL INDICATORS

Type of Indicator	Measurement	Explanation
Asset Renewal Ratio	**45.7%**	This ratio demonstrates the rate the city renews its Wastewater Assets.
10 Year O&M Forecast	**69.4%**	The % of funding allocated compared to what needs to be spent.
Annual Infrastructure Gap	**$50 Million**	The difference between what is being spent and what should be spent.



3. WASTEWATER

3.0 WASTEWATER ASSETS

The wastewater network collects wastewater from its customers across the City and conveys it for treatment before it is returned to the natural watercourse. The service objective is to provide reliable wastewater services to its customers 24 hours a day and 7 days a week. A reliable wastewater network service provides both direct and indirect benefits ensuring good public health to the broader community.

Wastewater assets relate to the collection, transmission, treatment or disposal of wastewater, including any wastewater asset that from time to time manages stormwater. For this iteration of the AM Plan the wastewater asset hierarchy is grouped into linear and vertical assets. Vertical assets are assets that can only occupy one site and are typically within a building or a facility which may be comprised of other multiple components. Linear assets are assets which traverse horizontally and are often defined by length but also encompass components that are considered part of the linear network.

The asset class asset hierarchy outlining assets included in this section is shown below in Table 33.

Table 33: Asset Hierarchy

VERTICAL ASSETS	LINEAR ASSETS	ADMINISTRATIVE
Wastewater Treatment Plants	Combined Sewer Main	Vehicles
Combined Sewer Overflow (CSO) Tanks	Separated Gravity Sewer Main	SCADA
Lift Stations	Interceptor	
	Forcemain	
	Maintenance Hole	
	Odour Control Unit	
	Control Gates	
	Valves	
	Sewer Laterals	

1. 3.0 WASTEWATER

3.1 BACKGROUND

This AM Plan is intended to communicate the requirements for the sustainable delivery of services through the management of assets, compliance with regulatory requirements and required funding to provide the appropriate levels of service over the 2022 – 2031 planning period.

The information in the wastewater section of the plan is intended to give a snapshot in time of the current state of the wastewater service area by providing a detailed summary and analysis of existing information, and will provide the necessary background for the remainder of the report.

Due to the age of the City, significant portions (32%) of the wastewater system consist of combined sewer mains (the lower City and also on the escarpment north of Mohawk Road) as shown in Map 3. Combined sewer main refers to pipes where wastewater (sanitary) and stormwater are carried in the same pipe. The City's wastewater system is therefore more complex than many municipalities because during significant wet weather events, the City's wastewater system can reach capacity causing diluted wastewater to enter the natural watercourses through combined sewer overflows or WWTP bypasses. These wet weather events are anticipated to become more significant and frequent due to climate change as indicated in Section 3.5.5. The City has been working to reduce combined sewer overflows and WWTP bypasses for more than 30 years with total investments exceeding $550 million.

The City acquired significant amounts of wastewater network assets through amalgamation in 2001. These aging assets were included into the City's wastewater inventory and were in varied condition and held various collection capacity when acquired. Once amalgamated, any aging assets or deficient assets became the responsibility of Hamilton Water and created several new challenges that will need to be taken into consideration and planned.

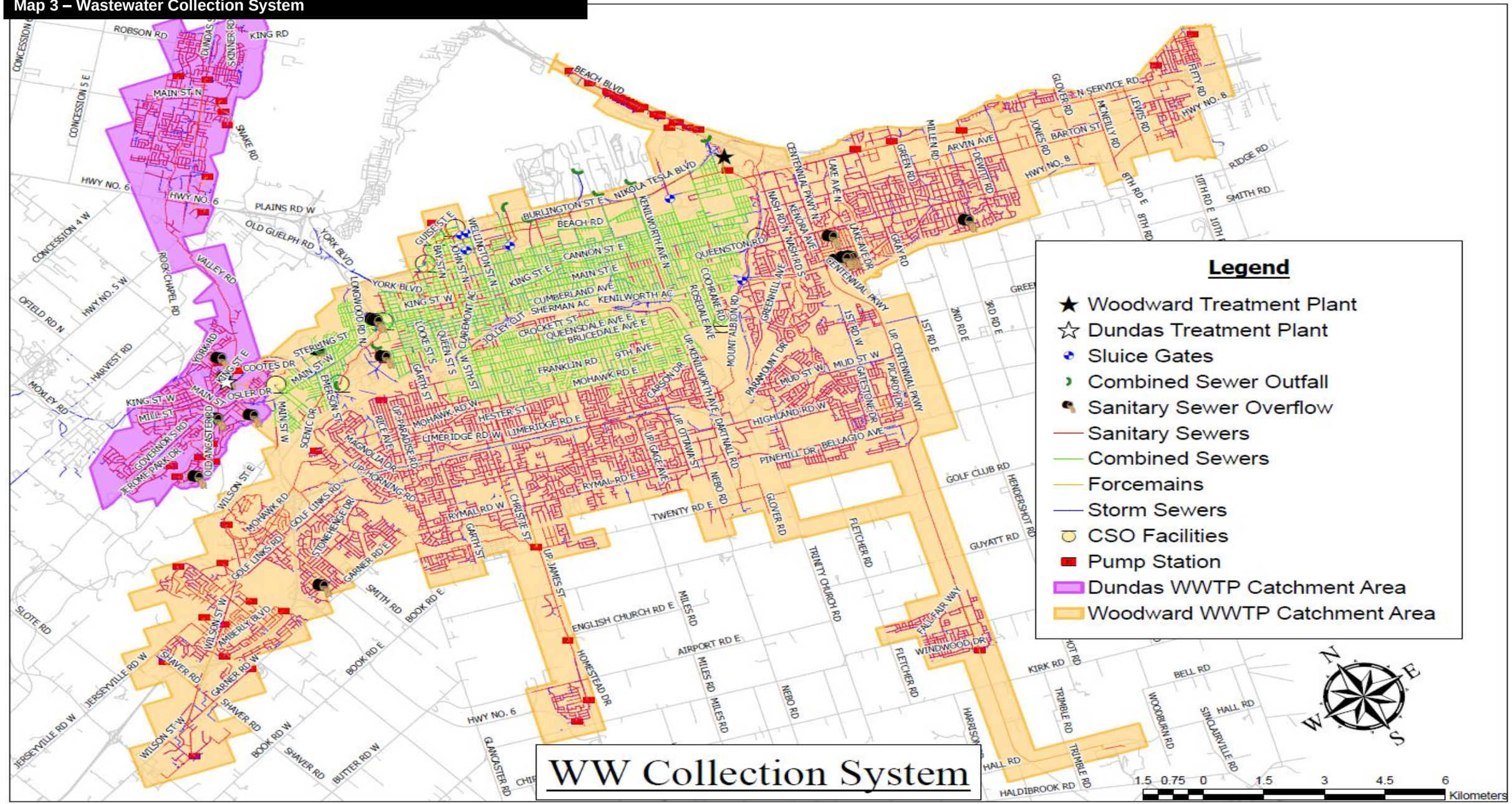
The City also operates and maintains two (2) Wastewater Treatment Plants (WWTPs), Woodward and Dundas, which service different areas of the City, and are referred to as catchment areas below in Table 34 and Map 3. Map 3 also shows the locations of the major vertical assets and mains. The Woodward WWTP catchment area services the majority of the population, and the Dundas WWTP catchment services areas in Dundas and Waterdown. Residents not found on this map are typically treating wastewater on their own properties using private septic systems.

Table 34: Catchment Areas

Wastewater Catchment Area	Population Served
Woodward	465,000
Dundas	45,000

4. WASTEWATER

Map 3 – Wastewater Collection System



4. WASTEWATER

3.1.1 Detailed Summary of Assets

Table 35 below displays the detailed summary of assets for the wastewater service area. In addition, it is possible that there are assets that may not be owned by Public Works which may be considered wastewater assets which may be missing from this inventory. This has been identified as a Continuous Improvement Item in Table 58.

The City owns approximately **$7.25B** in wastewater assets which are in an average of **Fair** condition. Overall, assets are an average of **30 years** in age which indicated there is on average **34%** of remaining service life (RSL). The data below is a combination of data from various sources as there is not yet an asset registry containing all inventory information in one data source. Examples of data sources which were used for this iteration of the Core AM Plans are stated in the AMP Overview. The lack of an asset registry is a continuous improvement item in Table 58. The City must plan to complete a detailed review of this data and create data standards in order to improve overall data quality.

For most assets, Fair condition means that the City should be planning to complete minor to moderate maintenance activities to ensure the assets reach their intended useful lives since assets begin to experience deterioration affecting asset usage at this stage as indicated in Table 35.

4. WASTEWATER

Table 35: Detailed Summary of Assets
***Weighted Average**

Asset Category	Number of Assets	Replacement Value	Average Age (% RSL)	Average Equivalent Condition
Vertical Assets				
Wastewater Treatment Plant	2	$3.20B	66 years (0%)	3-Fair*
Data Confidence	High	Low	Medium	Low
Lift Stations	71	$181.24M	34 years (44%)	3-Fair
Data Confidence	High	Low	High	Medium
Combined System Overflow Tanks	9	$222.86M	22 years (44%)	3-Fair
Data Confidence	High	Low	High	Medium
	SUBTOTAL	**$3.604B**	**41 years (24%)**	**3-Fair***
	Data Confidence	**Low**	**High**	**Medium**
Linear Assets				
Separated Trunk Wastewater Main	217.14 km	$739.41M	39 years (60%)	2-Good
Data Confidence	High	Medium	Medium	Medium
Separated Local Wastewater Main	977.39 km	$410.21M	40 years (55%)	2-Good
Data Confidence	High	Medium	Medium	Medium
Combined Main	568.37 km	$710.86M	84 years (4%)	2-Good
Data Confidence	High	Medium	Medium	Medium
Interceptor	34.63 km	$519.38M	63 years (37%)	2-Good
Data Confidence	High	Medium	Medium	Medium
Forcemain	46.49 km	$45.24M	31 years (62%)	2-Good
Data Confidence	High	Medium	High	Low
Valves	130	$355.2K	16 years (80%)	2-Good
Data Confidence	Low	Low	High	Low
Maintenance Hole	25,897	$535.61M	54 years (33%)	3-Fair
Data Confidence	High	Low	Medium	Low
Sewer Lateral	134,202	$671.01M	13 years (78%)	2-Good
Data Confidence	Low	Low	Very Low	Very Low
Odour Control Unit	7	$525K	1 year (98%)	1-Very Good
Data Confidence	High	High	Low	Low
Control Gates	7	$350K	27 years (46%)	3-Fair
Data Confidence	High	Low	Very High	Low
	SUBTOTAL	**$3.632B**	**44 years (42%)**	**2-Good***
	Data Confidence	**Medium**	**Medium**	**Medium**
Administrative				
Vehicles	47	$2.331M	7 years (29%)	3-Fair
Data Confidence	High	High	High	Low
SCADA	N/A	$15.0M	N/A	N/A
Data Confidence	N/A	Low	N/A	N/A
	SUBTOTAL	**$17.331M**	**7 years (29%)**	**3-Fair**
	Data Confidence	**Medium**	**High**	**Low**
	TOTAL	**$7.254B**	**30 years (34%)**	**3-Fair***
	Data Confidence	**Low**	**Medium**	**Medium**

4. WASTEWATER

The City has two (2) Wastewater Treatment Plants (WWTP). The Woodward plant services the majority of the population as shown in Table 34. Both WWTPs have several complex processes that run throughout several facilities but have been simplified into two (2) assets for ease of reporting for this first iteration of the AM Plan. A Continuous Improvement item in Table 58 is to improve the reporting for the WWTP for future iterations of the AM Plan to provide more details on the specific processes it undertakes. The WWTPs are the single largest value wastewater assets in the City and has been estimated at **$3.2B** with a low data confidence level due to the complexity of the plant.

The data confidence for number of vertical assets is typically high due to the asset's locations being above ground and able to be visually confirmed easily. The confidence is not yet considered Very High due to multiple data sources which showed conflicting quantities and registry information. There has been a continuous improvement item identified to confirm data across all data sets and unify the data into a single source to reference from in the future.
Due to the lack of current data, the complexity of vertical assets and the low frequency of asset replacements, it is difficult to achieve a high data confidence for replacement cost for this iteration of the plan. Future plans will improve on the current replacement cost values, and so the data confidence is considered low for these assets. Age and condition information and data confidence is presented in Table 35.

For linear assets, the data confidence for number of assets is considered to be high because of active data management. These assets are typically more challenging to confirm as they are generally buried infrastructure that cannot simply be visually verified. Due to these limitations there are some assets such as sewer laterals where the quantities are of a lesser confidence.

Linear assets are replaced much more frequently than vertical assets and as such the replacement costs generally have a higher confidence level and are often close to the approximate market rates. However, improving asset replacement costs by updating current market prices regularly instead of historical costs/estimates or internal models has been identified as a Continuous Improvement Item in Table 58.

The City has included its administrative assets (e.g. vehicles, software, etc.) in a limited capacity for this iteration of the AM Plan so that the replacement costs are beginning to be recognized in the report. These assets contribute to the overall wastewater service however, these have not yet been completed at a detailed level and will be encompassed in more detail before the 2025 iteration of the plan. Administrative facilities are included as part of the WTP replacement cost and support the entire Waterworks Strategive Level.

Please refer to the AMP Overview for a detailed description of data confidence.

3.1.2 Asset Condition Grading

Condition refers to the physical state of the wastewater assets and are a measure of the physical integrity of these assets or components, and is the preferred measurement for planning lifecycle activities to ensure assets reach their expected useful life. Since condition scores are reported

using different scales and ranges depending on the asset, Table 36 below shows how each rating was converted to a standardized 5-point condition category so that the condition could be reported consistently across the AM Plan. A continuous improvement item identified in Table 58, is to review existing internal condition assessments and ensure they are revised to report on the same 5-point scale with equivalent descriptions.

4. WASTEWATER

Table 36: Condition Grading System

Equivalent Condition Grading	Condition Description	% Remaining Service Life	Combined, Wastewater & Interceptor Main	Vertical Assets Condition Rating
1-Very Good	The asset is new, recently rehabilitated, or very well maintained. Preventative maintenance required only.	>79.5%	PACP Score = 1; If PACP unknown, WRC Structural Score =1; If both unknown: RSL	1-Very Good
2-Good	The asset is adequate and has slight defects and shows signs of some deterioration that has no significant impact on asset's usage. Minor/preventative maintenance may be required.	69.5% – 79.4%	PACP Score = 2; If PACP unknown, WRC Structural Score =2 or Lined Pipe; If all unknown: RSL	2-Good
3-Fair	The asset is sound but has minor defects. Deterioration has some impact on asset's usage. Minor to significant maintenance is required.	39.5% - 69.4%	PACP Score = 3; If PACP unknown, WRC Structural Score =3; If all unknown: RSL	3-Fair
4-Poor	Asset has significant defects and deterioration. Deterioration has an impact on asset's usage. Rehabilitation or major maintenance required in the next year.	19.5% -39.4%	PACP Score = 4; If PACP unknown, WRC Structural Score =4; If all unknown: RSL	4-Poor
5-Very Poor	Asset has serious defects and deterioration. Asset is not fit for use. Urgent rehabilitation or closure required.	<19.4%	PACP Score = 5; If PACP unknown, WRC Structural Score =5; If all unknown: RSL	5-Very Poor

The following conversion assumptions were made:

- Wastewater Treatment Plant (WWTP) condition was based on subject expert opinion based on the condition descriptions provided above;
- Vertical assets' Level 2 Condition Assessments are based on a 5-point scale which was considered equivalent to the AMP 5-point scale; and
- Pipes were based on a combination of PACP and WRC scores where known, where the PACP score was prioritized over the WRC Score.
- If pipe was indicated to have been lined CIPPS, then the condition was assumed to be 2-Good.
- If PACP was unknown, and WRC score was 6, indicating an incomplete inspection, the condition was based on % of remaining service life.
- For assets where a condition assessment was not completed, but age information was known, the condition was based on the % of remaining service life.

3.1.3 Vertical

The background information for wastewater vertical assets is below and includes an age profile, the condition methodology used, the condition profile, and asset usage and performance.

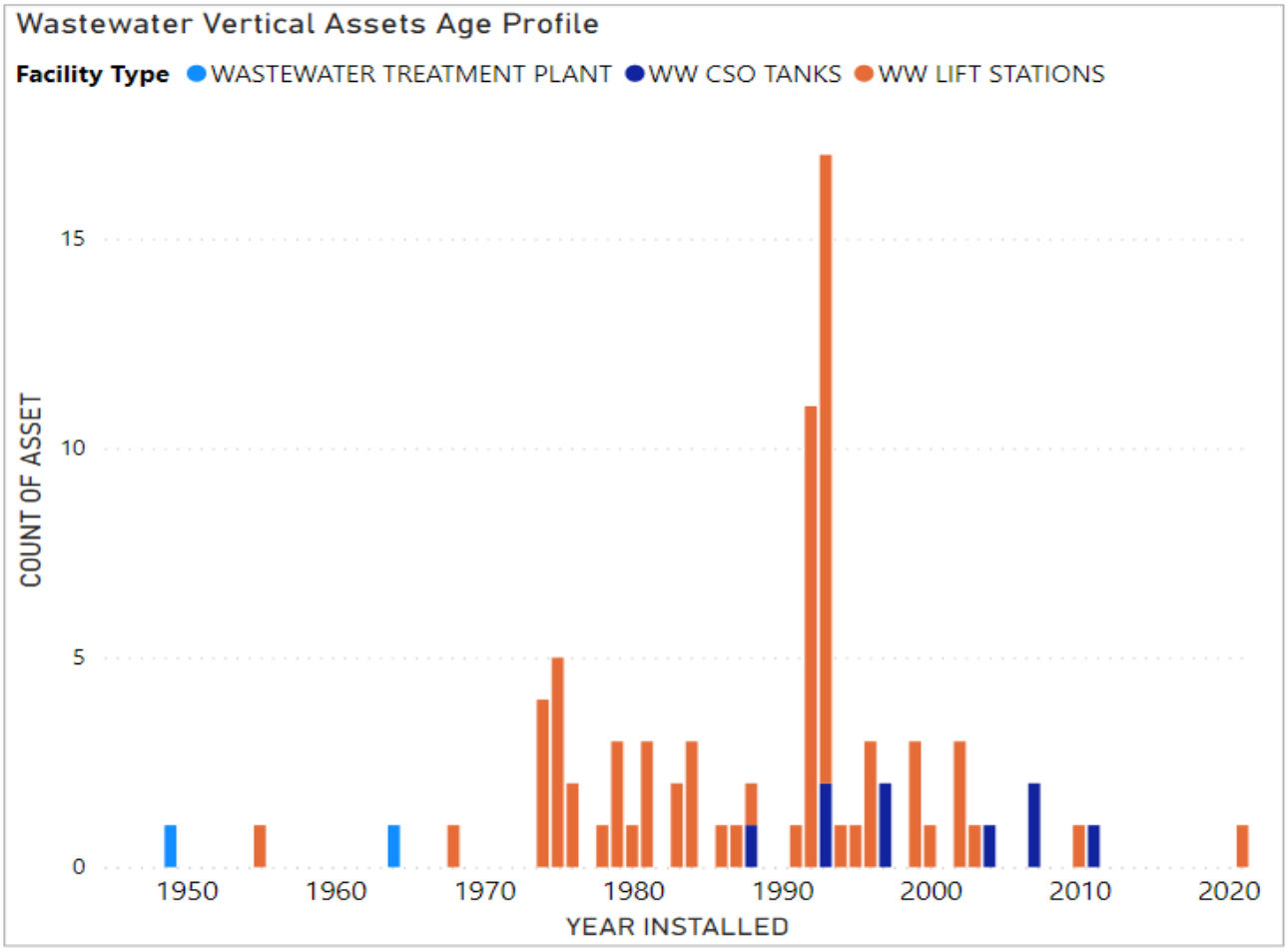
3.1.3.1 Age Profile

The age of an asset is an important consideration in the asset management planning process especially for assets that will not receive a typical condition grading through inspections. Some lower cost or lower criticality assets can be planned for renewal based on age as a proxy for condition or until other condition methodologies are established. It should be noted that if a wastewater assets' condition is based on age, it is typically considered to be of a lower confidence level.

The age profile of the wastewater vertical assets are shown in Figure 10. An analysis of the age profile is provided below. For vertical assets, the age information confidence is typically high because this information was collected using an inventory process.

3.0 WASTEWATER ASSETS

Figure 10: Wastewater Vertical Assets Age Profile



WASTEWATER TREATMENT PLANT (WWTP)

The Woodward WWTP is approximately 58 years old which is approaching the design life of the original plant which is estimated to be 60 years. The Dundas WWTP is approximately 73 years old which has exceeded the design life of 60 years. However, these age estimates do not reflect the significant upgrades that have been completed over the lifecycle of the plant which have extended the life of the plant well past its design life. Future iterations of the plan will ensure that the WWTPs are analyzed more fulsomely to ensure the City is better able to analyze the plants' estimated service life. The age data confidence is medium because there are many assets as part of the WWTP and this is only representing the initial construction date.

LIFT STATIONS

The majority of lift stations in the City were constructed from 1974 – 2000, with a spike in acquisitions in 1992/1993. The estimated service life (ESL) of a booster station is estimated to be 60 years old, and one (1) booster station is currently beyond its estimated service life and one (1) additional station will exceed its ESL in the next ten years. After an asset has reached its ESL it should be monitored with an increased frequency to ensure the asset is performing as

expected and to determine if the ESL for the asset type should be extended. The age data confidence is high because assets are populated and the data is likely accurate.

COMBINED SEWER OVERFLOW (CSO) TANKS

Approximately two (2) CSO tanks have been constructed per decade since 1988, and as the ESL for a CSO tank is estimated to be 40 years, none of the CSO tanks have yet reached their useful life. The age data confidence is high because assets are populated and the data is likely accurate.

3.1.3.2 Condition Methodology

For treatment plants, there is no formal condition assessment process for the entire plant, and for the purposes of this report the condition has been identified by subject matter experts at the City based on various available condition information as well as the condition descriptions presented in Table 37. Condition assessments for various components have been completed on the plant as deemed necessary. However, a formal condition assessment program should be identified by process on a pre-determined cycle, which should be investigated further. This has been identified as a continuous improvement item in Table 58.

For other vertical assets, the City typically undertakes three (3) different levels of condition assessments as defined below in Table 37. Historically, the City had a target of 10 years for vertical assets, but it was recommended to complete Level 1 inspections regularly to prioritize Level 2 inspections. However, the City has not fully implemented this approach and has focused on completing Level 2 inspections instead.

At this time, the City has not been completing Level 1 inspections. The City should investigate completing Level 1 internal assessments as part of existing operations to ensure works are up to date and to prioritize Level 2 condition assessments in case performance deficiencies are flagged by staff.

TABLE 37: Condition Descriptions

INSPECTION LEVEL	DESCRIPTION	TARGET FREQUENCY	ACTUAL FREQUENCY
1	High level inspection at the facility level for stated lifecycle categories and is used to inform the Level 1 risk assessment and the lifecycle analysis.	1 to 2 years	N/A
2	More detailed condition grade assessed at the assembly level and is used to inform the Level 2 risk assessment and as a more detailed input to the lifecycle analysis. Data captured through a formalized asset inspection, typically conducted by external resources.	Dependent on Level 1 findings, or target of 10 years.	27-year cycle

TABLE 37: Condition Descriptions			
INSPECTION LEVEL	**DESCRIPTION**	**TARGET FREQUENCY**	**ACTUAL FREQUENCY**
3	Detailed investigation, where shown to be cost-effective.	Undertaken as required	N/A

A combination of six (6) Level 2 condition assessments for water & wastewater vertical assets are completed annually excluding the treatment plants. Typically, this is an even distribution with three (3) Level 2 condition assessments completed annually for wastewater vertical assets. However, sometimes more or less water assets are included depending on priority. This means on average vertical assessments are completed on an approximate 27-year cycle. The priority assets have been identified by staff using information from audits completed in 2003 and 2012 as well as staff input. At this time, the process for selection is not formally documented, as such this has been identified as a continuous improvement item. Another continuous improvement item would be to achieve the Level 2 condition assessments on vertical assets on a minimum 10-year cycle if Level 1 assessments continue to not occur to ensure that the City is aware of upcoming forecast requirements, which is approximately another five (5) assessments per year.

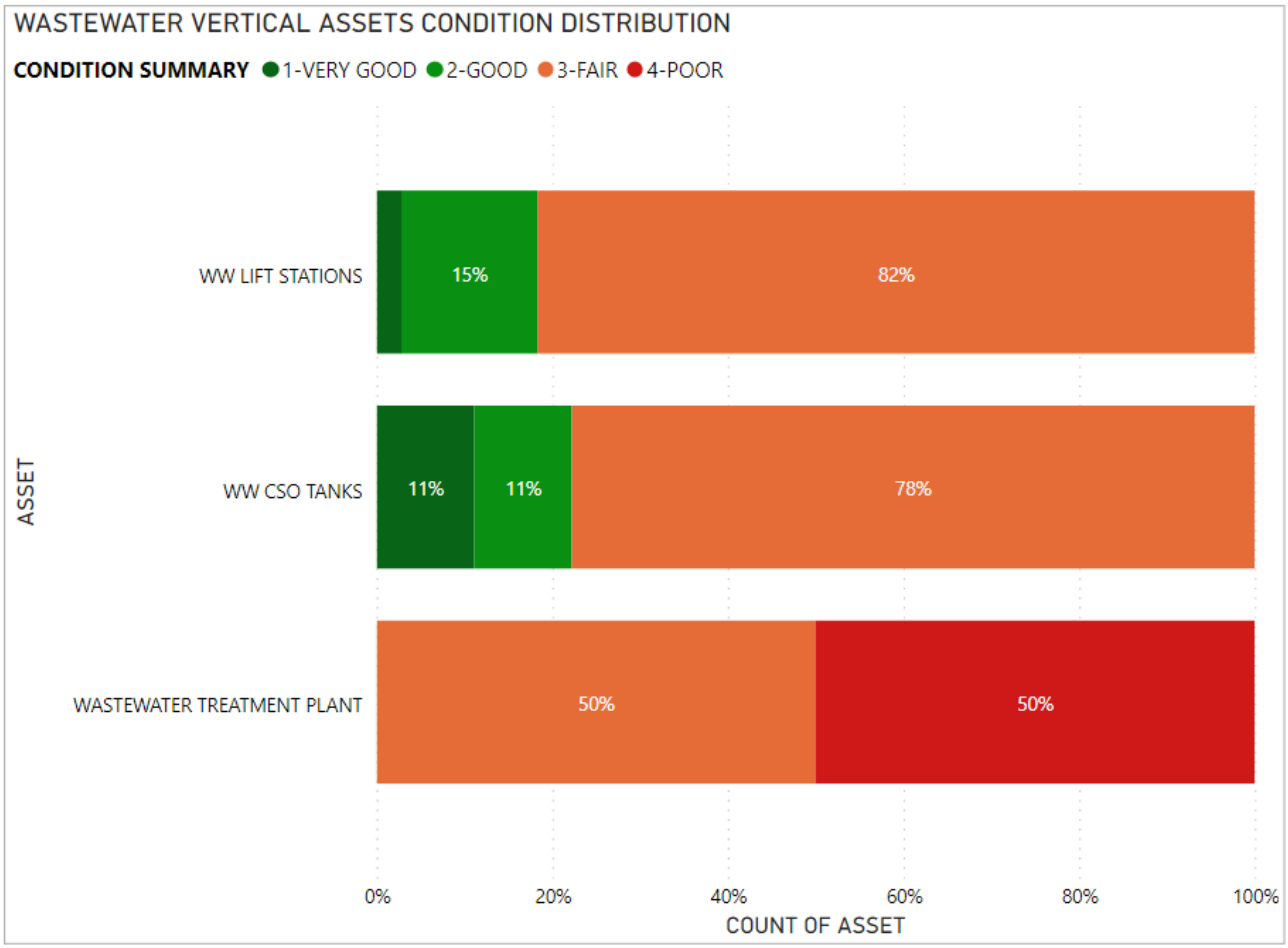
Finally, condition assessments should begin on any new facility within a determined timeline after being constructed, possibly 10-15 years into its lifecycle. This has been identified as a continuous improvement item in Table 58.

3.1.3.3 Asset Condition Profile

The condition profile of the City's assets is shown in Figure 11. As mentioned in Section 3.1.2. The original condition grades were converted to a standardized condition category for reporting consistency.

3.0 WASTEWATER ASSETS

Figure 11: Asset Condition Profile



WWTP

Based on subject area experts and the definitions provided in Table 37, Woodward WWTP infrastructure is considered to be in Fair condition as it is generally sound with some minor defects. This is considered for be of low data confidence because it was estimated based on staff opinion. The plant has recently had several process upgrades and facility replacements including a new Main Pumping Station, Electrical Power and Distribution system replacement, fully rehabilitated South Secondary treatment plant and addition of a new Tertiary treatment process. However, there are a number of process areas that have had condition assessments completed and do require significant rehabilitation and maintenance over the next few years, specifically the north secondary treatment process, north and south digester complexes and the middle primary clarifier tanks/galleries. Condition assessments have been completed for the Digesters, Primary Clarifiers 1-8, and North Secondary Treatment Plant, but the City has identified additional areas that would benefit from a condition assessment including the Headworks, North and South Aeration, and some other smaller systems (e.g. Boilers).

However, the Dundas WWTP infrastructure is considered to be in Poor condition due to significant deterioration as well as major parts of the plant processes and structures reaching

the end of their normal service life. An assessment and Facility Plan were completed on the Dundas WWTP in February 2015. It was determined from the findings of the assessment that due to the age and condition of Plant A, the treatment train needs to be replaced within the next 3 to 5 year period, which has already passed. Furthermore, Plant B and other auxiliary process tankage, including sludge storage, tertiary process and phosphorous chemical systems were also approaching the end of their life cycle. The Dundas WWTP provides a high level of treatment for both phosphorus and ammonia. The existing secondary process can achieve almost complete ammonia removal but is not designed to remove total nitrogen. In order for the Dundas WWTP to achieve that draft HHRAP removal targets for phosphorous and total nitrogen, the entire secondary treatment process would require replacement with a membrane bioreactor or equivalent technology. This would involve integration of the existing Plant B aeration tanks retrofitted to an Modified Ludzack-Ettinger (MLE) Activated Sludge Processconfiguration for enhanced nitrogen removal coupled with membranes designed to provide Best Available Techniques (BAT) tertiary phosphorus removal (a process to achieve low phosphorus concentrations and/or total nitrogen removal). The upgrade project for replacement fo the Dundas WWTP with a new facility with higher levels of treatment is currently unfunded.

LIFT STATIONS

Since condition assessments are completed on lift stations, these stations are known to be in overall Fair condition. However, some of these condition assessments are older and so the data confidence for condition is medium. Major upgrades have been completed on many of these stations since construction. However, some lift stations are beginning to approach their ESL, which shows the importance of completing condition assessments on these assets regularly and performing upgrades and preventative operations and maintenance activities so that these assets reach their ESL without major reactive repairs.

CSO TANKS

Based on condition assessment information, CSO tanks are in overall Fair condition. However, some of these condition assessments are older and so the data confidence for condition is medium. If the condition had been based on age, some assets that have been identified to be in Fair condition would have been assumed to be in Good condition. This shows the importance of completing condition assessments on these assets regularly and performing upgrades and preventative operations and maintenance activities so that these assets reach their ESL without major reactive repairs.

3.1.3.4 Asset Usage and Performance

Assets are generally provided to meet design standards where available. However, there are often insufficient resources to address all known deficiencies.

The largest performance issues with vertical wastewater assets involve combined sewer overflows, odours, and degradation of components. The service deficiencies in Table 38 below were identified using staff input.

Table 38: Known Service Performance Deficiencies			
Asset	**Location**	**Service Deficiency**	**Description of Deficiency**
WWTP	Woodward	Bypass incidents during major storm events	When the WWTP has reached capacity during a stormwater event, a bypass is often required so that regulated treatment capacity is not exceeded, and to ensure the plant does not become damaged.
WWTP	Woodward	Odour Complaints	Odours from the plant are often due to the biosolids handling process that is operated by a third party contractor, and improvement actions are ongoing.
CSO Tank	Main/King Cootes Paradise	Leakage of wastewater into surrounding environment	Inaccuracies in facility operational guidance documents and SCADA system programming (related to the CSO tank bypass gate) resulted in an undetected discharge to Cootes Paradise. The facility issues have since been fixed.
CSO Tanks	Various Locations	Overflows during major storm events	When CSO tank has reached capacity during a stormwater event, the combined sewer outflow overflows into the natural watercourse.
Lift Station	Various Locations	Accelerated degradation of components	Harsh operating conditions can cause components to degrade faster than expected.
CSO Tanks	Various Locations	Accelerated degradation of components	Harsh operating conditions can cause components to degrade faster than expected.

3.1.4 Linear

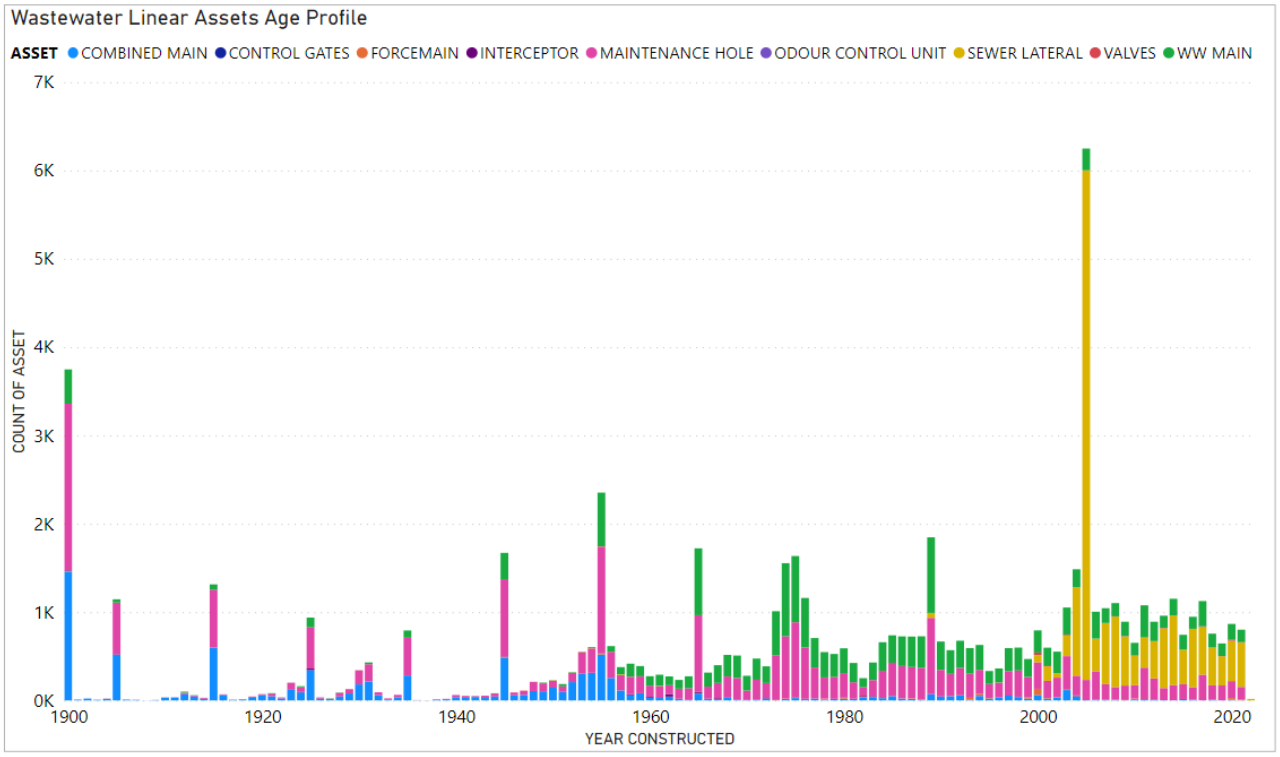
The background information for wastewater linear assets is included below and includes an age profile, the condition methodology used, the condition profile, and asset usage and performance.

3.1.4.1 Age Profile

The age of an asset is an important consideration in the asset management process as it can be used for planning purposes as typically assets have an ESL where they can be planned for replacement.

The age profile of the wastewater linear assets are shown in Figure 12. An analysis of the age profile is provided below for each asset.

Figure 12: Wastewater Linear Assets Age Profile



When age is unknown, there are common years where asset age is typically assumed. This typically includes decade and mid-decade, and so large spikes are seen in many assets in 1900, 1915, 1925, 1935, 1945, 1955, 1965, 1990 etc.

COMBINED MAIN

For legibility of the graph, the wastewater linear assets have been shown since 1900. There are a small number of combined sewer segments that predate 1900 with the earliest installation date being 1855, indicating that combined sewers are aging assets as they are the oldest linear wastewater assets in the City. Combined sewer construction was eliminated (except for replacement/rehabilitation of existing sewers) around 1955 when separated WW main construction became the standard.

The average age for combined main in the City is 84 years, and with an average estimated service life (ESL) of 87 years. This means on average there is 4% of service life remaining. The

condition of combined sewer is typically based on a condition assessment program, but if assessments had not been completed were based on age. The age data confidence for combined main is considered to be Medium as this information is typically populated, but the accuracy of the data appears to contain assumptions based on the spikes by decade.

SEPARATED WASTEWATER MAIN (WW MAIN)

Separated wastewater main is typically a newer linear asset than combined sewers as shown above and were typically installed after 1955. This is in line with historic practices as explained above as typically older municipalities began with a combined sewer network before best practice shifted to a separated sewer system. There are a few segments that pre-date 1955, but these pipe dates are likely estimated as they occur regularly every 10 years or were previously considered combined main but were later repurposed as separated WW main.

The average age for separated trunk and local wastewater main is 39 and 40 years respectively which with an average ESL of 97 and 89 years means there is 60% and 55% of the useful life remaining. The condition of separated wastewater sewer is typically based on a condition assessment program, but if assessments had not been completed were based on age. The age data confidence for wastewater main is considered to be Medium as this information is typically populated, but the accuracy of the data appears to contain assumptions based on the spikes by decade.

INTERCEPTOR

Interceptor's are difficult to view on the graph above because there are less of these assets in the City compared to some of the other linear assets. However, there is a steady distribution of interceptor acquisitions with a peak in 1962. Interceptors have an average ESL of 100 years and approximately 3 km of pipe have exceeded this value which is approximately 9% of interceptors. The condition of interceptors is typically based on inspection programs where available but is estimated based on age where condition information is unavailable.

The average age for interceptors is 63 years which indicates there is 37% of service life remaining. The age data confidence for interceptors is considered to be Medium as this information is typically populated, but the accuracy of the data appears to contain assumptions.

FORCEMAIN

Forcemains are difficult to view on the graph above because there are less of these assets in the City compared to some of the other linear assets. However, there is a steady distribution of forcemain acquisitions with a peak in 2000.

The average age for forcemain is 31 years and with an ESL of 81 years, this means there is 62% of service life remaining. The age data confidence for forcemain is considered to be High as this information is typically populated, although the source of this data may be estimated. Since condition is based on age for this asset, this also affects the condition profile shown in Figure 13.

3.0 WASTEWATER ASSETS

MAINTENANCE HOLES

Maintenance holes have typically been acquired at a steady distribution over the last 100 years with a peak in 1900. This peak is due to estimated values for year of construction/acquisition.

The average age of maintenance holes is 54 years, and with an ESL of 80 years, this indicates there is typically 33% of useful life remaining. The age data confidence for maintenance holes is considered to be Medium as this information is typically populated, but the accuracy of the data appears to contain assumptions based on the spikes by decade.

SEWER LATERALS

Sewer laterals are shown above to be newer assets with installations typically occurring after 2000 with a spike in 2005. However, this data is not accurate as sewer laterals have historically not been formally inventoried as they are not considered to be a City-owned asset. However, since the City typically completes work on these assets, the City has begun collecting inventory information. Only 12% of age data for known laterals was populated a the time of writing.

Since the AM Plan can only present the data that is available, sewer laterals are shown to be an average of 13 years old with 78% useful life remaining with Very Low confidence. Since condition is based on age for this asset, this also affects the condition profile shown in Figure 13.

VALVES

These assets are also difficult to view on the graph above because the quantities of valves are small compared to other linear assets. The average age of valves is 16 years, and with an ESL of 80 years, this indicates there is typically 80% of useful life remaining. The age data confidence for valves is considered to be High as this information is typically populated, and is likely accurate. Since condition is based on age for this asset, this also affects the condition profile shown in Figure 13.

ODOUR CONTROL UNITS

These assets are also difficult to view on the graph above because the quantities of odour control units is small compared to other linear assets. These assets are very new having been constructed in the last year and typically has 98% of service life remaining, but are considered a low confidence level because many dates haven’t been populated in the database.

CONTROL GATES

These assets are also difficult to view on the graph above because the quantities of control gates are small compared to other linear assets. All seven (7) control gates have age data associated with them, and is known to be accurate showing that there is Very High data confidence associated with these assets. Since the condition is based on age for these assets, this also affects the profile below.

Since the AM Plan can only present the data that is available, control gates are shown to be an average of 27 years which is within the ESL of 50 years. However, three (3) control gates are beyond their service lives which is shown in the condition profile in Figure 13.

3.1.4.2 Condition Methodology

The inspection frequency and condition score output for each linear asset is found below in Table 39. An analysis for each asset is found below.

Table 39: Inspection Frequency

ASSET	INSPECTION FREQUENCY	CONDITION SCORE OUTPUT
Sewer Main	Based on priority	Combination of inspection & age data
Forcemain	None	None, used age
Maintenance Holes	Ad Hoc	None, used age
Valves	None	None, used age
Sewer Laterals	Ad Hoc	None, used age
Control Gates	Annual	None, used age
Ocour Control Unit	None	None, used age

GRAVITY MAIN (INCLUDING COMBINED MAIN, SEPARATED WASTEWATER MAIN, AND INTERCEPTORS)

Since gravity mains are not under pressure and there are maintenance hole access points along the pipe segments, it is easier and more cost effective to inspect these assets than it is to inspect pressurized pipes such as forcemains and watermains. The City completes CCTV (Closed Circuit Television) inspections on these assets which involves sending a robot with a camera to inspect the inside of the pipe to determine any defects or rehabilitation needs. The results of the CCTV inspections assign a structural score to the pipe segment which the City uses to prioritize sewer lining and/or renewal. The City assesses pipes based on the defined criticality of the pipe but does not yet have a cycle to assess all pipes at a specified frequency, and not all pipes have been assessed. This has been identified as a continuous improvement item in Table 58.

FORCEMAIN

Due to limitations associated with asset location and pressurized pipes, forcemains do not yet have an inspection program and conditions are typically based on estimated service life. The City does complete inspections using various technologies on critical watermain pipes and the

City should investigate completing similar assessments on forcemains since they can have rapid deterioration from corrosive gases and are suject to pressure transients and other forces that cause leaks and breaks. This has been identified as a continuous improvement item in Table 58.

MAINTENANCE HOLES

Historically, the City completed visual camera inspections of many maintenance holes, but these inspections did not output a condition score. These assessments are no longer being completed but the collected data should be reviewed, and a condition score should be approximated. This has been identified as a continuous improvement item in Table 58. For this AM Plan, the condition has been based on age.

VALVES

Wastewater valves are typically valves as part of a forcemain. Since the risk of exercising these valves is high due to the harsh environment causing premature failures and no redundancy in the forcemain, there is no valve exercising program, and valves are typically left open. For the purposes of estimating condition, the valve conditions are based on estimated remaining service life as shown in Table 39.

SEWER LATERALS

As previously explained, sewer laterals are not considered a City-owned asset. However, often the City is called when a resident has an issue with the sewer lateral and the City will reactively inspect the pipe as a result of these calls. If the City inspects the pipe and determines any issues are the fault of the City (e.g. City tree roots blocked the lateral), the City will provide the resident with a grant as part of the Sewer Lateral Management Program, or if the issue is on City property and may damage public infrastructure, the City will pay for the replacement of the pipe. Since this happens often, the City should investigate responsibilities for this asset and improve the inventory data. This has been identified as a continuous improvement item in Table 58.

CONTROL GATES

At this time, there is no condition assessment program for these assets, however, there is an inspection program which does not yet output a condition score. This has been identified as a continuous improvement item in Table 58.

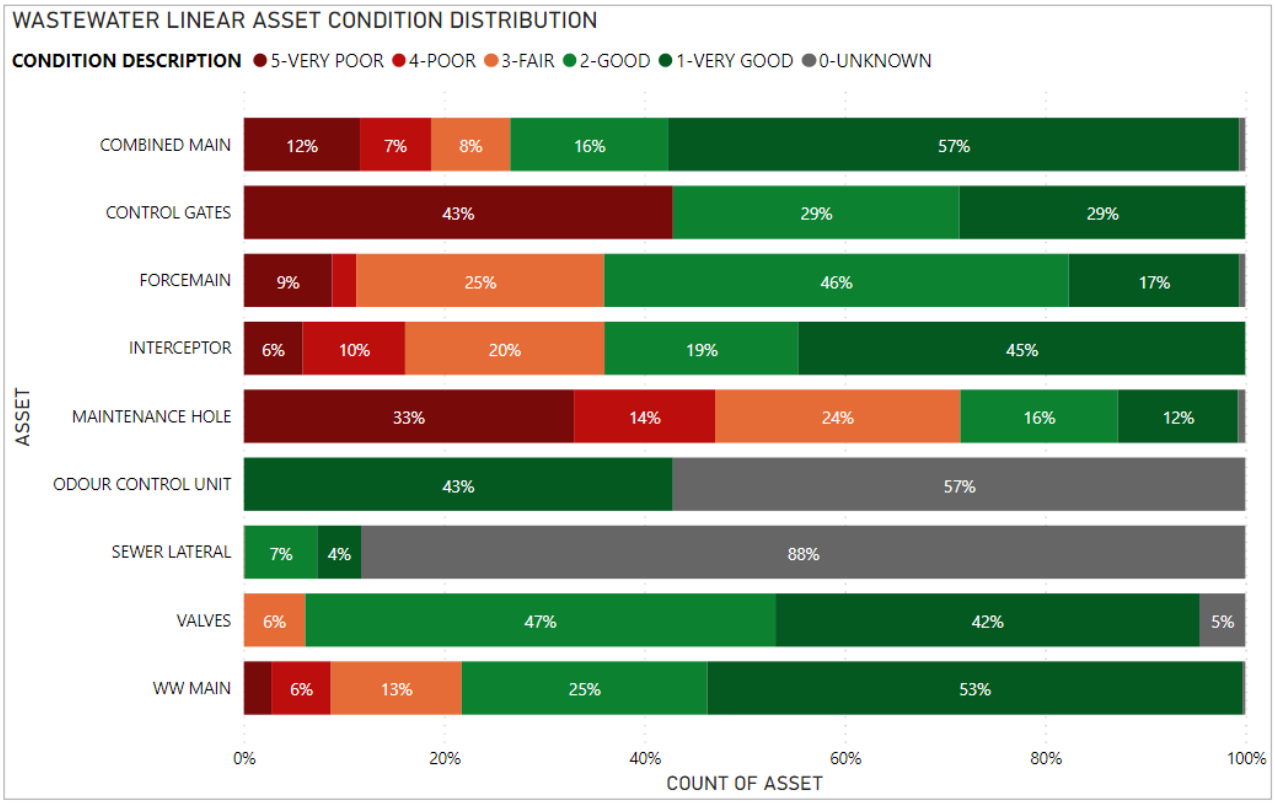
ODOUR CONTROL UNITS

For odour control units, this should eventually begin but because the assets are new, it is not yet a priority.

3.1.4.3 Asset Condition Profile

The condition profile of the City's assets is shown in Figure 13. As mentioned in Section 3.1.2, the original condition grades were converted to a standardized condition category for report consistency.

Figure 13: Asset Condition Profile



GRAVITY MAIN (INCLUDING COMBINED MAIN, SEPARATED WASTEWATER MAIN, AND INTERCEPTORS)

Based on a combination of condition and age data, these assets are shown to be on average, in Good condition. As stated above, there is a condition assessment program for gravity main. However, at this time not all assets have been encompassed into the assessment program. Therefore, the data confidence is shown to be Medium as it is a combination of very high data confidence and low to medium confidence methodologies.

This profile shows the importance of completing condition assessments on these assets. If these assets had been estimated based on age, they would typically show an average of Fair to Very Poor condition based on the remaining service life of the asset and would have been prematurely scheduled for renewals. In addition, some of these pipes may have been lined, but still show an older age profile even though the City considers these to be the equivalent of a new pipe. This should be accounted for in the data for future iterations of the AM Plan.

OTHER LINEAR ASSETS

The remaining linear assets' conditions are estimated based on age where known. As previously stated, age is not the best indicator of condition but is used when condition information is unavailable or difficult to obtain. A detailed analysis for the age profile of these assets can be found in Section 3.1.4.1. In addition, most assets are shown to be in Good condition, excluding maintenance holes which are an asset with a fairly even distribution of Good to Poor assets. There is Low confidence in sewer laterals because there are many unknown ages within this data. As previously stated, a continuous improvement item is to complete condition assessments on the wastewater control gates as age-based information is showing many of these assets to be in very poor condition.

3.1.4.4 Asset Usage and Performance

Assets are generally provided to meet design standards where available. However, there are often insufficient resources to address all known deficiencies.

The largest performance issues with linear wastewater assets involve combined sewer overflows, odours, and degradation of components.

The service deficiencies in Table 40 below were identified from the most recent inspection reports as well as staff input.

Table 40: Known Service Performance Deficiencies

Asset	Location	Service Deficiency	Description of Deficiency
Sewer	Various Locations	Odour Issues	Odours from sewer releasing into private property's basements or through maintenance holes into City streets.
Combined Sewer	Various Locations	Overflows	Overflows from outfalls during storm events
Forcemain	Various Locations	Corrosion	Hydrogen sulfide formation in air pockets in pipes causing premature corrosion in pipe wall.
Control Gates	Various Locations	Accelerated degradation of components	Harsh operating conditions can cause components to degrade faster than expected.

3.1.5 Administrative

Administrative assets are assets which contribute to the wastewater service but are not wastewater assets. These include vehicles, testing equipment, software and administrative facilities. Administrative facilities replacement costs have been incorporated as part of the WTP cost.

As previously mentioned, the City has included these assets in a limited capacity so that the replacement costs are incorporated in the report since these assets contribute to the overall wastewater service. However, these have not yet been completed at a detailed level because they are not defined as part of the O.Reg. 588/17 definition of a wastewater asset. These will be encompassed in more detail before the 2025 iteration of the AM Plan.

3.2 LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how the City plans to manage and operate the assets at the agreed levels of service while managing life cycle costs.

3.2.1 Acquisition Plan

Acquisition reflects new assets that did not previously exist or works which will upgrade or improve an existing asset beyond its current capacity. They may result from growth, demand, legal obligations or social or environmental needs. Wastewater assets are generally donated to the City through the development agreements process directly related to growth.

CURRENT PROJECT DRIVERS – 10 YEAR PLANNING HORIZON

Hamilton Water currently prioritizes capital projects as per the drivers listed below. These drivers help to determine a ranking priority for projects and ensures that multiple factors are being considered to drive investment decisions. These drivers should be reviewed during each iteration of the AM Plan to ensure they are appropriate and effective in informing decision making.

Table 41: Acquired Assets Priority Ranking Criteria

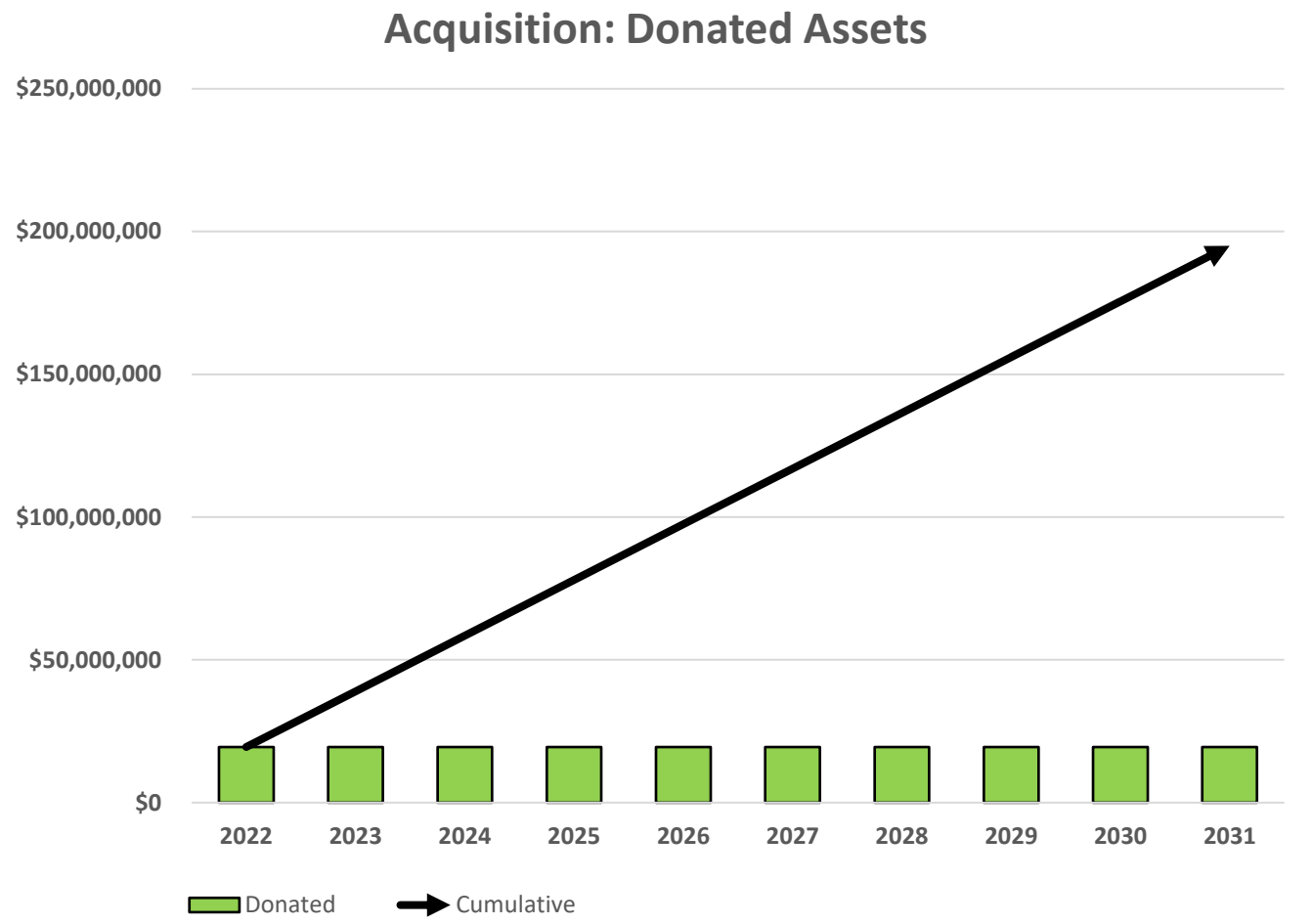
Driver	% of Planned Projects (10 Year Horizon)
Legal Compliance	20%
Coordination, Funding, Budgeting	25%
Risk Mitigation	25%
Health and Safety	10%
Operating and Maintenance Impacts	10%
Development Growth	10%
Total	**100%**

SUMMARY OF FUTURE ASSET ACQUISITION COSTS

Forecast acquisition asset costs are summarized in Figure 16 and shown relative to the proposed acquisition budget.

3.0 WASTEWATER ASSETS

Figure 14: Acquisition Donated Assets
All figures are in 2021 dollars.



Annually, on average, the City assumes over **$19,500,000** of donated assets through subdivision agreements or other development agreements. These assets include approximately 9 km's of sanitary mains, **1,500** new wastewater service connections, **140** maintenance holes and nearly **$500,000** in valves. The City is reviewing its donated asset assumption process to ensure that it proactively understands what assets are being donated annually to ensure they are planned for properly. This will allow multiple departments across the City to plan for the assets properly such as:

- AM to forecast the long-term needs and obligations of the assets;
- Operations and maintenance can include the assets in their planned activities (inspections, legislative compliance activities); and,
- Finance can ensure that assets are properly captured and recognized appropriately (Audited Financial Statements, TCA process, Provincial reporting such as the FIR)

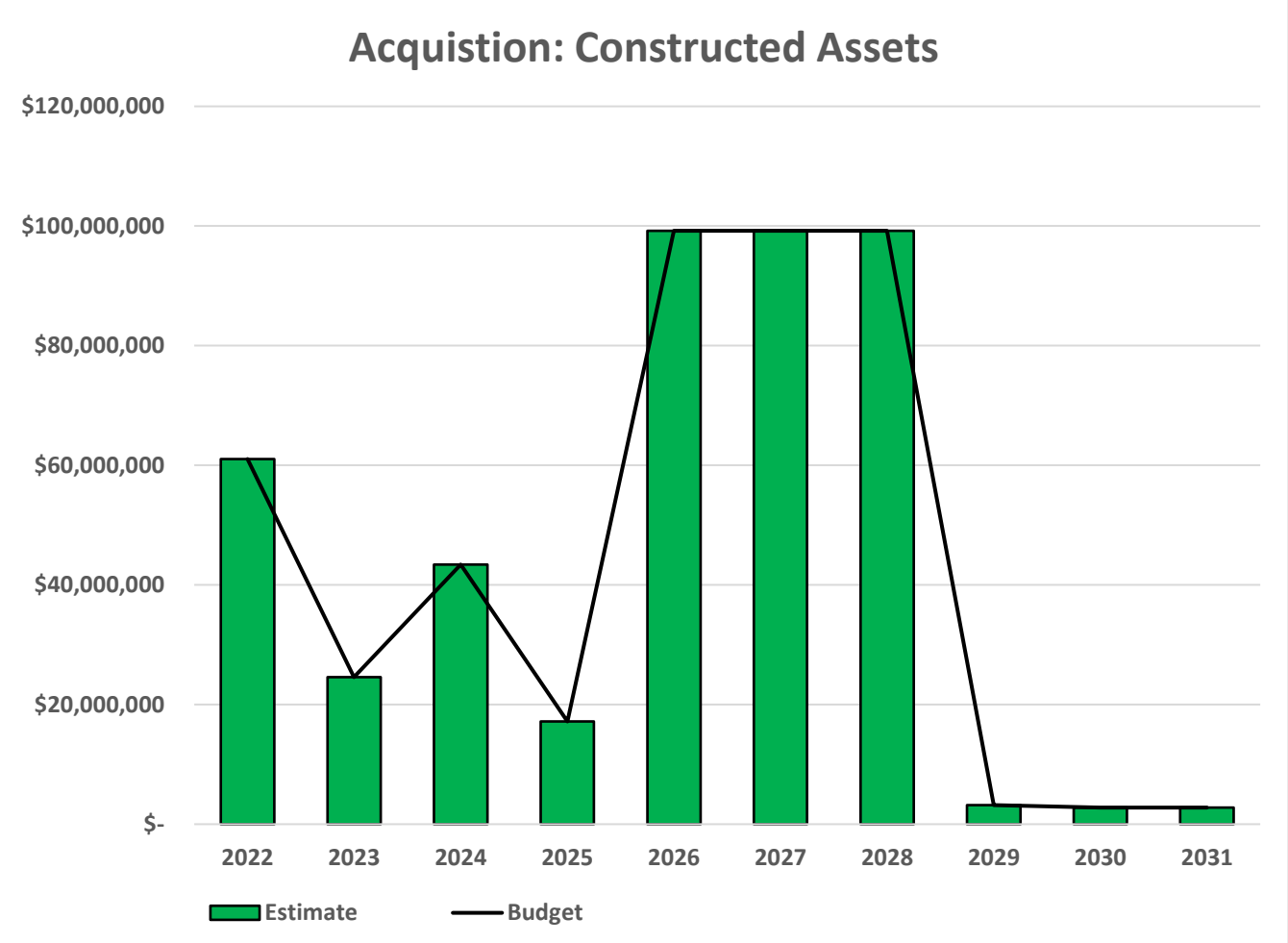
The City will need to ensure the required data is updated frequently and to a single source to ensure that all the departments have access to the data they require in a timely manner. Once Wastewater assets are assumed, the City then becomes the stewards of these assets and is

responsible for all ongoing costs for the assets operation, continued maintenance, inevitable disposal and their likely renewal.

Construction costs are often only **10-15 %** of an asset's whole life costs. When development assets are donated to the City, the City then becomes obligated to fund the remaining whole life costs. Over the next ten-year planning period the City anticipates ***receiving*** **$195,000,000** of donated assets which, would then obligate the City to fund the remaining lifecycle costs over the donated assets ESL.

Hamilton has internal design standards, inspection practices as well as assessment which are intended to ensure the assets that are being donated to the City through subdivision agreements are in excellent condition before assumption. The City should continue to review its assumption process to ensure that the City is receiving high quality and appropriately sized donated assets to defer lifecycle activities as much as possible.

Figure 15: Acquisition (Constructed) Summary
All figure values are shown in 2021 dollars.



3.0 WASTEWATER ASSETS

When the City commits to new assets, the municipality must be prepared to fund future operations, maintenance and renewal costs. The City must also account for future depreciation when reviewing long term sustainability. When reviewing the long-term impacts of asset acquisition, it is useful to consider the cumulative value of the acquired assets being taken on by Hamilton. The cumulative value of all acquisition work, including assets that are constructed and contributed are shown in Figure 16.

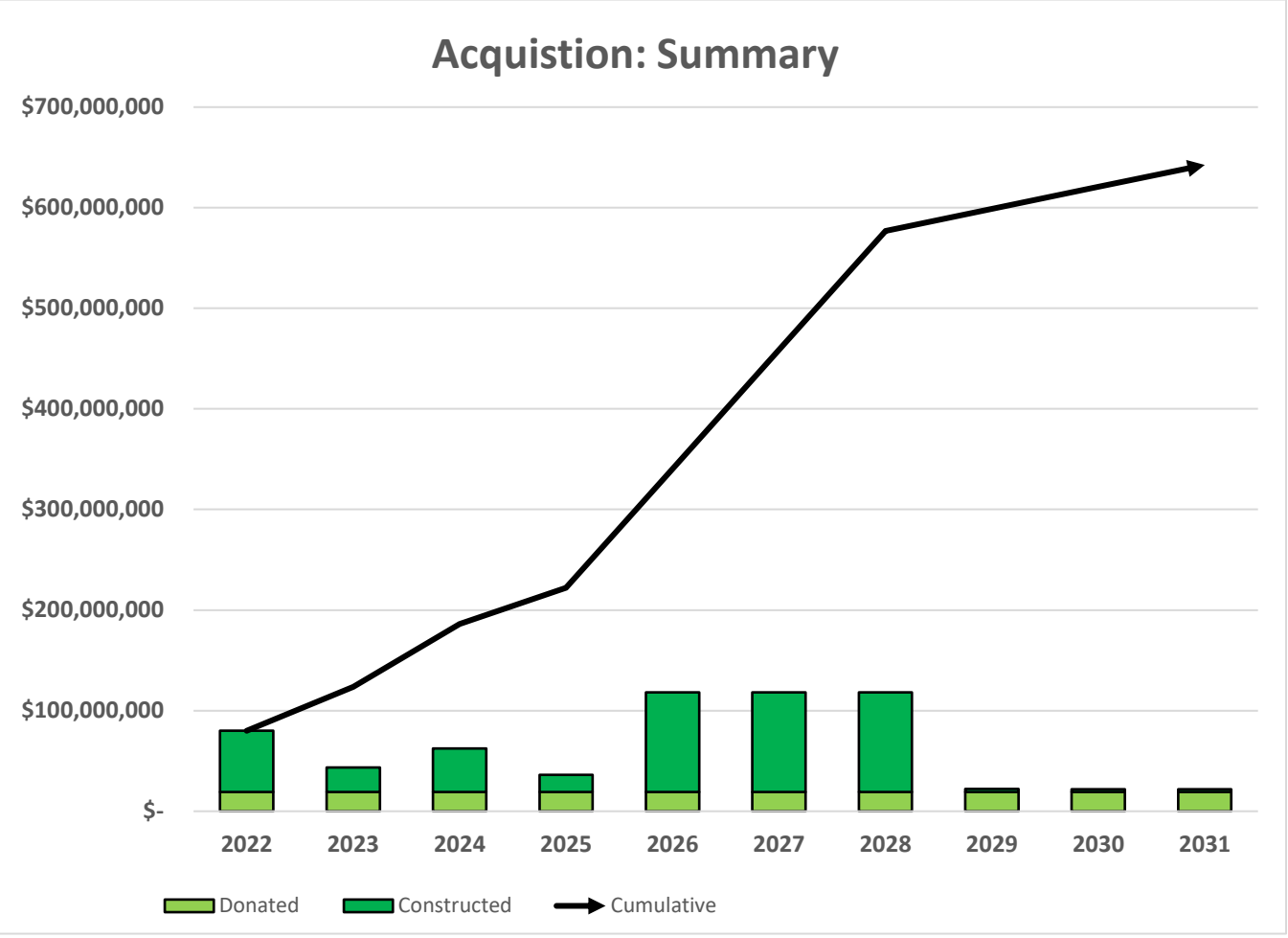
Over the next 10 Year planning period, the City will acquire approximately **$439,597,000** of constructed assets which can either be new assets which did not exist previously, or expansion of assets when they are to be replaced. Major acquisition expenditures over the next ten years include;

- **$10.6 million** for a new haulage receiving station to be completed by **2025**
- **$313** million for Woodward Treatment Plant Expansion by the end of **2028**
- **$7.5 million** for a Centralized operations centre
- **$77.6 million** for Trunk Sewers along Dickenson Rd.

The bulk of these constructed asset costs peak between 2026 – 2028 and after that it appears that there will only be minimal construction of assets. The lack of acquired constructed assets between 2029 – 2031 is due to lack of data and limited forecasting ability currently. As AM knowledge, practices and abilities mature within the City then in all likelihood there will be significant projects with significant costs that will appear within later years of the 10-year horizon.

3.0 WASTEWATER ASSETS

Figure 16: Acquisition Summary
All figure values are shown in 2021 dollars.



SUMMARY OF ASSET FORECAST COSTS

Over the next ten years the City expects to acquire nearly $**642.8 million** dollars of Wastewater assets.

The City has sufficient budget for its planned constructed acquisitions at this time. It will become critical to understand that through the construction or assumption of new assets, the City will be committing to funding the ongoing operations, maintenance and renewal costs which are very significant. The City will need to address how to best fund these ongoing costs as well as the costs to construct the assets while seeking the highest level of service possible.

Future AM Plans will focus on improving the understanding of Whole Life Costs and funding options. However, at this time the plan is limited on those aspects. Expenditure on new assets and services will be accommodated in the long-term financial plan but only to the extent that there is available funding.

3.2.2 Operations and Maintenance Plan

Operations include all regular activities to provide services. Daily, weekly, seasonal, and annual activities are undertaken by staff to ensure the assets perform within acceptable parameters and to monitor the condition of the assets for safety and regulatory reasons. Examples of typical operational activities include cleaning, sample collection, quality testing, inspections, utility costs and the necessary staffing resources to perform these activities.

Maintenance should be viewed as the ongoing management of deterioration. The purpose of planned maintenance is to ensure that the correct interventions are applied to assets in a proactive manner and to ensure it reaches its intended useful life. Maintenance does not significantly extend the useful life of the asset but allows assets to reach their intended useful life by returning the assets to a desired condition.

Proactively planning maintenance significantly reduces the occurrence of reactive maintenance which is always linked to a higher risk to human safety and higher financial costs. The City needs to plan and properly fund its maintenance to ensure the engineered structures are reliable and achieve their desired level of service.

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating. Examples of typical maintenance activities include pipe repairs, service repairs, pump maintenance, equipment repairs along with appropriate staffing and material resources.

Some of the major mainteanance projects Hamilton plans to undertake over the next 10 years include:

- **$35.5 Million** for sewer lateral management program
- **$3 Million** allocated for reactive repairs for cross connections
- **13.25 Million** acllocated for Pier 25 Dredging – Windermere Basin

Assessment and priority of reactive maintenance is undertaken by staff using experience and judgement

3.2.3 Vertical Lifecycle Activities

The major operating and maintenance lifecycle activities per vertical asset with their accompanying 2021 costs (if known) are shown below in Table 42.

Table 42: Vertical Lifecycle Activities

Asset	Lifecycle Stage	Lifecycle Activity	2021 Annual Cost
Combined Sewer Overflow Tank	Operations	Calibration & Verification	$5,380
		Inspection & Operations	$102,900
	Maintenance	Preventative Maintenance	$14,390
		Reactive Maintenance	$293,780
Dundas WWTP	Operations	Calibration & Verification	$4,200
		Inspection & Operations	$306,760
		Maintenance	$110,900
Woodward WWTP	Operations	Calibration & Verification	$24,610
		Operations & Inspection	$12,417,830
		Cleaning & Flushing	$6,530
		Lubrication	$7,330
	Maintenance	Preventative Maintenance	$9,360
		Reactive Maintenance	$1,420,600
Lift Stations	Operations	Calibration & Verification	$3,210
		Inspection & Operations	$1,056,700
	Maintenance	Preventative Maintenance	$18,460
		Reactive Maintenance	$163,940
Misc Wastewater	Operations	Preventative Operations	$3,800
	Maintenance	Preventative Maintenance	$1,300
		Reactive Maintenance	$38,810
		Total Annual Cost	**$16,000,930**

3.2.4 Linear Lifecycle Activities

The major operating and maintenance lifecycle activities per linear asset with their accompanying 2021 costs (if known) are shown below in Table 43.

Table 43: Linear Lifecycle Activities

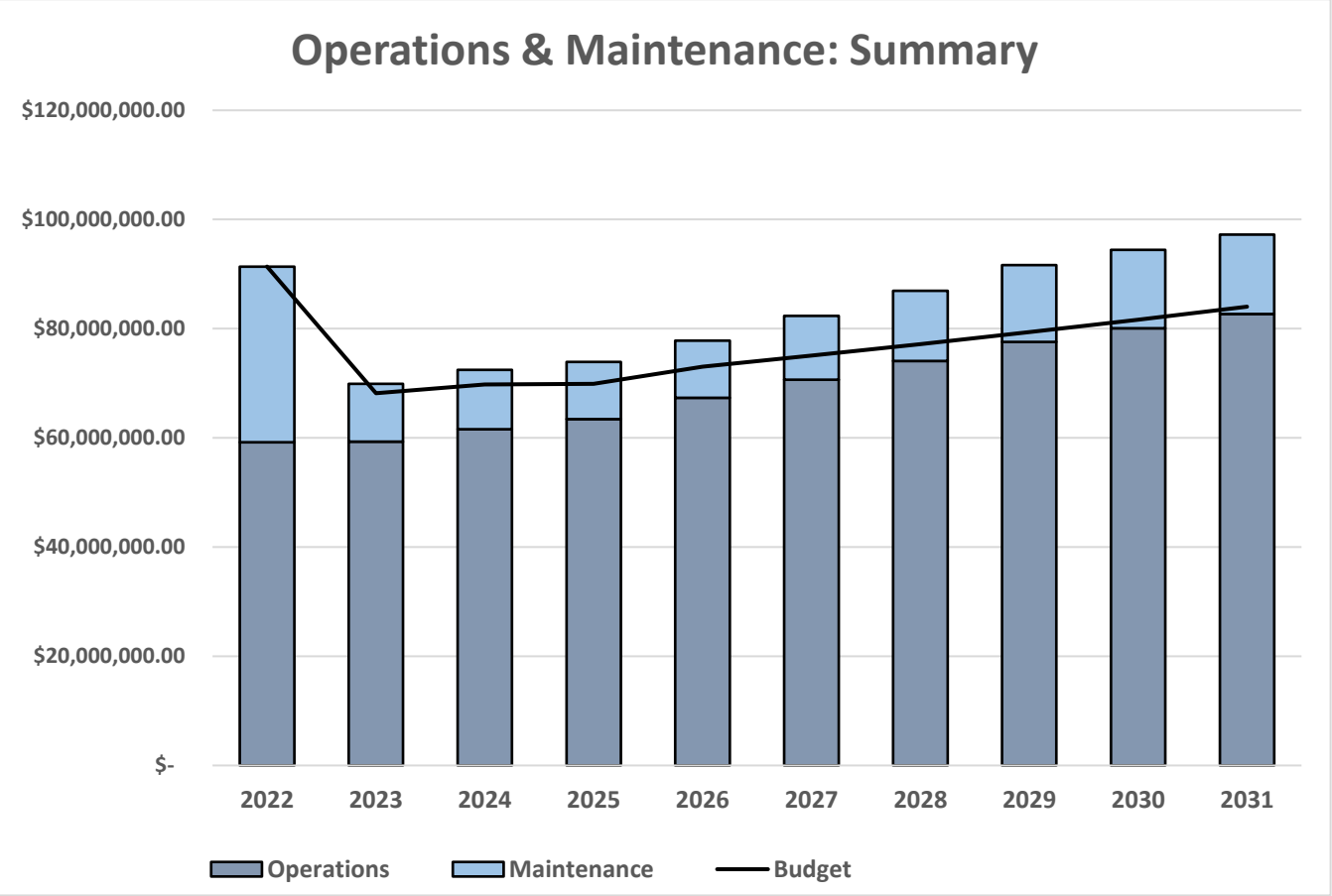
Asset	Lifecycle Stage	Lifecycle Activity	Frequency	2021 Cost	Unit
Sewer Main	Operation	Condition Assessment	Planned	$15-30	per metre
		Cleaning	Ad Hoc	$10,000	per instance
	Maintenance	Spot Repair	Ad Hoc	$40,000	per instance
Forcemain	Operation	Swabbing	Ad Hoc	$10,000	per instance
	Maintenance	Repair	Ad Hoc	$40,000	per instance
Odour Control Unit	Operation	Inspection	6 months	$ 61	per instance
	Maintenance	Change Media Filter	Ad Hoc	$ 1061	per instance
Maintenance Holes	Operation	Inspection	Ad Hoc	$ 50 – $ 71	per unit
	Operation	Condition Assessment - Zoom Camera	Ad Hoc	$ 50	per unit
	Maintenance	Frame & Cover Resets	Ad Hoc	$ 250,000	per year
	Maintenance	Grout Sealing	Ad Hoc	$ 3,000	per unit
	Maintenance	Ladder Rung Repair	Ad Hoc	$ 300	per unit
	Maintenance	Benching	Ad Hoc	$ 1500	per unit
Sewer Laterals	Operation	Cleaning	Ad Hoc	$ 500	ls
	Renewal	Lining	Ad Hoc	$ 456	per m
	Renewal	Replacement	Ad Hoc	$ 8000	per lateral
	Operation	Reactive Inspection	Ad Hoc	$ 500	ls
	Operation	Planned Inspection	Ad Hoc	$159	per lateral

When the City completes necessary operational and maintenance activities, high cost reactive repairs can be prevented, and this will ensure the assets reach their ESL. Currently, assessment and priority of reactive maintenance is undertaken by staff using subject matter expert experience and judgement.

3.0 WASTEWATER ASSETS

Forecast operations and maintenance costs vary in relation to the total value of the asset registry. When additional assets are acquired, the future operations and maintenance costs are forecast to increase. When assets are disposed of the forecast operation and maintenance costs are reduced. Figure 17 shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget.

Figure 17: Operations and Maintenance Summary
All figure values are shown in 2021 dollars.



The forecast costs include all costs from both the Capital and Operating budget. AM focuses on how taxpayer or ratepayer dollars are invested by lifecycle activities and not by budget allocation since both budgets contain various lifecycle activities they must both be consolidated for the AM plans.

The forecast of operations and maintenance costs are increasing steadily over time and it is clear, the City has insufficient budget to achieve all of the works required to ensure that assets will be able to achieve their estimated service life at the desired level of service**.** It is anticipated that at the current budget levels there will be insufficient budget to address all operating and maintenance needs over the 10-year planning horizon. The peak in 2022 is due to the investment of **$13.2 million** for the Pier 25 dredging and other major planned maintenance activities.

The graph above illustrates that without increased funding or changes to lifecycle activities there is a significant shortage of funding which will lead to:

- Higher cost reactive maintenance;
- Possible reduction to the availability of the assets;
- Impacts to private property; and,
- Increased financial and reputational risk.

The shortfall is primarily due to the significant number of assets that are donated through subdivision agreements annually and insufficient funding allocations over an extended period of time. Every year that Hamilton adds additional assets without properly funding the necessary lifecycle activities, staff's ability to sustain the assets to expected or mandatory level of service can be significantly impacted. It should be noted that there are mandatory operational and maintenance expenditures due to legislative requirements and cannot and should not simply be avoided or deferred.

As the City continues to develop condition profiles and necessary works are identified based on their condition, it is anticipated operation and maintenance forecasts will increase significantly. Where budget allocations will result in a lesser level of service, the service consequences and risks will be identified and are highlighted in the Risk Section 3.7. Deferred maintenance (i.e. works that are identified for maintenance activities but unable to be completed due to available resources) will be included in the infrastructure risk management plan for the next iteration.

Future iterations of this plan will provide a much more thorough analysis of operations and maintenance costs including types of expenditures for training, mandatory certifications, insurance, staffing costs and requirements, equipment and maintenance activities.

3.2.5 Renewal Plan

Renewal is major works which does not increase the assets design capacity but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Works over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional future operations and maintenance costs.

Asset renewals are typically undertaken to either ensure the assets reliability or quality will meet the service requirements set out by the City. Renewal projects are often triggered by service quality failure and can often be prioritized by those that have the highest consequence of failure, have high usage, have high operational and maintenance costs and other deciding factors.

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in Table 44 and are based on estimated design life for this iteration. Future iterations of the plan will focus on the Lifecycle approach to ESL which can vary greatly from design life. Asset useful lives were last reviewed in 2022 however they will be reviewed annually until their accuracy reflects the City's current practices.

Table 44: Useful Lives of Assets	
Asset (Sub)Category	**Useful life**
Wastewater Treatment Plant	60
Lift Stations	60
Combined System Overflow Tanks	40
Trunk Mains	97
Local Mains	89
Combined Mains	87
Interceptors	100
Vehicles	7 or 8
Forcemains	81
Valves	80
Maintenance Holes	100
Control Gates	50
Sewer Laterals	60

The estimates for renewals in this AM Plan were based on the register method which utilizes the data from the City's asset registry to analyse all available lifecycle information and then determine the optimal timing for renewals.

RENEWAL RANKING CRITERIA

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing a bridge that has a load limit); or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. condition of a culvert).[9]
- It is possible to prioritise renewals by identifying assets or asset groups that:
- Have a high consequence of failure;
- Have high use and subsequent impact on users would be significant;
- Have higher than expected operational or maintenance costs; and,
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.[10]

[9] IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.
[10] Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

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The ranking criteria used to determine priority of identified renewal proposals is detailed in Table 45.

Table 45: Renewal Priority Ranking Criteria

Criteria	Weighting
Regulatory / Legal Compliance	20%
Co-ordination – Funding and Budgeting	25%
Risk Mitigation	25%
Health & Safety (Users & Staff)	10%
Lifecycle Impacts (Operations & Maintenance)	10%
Demand Driver (Growth)	10%
Total	**100%**

SUMMARY OF FUTURE RENEWAL COSTS

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in Figure 18.

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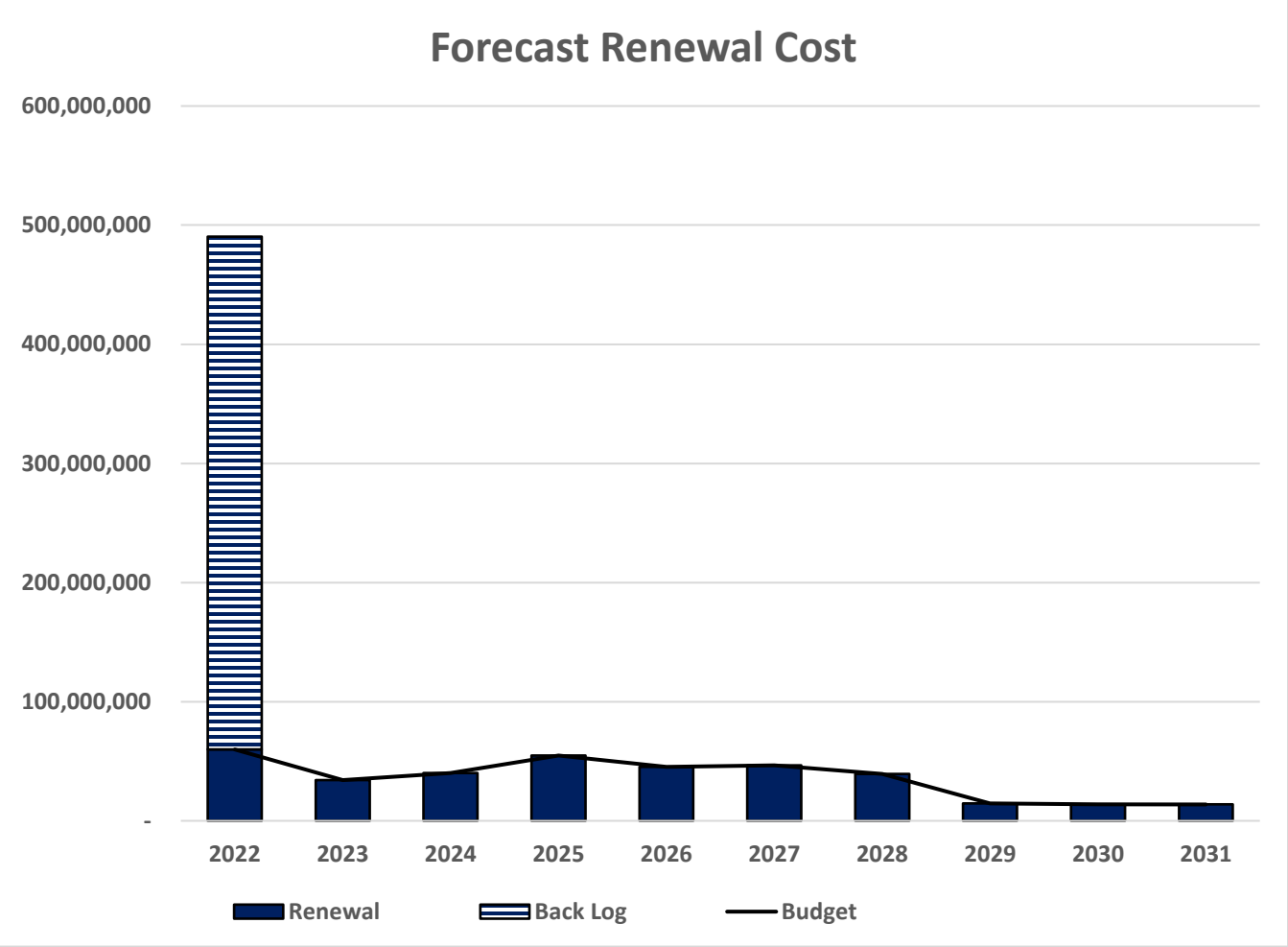
Figure 18: Wastewater Asset Forecast Renewal Costs
All figure values are shown in 2021 dollars.



The significant amount highlighted in 2022 represents the cumulative backlog of deferred work needed to be completed that has been either identified through its current estimated condition or age per Table 39 when condition was not available. Deferred renewal (assets identified for renewal and not scheduled in capital works programs) are included and identified within the risk management plan. Prioritization of these projects will need to be funded and managed over time to ensure renewal occurs at the optimal time.

There is only sufficient budget to support the planned projects only and without additional funding the backlog will remain and continue to grow as future projects outside of the 10-year planning horizon continue to move forward into the 10-year scope. Continued deferrals of projects will lead to significantly higher operational and maintenance costs and will affect the availability of services in the future.

Forecasted renewals over the 10-year planning horizon include select sewer lateral replacements along Strathearne Avenue as well as main replacements along sections of Melvin Avenue, Marion Street and Fairfield Avenue in 2022. In 2023 the City will renew **$3.1 Million** of

Sewer laterals as well as **$4 Million** for network lining, **$3.35 Million** for Rockcliffe pumping station and **$4.7 Million** to complete the **$13.6 Million dollar** renewal of digesters 3 & 5 at the Woodward treatment plant. In 2024 the City will invest **$6 Million** for a secondary digestor at the Woodward plant**, $5.9 Million** to continue th e renew the North digester complex ($15.25 million total) as well as continued upgrades to the Environmental Lab. Other major renewals over the 10-year planning horizon include **$28.2 million** of renewals to the Dundas WWTP, **$44.5 million** for system relining's, **$36.6 million** for Sewer lateral replacements, **$8 million** for interceptor renewals, **$27 million** for primary clarifiers as well as continued renewals for SCADA components.

Deferring renewals create risks of higher financial costs, decreased availability, and decreased satisfaction with asset performance. Ultimately, continuously deferring renewals works ensures Hamilton will not achieve intergenerational equality. If Hamilton continues to push out necessary renewals, there is a high risk that future generations will be unable to maintain the level of service the customers currently enjoy. It will burden future generations with such significant costs that inevitably they will be unable to sustain them.

Properly funded and timely renewals will ensure the assets perform as expected and it is recommended to continue to analyze asset renewals based on criticality and availability of funds for future AM Plans.

3.2.6 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, possible closure of service, decommissioning, disposal of asset materials, or relocation. Disposals will occur when an asset reaches the end of its useful life. The end of its useful life can be determined by factors such as excessive operation and maintenance costs, regulatory changes, obsolescence or demand for the structure has fallen.

Assets identified for possible decommissioning and disposal are shown in Table 46. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined. Any costs or revenue gained from asset disposals is included in future iterations of the AM Plan and the long-term financial plan.

Table 46: Assets Identified for Disposal

Asset	Reason for Disposal	Timing	Disposal Costs	Operations & Maintenance Annual Savings
Aberdeen Sewage Pumping Station	End of Life	2026	$1,310,000	$15,000

3.0 WASTEWATER ASSETS

Table 46: Assets Identified for Disposal				
Asset	**Reason for Disposal**	**Timing**	**Disposal Costs**	**Operations & Maintenance Annual Savings**
Woodward WWTP Standby Bldg.	End of Life. New Power Centre installed	2022	$150,000	$3,000

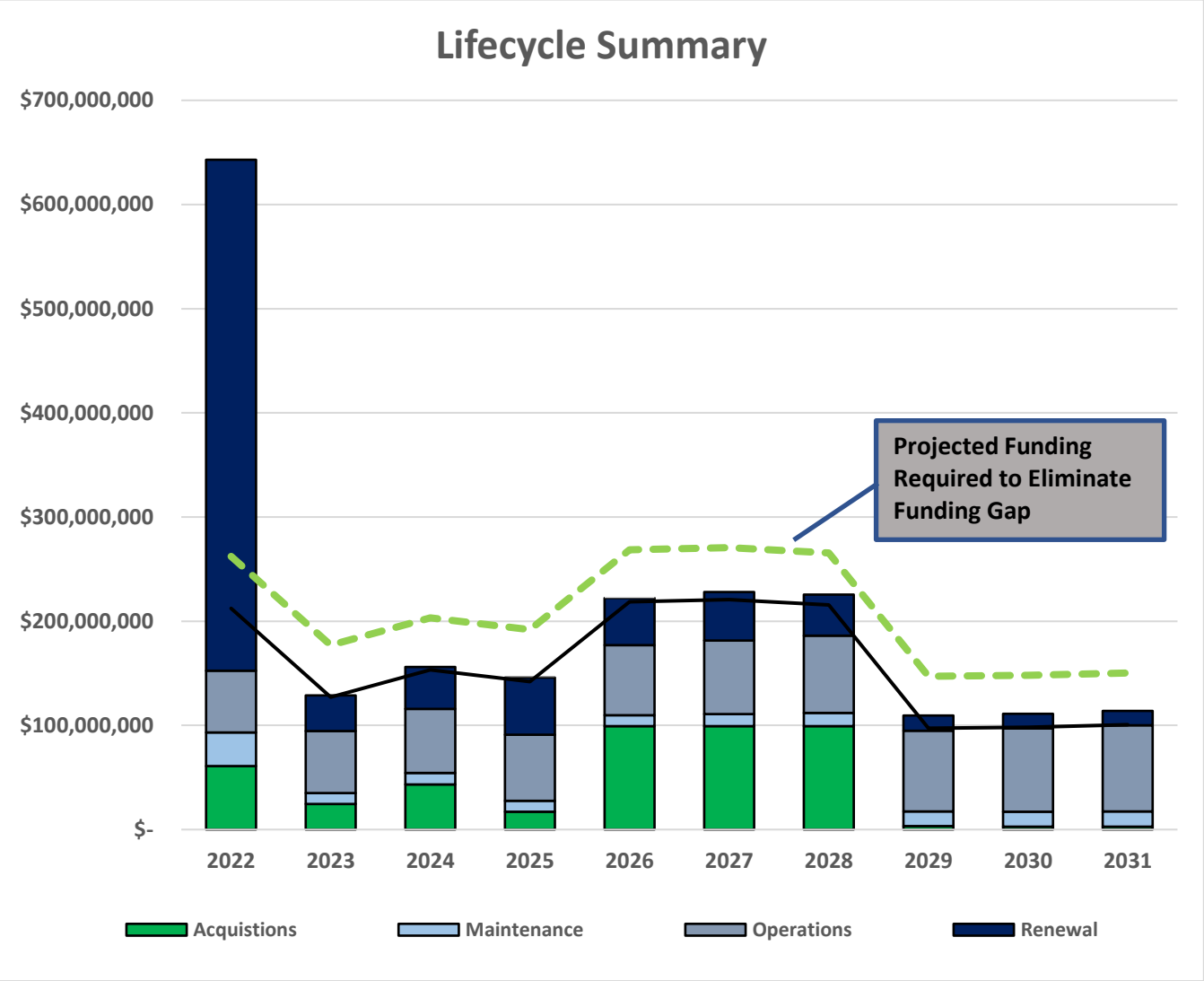
SUMMARY OF ASSET FORECAST COSTS

The financial projections from this AM Plan are shown in Figure 19. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

The bars in the graphs represent the forecast costs needed to minimize the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.

3.0 WASTEWATER ASSETS

Figure 19: Lifecycle Summary
All figure values are shown in 2021 dollars.



Currently there is insufficient budget to address the large backlog of renewal work projected by the plan. There is sufficient budget to address ongoing operational and maintenance needs for most of the planning period however with the assumption of assets over time and their increased costs there may be impacts to the service itself as illustrated by Figure 19. Without some adjustment to available funds or other lifecycle management decisions there will be insufficient budget to address all planned lifecycle activities.

Allocating sufficient resources is imperative to managing asset throughout their lifecycle. This can include funding for lifecycle activities, sufficient staffing, increased asset knowledge, improved planning, contracted services, additional equipment or vehicles to ensure that Hamilton is optimizing its lifecycle approach.

Without sufficient funding the City has little option but to defer these necessary lifecycle activities. Deferring important lifecycle activities is never recommended. The City will benefit from allocating sufficient resources to developing its long-term financial plan to ensure that over time the City can fully fund the necessary lifecycle activities. Funding these activities helps to ensure the assets are compliant, safe and effectively deliver the service the customers need and desire.

The lack of funding allocated for the backlog of renewals and the necessary lifecycle activities creates an additional issue which is intergenerational equity. Each year the City defers necessary lifecycle activities it pushes the ever-increasing financial burden on to future generations. It is imperative the City begin addressing the lack of consistent and necessary funding to ensure that intergenerational equity will be achieved. Over time, allocating sufficient funding on a consistent basis ensures that future generations will be able to enjoy the same standards being enjoyed today.

Over time the City will continue to improve its lifecycle data, and this will allow for informed choices as how best to mitigate those impacts and how to address the funding gap itself. This gap in funding future plans will be refined over the next three (3) years and improve the confidence and accuracy of the forecasts.

3.3 MANDATORY O.REG. 588/17 LEVELS OF SERVICE

Per Table 2 in O. Reg. 588/17, there are community levels of service that the City is required to report on in order to meet the provincial level of service requirement. These metrics are required to be reported, and so they have been separated from the customer levels of service described in Section 3.4.2. These qualitative metrics are reported below.

3.3.1 Mandatory O.Reg. 588/17 Community Levels of Service

Per Table 2 in O.Reg. 588/17, there are community levels of service that the City is required to report on in order to meet the provincial level of service requirement. These metrics are required to be reported, and so they have been separated from the customer levels of service described in Section 3.4.2. These qualitative metrics are reported below.

Scope:

1. Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system

Most properties within the City's urban area are connected to the municipal wastewater system. Similar, to the water system, these urban properties include residential, industrial, commercial and institutional uses. Communities not within the urban area are likely treating wastewater using private septic systems.

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There are two (2) wastewater treatment plants at the City which service different communities. A map of the wastewater catchment areas and the population serviced can be found in Section 3.1.

As previously mentioned, 32% of the City's wastewater linear network is combined sewer, which is a legacy system, and refers to pipes where wastewater and stormwater are collected in the same pipe. Modern areas of the City have separated sewers meaning that wastewater and stormwater are collected in separate pipes, and the City is working toward separating combined sewers where possible. Areas serviced by a combined sewer are also shown in Section 3.1. It has been identified as a Continuous Improvement item in Table 58 to continue to identify separating combined sewers as part of the renewal process.

Reliability

1. 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.

During periods of heavy rainfall, snowmelt, or elevated lake levels the combined sewers are inundated with large volumes of stormwater that can exceed the capacity of the pipes. To avoid basement flooding and backups into homes, existing combined sewers have combined sewer overflows (CSOs), which relieve overloaded combined sewers into an adjacent storm sewer or receiving water bodies. Sewer overflows exist on both combined sewers and on separated sewers. Many overflows have been retroactively installed after basement flooding experiences. The design varies greatly among the overflow locations. The Hamilton Harbour Remedial Action Plan and the Pollution Prevention and Control Plan (PPCP) detail overflow locations along with characterizing each overflow site and setting priorities/strategies for remediation.

The City also has nine (9) combined sewer overflow tanks (CSOs). The purpose of these CSO tanks is to protect the system against surcharges and overflows during wet weather events by holding the untreated wastewater until the WWTPs have capacity to treat it. The CSO tanks are also necessary to protect the treatment plant against hydraulic overloading that could upset the sewage treatment processes. These tanks also contain overflow pipes which overflow into the natural watercourses during significant wet weather events. Water samples are regularly taken at these overflow locations. Additionally, overflow pump stations also exist in limited areas, and function when the wastewater system is at capacity and there is flooding risk to homes. These pump stations send wastewater to the storm sewer to be released into the environment.

Despite, these overflows, these events can still overwhelm the WWTPs resulting in a temporary bypass of certain treatment processes, and these bypasses are seasonally disinfected. WWTP operators monitor incoming flows and make operational adjustments to the treatment processes as required. To protect the plant from infrastructure damage, prevent flooding, and maintain compliance with the WWTP Environmental Compliance Approval (ECA) the WWTP operator will initiate a bypass event.

3.0 WASTEWATER ASSETS

Flows from the Dundas WWTP are carefully controlled and flows exceeding the plant's capacity are directed to the Woodward WWTP rather than initiating a bypass at Dundas.

In 2021, all bypass events at the Woodward WWTP were the result of wet weather that generated flows in excess of the WWTP's treatment capacity. All bypasses are promptly reported to the Ministry of Environment, Conservation, and Parks (MECP) Spills Action Centre and to Public Health Services as required by the regulations. In 2021, there were 23 bypasses at the Woodward WWTP.

1. Description of the frequency and volume of overflows in combined sewers in the municipal wastewater system that occur in habitable areas or beaches

Overflows are triggered by wet weather (rainfall) events or snow melt. Frequency and volumes vary from site to site, based on intensity and duration of the wet weather event. Bypasses and overflows are reported online by type, volume and duration of each event.

In 2021 there were 149 known total events as shown in Table 47. The vast majority of these events are through uncontrolled and unmonitored sewer regulator structures. Many CSO assets do not have flow/volume monitoring, and the annual CSO events and volumes are estimated using a computer model. Projects are underway to install flow/volume monitoring at additional locations, but it is impractical to try to monitor every location where combined or sanitary sewage can overlow to the storm sewer system and make its way to the natural environment. Computer models will remain an important tool for CSO reporting in the future.

In addition, water at swimmable beaches is tested at a minimum of once a week during the swimming season for E. coli bacteria and residents are advised not to swim in these areas after a heavy rainfall. CSO outfalls are clearly labelled with signage.

2. Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes.

In addition to a storm event causing the combined sewers to exceed design capacity causing sewage overflows, there are other possible ways where inflow and infiltration (I&I) can make its way into the wastewater system.

Examples of situations where infiltration can occur include: defective joints, holes, and cracks in gravity main pipes can allow groundwater infiltration. This is particularly a concern at low elevation points in the system (e.g. pump stations, private infrastructure).

Examples of situations where inflow can occur include illegal sump pump, downspout, directed surface water flows, and drain connections where unanticipated stormwater is added to the system.

3.	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to avoid events described above in item 3.

Inflow & infiltration (I&I) studies have been conducted to quantify the expected amount of I&I, and rain gauges exist at various locations throughout the City to monitor rainfall. The City has used this information to establish design standards to convey flows under ultimate conditions, and design sheets for capacity. In addition, supervisors have the ability to monitor the system during wet weather events to optimize storage within the system and minimize overflows.

As indicated in item 1 above, overflow structures have also been designed to avoid events described in item 3 above.

4.	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system.

The Ministry of Environment, Conservation and Parks (MECP) issues Environmental Compliance Approvals (ECAs) to wastewater treatment facilities in the province, which outlines the effluent limits that the City must be in compliance with. The effluent from the active treatment facilities in the City has documented compliance limits, objectives, and actual performance. The effluent criteria include but are not limited to effluent flow rates, and various quality parameters such as suspended solids and E. coli.

In 2021, the Woodward and Dundas WWTPs did not have any instances where effluent was not compliant with regulatory standards.

3.3.2 Mandatory O.Reg. 588/17 Technical Levels of Service

In addition, per Table 5 in O.Reg. 588/17, there are technical levels of service that the City is required to report on in order to meet the provincial level of service requirement. These quantitative metrics are reported below.

Table 47: Mandatory Technical Levels of Service

Service Attribute	Technical levels of service	Measure
Scope	**1.** Percentage of properties connected to the municipal wastewater system.	83% of 162,308 properties

3.0 WASTEWATER ASSETS

Table 47: Mandatory Technical Levels of Service		
Service Attribute	**Technical levels of service**	**Measure**
Reliability	**1.** 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.	149 events of 134,202 connected properties
	2. The number of connection-days* per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system.	446** connection days of 134,202 connected properties
	3. The number of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system.	0

*Connection-days are defined as “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”.

**782 backups for single lateral connections, and 22 main line back-ups assuming five (5) properties each, multiplied by 0.5 days (12 hours) to resolve

3.4 MUNICIPALLY DEFINED LEVELS OF SERVICE

Levels of service are measures for what the City provides to its customers, residents, and visitors. Service levels are best described as the link between providing the outcomes the community desires, and the way that the City provides those services. Service levels are defined in three ways, customer values, customer levels of service and technical levels of service which are outlined in this section.

3.4.1 Customer Values

Customer values are what the customer can expect from their tax dollar in “customer speak”. These values are used to develop level of service statements.

Customer Values indicate:

- what aspects of the service is important to the customer;
- whether they see value in what is currently provided; and,
- the likely trend over time based on the current budget provision.

To develop these customer values, as stated in the AMP Overview, a Customer Engagement Survey was released in January 2022 on the Engage Hamilton platform. The survey received 184 submissions and contained 14 questions related to wastewater service delivery. The survey results can be found in Appendix “A” of the AMP Overview. While these surveys were used to establish customer values and customer performance measures, it’s important to note that the number of survey respondents only represents a small portion of the population.

The future intent is to release this survey on an annual basis to measure the trends in customer satisfaction and ensure that the City is providing the agreed level of service as well as to improve the marketing strategy to receive more responses. This has been noted in Table 58 in the Continuous Improvement section.

Table 48: Customer Values Service Objective			
Customer Values	**Customer Satisfaction Measure**	**Current Feedback**	**Expected Trend Based on Planned Budget**
Sewer backup does not occur in my home	Annual Customer Engagement Survey	The vast majority of survey respondents did not experience a sewer back-up in the past year. Though many respondents were concerned with the possibility of it happening due to aging infrastructure and climate change.	Maintain
No sewage odour in the air or in my home	Annual Customer Engagement Survey	A number of survey respondents have noticed odour issues related to wastewater in the City two or more times per year.	Maintain
No sewage discharge into environmental areas	Annual Customer Engagement Survey	A number of survey respondents do not think that the City behaves responsibly when returning wastewater back into the environment.	Maintain

3.4.2 Customer Levels of Service

Ultimately customer performance measures are the measures that the City will use to assess whether it is delivering the level of service the customers desire. Customer level of service measurements relate to how the customer feels about the City's water network in terms of their quality, reliability, accessibility, responsiveness, sustainability and over course, it's cost. The City will continue to measure these customer levels of service to ensure a clear understanding on how the customers feel about the services and the value for their rate dollars.

The Customer Levels of Service are considered in terms of:

Condition	How good is the service? What is the condition or quality of the service?
Function	Is it suitable for its intended purpose? Is it the right service?
Capacity/Use	Is the service over or under used? Do we need more or less of these assets?

4. WASTEWATER

In Table 49 under each of the service measures types (Condition, Function, Capacity/Use) there is a summary of the performance measure being used, the current performance, and the expected performance based on the current budget allocation.

Table 49: Customer Levels of Service

Type of Measure	Level of Service	Source	Performance Measure	Current Performance	Expected Trend Based on Planned Budget
Condition	Provide reliable wastewater services with minimal sewer back-ups.	Annual Customer Engagement Survey	96.3% of survey respondents had not had a sewer back-up in the last 12 months	Very Satisfied	Maintain
			45.7% of survey respondents were concerned with a sewer back-up occurring on their property	Unsatisfied	Maintain
		Confidence levels		**Medium**	
		Unknown	Average condition of WWTPs	Unknown	
		Confidence levels		**Very Low**	
		Condition Assessment	Average condition of lift station	Fair	Maintain
		Confidence levels		**Medium**	
		Combination of Inspection & Age Based	Average estimated condition of combined main	Good	Maintain
		Combination of Inspection & Age Based	Average estimated condition of wastewater main	Good	Maintain
		Confidence levels		**Medium**	
Function	Ensure wastewater is being collected and treated responsibly with minimal odour issues.	Annual Customer Engagement Survey	87.2% of survey respondents are satisfied with the wastewater services they receive.	Fairly satisfied	Maintain
			45.9% of survey respondents have noticed odour issues in the City related to wastewater	Unsatisfied	Maintain
			42.9% of survey respondents do not think Hamilton behaves responsibly when returning wastewater back to the environment	Unsatisfied	Slight Decrease
		Confidence levels		**Medium**	
		Customer BIMA Metric	15 odour complaints received from Woodward WWTP	Unsatisfied	Maintain
		Hansen	136 sewer odour complaints	Unsatisfied	Maintain
		Confidence levels		**Medium**	
Capacity	Ensure wastewater assets are used and within design capacity.	Annual Customer Engagement Survey	89.1% of survey respondents are connected to Hamilton's wastewater network.	High	Maintain
		Confidence levels		**Medium**	

4. WASTEWATER

3.4.3 Technical Levels of Service

Technical levels of service are operational or technical measures of performance, which measure how the City plans to achieve the desired customer outcomes and demonstrate effective performance, compliance and management. The metrics should demonstrate how effectively Hamilton delivers its services in alignment with its customer values; and should be viewed as possible levers to impact and influence the Customer Levels of Service. Hamilton will measure specific lifecycle activities to demonstrate how Hamilton is performing on delivering the desired level of service as well as to influence how customer perceive the services they receive from the assets.

Technical service measures are linked to the activities and annual budgets covering Acquisition, Operation, Maintenance, and Renewal.

Service and asset managers plan, implement and control technical service levels to influence the service outcomes.

Table 50 shows the activities expected to be provided under the current 10 year Planned Budget allocation, and the Forecast activity requirements being recommended in this AM Plan.

Table 50: Technical Levels of Service

LIFECYCLE ACTIVITY	PURPOSE OF ACTIVITY	ACTIVITY MEASURE	CURRENT PERFORMANCE*	TARGET	RECOMMENDED PERFORMANCE **
Acquisition	Ensure wastewater assets are used and within design capacity.	% Main Wastewater Pump Station Construction Progress to Date at Woodward WWTP	90	No Data	100%
		% Tertiary Treatment Construction Progress to Date at Woodward WWTP	75.75	No Data	100%
		# WW / Storm Substantially Complete Projects	19	No Data	No Data
		Budget	**$42,742,500**		**$42,742,500**
Operation	Ensure wastewater is being collected and treated responsibly with minimal odour issues.	# of Main Line Sewer Back-ups	22	No Data	No Data
		# Lateral Back-up Investigations	782	No Data	No Data
		# of Sewer Odour Investigations	136	No Data	No Data
		% of sewer odour investigations started within 12 hrs - 80%	94.5%	80%	80%
		% completion monthly outstation inspections	92.12%	80%	80%
		% Conducted required sampling as per the Woodward ECA (EME sampling only)	100%	100%	100%
		# of Raw WWTP Wastewater Samples Collected (4232)	24	24	24
		# of STP FE WWTP Samples Collected (4233)	887	No Data	No Data
		Active Sewer Discharge Permits (2646)	287	No Data	No Data
		Mainline sewers inspected per year (4253)	107 km	100	100
		Woodward WWTP Volume treated wastewater (ML) (2853)	73,332.08	No Data	No Data
		Dundas WWTP Volume treated wastewater (ML) (2854)	2,868.01	No Data	No Data
		METRIC - Total Weight Biosolids Produced (Tonnes) (2874)	21,133.95	No Data	No Data
		Number of CSO tank overflow events	27	No Data	No Data
		Number of CSO outfall overflow events	85	No Data	No Data
		Number of overflow lift station overflow events	14	No Data	No Data
		% of CSO overflows with monitors	15%	No Data	No Data

3.0 WASTEWATER ASSETS

Table 50: Technical Levels of Service					
LIFECYCLE ACTIVITY	**PURPOSE OF ACTIVITY**	**ACTIVITY MEASURE**	**CURRENT PERFORMANCE***	**TARGET**	**RECOMMENDED PERFORMANCE ****
		Total ML of wastewater overflowed into natural watercourse in 2021	4,059.84	No Data	No Data
		Number of laterals inspected per year (4254)	2664	2200	2200
		Budget	**$49,442,892**		**$49,442,892**
Maintenance	Provide reliable wastewater services with minimal sewer back-ups.	# of Sewer Lateral Repair / Replacement Emergency & Scheduled	422	No Data	No Data
		% of emergency sewer repairs/replacement within 2 days - 100%	100%	100%	100%
		% of scheduled sewer lateral repairs/replacement within 45 days - 80%	98.92	80%	80%
		% of scheduled sewer repairs/replacement within 45 days - 80%	97.58	80%	80%
Renewal	Provide reliable wastewater services with minimal sewer back-ups.	Sewer laterals CIPP rehabilitation count/yr	500	No Data	No Data
		Sewermain CIPP rehabilitation km/yr	23.3 km	No Data	No Data
		Budget	**$34,284,500**		**$79,284,496**
Note: * Current activities related to Planned Budget. ** Expected performance related to forecast lifecycle costs. * B**					

It is important to monitor the service levels regularly as circumstances can and do change. Current performance is based on existing resource provision and work efficiencies. It is acknowledged changing circumstances such as technology and customer priorities will change over time.

At this time, many of the existing technical metrics do not have a target. These metrics should be improved to include a target to be in line with SMART objectives identified in the AMP Overview.

As the City's asset management maturity increases, and with the implementation of the EAM project mentioned in Section 7.2.3 of the AMP Overview, the City will also have more capacity to measure additional metrics. In addition, the City should investigate the BIMA scorecard further to ensure data and assumptions are consistent with ministry and City reporting. In addition, often times wastewater and stormwater metrics have been reported together, and these should be separated for ease of reporting which has been identified as a continuous improvement item.

3.4.4 Level of Service Analysis

At this time, the City's technical metrics for Wastewater assets are based on meeting regulatory and legislative requirements including Environmental Compliance Approvals (ECAs). It is evident per Table 50 that the City is typically meeting these standards with a few exceptions. However, customer preferences and expectations do not always match minimum legislated requirements, which is discussed below. As mentioned in Section 3.4.2, while these surveys were used to establish customer values and customer performance measures, it's important to note that the number of survey respondents currently only represents a small portion of the population.

CONDITION

The majority of survey respondents had not had a sewer back-up in 12 months and were considered to be very satisfied with the service. However, many survey respondents appeared to be concerned with possible sewer back-ups, and cited condition and climate change as reasons they were concerned with the possibility of a back-up.

As shown throughout the report, the condition of the main lines (e.g. combined, separated and interceptor) are typically in Good condition. Per the technical level of service table, the most frequent cause of sewer back-ups is with an individual home's lateral connection (782 instances), and not with main line infrastructure (22 instances). These issues can be at the fault of a deficient sewer lateral (e.g. tree roots, condition, settlement). The City investigates these issues typically within 12 hours, although technical metrics show the target as 2 days. The City will also investigate allocating more specific metrics for this issue which has been identified as a continuous improvement item in Table 58.

FUNCTION

The majority of survey respondents indicated they were satisfied with the wastewater services they received. However, many survey respondents indicated they had noticed sewage odours throughout the City on a few occasions and were considered to be unsatisfied with this level of service. Per the technical levels of service table, although odour complaints did occur, the City did respond to all of these complaints, and responded to 95% of these complaints within 24 hours which exceeds the City target of 80%. The City will continue to investigate odour complaints and investigate opportunities to prevent these complaints from occurring. The City will also investigate allocating more specific metrics for this issue which has been identified as a continuous improvement item in Table 58.

In addition, many survey respondents felt that the City was not responsible when returning wastewater back into the natural watercourse. As explained throughout the report, the City is working toward improving the legacy combined sewer system to reduce the frequency of combined sewer overflows. The technical levels of service show the number of overflow events and where these events have occurred. This data is publicly available on the website. However, it's important to note that these overflows do protect the system as well as properties in the City

connected to combined sewers from back-ups and it is a complex problem. As previously mentioned, the City has spent more than 30 years working to improve the system with total investments exceeding $550 million and will be continuing to improve the system over time.

CAPACITY

At this time, there were not any key findings associated with the wastewater capacity with respect to customer levels of service but the majority of survey respondents were shown to be connected to the municipal wastewater system, which is expected.

Although, there are some areas where the City could investigate capacity from a technical aspect to align with customer values. To quantify the volume of water exiting the outfalls, the City is in the process of acquiring monitoring at additional overflow locations. In the interim, Hamilton generates an annual report that uses the wastewater system model to compute event based overflow volumes for every CSO outfall (where there is no volumetric monitroring). The City has completed a Flooding & Drainage Improvement study to develop a long-term strategy to reduce and eliminate combined sewer overflows. This conceptual study will be presented to PWC in July. Finally, the City could also investigate adding additional odour control units in areas deemed to be hot spots for odour complaints.

3.5 FUTURE DEMAND

The ability for the City to be able to predict future demand for services enables the City to plan ahead and identify the best way of meeting the current demand while being responsive to inevitable changes in demand. Demand will inevitably change over time and will impact the needs and desires of the community in terms of the quantity of services (more communities connecting to the service) and types of service required (larger facilities to process increased volumes).

Demand is defined as the desire customers have for assets or services and that they are willing to pay for. These desires are for either new assets/services or current assets.

3.5.1 Demand Drivers

For wastewater, the key drivers are population change, climate change, technological changes, legislative requirements and customer preferences and expectations. A future continuous improvement item is to identify additional demand drivers.

3.5.2 Demand Forecasts

The high level present position and projections for demand drivers that may impact future service delivery and use of assets have been identified and documented in Table 51. At this time, specific projections have not been calculated and will be updated in the 2025 AM Plan per the timelines stated in the AMP Overview. Growth projections have been shown in the AMP Overview.

3.5.3 Demand Impact and Demand Management Plan

The impact of demand drivers that may affect future service delivery and use of assets are shown in Table 51.

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Demand management practices can include non-asset solutions, insuring against risks, and managing failures.

Opportunities identified to date for demand management are shown in Table 51. Climate change adaptation is included in Table 52. Further opportunities will be developed in future revisions of this AM Plan, as identified in Table 58 in the Continuous Improvement Section.

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Table 51: Demand Management Plan

DEMAND DRIVER	CURRENT POSITION	PROJECTION	IMPACT ON SERVICES	DEMAND MANAGEMENT PLAN
Population Change	573,000 (2021)	636,080 (2031)	Greater treatment capacity at WWTP.	Increase budget due to increased costs for treatment. New staff may be required for legislative compliance. Adjust budgets, long-term financial plan, and AM Plan. Construction on Woodward WWTP is currently scheduled to commence in 2026 and be completed in 2030.
Population Change	573,000 (2021)	636,080 (2031)	More WW main required.	Investigate need for new lift stations. New staff may be required for legislative compliance. Adjust budgets, long-term financial plan, and AM Plan. These needs are being investigated by the Water, Wastewater and Stormwater Masterplan which will be completed in early 2023.
Customer Preferences and Expectations	Existing private properties not on a Hamilton wastewater catchment may desire to join system.	More properties connected to Hamilton wastewater catchment.	Additional connections require operations, maintenance and renewals.	Future extensions would be required, and pipe capacities would need to be assessed. New staff may be required for legislative requirements. Adjust budgets, long-term financial plan, and AM plan.

3.5.4 Asset Programs to meet Demand

The new assets required to meet demand may be acquired, donated or constructed. Additional assets are discussed in Section 3.2.1.

Acquiring new assets will commit the City to ongoing operations, maintenance and renewal costs for the period that the service provided from the assets is required. These future costs are identified and considered in developing forecasts of future operations, maintenance and renewal costs for inclusion in the long-term financial plan.

3.5.5 Climate Change Adaptation

The impacts of climate change may have a significant impact on the assets we manage and the services they provide. In the context of the asset management planning process, climate change can be considered as both a future demand and a risk.

Climate change impacts on assets will vary depending on the location and the type of services provided, as will the way in which those impacts are responded to and managed.[11]

As a minimum the City must consider how to manage our existing assets given potential climate change impacts for our region.

Risk and opportunities identified to date are shown in Table 52. This is a continuous process and will be updated in the 2025 AM Plan per the timelines outlined in the AMP Overview.

Table 52: Managing the Impact of Climate Change on Assets and Services

CLIMATE CHANGE DESCRIPTION	PROJECTED CHANGE	POTENTIAL IMPACT ON ASSETS AND SERVICES	MANAGEMENT
Increased wet weather events	Increased demand on combined sewer system.	Wastewater system at capacity causing more combined sewer overflows into natural watercourse.	Monitor overflows and bypasses. Develop plans to mitigate the increased demand (e.g. increased wet weather treatment capacity, additional wet weather storage capacity, or removal of wet weather flow from the combined sewer system).

[11] IPWEA Practice Note 12.1 Climate Change Impacts on the Useful Life of Infrastructure

3.0 WASTEWATER ASSETS

Additionally, the way in which the City constructs new assets should recognize that there is opportunity to build in resilience to climate change impacts. Building resilience can have the following benefits:

- Assets will withstand the impacts of climate change;
- Services can be sustained; and,
- Assets that can endure may potentially lower the lifecycle cost and reduce their carbon footprint.

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Table 53 summarizes some asset climate change resilience projects the City is currently pursuing.

Table 53: Building Asset Resilience to Climate Change

PROJECT	PROJECT DESCRIPTION	CLIMATE CHANGE IMPACT	BUILD RESILIENCE IN NEW WORKS
West Mountain Inflow & Infiltration (I/I) Study	Quantify I/I generated in West Mountain service areas.	I/I will increase as wet weather events increase due to climate change and may increase likelihood of basement flooding.	To improve Hamilton's climate resiliency by decreasing our vulnerability to extreme weather, minimizing future damages, take advantage of opportunities, and better recover from future damages.
Lift Station Upgrades	Upgrades increasing energy efficiency of equipment at various stations as well as increased capacity.	Old technology at facilities leads to wasted energy which increases GHG emissions, in addition increased capacity provides additional resilience.	To increase the number of new and existing high performance state-of-the-art buildings that improve energy efficiency and adapt to a changing climate.
Combined Sewer Upgrades	Ongoing work to upgrade the capacity and separate combined sewer infrastructure.	Significant wet weather events which may increase due to climate change may cause combined sewers to overflow more often into natural watercourses.	To improve Hamilton's climate resiliency by decreasing our vulnerability to extreme weather, minimizing future damages, take advantage of opportunities, and better recover from future damages.
WWTP Expansions	Expand treatment capacity at WWTPs for additional wet weather flow capacity.	Significant wet weather events which may increase due to climate change may cause WWTP to reach capacity and bypass wastewater into natural watercourse more often.	To improve Hamilton's climate resiliency by decreasing our vulnerability to extreme weather, minimizing future damages, take advantage of opportunities, and better recover from future damages.
Sewer Pipe Flow Monitoring	Monitors reveal whether wastewater sewers are receiving substantial amounts of rainwater inflow and groundwater infiltration (I/I) which can result in flooding.	Significant wet weather events which may increase due to climate change may cause the combined sewer system to reach capacity.	To improve Hamilton's climate resiliency by decreasing our vulnerability to extreme weather, minimizing future damages, take advantage of opportunities, and better recover from future damages.
Back Water Valves for Outfalls	Installation of back water valves at all CSO outfall locations. Mitigation/diversion of wet weather flows from the environment.	Significant wet weather events which may increase due to climate change may cause the combined sewer system to reach capacity.	To improve Hamilton's climate resiliency by decreasing our vulnerability to extreme weather, minimizing future damages, take advantage of opportunities, and better recover from future damages.
CCTV Inspections	Lateral CCTV Inspections, CCTV & Zoom Camera Inspections - proactive with inspections to help determine structural condition of pipes, presence of blockages,	Significant wet weather events which may increase due to climate change may cause the combined sewer system to reach capacity.	To improve Hamilton's climate resiliency by decreasing our vulnerability to extreme weather, minimizing future damages, take advantage of opportunities, and better recover from future damages.
Cured in Place Pipe Rehabilitation Program	Cured in Place Pipe (CIPP) Rehabilitation Program - when initiated, helps prevent infiltration and exfiltration's of water from the sewer system.	I/I will increase if wet weather events increase due to climate change and will increase likelihood of basement flooding.	To improve Hamilton's climate resiliency by decreasing our vulnerability to extreme weather, minimizing future damages, take advantage of opportunities, and better recover from future damages.
Children's Water Festival	Support and Coordination of the annual Children's Water Festival. Educate children about importance of water quality and conservation.	The City is a steward of the infrastructure built and needs to ensure future generations are educated about climate change's effects on our infrastructure.	To ensure all our work promotes equity, diversity, health and inclusion and improves collaboration and consultation with all marginalized groups, including local Indigenous Peoples.
Master Plan Update	Identify infrastructure needs related to growth. Guiding policy item related to GHG emission reduction.	Population increases and increased wet weather events will change the design capacity of the system, and so the City needs to plan accordingly.	To improve Hamilton's climate resiliency by decreasing our vulnerability to extreme weather, minimizing future damages, take advantage of opportunities, and better recover from future damages.
Flooding and Drainage Improvement Framework	Master study to identify existing performance of the City's combined sewer network and to identify system enhancements to reduce the risk of basement flooding.	Develop a long range plan to improve the performance of the combined sewer network and to reduce basement flooding during wet weather.	To improve Hamilton's climate resiliency by decreasing our vulnerability to extreme weather, minimizing future damages, take advantage of opportunities, and better recover from future damages.

The impact of climate change on assets is a new and complex discussion and further opportunities will be developed in future revisions of this AM Plan.

3.6 RISK MANAGEMENT

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2018 as: 'coordinated activities to direct and control with regard to risk[12].

The City is developing and implementing a formalized risk assessment process to identify risk associated with service delivery and to implement proactive strategies to mitigate risk to tolerable levels. The risk assessment process identifies credible risks associated with service delivery and will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

The risk assessment process identifies credible risks, the likelihood of those risks occurring, and the consequences should the event occur. The City is further developing its risk assessment maturity with the inclusion of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable in the next iteration of the AM Plan.

3.6.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarized in Table 54. Failure modes may include physical failure, collapse or essential service interruption.

Table 54: Critical Assets

CRITICAL ASSET(S)	FAILURE MODE	IMPACT
Wastewater Treatment Plants	Essential Service Interruption Contamination	Untreated wastewater returns to the environment and degrades Hamilton Harbour and the integrated natural ecosystems.
Lift Station	Essential service interruption Contamination	Wet well overflows resulting in wastewater spills and property damage caused by back-ups.
Critical Combined / Wastewater Main	Physical Failure	Sewer backups resulting in wastewater spills and property damage caused by back-ups.

[12] ISO 31000:2009, p 2

Table 54: Critical Assets		
CRITICAL ASSET(S)	**FAILURE MODE**	**IMPACT**
CSO	Physical failure	CSO tank leaks and degrades Hamilton Harbour and the integrated natural ecosystems.
SCADA	System Failure	Essential service interruption to WWTP and lift stations causing above failures.

By identifying critical assets and failure modes an organization can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

3.6.2 Risk Assessment

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

An assessment of risks associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a ‘financial shock’, reputational impacts, or other consequences.

Critical risks are those assessed with ‘Very High’ (requiring immediate corrective action) and ‘High’ (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment costs of implementing the selected treatment plan is shown in Table 55. It is essential that these critical risks and costs are reported to management. Additional risks will be developed in future iterations of the plan and is identified in Table 58 in the Continuous Improvement Section the plan.

Table 55: Risks and Existing Controls
Note * The residual risk is the risk remaining after the selected risk treatment plan is implemented.

SERVICE OR ASSET AT RISK	WHAT CAN HAPPEN	RISK RATING	EXISTING CONTROLS
WWTP	Plant reaches capacity due to significant wet weather event.	High	Bypasses exist at each treatment level to bypass plant when necessary.
Lift Station	Pump failure or station reaches capacity.	High	Monthly station checks and verifications by operators. Overflows at station. Contingency planning. Emergency SOPs.
Critical WW, Interceptor, or Combined Main	Blockage due to structural failure, oils or debris	High	Inspections occur based on priority.
Forcemain	Break due to pressure transient, aging pipe, sewer gas build up.	High	Emergency sewer repair contract. Some forcemains have a redundancy (e.g. twinned).

3.6.3 Infrastructure Resilience Approach

The resilience of our critical infrastructure is vital to the ongoing provision of services to customers. To adapt to changing conditions the City needs to understand its capacity to 'withstand a given level of stress or demand', and to respond to possible disruptions to ensure continuity of service. An example would be how wastewater assets operate during their peak usage. We do not currently measure our resilience in service delivery and will be included in the next iteration of the AM Plan.

Resilience covers the capacity of the City to withstand any service disruptions, act appropriately and effectively in a crisis, absorb shocks and disturbances as well as adapting to ever changing conditions. Resilience is built on aspects such as response and recovery planning, financial capacity, climate change, risk assessment and crisis leadership.

3.6.4 Service and Risk Trade-Offs

The decisions made in AM Plans are based on the objective to achieve the optimum benefits from the available resources. At this time, the City does not have sufficient data to present risks and tradeoffs. This information will be presented in the **2025** AM Plan regarding Proposed Levels of Service per the timelines outlined in the AMP Overview.

3.7 FINANCIAL SUMMARY

This section contains the financial requirements resulting from the information presented in the previous sections of this AM Plan. Effective asset and financial management will enable the City to ensure its wastewater network provides the appropriate level of service for the City to achieve its goals and objectives. Reporting to stakeholders on service and financial performance ensures the City is transparently fulfilling its stewardship accountabilities.

Long-Term financial planning (LTFP) is critical for the City to ensure the networks lifecycle activities such as renewals, operations, maintenance and acquisitions can happen at the optimal time. The City is under increasing pressure to meet the wants and needs of its customer while keeping costs at an affordable level and maintaining its financial sustainability.

Without funding asset activities properly for its wastewater network; the City will have difficult choices to make in the future which will include options such as higher cost reactive maintenance and operational costs, reduction of service and potential reputational damage.

The City will be seeking to fully incorporate its wastewater network into the LTFP. Aligning the LTFP with the AM Plan is critical to ensure the all the networks needs will be met while the City is finalizing a clear financial strategy with measurable financial targets. The financial projections will be improved as the discussion on desired levels of service and asset performance matures.

3.7.1 Sustainability of service delivery

There are two key indicators of sustainable service delivery that are considered in the AM Plan for this service area. The two indicators are the:

- asset renewal funding ratio (proposed renewal budget for the next 10 years / forecast renewal costs for next 10 years); and,
- medium term forecast costs/proposed budget (over 10 years of the planning period).

ASSET RENEWAL FUNDING RATIO

Asset Renewal Funding Ratio[13] **45.7**%

The Asset Renewal Funding Ratio is used to determine if the City is accommodating asset renewals in an **optimal** and **cost effective** manner from a timing perspective and relative to financial constrains, the risk the City is prepared to accept and service levels it wishes to maintain. Ideally the target renewal funding ratio should be ideally between **90% - 110%** over the entire planning period. A low indicator result generally indicates that service levels are achievable however the expenditures are below this level because the City is challenged to fund the necessary work or has historical preferences or constraints that prevent Hamilton from utilizing additional debt.

[13] AIFMM, 2015, Version 1.0, Financial Sustainability Indicator 3, Sec 2.6, p 9.

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Over the next 10 years the City expects to have **45.7%** of the funds required for the optimal renewal of assets. By only having sufficient funding to renew **45.7%** of the required assets in the appropriate timing it will inevitably require difficult trade off choices that could include:

- a reduction of the level of service and availability of assets;
- increased complaints and reduced customer satisfaction;
- increased reactive maintenance and renewal costs; and,
- damage to the City's reputation and risk of fines or legal costs.

The lack of renewal resources will be addressed in future AM Plan's while aligning the plan to the LTFP. This will allow staff to develop options and long-term strategies to address the renewal rate. The City will review its renewal allocations once the entire inventory has been confirmed and amalgamated.

MEDIUM TERM – TEN (10) - YEAR FINANCIAL PLANNING PERIOD

This AM Plan identifies the forecast operations, maintenance and renewal costs required to provide an agreed level of service to the community over a ten (10) - year period. This provides input into ten (10) - year financial and funding plans aimed at providing the required services in a sustainable manner. As the City continues to develop condition profiles and necessary works are identified based on their condition, it is anticipated operation and maintenance forecasts will increase significantly.

This forecast work can be compared to the proposed budget over the first ten (10) - years of the planning period to identify any funding shortfall.

The forecast operations, maintenance and renewal costs over the ten (10) - year planning period is **$163,083,936** on average per year.

The proposed (budget) operations, maintenance and renewal funding is **$113,198,976** on average per year giving a ten (10) - year funding **shortfall** of **$49,884,956** per year or **$498,849,560** in total over the ten year planning period . This indicates that **69.41%** of the forecast costs needed to provide the services documented in this AM Plan are accommodated in the proposed budget. Note, these calculations exclude acquired assets.

Funding an annual funding shortfall or funding 'gap' of **$49,884,956** per year cannot be addressed in a single year and has not been incorporated as identified within this plan into any existing plan. The Gap will require vetting, planning and resources to begin to incorporate gap management into the future budgets. This gap will need to be managed over time to reduce it in a sustainable manner and limit financial shock to customers. Options for managing the gap include;

- Financing strategies – increased funding, block funding for specific lifecycle activities, long term debt utilization
- Adjustments to lifecyle activites – increase/deacrease maintenance or operations, increase/decrease frequency of renewals, limit acquisitions or dispose of underutilized assets

- Influence level of service expectations or demand drivers

These options and others will allow Hamilton to ensure the gap is managed appropriately and ensure the level of service ouctomes the customers desire.

Providing sustainable services from infrastructure requires the management of service levels, risks, forecast outlays and financing to achieve a financial indicator of approximately 1.0 for the first years of the AM Plan and ideally over the ten (10) - year life of the Long-Term Financial Plan.

3.7.2 Forecast Costs (Outlays) For the Long-Term Financial Plan

Table 56 shows the forecast costs (outlays) required for consideration in the ten (10) - year long-term financial plan.

Providing services in a financially sustainable manner requires a balance between the forecast outlays required to deliver the agreed service levels with the planned budget allocations in the operational and capital budget. The City will begin developing its long-term financial plan (LTFP) to incorporate both the operational and capital budget information and help align the LTFP to the AM Plan which is critical for effective asset management planning.

A gap between the recommended forecast outlays and the amounts allocated in the operational and capital budgets indicates further work is required on reviewing service levels in the AM Plan.

The City will manage the ‘gap’ by continuing to develop this AM Plan to provide guidance on future service levels and resources required to provide these services in consultation with the community. Options to manage the gap include reduction and closure of low use assets, increased funding allocations, reduce the expected level of service, utilize debt based funding over the long term, adjustments to lifecycle activities, improved renewals and multiple other options or combinations of options. These options will be explored in the next AM Plan and the City will provide analysis and options for Council to consider going forward.

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Table 56: Forecast Costs (Outlays) for the Long-Term Financial Plan
Forecast costs are shown in 2021 dollar values.

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL	TOTAL
2022	$61,038,000	$59,194,776	$32,185,000	$59,908,000	0	$212,325,776
2023	$24,590,000	$58,426,964	$9,750,000	$34,275,000	0	$127,041,968
2024	$43,395,000	$60,198,444	$9,600,000	$40,210,000	0	$153,403,440
2025	$17,170,000	$61,421,980	$8,500,000	$54,785,000	$110,000	$141,986,976
2026	$99,194,664	$64,897,460	$8,158,000	$45,158,332	$1,190,000	$218,598,464
2027	$99,194,664	$66,923,880	$8,158,000	$46,448,332	0	$220,724,880
2028	$99,194,664	$69,031,352	$8,158,000	$39,328,332	0	$215,712,352
2029	$31,900,00	$71,223,128	$8,158,000	$14,670,000	0	$97,241,128
2030	$2,770,000	$73,502,576	$8,158,000	$13,805,000	0	$98,235,576
2031	$2,770,000	$75,873,200	$8,158,000	$13,725,000	0	$100,526,200

3.7.3 Funding Strategy

The proposed funding for assets is outlined in the City's operational budget and ten (10) - year capital budget.

These operational and capital budgets determine how funding will be provided, whereas the AM Plan typically communicates how and when this will be spent, along with the service and risk consequences. Future iterations of the AM Plan will provide service delivery options and alternatives to optimize limited financial resources.

3.7.4 Valuation Forecasts

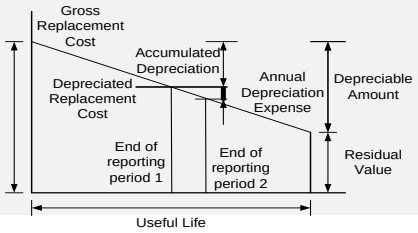
Asset values are forecast to increase as projections improve and can be validated as market pricing. The net valuations will increase significantly despite some assets being programmed for disposal that will be removed from the register over the ten (10) – year planning horizon.

Any additional assets will add to the operations and maintenance needs in the longer term and would also require additional costs due to future renewals obligations. Any additional assets will also add to future depreciation forecasts. Any disposals of assets would decrease the operations and maintenance needs in the longer term and removes the high costs renewal obligations.

3.7.5 Asset Valuations

The best available estimate of the value of assets included in this AM Plan are shown below. The assets are valued at estimated replacement costs:

Replacement Cost (Current/Gross)	$7,254,000,000
Depreciable Amount	$7,254,000,000
Depreciated Replacement Cost[14]	$4,134,922,240
Depreciation	$ 118,148,849



The current replacement cost is the most common valuation approach for specialized infrastructure assets such as infrastructure waste water assets. The methodology includes establishing a comprehensive asset registry, assessing replacement costs (based on market pricing for the modern equivalent assets), determining the appropriate depreciation method, testing for impairments, and determining remaining useful life.

3.7.6 Key Assumptions Made in Financial Forecasts

In compiling this AM Plan, it was necessary to make some assumptions. This section details the key assumptions made in the development of this AM Plan and should provide readers with an understanding of the level of confidence in the data behind the financial forecasts.

Key assumptions made in this AM Plan are:

- Operational forecasts are based on current budget allocations and are the basis for the projections for the 10-year horizon and do not address other operational needs not yet identified;
- Maintenance forecasts are based on current budget allocations and do not identify all asset needs at this time. It is solely based on planned activities;
- 1% p.a. has been added to maintenance forecasts to accommodate for donated assets assumed over the 10-year planning horizon;

[14] Also reported as Written Down Value, Carrying or Net Book Value.

- 1.03 % p.a has been added to operational forecasts to accommodate for donated assets assumed over the 10-year planning horizon; and,
- Replacement costs were based on historical costing and engineering estimates. They were also made without determining what the asset would be replaced with in the future.

3.7.7 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AM Plan are based on the best available data. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is defined in the AMP Overview.

The estimated confidence level for and reliability of data used in this AM Plan is shown in Table 57.

Table 57: Data Confidence Assessment for Data used in AM Plan

DATA	CONFIDENCE ASSESSMENT	COMMENT
Demand drivers	Medium	Further investigation is required to better understand demand drivers
Growth projections	Medium	Current growth projections will need to be vetted an improved. Continuous improvements are required and identified
Acquisition forecast	Medium	Currently based on 2019 DC study and SME opinion. Continuous improvements are required and identified
Operation forecast	Medium	Currently budget based and requires future improvement to ensure allocation is accurate
Maintenance forecast	Medium	Currently budget based and requires future improvement to ensure allocation is accurate
Renewal forecast - Asset values	Medium	Currently budget based and requires future improvements to further identify specific needs
- Asset useful lives	Low	Based on SME opinion. Continuous improvement required to ensure data is vetted and ensure it aligns with Hamilton's actual practices
- Condition modelling	Low	Mixture of assessment methods. Requires standardization along with predictable timelines for assessments
Disposal forecast	Low	Current disposal information is rolled into renewal. Continuous improvements are required to ensure accurate data is available.

The estimated confidence level for and reliability of data used in this AM Plan is considered to be a **Medium** confidence level.

3.8 PLAN IMPROVEMENT AND MONITORING

3.8.1 Status of Asset Management Practices[15]

ACCOUNTING AND FINANCIAL DATA SOURCES

This AM Plan utilizes accounting and financial data. The sources of the data:

- 2022 Capital & Operating Budgets;
- 2021 Tender Documents (various);
- Asset Management Data Collection Templates;
- Audited Financial Statements and Government Reporting (FIR, TCA etc);
- Financial Exports from internal financial systems; and,
- Historical cost and estimates of budget allocation based on SME experience.

ASSET MANAGEMENT DATA SOURCES

This AM Plan also utilizes asset management data. The sources of the data are:

- Data extracts from various city applications and management software;
- Asset Management Data Collection Templates;
- Tender documents, subdivision agreements and projected growth forecasts as well as internal reports;
- Condition assessments;
- Subject matter expert opinion and anecdotal information; and,
- Reports from the mandatory biennial inspection, operational & maintenance activities internal reports

3.8.2 Improvement Plan

It is important that the City recognize areas of the AM Plan and planning process that require future improvements to ensure the effective management of the wastewater network assets and to inform decision making. The tasks listed below are essential to improving the AM Plan and the City's ability to make evidence based and informed decisions. These improvements span from improved lifecycle activities, improved financial planning, improved data quality as well as plans to physically improve the assets. The Continuous Improvement plan table below highlights proposed continuous improvement items that will require further discussion and analysis to determine feasibility, resource requirements and alignment to current workplans. Future iterations of this AM Plan will provide updates on these continuous improvement plans. The improvement plan generated from this AM Plan is shown in Table 58.

[15] ISO 55000 Refers to this as the Asset Management System

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Table 58: Improvement Plan
*** p.a – per annum**

TASK	TASK	RESPONSIBILITY	RESOURCES REQUIRED	DRAFT TIMELINE
1	Collect and confirm data from databases before it goes into EAM including spatial referencing and possible Collector Apps.	**Hamilton Water**	**$40,000 p.a.** **$120,000 Total** Internal Staff Time	**3 Years** (2022-2024)
2	Develop a Long Term Financial Plan to connect the budgeting process to AM planning.	**CAM, Hamilton Water, Finance**	**$15,000 p.a** **$60,000 Total** Internal Staff Time	**4 Years** (2022-2025)
3	Complete condition assessments on WWTPs.	**CAM, Hamilton Water,**	**$250,000 Total** Internal Staff, Tender Process Specialty Assessor	**3 Years** (2022-2024)
4	Investigate modifying control gates inspection to incorporate condition score.	**CAM, Hamilton Water,**	**$10,000 Total**	**2 Years** (2022-2023)
5	Standardize condition assessments for critical wastewater main, combined main, interceptor and forcemain and establish timeline to complete system wide assessment.	**CAM, Hamilton Water, Infrastructure Renewal**	**$10,000 p.a.** **$20,000 Total** Internal Staff Time	**2 Years** (2022-2023)
6	Plan condition assessments for vertical assets on a regular cycle (e.g. 10 years).	**CAM, Hamilton Water,**	**$11,000** Internal Staff Time	**1 Year** (2022)
9	Standardize condition assessment outcomes and timed deliverables.	**CAM, Hamilton Water,**	**$6,000 p.a.** **$18,000 Total** Internal Staff Time	**3 Years** (2022-2024)
10	Improve data confidence levels for asset register.	**CAM, Hamilton Water,**	**10,000 p.a.** **$50,000 Total** Internal Staff Time	**5 Years** (2022-2026)

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Table 58: Improvement Plan
*** p.a – per annum**

TASK	TASK	RESPONSIBILITY	RESOURCES REQUIRED	DRAFT TIMELINE
11	Improve Growth projection data and modelling for next AM Plan iteration.	**CAM, Hamilton Water, Ec. Dev**	**$6,000 p.a. $12,000 Total** Internal Staff Time	**2 Years** (2022-2023)
12	Develop and implement an annual demand review process to ensure sufficient knowledge is available to inform future planning.	**CAM, Hamilton Water, Ec. Dev**	**$17,500 $35,000 Total** Internal Staff Time	**2 Years** (2022-2023)
13	Analyze operational budget to improve AM allocations for lifecycle activities.	**CAM, Hamilton Water, Finance**	**$10,000 p.a. $30,000 Total** Internal Staff Time	**3 Years** (2022-2024)
14	Analyze maintenance activities to identify future needs and recommended actions.	**CAM, Hamilton Water**	**$10,000 p.a. $40,000 Total** Internal Staff Time	**4 Years** (2022-2025)
15	Develop Renewal forecasting prioritization to optimize resources and ensure level of services can be maintained.	**CAM, Hamilton Water**	**$6,000 p.a. $24,000 Total** Internal Staff Time	**4 Years** (2022-2025)
16	Improve annual engagement survey process to optimize engagement and respondents.	**CAM, Hamilton Water, Communications**	**$35,000 p.a. $140,000 Total** Internal Staff Time	**4 Years** (2022-2025)
17	Review BIMA Scorecard reporting and ensure data and assumptions are consistent with ministry and City reporting and develop additional technical metrics.	**CAM, Hamilton Water, Continuous Improvement**	**$2,500 p.a. $5,000 Total** Internal Staff Time	**2 Years** (2022-2023)
18	Standardize and develop risk management knowledge along with supporting documentation.	**CAM, Engineering Services, Continuous Improvement**	**$12,500 p.a. $25,000 Total** Internal Staff Time	**2 Years** (2022-2023)

3.0 WASTEWATER

Table 58: Improvement Plan
*** p.a – per annum**

TASK	TASK	RESPONSIBILITY	RESOURCES REQUIRED	DRAFT TIMELINE
19	Identify wastewater assets in other divisions and incorporate into next AM Plan.	**CAM, Hamilton Water**	**$10,000 p.a. $30,000 Total** Internal Staff Time	**3 Years** (2022-2024)
20	Investigate sewer laterals repair/replacement procedure for private residence as City does not own asset but acts as asset owner.	**CAM, Hamilton Water**	**$4,000 p.a. $8,000 Total** Internal Staff Time	**2 Years** (2022-2023)
21	Further develop vertical asset knowledge for future iterations of AM Plans.	**CAM, Hamilton Water**	**$50,000 p.a. $150,000 p.a.** Internal Staff Time, Tender Process	**3 Years** (2022-2024)
22	Identify opportunities to separate combined sewer system through renewal activities.	**CAM, Hamilton Water**	**$3,000 p.a. $9,000 p.a.** Internal Staff Time	**3 Years** (2022-2024)
23	Improve asset replacement costs by vetting with current market prices instead of historical costs/estimates or internal models.	**CAM, Hamilton Water, Finance**	**$30,000 p.a. $90,000 Total** Internal Staff Time	**3 Years** (2022-2024)
24	Refine acquisition model to ensure projections are accurate and updated.	**CAM, Hamilton Water, Ec.Dev., Finance**	**$7,000 p.a.** Internal Staff Resources	**Annual**
25	Investigate adding additional odour control units in hot spots.	**CAM, Hamilton Water**	**$5,000** Internal Staff Time	**3 Years** (2022-2024)
26	Incorporate forcemain into watermain inspection program	**CAM, Hamilton Water**	**$200,000 p.a.**	**2 years (2022-2023)**
27	Review maintenance hole inspections to output condition score	**CAM, Engineering Services**	**$6,000 p.a. $24,000 Total** Internal Staff Time	**4 Years** (2022-2025)

Table 58: Improvement Plan * p.a – per annum				
TASK	**TASK**	**RESPONSIBILITY**	**RESOURCES REQUIRED**	**DRAFT TIMELINE**
28	Separate & validate wastewater technical metrics reported in the BIMA tool	**CAM, Hamilton Water**	$5,000 p.a Internal Staff Time	Annual
29	Ensure new technical metrics are considering different lifecycle stages (e.g. acquisition, disposal)	**CAM, Hamilton Water**	$2,000 p.a $6.000 Total Internal Staff Time	3 Years (2022-2024)

3.8.3 Monitoring and Review Procedures

This AM Plan will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets as a result of budget decisions.

The AM Plan will be reviewed and updated on a regular basis to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, acquisition and asset disposal costs and planned budgets. These forecast costs and proposed budget will be incorporated into the Long-Term Financial Plan once completed.

3.8.4 Performance Measures

The effectiveness of this AM Plan can be measured in the following ways:

- The degree to which the required forecast costs identified in this AM Plan are incorporated into the long-term financial plan;
- The degree to which the 1-10 year detailed works programs, budgets, business plans and corporate structures consider the 'global' works program trends provided by the AM Plan;
- The degree to which the existing and projected service levels and service consequences, risks and residual risks are incorporated into the Strategic Planning documents and associated plans; and,
- The Asset Renewal Funding Ratio achieving the Organizational target (this target is often 90 – 100%)

2022 Stormwater Asset Management Plan

Hamilton

STORMWATER SERVICE AREA

Description

The stormwater network collects stormwater from rooftops, roads, ditches, and other impervious surfaces across the City and conveys it to the natural watercourse. These assets relate to the collection, transmission, treatment, retention, infiltration, control or disposal of stormwater.

Replacement Value $3.1 Billion

Average Asset Condition

Did You Know?

- Replacing grass or gardens on your property with asphalt or concrete can increase the demand on the stormwater network.
- Low Impact Developments (LIDs) are systems that allow for infiltration or storage of stormwater. Solutions can include rain barrels and gardens.

Critical Asset Summary

Critical Assets	Quantity	Replacement Cost	Condition	Stewardship Measures
Stormwater Management ponds	119	$179 million	Good	% of Ponds inspected in 2021 **100%**
Pump Station	2	$9.52 million	Very Good	Inspection Frequency **Monthly**
Gravity Main	1,263 km	$1.8 billion	Good	km's of Main Inspected in 2021 **78 km**

Data Confidence

VERY HIGH | MEDIUM | VERY LOW

FINANCIAL FACTS

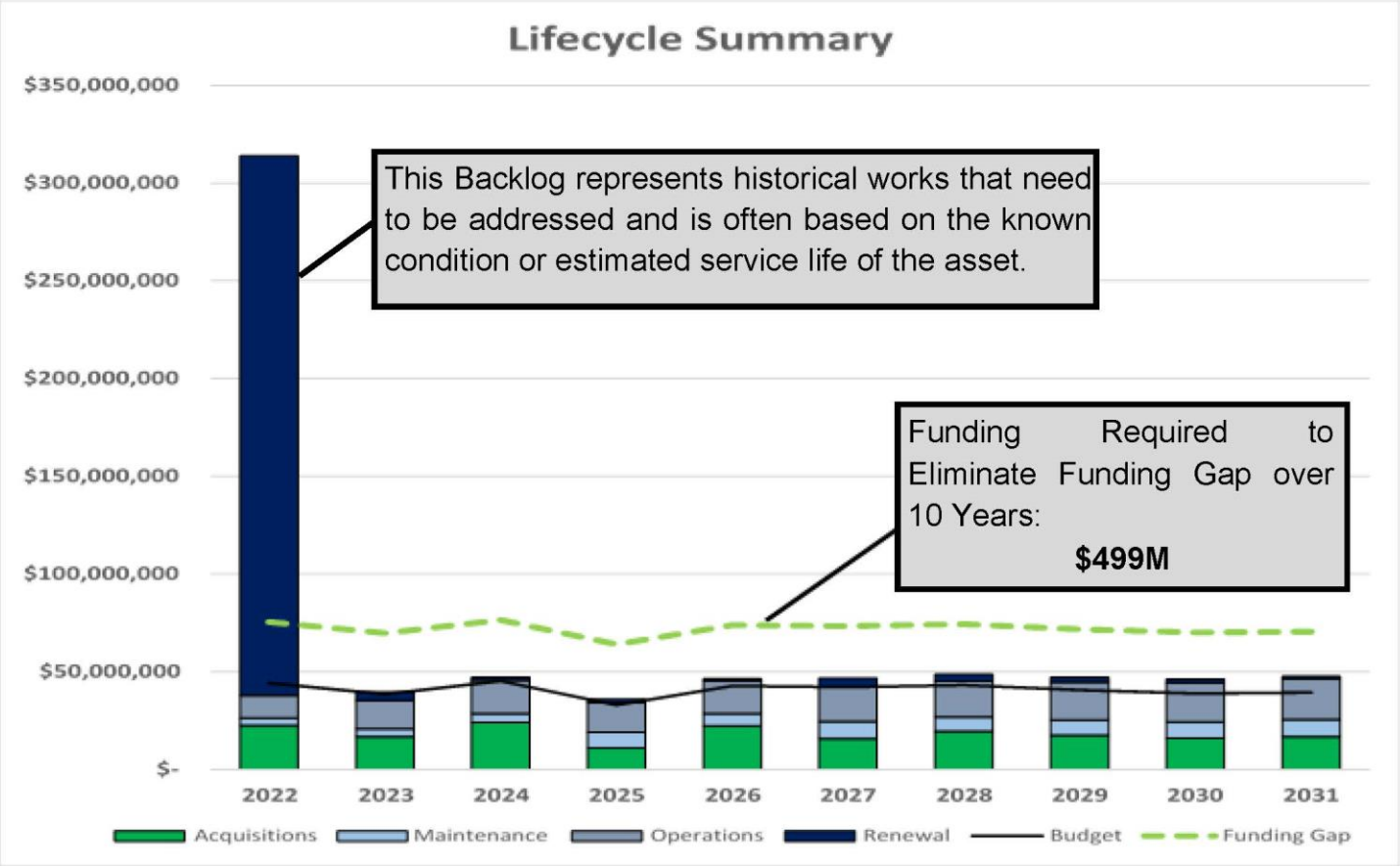
- Hamilton will receive **$451 million** dollars worth of assets over the next 10 years.
- Hamilton will invest on average **$239 million** to operate, maintain Stormwater assets over the next ten year.

DID YOU KNOW?

- Stormwater Management Ponds reduce the risk of flooding throughout the community by storing water.
- The City is completing stormwater modelling to mitigate flooding risks.

FINANCIAL INDICATORS

Type of Indicator	Measurement	Explanation
Asset Renewal Ratio	**9.49%**	This ratio demonstrates the rate the city renews its Stormwater Assets
10 Year O&M Forecast	**43%**	The % of funding allocated compared to what needs to be spent
Annual Infrastructure Gap	**$31 million**	The difference between what is being spent and what should be spent



4.0 STORMWATER ASSETS

The stormwater network collects stormwater from rooftops, roads, ditches, and other surfaces across the City and conveys it to the natural watercourse. The service objective is to provide reliable stormwater services by preventing flooding. A reliable stormwater network service provides both direct and indirect benefits ensuring good public health to the broader community. For this iteration of the AM Plan, stormwater assets include linear and vertical assets.

Stormwater assets relate to the collection, transmission, treatment, retention, infiltration, control or disposal of stormwater. For this iteration of the AM Plan the stormwater asset class hierarchy is grouped into linear and vertical assets. Vertical assets are assets that can only occupy one site and are typically within a building or a facility which may be comprised of other multiple components. Linear assets are assets which traverse horizontally and are often defined by length but also encompass components that are considered part of the linear network. It is important to note that watercourses and shorelines can also be considered Stormwater assets, but these will be included in the Natural Assets AM Plan which will be included in the 2024 iteration of the AM Plan.

The asset class asset hierarchy outlining assets included in this section is shown below in Table 59.

Table 59: Asset Class Hierarchy

VERTICAL ASSETS	LINEAR ASSETS
Pump Station	Trunk Main
Flood Control Structure	Local Main
Flood Control Gate	Minor Culverts
Stormwater Management (SW) Ponds	Catchbasins (CB)
	Catchbasin Maintenance Holes (CBMH)
	Maintenance Holes (MH)
	Oil and Grit Separators
	Inlets
	Outfalls
	Ditches
	Swales (No Data)
	Low Impact Development (LID) (No Data)

4.0 STORMWATER

4.1 BACKGROUND

This AM Plan is intended to communicate the requirements for the sustainable delivery of services through the management of assets, compliance with regulatory requirements and required funding to provide the appropriate levels of service over the 2022 – 2031 planning period. The infrastructure assets covered by this plan include the major components required to deliver effective stormwater services to the City's customers.

The information in the stormwater section of the plan is intended to give a snapshot in time of the current state of the stormwater service area by providing the necessary background, detailed summary, and analysis of existing information.

As mentioned in the wastewater section, there are combined sewer mains in the lower and upper City which carry a combination of wastewater and stormwater. The combined sewer infrastructure was considered part of the wastewater section, and so this section includes assets that exclusively manage stormwater (i.e. separated stormwater system). A map of the separated stormwater network and infrastructure is shown below in Map 4.

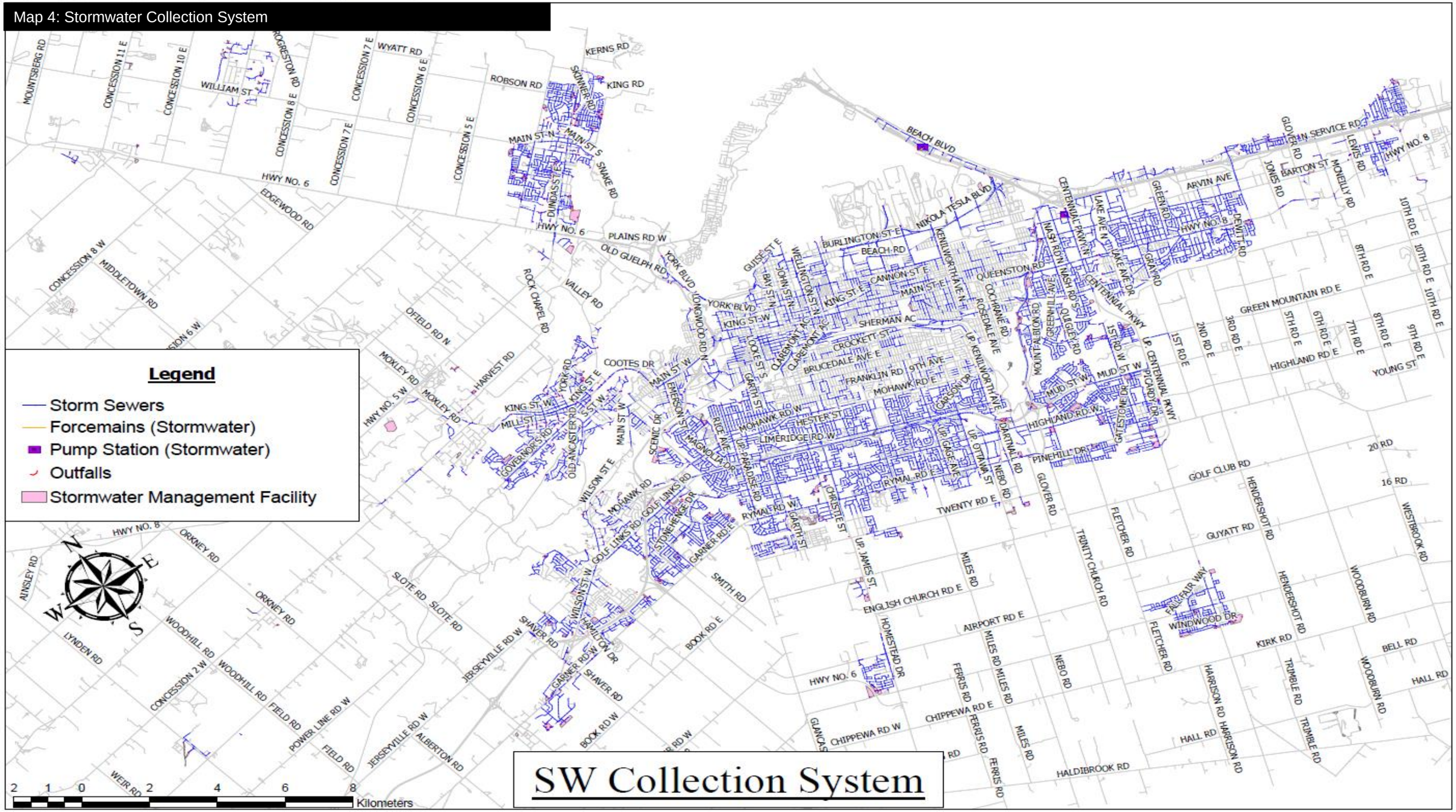
The City acquired significant amounts of stormwater network assets through amalgamation in 2001. These assets were included into the City's stormwater inventory and were in varied condition and held various collection capacity when acquired. Once amalgamated, any aging assets or deficient assets became the City's responsibility and created several new challenges that will need to be taken into consideration when planning.

The separated stormwater system is common in newer areas of the City such as Stoney Creek east of the Red Hill Valley Parkway, upper Hamilton south of Mohawk Road, and areas in Dundas and Ancaster. However, it is evident in the figure below that there are older areas of the City where combined sewers have been converted to a partially separated storm sewer (in these areas combined sewers have been separated, but often the separated storm sewer discharges into a combined sewer because there is no available outlet to a natural watercourse). In most rural communities, including Glanbrook and Flamborough, stormwater is typically carried to the natural watercourse via ditches and municipal drains, which are not shown on the map below.

Typically, stormwater (excluding stormwater from combined sewers) is released into the natural watercourse without any treatment because stormwater is composed of surface runoff from rain events, and as such does not require specific treatment in the same way as for drinking water and wastewater. However, to reduce any oil and grit from the road network and facilities infiltrating into the natural watercourse, there are assets such as oil and grit separators and stormwater ponds which are designed to settle out grit and collect oil before it is released into surrounding watercourses.

4.0 STORMWATER

Map 4: Stormwater Collection System



4.1.1 Detailed Summary of Assets

Table 60 below displays the detailed summary of assets for the stormwater service area. In addition, it is possible that there are assets that may not be owned by Public Works which may be considered stormwater assets which may be missing from this inventory. In addition, LiDAR technology could be used to obtain more accurate information on ditches and swales and assist with modelling. This has been identified as a Continuous Improvement Item in Table 82.

The City of Hamilton owns approximately **$3.1B** in stormwater assets which are on average in **Good** condition. For most assets, Good condition means that the City should be completing preventative maintenance activities per the inspection reports as well as operating activities (e.g. inspection, cleaning) to ensure the assets reach their intended useful lives.

Assets are an average of **22 years** in age which means there is an average of **73%** of remaining service life (RSL). Since the separated stormwater asset class is relatively new in comparison to other core asset classes, many assets have not had the same level of inventory control and condition assessment programming. This will be investigated in future iterations of the AM Plan.

The data below is a combination of data from various sources as there is not yet an asset registry containing all inventory information in one data source. Examples of data sources which were used for this iteration of the Core AM Plans are stated in the AMP Overview.

The lack of an asset registry is a continuous improvement item in Table 82. The City must plan to complete a detailed review of this data and create data standards in order to improve overall data quality. Currently, there is no data for swales or low impact developments (LIDs) and so these have not been included as part of this plan. Ditches have been included at a limited capacity since a map was created based on aerial imagery without any attributes.

4.0 STORMWATER

Table 60: Detailed Summary of Assets
***Weighted Average**

ASSET CATEGORY	NUMBER OF ASSETS	REPLACEMENT VALUE	AVERAGE AGE (% RSL)	AVERAGE EQUIVALENT CONDITION
VERTICAL ASSETS				
Pump Stations	2	$9.52M	8 years (87%)	1-Very Good
Data Confidence	Very High	Medium	Very High	Low
Flood Control Structure	1	$5.0M	No Data	No Data
Data Confidence	Very High	Low	Very Low	Very Low
Flood Control Gate	1	$2.5M	No Data	No Data
Data Confidence	Very High	Low	Very Low	Very Low
SWM Pond (excl wetlands)	119	$178.5M	24 years (76%)	2-Good
Data Confidence	Medium	Low	Medium	Low
	SUBTOTAL	**$195.52M**	**16 years (80%)**	**2-Good***
	Data Confidence	**Low**	**Medium**	**Low**
LINEAR ASSETS				
Trunk Stormwater Main (>600mm diameter)	607.79 km	$1.084B	39 years (60%)	2-Good
Data Confidence	High	Medium	Medium	Medium
Local Stormwater Main (<600mm diameter)	655.70 km	$702.07M	39 years (58%)	2-Good
Data Confidence	High	Medium	Medium	Medium
Catchbasin	49,882	$460.18M	No Data	2-Good
Data Confidence	Medium	Low	Very Low	Low
Maintenance Hole	20,307	$203.07M	40 years (60%)	2-Good
Data Confidence	Medium	Low	Medium	Low
Catchbasin Maintenance Hole	1,101	$11.01M	51 years (49%)	3-Fair
Data Confidence	Medium	Low	Medium	Low
Oil and Grit Separator (OGS)	84	$3.36M	15 years (41%)	3-Fair
Data Confidence	High	Low	High	Low
Storm Sewer Lateral	No data	No data	No data	No data
Data Confidence	Very Low	Very Low	Very Low	Very Low
Minor Culvert	3,448	$172.40M	4 years (92%)	3-Fair
Data Confidence	Medium	Low	Low	High
Inlet	515	$25.75M	26 years (67%)	2-Good
Data Confidence	Medium	Low	Medium	Low
Outfall	917	$45.85M	34 years (57%)	3-Fair
Data Confidence	Medium	Low	Medium	Low
Ditches	1,603.04 km	$240.46M	No Data	No Data
Data Confidence	Low	Low	Very Low	Very Low
Low Impact Development (LID)	No Data	No Data	No Data	No Data
Data Confidence	Very Low	Very Low	Very Low	Very Low
Swales	No Data	No Data	No Data	No Data
Data Confidence	Very Low	Very Low	Very Low	Very Low
	SUBTOTAL	**$2.949B**	**28 years (81%)**	**2-Good***
	Data Confidence	**Medium**	**Medium**	**Low**
	TOTAL	**$3.144B**	**22 years (73%)**	**2-Good***
	Data Confidence	**Medium**	**Medium**	**Low**

The data confidence for number of vertical assets is typically very high due to the asset's locations being above ground and able to be visually confirmed easily. The confidence for stormwater ponds is Medium as there are likely stormwater ponds in new developments that have not yet been incorporated into the existing inventory. There has been a continuous improvement item identified to confirm data across all data sets and unify the data into a single source to reference from in the future. In addition, another identified Continuous Improvement item in Table 82 is to improve the reporting for vertical assets for future iterations of the AM Plan to provide more details on the specific processes they undertake.

Due to the lack of current data, the complexity of vertical assets and the low frequency of asset replacements, it is difficult to achieve a high data confidence for replacement cost for this iteration of the plan. However, improving asset replacement costs by updating current market prices regularly instead of historical costs/estimates or internal models has been identified as a Continuous Improvement Item in Table 82. Age and condition information and data confidence is presented in Table 60.
For linear assets, the data confidence for number of assets is typically Low to Medium. Since many of these assets are newer and are not as stringently regulated as other core assets, there are not formal inventories for all stormwater linear assets. A future improvement in data would be to complete inventories of assets where no or limited data is available (e.g. sewer laterals, ditches, swales, and low impact developments (LIDs)).

These improvements have been noted in Table 82 in the Continuous Improvement section of the report. Please refer to the AMP Overview for a detailed description of data confidence.

4.1.2 Asset Condition Grading

Condition refers to the physical state of the wastewater assets and are a measure of the physical integrity of these assets or components, and is the preferred measurement for planning lifecycle activities to ensure assets reach their expected useful life. Since condition scores are reported using different scales and ranges depending on the asset, Table 61 below shows how each rating was converted to a standardized 5-point condition category so that the condition could be reported consistently across the AM Plan. A continuous improvement item identified in Table 82, is to review existing internal condition assessments and ensure they are revised to report on the same 5-point scale with equivalent descriptions.

4.0 STORMWATER

Table 61: Condition Grading System

EQUIVALENT CONDITION GRADING	CONDITION DESCRIPTION	% REMAINING SERVICE LIFE	STORM MAIN	MINOR CULVERTS CONDITION	CATCHBASIN
1-Very Good	The asset is new, recently rehabilitated, or very well maintained. Preventative maintenance required only.	>79.5%	PACP Score = 1; If PACP unknown, WRC Structural Score =1; If both unknown: RSL	Maximum Condition Score = 0 during inspection	N/A
2-Good	The asset is adequate and has slight defects and shows signs of some deterioration that has no significant impact on asset's usage. Minor/preventative maintenance may be required.	59.5% – 79.4%	PACP Score = 2; If PACP unknown, WRC Structural Score =2 or Lined Pipe; If all unknown: RSL	Maximum Condition Score =1 during inspection	Good
3-Fair	The asset is sound but has minor defects. Deterioration has some impact on asset's usage. Minor to significant maintenance is required.	39.5% - 59.4%	PACP Score = 3; If PACP unknown, WRC Structural Score =3; If all unknown: RSL	Maximum Condition Score = 2 during inspection	Fair
4-Poor	Asset has significant defects and deterioration. Deterioration has an impact on asset's usage. Rehabilitation or major maintenance required in the next year.	19.5% -39.4%	PACP Score = 4; If PACP unknown, WRC Structural Score =4; If all unknown: RSL	Maximum Condition Score = 3 or culvert was identified as maybe needing a replacement during inspection.	Poor
5-Very Poor	Asset has serious defects and deterioration. Asset is not fit for use. Urgent rehabilitation or closure required.	<19.4%	PACP Score = 5; If PACP unknown, WRC Structural Score =5; If all unknown: RSL	Maximum Condition = 4 or culvert was identified as needing replacement in inspection.	N/A

The following conversion assumptions were made:

- Pipes were based on a combination of PACP and WRC scores where known, where the PACP score was prioritized over the WRC Score.
- If pipe was indicated to have been lined CIPPS, then the condition was assumed to be 2-Good.
- If PACP was unknown, and WRC score was 6, indicating an incomplete inspection, the condition was based on % of remaining service life.
- Minor culverts' condition was based on the worst score for a culvert component.
- Catchbasins' condition was on the existing condition scoring in the database.
- For assets where a condition assessment was not completed, but age information was known, the condition was based on the % of remaining service life.

4.1.3 Vertical

The background information for stormwater vertical assets is below and includes an age profile, the condition methodology used, the condition profile, and asset usage and performance.

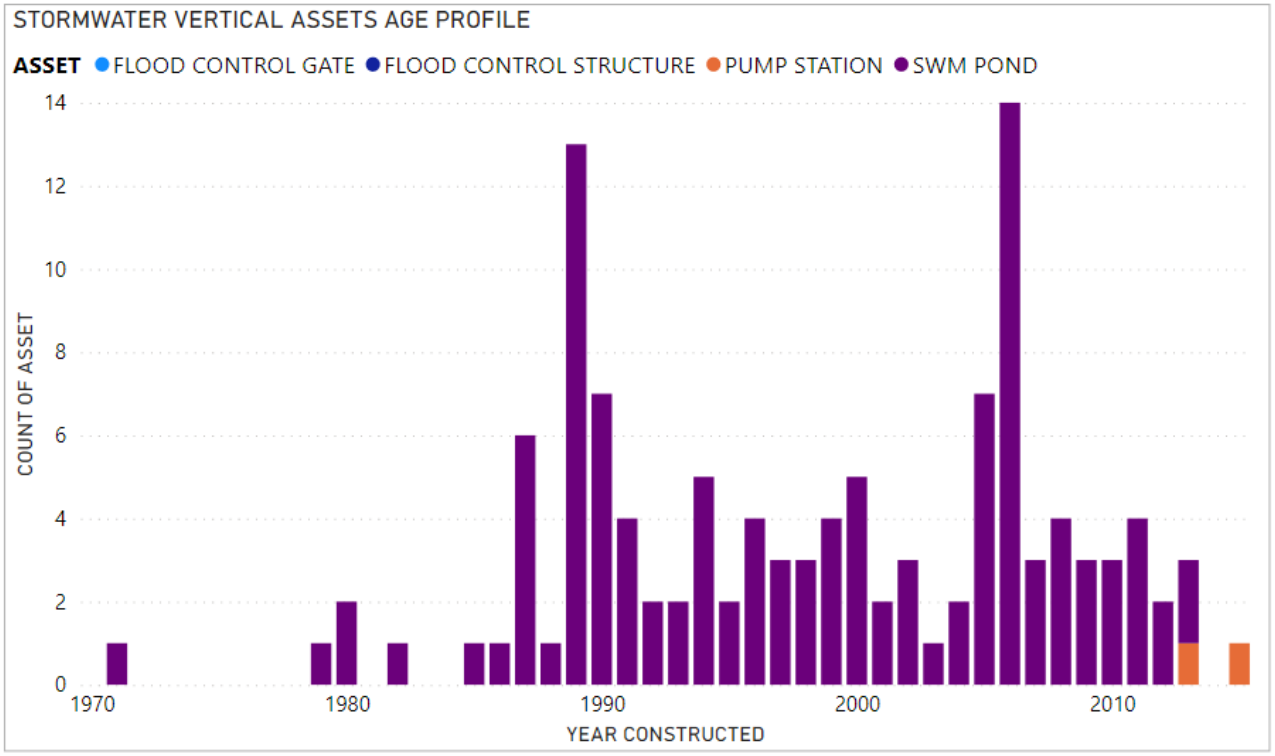
4.1.3.1 Age Profile

The age of an asset is an important consideration in the asset management planning process especially for assets that will not receive a typical condition grading through inspections. Some lower cost or lower criticality assets can be planned for renewal based on age as a proxy for condition or until other condition methodologies are established. It should be noted that if a stormwater assets' condition is based on age, it is typically considered to be of a lower confidence level.

The age profile of stormwater vertical assets are shown in Figure 20. An analysis of the age profile is provided below.

4.0 STORMWATER

Figure 20: Stormwater Vertical Assets Age Profile



STORMWATER PONDS

It is evident that there are spikes in the installation of stormwater (SW) ponds in 1989 and 2006, meaning that there may be a spike in major maintenance requirements in 2031 since full dredging activities are completed on a 25-year cycle per Table 67. In addition, the SW ponds included in the AM Plan are assumed ponds only. There are additional unassumed SW ponds that exist in the City which are not yet the City's responsibility. These will be assumed in future and therefore, may have additional maintenance requirements for which the City is not yet aware. As a result, the age information is considered Medium confidence, even though the dataset is mostly complete.

On average stormwater ponds are 24 years old and have an estimated service life of 100 years and 76% of service life remaining. At this time, there are no SW ponds which have exceeded their service life.

PUMP STATIONS

At this time there are two (2) pump stations which are new assets, with 87% of service life remaining.

FLOOD CONTROL ASSETS

At this time, there is no age data available for the age of flood control assets.

4.1.3.2 Condition Methodology

The inspection frequency, and condition score output for vertical assets is found below in Table 62. An analysis for each asset is found below.

Table 62: Inspection and Condition Information

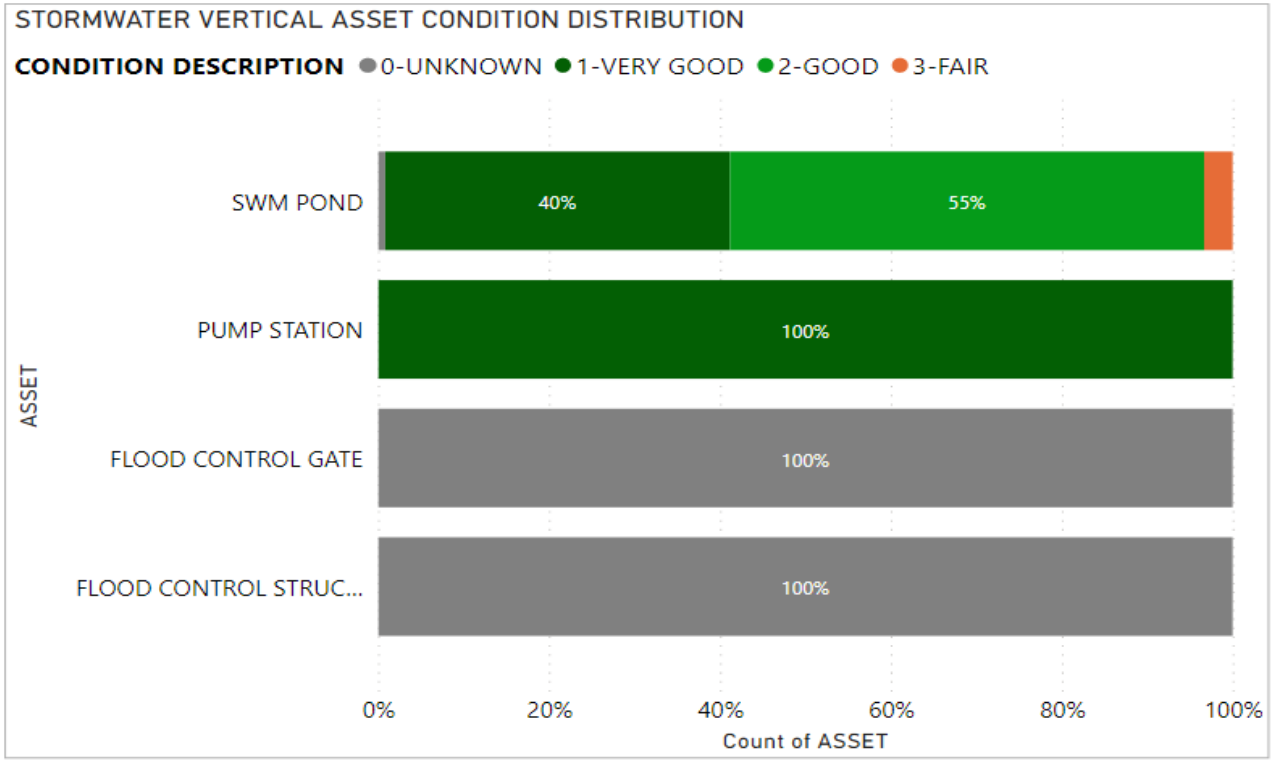
Asset	Inspection Frequency	Condition Score Output
Pump Station	N/A	None – used age
Stormwater Pond	Annually, Ad Hoc	None – used age
Flood Control Structure / Gate	N/A	N/A

Condition assessments for vertical assets are not completed on a regular cycle at this time. A continuous improvement item would be to complete asset condition assessments for pump stations using a similar methodology and frequency as booster and lift stations for water and wastewater assets. Since these assets are new, there has not yet been a need to complete an assessment, but condition assessments should begin on any new facility within a determined timeline after being constructed, possibly 10-15 years into its lifecycle. In addition, stormwater ponds are inspected on an annual basis, but do not output an overall condition score which should be investigated in future. Finally, at this time, flood control assets have not had condition assessments completed and this should be investigated. These items have been identified in Table 82 of the Continuous Improvement section.

4.1.3.3 Asset Condition Profile

The condition profile of the City's assets is shown in Figure 21. As mentioned in Section 4.1.2, the original condition grades were converted to a standardized condition category for report consistency.

Figure 21: Stormwater Vertical Asset Condition Distribution



Based on age data, vertical stormwater assets are typically in Good condition. This is because they are typically early in their useful life. At this time, there is no age or condition data available for flood control assets and therefore they are shown to be of unknown condition.

As previously stated, continuous improvement items have been identified to complete condition assessments for pump stations and flood control assets and to encompass condition scores into existing inspections for stormwater ponds to estimate condition.

4.1.3.4 Asset Usage and Performance

Assets are generally provided to meet design standards where available. However, there are often insufficient resources to address all known deficiencies.

The largest performance issues with vertical stormwater assets involve assets not functioning optimally. The service deficiencies in Table 63 below were identified using staff input.

Table 63: Known Service Performance Deficiencies			
ASSET	**LOCATION**	**SERVICE DEFICIENCY**	**DESCRIPTION OF DEFICIENCY**
Stormwater Pond	Various Locations	Reduced capacity	Backlog of ponds needing cleanout
Flood Gate	Davis Creek	Not functional	Electrical wiring stolen from station and requiring replacement.
Pump Stations	Grafton, Centennial	No emergency power	In the case of power outage, station will not function.

4.1.4 Linear

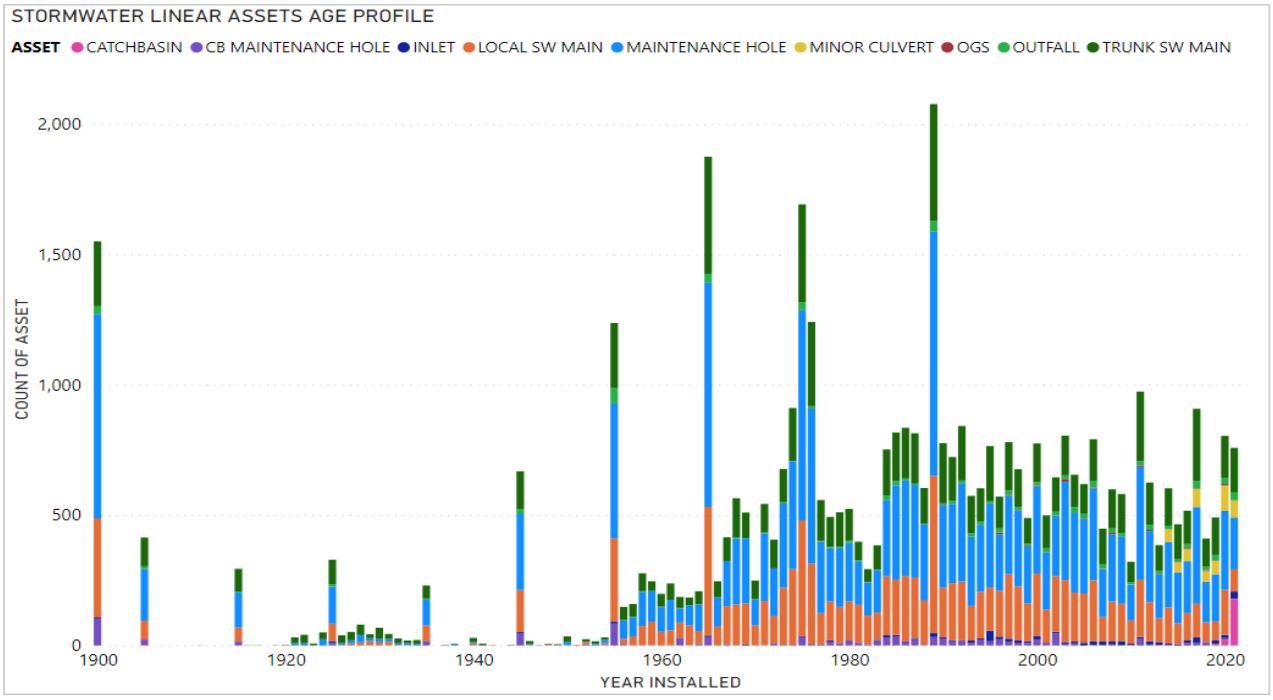
The background information for stormwater linear assets is included below and includes an age profile, the condition methodology used, the condition profile, and asset usage and performance.

4.1.4.1 Age Profile

The age of an asset is an important consideration in the asset management process as it can be used for planning purposes as typically assets have an ESL where they can be planned for replacement.

The age profile of the stormwater linear assets are shown in Figure 22. An analysis of the age profile is provided below for each asset.

Figure 22: Stormwater Linear Assets Age Profile



4.0 STORMWATER

STORMWATER GRAVITY MAIN (INCLUDING TRUNK AND LOCAL)

Separated stormwater gravity mains began to be installed just before 1960, as best practices changed, and the City began to prioritize separating wastewater and stormwater sewers around this timeframe. The mains installed before this date, have likely been assumed by decade which is why spikes are shown in 1900, 1905, 1915, 1925, 1935, 1945, 1955 and 1965.

The average age for separated trunk and local wastewater main is 39 years with an average ESL of 97 and 93 years resulting in 60% and 58% of the useful life remaining respectively. The condition of storm sewers is typically based on a condition assessment program but if assessments have not been completed, condition was based on age. The age data confidence for stormwater main is considered to be Medium as this information is typically populated, although the source of this data may be estimated.

MAINTENANCE HOLES

Maintenance holes have typically been acquired at a steady distribution over the last 100 years with a peak in 1900. This peak is typically due to estimated values for construction.

The average age of maintenance holes is 40 years, and with an ESL of 100 years, this indicates there is typically 60% of useful life remaining. The age data confidence for maintenance holes is considered to be Medium as this information is typically populated, although the source of this data may be estimated.

CATCHBASIN

Catchbasins are at a very low confidence level since age data was mostly not populated. The current dataset for catchbasins has shown these to be a new asset (installed from 2019 – 2022) which is known to not be accurate. The City will continue to collect or estimate age data on catchbasins.

CATCHBASIN MAINTENANCE HOLE

Catchbasin maintenance holes have typically been acquired at a steady distribution over the last 100 plus years with a peak in 1900. This peak is likely due to estimated values for construction.

The average age of catchbasin maintenance holes is 51 years, and with an ESL of 100 years, this indicates there is typically 49% of useful life remaining. The age data confidence for catch basin maintenance holes is considered to be Medium as this information is typically populated, although some of the source data may be estimated.

INLET

Inlets have typically been acquired at a steady distribution over the last 100 years with a peak in 1995.

The average age of inlets is 26 years, and with an ESL of 80 years, this indicates there is typically 67% of useful life remaining. The age data confidence for inlets is considered to be Medium as this information is typically populated, although the source of this data may be estimated.

OUTFALL

Outfalls have typically been acquired at a steady distribution over the last 100 years with a peak in 1955.

The average age of outfalls is 34 years, and with an ESL of 80 years, this indicates there is typically 57% of useful life remaining. The age data confidence for outfalls is considered to be Medium as this information is typically populated, although the source of this data may be estimated.

MINOR CULVERT

Minor culverts are at a low confidence level since age data was mostly not populated. The current dataset for minor culverts has shown these to be a new asset (installed from 2007 – 2022) which is known to not be accurate.

Since the AM Plan can only present the data that is available, minor culverts are shown to be an average of 4 years old with 92% of service life remaining, which is not accurate.

OIL & GRIT SEPARATOR (OGS)

Oil & grit separators (OGS) are shown to be a relatively new asset, with the first asset being installed in 1975, but the majority being installed after 1990 with a peak in 2003. With an ESL of 25 years, it is possible there may be a spike in renewals for these assets in 2028.

The average age of OGS is 15 years, and with an ESL of 25 years, there is typically 41% of service life remaining. The age data confidence for OGS is considered to be High as this information is typically populated, and the accuracy is thought to be high..

DITCHES

As previously mentioned, there is no age data available for ditches, and so they have not been analyzed based on age.

4.1.4.2 Condition Methodology

The inspection frequency and condition score output for each linear asset is found below in Table 64. An analysis for each asset is found below.

Table 64: Inspection and Condition Information

ASSET	INSPECTION FREQUENCY	CONDITION SCORE OUTPUT
Sewer Main	Based on priority	Combination of inspection & age data
Minor Culverts	5-year cycle	Outputs scores from 0 (Very Good) – 4 (Very Poor) for each component and side of the culvert.
OGS	Monthly	None, used age
Inlet/Outfall	Annually & Ad Hoc	None, used age
Catchbasin	3-year cycle	Structural Cleaning score outputs Good, Fair, Poor.
Maintenance Hole, Catchbasin Maintenance Hole	Ad Hoc	None, used age

SEWER MAIN

Since gravity sewer mains are not under pressure and there are maintenance hole access points along the pipe segments, it is easier and more cost effective to inspect these assets than it is to inspect pressurized pipes such as forcemains and watermains. The City completes CCTV (Closed Circuit Television) inspections on these assets which involves sending a robot with a camera to inspect the inside of the pipe to determine any defects or rehabilitation needs. The results of the CCTV inspections assign a structural score to the pipe segment which the City uses to prioritize sewer lining and/or replacement. The City assesses pipes based on the defined criticality of the pipe but does not yet have a cycle to assess all pipes at a specified frequency, and not all pipes have been assessed. This has been identified as a continuous improvement item in Table 82.

MINOR CULVERTS

Minor culverts are assessed on a five (5) year cycle, where multiple components of the culverts are assessed separately and the condition of the culvert is differentiated by the side of the culvert. A continuous improvement item identified in Table 82 is to improve the inspection program to output an overall condition score.

CATCHBASINS

Catchbasins are inspected in on a three (3) year cycle. These inspections output a structural cleaning score of Good, Fair or Poor which was used to approximate condition for this report. A continuous improvement item identified in Table 82 is to improve the inspection program to be on a 5-point condition scale to be consistent with the majority of the City's condition assessment programs.

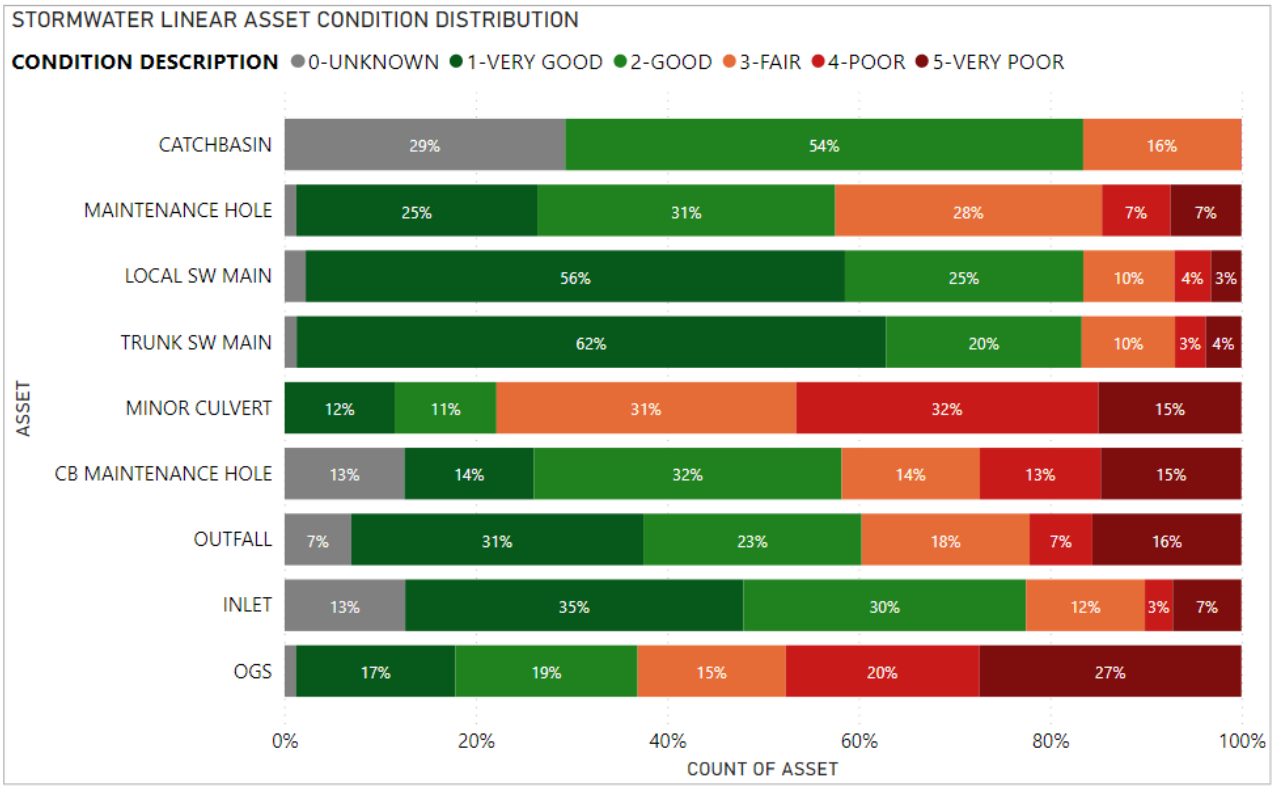
OTHER ASSETS

Other linear assets' conditions were based on age. Some of these assets are inspected regularly as shown, but these inspections do not output a condition score. A continuous improvement item identified in Table 82 is to improve the inspection program to output an overall condition score.

4.1.4.3 Asset Condition Profile

The condition profile of the City's assets is shown in Figure 23. As mentioned in Section 4.1.2, the original condition grades were converted to a standardized condition category for report consistency.

Figure 23: Stormwater Linear Asset Condition Distribution



GRAVITY MAIN (INCLUDING TRUNK AND LOCAL)

Based on a combination of condition and age data, these assets are shown to be on average, in Good condition. As stated above, there is a condition assessment program for gravity mains. However, at this time not all assets have been encompassed into the assessment program. Therefore, the data confidence is shown to be Medium as it is a combination of very high data confidence and low confidence methodologies.

MINOR CULVERT

Based on an assumed methodology to calculate overall condition from the assessment data, minor culverts are in overall Fair condition. The data confidence is considered to be High because the majority of culverts had condition data available.

CATCHBASIN

Based on available condition data populated in the data set, catchbasins are shown to generally be in Good condition, although not all assets have been included. The data confidence is considered to be Medium because 70% of catchbasins had condition data available. Where condition data was unavailable, age was used. However, as previously mentioned, the age data is of Very Low confidence. Therefore 29% of catchbasins are shown as unknown for condition.

OTHER LINEAR ASSETS

The remaining linear assets' conditions are estimated based on age where known and are shown to generally be in Good condition. As previously stated, age is not the best indicator of condition but is used when condition information is unavailable or difficult to obtain. A detailed analysis for the age profile of these assets can be found in Section 4.1.9. Many of these assets are inspected on a regular basis as shown in Table 64, but these inspections do not output condition scores which has been identified as a continuous improvement item in Table 82.

4.1.4.4 Asset Usage and Performance

Assets are generally provided to meet design standards where available. However, there are often insufficient resources to address all known deficiencies.

The largest performance issues with linear stormwater assets involve assets not functioning optimally. The below service deficiencies in Table 65 were identified using staff input.

Table 65: Known Service Performance Deficiencies			
ASSET	**LOCATION**	**SERVICE DEFICIENCY**	**DESCRIPTION OF DEFICIENCY**
Collection System	All outlets, Beach Blvd	Periodic lake levels higher than outfall location	Catchbasin surcharges during high lake levels and causes road flooding.
Minor Culvert	Alma Street	Culvert damaged, plate on road, routine maintenance required	Culvert replaced in 2022, routine disruptions in the area.
Outfall	Various Locations	Poor condition	Corrugated pipe outfall, outside of right of way, and difficult to access
Gravity main	Various Locations	Very Poor condition	Pipes are shown to be in very poor condition and may require replacement.

4.1.5 Administrative

Administrative assets are assets which contribute to the stormwater service but are not stormwater assets. These include vehicles, software and administrative facilities. These assets are shared with water and wastewater and have been included under administrative assets for these asset classes for this iteration of the AM Plan.

4.2 LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how the City of Hamilton plans to manage and operate the assets at the agreed levels of service while managing life cycle costs.

4.2.1 Acquisition Plan

Acquisition reflects new assets that did not previously exist or works which will upgrade or improve an existing asset beyond its existing capacity. They may result from growth, demand, legal obligations or social or environmental needs. Stormwater assets are generally donated to the City of Hamilton through the development agreements process directly related to growth.

CURRENT PROJECT DRIVERS – 10 YEAR PLANNING HORIZON

Hamilton Water currently prioritizes capital projects as per the drivers listed below. These drivers help to determine a ranking priority for projects and ensures that multiple factors are being considered to drive investment decisions. These drivers should be reviewed during each iteration of the AM Plan to ensure they are appropriate and effective in informing decision making.

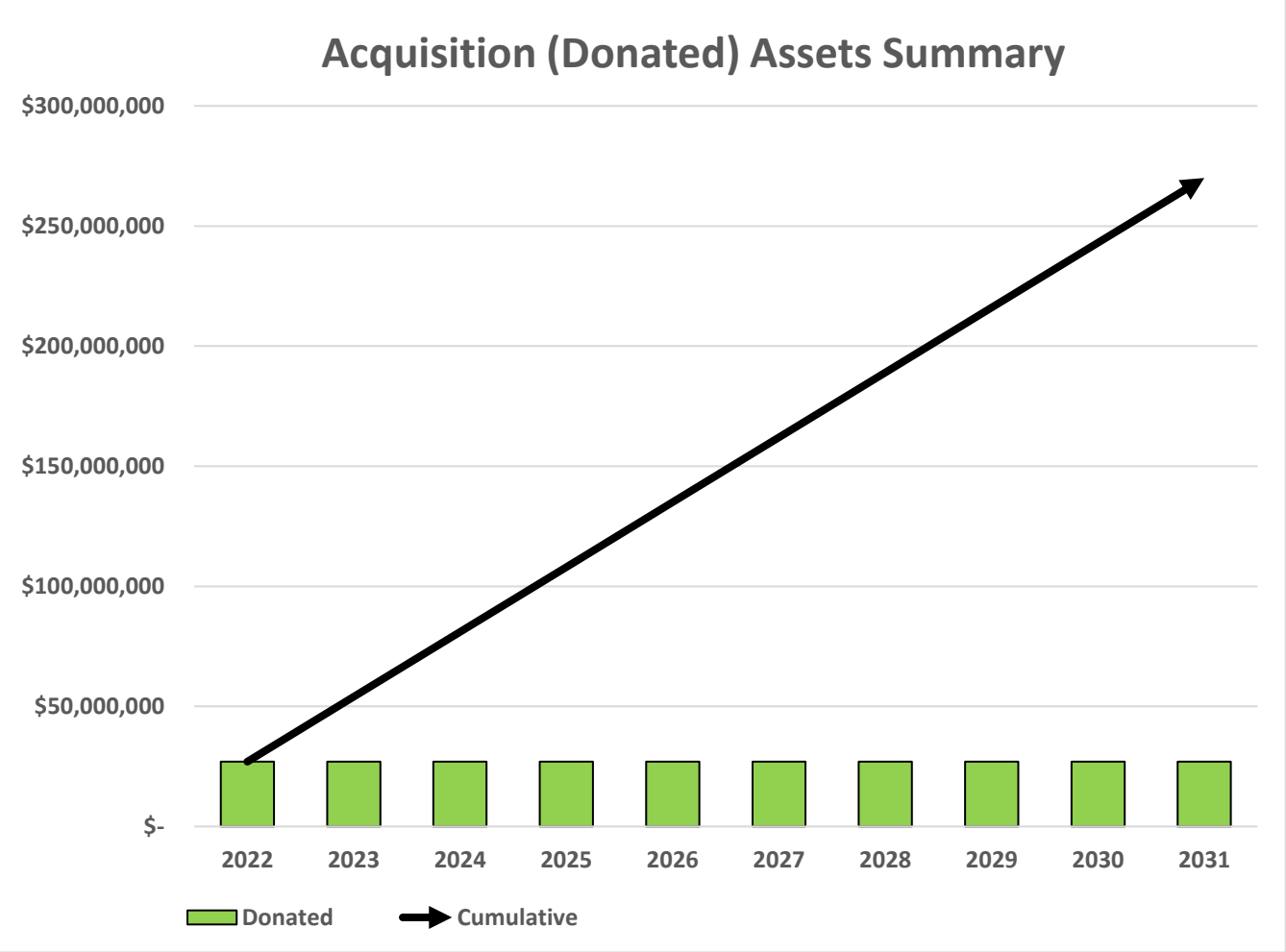
Table 66: Acquired Assets Priority Ranking Criteria

Criteria	Weighting
Legal Compliance	20%
Coordination, Funding, Budgeting	25%
Risk Mitigation	25%
Health and Safety	10%
Operating and Maintenance Impacts	10%
Development Growth	10%
Total	**100%**

SUMMARY OF FUTURE ASSET ACQUISITION COSTS

Forecast acquisition asset costs are summarized in Figure 26 and show the cumulative effect of asset assumptions over the next 10-year planning period.

Figure 24: Acquisition (Donated) Assets Summary
All figures are in 2021 dollars.



Annually, on average, the City of Hamilton will assume over **$27,000,000** of donated assets through subdivision agreements or other development agreements. These assets include approximately **9** km's of storm sewer mains, **1,500** new stormwater laterals, **144** maintenance holes, **6** ponds/facilities and **117** catch basins every year. Hamilton is reviewing its donated asset assumption process to ensure that it proactively understands what assets are being donated annually to ensure they are planned for effectively. This will allow multiple departments across the City to plan for the assets properly such as:

- Forecast the long-term needs and obligations of the assets;
- Operations and maintenance can include the assets in their planned activities (inspections, legislative compliance activities); and,
- Finance can ensure that assets are properly captured and recognized appropriately (Audited Financial Statements, TCA process, Provincial reporting such as the FIR).

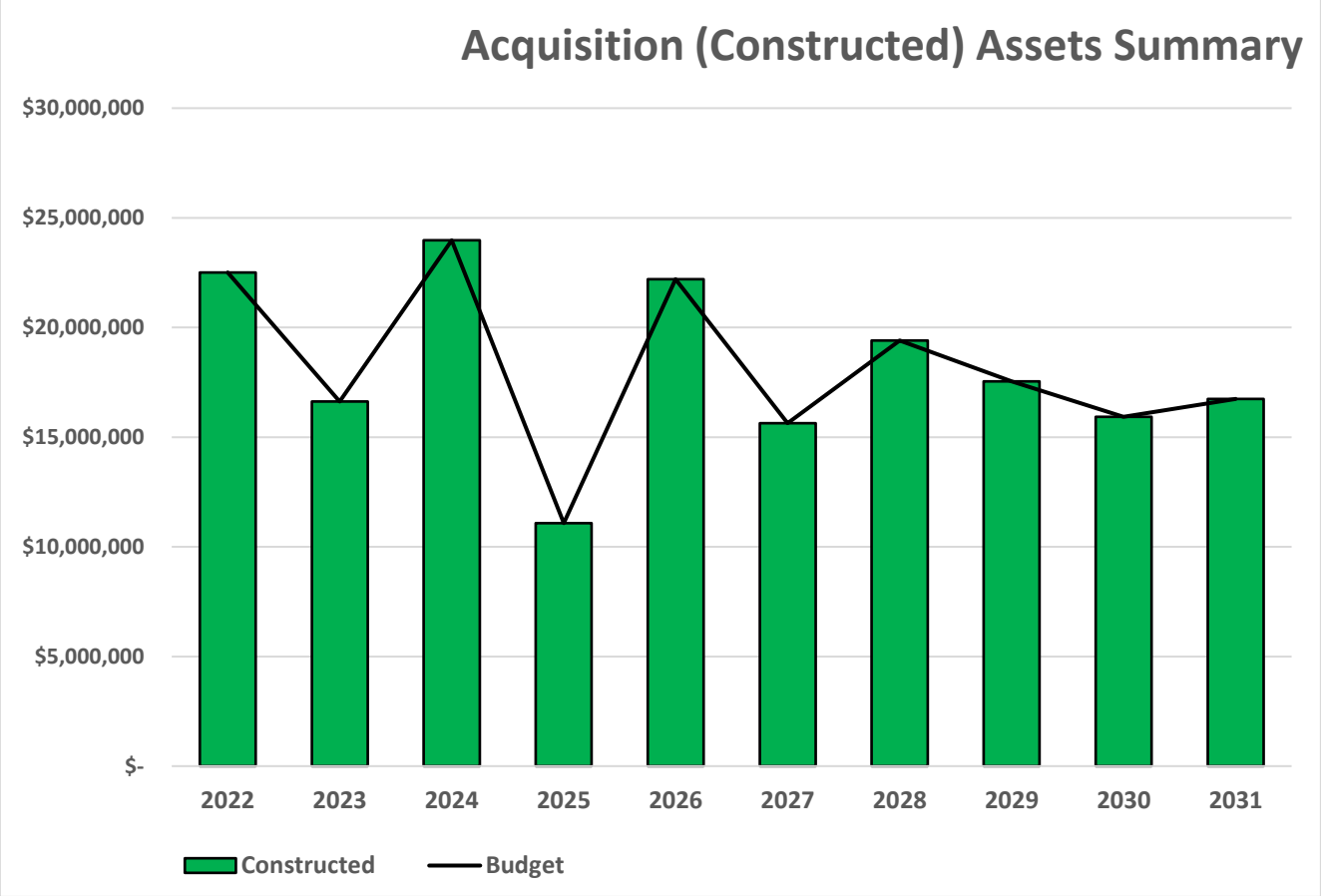
4.0 STORMWATER

The City will need to ensure the required data is updated frequently and to a single source to ensure that all the departments have access to the data they require in a timely manner. Once stormwater assets are assumed, Hamilton then becomes the stewards of these assets and is responsible for all ongoing costs for the asset's operation, continued maintenance, inevitable disposal and their likely renewal.

Construction costs are often only **10-15 %** of an asset's whole life costs. When development assets are donated to Hamilton, the City then becomes obligated to fund the remaining whole life costs. Over the next ten-year planning period Hamilton anticipates ***receiving*** **$270,000,000** of donated assets which, would then obligate Hamilton to fund the remaining costs over the donated assets ESL.

The City has internal design standards, inspection practices as well as assessment which are intended to ensure the assets that are being donated to the City through subdivision agreements are in excellent condition before assumption. The City should continue to review its assumption process to ensure that the City is receiving high quality and appropriately sized donated assets to defer lifecycle activities as much as possible.

Figure 25: Acquisition (Constructed) Assets Summary
All figures are in 2021 dollars.



4.0 STORMWATER

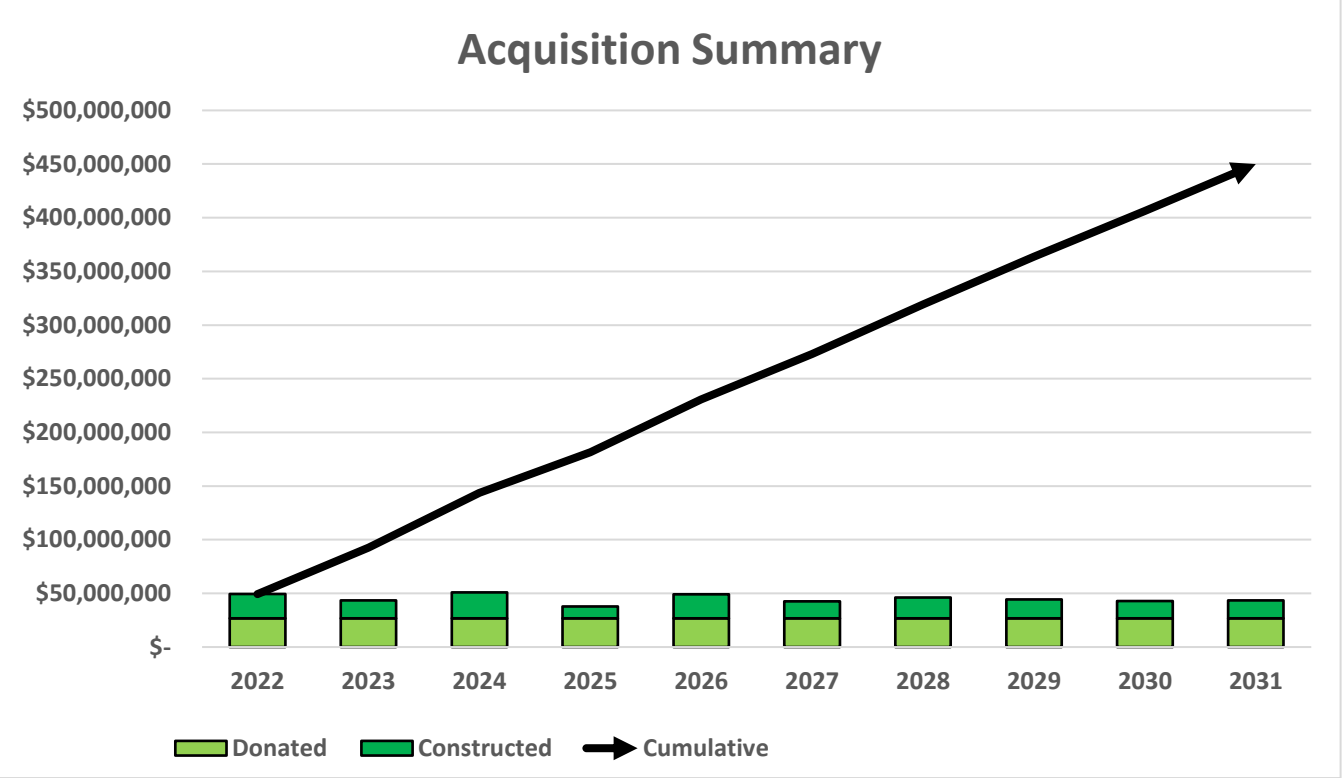
When Hamilton commits to new assets, the municipality must be prepared to fund future operations, maintenance and renewal costs. Hamilton must also account for future depreciation when reviewing long term sustainability. When reviewing the long-term impacts of asset acquisition, it is useful to consider the cumulative value of the acquired assets being taken on by the City. The cumulative value of all acquisition work, including assets that are constructed and contributed shown in Figure 26.

Over the next 10-year planning period Hamilton will acquire approximately **$181,645,000** of constructed assets which can either be new assets which did not exist before or expansion of assets when they are to be replaced. Major acquisition expenditures over the next ten years include;

- **$16 million** for new Beach Strip pumping stations
- **$12.6** million for the Parkside and Kipling stormwater facility
- **$67.5 million** to address flooding and drainage plans, and
- **$19.6** million dollars for connecting development areas

Hamilton has sufficient budget planned for its planned constructed acquisitions at this time however this does not address future asset needs that may need to be constructed to ensure service levels are maintained over the long term. With competing needs for resources across the entire city there will be a need to investigate tradeoffs and design options to further optimize asset decisions and ensure intergenerational equity can be achieved.

Figure 25: Acquisition (Constructed) Assets Summary
All figures are in 2021 dollars.



It is anticipated that Hamilton will acquire **$451,645,000** of new stormwater assets over the next ten years. This is a significant amount of assets that will require funding and resources far into the future and should be planned for over the long term.

It will become critical to understand that either the construction or assumption of new assets will commit the City to the funding of ongoing operations, maintenance and renewal costs which are significant. Hamilton will need to address how it is best to fund these ongoing costs as well as the costs to construct the assets while seeking the highest level of service possible.

Future AM Plans will focus on improving the understanding of Whole Life Costs and funding options. However, at this time the plan is limited on those aspects. Expenditure on new assets and services will be accommodated in the long-term financial plan but only to the extent that there is available funding.

4.2.2 Operations and Maintenance Plan

Operations include all regular activities to provide services. Daily, weekly, seasonal and annual activities are undertaken by staff to ensure the assets perform within acceptable parameters and to monitor the condition of the assets for safety and regulatory reasons. Examples of typical operational activities include catch basin cleaning, water sample collection, quality testing, inspections, utility costs and the necessary staffing resources to perform these activities.
Some of the major operational investments over the next 10 years include:

- **$17 million** allocated for support from Engineering Services Division;
- **$3 million** allocated for storm sewer network planning; and,
- **$2.6 million** allocated for Hamilton's Shoreline Protection Program.

Maintenance should be viewed as the ongoing management of deterioration. The purpose of planned maintenance is to ensure that the correct interventions are applied to assets in a proactive manner and to ensure it reaches its intended useful life. Maintenance does not significantly extend the useful life of the asset but allows assets to reach their intended useful life by returning the assets to a desired condition.

Proactively planning maintenance significantly reduces the occurrence of reactive maintenance which is always linked to a higher risk to human safety and higher financial costs. The City needs to plan and properly fund its maintenance to ensure the stormwater network is reliable and can achieve their desired level of service.

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating. Examples of typical maintenance activities include pipe repairs, pond dredging, catch basin repairs, equipment repairs along with appropriate staffing and material resources.

4.0 STORMWATER

Major maintenance projects Hamilton plans to undertake over the next 10 years include:

- **$16 million** allocated for the right of way drainage program;
- **$10.3 million** allocated for Hamilton's Watercourse Erosion Rehabilitation program; and,
- **$14.1 million** allocated for Storm Water Facility maintenance.

4.2.3 Vertical Lifecycle Activities

The major operating and maintenance lifecycle activities per vertical asset with their accompanying 2021 costs (if known) are shown below in Table 67.

Table 67: Vertical Lifecycle Activities

ASSET	LIFECYCLE STAGE	LIFECYCLE ACTIVITY	FREQUENCY	2021 COST	UNIT
Pump Station	Operation	Inspection	Monthly	$639.54	annually
		Calibration	Ad Hoc	$73.34	annually
	Maintenance	Preventative Maintenance	Seasonal/ Annual	$195.03	annually
		Reactive Maintenance	Ad Hoc	$2,095.07	annually
Wet SWM Ponds	Operation	Sediment Depth Surveys	5-year cycle	$100,000.00	annually
		Water Level Monitoring	5 year cycle	$75,000.00	annually
	Maintenance	Full Dredging	25-year cycle	$1,650,000.00	annually
		Forebay Dredging	10-year cycle		
All SWM Ponds	Operation	Grass Cutting	6x per year	$110,000.00	annually
		Litter Collection	2x per year		
		Compliance Inspections	annually	$236.00	per unit
		Rainfall Inspections	ad hoc	$118.00	per unit
		Control Device Inspections	annually	$118.00	per unit
		Water Quality Sampling	6x per year	$60,000.00	annually
	Maintenance	Invasive Species Management	ad hoc	$450,000.00	annually
		Minor Repairs	ad hoc	$5,000.00	annually
		Sign Replacement	ad hoc	$10,000.00	annually
		Fencing Replacement	ad hoc	$50,000.00	annually
		Entry Treatment Replacement	ad hoc	$100,000.00	annually
		Administrative Tasks	annually	$675,000.00	annually
Flood Control Structure / Gate	Maintenance	Minor Repairs	ad hoc	$20,000	annually
	Operation	Rainfall Inspections	ad hoc	$118.00	per occurrence

When the City completes necessary operational and maintenance activities, high cost reactive repairs can be prevented, and this will ensure the assets reach their ESL.

4.2.4 Linear Lifecycle Activities

The major operating and maintenance lifecycle activities per linear asset with their accompanying 2021 costs (if known) are shown below in Table 68.

Table 68: Linear Lifecycle Activities

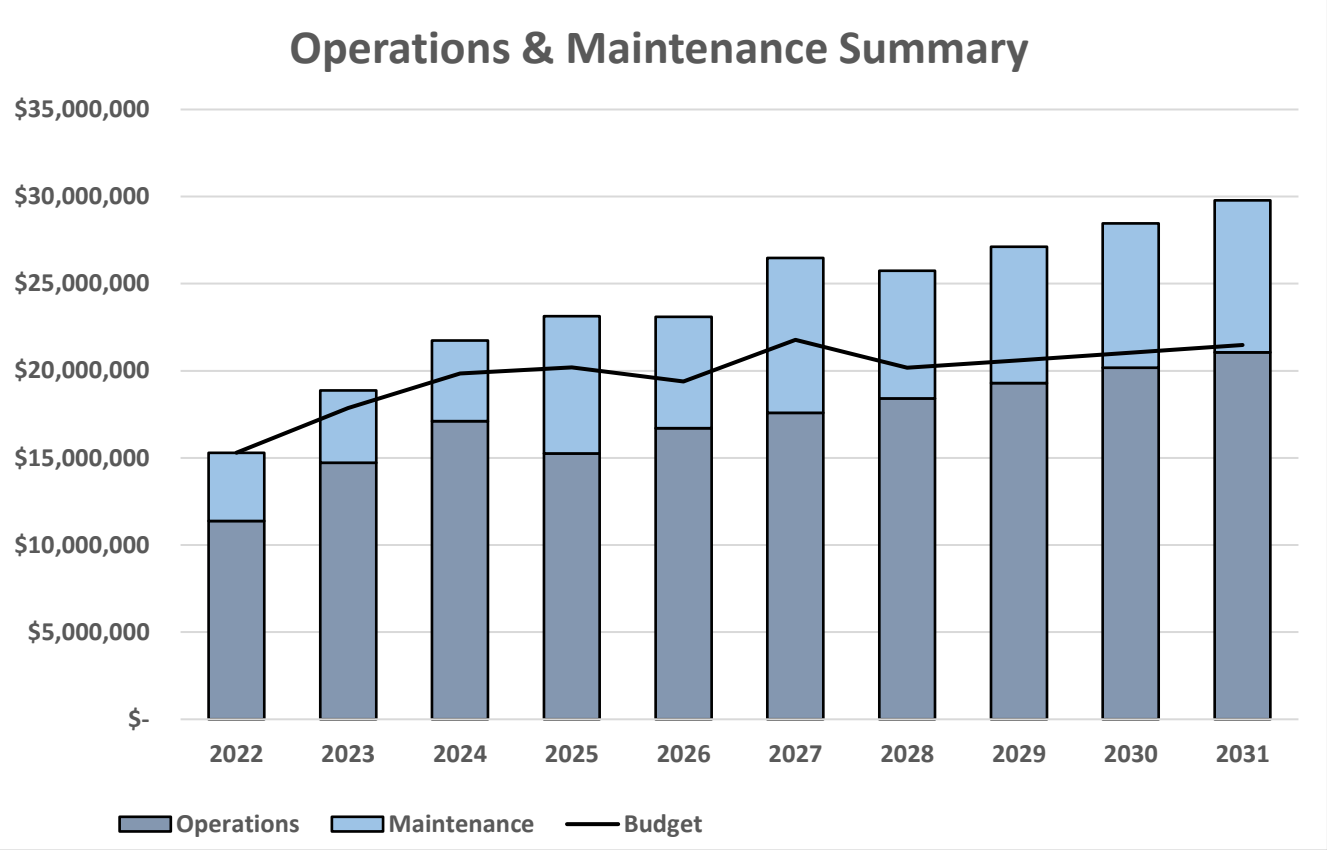
ASSET	LIFECYCLE STAGE	LIFECYCLE ACTIVITY	FREQUENCY	2021 COST	UNIT
Minor Culvert	Operation	Inspection	5 year cycle	$15,000.00	per year
		Cleaning	Ad Hoc	$1,000.00	Per instance
	Maintenance	Ditching	Ad Hoc	$500.00	Per instance
		Repair	Ad Hoc	No data	
Swales	Maintenance	Minor Maintenance	Ad Hoc	No data	
Catchbasins	Operation	Inspection	Ad Hoc	$61.00	Per instance
		Cleaning	Ad Hoc	$250.00	Per instance
OGS	Operation	Inspection Program	Monthly	$30.00	Per instance
		Cleaning	Ad Hoc	$450.00	Per instance
Inlet/Outfalls	Operation	Inspection	Annually	$30.00	Per instance
		Cleaning	Ad Hoc	$450.00	Per instance
	Maintenance	Minor Repairs	Ad Hoc	$2,000.00	Per instance

Assessment and priority of reactive maintenance is undertaken by staff using experience and judgement.

SUMMARY OF FORECAST OPERATIONS AND MAINTENANCE COSTS

Due to ongoing acquisitions the current operational and maintenance budget levels are considered to be inadequate to meet estimated service levels. Ongoing acquisitions from donated assets will require Hamilton to review its funding availability in the short term to ensure long term impacts can be mitigated.

Figure 27: Operations and Maintenance Summary
All figure values are shown in 2021 dollars.



The forecast of operations and maintenance costs are increasing steadily over time and it is clear, the City has insufficient budget to achieve all of the works required to ensure that assets will be able to achieve their estimated service life at the desired level of service. It is anticipated that at the current budget levels there will be insufficient budget to address all operating and maintenance needs over the 10-year planning horizon. The graph above illustrates that without increased funding or changes to lifecycle activities there is a significant shortage of funding which will lead to:

- Higher cost reactive maintenance;
- Possible reduction to the availability of the assets;
- Impacts to private property; and,
- Increased financial and reputational risk.

The shortfall is primarily due to the significant number of assets that are donated through subdivision agreements annually and insufficient funding allocations over an extended period of time. Every year that Hamilton adds additional assets without properly funding the necessary lifecycle activities, staff's ability to sustain the assets to expected or mandatory level of service can be significantly impacted. It should be noted that there are mandatory operational and

maintenance expenditures due to legislative requirements and cannot and should not simply be avoided or deferred.

The forecast costs include all costs from both the Capital and Operating budget. Asset management focuses on how taxpayer or ratepayer dollars are invested by lifecycle activities and not by budget allocation since both budgets contain various lifecycle activities they must both be consolidated for the AM Plans.

As the City continues to develop condition profiles and necessary works are identified based on their condition, it is anticipated operation and maintenance forecasts will increase significantly. Where budget allocations will result in a lesser level of service, the service consequences and risks will be identified and are highlighted in the Risk Section 4.5.

Deferred maintenance (i.e. works that are identified for maintenance activities but unable to be completed due to available resources) will be included in the infrastructure risk management plan for the next iteration.

Future iterations of this plan will provide a much more thorough analysis of operations and maintenance costs including types of expenditures for training, mandatory certifications, insurance, staffing costs and requirements, equipment and maintenance activities.

4.2.5 Renewal Plan

Renewal is major works which does not increase the assets design capacity but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Works over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional future operations and maintenance costs.

Stormwater asset renewals are typically undertaken to either ensure the assets reliability or quality will meet the service requirements set out by the City. Renewal projects are often triggered by service quality failure and can often be prioritized by those that have the highest consequence of failure, have high usage, have high operational and maintenance costs and other deciding factors.

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in Table 69 and are based on estimated design life for this iteration. Future iterations of the plan will focus on the Lifecycle approach to ESL which can vary greatly from design life. Asset useful lives were last reviewed in 2022 however they will be reviewed annually until their accuracy reflects the City’s current practices.

Table 69: Useful Lives of Assets	
ASSET (SUB)CATEGORY	**AVERAGE USEFUL LIFE**
Pump Station	60 years
SWM Pond	100 years
Flood Control Gate/Structure	80 years
Local SW Main	94 years
Trunk SW Main	98 years
Inlet, Outfall	80 years
Catchbasin, Maintenance Hole,	100 years
Oil & Grit Separator (OGS)	25 years
Minor Culvert	50 years

The estimates for renewals in this AM Plan were based on the register method which utilizes the detailed listing of Hamilton's asset inventory and all available lifecycle information to determine the optimal timing for renewals

RENEWAL RANKING CRITERIA

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing a bridge that has a load limit), or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. condition of a culvert).[16]

It is possible to prioritise renewals by identifying assets or asset groups that:

- Have a high consequence of failure,
- Have high use and subsequent impact on users would be significant,
- Have higher than expected operational or maintenance costs, and
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.[17]

The ranking criteria used to determine priority of identified renewal proposals is detailed in Table 70.

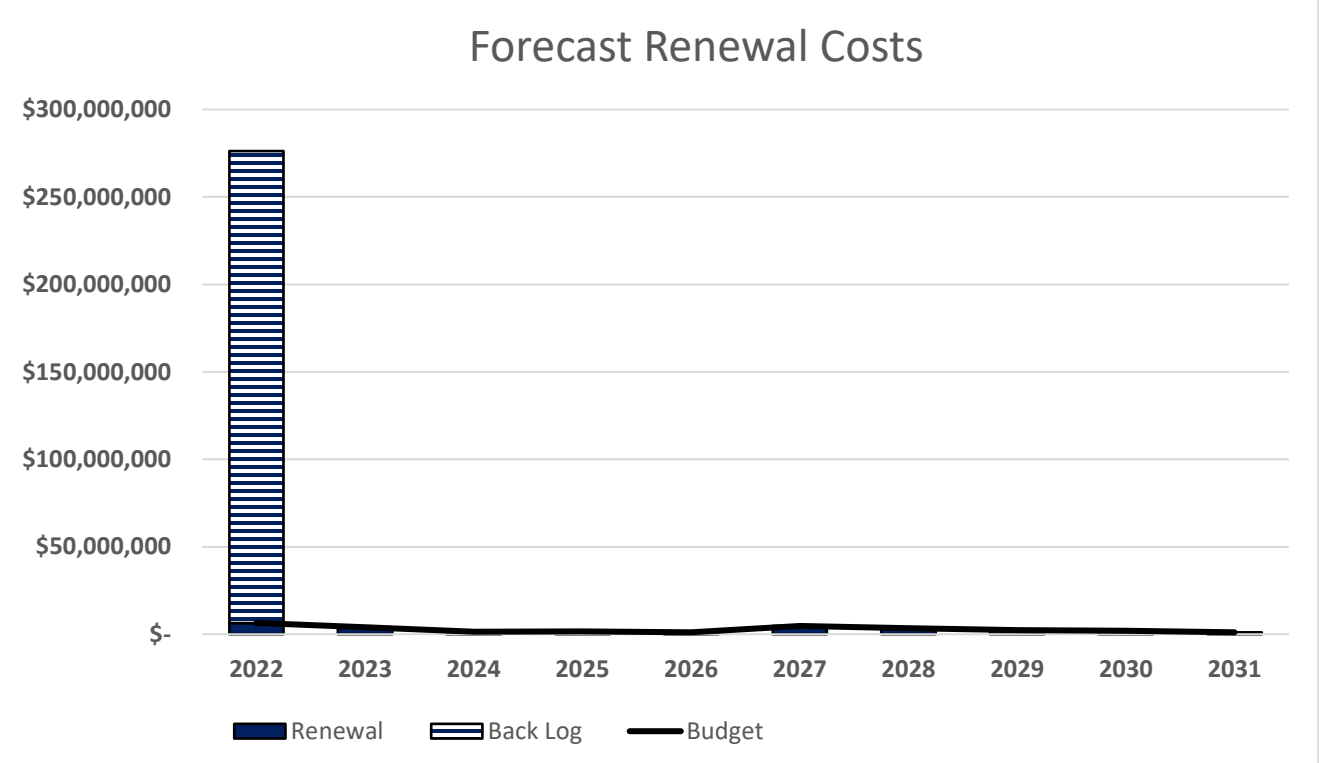
[16] IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.
[17] Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

Table 70: Renewal Priority Ranking Criteria	
CRITERIA	**WEIGHTING**
Regulatory / Legal Compliance	20%
Co-ordination – Funding and Budgeting	25%
Risk Mitigation	25%
Health & Safety (Users & Staff)	10%
Lifecycle Impacts (Operations & Maintenance)	10%
Demand Driver (Growth)	10%
Total	**100%**

SUMMARY OF FUTURE RENEWAL COSTS

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in Figure 28.

Figure 28: Forecast Renewal Costs
All figure values are shown in 2021 dollars.



The significant amount highlighted in 2022 represents the cumulative backlog of deferred work to be completed that has been either identified through its current estimated condition or age per Table 61 when condition was not available. This back log represents nearly **$272,000,000** of deferred works. Deferred renewal (assets identified for renewal and not funded) are included and identified within the risk management plan. Prioritization of these projects will need to be managed over time to ensure renewal occurs at the optimal time.

There is sufficient budget to support the **planned** projects only. Without additional funding the **backlog** will remain and continue to grow as future projects outside of the 10-year planning horizon continue to move forward into the 10 years scope. Continued deferrals of projects will lead to significantly higher operational and reactive maintenance costs and will affect the availability of services in the future. Hamilton has allocated **$28.3 million** dollars for future renewal projects which includes **$3.2** million for renewals in Westdale North neighborhood, **$6.5 million** for watercourse and drainage channel projects and **$5.5 million** for Catch Basin renewals.

Deferring renewals create risks of higher financial costs, decreased availability, and decreased satisfaction with asset performance. Ultimately, continuously deferring renewals works ensures Hamilton will not achieve intergenerational equality. If Hamilton continues to push out necessary renewals, there is a high risk that future generations will be unable to maintain the level of service the customers currently enjoy. It will burden future generations with such significant costs that inevitably they will be unable to sustain them.

Properly funded and timely renewals will ensure the assets perform as expected and it is recommended to continue to analyze asset renewals based on criticality and availability of funds for future AM Plans.

4.2.6 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, possible closure of service, decommissioning, disposal of asset materials, or relocation. Disposals will occur when an asset reaches the end of its useful life. The end of its useful life can be determined by factors such as excessive operation and maintenance costs, regulatory changes, obsolesce or demand for the structure has fallen.

In future plans assets identified for possible decommissioning will be summarized withing this section of the plan. Hamilton will provide summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined. Any costs or revenue gained from asset disposals is included in future iterations of the AM Plan and the long-term financial plan.

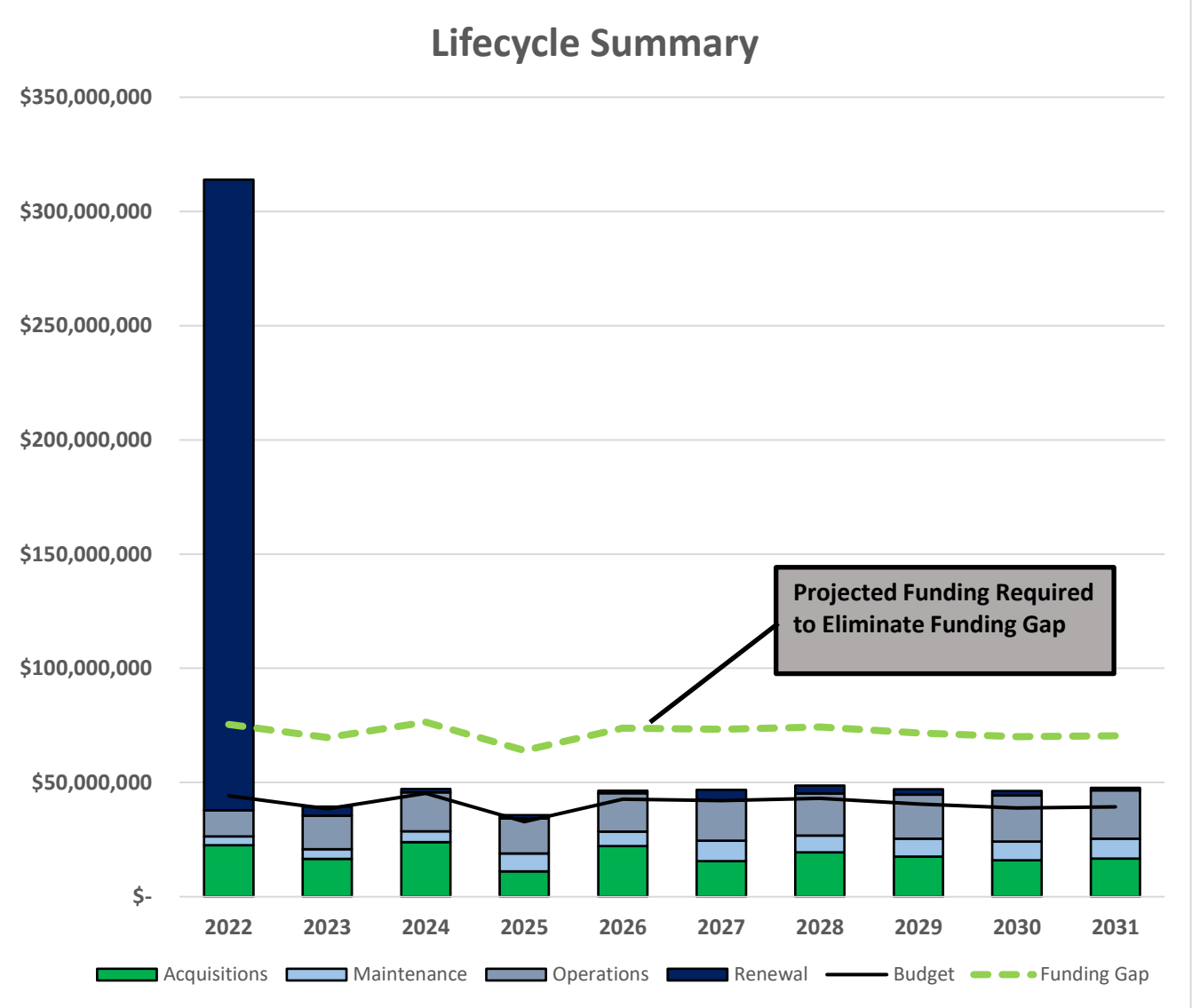
SUMMARY OF ASSET FORECAST COSTS

The financial projections from this asset plan are shown in Figure 29. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

The bars in the graphs represent the forecast costs required to minimize the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.

4.0 STORMWATER

Figure 29: Lifecycle Summary
All figure values are shown in 2021 dollars.



Currently there is insufficient budget to address the large backlog of renewal work projected by the plan. There is sufficient budget to address most of the ongoing operational and maintenance activities for the planning period however with the significant assumption of assets over time and their increased costs there may be impacts to the service itself as illustrated by Figure 29. Without some adjustment to available funds or other lifecycle management decisions there will be insufficient budget to address all planned lifecycle activities.

Allocating sufficient resources is imperative to managing asset throughout their lifecycle. This can include funding for lifecycle activities, sufficient staffing, increased asset knowledge, improved planning, contracted services, additional equipment or vehicles to ensure that Hamilton is optimizing its lifecycle approach.

4.0 STORMWATER

Without sufficient funding the City has little option but to defer these necessary lifecycle activities. Deferring important lifecycle activities is never recommended. The City will benefit from allocating sufficient resources to developing its long-term financial plan to ensure that over time the City can fully fund the necessary lifecycle activities. Funding these activities helps to ensure the assets are compliant, safe and effectively deliver the service the customers need and desire.

The lack of funding allocated for the backlog of renewals and the necessary lifecycle activities creates an additional issue which is intergenerational equity. Each year the City defers necessary lifecycle activities it pushes the ever-increasing financial burden on to future generations. It is imperative the City begin addressing the lack of consistent and necessary funding to ensure that intergenerational equity will be achieved. Over time, allocating sufficient funding on a consistent basis ensures that future generations will be able to enjoy the same standards being enjoyed today.

Over time the City will continue to improve its lifecycle data, and this will allow for informed choices as how best to mitigate those impacts and how to address the funding gap itself. This gap in funding in future plans will be refined over the next 3 years and improve the confidence and accuracy of the forecasts.

4.3 MANDATORY O.REG. 588/17 LEVELS OF SERVICE

Table 1 in O.Reg. 588/17 identifies specific metrics that must be reported in the AM Plan for stormwater assets. These metrics are divided into community and technical levels of service and are provided below.

4.3.1 Mandatory O.Reg. 588/17 Community Levels of Service

Per Table 3 in O.Reg. 588/17, there are community levels of service that the City is required to report on in order to meet the provincial level of service requirement. These metrics are required to be reported, and so they have been separated from the customer levels of service described in Section 4.3.2. These qualitative metrics are reported below.

Scope

1. 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.

Areas of the City are protected from flooding through a variety of City infrastructure. In urban areas, underground storm infrastructure (i.e. stormwater main) provides some degree of flooding protection to private properties and flooding of the road allowance. Stormwater facilities and structures, including wet ponds, low impact development structures and storage facilities also allow the City to lower the risk and impacts of flooding. In rural areas, roadside ditches manage road flooding and may offer some property flooding protection, and municipal drains provide formal drainage and flooding considerations. Map 4 in Section 4.1 shows the areas of the City which have separated storm sewers and also shows the location of the stormwater ponds (Stormwater Management Facilities).

4.3.2 Mandatory O.Reg 588/17 Technical Levels of Service

In addition, per Table 3 in O.Reg 588/17, there are technical levels of service that the City is required to report on in order to meet the provincial level of service requirement. These quantitative metrics are reported below.

Table 71: Mandatory Technical Levels of Service

SERVICE ATTRIBUTE	TECHNICAL LEVELS OF SERVICE	MEASURE
Scope	**1.** Percentage of properties in municipality resilient to a 100-year storm.	95%
	2. Percentage of the municipal stormwater management system resilient to a 5-year storm.	89%

4.0 STORMWATER

In theory, all City properties connected to the stormwater drainage system should currently be protected from a 100-year storm. However, there are known flooding issues in the City which have not yet been quantified. Therefore, the number above is an estimate which will be updated when the stormwater modelling for the City's storm system is complete.

In addition, the current City-wide criteria is for minor system conveyance to be designed for a 5-year return period, however many legacy systems remain throughout the City especially in Ancaster, Dundas and Flamborough.

4.4 MUNICIPALLY DEFINED LEVELS OF SERVICE

Levels of service are measures for what Hamilton provides to its customers, residents, and visitors. Service levels are best described as the link between providing the outcomes the community desires, and the way that Hamilton provides those services. Service levels defined in three ways, customer values, customer levels of service and technical levels of service which are outlined in this section.

4.4.1 Customer Values

Customer values are what the customer can expect from their tax dollar in “customer speak”. These values are used to develop level of service statements.

Customer Values indicate:

- what aspects of the service is important to the customer;
- whether they see value in what is currently provided; and,
- the likely trend over time based on the current budget provision.

To develop these customer values, as stated in the AMP Overview, a Customer Engagement Survey was released in January 2022 on the Engage Hamilton platform. The survey received 184 submissions and contained 14 questions related to stormwater service delivery. The survey results can be found in Appendix “A” in the AMP Overview. While these surveys were used to establish customer values and customer performance measures, it’s important to note that the number of survey respondents only represents a small portion of the population.

The future intent is to release this survey on an annual basis to measure the trends in customer satisfaction and ensure that the City is providing the agreed level of service as well as to improve the marketing strategy to receive more responses. This has been noted in Table 82 in the Continuous Improvement section.

Table 72: Customer Values Service Objective:			
CUSTOMER VALUES	**CUSTOMER SATISFACTION MEASURE**	**CURRENT FEEDBACK**	**EXPECTED TREND BASED ON PLANNED BUDGET**
Streets and properties don't flood	Annual Customer Engagement Survey	Most survey respondents had not had flooding on their properties or had to detour due to flooding on roads, but many survey respondents were concerned with future flooding.	Maintain Trend
Stormwater is returned to the natural watercourse responsibly.	Annual Customer Engagement Survey	Many survey respondents did not think the City was responsible about returning stormwater back to the environment.	Maintain Trend

4.4.2 Customer Levels of Service

The Customer Levels of Service are considered in terms of:

Condition	How good is the service? What is the condition or quality of the service?
Function	Is it suitable for its intended purpose? Is it the right service?
Capacity/Use	Is the service over or under used? Do we need more or less of these assets?

In Table 73 under each of the service measures types (Condition, Function, Capacity/Use) there is a summary of the performance measure being used, the current performance, and the expected performance based on the current budget allocation.

4.0 STORMWATER

Table 73: Customer Levels of Service

TYPE OF MEASURE	LEVEL OF SERVICE	SOURCE	PERFORMANCE MEASURE	CURRENT PERFORMANCE	EXPECTED TREND BASED ON PLANNED BUDGET
Condition	Provide reliable stormwater services with minimum flooding.	Annual Customer Engagement Survey	76.4% of survey respondents have not experienced flooding impacts on their property	Fairly Satisfied	Maintain Trend
			48.4% of survey respondents are concerned with flooding on their property	Unsatisfied	Trending downwards
			76.4% of survey respondents have not experienced flooding impacts on their property	Fairly Satisfied	Maintain Trend
			92.9% of survey respondents did not have to delay or cancel plans due to roads flooding	Very Satisfied	Maintain Trend
			Confidence levels	Medium	
		Age-based	Average condition of pump stations	Very Good	Trending downwards
		Age-based	Average condition of stormwater ponds	Good	Maintain Trend
			Confidence levels	Low	
		Age & Condition Based	Average condition of stormwater main	Good	Maintain Trend
			Confidence levels	Medium	
		Unknown	Average condition of flood control gate/structure	Unknown	Trending downwards
			Confidence levels	Very Low	
Function	Ensure stormwater is being collected responsibly.	Annual Customer Engagement Survey	40.1% of survey respondents do not think that Hamilton behaves responsibly when returning stormwater back to the environment	Unsatisfied	Maintain Trend
			Confidence levels	Medium	
Capacity	Ensure stormwater assets are used and within design capacity.	Annual Customer Engagement Survey	30.3% of survey respondents were connected to the storm sewer	Low	Maintain Trend
			Confidence levels	Medium	

4.4.3 Technical Levels of Service

Technical levels of service are operational or technical measures of performance, which measure how the City plans to achieve the desired customer outcomes and demonstrate effective performance, compliance and management. The metrics should demonstrate how effectively Hamilton delivers its services in alignment with its customer values; and should be viewed as possible levers to impact and influence the Customer Levels of Service. Hamilton will measure specific lifecycle activities to demonstrate how Hamilton is performing on delivering the desired level of service as well as to influence how customer perceive the services they receive from the assets.

Technical service measures are linked to the activities and annual budgets covering Acquisition, Operation, Maintenance, and Renewal.

Service and asset managers plan, implement and control technical service levels to influence the service outcomes.

Table 74 shows the activities expected to be provided under the current 10 year Planned Budget allocation, and the Forecast activity requirements being recommended in this AM Plan.

4.0 STORMWATER

Table 74: Technical Levels of Service					
LIFECYCLE ACTIVITY	**PURPOSE OF ACTIVITY**	**ACTIVITY MEASURE**	**CURRENT PERFORMANCE***	**TARGET**	**RECOMMENDED PERFORMANCE ****
Acquisition	Ensure stormwater assets are used and within design capacity.	% of stormwater ponds inspected before assumption	100%	100%	100%
Operation	Provide reliable stormwater services with minimum flooding.	METRIC -# of Oil & Grit Interceptor Inspections	862	No Data	No Data
		Mainline sewers inspected per year	78 km	100	100
		% of stormwater pond inspections completed	100%	100	100%
		% Watercourse erosion inspection per year	No Data	33%	33%
		# inlet/outlet inspections completed	2,267	No Data	No Data
Maintenance	Provide reliable stormwater services with minimum flooding.	% of stormwater ponds cleaned out versus ponds requiring clean out	No Data	No Data	No Data
Renewal	Provide reliable stormwater services with minimum flooding.	Sewermain CIPP rehabilitation km/yr (4113)	4.5 km	No Data	No Data
Note: * Current activities related to Planned Budget. ** Expected performance related to forecast lifecycle costs.					

It is important to monitor the service levels regularly as circumstances can and do change. Current performance is based on existing resource provision and work efficiencies. It is acknowledged changing circumstances such as technology and customer priorities will change over time.

As the City's asset management maturity increases, and with the implementation of the EAM project mentioned in the AMP Overview, the City will also have more capacity to measure additional metrics. In addition, the City should investigate the balanced scorecard further to ensure data and assumptions are consistent with ministry and City reporting. This has been identified as a continuous improvement item in Table 82. In addition, often times wastewater and stormwater metrics have been reported together, and these should be separated for ease of reporting which has been identified as a continuous improvement item.

4.4.4 Levels of Service Summary

At this time, the City's technical metrics for stormwater assets are not as robust as for other core service areas. This will improve as the City continues to mature in asset management. As mentioned in Section 3.4.2, while these surveys were used to establish customer values and customer performance measures, it's important to note that the number of survey respondents currently only represents a small portion of the population.

CONDITION

Survey respondents appeared to be overall satisfied with the stormwater services they were provided. The majority of survey respondents had not had flooding on their properties and had not had to cancel travel plans due to road flooding. However, there were respondents who were concerned with the possibility of future flooding on their properties. Survey respondents who indicated flooding had occurred on their property typically referenced basement flooding associated with snow melt, faulty sump pumps, grading issues, or heavy rain events. These types of events are not typically the result of City infrastructure, although sometimes heavy rain events do cause some of these issues – however as shown in the technical metrics approximately 2200 inspections and clean outs (if required) were completed on inlets/outlets in the City to ensure they were functioning as intended. As shown throughout the report, the separated storm sewer network is typically maintained in Good condition, and the City is completing inspections and renewals for priority stormwater main. Additional technical metrics should be explored for stormwater for future iterations of the report and has been identified in Table 82 as a Continuous Improvement item.

FUNCTION

Many survey respondents did not feel that the City was responsible when returning stormwater back into the natural watercourse. As previously mentioned, best practice is not to disinfect stormwater before being returned to the environment since it is not of poor water quality, but as shown in the technical levels of service the City does complete the required inspections for stormwater ponds and oil & grit separators (OGS) which settle out grit and remove oil to prevent pollution.

CAPACITY

At this time, there were no key findings associated with stormwater capacity with respect to customer or technical levels of service. Few survey respondents were shown to be connected to the municipal stormwater system, which is expected since most residents do not have a storm lateral.

4.5 FUTURE DEMAND

The ability for Hamilton to be able to predict future demand for services enables the City to plan ahead and identify the best way of meeting the current demand while being responsive to inevitable changes in demand. Demand will inevitably change over time and will impact the needs and desires of the community in terms of the quantity of services (more communities connecting to the service) and types of service required (larger facilities to process increased volumes).

Demand is defined as the desire customers have for assets or services and that they are willing to pay for. These desires are for either new assets/services or current assets.

Since demand is not yet an extensive requirement in O.Reg 588/17 for the July 1st, 2022 deadline, this section is not as robust as some other sections of the report, but is an obligation for the report by July 1st, 2025, and will be expanded on in future iterations of the report.

4.5.1 Demand Drivers

For stormwater, the key drivers are population change, climate change and customer preferences and expectations. A future continuous improvement item is to identify and incorporate any additional demand drivers.

4.5.2 Demand Forecasts

The high level present position and projections for demand drivers that may impact future service delivery and use of assets have been identified and documented in Table 75. At this time, specific projections have not been calculated and will be updated in the 2025 AM Plan as per the timelines stated in the AMP Overview. Growth projections have been shown in the AMP Overview.

4.5.3 Demand Impact and Demand Management Plan

The impact of demand drivers that may affect future service delivery and use of assets are shown in Table 75.

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Demand management practices can include non-asset solutions, insuring against risks, and managing failures.

Opportunities identified to date for demand management are shown in Table 75. Climate change adaptation is included in Table 76. Further opportunities will be developed in future revisions of this AM Plan, as identified in Table 82 in the Continuous Improvement Section.

Table 75: Demand Management Plan

DEMAND DRIVER	CURRENT POSITION	PROJECTION	IMPACT ON SERVICES	DEMAND MANAGEMENT PLAN
Population Change	573,000 (2021)	660,000 (2031)	More SW main required	Investigate need for new pump stations. New staff may be required for legislative compliance. Adjust budgets, long-term financial plan, and AM Plan.
Population Change	573,000 (2021)	660,000 (2031)	More SWM Ponds required	Acquisitions through subdivision agreements. Impacts to budget, LTFP and Staffing
Customer Preferences & Expectations	Most rural roads have rural cross sections (e.g. ditches)	Rural roads converted to urban cross section (e.g. curbs and stormwater pipes)	Reduced infiltration of stormwater increasing flow to downstream facilities.	Educate customers on benefits of ditches. Complete models of stormwater network and run models before urbanizing road.
Customer Preferences & Expectations	Homeowners have areas for infiltration on property (e.g. grass)	Homeowners converting lot with more impervious surfaces (e.g. driveways)	Reduced infiltration of stormwater increasing flow to downstream facilities.	Dedicated SW Rate Program based on impervious surface. Incentive programs for LIDs.

4.5.4 Asset Programs to meet Demand

The new assets required to meet demand may be acquired, donated or constructed. Additional assets are discussed in 4.2.1.

Acquiring new assets will commit the City of Hamilton to ongoing operations, maintenance and renewal costs for the period that the service provided from the assets is required. These future costs are identified and considered in developing forecasts of future operations, maintenance and renewal costs for inclusion in the long-term financial plan.

4.5.5 Climate Change Adaptation

The impacts of climate change may have a significant impact on the assets we manage and the services they provide. In the context of the asset management planning process, climate change can be considered as both a future demand and a risk.
Climate change impacts on assets will vary depending on the location and the type of services provided, as will the way in which those impacts are responded to and managed.[18]

As a minimum the City must consider how to manage our existing assets given potential climate change impacts for our region.

Risk and opportunities identified to date are shown in Table 76. This is a continuous process and will be updated in the 2025 AM Plan per the timelines outlined in the AMP Overview.

Table 76: Managing the Impact of Climate Change on Assets and Services

CLIMATE CHANGE DESCRIPTION	PROJECTED CHANGE	POTENTIAL IMPACT ON ASSETS AND SERVICES	MANAGEMENT
Increased wet weather events.	Increased demand on storm sewer system.	Stormwater system at capacity causing more overflows into natural watercourse or flooding.	Model combined sewer network and upgrade pipe size or separate sewers.

Additionally, the way in which the City constructs new assets should recognize that there is opportunity to build in resilience to climate change impacts. Building resilience can have the following benefits:

- Assets will withstand the impacts of climate change;
- Services can be sustained; and
- Assets that can endure may potentially lower the lifecycle cost and reduce their carbon footprint

Table 77 summarizes some asset climate change resilience projects the City is currently pursuing.

[18] IPWEA Practice Note 12.1 Climate Change Impacts on the Useful Life of Infrastructure

Table 77: Building Asset Resilience to Climate Change

PROJECT	PROJECT DESCRIPTION	CLIMATE CHANGE IMPACT	BUILD RESILIENCE IN NEW WORKS
Rain Gauges Monitoring Program	Operate a rain gauge network in the City of Hamilton.	Significant wet weather events which are increasing due to climate change will cause sewers to overflow more often into natural watercourse and increase risk of basement flooding.	To improve Hamilton's climate resiliency by decreasing our vulnerability to extreme weather, minimizing future damages, take advantage of opportunities, and better recover from future damages.
Rosedale Neighborhood Flood Protection Works	EA study for the control of surface water flows to mitigate basement flooding in the Rosedale Neighborhood.		
Stormwater Management Pond Retrofits	Condition assessment and analysis on the operating performance of four existing SWM ponds which will quantify operating performance and recommend enhancements.		
Rain Barrels	Rain-barrel sale; encourage use of rain barrels through outreach program		
Downspout Disconnection Program	Downspout Disconnection Program - This pilot program was implemented as an effort to provide some immediate relief against flooding basements during major rain storms for selected volunteer homes		
Stormwater Computer Models	Development of Stormwater Computer Models - A robust and calibrated computer model can predict the location within a collection system where the capacity will be exceeded when modelling increased rain fall events		
Bioretention Swales	Integrate bio retention swales into new roadway/boulevard construction		
LID Solutions in Parks	Storm Water Management - included some LID solutions in parks.		
Beach Strip SW Pump Station	Environmental Assessment to Identify Preferred Flood Mitigating Solutions for Beach neighbourhood flooding and elevated Lake Ontario water levels.	Frequency and extent of floods is increasing due to higher Lake Ontario water levels, driven in part by climate change	
Backflow Device Installation	Installation of new backflow devices in the city's sewer system, which are designed to prevent lake and harbour water from entering sewers during extreme storms, and therefore lessen basement flooding		
Stormwater Funding Restructuring	Report presented to Council which proposed to restructure the funding mechanism to separate the stormwater rate from water rate.	Increased wet weather events and higher lake levels means that stormwater will become a larger part of City budget and must be budgeted accordingly.	

The impact of climate change on assets is a new and complex discussion and further opportunities will be developed in future revisions of this AM Plan.

4.6 RISK MANAGEMENT

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.
Risk Management is defined in ISO 31000:2018 as: 'coordinated activities to direct and control with regard to risk[19].

Hamilton is developing and implementing a formalized risk assessment process to identify risk associated with service delivery and to implement proactive strategies to mitigate risk to tolerable levels. The risk assessment process identifies credible risks associated with service delivery and will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

The risk assessment process identifies credible risks, the likelihood of those risks occurring, and the consequences should the event occur. For its bridge and culvert assets Hamilton utilizes two risk assessment methods to determine risk along with subject matter expert opinion to inform the prioritization. The City is further developing its risk assessment maturity with the inclusion of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable in the next iteration of the plan.

Risk Assessment is not yet an extensive requirement in O.Reg. 588/17 for the July 1st, 2022 deadline. As a result, this section is not as robust as some other sections of the report, but is an obligation for the report by July 1st, 2025, and will be expanded on in future iterations of the report.

4.6.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarized in Table 78. Failure modes may include physical failure, service interruptions or lack of availability.

Table 78: Critical Assets

CRITICAL ASSET(S)	FAILURE MODE	IMPACT
Pump Station	Essential service interruption	Overflow of wet well or gravity main causing flooding.

[19] ISO 31000:2009, p 2

Table 78: Critical Assets		
CRITICAL ASSET(S)	**FAILURE MODE**	**IMPACT**
Storm Water Management Pond	Physical Failure	Contaminants don't settle out and pollutes watercourse and/or pipes reach capacity causing flooding.
Critical Stormwater Main	Physical Failure	Storm backup might occur at catchbasins or laterals and flood streets/properties.
SCADA	Essential service interruption	System failure causing service interruption to pump station

By identifying critical assets and failure modes an organization can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

4.6.2 Risk Assessment

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

An assessment of risks associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment costs of implementing the selected treatment plan is shown in Table 6.2. It is essential that these critical risks and costs are reported to management. Additional risks will be developed in future iterations of the plan and is identified in Table 82 in the Continuous Improvement Section the plan.

Table 79: Risks and Existing Controls			
SERVICE OR ASSET AT RISK	**WHAT CAN HAPPEN**	**RISK RATING**	**EXISTING CONTROLS**
Stormwater network	Lack of comprehensive stormwater model so City cannot predict where flooding may occur	Very High	Modelling is currently being completed.
Orphan Stormwater Asset	Asset fails due to no maintenance or inspection program	High	None
SWM Pond	Pipe Blockage	High	Control Structure Inspections; Compliance Inspections; Rainfall Inspections
SWM Pond	Invasive species reduce storage capacity (e.g. phragmites, goldfish)	High	Contract works; Educate public on not discarding pets
Low Impact Development	Lack of lot level controls on LIDs necessary to support intensification leads to assets not effectively managing stormwater	High	None
Critical Stormwater Main	Blockage due to structural failure or debris	High	CCTV inspection program
Pump Station	Pump failure or station reaches capacity.	High	Monthly station checks and verifications by operators

4.6.3 Infrastructure Resilience Approach

The resilience of our critical infrastructure is vital to the ongoing provision of services to customers. To adapt to changing conditions Hamilton needs to understand its capacity to 'withstand a given level of stress or demand', and to respond to possible disruptions to ensure continuity of service. An example would be how the storm water management ponds perform during the most significant storm water events during a given year. We do not currently measure our resilience in service delivery and will be included in the next iteration of the AM Plan.

Resilience covers the capacity of Hamilton to withstand any service disruptions, act appropriately and effectively in a crisis, absorb shocks and disturbances as well as adapting to ever changing conditions. Resilience is built on aspects such as response and recovery planning, financial capacity, climate change, risk assessment and crisis leadership.

4.6.4 Service and Risk Trade-Offs

The decisions made in AM Plans are based on the objective to achieve the optimum benefits from the available resources. At this time, the City does not have sufficient data to present risks and tradeoffs. This information will be presented in the **2025** AM Plan regarding Proposed Levels of Service per the timelines outlined in the AMP Overview.

4.6.5 Financial Summary

This section contains the financial requirements resulting from the information presented in the previous sections of this AM Plan. Effective asset and financial management will enable Hamilton to ensure its storm water network provides the appropriate level of service for the City to achieve its goals and objectives. Reporting to stakeholders on service and financial performance ensures Hamilton is transparently fulfilling its stewardship accountabilities.

Long-Term financial planning (LTFP) is critical for Hamilton to ensure the stormwater network's lifecycle activities such as renewals, operations, maintenance and acquisitions can happen at the optimal time. Hamilton is under increasing pressure to meet the wants and needs of its customer while keeping costs at an affordable level and maintaining its financial sustainability.

Without funding asset activities properly for its storm water network; Hamilton will have difficult choices to make in the future which will include options such as higher cost reactive maintenance and operational costs, reduction of service and potential reputational damage.

Hamilton will be seeking to fully incorporate its storm water network into the LTFP. Aligning the LTFP with the AM Plan is critical to ensure the all the networks needs will be met while the City is finalizing a clear financial strategy with measurable financial targets. The financial projections will be improved as the discussion on desired levels of service and asset performance matures.

4.6.6 Sustainability of Service Delivery

There are two key indicators of sustainable service delivery that are considered in the AM Plan for this service area. These indicators are used to monitor and assess financial performance over the planning period. The two indicators are the:

- asset renewal funding ratio (proposed renewal budget for the next 10 years / forecast renewal costs for next 10 years), and
- medium term forecast costs/proposed budget (over 10 years of the planning period).

4.0 STORMWATER

ASSET RENEWAL FUNDING RATIO

Asset Renewal Funding Ratio[20] **9.49**%

The Asset Renewal Funding Ratio is used to determine if Hamilton is accommodating asset renewals in an **optimal** and **cost effective** manner from a timing perspective and relative to financial constrains, the risk Hamilton is prepared to accept and service levels it wishes to maintain. The target renewal funding ratio should be ideally between **90% - 110%** over the entire planning period. A low indicator result generally indicates that service levels are achievable however the expenditures are below this level because Hamilton is reluctant to fund the necessary work or prefers to maintain low levels of debt.

Over the next 10 years Hamilton expects to have **9.49%** of the funds required for the optimal renewal of assets. By only having sufficient funding to renew **9.49%** of the required assets in the appropriate timing it will inevitably require difficult trade off choices that could include:

- a reduction of the level of service and availability of assets;
- increased complaints and reduced customer satisfaction;
- increased reactive maintenance and renewal costs;
- damage to the City's reputation and risk of fines or legal costs; and,
- property damage and increased pollutants entering the watercourse

The historical lack of renewal funding resources will be addressed in future AM Plan's while aligning the plan to the LTFP. This will allow staff to develop options and long-term strategies to address the renewal rate. Hamilton will review its renewal allocations once the entire inventory has been confirmed and amalgamated.

The Asset Renewal Funding Ratio is an important indicator and illustrates that over the next 10 years we expect to have **9.49 %** of the funds required for the optimal renewal of assets.

MEDIUM TERM → 10-YEAR FINANCIAL PLANNING PERIOD

This AM Plan identifies the forecast operations, maintenance and renewal costs required to provide an agreed level of service to the community over a 10 year period. This provides input into 10 year financial and funding plans aimed at providing the required services in a sustainable manner.

This forecast work can be compared to the proposed budget over the first 10 years of the planning period to identify any funding shortfall.

The forecast operations, maintenance and renewal costs over the 10 year planning period is **$53,766,052** on average per year.

[20] AIFMM, 2015, Version 1.0, Financial Sustainability Indicator 3, Sec 2.6, p 9.

The proposed (budget) operations, maintenance and renewal funding is **$22,596,378** on average per year giving a 10 year funding **shortfall** of **$31,169,674** per year or **$311,696,740** in total over the ten year planning period. This indicates that **42.03%** of the forecast costs needed to provide the services documented in this AM Plan are accommodated in the proposed budget. Note, these calculations exclude acquired assets.

Funding an annual funding shortfall or funding 'gap' of **$31,169,6746** per year cannot be addressed in a single year and has not been incorporated as identified within this plan into any existing plan. The Gap will require vetting, planning and resources to begin to incorporate gap management into the future budgets. This gap will need to be managed over time to reduce it in a sustainable manner and limit financial shock to customers. Options for managing the gap include;

- Financing strategies – increased funding, block funding for specific lifecycle activities, long term debt utilization;
- Adjustments to lifecyle activites – increase/deacrease maintenance or operations, increase/decrease frequency of renewals, limit acquisitions or dispose of underutilized assets; and,
- Influence level of service expectations or demand drivers

These options and others will allow Hamilton to ensure the gap is managed appropriately and ensure the level of service ouctomes the customers desire.

Providing sustainable services from infrastructure requires the management of service levels, risks, forecast outlays and financing to achieve a financial indicator of approximately 1.0 for the first years of the AM Plan and ideally over the 10 year life of the Long-Term Financial Plan.

4.6.7 Forecast Costs (Outlays) For the Long-Term Financial Plan

Table 80 shows the forecast costs (outlays) required for consideration in the 10-year long-term financial plan.

Providing services in a financially sustainable manner requires a balance between the forecast outlays required to deliver the agreed service levels with the planned budget allocations in the operational and capital budget. Hamilton will begin developing its long-term financial plan (LTFP) to incorporate both the operational and capital budget information and help align the LTFP to the AM Plan which is critical for effective asset management planning.

A gap between the recommended forecast outlays and the amounts allocated in the operational and capital budgets indicates further work is required on reviewing service levels in the AM Plan.

Hamilton will manage the 'gap' by continuing to develop this AM Plan to provide guidance on future service levels and resources required to provide these services in consultation with the community. Options to manage the gap include reduction and closure of low use assets, increased funding allocations, reduce the expected level of service, utilize debt based funding

over the long term, adjustments to lifecycle activities, improved renewals and multiple other options or combinations of options.

These options will be explored in the next AM Plan and Hamilton will provide analysis and options for Council to consider going forward. Table 80: Forecast Costs (Outlays) for the Long-Term Financial Plan

Table 80: Forecast Costs (Outlays) for the Long-Term Financial Plan
Forecast costs are shown in 2021 dollar values.

YEAR	ACQUISITION	OPERATION	MAINTENANCE	RENEWAL	DISPOSAL	TOTAL
2022	$22,500,000	$11,381,345	$3,920,000	$64,55,000	0	$44,256,344
2023	$16,630,000	$14,222,998	$3,650,000	$40,10,000	0	$38,513,000
2024	$23,975,000	$16,189,918	$3,650,000	$14,50,000	0	$45,264,920
2025	$11,080,000	$13,826,635	$6,370,000	$15,80,000	0	$32,856,636
2026	$22,202,000	$14,899,700	$4,490,000	$11,00,000	0	$42,691,700
2027	$15,642,000	$15,287,688	$6,490,000	$46,90,000	0	$42,109,688
2028	$19,412,000	$15,691,196	$4,490,000	$35,10,000	0	$43,103,196
2029	$17,542,000	$16,110,844	$4,490,000	$24,30,000	0	$40,572,844
2030	$15,922,000	$16,547,287	$4,490,000	$19,50,000	0	$38,909,288
2031	$16,742,000	$17,001,168	$4,490,000	$11,00,000	0	$39,333,168

4.6.8 Funding Strategy

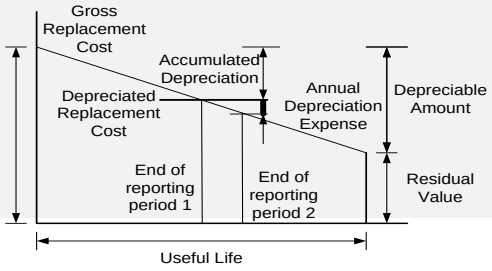
The proposed funding for assets is outlined in Hamilton's operational budget and ten (10) - year capital budget.

The financial strategy of Hamilton determines how funding will be provided, whereas the AM Plan communicates how and when this will be spent, along with the service and risk consequences of various service alternatives. Future iterations of the AM Plan will provide service delivery options and alternatives to optimize limited financial resources.

4.6.9 Asset Valuations

The best available estimate of the value of assets included in this AM Plan are shown below. The assets are valued at estimated replacement costs:

Replacement Cost (Current/Gross)	$3,100,000,000
Depreciable Amount	$3,100,000,000
Depreciated Replacement Cost[21]	$2,189,000,000
Depreciation	$ 51,054,900



The current replacement cost is the most common valuation approach for specialized infrastructure assets. The methodology includes establishing a comprehensive asset registry, assessing replacement costs (based on market pricing for the modern equivalent assets) and useful lives, determining the appropriate depreciation method, testing for impairments, and determining remaining useful life.

As the City matures its asset data, it is highly likely that these valuations will fluctuate significantly over the next 3 years and they should increase over time based on improved market equivalent costs

4.6.10 Valuation forecast

Asset values are forecast to increase as projections improve and can be validated as market pricing. The net valuations will increase significantly despite some assets being programmed for disposal that will be removed from the register over the ten (10) – year planning horizon.

Any additional assets will add to the operations and maintenance needs in the longer term and would also require additional costs due to future renewals obligations. Any additional assets will also add to future depreciation forecasts. Any disposals of assets would decrease the operations and maintenance needs in the longer term and removes the high costs renewal obligations.

[21] Also reported as Written Down Value, Carrying or Net Book Value.

4.6.11 Key Assumptions Made in Financial Forecasts

In compiling this AM Plan, it was necessary to make some assumptions. This section details the key assumptions made in the development of this AM Plan and should provide readers with an understanding of the level of confidence in the data behind the financial forecasts.

Key assumptions made in this AM Plan are:

- Operational forecasts are based on current budget allocations and are the basis for the projections for the 10-year horizon and do not address other operational needs not yet identified;
- Maintenance forecasts are based on current budget allocations and do not identify asset needs at this time. These forecasts are solely based on planned activities;
- 1.04 % p.a. has been added to maintenance forecasts to accommodate for donated assets assumed over the 10-year planning horizon; and,
- 1.00 % p.a has been added to operational forecasts to accommodate for donated assets assumed over the 10-year planning horizon.

4.6.12 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AM Plan are based on the best available data. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is classified on a A - E level scale[22] in accordance with Table 5 in the AMP overview.
The estimated confidence level for and reliability of data used in this AM Plan is shown in Table 81.

Table 81: Data Confidence Assessment for Data used in AM Plan

DATA	CONFIDENCE ASSESSMENT	COMMENT
Demand drivers	Medium	Further investigation is required to better understand demand drivers.
Growth projections	Medium	Current growth projections will need to be vetted and improved. This is identified under continuous improvement initiatives.
Acquisition forecast	Medium	Currently based on 2019 DC study and SME opinion. Continuous improvements are required and identified.
Operation forecast	Medium	Currently budget based and requires future improvements to ensure allocation is accurate.
Maintenance forecast	Medium	Currently budget based and requires future improvements to ensure allocation is accurate.

[22] IPWEA, 2015, IIMM, Table 2.4.6, p 2|71.

4.0 STORMWATER

Table 81: Data Confidence Assessment for Data used in AM Plan		
DATA	**CONFIDENCE ASSESSMENT**	**COMMENT**
Renewal forecast - Asset values	Low	Currently based on estimates and historical costs. These need to be improved to market prices.
- Asset useful lives	Low	Based on SME opinion. Continuous improvement required to ensure data is vetted and ensure it reflects Hamilton's actual practices.
- Condition modelling	Low	Mixture of assessment methods. Requires standardization along with predictable timelines for assessments.
Disposal forecast	Low	Current disposal information is rolled into renewal. Continuous improvements are required to ensure accurate data is available.

The estimated confidence level for and reliability of data used in this AM Plan is considered to be of **Low to Medium** confidence level.

4.7 PLAN IMPROVEMENT AND MONITORING

4.7.1 Status of Asset Management Practices[23]

ACCOUNTING AND FINANCIAL DATA SOURCES

This AM Plan utilizes accounting and financial data. The sources of the data:

- 2022 Capital & Operating Budgets;
- 2021 Tender Documents (various);
- Asset Management Data Collection Templates;
- Audited Financial Statements and Government Reporting (FIR, TCA etc);
- Financial Exports from internal financial systems; and,
- Historical cost and estimates of budget allocation based on SME experience.

ASSET MANAGEMENT DATA SOURCES

This AM Plan also utilizes asset management data. The sources of the data are:

- Data extracts from various city applications and management software;
- Asset Management Data Collection Templates;
- Tender documents, subdivision agreements and projected growth forecasts as well as internal reports;
- Condition Assessments;
- SOP's, Subject matter expert opinion and anecdotal information; and,
- Reports from the mandatory biennial inspection, operational & maintenance activities internal reports.

4.7.2 Improvement Plan

It is important that Hamilton recognize areas of the AM Plan and planning process that require future improvements to ensure the effective management of the stormwater network assets and to inform decision making. The tasks listed below are essential to improving the AM Plan and Hamilton's ability to make evidence based and informed decisions. These improvements span from improved lifecycle activities, improved financial planning, improved data quality as well as plans to physically improve the assets.

Each year Hamilton will revisit these planned activities and report on progress made. The Continuous Improvement plan table below highlights proposed continuous improvement items that will require further discussion and analysis to determine feasibility, resource requirements and alignment to current workplans. The Improvement plans in Table 32 highlights proposed improvement items that will require further discussion and analysis to determine feasibility,

[23] ISO 55000 Refers to this as the Asset Management System

resource requirements and alignment to current workplans. Future iterations of this AM Plan will provide updates on these improvement plans.

Table 82: Improvement Plan
*** p.a – per annum**

TASK	TASK	RESPONSIBILITY	RESOURCES REQUIRED	DRAFT TIMELINE
1.	Collect and verify data from systems (GIS, Hansen, etc.) before integrating into EAM	Hamilton Water	$40,000 p.a. $120,000 Total Internal Staff Time	3 Years (2022-2024)
2.	Develop a Long-Term Financial Plan to connect the budgeting process to AM planning	CAM, Hamilton Water, Finance	$15,000 p.a. $60,000 Total Internal Staff Time	4 Years (2022-2025)
3.	Complete condition assessments on pump stations and flood control structure/gates. Implement on a consistent cycle/methodology.	CAM, Hamilton Water	$84,000 p.a. $252,000 Total Internal Staff, Tender Process Specialty Assessor	3 Years (2022-2024)
4.	Standardize condition assessments for stormwater main and establish program and timeline to complete system wide assessment	CAM, Hamilton Water, Infrastructure Renewal l	$10,000 p.a. $20,000 Total Internal Staff Time	2 Years (2022-2023)
5.	Complete stormwater modelling to assess capacity of system and identify areas of concern.	CAM, Hamilton Water	$150,000 p.a. $450,000 Total Internal Staff time, Tender Process, External Assessment	3 Years (2022-2024)
6.	Investigate LIDAR technology to create inventory for swales and ditches	CAM, TOM	$100,000 p.a. $500,000 Total Internal Staff time, Tender	5 Years (2022-2026)

Table 82: Improvement Plan
*** p.a – per annum**

TASK	TASK	RESPONSIBILITY	RESOURCES REQUIRED	DRAFT TIMELINE
			Process, External Assessment	
7.	Create inventory of low impact developments (LID) , ditches, swales, laterals in the City	CAM, Hamilton Water	$50,000 p.a. $150,000 Total Internal Staff time, Tender Process, External Vendors	3 Years (2022-2024)
8.	Modify existing inspection programs to output condition scores (SWM Ponds, minor culverts, OGS, Inlet/Outfalls)	CAM, Hamilton Water	$20,000 p.a. $60,000 Total Internal Staff Time	3 Years (2022-2024)
9.	Establish condition assessment programs for all maintenance holes, and catchbasins	CAM, Hamilton Water	$5,000 p.a. $10,000 Total Internal Staff Time	2 Years (2022-2023)
10.	Standardize condition assessment outcomes and timed deliverables	Engineering Services, TOM, CAM	$6,000 p.a. $18,000 Total Internal Staff Time	3 Years (2022-2024)
11.	Improve data confidence levels for asset register especially for assets with low data confidence (e.g. sewer laterals)	CAM, Hamilton Water	10,000 p.a. $50,000 Total Internal Staff Time	5 Years (2022-2026)
12.	Improve Growth projection data and modelling for next AM Plan iteration	CAM, Hamilton Water, Ec. Dev	$6,000 p.a. $12,000 Total Internal Staff Time	2 Years (2022-2023)
13.	Develop and implement an annual demand review process to ensure sufficient	CAM, Hamilton Water, EC. Dev	$17,500 $35,000 Total Internal Staff Time	2 Years (2022-2023)

Table 82: Improvement Plan
*** p.a – per annum**

TASK	TASK	RESPONSIBILITY	RESOURCES REQUIRED	DRAFT TIMELINE
	knowledge is available to inform future planning			
14.	Analyze operational budget to improve AM allocations for lifecycle activities	CAM, Hamilton Water, Finance	$10,000 p.a. $30,000 Total Internal Staff Time	3 Years (2022-2024)
15.	Analyze maintenance activities to identify future needs and recommended actions	CAM, Hamilton Water	$10,000 p.a. $40,000 Total Internal Staff Time	4 Years (2022-2025)
16.	Develop Renewal forecasting prioritization to optimize resources and ensure level of services can be maintained	CAM, Hamilton Water	$6,000 p.a. $24,000 Total Internal Staff Time	4 Years (2022-2025)
17.	Improve annual engagement survey process to optimize engagement and respondents	CAM, Hamilton Water, Communications	$35,000 p.a. $140,000 Total Internal Staff Time	4 Years (2022-2025)
18.	Review BIMA Scorecard reporting and ensure data and assumptions are consistent with ministry and City reporting and develop additional technical metrics.	CAM, Hamilton Water, Continuous Improvement	$2,500 p.a. $5,000 Total Internal Staff Time	2 Years (2022-2023)
19.	Standardize and develop risk management knowledge along with supporting documentation	CAM, Engineering Services, Continuous Improvement & Quality	$12,500 p.a. $25,000 Total Internal Staff Time	2 Years (2022-2023)
20.	Identify stormwater assets in other divisions and incorporate into next AM Plan	CAM, Hamilton Water	$10,000 p.a. $30,000 Total Internal Staff Time	3 Years (2022-2024)

Table 82: Improvement Plan
*** p.a – per annum**

TASK	TASK	RESPONSIBILITY	RESOURCES REQUIRED	DRAFT TIMELINE
21.	Investigate sewer laterals repair/replacement procedure for private residence as City does not own asset but acts as asset owner	CAM, Hamilton Water	$4,000 p.a. $8,000 Total Internal Staff Time	2 Years (2022-2023)
22.	Further develop vertical asset knowledge for future iterations of AM Plans	CAM, Hamilton Water	$50,000 p.a. $150,000 p.a. Internal Staff Time, Tender Process	3 Years (2022-2024)
23.	Improve asset replacement costs by vetting with current market prices instead of historical costs/estimates or internal models	CAM, Hamilton Water, Finance	$30,000 p.a. $90,000 Total Internal Staff Time	3 Years (2022-2024)
24.	Refine acquisition model to ensure projections are accurate and updated	CAM, Hamilton Water, Ec.Dev., Finance	$7,000 p.a. Internal Staff Resources	Annual
25.	Implement additional technical metrics for SWM ponds and minor culverts	CAM, TOM	$5,000 p.a Internal Staff Time	Annual
26.	Separate & validate stormwater technical metrics reported in the BIMA tool	CAM, Hamilton Water	$5,000 p.a Internal Staff Time	Annual
27.	Ensure new technical metrics are considering different lifecycle stages (e.g. acquisition, disposal)	CAM, Hamilton Water	$2,000 p.a $6.000 Total Internal Staff Time	3 Years (2022-2024)

4.7.3 Monitoring and Review Procedures

This AM Plan will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets as a result of budget decisions.

The AM Plan will be reviewed and updated on a regular basis to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, acquisition and asset disposal costs and planned budgets. These forecast costs and proposed budget will be incorporated into the Long-Term Financial Plan once completed.

4.7.4 Performance Measures

The effectiveness of this AM Plan can be measured in the following ways:

- The degree to which the required forecast costs identified in this AM Plan are incorporated into the long-term financial plan,
- The degree to which the 1-10 year detailed works programs, budgets, business plans and corporate structures consider the 'global' works program trends provided by the AM Plan,
- The degree to which the existing and projected service levels and service consequences, risks and residual risks are incorporated into the Strategic Planning documents and associated plans,
- The Asset Renewal Funding Ratio achieving the Organisational target (this target is often 90 – 100%).

REFERENCES

- IPWEA, 2006, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
- IPWEA, 2015, 3rd edn., 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
- IPWEA, 2008, 'NAMS.PLUS Asset Management', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/namsplus.
- IPWEA, 2015, 2nd edn., 'Australian Infrastructure Financial Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/AIFMM.
- IPWEA, 2020 'International Infrastructure Financial Management Manual', Institute of Public Works Engineering Australasia, Sydney
- IPWEA, 2018, Practice Note 12.1, 'Climate Change Impacts on the Useful Life of Assets', Institute of Public Works Engineering Australasia, Sydney
- IPWEA, 2012, Practice Note 6 Long-Term Financial Planning, Institute of Public Works Engineering Australasia, Sydney, https://www.ipwea.org/publications/ipweabookshop/practicenotes/pn6
- IPWEA, 2014, Practice Note 8 – Levels of Service & Community Engagement, Institute of Public Works Engineering Australasia, Sydney, https://www.ipwea.org/publications/ipweabookshop/practicenotes/pn8
- ISO, 2014, ISO 55000:2014, Overview, principles and terminology
- ISO, 2018, ISO 31000:2018, Risk management – Guidelines

Hamilton

ASSET MANAGEMENT PLAN FOR CORE ASSETS

General Issues Committee

June 15, 2022

PAT LEISHMAN
DIRECTOR OF CORPORATE ASSET MANAGMENT

Public Works
Corporate Asset Management Office

General Information

Recommendation

To approve the Asset Management Overview and Plans for Core Assets per O. Reg 588/17.

No financial commitments at this time. Findings will be used to inform the 2023 tax and rate supported budget process.

Asset Management Goal

- To meet a required level of service (LOS), in the most cost-effective manner, through the management of assets for present and future customers.

Benefits

- Governance and accountability,
- Effective and sustainable decisions,
- Enhanced customer service,
- Effective risk management,
- Improved financial efficiency.

Ontario

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

Ontario Regulation 588/17 Mandates

Asset Management Policy PW19053

2019

Information Report PW22037

JULY 1, 2022

Asset Management Plan: Core Assets PW22048

- Transportation
  - (Roads, Engineered Structures),
- Water Works
  - (Water, Wastewater, Stormwater),
- Current LOS with cost to maintain.

Asset Management Plan: Non-Core Assets

- All remaining assets
- Current LOS with cost to maintain

JULY 1, 2024

JULY 1, 2025

Proposed LOS and Financial Strategy Completed

LOS – Levels of Service

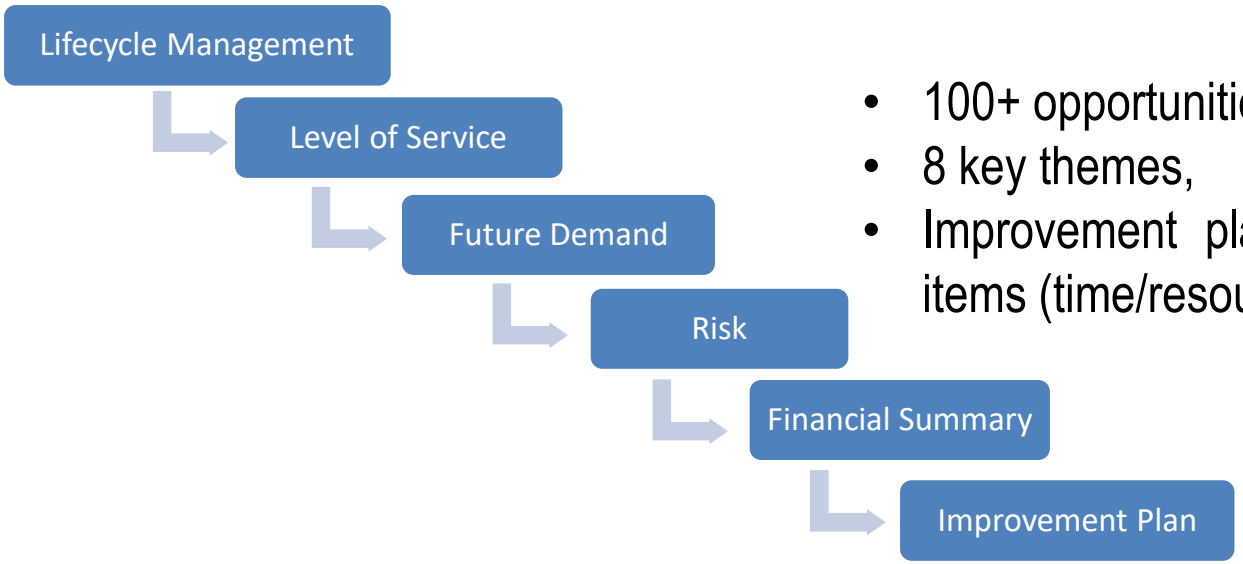
Asset Management Approach

Principles

- Adopt a lifecycle approach,
- Endorse evidence based decision making,
- Embrace continuous improvement,
- Provide optimal value,
- Develop service knowledge.

Lifecycle Management

Plan Components



- 100+ opportunities for improvement,
- 8 key themes,
- Improvement plan identified on all items (time/resources).

Issues/Opportunities

Asset Information (Data)

- AM Planning starts with data (registry – age, location, condition, quantity etc.),
- Data confidence scale developed in order to quantify concerns,

Data Confidence Grading Scale		
Confidence Grade	**Reliability**	**Accuracy**
A - Very High	Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment.	Dataset is complete and Estimated to be accurate +/- 2%
B - High	As above with minor shortcomings e.g. some data old, or missing.	Dataset is complete Estimated to be accurate +/- 10%
C - Medium	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample	Dataset is substantially complete but up to 50% extrapolated data and accuracy estimate +/- 25%
D - Low	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis.	Most data is estimated or extrapolated. Accuracy +/- 40%
E - Very Low	None or very little data held.	Dataset does not exist or very little accuracy.

- Data found to be missing, old, incomplete, duplicated and not aligned to AM processes that are still being developed.

Issues/Opportunities

Asset Condition

Continuous Improvement

- No condition process for many assets,
- Lack of condition assessments (CA's),
- Use of Estimated Service Life (ESL) and age to approximate condition.

Lifecycle Management

Continuous Improvement

- Not all assets are properly programmed,
- Impact of acquired assets on O&M activities,
- Timing of renewals requires more analysis.

Levels of Service

Continuous Improvement

- LOS is critical for asset owners to understand,
- Owners are learning about and starting to embrace LOS,
- Standardized procedure being finalized,
- Community engagement is paramount and will be ongoing.

Issues/Opportunities

Replacement Cost

- Variations exist in current data,
- Need to apply a robust process across all asset classes.

Demand & Risk Management Improvements

- Not yet extensive requirements in O. Reg 588/17,
- Required by 2025; currently in development.

Financial Management Improvements

- Planning horizon expanded from 10 to 30 years,
- Infrastructure gap at low-med confidence,
- Future Long-Term Financial Plan will connect the budget to AM Plans.

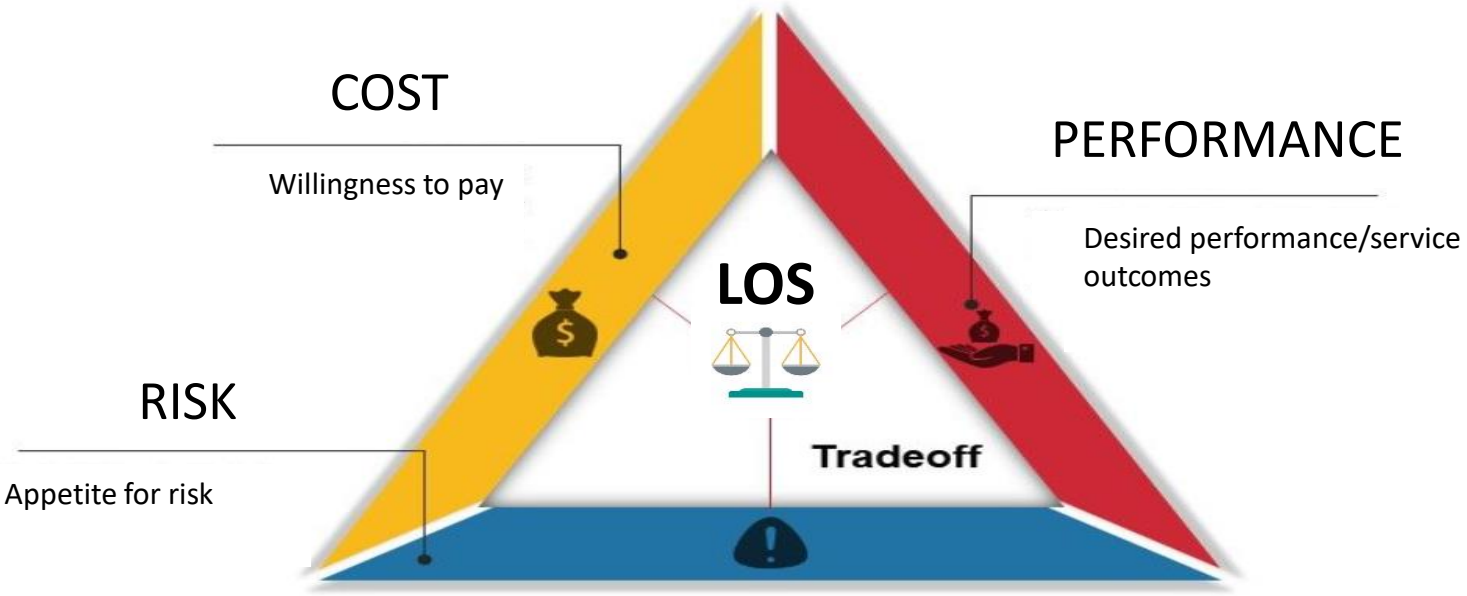
Governance

- Need for standard processes evident; currently in development,
- Clearly defined asset ownership apparent yet still some gray areas.

AM Plans - Findings

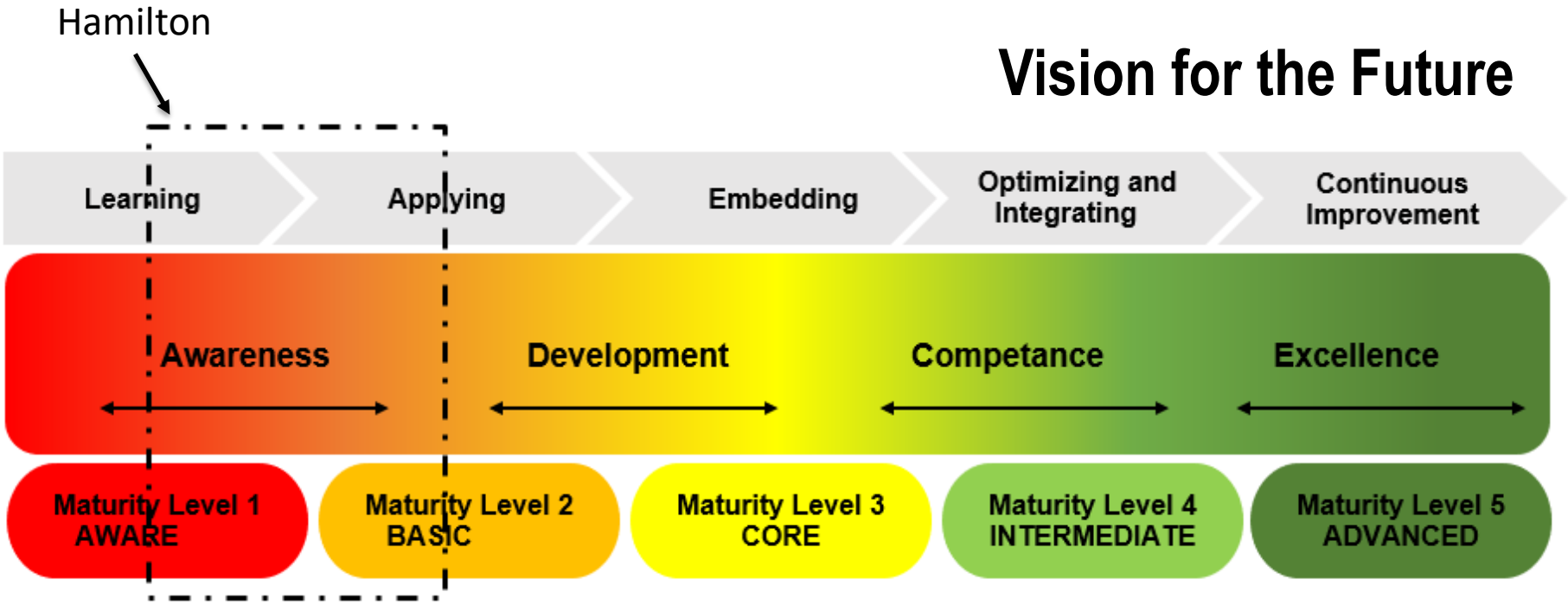
Asset Category	Replacement Value (B)	Average Age (Years)	Average Condition	Renewal Funding Ratio	10 Year O&M & Renewal Funding Ratio	Funding Gap per year (M)	Funding Gap over 10 years (M)
Water	$4.3	34	Fair	75%	85%	$20	$202
Data Confidence	Low	Medium	Low	Low-Med	Low-Med	Low-Med	Low-Med
Wastewater	$7.3	30	Fair	46%	70%	$49.8	$498
Data Confidence	Low	Medium	Medium	Low-Med	Low-Med	Low-Med	Low-Med
Storm Water	$3.1	22	Good	9.5%	42%	$31	$312
Data Confidence	Medium	Medium	Low	Low-Med	Low-Med	Low-Med	Low-Med
Road Network	$5.1	16	Fair	14%	66%	$87	$866
Data Confidence	Low	Low	Medium	Low-Med	Low-Med	Low-Med	Low-Med
Engineered Structures	$1.5	33	Good	33%	67%	$8.1	$81
Data Confidence	Medium	Medium	Medium	Low-Med	Low-Med	Low-Med	Low-Med
TOTAL	**$21.3**	Funding Gap $195.9 M annually (data confidence low-med)				**$195.9**	**$1,959**

Future State – By 2025



- Proposed levels of service will be achieved through the balance of cost, risk and service/asset performance.
- Prioritization of operating and capital funds becomes critical in order to ensure the best balance is achieved.
- Must find the balance that delivers the greatest value to the City.

Asset Management Journey



- Reset the conversation: Managing assets vs asset management,
- Definition of Asset Owner: Service provider “owns” the assets,
- CAM Office collaboration/engagement with asset owners and stakeholders,
- Corporate Asset Management Program development.

Many Thanks to the Team

CAM Office

- Amber Dewar, Sean Hilderley, Jasmine MacDonald and Alix Luciani

Corporate Services Financial Planning and Policy Division

Public Works

- Transportation Asset Owner (Chief Road Official Edward Soldo),
- Water Works Asset Owner (Acting Director Hamilton Water Nick Winters),
- Engineering Services,
- Hamilton Water,
- Transportation, Operations & Maintenance.

Planning and Economic Development

- Transportation Planning,
- City Planning and Strategic Growth.

CITY OF HAMILTON
PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT
Tourism and Culture Division

TO:	Mayor and Members General Issues Committee
COMMITTEE DATE:	June 15, 2022
SUBJECT/REPORT NO:	Pilot Program, Partnership Between Hamilton Civic Museums and the Hamilton Public Library for Free Museum Admission (PED20069(a)) (City Wide) **(Outstanding Business List Item)**
WARD(S) AFFECTED:	City Wide
PREPARED BY:	John Summers (905) 546-2424 Ext. 1747
SUBMITTED BY: **SIGNATURE:**	Carrie Brooks-Joiner Director, Tourism and Culture Planning and Economic Development Department 

RECOMMENDATION

(a) Staff be directed to extend the Pilot Program, Partnership Between Hamilton Civic Museums and the Hamilton Public Library for Free Museum Admission, for a period of two years, until March 25, 2024; and

(b) That staff continue to monitor the impact of this program on Hamilton Civic Museums' revenue, attendance and visitor demographics and report back to the General Issues Committee for direction.

EXECUTIVE SUMMARY

A one-year pilot program offering Hamilton Public Library card holders' free general admission to the Hamilton Civic Museums was launched in February 2019. In March 2020, the program was extended for an additional two years (See Report PED20069).

Since March 2020, the Hamilton Civic Museums have experienced minimal attendance owing to the COVID-19 pandemic. In order to properly assess the impact of this program on Hamilton Civic Museums' revenue, attendance and visitor demographics, a further two-year extension to March 25, 2024 is Recommended.

Alternatives for Consideration - Not Applicable

FINANCIAL - STAFFING - LEGAL IMPLICATIONS

Financial: Implementation of the extension of the pilot program is not expected to have a significant adverse effect on museum admission revenue.

Staffing: No impact on staffing levels.

Legal: N/A

HISTORICAL BACKGROUND

At the January 16, 2019, General Issues Committee meeting, it was resolved:

(a) "That staff be directed to conduct a one-year pilot project that allows Hamilton library card holders free general admission (excluding paid special events, booked programs and workshops) to any of the City of Hamilton operated museums (Dundurn National Historic Site, Hamilton Military Museum, Fieldcote Memorial Park and Museum, Griffin House Museum, Whitehern Historic House and Garden, Hamilton Children's Museum, Battlefield House Museum and Park and the Hamilton Museum of Steam and Technology); and

(b) That staff report back to the General Issues Committee after a period of one year with the outcomes of the pilot project that provides free museum visits with a Hamilton Public Library card."

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

The pilot program aligns with Action 7.1 in Transforming Hamilton Through Culture: The Cultural Plan 2013: "Work with major cultural institutions and organizations (such as the Hamilton Public Library, local universities and colleges, arts service organizations) to identify, share and celebrate cultural assets" and Action 11.3 "Examine the feasibility of providing free admission opportunities to Hamilton's civic museums." The objective of the program was to determine if it would increase accessibility to Hamilton Civic Museums among residents for whom the admission price would otherwise be a barrier.

RELEVANT CONSULTATION

Internal

Director, Tourism and Culture Division, Planning and Economic Development Department

External

CEO and Chief Librarian, Hamilton Public Library

Manager, Communications, Hamilton Public Library

ANALYSIS AND RATIONALE FOR RECOMMENDATION

This program benefits residents by removing a financial barrier for access to Hamilton Civic Museums. It benefits the Hamilton Public Library by incentivizing resident registration for library cards. It aligns with Action 7.1 in Transforming Hamilton Through Culture: The Cultural Plan 2013 by establishing a partnership between Hamilton Civic Museums and the Hamilton Public Library and by exploring the feasibility of providing free admission opportunities to Hamilton Civic Museums.

More than 12,292 Hamilton residents as museum visitors were admitted with HPL cards from February 19, 2019 to January 31, 2020 (5,605 adults; 3,236 children; 2,677 family members; 541 seniors and 233 students). The total admission revenue showed only a slight variation from 2019 to 2020. The minor negative impact on admission revenue was offset by increases in merchandise sales and paid ticketed events (such as workshops).

Based on the limited data currently available on the profile of users of the library card and anecdotal visitor feedback, the pilot program successfully increased access to museum visitors for whom the price might otherwise have been a barrier.

The 2019 7% decline in established free special event attendance suggests that some residents took advantage of the library pass program to visit on regular admission days (which would previously have been ticketed) instead of visiting on the occasional free event days.

During the same period, the Hamilton Public Library saw a 48% year-over-year increase in new library card registrations which HPL staff attribute almost entirely to the incentive of free civic museum visitation.

ALTERNATIVES FOR CONSIDERATION

N/A

ALIGNMENT TO THE 2016 - 2025 STRATEGIC PLAN

Community Engagement and Participation

Hamilton has an open, transparent and accessible approach to City government that engages with and empowers all citizens to be involved in their community.

Culture and Diversity

Hamilton is a thriving, vibrant place for arts, culture, and heritage where diversity and inclusivity are embraced and celebrated.

APPENDICES AND SCHEDULES ATTACHED

N/A

JS:ac

Hamilton

CAPITAL PROJECTS WORK-IN-PROGRESS REVIEW SUB-COMMITTEE REPORT 22-002

9:30 a.m.
May 26, 2022
Council Chambers
Hamilton City Hall

Present: Councillors M. Pearson (Chair), J.P. Danko (Vice-Chair), N. Nann and M. Wilson

THE CAPITAL PROJECTS WORK-IN-PROGRESS REVIEW SUB-COMMITTEE PRESENTS REPORT 22-002 AND RESPECTFULLY RECOMMENDS:

1. Capital Project Closing Report as of December 31, 2021 (FCS21080(b)) (City Wide) (Item 10.1)

(a) That the General Manager, Finance and Corporate Services, be authorized to transfer a net amount of $314,962 to the Unallocated Capital Levy Reserve (108020) and draw $8,052 from other reserves as outlined in Appendix "A" to Capital Projects Work-in-Progress Review Sub-Committee Report 22-002;

(b) That the General Manager, Finance and Corporate Services, be directed to close the completed and / or cancelled capital projects listed in Appendix "B" to Capital Projects Work-in-Progress Review Sub-Committee Report 22-002, in accordance with the Capital Projects Closing and Monitoring Policy;

(c) That Appendix "C" to Report FCS21080(b), Capital Projects Budget Appropriations for the period covering October 1, 2021 through December 31, 2021, be received as information;

(d) That Appendix "C" to Capital Projects Work-in-Progress Review Sub-Committee Report 22-002, Capital Projects Budget Appropriations of $250,000 or greater and Capital Project Reserve Funding Requiring Council Approval, be approved;

(e) That Appendix "D" to Capital Projects Work-in-Progress Review Sub-Committee Report 22-002, Capital Projects Requiring a Budget Adjustment, be approved.

2. Capital Projects Status Report as of December 31, 2021 (FCS21079(b)) (City Wide) (Item 10.2)

(a) That Appendix "A" to Report FCS21079(b) respecting Capital Projects Status Report – Tax Supported, as of December 31, 2021, be received;

(b) That Appendix "B" to Report FCS21079(b) respecting Capital Projects Status Report – Rate Supported, as of December 31, 2021, be received.

(c) That Confidential Appendix "C" to Report FCS21079(b) respecting Capital Projects Status Report as of December 31, 2021, be received and remain confidential.

FOR INFORMATION:

(a) CHANGES TO THE AGENDA (Item 2)

The Committee Clerk advised that there were no changes to the agenda.

The agenda for the May 26, 2022 Capital Projects Work-In-Progress Review Sub-Committee meeting was approved, as presented.

(b) DECLARATIONS OF INTEREST (Item 3)

There were no declarations of interest.

(c) APPROVAL OF MINUTES OF PREVIOUS MEETING (Item 4)

(i) February 11, 2022 (Item 4.1)

The Minutes of the February 11, 2022 meeting of the Capital Projects Work-In-Progress Review Sub-Committee meeting were approved, as presented.

(d) ADJOURNMENT (Item 15)

There being no further business, the Capital Projects Work-In-Progress Review Sub-Committee adjourned at 10:00 a.m.

Respectfully submitted,

Councillor Pearson, Chair
Capital Projects Work-in-Progress
Sub-Committee

Angela McRae
Legislative Coordinator
Office of the City Clerk

CITY OF HAMILTON
CAPITAL PROJECT CLOSINGS
AS OF DECEMBER 31, 2021
Projects impacting the Unallocated Capital Levy Reserve and Other Sources

Year Approved	ProjectID	Description	Surplus/ (Deficit) ($)	Reserve	Description
Projects requiring funds					
2008	4140846106	Parkside Hills - Phase 1A	(62,389.26)	108020	Unalloc Capital Levy
2017	7101758002	Alexander Park Spraypad	(4,469.34)	108020	Unalloc Capital Levy
2018	3541841123	Ancaster Tennis Bubble	(3,640.56)	108020	Unalloc Capital Levy
2018	6731841822	Riverdale HUB	(19.95)	108020	Unalloc Capital Levy
2019	3541955001	Program Yard Capital Renewal	(8,715.39)	108020	Unalloc Capital Levy
			(79,234.50)		
Projects returning funds				108020	Unalloc Capital Levy
2015	4031555215	Highway 403 Ramp Studies	888.25	108020	Unalloc Capital Levy
2015	4401556506	Vincent Massey Park Development	44,179.41	108020	Unalloc Capital Levy
2016	7101654610	Carlisle & Beverly Arena Accessibility Upgrades & Expansion	7,068.61	108020	Unalloc Capital Levy
2017	3541741013	Program - Firestations Facility Upgrade	7,454.23	108020	Unalloc Capital Levy
2017	7101741701	Program - Community Halls Retrofits	5,371.11	108020	Unalloc Capital Levy
2018	4401856815	Caterini Park (Binbrook)	13,556.36	108020	Unalloc Capital Levy
2018	7101854806	Dundas Lawn Bowling Club Imprv	21,041.26	108020	Unalloc Capital Levy
2018	7101854815	Westoby Parking Resurfacing	41,359.64	108020	Unalloc Capital Levy
2019	3501957001	Corp Trunk Radio Upgrade	163,645.84	108020	Unalloc Capital Levy
2019	7401941603	Multi Agency Training Centre - Facility Upgrades	35,488.89	108020	Unalloc Capital Levy
2020	4032020048	Durable Pavement Markings	3,069.79	108020	Unalloc Capital Levy
2020	4032041042	District West - Dundas Changeroom & Meeting Room Improvements	4,257.39		
				108020	Unalloc Capital Levy
2020	4032058001	Consultation and Accommodation	2,046.22	108020	Unalloc Capital Levy
2020	4032080001	Creekside Drive Developer Road	8,036.81	108020	Unalloc Capital Levy
2020	4452053444	Tree Planting Program	1,979.89	108020	Unalloc Capital Levy
2020	4662016102	Traffic Calming	13,351.32	108020	Unalloc Capital Levy
2021	4662120140	New bump-outs at Barton & Lottridge and Barton & Barnesdale	21,401.79	108020	Unalloc Capital Levy
			394,196.81		
Net impact to the Unallocated Capital Levy Reserve			**314,962.31**		
Projects requiring funds					
2021	7642151102	Automated CPR Units	(8,052.25)	100033	EMS Equipment Reserve
Net impact to Other Reserves			**(8,052.25)**		
Total Net impact to the Unallocated Capital Levy Reserve & Other Reserves			**306,910.06**		

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YEAR APPROVED	PROJECT ID	DESCRIPTION	APPROVED BUDGET ($)	REVENUES ($)	EXPENDITURES ($)	PROJECT SURPLUS/ (DEFICIT) ($)	% SPENT
			a	b	c	d = b - c	e=c/a
UNALLOCATED CAPITAL LEVY RESERVE							
2008	4140846106	Parkside Hills - Phase 1A	603,300.00	603,300.00	665,689.26	-62,389.26	110.3%
2015	4031555215	Highway 403 Ramp Studies	64,440.00	64,453.15	63,564.90	888.25	98.6%
2015	4401556506	Vincent Massey Park Development	624,000.00	624,000.00	579,820.59	44,179.41	92.9%
2016	7101654610	Carlisle & Beverly Arena Accessibility Upgrades & Expansion	790,000.00	790,150.00	783,081.39	7,068.61	99.1%
2017	3541741013	Program - Firestations Facility Upgrade	132,000.00	132,000.00	124,545.77	7,454.23	94.4%
2017	7101741701	Program - Community Halls Retrofits	85,000.00	91,028.85	85,657.74	5,371.11	100.8%
2017	7101758002	Alexander Park Spraypad	771,598.00	632,221.00	636,690.34	-4,469.34	82.5%
2018	3541841123	Ancaster Tennis Bubble	60,000.00	60,000.00	63,640.56	-3,640.56	106.1%
2018	4401856815	Caterini Park (Binbrook)	477,000.00	477,000.00	463,443.64	13,556.36	97.2%
2018	6731841822	Riverdale HUB	2,400,821.00	2,400,821.00	2,400,840.95	-19.95	100.0%
2018	7101854806	Dundas Lawn Bowling Club Imprv	175,000.00	175,000.00	153,958.74	21,041.26	88.0%
2018	7101854815	Westoby Parking Resurfacing	388,000.00	388,000.00	346,640.36	41,359.64	89.3%
2019	3501957001	Corp Trunk Radio Upgrade	5,566,283.00	5,566,283.00	5,402,637.16	163,645.84	97.1%
2019	3541955001	Program Yard Capital Renewal	91,097.78	91,097.78	99,813.17	-8,715.39	109.6%
2019	7401941603	Multi Agency Training Centre - Facility Upgrades	250,000.00	250,000.00	214,511.11	35,488.89	85.8%
2020	4032020048	Durable Pavement Markings	5,000.00	5,000.00	1,930.21	3,069.79	38.6%
2020	4032041042	District West - Dundas Changeroom & Meeting Room Improvements	20,000.00	20,000.00	15,742.61	4,257.39	78.7%
2020	4032058001	Consultation and Accommodation	4,000.00	4,000.00	1,953.78	2,046.22	48.8%
2020	4032080001	Creekside Drive Developer Road	198,000.00	198,893.81	190,857.00	8,036.81	96.4%
2020	4452053444	Tree Planting Program	1,345,000.00	1,345,000.00	1,343,020.11	1,979.89	99.9%
2020	4662016102	Traffic Calming	225,000.00	225,000.00	211,648.68	13,351.32	94.1%
2021	4662120140	New bump-outs at Barton & Lottridge and Barton & Barnesdale	60,000.00	60,000.00	38,598.21	21,401.79	64.3%
TOTAL FUNDS TO UNALLOCATED CAPITAL LEVY (22)			**14,335,539.78**	**14,203,248.59**	**13,888,286.28**	**314,962.31**	**96.9%**
OTHER PROGRAM SPECIFIC RESERVES							
2021	7642151102	Automated CPR Units	500,000.00	500,000.00	508,052.25	-8,052.25	101.6%
TOTAL FUNDS FROM PROGRAM SPECIFIC RESERVES (1)			**500,000.00**	**500,000.00**	**508,052.25**	**-8,052.25**	**101.6%**
DELAYED/CANCELLED PROJECTS							
2017	4141746100	City Share of Servicing Costs under Subdivision Agreements	1,207,894.64	0.00	0.00	0.00	0.0%
2017	5141796011	Intensification Infrastructure Upgrades Program - Water	200,000.00	0.00	0.00	0.00	0.0%
2018	4031855815	South Mountain Arterial Study (SMATS)	0.00	0.00	0.00	0.00	0.0%
2019	4031955985	Highway 403 Connections Study	0.00	0.00	0.00	0.00	0.0%
2019	5121951900	Waste Collection Equipment - Downtown/BIA	165,000.00	0.00	0.00	0.00	0.0%
2019	6731941113	COCHI - Transitional Ops Yr 3	0.00	0.00	0.00	0.00	0.0%
2020	3542010555	2020 Chargebacks - Facilities	0.00	0.00	0.00	0.00	0.0%
2020	3722051000	Commonwealth Square Timber Railing Replacement	0.00	0.00	0.00	0.00	0.0%
2020	4032011777	Pavement Degradation Funds	0.00	0.00	0.00	0.00	0.0%
2020	4032049555	QA-QC Service Contract Program	0.00	0.00	0.00	0.00	0.0%
2020	4242009305	Birch Avenue Greenspace	2,000.00	0.00	0.00	0.00	0.0%
2020	5142049555	QA-QC Service Contract Program	0.00	0.00	0.00	0.00	0.0%
2020	5162060302	Emergency Repairs - Cross Connections Program	0.00	0.00	0.00	0.00	0.0%
2020	5162060533	Trenchless Manhole Rehabilitation	0.00	0.00	0.00	0.00	0.0%
2020	5162060576	Sewer Lateral Condition Assessment Program	0.00	0.00	0.00	0.00	0.0%
2020	5182017549	Concrete Box Culvert Rehab/Repair - T.O.M.	0.00	0.00	0.00	0.00	0.0%
2021	4242109101	Hydro poles outlets - Locke St	5,000.00	0.00	0.00	0.00	0.0%
2021	4242109803	William Connell Park WiFi	99,000.00	0.00	0.00	0.00	0.0%
2021	4402110555	2021 Chargebacks- Open Space	0.00	0.00	0.00	0.00	0.0%
2021	4662120526	New Intersection Pedestrian Signal (IPS) - Barton St and Milton Ave	0.00	0.00	0.00	0.00	0.0%
2021	4662120527	New Intersection Pedestrian Signal (IPS) - Sherman Ave and Dunsmure Rd	0.00	0.00	0.00	0.00	0.0%
2021	4662120528	New Intersection Pedestrian Signal (IPS) - Wentworth & King William (near	0.00	0.00	0.00	0.00	0.0%
2021	4662220008	New Traffic Signal Installation Program	0.00	0.00	0.00	0.00	0.0%

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2021	4902141202	York Parkade Fire Door and Window Replacement	100,000.00	0.00	0.00	0.00	0.0%
2021	5162171311	Highway 8 - Bond to Woodleys Lane	0.00	0.00	0.00	0.00	0.0%
TOTAL DELAYED/CANCELLED PROJECTS (25)			**206,000.00**	**0.00**	**0.00**	**0.00**	**0.0%**
COMPLETED PROJECTS							
CORPORATE SERVICES DEPARTMENT(Tax Budget)							
Information Technology							
2013	3501357303	GIS Upgrades	390,000.00	387,628.82	387,628.82	0.00	99.4%
CORPORATE PROJECTS DEPARTMENT (Tax Budget)							
Councillor Infrastructure Program							
2017	4241709105	Water Bottle Filling Stations	196,000.00	123,155.08	123,155.08	0.00	62.8%
2017	4241709201	AR - Ferguson Ave N - Simcoe to Burlington (W2 A/R)	1,400,000.00	1,386,785.69	1,386,785.69	0.00	99.1%
2017	4241709403	Kenilworth Christmas Wreaths	30,145.00	28,042.06	28,042.06	0.00	93.0%
2018	4241809305	Pedestrian Crossing - Victoria Ave N at Copeland	75,000.00	35,154.80	35,154.80	0.00	46.9%
2019	4241909143	RA Riddell & Gilkson Prk Imprv	120,000.00	115,450.40	115,450.40	0.00	96.2%
2019	4241909201	Robinson Speed Cushion	60,000.00	50,437.26	50,437.26	0.00	84.1%
2019	4241909230	Hess Village Lighting	20,000.00	17,960.68	17,960.68	0.00	89.8%
2019	4241909216	Eastwood Park Playground	126,000.00	120,775.11	120,775.11	0.00	95.9%
2019	4241909409	Rosedale Playground Imprv	200,000.00	181,725.71	181,725.71	0.00	90.9%
2019	4241909603	Mohawk Sports Park Lighting	300,000.00	179,605.42	179,605.42	0.00	59.9%
2019	4241909702	Confidential - 155 Macassa Feasibility Inv	28,489.81	28,489.81	28,489.81	0.00	100.0%
2019	4241909703	TB McQuesten Prk Entrace	98,500.00	75,281.77	75,281.77	0.00	76.4%
2020	4242009141	Sir Allan MacNab Tennis Court	40,000.00	39,686.48	39,686.48	0.00	99.2%
2020	4242009203	Gum Removal Kit	6,000.00	5,339.97	5,339.97	0.00	89.0%
2020	4242009402	AR Rosedale Court	100,000.00	82,243.59	82,243.59	0.00	82.2%
2021	4242109201	Ferguson St - shrubs & baskets	18,000.00	6,432.39	6,432.39	0.00	35.7%
2021	4242109304	Lucy Park security fence	60,000.00	40,187.23	40,187.23	0.00	67.0%
2021	4242109901	Summit Park Pathway Connection	10,000.00	3,877.43	3,877.43	0.00	38.8%
OUTSIDE BOARDS AND ANGENCIES (Tax Budget)							
City Housing							
2016	6181641602	City Housing Contribution	1,500,000.00	1,499,999.80	1,499,999.80	0.00	100.0%
2016	6181641603	Repairs-W7 City Housing Units	814,682.00	864,504.00	864,504.00	0.00	106.1%
2019	6181941602	Unit Retrofits/Bay/Cannon Development	500,000.00	500,000.00	500,000.00	0.00	100.0%
Healthy & Safe Communities (Tax Budget)							
Housing Services							
2015	6731541504	IAH Extension - Admin	1,526,600.00	1,526,600.26	1,526,600.26	0.00	100.0%
2015	6731541505	IAH Extension - Rental Housing	13,450,000.00	13,450,000.00	13,450,000.00	0.00	100.0%
2016	6731641603	Capital Infrastructure Emergency Shelters	13,558,030.00	13,558,030.00	13,558,030.00	0.00	100.0%
Children's Services and Neighbourhood Development							
2018	6731841800	Red Hill Family Centre Reno	841,834.00	607,365.11	607,365.11	0.00	72.1%
2019	6501941901	Biindigen Roof Project	590,000.00	375,285.64	375,285.64	0.00	63.6%
2020	6792041001	Bernie Morelli Fam Centre Reno	510,000.00	408,964.36	408,964.36	0.00	80.2%
Hamilton Fire Department							
2019	7401951600	Annual Fire Equipment Replacement	1,268,000.00	1,077,489.69	1,077,489.69	0.00	85.0%

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			a	b	c	d = b - c	e=c/a
Hamilton Paramedic Service							
2021	7642151100	Annual Vehicle Replacement	2,113,000.00	1,839,701.10	1,839,701.10	0.00	87.1%
2021	7642151101	Annual Equipment Replacement	274,000.00	226,395.10	226,395.10	0.00	82.6%
2021	7642151104	Community Paramedicine Long Term Care	0.00	284,115.95	284,115.95	0.00	0.0%
Recreation							
2021	7102154701	ASAC - Pickleball Courts	110,000.00	97,230.00	97,230.00	0.00	88.4%
Planning & Economic Development (Tax Budget)							
Growth Management & Economic Development							
2003	3620374100	SC-Strm Drainage Watercourse 7	7,590,004.17	5,097,577.96	5,097,577.96	0.00	67.2%
2007	3620707690	North Glanbrook Industrial Business Park	4,197,500.00	4,536,795.46	4,536,795.46	0.00	108.1%
2007	4030780741	Binbrook Rd Roundabout	761,144.03	691,648.15	691,648.15	0.00	90.9%
2009	4140946100	2009-City Share of Servicing Costs	578,274.29	362,917.20	362,917.20	0.00	62.8%
2010	4141046108	Meadowlands of Ancaster - Ph 9	214,435.53	214,435.53	214,435.53	0.00	100.0%
2011	4031180583	Upper Mnt Albion Urbanization	134,000.00	34,622.54	34,622.54	0.00	25.8%
2012	4141246110	Summit Park Ph 7 Internal Wrks	312,000.00	280,374.39	280,374.39	0.00	89.9%
2013	4031380386	Parkside Dr Urbanization - Phase 1	6,865,000.00	6,862,122.84	6,862,122.84	0.00	100.0%
2013	4031380387	Roundabout @ Isaac Brock and First Street	690,498.91	690,587.03	690,587.03	0.00	100.0%
2014	4141446105	Heritage Commons	85,000.00	80,565.83	80,565.83	0.00	94.8%
2015	3621555700	2015-2019 Econ Dev Strategy	75,000.00	75,000.00	75,000.00	0.00	100.0%
2016	4141646102	Ancaster Wooodlands Subd	156,669.61	156,669.61	156,669.61	0.00	100.0%
2016	4141646106	Winona Crossing	15,141.47	15,141.47	15,141.47	0.00	100.0%
2016	4141646107	Fairground West	405,685.63	405,685.63	405,685.63	0.00	100.0%
2017	4141746107	Red Hill Ph 1 and 2	1,864,493.38	1,748,387.01	1,748,387.01	0.00	93.8%
2018	4141846104	Orlick Aeropark Ph 1 Watermain	80,029.35	80,029.35	80,029.35	0.00	100.0%
2018	4401856801	Confidential - RE1801	8,130,000.00	5,817,323.36	5,817,323.36	0.00	71.6%
2019	3561950120	Confidential - RE1900	2,162,407.19	2,162,407.19	2,162,407.19	0.00	100.0%
2020	4142046101	Upper Sherman Extension	551,258.89	496,002.45	496,002.45	0.00	90.0%
2020	4142046104	555 Sanatorium Road Dev	30,101.59	30,101.59	30,101.59	0.00	100.0%
Transportation, Planning & Parking							
2014	4041417125	Cannon Bi-Directnl Cycle Trck	889,006.28	889,006.28	889,006.28	0.00	100.0%
2019	4901955900	Parking Master Plan Consultant	200,000.00	198,191.00	198,191.00	0.00	99.1%
2021	4032117054	Hatt Street Bikeway	113,956.43	113,956.43	113,956.43	0.00	100.0%
Public Works (Tax Budget)							
Transportation Operations & Maintenance							
2019	4031910012	Railway Roadway Crossings Rehabilitation Program	84,000.00	84,000.00	84,000.00	0.00	100.0%
2019	4661920019	Traffic Controller Replacement Program	345,000.00	345,000.00	345,000.00	0.00	100.0%
2020	4032041762	Yard Facility Maintenance and Improvement Program	98,000.00	98,000.00	98,000.00	0.00	100.0%
2020	4662015820	Traffic Counts Program	122,518.33	122,518.33	122,518.33	0.00	100.0%
2020	4662020011	Traffic Signal Upgrades	381,000.00	381,000.00	381,000.00	0.00	100.0%
2020	4662020017	Traffic Signal LED Lighting Upgrade Program	50,000.00	50,000.00	50,000.00	0.00	100.0%
2020	4662020024	New Traffic Signal - Glanair at Upper James	390,655.23	390,655.23	390,655.23	0.00	100.0%
2020	4662020720	Plastic Pavement Marking Rehabilitation	400,000.00	400,000.00	400,000.00	0.00	100.0%
Transit Division							
2013	5301384001	Rapid Transit - Quick Wins	11,993,000.00	8,690,832.58	8,690,832.58	0.00	72.5%

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Waste Management							
2016	5121655610	2020 Waste System Planning	759,843.26	715,238.72	715,238.72	0.00	94.1%
2020	5122051001	Waste Management By-Law - Support Fleet Acquisition	87,509.70	87,509.70	87,509.70	0.00	100.0%
2020	5122051002	Waste Collections - Safe-Stop Trailer Attenuator	31,361.47	31,361.47	31,361.47	0.00	100.0%
2020	5122094000	Transfer Station/CRC Maintenance & Capital Improvement Program	215,272.78	215,272.78	215,272.78	0.00	100.0%
Energy, Fleet & Facilities							
2012	7101254201	Scott Park - Bernie Morelli Recreation Centre (BMRC-NSC)	24,557,420.21	24,557,420.21	24,557,420.21	0.00	100.0%
2014	3541441401	Provincial Offences Administration Offices	37,387,998.00	37,631,807.52	37,631,807.52	0.00	100.7%
2015	3541541510	Control Ctre & Automation Upgr	456,324.73	456,309.48	456,309.48	0.00	100.0%
2016	3541641648	Program - Parking Lot Rehabilitation	344,617.29	344,617.29	344,617.29	0.00	100.0%
2016	7101641701	Program - Community Halls Retrofits	423,979.63	423,969.63	423,969.63	0.00	100.0%
2016	7101649601	Bernie Arbour Stadium - Upgrades	290,014.85	290,014.85	290,014.85	0.00	100.0%
2016	7101654612	Bobby Kerr & Trenholme Park Washroom Facilities	1,048,732.13	1,058,732.13	1,058,732.13	0.00	101.0%
2017	3541741603	Central Library Window Replacement	3,526,262.23	3,526,262.23	3,526,262.23	0.00	100.0%
2017	3721741600	Commonwealth Square & Summer's Lane	173,275.16	173,275.16	173,275.16	0.00	100.0%
2017	7101754701	Glanbrook Arena Elevator	819,831.05	750,622.05	750,622.05	0.00	91.6%
2018	7101854807	Dundas Valley Community Park Improvement & Pavillion Feasibility	148,852.53	148,852.53	148,852.53	0.00	100.0%
2019	3541941532	Program - Facility Capital Maintenance	357,076.15	356,988.60	356,988.60	0.00	100.0%
2019	3541941631	Program - Facilities Security	243,732.86	243,732.86	243,732.86	0.00	100.0%
2019	3541941901	Capital Lifecycle Renewal - Hamilton Farmer's Market	672,706.79	672,706.79	672,706.79	0.00	100.0%
2019	7101941701	Program - Community Halls Retrofits	76,932.64	76,932.64	76,932.64	0.00	100.0%
2019	7101954105	Program - Park & Fieldhouse Retrofits	74,664.38	74,664.38	74,664.38	0.00	100.0%
2020	3542041005	City Hall 5th & 6th Floor Renovations	201,497.84	201,497.84	201,497.84	0.00	100.0%
2020	4942051004	Street Sweeper Purchase	750,000.00	760,025.79	760,025.79	0.00	101.3%
Engineering Services							
2016	4031611610	Council Priority - Ward 10 Minor Rehabilitation	432,210.32	432,210.32	432,210.32	0.00	100.0%
2018	4661820540	Traffic Signal Modernization Coordinated with Construction	262,000.00	261,077.02	261,077.02	0.00	99.6%
2019	4031914405	Contaminated Soil & Rock Disposal Program	367,000.00	367,000.00	367,000.00	0.00	100.0%
2019	4031918218	OSIM Bridge, Culvert, Retaining Wall & Overhead Sign Inspections	50,000.00	50,000.00	50,000.00	0.00	100.0%
2019	4031918219	Structural Investigations and Reports	10,000.00	10,000.00	10,000.00	0.00	100.0%
2020	4032001099	Engineering Services Staffing Costs - Road	3,685,000.00	3,685,000.00	3,685,000.00	0.00	100.0%
2020	4032018218	OSIM Bridge, Culvert, Retaining Wall & Overhead Sign Inspections	230,000.00	230,000.00	230,000.00	0.00	100.0%
2020	4032019106	Hillcrest - Chedoke to end	244,041.91	244,041.91	244,041.91	0.00	100.0%
2020	4032055522	State of the Infrastructure - Asset Management	200,000.00	200,000.00	200,000.00	0.00	100.0%
2020	4042010004	Escarpment Slope & Appurtenance Stabilization Program	864,000.00	864,000.00	864,000.00	0.00	100.0%
Environmental Services							
2014	4451451004	Gage Park Tropical House	5,671,500.00	5,646,654.98	5,646,654.98	0.00	99.6%
2015	4401556504	Trails Master Plan Programming	415,300.00	415,193.22	415,193.22	0.00	100.0%
2019	4401941001	Cemetery Building Repairs	96,916.13	96,916.13	96,916.13	0.00	100.0%
2020	4402049101	Park Pathway Resurfacing Program	228,681.23	288,681.23	288,681.23	0.00	126.2%
Planning & Economic Development (Rate Budget)							
Growth Management & Economic Development							
2014	5141480480	Cormorant Rd Watermain Extension	500,000.00	389,584.84	389,584.84	0.00	77.9%
2016	5141680683	RHBP - Twenty Road East - Nebo Road to 900m westerly	601,015.57	254,352.19	254,352.19	0.00	42.3%
2009	5180955943	Grids Related Secondary Plan & SWM MP/Class EA	25,563.81	25,563.81	25,563.81	0.00	100.0%
2009	5180980980	SWMP Program	2,745,019.46	2,791,019.46	2,791,019.46	0.00	101.7%
2009	5180980983	SWMP - H8 - North of Rymal at Quarry	1,742,070.48	1,742,070.48	1,742,070.48	0.00	100.0%
2011	5181180090	Annual Storm Water Management Program	7,264,053.16	7,090,853.62	7,090,853.62	0.00	97.6%

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YEAR APPROVED	PROJECT ID	DESCRIPTION	APPROVED BUDGET ($)	REVENUES ($)	EXPENDITURES ($)	PROJECT SURPLUS/ (DEFICIT) ($)	% SPENT
			a	b	c	d = b - c	e=c/a
2012	5181280280	SWMP - A20 - Limestone Manor	570,000.00	411,456.52	411,456.52	0.00	72.2%
2013	5181380090	Storm Water Management Program	2,983,521.83	2,204,438.97	2,204,438.97	0.00	73.9%
2015	5181580090	Storm Water Management Program	4,837,541.49	5,063,316.75	5,063,316.75	0.00	104.7%
2017	5181780785	RHBP - Dartnall - Stone Church to Rymal	1,070,154.67	1,070,154.67	1,070,154.67	0.00	100.0%
2018	5181880870	Lewis Rd Culvert - approximately 200m n/o Barton	660,000.00	628,679.92	628,679.92	0.00	95.3%
Public Works (Rate Budget)							
Waterworks Regular Program							
2018	5141851810	Fleet Additions	1,698,000.00	1,698,000.00	1,698,000.00	0.00	100.0%
2018	5141860577	Metallic Watermain Condition Assessment Program	515,000.00	577,318.77	577,318.77	0.00	112.1%
2019	5141911101	Road Cut Restoration Program	3,505,440.78	3,505,440.78	3,505,440.78	0.00	100.0%
2020	5142001099	Engineering Services Staffing Costs - Water	4,236,000.00	4,236,000.00	4,236,000.00	0.00	100.0%
2020	5142011101	Road Cut Restoration Program	4,335,000.00	4,335,000.00	4,335,000.00	0.00	100.0%
2020	5142057626	Critical Watermain Inspection Program	529,000.00	529,000.00	529,000.00	0.00	100.0%
2020	5142060080	Valve Replacement Program	2,530,000.00	2,530,000.00	2,530,000.00	0.00	100.0%
2020	5142060750	Unscheduled Valve, Hydrant, Watermain & Misc Water Replace Program	3,000,000.00	3,123,832.71	3,123,832.71	0.00	104.1%
2020	5142062073	Field Data Systems Program	10,000.00	10,000.00	10,000.00	0.00	100.0%
2020	5142062078	Substandard Water Service Replacement Program	2,750,000.00	2,750,000.00	2,750,000.00	0.00	100.0%
2020	5142071306	Hillcrest - Chedoke to end	94,000.00	93,557.95	93,557.95	0.00	99.5%
Wastewater Regular Program							
2018	5161860575	Mainline Sewer Condition Assessment Program	770,000.00	1,089,156.05	1,089,156.05	0.00	141.4%
2019	5161911101	Road Cut Restoration Program	1,440,000.00	1,440,000.00	1,440,000.00	0.00	100.0%
2019	5161960302	Emergency Repairs - Cross Connections Program	220,000.00	220,000.00	220,000.00	0.00	100.0%
2019	5161960574	Capital Programming Sewer Inspection & Assessment	400,000.00	400,000.00	400,000.00	0.00	100.0%
2019	5161960577	Mainline Sewer Condition Assessment for Compliance & Regulations	48,000.00	48,000.00	48,000.00	0.00	100.0%
2019	5161960820	Open Cut Repairs for CIPP Program	400,000.00	435,124.60	435,124.60	0.00	108.8%
2019	5161971015	Sewer Lateral Replacement for Co-ordinated Projects	270,000.00	295,000.00	295,000.00	0.00	109.3%
2020	5162001099	Engineering Services Staffing Costs - Wastewater	4,122,000.00	4,122,000.00	4,122,000.00	0.00	100.0%
2020	5162011101	Road Cut Restoration Program	1,645,000.00	1,645,000.00	1,645,000.00	0.00	100.0%
2020	5162055878	Forcemain Condition Assessment Program	26,000.00	26,000.00	26,000.00	0.00	100.0%
2020	5162060574	Capital Programming Sewer Inspection & Assessment	230,000.00	230,000.00	230,000.00	0.00	100.0%
2020	5162061444	Sewer Lateral Replace/Rehab Program	3,080,000.00	3,080,000.00	3,080,000.00	0.00	100.0%
2020	5162071015	Sewer Lateral Replacement for Co-ordinated Projects	165,000.00	165,000.00	165,000.00	0.00	100.0%
Storm Sewers Regular Program							
2013	5181380377	Arvin Avenue - McNeilly Road to 350m westerly	540,000.00	345,313.18	345,313.18	0.00	63.9%
2015	5181555077	Zoom Camera Inspection - Data Component	726,172.40	726,172.40	726,172.40	0.00	100.0%
2019	5181917549	Concrete Box Culvert Rehabilitation/Repair (< 3.0m span)	58,608.79	58,608.79	58,608.79	0.00	100.0%
2019	5181974950	Watercourse and Drainage Channel Maintenance	35,000.00	35,000.00	35,000.00	0.00	100.0%
TOTAL COMPLETED PROJECTS (140)			**236,081,778.83**	**225,834,101.07**	**225,834,101.07**	**0.00**	**95.7%**
GRAND TOTAL COMPLETED/CANCELLED PROJECTS (188)			**251,123,318.61**	**240,537,349.66**	**240,230,439.60**	**306,910.06**	**95.7%**

CITY OF HAMILTON
CAPITAL PROJECTS BUDGET APPROPRIATIONS OF $250,000 OR GREATER AND CAPITAL PROJECT RESERVE FUNDING REQUIRING COUNCIL APPROVAL
FOR THE PERIOD COVERING OCTOBER 1, 2021 TO DECEMBER 31, 2021

Appropriated/ Transferred From	Description	Appropriated/ Transferred To	Description	Amount ($)	Council Approval / Comments	Comments
Healthy & Safe Communities						
Hamilton Fire Department						
7402051102	Hazmat Foam Response Apparatus	7402051101	Annual Vehicle Replacement	**300,000.00**		Transfer of funds from a project with an expected surplus to a project that requires funding to offset the current deficit.
Healthy & Safe Communities Total				**$ 300,000.00**		
Planning & Economic Development (Tax Budget)						
Economic Development						
4030780746	Binbrook Community Core Improvements	4030780741	Binbrook Rd Roundabout	**311,144.03**		Project 4030780741 has been completed and currently has a deficit as a result of uncollected revenues of approximately $70,000 and additional expenditures of approximately $240,000. Appropriation from a project with an expected surplus is required.
5181980090	Storm Water Management Program	3620374100	SC-Strm Drainage Watercourse 7	**2,364,004.17**		3620374100 is a dated project that was approved through the capital budget from 2003-2005. The funding sources were not clearly defined and the revenues that were budgeted as cost recoveries from developers were never collected resulting in a large deficit. Appropriation is required to eliminate the deficit and close project 3620374100.
Planning & Economic Development Department (Tax Budget) Total				**$ 2,675,148.20**		
Planning & Economic Development (Rate Budget)						
Growth Management						
5141680683	RHBP - Twenty Road East - Nebo Road to 900m westerly	5161096011	2010 Intnsificatn Infra Upgrad	**308,984.43**		Project 5141680683 has been completed with a surplus. Funds are required to offset deficit in project 5161096011.
5181380090	Storm Water Management Program	5180980980	SWMP Program	**445,019.46**		Both projects are completed. Appropriation is required to clear deficit before project closure.
5181380090	Storm Water Management Program	5180980983	SWMP - H8 - North of Rymal at Quarry	**252,070.48**		Both projects are completed. Appropriation is required to clear deficit before project closure.
Planning & Economic Development Department (Rate Budget) Total				**$ 1,006,074.37**		
Project Totals				**$ 3,981,222.57**		

CITY OF HAMILTON
CAPITAL PROJECTS REQUIRING A BUDGET ADJUSTMENT
AS OF DECEMBER 31, 2021

Recommendations

Project	Description	Amount ($)	Comment
Healthy & Safe Communities			
Hamilton Fire Department			
7402051101	Annual Vehicle Replacement	$ 45,456.13	Unbudgeted Vehicle Sales.
Housing Services			
2051255204	Neighbourhood Strategy	$ 965,139.00	Unbudgeted donations and receipt of grants for the urban farm from Hamilton Community Foundation.
Planning & Economic Development			
Economic Development			
3621708900	Economic Development Initiatives	$ 36,738.59	Additional grant revenue and cost recoveries.
Tourism & Culture			
7201858702	Confidential - TC1801	$ 200,000.00	Unbudgeted sponsorship revenue.
7201941903	Gage House Porch and Exterior Cladding	$ 75,003.00	Additional grant revenue received.
7202058202	Collections Management	$ 100,000.00	Additional grant revenue received.
Public Works (Tax)			
Energy Fleet and Facilities			
7101854810	Durand Washroom Facility	$ 30,000.00	Donation money received.
7101954905	Sackville Hill Senior Expansion & Lifecycle Renewal	$ 100,000.00	Donation money received.
Engineering Services			
4031911606	Council Priority - Ward 6 Minor Rehabilitation	$ 71,867.50	Funds received from developer.
4411606002	Real Estate Disposition	$ 17,075.80	Cost recoveries.
4411806105	Police Marine Facility Replacement	$ 46,760.75	Fees collected.
Environmental Services			
4400756755	Joe Sams Leisure Park	$ 30,000.00	Donation money received.
4401951700	Small Equipment Replacement (Reserve) Program	$ 48,293.23	Sale of old equipment.
4401952600	Playground Lifecycle Replacement Program	$ 57,000.00	Donation money received.
4451953444	Tree Planting Program	$ 337,314.72	Transfer from Forestry Deferred Revenues to assist with tree plantings relating to new subdivisions.
4452153444	Tree Planting Program	$ 319,712.40	Transfer from Forestry Deferred Revenues to assist with tree plantings relating to new subdivisions.

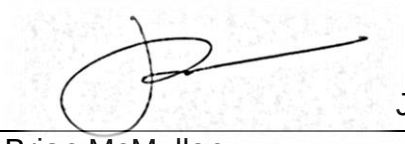
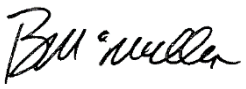
CITY OF HAMILTON
CAPITAL PROJECTS REQUIRING A BUDGET ADJUSTMENT
AS OF DECEMBER 31, 2021

Recommendations

Project	Description	Amount ($)	Comment
Transportation Operations & Maintenance			
4032011224	Sidewalk Rehabilitation Program – 2020	$ 28,000.00	Funds received from developer.
4032117677	Preventative Asphalt Road Maintenance Program	$ 257,465.70	Third party billings.
4661920008	New Traffic Signal Installation Program	$ 482,000.00	Third party billings.
Public Works (Rate)			
Waterworks Regular Program			
5141455425	Concrete Pipe Condition Assessment – 2014	$ 21,302.88	Additional grant revenue received.
5141555555	City Wide Groundwater Model	$ 60,000.00	Third party billings.
5141766713	Water Maintenance Capital Program	$ 59,396.16	Cost recoveries.
5142055851	Water Efficiency Plan – 2020	$ 11,822.10	Unbudgeted sales.
5142160750	Unscheduled Valve, Hydrant etc. - 2021/22	$ 596,540.22	Cost recoveries.
Wastewater Regular Program			
5162160390	Wastewater System Lining Program - 2021/22	$ 200,000.00	Funds received from developer.
5162161740	Unscheduled Manhole & Sewermain - 2021/22	$ 17,808.04	Cost recoveries.
Storm Sewers Regular Program			
5181206222	West Harbour (Setting Sail) Main Basin - New Floating Breakwater	$ 215,662.45	Third party contributions.
5182117152	Right of Way Drainage Program	$ 59,709.59	Third party billings.
Total Budget Increase		**$ 4,490,068.26**	

CITY OF HAMILTON

PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT
Economic Development Division
and
CORPORATE SERVICES DEPARTMENT
Financial Planning, Administration and Policy Division

TO:	Mayor and Members General Issues Committee
COMMITTEE DATE:	June 15, 2022
SUBJECT/REPORT NO:	Environmental Remediation and Site Enhancement (ERASE) Redevelopment Grant Application, 405 James Street North, Hamilton (Jamesville) ERG-19-06 (PED22107 / FCS22035) (Ward 2)
WARD(S) AFFECTED:	Ward 2
PREPARED BY:	Chris Phillips (905) 546-2424 Ext. 5304 Phil Caldwell (905) 546-2424 Ext. 2359 Kirk Weaver (905) 546-2424 Ext. 2878
SUBMITTED BY: **SIGNATURE:**	Norm Schleehahn Director, Economic Development Planning and Economic Development Department  Jennifer Patterson Acting Director
SUBMITTED BY: **SIGNATURE:**	Brian McMullen Director, Financial Planning Administration and Policy Corporate Services Department 

RECOMMENDATION(S)

(a) That the terms for the Environmental Remediation and Site Enhancement (ERASE) Redevelopment Grant Program, being Appendix “B” to the ERASE Community Improvement Plan, be amended as outlined and highlighted in yellow in Appendix “A” to Report PED22107 / FCS22035;

(b) That Environmental Remediation and Site Enhancement (ERASE) Redevelopment Grant (ERG) Program application ERG-19-06, submitted by CityHousing Hamilton Corporation (CHH), owner of the property at 405 James Street North, Hamilton (the site), for a Grant not to exceed $1,744,445, for estimated eligible building demolition costs, provided over a maximum of ten (10) years, be authorized and approved in accordance with the terms and conditions of the ERASE Redevelopment Agreement and the following additional conditions:

(i) that approval of the Grant application be transferred from CityHousing Hamilton Corporation to Jamesville Redevelopment Limited Partnership (JRLP) if/when JRLP becomes the registered owner of the site;

(ii) that approval of the Grant shall not prejudice or fetter City Council's discretion with respect to any current or future *Planning Act* application(s) regarding the site, including, but not limited to, Official Plan and / or Zoning By-law amendment applications;

(c) That, subject to approval of Recommendation (b) of Report PED22107 / FCS22035, the General Manager of Planning and Economic Development Department be authorized and directed to execute, on behalf of the City, the Environmental Remediation and Site Enhancement (ERASE) Redevelopment Agreement together with any ancillary documentation required to give effect to the approval of Program application ERG-19-06 and the ERASE Redevelopment Grant to CityHousing Hamilton Corporation, owner of the property at 405 James Street North, Hamilton and / or the intended subsequent property owner being Jamesville Redevelopment Limited Partnership, at such time, as the proposed development has received, at minimum, conditional Site Plan approval and that such agreements and ancillary documentation be in a form satisfactory to the City Solicitor;

(d) That, subject to approval of Recommendations (b) and (c) of Report PED22107 / FCS22035, the General Manager of the Planning and Economic Development Department be authorized and directed to administer the ERASE Redevelopment Grant and the ERASE Redevelopment Agreement including, but not limited to, implementing any appropriate actions in respect of events of default and executing any appropriate amending agreements and ancillary documentation, all in accordance with the terms and conditions of the ERG Program, as approved by City Council and all in a form satisfactory to the City Solicitor;

(e) That, subject to approval of Recommendations (b) through (d) of Report PED22107 / FCS22035, the General Manager, Finance and Corporate Services, be authorized to execute, on behalf of the City, the City's ERASE Development Charge Deferral Agreement augmented by the additional terms and conditions outlined in Appendix "B" to Report PED22107 / FCS22035 in a form satisfactory to the City Solicitor.

EXECUTIVE SUMMARY

On October 27, 2020, CHH's Board of Directors approved the authorization to enter into a Master Development Agreement (MDA) with Jamesville Redevelopment Limited Partnership (JRLP) to redevelop and intensify the Jamesville property known as 405 James Street North, as well as, City-owned lands at 38 Strachan Street West and 344 Bay Street North. JRLP, a private development consortium, was selected as the Preferred Proponent through a competitive Request for Proposals (RFP) process (City of Hamilton RFP C18-07-19) which was issued in April 2019 and closed in June 2019. The MDA was formally executed with JRLP on December 10, 2021.

The proposed redevelopment of the site, as presented to staff by CHH and JRLP and for which necessary Planning approvals, including Urban Hamilton Official Plan (UHOP) and Zoning By-law amendments have not been obtained, is planned to consist of a 46-unit CHH building and up to 120 affordable rental housing units owned by Indwell Community Homes which are to be integrated within 287 market-priced stacked townhouses. Total construction costs are estimated at $100,000,000.

On August 19, 2019 and March 3, 2020, separate ERASE Redevelopment Grant (ERG) Program applications were submitted by CHH for the two non-contiguous sites forming part of the overall Jamesville redevelopment: ERG-19-06 respecting 405 James Street North and ERG-20-01 respecting 38 Strachan Street West and 344 Bay Street North. The applications anticipate costs for the abatement / removal of designated substances and hazardous materials from and demolition of the existing vacant 91 townhouses on 405 James Street North, as well as, remediation costs related to soil / groundwater contamination at 405 James Street North and also potentially 38 Strachan Street West and 344 Bay Street North.

At the time of writing Report PED22107 / FCS22035, only estimated eligible costs respecting the removal / abatement of designated substances and hazardous materials and building demolition for the existing townhouses located on 405 James Street North (application ERG-19-06) are known and are estimated at $1,744,445. Work is on-going by JRLP, as the future intended owner of these properties, to investigate soil / groundwater contamination, develop a remediation plan and identify additional estimated remediation costs that will be required prior to redevelopment of the sites. Once these estimated costs are known, staff anticipate future supplementary recommendation reports regarding the potential eligibility of these additional costs will be brought forward for Council consideration for ERG Program applications ERG-19-06 and potentially ERG-20-01.

On March 30, 2022, City Council approved a Motion that, among other things, directed staff to prepare and bring forward a report to General Issues Committee and Council for the consideration of the applicable ERG application (ERG-19-06), along with any necessary program amendments to the ERASE Redevelopment Grant Program required to facilitate site remediation for the Jamesville affordable housing Development.

Amendments proposed via Recommendation (a) and Appendix “A” to Report PED22107 / FCS22035 would allow for assignment of ERG Program applications after Council approval, at Council’s discretion, to a future intended owner where the assignment will provide the necessary financial security needed for that future intended owner to undertake remediation or other ERG Program eligible costs prior to becoming the registered property owner. Incorporating these amendments into the ERG Program terms will provide flexibility and predictability to consider similar arrangements for future City-owned lands subject to disposition where there is a desire to expedite, and transfer costs / liability for, necessary remediation works eligible under the ERG Program to a future intended owner.

Recommendation (e) to Report PED22107 / FCS22035 proposes that several additional terms and conditions specific only to the Jamesville redevelopment be added to the City’s standard ERASE Development Charge Deferral Agreement which would apply to application ERG-19-06 (the subject to Report PED22107 / FCS22035) and also application ERG-20-01 should Council approve these applications. These terms are detailed in Appendix “B” to Report PED22107 / FCS22035 and are intended to facilitate the redevelopment process from a financial perspective for JRLP, while limiting the additional financial risk to the City.

At this time, it is estimated that the proposed development, if approved and built as proposed, would increase the property assessment from the pre-development value of $8,314,000 (EN - Exempt) to approximately $98,425,000 (RT – Residential, NT – Multi Residential and XT - Commercial). This would increase total annual property taxes generated by this site from $0 to $1,200,488. The municipal portion of this increase would be $1,045,376 of which 80%, representing the maximum potential annual Grant permitted under the ERG Program, would be approximately $836,301. With a maximum Grant not exceeding $1,744,445, it's estimated that the Grant will be provided over three (3) annual payments. The above estimates may be subject to change in accordance with the outcome of any and all future Planning approvals obtained for the site.

The existing condition of the site, as well as, renderings of the proposed development are provided below.

Existing Conditions – 405 James Street North, Hamilton viewed looking north east from Strachan Street West (Source: maps.google.ca)

Proposed Development – 405 James Street North aerial view looking northwest
(Source: Jamesville Redevelopment Limited Partnership)

Alternatives for Consideration – See Page 16

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: As per the ERG Program, the City will provide the Applicant with a Grant equivalent to 80% of the increase in municipal taxes up to the total eligible cost figure of $1,744,445. Based on an estimated maximum potential annual Grant amount of $836,301, the annual Grant payments will conclude in year three with the City realizing the full municipal tax thereafter for life of the development.

Under the terms of the ERASE Development Charge Deferral Agreement recommended in Recommendation (e) of Report PED22107 / FCS22035 and detailed in Appendix “B” to Report PED22107 / FCS22035, the ERG will be used to fund the Development Charges payable on this development over the life of the Grant.

The City will retain the remaining 20% of the annual municipal tax increment estimated at $209,075, to a maximum of 20% of the total Grant to be provided, estimated to total $348,889 over two years, will be deposited into the Brownfield Pilot Project Account No. 3621755102 to be used by the City for its Municipal Acquisition and Partnership Program. This Program, as approved in the ERASE Community Improvement Plan (CIP), enables the City to acquire strategic brownfield sites, remediate and redevelop property it already owns, or participate in public / private partnerships to redevelop brownfield properties.

Staffing: Applications and Grant payments under the ERG Program are administered by staff from the Commercial Districts and Small Business Section, Economic Development Division and Taxation Section of the Financial Services and Administration Division. Administration of ERASE Development Charge Deferrals are administered by the Financial Planning, Administration and Policy Division of the Corporate Services Department.

There are no additional staffing requirements arising from the recommendations of Report PED22107 / FCS22035.

Legal: The ERG Program is authorized by the ERASE CIP which was adopted and approved in 2001 and subsequently comprehensively updated in 2005, 2010 and 2018 under Section 28 of the *Planning Act*. The ERASE Redevelopment Agreement will specify the obligations of the City and the Applicant and will be prepared in a form satisfactory to the City Solicitor.

HISTORICAL BACKGROUND

Project Background:

On April 8, 2019, on behalf of CHH, the City initiated a Request for Proposals (RFP) process (City of Hamilton RFP C18-07-19) which closed on June 6, 2019. Four Proposals were received and evaluations were conducted between June 7, 2019 and concluded on July 18, 2019. Through this open and competitive process, JRLP was selected as the Preferred Proponent. JRLP is a private development consortium consisting of the firms Fram + Slokker, Melrose Investments Inc., Marz Developments Inc. and Homes by DeSantis, as well as, Indwell Community Homes.

Subsequently, on October 27, 2020, CHH's Board of Directors approved the authorization to enter into a Master Development Agreement (MDA) with JRLP to redevelop and intensify the Jamesville site (405 James Street North), as well as, the City-owned lands at 38 Strachan Street West and 344 Bay Street North which Council has approved by Motion to be conveyed to CHH as a phase of this development. The MDA was formally executed on December 10, 2021.

The redevelopment of Jamesville will transform the 91-townhouse site into a mixed-income community that includes a 46-unit CHH building, up to 120 affordable rental housing units owned by Indwell Community Homes integrated within a 287-unit private market residential development.

As per the MDA, JRLP has agreed to take financial and operating responsibility for the full site demolition, as well as, the environmental remediation and planning approvals process for the entire site.

A detailed summary of the CHH's timeline of direction, approvals and milestones for the Jamesville redevelopment are as follows:

- On September 20, 2016, the CHH Board approved Report #16034, authorizing the redevelopment of the West Harbour properties of 500 MacNab, Jamesville and 10 Brock;

- On March 21, 2017, City Council approved a motion to convey the land at 38 Strachan Street West / 344 Bay Street North to CHH for use as part of the Jamesville development;

- On July 18, 2017, the CHH Board approved Report #17021(a) outlining the replacement impacts and financial modelling of the five new CHH developments including Jamesville and the Bay-Cannon site; and,

- On December 20, 2018, the CHH Board approved Report #17007(b) authorizing staff to commence the RFP, the Evaluation Criteria and Scoring Framework.

ERG Program Application and Environmental Background:

On August 19, 2019 and March 3, 2020, separate ERG Program applications were submitted by CHH for the two non-contiguous sites forming part of the overall Jamesville redevelopment for which JRLP has been identified as the Preferred Proponent and intended future owner: ERG-19-06 respecting 405 James Street North; and ERG-20-01 respecting 38 Strachan Street West and 344 Bay Street North, respectively.

At the time of writing Report PED22107 / FCS22035, only the estimated eligible costs respecting the removal / abatement of designated substances and hazardous materials and building demolition for the existing vacant 91 townhouses located on 405 James Street North (the site) are known. This site is approximately 2.18 ha (5.39 ac) in size and consists of the entire area bounded by Ferrie Street West to the north, James Street North to the east, Strachan Street West to the south and MacNab Street North to the west in the North End neighbourhood of central Hamilton. The immediate area is primarily characterized by low-rise residential to the north, east and west and open space and the Canadian National Railway (CNR) rail line to the south.

As part of the investigation of the environmental condition of the subject site's existing buildings and soil / groundwater conditions, a Phase One ESA, Phase Two ESA and Designated Substances Survey (DSS) were completed by Peto MacCallum Ltd. for CHH in November 2018, January 2019 and September 2018, respectively. A supplemental Phase Two ESA was also completed Peto MacCallum Ltd. for JRLP in March 2021.

The DSS study completed for the site has identified the presence of asbestos in several building materials from a sampling of units existing on the site. The conclusions of the environmental consultants are that the samplings are representative of all units currently located on the site and that asbestos abatement / removal and demolition be carried out accordingly for all units on the site. The identification of designated substances / hazardous materials is undertaken in accordance with Ontario Regulation 490/09 with the abatement / removal of any Asbestos Containing Materials (ACM) found required to be undertaken in accordance with Ontario Regulation 278/05.

The outcome of the ESA studies confirmed the presence of contaminants in the soil / groundwater that will require remediation of the site as part of any future redevelopment involving residential uses. At the time of writing Report PED22107 / FCS22035, work is on-going to develop a remediation plan and cost estimate for this work, details of which will be the subject of a future supplementary report for Council's consideration regarding the eligibility of such costs and any required updates to the approved maximum Grant amount.

Investigation and assessment of the soil / groundwater conditions of the properties subject to the second Jamesville redevelopment ERG application (ERG-20-01) respecting 38 Strachan Street West and 344 Bay Street North are on-going. At such time as any remediation work and related cost estimates are identified as being required for these properties, staff will bring forward a separate recommendation report for application ERG-20-01. However, staff note that Recommendation (e) and the associated Appendix "B" to Report PED22107 / FCS22035 regarding modifications to the ERASE Development Charge Deferral Agreement are intended to apply to both application ERG-19-06 that is the subject of Report PED22107 / FCS22035, as well as, to application ERG-20-01 should a subsequent ERG Program recommendation on application ERG-20-01 be brought forward for Council consideration. Proposed modifications to ERASE Development Charge Deferral Agreement for these two applications are further discussed in the "Analysis and Rational for Recommendation(s)" section of Report PED22107 / FCS22035.

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

Proposed ERG Program Amendment:

Recommendation (a) of Report PED22107 / FCS22035 consists of an update to the program terms of the ERG program. These terms are implemented as Appendix "B" to Report PED22107 / FCS22035 to the authorizing ERASE CIP. As the ERASE CIP appendices do not form part of the approval of the ERASE CIP or its implementing By-Law (No. 18-076) and as the recommended amendments do not alter the intent of the authorizing CIP, an amendment under Section 28 of the *Planning Act* to implement Recommendation (a) of Report PED22107 / FCS22035 is not required.

ERG Application ERG-19-06 for 405 James Street North:

Details of the proposed redevelopment of the site have been provided to staff by CHH and JRLP. The proposed redevelopment is anticipated to require an UHOP and Zoning By-law amendment based on the existing Planning permissions applicable to the site. At the time of Report PED22107 / FCS22035, these approvals have not been obtained.

Information provided in Report PED22107 / FCS22035 regarding the proposed redevelopment, including estimated municipal tax increments potentially generated by the proposal for the purposes of a potential Grant, may be subject to change in accordance with current or future Planning permissions, policies and regulations applicable to the site.

Staff's recommendation to approve an ERG Program application for the site is not an approval or endorsement of the proposed redevelopment as provided to staff by CHH/JRLP.

RELEVANT CONSULTATION

Staff from the Corporate Services Department – Taxation Section, Financial Services and Taxation Division and the Legal and Risk Management Services Division – were consulted and the advice received incorporated in Report PED22107 / FCS22035.

ANALYSIS AND RATIONALE FOR RECOMMENDATION(S)

Proposed ERG Program Amendment:

On March 30, 2022, City Council approved the following Motion regarding the site:

a) That the Chief Building Official be authorized to issue demolition permits for the 13 townhouse dwellings located at 405 James Street North, Hamilton, also known as, 2-8 Strachan Street West, 10-22 Strachan Street West, 24-38 Strachan Street West, 405-411 James Street North, 413-425 James Street North, 427-441 James Street North, 443-457 James Street North, 459-471 James Street North, 15-29 Ferrie Street West, 312-322 MacNab Street North, 324-338 MacNab Street North, 340-354 MacNab Street North and 356-372 MacNab Street North, in accordance with By-law 09-208, as amended by Bylaw 13-185, pursuant to Section 33 of *The Planning Act,* as amended, without having to comply with conditions 6(a), (b), and (c) of the Demolition Control By-law 09-208; and

b) That Staff be directed to prepare and bring forward a report to General Issues Committee and Council for the consideration of the applicable ERG application (ERG-19-06), along with any necessary program amendments to the ERASE Redevelopment Grant Program required to facilitate site remediation for the Jamesville affordable housing Development.

As per the current Council-approved ERG Program terms, applications to the ERG Program may only be submitted by and approved by Council for the current property owner of a site. Transfers / assignments of Council approvals to third-parties, including any future owner of the property, are prohibited. This prohibition is intended to ensure financial assistance is being provided to the owner who is taking the initial risk of remediating and redeveloping the contaminated property, is incurring the financial cost of remediating the property and who will be subject to obligations with respect to the proper remediation of site.

However, the redevelopment of this site is unique with CHH being the current owner but not the party who will undertake building demolition and site remediation. These works, and the associated financial risk and costs for such works, will be borne by the Preferred Proponent and intended future property owner chosen by CHH, JRLP.

In order to provide JRLP with the security of approval under the ERG Program necessary to facilitate their undertaking of significant building demolition and remediation costs required prior to their taking ownership of the site, the ERG Program terms require an amendment to permit the future assignment of any approval Council may provide to CHH under the ERG Program to JRLP.

As such, staff are proposing the addition of new terms under the ERG Program to permit such a transfer, at Council's discretion. These new terms, which have been incorporated into the ERG Program Terms contained in Appendix "A" to Report PED22107 / FCS22035 are as follows:

> "Notwithstanding any other term or condition of this program, where an application has been approved by City Council, the application and the associated approval, including the assignment of any eligible costs incurred by the Council approved applicant since the date of application submission, may be assigned to a future intended owner of the subject site(s) only in such instance where the registered owner of the site(s) at the time of Council approval was the City of Hamilton, CityHousing Hamilton Corporation or any other entity wholly owned by the City of Hamilton and where the assignment will further facilitate the remediation and redevelopment of a site and/or support the achievement of strategic City priorities / objectives. It is understood that one effect of such an assignment shall be that the future intended site owner will assume all requirements and obligations required under the program and become the recipient of any future grant payments which may be eligible under the Program at such time as they become the registered site owner.

A request to assign the application shall be submitted, in writing, to the City by the existing site owner and the Council approved applicant with accompanying rationale and be subject to approval by City Council in its sole discretion. The future intended site owner shall be subject to all applicable due diligence required under this program, including, but not limited to, applicable corporate title and litigation searches, to the satisfaction of the City prior to the assignment being considered by City Council. An assignment or transfer may require that the assignee or transferee submit an application, assignment or transfer agreement and/or such other documents as determined by the GM of Planning and Economic Development in their sole, absolute and unfettered discretion."

It should be noted that incorporating these amendments into the ERG Program terms will provide flexibility and predictability to consider similar arrangements for future City-owned lands subject to disposition where there is a desire to expedite and transfer costs / liability for necessary remediation works eligible under the ERG Program to a future intended owner.

ERG Application for 405 James Street North:

Recommendation (b) of Report PED22107 / FCS22035, with respect to a maximum Grant amount, is currently limited to estimated designated substances and hazardous materials abatement / removal and building demolition costs known at this time totalling $1,744,445 and comprised of the following:

- $1,032,000 in costs for the abatement / removal of designated substances and hazardous materials including asbestos;

- $663,500 in costs for building demolition and associated activities; and

- $48,945 in costs for the undertaking of the Designated Substances Survey.

These costs are eligible under the ERG Program based on the site's location within Area 3 – West Harbour of the ERASE CIPA and because the costs will be incurred in association with planned soil / groundwater remediation and site redevelopment activities.

Staff anticipate that at such time as a remediation plan for soil / groundwater contamination on the site is completed and an estimated cost for eligible works in accordance with the ERG program have been prepared and submitted to staff for review, staff will bring forward a supplementary report outlining the details of the soil / groundwater contamination works in more detail and provide recommendations for Council consideration with respect to the eligibility of such costs and any recommend changes to the approved maximum Grant amount, as required.

Invoices and supporting documentation for the above-noted costs shall be required to be submitted to staff and will be the subject of an audit to ensure compliance with the Council-approved parameters of the ERG Program, as well as, to determine the final actual costs subject to a Grant. Auditing of invoices and supporting documentation will be undertaken by staff and may be subject to a third-party review at staff's discretion. Where such third-party review is required, the cost will be at the approved applicant's expense but subject to eligibility under the ERG program for the purposes of the Grant.

The following is an overview of pre and post development property assessments and associated taxes which have informed the estimated maximum potential Grant and Grant payment period contained in Report PED22107 / FCS22035:

Grant Level:		80%	
Total Estimated Eligible Costs (Maximum):	$	1,744,445	
Total Estimated Grant (Maximum):	$	1,744,445	
Pre-project CVA (EN - Exempt):	$	8,314,000	Year: 2021
Municipal Levy:	$	0	
Education Levy:	$	0	
Pre-project Property Taxes	$	0	
Estimated Post-project CVA (RT – Residential, NT – Multi Residential and XT - Commercial):	$	98,425,000	Year: TBD
Estimated Municipal Levy:	$	1,045,376	
Estimated Education Levy:	$	155,112	
Estimated Post-project Property Taxes:	$	1,200,488	

Provisions for Calculations:

1) The actual roll number(s) assessed value(s), tax classification(s) and value partitioning (where applicable) are to be determined by the Municipal Property Assessment Corporation (MPAC) upon completion of the development;
2) As per Program requirement, the increase in realty taxes is based on the year in which the tax estimate was requested;
3) 2021 tax rates have been used for calculation of the estimated post-development property taxes;
4) Annual Taxes exclude any Local Charges;
5) Post development assessment estimate provided by MPAC; and
6) All dollar figures rounded to the nearest dollar.

ERASE Development Charge Deferral Agreement for 405 James Street North:

Under the ERG program, applicants may elect to utilize a Development Charge Reduction (DCR) option which allows applicants to apply the value of their actual Grant towards payable Development Charges (DCs). The ERASE DCR option is treated as an ERASE specific deferral of payable DCs at 0% interest. Approved ERASE applicants enter into a deferral agreement which is registered on title of the property. The deferral can last for the period that the applicant would have otherwise received annual grant payments.

Normally, a condition within the deferral agreement requires deferred DCs be paid when ownership changes (such as in condo projects). This condition is needed because DCs are tied to a property, not an organization and the agreement is registered on the property. However, the requirement to pay DCs at time of sale can result in concerns related to cash flow for the developer.

Staff do not recommend removing the condition in its entirety as it poses a risk whereby should the estimated assessment / tax uplift (and resulting total grant payment) not materialize as needed to fully offset the DC deferral, the City would have limited means to recoup the outstanding amount as the applicant is no longer the owner. Risk exists because the actual tax uplift may not be known until MPAC has reassessed the project which will occur after the developer has transferred units in most cases.

Under the terms of the ERASE Development Charge Deferral Agreement recommended in Recommendation (e) of Report PED22107 / FCS22035 and detailed in Appendix "B" to Report PED22107 / FCS22035, the ERG will be used to fund the Development Charges payable on this development over the life of the Grant. The Deferral agreement requires the developer to provide security in the form of either a collateral mortgage registered on title or a Letter of Credit with a value equivalent to 25% of the deferred development charges. This security helps to mitigate the risk to the City of the value of the ERASE Grant not being sufficient to cover the amount of Development Charges due, while not requiring the developer to provide security on the full amount of DCs payable limiting the financial capacity of the developer.

As noted in the "Historical Background" section of Report PED22107 / FCS22035, in addition to applying to ERG application ERG-19-06, the same modified terms contained in Appendix "B" to Report PED22107 / FCS22035 would also apply to any future Council approval of ERG application ERG-20-01 for 38 Strachan Street West and 344 Bay Street North.

ALTERNATIVES FOR CONSIDERATION

In the event the site / project is not considered for the program, the application should be referred back to staff for further information on possible financial or legal implications, as well as, impacts to the MDA entered into with JRLP.

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

Economic Prosperity and Growth
Hamilton has a prosperous and diverse local economy where people have opportunities to grow and develop.

Healthy and Safe Communities
Hamilton is a safe and supportive City where people are active, healthy, and have a high quality of life.

Clean and Green
Hamilton is environmentally sustainable with a healthy balance of natural and urban spaces.

Our People and Performance
Hamiltonians have a high level of trust and confidence in their City government.

APPENDICES AND SCHEDULES ATTACHED

Appendix “A” to Report PED22107 / FCS22035 – Appendix B 8.2 to the ERASE Community Improvement Plan – ERASE Redevelopment Grant Program (ERG).

Appendix “B” to Report PED22107 / FCS22035 – Terms and Conditions to be Included in ERASE Development Charge Deferral Agreement at 405 James Street North (Jamesville) ERG-19-06

Appendix “C” to Report PED22107 / FCS22035 – Site Location Map

APPENDIX B

8.2 ERASE Redevelopment Grant Program (ERG)

8.2.1 Purpose

The purpose of this program is to alleviate a serious financial impediment to brownfield redevelopment efforts, namely the large tax increase that can result when a brownfield property is redeveloped. The intent of the ERG is to encourage environmental remediation, rehabilitation, redevelopment and adaptive re-use of brownfield sites. Therefore, only those brownfield redevelopment projects that result in an increase in property assessment and taxes will be eligible for funding under the ERG. The ERG also leverages public sector investment and encourages development that would otherwise not take place without this incentive program.

8.2.2 Program Description

The ERG is a tax-increment based program that will provide a financial incentive in the form of a grant to help offset the cost of environmental remediation and rehabilitation of brownfield properties where redevelopment results in a re-valuation and tax increase on these properties. The applicant will initially pay for the entire cost of the remediation and redevelopment project. Once the municipality receives the first full calendar year of newly assessed property taxes that result from the development, the municipality will reimburse the applicant in the form of an annual grant equivalent to 80% of the increase in City taxes that result from redevelopment. Each year, the property owner must first pay taxes owing and then the approved applicant will receive the grant. In no case will the total amount of the grant provided under this program exceed the value of the approved eligible program costs. Also, in no case, will the total amount of the grants provided under this program, and the Tax Assistance Program (TAP) (8.3) exceed the estimated eligible program costs as approved by City Council.

The grant provided under the ERG will equal 80% of the increase in the City portion of property taxes. The remaining 20% of the increase in the City portion of property taxes will be dedicated to the ERASE Municipal Acquisition and Partnership Program (MAPP).

The grants may be received by the property owner in conjunction with any other available municipal program except for other tax increment financing programs.

Assignment of a grant under this Program is not permitted except where the grant is to be assigned to the City of Hamilton as payment towards a loan under the Downtown Hamilton/West Harbourfront Remediation Loan Program for the same project.

The grant will be earned by the applicant if they have met all terms and conditions of the Program and the property and property owner are in good standing with the City in terms of all City By-laws that apply to the property and project, all laws that govern the construction and development of the project and the payment of all taxes during the

development *stage* and for any portion of the property retained by the property owner after remediation and redevelopment are complete. The annual grant to the applicant will be pro-rated if an appeal has been filed with the Municipal Property Assessment Corporation (MPAC) by any of the condominium unit owners. The grant for condominium units that are under appeal will not be released until the appeals are settled through the Assessment Review Board.

For developments containing condominium units, the first-year grant is payable during the calendar year in which 75% of the condominium units within the project are reassessed by MPAC and the property owner(s) have paid in full the new taxes for one (1) calendar year. For non-condominium developments, the first-year grant is payable during the calendar year in which the redevelopment project is complete, the property has been reassessed by MPAC and the property owner has paid in full the new taxes for one (1) calendar year.

Grant payments under the ERG Program will cease at such time as whichever of the following comes first:

a) Total grant payments provided under this program equal the approved and accepted eligible costs have been reimbursed; or,

b) 10 annual payments have been provided.

The ERG is an application-based program. As early as possible in the development approvals process, a property owner will register their intent to participate in the program by filing an ERG Application with the Economic Development Division. Before accepting this application, the Economic Development Division will screen the application to ensure that it is for a property within the designated ERASE Community Improvement Project Area (CIPA) and the application meets the eligibility requirements.

Applications that are not within the ERASE CIPA or applications that clearly do not meet the eligibility requirements will not be accepted. Acceptance of the application by the Economic Development Division in no way implies grant approval.

Applications will be processed and approved on a first come, first serve basis. Review and evaluation of the application and supporting materials against program eligibility requirements will be done by City staff. The applicant participating in the ERG program must enter into an agreement with the City. This Agreement will specify the terms and conditions of the grant and will include terms and conditions in addition to those contained in this Appendix "B" as determined by the City Solicitor and General Manager of Planning and Economic Development (GM). All ERG applications and agreements will be subject to approval by City Council or Council's designate.

The amount of City taxes ("base rate") will be determined before commencement of the project. The increase in the municipal portion of real property taxes (or "municipal tax increment") will be calculated as the difference between the base rate and the amount of City taxes levied as a result of reassessed by the Municipal Property Assessment Corporation (MPAC) following project completion. The municipal tax increment will be used to fund the grant. This program does not exempt property owners from an

increase/decrease in municipal taxes due to a general tax rate increase/decrease, or a change in assessment for any other reason.

For eligible sites where environmental remediation is proposed, the applicant shall obtain and submit to the City a Phase II ESA and/or Risk Assessment and a Remedial Action Plan undertaken by a Qualified Person that:

a) Identifies the extent and provides a cost estimate for the environmental remediation of the eligible property; and,

b) Contains a detailed work plan and budget for said environmental remediation.

For eligible sites where the removal and/or abatement of designated substances and/or hazardous materials is proposed, the applicant shall obtain and submit to the City:

a) A Designated Substances and Hazardous Materials Survey which identifies the presence, extent and need for the removal and/or abatement of such substances/materials in accordance with the *Occupation Health and Safety Act*, Ontario Regulation 278/05 (where applicable) and to the City's satisfaction; and,

b) A detailed work plan and cost estimate.

For eligible sites where the removal, replacement and/or upgrade of capacity for existing on-site infrastructure (water services, sanitary sewers and storm sewers) and/or building demolition is proposed, the applicant shall obtain and submit to the City:

a) Any applicable engineering/servicing reports identifying the need for the removal, replacement and/or upgrade of on-site infrastructure; and,

b) A detailed work plan and cost estimate for the demolition and/or removal, replacement and/or upgrade of on-site infrastructure.

The actual component costs for all eligible cost items will be supplied to the City upon completion of the project. Payment of the grant will be based on the City's review, satisfaction and acceptance of all reports, paid invoices and documentation which is submitted outlining the full scope and cost of the work completed. Any and all of these costs may be subject to audit, at the expense of the property owner. The grant may be reduced or cancelled if the eligible work is not completed, not completed as approved and/or where documentation/invoicing of said costs is not provided to the City's satisfaction.

If during the course of the work, the scope of the work changes, or actual costs are greater or less than estimated costs, the City reserves the right to increase or decrease the total amount of the grant. The annual grant payment will be based on the actual increase in property taxes as calculated, based on the actual reassessment by MPAC following project completion and receipt of an RSC.

The City may discontinue the ERG Program at any time. However, participants in the ERG Program with applications and agreements that were approved prior the closing of the program will continue to receive grant payments as determined through their ERG Agreement with the City. The City is not responsible for any costs incurred by the property

owner in any way relating to the program, including without limitation, costs incurred in anticipation of a grant.

It should be noted that peer-reviewed Risk Assessments are to be permitted in situations where a RSC is not required by the Ministry of Environment, Conservation and Parks (MOECP) (i.e. not moving to a more sensitive land use).

Finally, for the purposes of clarity a 'project' consists of the redevelopment site. The redevelopment site may include multiple properties with more than municipal address.

8.2.3 Eligibility Requirements

All owners of properties within the ERASE Community Improvement Project Area are eligible to apply for funding under this program, subject to meeting the general program requirements in Section 8.0, the following eligibility requirements, and subject to availability of funding as approved by Council:

a) An application for the ERG must be submitted to the Economic Development Department prior to the commencement of any works and prior to application for building permit (Program is not retroactive);

b) Such application shall include reports, plans, estimates, contracts and other details as may be required to satisfy the City with respect to the eligible costs of the project and conformity of the project with the ERASE CIP;

c) The applicant shall obtain and submit to the City a Phase II ESA and/or Risk Assessment and Remedial Action Plan undertaken by a Qualified Person that:

    i) identifies the extent and provides a cost estimate for the environmental remediation of the eligible property; and,

    ii) contains a detailed work plan and budget for said environmental remediation.

d) As a condition of the grant application, the City may require the applicant to submit a Business Plan, with said Plan to the City's satisfaction;

e) The property shall be redeveloped such that the amount of work undertaken is sufficient to at a minimum result in an increase in the assessed value of the property;

f) The total value of the grant provided under this program shall not exceed the total value of work done under eligible program costs;

g) Eligible program costs include the following:

    i) environmental remediation (i.e., the cost of any action taken to reduce the concentration of contaminants on, in or under the eligible property to

permit a Record of Site Condition (RSC) to be filed for the proposed use by a Qualified Person, including costs of preparing and filing of an RSC and Certificate of Property Use (CPU), cost of clean fill, grading and compaction to replace contaminated soils;

Eligible environmental remediation costs do not include construction/development costs that would be required regardless of the presence of contamination.

ii) Phase II ESAs, Risk Assessments and Remedial Action Plans not covered by the ERASE Study Grant program;

iii) installing environmental and/or engineering controls/works, as specified in the Remedial Work Plan and/or Risk Assessment and/or CPU;

iv) monitoring, maintaining and operating environmental and/or engineering controls/works related to environmental remediation, as specified in the Remedial Action Plan and/or Risk Assessment and/or CPU;

v) Industrial/Office Reuse Feasibility Study (Area 2 only)

vi) Designated Substances and Hazardous Material Survey and their removal and abatement in accordance with the *Occupational Health and Safety Act* and Ontario Regulation 278/05 (where applicable) in the Older Industrial Area (Area 2);

vii) Designated Substances and Hazardous Material Survey and their removal and abatement in accordance with the *Occupational Health and Safety Act* and Ontario Regulation 278/05 (where applicable) in current/closed Institutional use buildings across the CIPA;

viii) Designated Substances and Hazardous Material Survey and their removal and abatement in accordance with the *Occupational Health and Safety Act* and Ontario Regulation 278/05 (where applicable) as part of the rehabilitation and restoration of heritage buildings/properties designated under Part IV or V of the *Ontario Heritage Act* across the CIPA; and

ix) In addition to the above, the following costs may also be considered eligible when incurred on a site requiring remediation/rehabilitation and located in the applicable geographic area:

A. the following Leadership in Energy and Environmental Design (LEED) Program components up to a maximum of 50% as per the City of Hamilton's LEED Grant Program (LGP) to achieve LEED certification under the LEED rating system by the Canadian Green Building Council – CaGBC:

- incremental construction costs;
- consultation costs;
- energy modeling; and
- certification fees.

B. demolition costs not covered by demolition charge credits (Areas 2 and 3 only);

C. the removal, replacement and/or upgrade of capacity for existing infrastructure (water services, sanitary sewers and storm sewers) up to a maximum of 25% of the cost of said improvement provided the improvement is located on the property and will support the rehabilitation and reuse of the property (Areas 2 and 3 only);

D. certain relocation/removal costs for existing and operating industrial manufacturing and transportation uses, where such costs relate to or contribute directly to the actual remediation and rehabilitation of the site (Areas 2 and 3 only);

h) Notwithstanding 8.2.3 g), costs shall not be considered to be eligible if incurred prior to the date an application has been submitted under this program and accepted by the City with the exception of studies which were the subject of an approved ERASE Study Grant (ESG) Program (8.1) application. The total of the grant provided under this Program in combination with any tax assistance provided under the Tax Assistance Program (TAP) (8.3) shall not exceed the total approved eligible costs. Previous grant payments provided under the ESG Program for studies which are also to be accepted as eligible costs under this program will be deducted from the approved eligible costs;

i) To be eligible under this program, costs must be incurred by the property owner as identified on the submitted program application accepted by the City;

j) Actual costs for any or all of the items in eligible program costs above may be subject to audit by the City, at the expense of the property owner;

k) All property owners participating in this program will be required to enter into an agreement with the City which will specify the terms and conditions of the grant;

l) All ERG applications must be approved by City Council or City Council's designate;

m) The property owner shall be required to submit one of the following prior to a grant being paid under this program:

i) a Record of Site Condition ("RSC") conforming to the latest Ontario Regulation 153/04 standards and prepared by a Qualified Person to the Environmental Site Registry under section 168.4 of the *Environmental Protection Act* and shall submit to the City an acknowledgement of receipt of the RSC by the MOECP; or

ii) where the submission of a signed RSC is not required under the *Environmental Protection Act* to permit the brownfield redevelopment, and provided that the owner of the property within the ERASE Community Improvement Project Area undertakes a Risk Assessment and remediates the property to a standard that would enable the owner to submit a RSC,

the property owner may instead provide the City with a Risk Assessment prepared by a Qualified Person for Risk Assessments (as defined in the *Environmental Protection Act* and Ontario Regulation 153/04, as amended), subject to a peer-review by a Qualified Person for Risk Assessment, who is acceptable to the City. This peer-review must certify that the property has been remediated to the appropriate levels for the proposed use in accordance with the Risk Assessment, to the satisfaction of the City. The cost of the peer-review will be an eligible cost under this program;

n) The City reserves the right to require the submission, to the City's satisfaction, of environmental reports and documentation showing the subject property has been remediated to the appropriate levels for the proposed use;

o) If a building(s) erected on a property participating in this Program is demolished before the grant period expires, the remainder of the monies to be paid out under the grant shall be forfeited;

p) The improvements made to buildings and/or land shall be made pursuant to a Building Permit, constructed in accordance with the Ontario Building Code, and in compliance with all applicable Official Plan, Zoning By-Law and Site Plan Control requirements and approvals;

q) Outstanding work orders and/or orders or requests to comply from the City must be satisfactorily addressed prior to grant approval;

r) No grant is to be paid out until the project is completed. Alternatively, subject to written approval by the Director of Economic Development, a percentage of the total grant payment may be provided for phased developments based on the number of phases completed and proportional to the eligible costs incurred in each completed phase. Such partial payments shall be limited to those projects where the incremental tax increase for individual development phase can be determined to the City's satisfaction; and,

s) Work on the portion of the Project that is at or above grade shall commence no longer than five (5) years from the date an application under this program was approved by City Council (or City Council's designate) and the Project and all eligible works shall be completed and the project capable of being fully occupied within 10 years from the date an application under this program approved by City Council (or City Council's designate). Where a project consists of multiple phases, consideration may be provided for an extended project completion and occupancy period at the sole absolute and unfettered discretion of City Council.

Eighty-percent (80%) of the municipal portion of the tax increment will be reimbursed to the property owner in the form of a grant, while the remaining 20% of the tax increment will be dedicated to the ERASE Municipal Acquisition and Partnership Program (see Section 8.5).

8.2.4 Administration

The Economic Development Division will be responsible for administering the ERG, in consultation with other division/departments as necessary. Applications shall be submitted to the Economic Development Division and shall be accompanied by a Phase II ESA and/or Risk Assessment and Remedial Action Plan undertaken by a Qualified Person (as defined under Ontario Regulation 153/04) and/or Designated Substances and Hazardous Materials Survey (where applicable). For sites undertaking environmental remediation, the work plan and cost estimate shall be in the form of a Remedial Action Plan prepared by a Qualified Person. Said work plan and cost estimate will be supported by a Phase II ESA and/or Risk Assessment undertaken by a Qualified Person. Studies/plans submitted shall:

a) Identify the extent of the environmental remediation and any installation, monitoring, maintaining and operating environmental and/or engineering controls/works required for the eligible property; and,

b) Provide a detailed work plan and cost estimate for said environmental remediation which includes the installation, monitoring, maintaining and operating environmental and/or engineering controls/works.

For other non-remediation eligible works under this program, a written contractor's estimate shall be provided which shall be supported by any applicable studies (such as Designated Substances and Hazardous Materials Survey) to the City's satisfaction. The City may also require the submission of a Business Plan for the proposed development.

In addition, a cost estimate for all eligible LEED program component costs by a LEED certified specialist must be provided.

Applicants will be required to have a pre-application consultation meeting with City staff in order to determine program eligibility, proposed scope of work, project timing, etc.

Before accepting an application, City staff will screen the application. If the application is not within the community improvement project area or the application clearly does not meet the program eligibility requirements, the application will not be accepted.

Acceptance of the application by the City in no way implies grant approval.

Program eligibility will be determined by the Economic Development Division, in consultation with other divisions/departments as necessary. Applications will be recommended for approval only if they meet the criteria specified in this Plan and any other requirements of the City including that the property and property owner are in good standing with the City in terms of all City By-laws that apply to the property and project, all laws that govern the construction and development of the project and the payment of all taxes.

In instances where an applicant cannot satisfy staff with all necessary eligible cost estimates and required back-up documentation, staff reserves the right to consider an application as part of a two-step application and approval process, with the ultimate

approval residing with City Council.

Where an ERG application has been submitted by a property owner and accepted by the City but not yet approved by City Council (or City Council's designate), and the subject property(s) are transferred to a new property owner, the City may permit the transfer or assignment of the application, and any eligible costs incurred from the original date of application, to the new owner at the sole, absolute and unfettered discretion of the GM. An assignment or transfer may require the assignee or transferee to submit an application, assignment or transfer agreement and/or such other documents as determined by the GM in their sole, absolute and unfettered discretion.

A recommendation on the ERG Application (including estimated eligible costs) will be forwarded to City Council (or Council's designate) for consideration.

A Program application may be denied by City Council if the development that is the subject of the grant application is not supported by City Council notwithstanding any approval of *Planning Act* applications by any other authority including, but not limited to, the Local Planning Appeal Tribunal or the Minister of Municipal Affairs and Housing, and that City Council's decision on the Program application will not fetter its discretion on *Planning Act* applications.

City Council's approval of a Program application can provide for a reduced grant amount so that no grant is payable in respect of any portion of the development that is the subject of the grant application which City Council does not support notwithstanding any approval of *Planning Act* applications by any other authority including, but not limited to, the Local Planning Appeal Tribunal or the Minister of Municipal Affairs and Housing, and that City Council's decision on the Program application will not fetter its discretion on *Planning Act* applications. In such cases, the applicant shall be required to provide additional supporting documentation, at the applicant's own expense, to support the providing of financial assistance in accordance with City Council's approval/direction, including but not limited to, all MPAC post development assessment estimates required by the City.

The applicant participating in the ERG program must enter into an agreement with the City which will be forwarded to the applicant for signature once City Council (or Council's designate) approves the ERG Application. Once the applicant has signed the agreement, the agreement will then be executed by City officials and a copy will be provided to the applicant. The City may require the applicant to register the agreement on title immediately upon execution of the agreement. This agreement will identify events of default whereby upon its occurrence, and for so long as the default continues, the City shall be entitled to remedies including but not limited to ceasing or delaying the release of grant payments without notice to the owner and any obligation of the City to make a grant payment or provide accommodation under the ERG Agreement shall cease. In addition, the City may declare, by notice to the owner, that any grant payments already made to be forthwith due and payable as determined by the General Manager of Planning and Economic Development in their sole, absolute and unfettered discretion.

For sites subject to environmental remediation, the property owner shall submit to the

MOECP a signed Record of Site Condition (RSC) prepared by a Qualified Person, and the property owner shall submit to the City an acknowledgement of receipt of the RSC by the MOECP. The City reserves the right to require the submission to the City's satisfaction, of environmental reports and documentation showing the subject property has been remediated to the appropriate levels for the proposed use. The RSC filed with the MOECP must conform to the latest Ontario Regulation 153/04 standards. Where the submission of a signed RSC is not required under the *Environmental Protection Act* to permit the brownfield redevelopment and provided that the owner of the property within the ERASE Community Improvement Project Area undertakes a Risk Assessment and remediates the property to a standard that would enable the owner to submit a RSC, the property owner may instead provide the City with a Risk Assessment prepared by a Qualified Person for Risk Assessments (as defined in the *Environmental Protection Act* and Ontario Regulation 153/04, as amended), subject to a peer-review by a Qualified Person for Risk Assessments, who is acceptable to the City. This peer-review must certify that the property has been remediated to the appropriate levels for the proposed use in accordance with the Risk Assessment, to the satisfaction of the City. The cost of the peer-review will be an eligible cost.

Once the development project is complete and the property has been reassessed by MPAC, the property owner will be sent a new tax bill. After the property owner has paid in full the new taxes for one (1) calendar year, the City will check to see that the property is not in tax arrears and that the property is still in conformity with the terms of the ERG Agreement. The City will calculate the actual tax increment and grant payment. The City will then issue payment of the grant in the form of a cheque in the amount specified as per the calculation of the actual grant payment. If the property is severed into multiple parcels or lots or if there is a conveyance of part of the property (all referred to as severed parcels) prior to the first full year of reassessment resulting from the completion of the project. the property taxes used to calculate the grant shall be the sum of the amount which is the lesser of the post-project municipal property taxes or the municipal property taxes payable for the year for which a grant payment is being made, for all the severed parcels but for the initial grant payment means the amount which equals the sum of the post-project municipal property taxes for the severed parcels.

A grant will not be made unless a written request for the grant payment has been made by the owner in the year in which the grant payment is payable. If a written request has not be made for grant payment in the year in which it is payable but all other conditions for its payment have been satisfied, the grant payment shall accrue and be payable together with any other grant payments for which a written request has not been made until such time as a written request has been made and upon such written request the grant payment shall equal the sum of the accrued and previously unrequested grant payments. If a request for the initial grant payment is not made within three (3) years of the year in which the first-years' grant is payable the agreement shall terminate and without limiting the generality of the foregoing the City shall not be obligated to make any grant payments.

Notwithstanding any other term or condition of this program, where an application has been approved by City Council, the application and the associated approval, including the assignment of any eligible costs incurred by the Council approved applicant since the date

of application submission, may be assigned to a future intended owner of the subject site(s) only in such instance where the registered owner of the site(s) at the time of Council approval was the City of Hamilton, CityHousing Hamilton Corporation or any other entity wholly owned by the City of Hamilton and where the assignment will further facilitate the remediation and redevelopment of a site and/or support the achievement of strategic City priorities/objectives. It is understood that one effect of such an assignment shall be that the future intended site owner will assume all requirements and obligations required under the program and become the recipient of any future grant payments which may be eligible under the Program at such time as they become the registered site owner.

A request to assign the application shall be submitted in writing to the City by the existing site owner and the Council approved applicant with accompanying rationale and be subject to approval by City Council in its sole discretion. The future intended site owner shall be subject to all applicable due diligence required under this program, including, but not limited to, applicable corporate title and litigation searches, to the satisfaction of the City prior to the assignment being considered by City Council. An assignment or transfer may require that the assignee or transferee submit an application, assignment or transfer agreement and/or such other documents as determined by the GM of Planning and Economic Development in their sole, absolute and unfettered discretion.

Additional Terms and Conditions to be Included in Jamesville ERASE Development Charge Deferral Agreement(s) at 405 James Street North (ERG-19-06) and/or 38 Strachan Street West / 344 Bay Street North (ERG-20-01)

That the Grants payable be applied to offset the City Development Charges payable by Jamesville Redevelopment Limited Partnership (JLRP) in respect of the residential condominium development (the "Development") to be completed on the Jamesville lands at 405 James Street North and/or 38 Strachan Street West / 344 Bay Street North (the "Properties") pursuant to By-law No. 19-142, also be subject to the additional following terms and conditions.

The payment of the City Development Charges, up to the amount of the estimated ERG payments per Applications ERG 19-06 & ERG 20-01 (should a ERASE Development Charges Deferral Agreement be entered into), for the Development be secured by an ERASE Development Charges Deferral Agreement, entered into between the City and JRLP, at the time the City Development Charges become payable pursuant to By-law No. 19-142, on the terms and conditions of the City's standard form of ERASE Development Charges Deferral Agreement, but subject to the following specific terms and conditions:

- The payment of the Deferred City Development Charges shall be secured by either:

  (i) a collateral mortgage registered on title to the Property (standard City requirement); or,

  (ii) a Letter of Credit, payable on demand, with a value equivalent to 25% of the deferred Development Charges;

- If secured by a Letter of Credit, there shall be no restriction on the sale or transfer of condominium units to be constructed on the Jamesville Properties to third party purchasers;

- If secured by a collateral mortgage, then JRLP shall be permitted to sell and transfer condominium units to be constructed on the Jamesville Properties to third party purchasers, and to obtain partial discharges of the collateral mortgage from the City, provided that there is no estimated shortfall between the future estimated ERG payment and the then outstanding balance of the Deferred Development Charges, provided further that if there is any estimated shortfall between the future estimated ERG payment and the then outstanding balance of the Deferred Development Charges, then partial discharges shall be granted on payment of the amount of such shortfall;

- If secured by a collateral mortgage, then JRLP shall be free to transfer portions of the Jamesville Properties designated to be transferred to CHH and Indwell (or

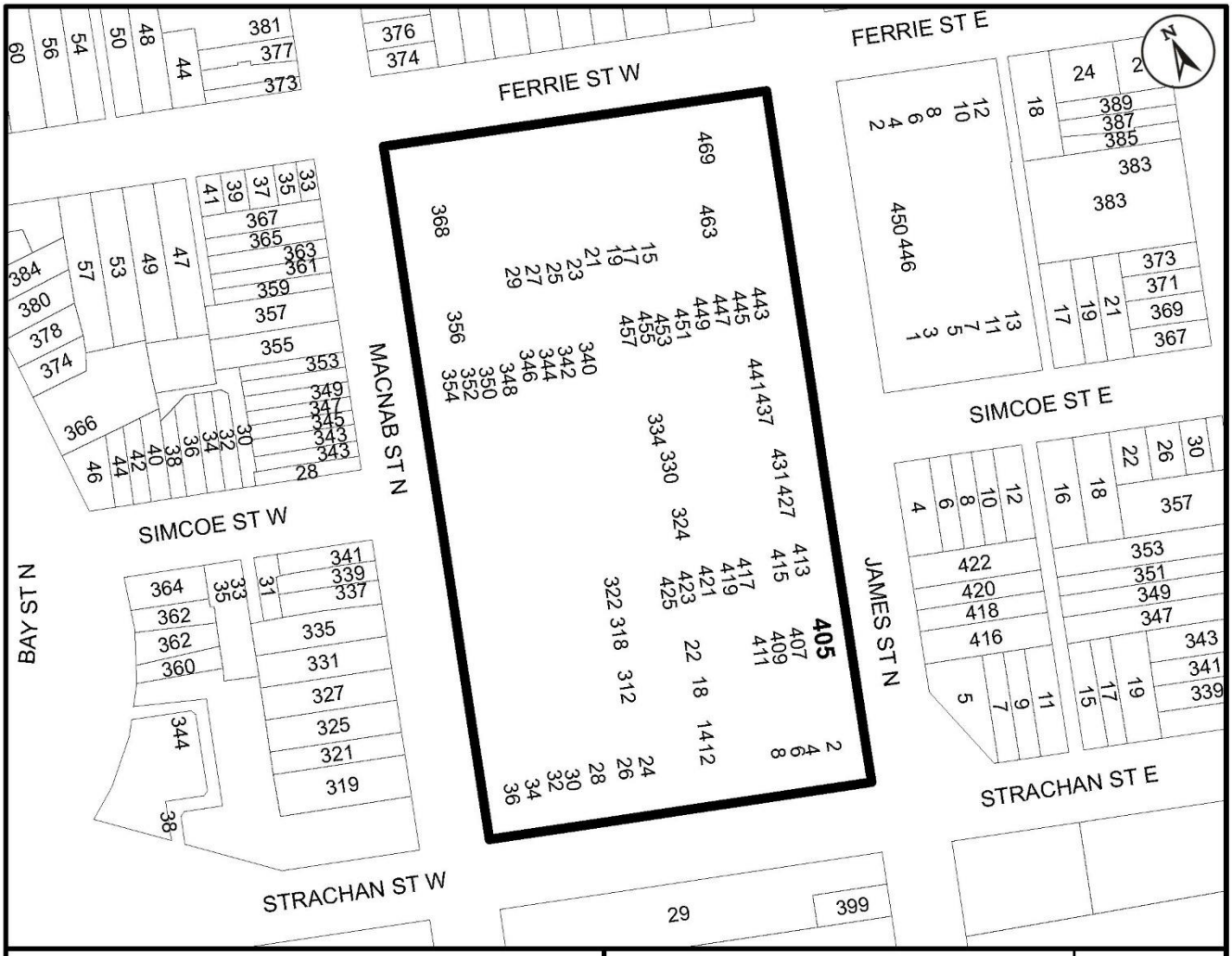
another non-profit social/affordable housing organization reasonably acceptable to CHH) without requirement of payment or partial payment of the Deferred Development Charges to the City;

- In lieu of the personal guarantee which is normally required by the General Manager of Corporate Services and Finance for deferred Development Charges, JRLP shall be permitted to provide corporate guarantee(s) from the four (4) limited partners of JRLP (or other guarantees and/or corporations reasonably acceptable to the General Manager of Corporate Services and Finance), on that basis that each guarantor guarantee 25% of the total value of the deferred Development charges (for a total aggregate guarantee of 100% of the total value of the deferred Development charges);

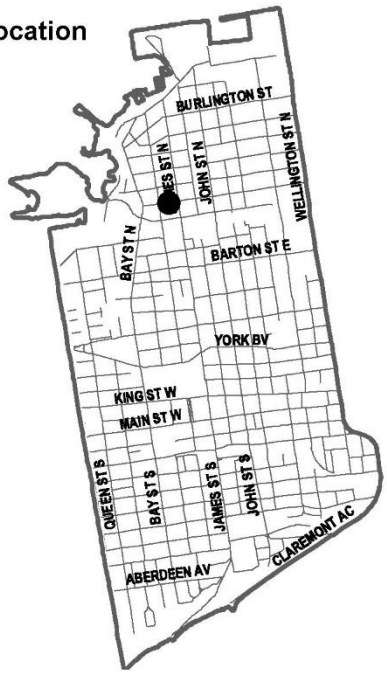
- Such additional terms and conditions, which do not conflict with the above, that do not conflict with By-law No. 19-142, and that are satisfactory to the General Manager of Finance and Corporate Services in his sole discretion; and,

- That the approval by Council to apply ERG Grant payments to offset the payment of deferred City Development Charges shall only apply to City Development Charges payable pursuant to By-law No. 19-142 as long as it permits the deferral of City Development Charges, and if By-law No. 19-142 is amended so as to no longer permit deferral of the payment of City Development Charges or if City Development Charges are payable pursuant to any City Development Charge By-law passed subsequent to By-law No. 19-142, the determination of whether the ERG Grant payments can be applied to offset City Development Charges shall be brought back to Council for consideration.

Appendix "C" to Report PED22107/FCS22035
Page 1 of 1



● Site Location



Key Map - Ward 2

Location Map

Hamilton

PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT

File Name/Number:	Date:
ERG-19-06	April 7, 2022

Appendix "A"	Scale:	Planner/Technician:
	N.T.S	PC/VS

Subject Property

405 James Street North, Hamilton

CITY OF HAMILTON
CITY MANAGER'S OFFICE
Administration

TO:	Mayor and Members General Issues Committee
COMMITTEE DATE:	June 15, 2022
SUBJECT/REPORT NO:	Restricted Acts After Nomination Day Delegated Authority (City Wide) (CM22009)
WARD(S) AFFECTED:	City Wide
PREPARED BY:	Aine Leadbetter x2753 Andrea Holland x5409
SUBMITTED BY: **SIGNATURE:**	Janette Smith City Manager 

RECOMMENDATION

That Council approve and enact the draft "By-Law to Delegate Authority during any Restricted Period following Nomination Day", attached as Appendix "A" to Report CM22009, which has been prepared in a form satisfactory to the City Solicitor.

EXECUTIVE SUMMARY

Pursuant to Section 275 of the *Municipal Act, 2001* (the "Act"), when it becomes impossible for 75% of the members of the outgoing Council to be re-elected, the Council will be subject to certain restrictions as set forth in Section 275(3) of the Act. This may occur after Nomination Day based on the nominations that have been certified, including any acclamations, or upon announcement of the results of the election after Voting Day. To ensure that the City is capable of addressing any potential impacts to operations that arise as a result of these restrictions, staff is recommending that the draft "By-law to Delegate Authority during any Restricted Period following Nomination Day" be enacted to provide the City Manager with delegated authority to act should Council's actions be restricted.

FINANCIAL – STAFFING – LEGAL IMPLICATIONS (for recommendation(s) only)

Financial: Expenses approved under the delegated authority during the restricted period which have not been approved in the City's annual budget will be funded through budget

appropriation transfers, and/or through reserves funding, and/or through debenture issue(s).

Staffing: There are no staffing implications

Legal: Delegation of authority prior to Nomination Day is required to ensure business related to restricted acts can continue during any restricted period.

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

Section 275(3) of the Act, which identifies restricted acts after nomination day is commonly referred to as the “Lame Duck Provision”.

The City of Hamilton will be subject to the restrictions set out in Section 275(3) of the Act only when it can be determined that fewer than three-quarters (75%) of the members of the outgoing Council will be re-elected. There are two scenarios in which this may occur:

- after nomination day (August 19th, 2022), if fewer than 75% of the incumbent members of Council have been certified as candidates in the upcoming election or acclaimed to office. For the City of Hamilton, this would mean that fewer than 12 members of Council have been certified (or acclaimed) by the City Clerk on August 22, 2022.

- after voting day (October 24, 2022), if fewer than 75% of the incumbent members of Council have been declared elected to the incoming Council. For the City of Hamilton, this would mean that fewer than 12 members of Council are re-elected to office.

Should either of the above scenarios occur triggering the Lame Duck Provision of the Act, the Council for the City of Hamilton would be unable to take action in the following areas as per section 275(3) of the Act until a new Council is inaugurated on November 16, 2022:

a) the appointment or removal from office of any officer of the municipality;
b) the hiring or dismissal of any employee of the municipality;
c) the disposition of any real or personal property of the municipality which had a value exceeding $50,000 at the time of disposal; and
d) making any expenditures or incurring any other liability which exceeds $50,000.

Notwithstanding the restrictions set forth in Section 275(3) of the Act, Section 275(4) provides that subsections (c) and (d) do not apply to any disposition or liability that was included in the most recent budget adopted by the council before nomination day in the

election, and Section 275(4.1) provides that nothing in Section 275 prevents a municipality from taking action in the event of an emergency. Further, pursuant to Section 275(6), nothing in Section 275 prevents the exercise of any authority delegated prior to nomination day.

Section 23.1 of the Act permits the municipality to delegate its powers and duties to a person subject to certain restrictions. Pursuant to section 23.3(1) a municipality is not permitted to delegate the power to appoint or remove from office an officer of the municipality whose appointment is required by the Act (for example, the City Clerk, Treasurer and the City Auditor). These positions, in addition to all Statutory Officials, are identified in Appendix "B" to Report CM22009.

RELEVANT CONSULTATION

Legal Services and the Office of the City Clerk were consulted in the development of this report and the associated By-law.

Staff were consulted to understand how the restricted acts after nomination day could impact City operations and services. Staff were asked to identify programs and initiatives that may be impacted by the restrictions and were asked to provide information on delegated authority required to ensure continued operations should the City be in a "lame duck" period.

Staff additionally consulted with municipalities across the province, including Ottawa, Windsor, Oakville, Toronto, London and Kingston. As a part of this consultation, staff compiled and conducted a review of By-laws specific to the Restricted Acts after Nomination Day period in addition to broader Delegated Authority By-laws that included language addressing the restricted acts period.

ANALYSIS AND RATIONALE FOR RECOMMENDATION

In advance of each Municipal Election, there is a possibility that fewer than 75% of existing Members of Council will either not submit nomination papers as of nomination day and become certified candidates or will not be re-elected on Election Day. Should this situation occur, the Council of a Municipality would be considered to be "lame duck", and as such would be restricted from specific acts as identified in Section 275 of the Act. While there are exceptions to the restricted acts, including where items are already approved in the Municipality's budget, where there is an emergency or where delegated authority already exists, there remains some risk as there would be areas where a municipality might be unable to act and where work of the Municipality could be stalled until the conclusion of the inaugural meeting of the new Council on November 16, 2022.

Risks Associated with a Potential Restricted Period

The City of Hamilton has some existing delegations that would address restricted areas. Additionally, the majority of City work for 2022 has been identified with budget approved, ensuring that vast majority of City business will continue regardless of a lame duck situation. Despite this framework and budget approval, staff has identified some areas of risk. This would include, but is not limited to:

- the ability to appoint acting employees to cover the vacancy or absence of a first level of senior management and statutory officials. Statutory Officials are identified in Appendix "B" to Report CM22009: Statutory Officials.

- the ability to engage in shared grant and loan programs with other levels of government that were not available prior to the lame duck period or that were available before the lame duck period but where it was not known that the City would be successful until during the lame duck period;

- the ability to divest or acquire properties not considered as a part of the budget process; and,

- the ability to award and negotiate contracts for capital projects or to address changes in capital projects. Examples of potential areas where restricted acts could cause potential challenges are found in Appendix "C" to Report CM22009: Potential Expenditures and Liabilities During the Restricted Period. (This appendix is provided to illustrate potential scenarios and is not an exhaustive list.)

Existing Authority Delegated to the City Manager

The City Manager has existing delegated authority that would serve to address components of the restricted acts, including:

- The City Manager may appoint, promote, demote, suspend and dismiss, subject to the provisions of any personnel policies adopted by Council, or collective agreements applicable to employees of the City, all employees of the City, except the first level of senior management and statutory officials. (By-law 19-044)

- The City Manager has authority to approve the funding for any procurement of a value of up to but not including $250,000 (By-law 20-205, as amended)

- The City Manager has authority to approve the acquisition, disposition, or lease of land or an interest in land to a value that does not exceed $250,000 (CS01083/PD04303)

Proposed Delegated Authority During the Restricted Period

Under the proposed By-law, the City Manager would be provided with additional delegated authority during a potential Lame Duck period only with respect to:

a) the appointment of any employee on an acting basis;

- By including delegated authority for the City Manager to appoint any employee on an acting basis during any Restricted Period, the City will have the ability to address absences or vacancies for Statutory Officials and first level Senior Management during the restricted period until such time as a permanent appointment can be made by Council. Appendix “B” to Report CM22009: Statutory Officials identifies the Statutory Officials of the City.

b) the disposition of any real or personal property of the City that has a value exceeding $250,000 at the time of disposal;

- By including delegated authority for the City Manager to dispose of any real or personal property with a value which exceeds the existing delegation of $250,000, the City will be able address critical circumstances that arise requiring the disposition of property during the restricted period.

c) making any expenditures or incurring any other liability of $250,000 or more;

- The inclusion of a delegated authority to make any expenditures or incur any other liability of $250,000 or greater would further provide the City with the ability to cover all possible expenditures and liabilities, and to engage in grants and loans, particularly from other levels of government, where the City is responsible for some cost sharing or administrative fees, should they exceed the threshold currently existing.

- Appendix “C” to Report CM22009: Potential Expenditures and Liabilities During a Restricted Period identifies types of costs and

liabilities that may be incurred during a Restricted Period. Note that this appendix is provided to illustrate potential scenarios and is not an exhaustive list.

d) approving the award of contract for any capital projects where the competitively procured cost exceeds the approved capital budget for that project by $250,000

- During a restricted period, there is the potential that capital projects that were anticipated in the budget could come in at a higher than estimated cost at the conclusion of the procurement process, or that economic pressures, including inflation or supply chain constraints, may result in cost increases requiring additional expenditures.

- Should costs increase such that they exceed original budget by $250,000, ordinarily Council approval would be required. Without delegating authority for approval to the City Manager, projects may be delayed, and the City could potentially incur financial impacts as costs may continue to rise or vendor relationship diminished while stalled.

The delegation of authority also includes the authority for the City Manager to negotiate, enter into and execute contracts and agreements and any ancillary documents in a form satisfactory to the City Solicitor and to take all necessary steps and actions to exercise the delegated authorities.

Checks and Balances:

The proposed By-law provides checks and balances to the provision of the delegated authority to be used during the restricted period. Under the proposed By-law, the City Manager is required to consult with the General Manager of Finance and Corporate Services and the General Manager of Planning and Economic Development prior to the acquisition or disposition of real or personal property, and to consult with the General Manager of Finance and Corporate Services and the appropriate General Manager prior to the making of any expenditure, or the incurring of any liability of $250,000 or more or the approval of the award of contract for capital project where the cost exceeds the budget for that project by $250,000 to ensure that any decisions made during this time resulting in expenses do not place the City in hardship.

The delegation of authority under the proposed By-law for the City Manager is limited and would come into effect only in the event that the restricted acts are triggered after nomination day or after election day. The proposed delegation of authority during the restricted period would terminate at the conclusion of the inaugural meeting of the new Council.

The City Manager, pursuant to section 7, of the By-law, will report back to Council at the first General Issues Committee on any use of the delegated authority during the restricted period.

ALTERNATIVES FOR CONSIDERATION

Council could choose not to implement a By-law to provide delegated authority to the City Manager in the event of a restricted period and instead rely on the delegated authority in place through existing policies and By-laws. This could result in the risk that delegated authority may not exist for all situations, and as such, could stall the work and operations of the City or not allow the City to participate in cost shared funding programs.

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

Our People and Performance
Hamiltonians have a high level of trust and confidence in their City government.

APPENDICES AND SCHEDULES ATTACHED

Appendix “A” to Report CM22009: A By-law to Delegate Authority during any Restricted Period following Nomination Day.

Appendix “B” to Report CM22009: Statutory Officials.

Appendix “C” to Report CM22009: Potential Expenditures and Liabilities During the Restricted Period. (This appendix is provided to illustrate potential scenarios and is not an exhaustive list)

Authority: Item ,
Report: CMO22009
CM:
Ward: City Wide

Bill No.

CITY OF HAMILTON

BY-LAW NO.

A By-law to Delegate Authority
During any Restricted Period following Nomination Day

WHEREAS section 275(3) of the Municipal Act restricts certain actions of the Council of a local municipality once it can be determined that any of the circumstances set forth in paragraphs 1, 2 or 3 of section 275(1) of the Municipal Act will apply to the new Council of the City;

AND WHEREAS subsection 275(6) of the Municipal Act provides that nothing in section 275 prevents any person or body exercising any authority of a municipality that is delegated to the person or body prior to Nomination Day for the election of the new Council;

AND WHEREAS, pursuant to section 23.1 of the Municipal Act, a municipality is authorized to delegate its powers and duties under the Municipal Act or any other Act to a person or body, subject to the restrictions set out in Part II of the Municipal Act;

AND WHEREAS to ensure the efficient and effective management of the City of Hamilton during any Restricted Period it is prudent that Council delegate certain authorities to the City Manager;

NOW THEREFORE the Council of the City of Hamilton enacts as follows:

1. The delegations of authority outlined in this By-law are in addition to any other delegations of authority established by other City by-laws, resolutions, policies and otherwise at law. In the event of any inconsistency between this By-law and any other City by-law, the provision that delegates the broader authority shall prevail to the extent of the inconsistency.

2. In this By-law:

"By-law" means this By-law to Delegate Authority during any Restricted Period following Nomination Day;

"City" means the City of Hamilton or the geographic area of the City of Hamilton as the context requires;

"City Clerk" means the Clerk for the City of Hamilton as appointed by Council;

"City Manager" means the Chief Administrative Officer for the City of Hamilton as appointed by Council;

"Council" means the Council for the City of Hamilton;

"Municipal Act" means the *Municipal Act, 2001*, S.0. 2001, c. 25, as amended;

"Nomination Day" means the third Friday in August in the year of the election for a regular election; and

"Restricted Period" means the period commencing when any of the circumstances set forth in paragraphs 1, 2 or 3 of section 275(1) of the Municipal Act apply and ending at the conclusion of the inaugural meeting of the newly elected Council.

3. During the Restricted Period the City Manager shall have the authority with respect to the following matters:

    (a) the appointment of any employee on an acting basis;

    (b) the disposition of any real or personal property of the City that has a value exceeding $250,000 at the time of disposal;

    (c) making any expenditures or incurring any other liability of $250,000 or greater; and

    (d) approve the award of contract for any capital projects where the competitively procured cost exceeds the approved capital budget for that project by $250,000.

4. During the Restricted Period, the General Manager, Finance and Corporate Services shall be authorized to fund estimates in excess of the budget for individual capital projects through budget appropriation transfers between capital projects and /or through reserves funding and/ or through debenture issue(s).

5. During the Restricted Period the General Manager, Finance and Corporate Services shall be authorized to amend the debt forecast and calculate an updated Annual Repayment Limit (ARL) related to incurring long term debt for any capital projects.

6. Prior to exercising the delegated authorities set forth in this By-law, the City Manager or the General Manager shall:

    (a) consult with the General Manager, Finance and Corporate Services and with the General Manager, Planning and Economic Development, with respect to any acquisition or disposition of real or personal property that exceeds $250,000;

(b) consult with the General Manager, Finance and Corporate Services and with the appropriate General Manager with respect to the making of any expenditure, or the incurring of any liability of $250,000 or greater; and

(c) consult with the General Manager, Finance and Corporate Services and with the appropriate General Manager with respect to approving the award of contract for capital projects where the cost exceeds the amount of the capital budget for that project by $250,000.

7. The City Manager shall provide a report to the first General Issues Standing Committee meeting following the inaugural meeting of the newly elected Council identifying any exercise of the authorities delegated pursuant to this By-law.

8. The authorities delegated to the City Manager pursuant to this By-law include the authority to negotiate, enter into and execute all necessary contracts and agreements and any ancillary documents required to give effect thereto in a form satisfactory to the City Solicitor and to take all necessary steps and actions to exercise the delegated authorities.

9. The City Clerk shall advise Council in writing when the Restricted Period has commenced.

10. This By-law shall come into force on the day it is passed and expire on the date of the inaugural meeting of the new term of Council.

Appendix B: Statutory Officials

The following chart outlines the Statutory Officials of the Municipality and details the coverage in existing by-law or legislation should the Official be absent from their role, or should this role be vacant.

Official	Appointment	Coverage
Treasurer	By-law No. 13-016 as amended to Appoint a Treasurer and Deputy Treasurers	By-law No. 13-016 as amended by By-law No. 17-161 provides that the Director of Financial Planning, Administration and Policy, the Director of Financial Services, Taxation and Corporate Controller (or the individuals acting in these positions) are appointed as Deputy Treasurers who, and, during the absence or illness of the Treasurer, can carry out the duties of the Treasurer.
City Clerk	By-law 19-182 to Appoint a Clerk for the City of Hamilton	By-law No. 19-183 To Appoint a Deputy City Clerk for the City of Hamilton appoints a Deputy City Clerk with the powers and duties of the City Clerk, subject to the direction of the City Clerk with respect to the times and manner in which the powers and duties shall be exercised.
Fire Chief	By-law No. 19-035 as amended Being a By-law to Appoint a Fire Chief, Deputy Fire Chief, and Provincial Fire Co-ordinator pursuant to the Hamilton Fire Department Establishing and Regulating By-law No. 19-034	Deputy Fire Chiefs appointed to act on behalf of the Fire Chief as needed.
Chief Building Official	By-law No. 22-112 Respecting the Appointments of a Chief Building Official, Deputies and Inspectors	By-law permits the deputies to perform and have all powers and duties of the Chief Building Official (CBO) as directed by the CBO or when the CBO is absent
City Auditor	By-law 19-180 to appoint the City Auditor as the General Auditor under	By-law does not include language on coverage should the Auditor be absent of the position vacant, however, under section 223.19 (5) of the Municipal Act,

Official	Appointment	Coverage
	Section 223.19 of the Municipal Act, 2001	2001, the Auditor may, in writing, delegate their powers and duties to any person, other than a member of Council.
Medical Officer of Health	Appointment made by Council Resolution.	The Health Protection and Promotion Act, 1990, in section 68(2) delegates authority to act to associate medical officers of health should the Medical Officer of Health be unable to act or should the position be vacant.
Chief Planning Official	Authority provided under the Planning Act, 1990. Role identified through job description.	In the absence of the Chief Planning Official, Acting Director of Planning (which rotates monthly) assumes all functions that the Chief Planning Official would normally undertake.

Appendix C: Potential Expenditures and Liabilities During the Restricted Period

Reserves/Transfer of Funds Potentially Required:

- Planning and Economic Development
  - Accessing the Development Fee Stabilization Reserve for the purposes of legal or planning costs associated with Local Planning appeal tribunal appeals
  - Accessing 112231 - Conventions/Sports Events Reserve for small bid events

- Public Works
  - First Street Sewage Pumping Station Project; Policy 10 Emergency was declared, and approval of funding is required
  - Approved Acquisitions on Lloyd Street as a part of the Brightside Park Development require authorization for funds to be moved to the project identification

Potential Upcoming Government Grants:

- Planning and Economic Development
  - Potential to receive grant from Tourism Relief Fund

- Healthy and Safe Communities
  - Canada Wide Early Learning Child Care Funding
  - High Intensity Support at Home
  - Potential for Housing Funding

Expenditures that may require additional funding beyond $250k:

- Planning and Economic Development
  - Project 4902141201 Surface Lots & Garage Repairs
  - Project 4901945900 Waterproof Convention Parking
  - Project 4901957901 Pay-on-Foot System Replacement
  - Project 4901751700 Parking Payment Equipment
  - Project 4902141203 Surface Lot Lighting Replacement

- Healthy and Safe Communities
  - Gas Price increases for fleets in Emergency Medical Services and Hamilton Fire Department

- Public Works
  - Equipment Purchases that are urgent and would require Policy 11 Approvals
  - Enterprise Asset Management Project

Upcoming Contracts/Agreements:

- Healthy and Safe Communities
  - agreement for research with McMaster University School of Nursing

- Public Works
  - The Special Event Security Guard Services (C-16-22) is expected to go to market at the end of May and will require approval as it will be beyond $250K
  - Negotiation of multiyear contract terms related to price increases for parts, service and new vehicle purchases

- Corporate Services
  - Insurance Negotiations

*The information within this Appendix "C" to CM22009 is provided to illustrate potential scenarios and this is not an exhaustive list.

CITY OF HAMILTON
PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT
Economic Development Division

TO:	Mayor and Members General Issues Committee
COMMITTEE DATE:	June 1, 2022
SUBJECT/REPORT NO:	Revitalizing Hamilton Tax Increment Grant - 16 West Avenue South (PED22115) (Ward 3)
WARD(S) AFFECTED:	Ward 3
PREPARED BY:	Carlo Gorni (905) 546-2424 Ext. 2755
SUBMITTED BY: **SIGNATURE:**	Norm Schleehahn Director, Economic Development Planning and Economic Development 

RECOMMENDATION

(a) That a Revitalizing Hamilton Tax Increment Grant Program (RHTIG) Application submitted by Crood Holdings Limited (Tal Dehtiar), for the property at 16 West Avenue South, Hamilton, estimated at $92,619.68 over a maximum of a four (4) year period, and based upon the incremental tax increase attributable to the redevelopment of 16 West Avenue South, Hamilton, be authorized and approved in accordance with the terms and conditions of the RHTIG;

(b) That the Mayor and City Clerk be authorized and directed to execute a Grant Agreement together with any ancillary documentation required, to give effect to the RHTIG for Crood Holdings Limited (Tal Dehtiar) for the property known as 16 West Avenue South, Hamilton, in a form satisfactory to the City Solicitor;

(c) That the General Manager of the Planning and Economic Development Department be authorized and directed to administer the Grant and Grant Agreement including, but not limited to, deciding on actions to take in respect of events of default and executing any Grant Amending Agreements, together with any ancillary amending documentation, if required, provided that the terms and conditions of the RHTIG Program, as approved by City Council, are maintained.

EXECUTIVE SUMMARY

The RHTIG Application for the redevelopment of the property at 16 West Avenue South, Hamilton was submitted by Crood Holdings Limited (Tal Dehtiar), owner of the property. This address contains a house of worship. The proposed works will see the redevelopment of the building resulting in the creation of nineteen (19) rental residential units. This property is designated under Part IV of the *Ontario Heritage Act* by City of Hamilton By-law Number 92-239 as a property of Historic and Architectural Value and Interest.

Redevelopment costs are estimated at $3,134,262 and it is projected that the proposed renovations will increase the assessed value of the property from its current value of $288,000 to approximately $4,080,000.

This will increase total annual property taxes generated by the property. The municipal share of this property tax increase (municipal tax increment) will be approximately $37,047.87 of which 100% would be granted to the owner during year one, 75% or approximately $27,785.90 in year two, 50% or approximately $18,523.94 in year three and 25% or approximately $9,261.97 in year four. The estimated total value of the Grant is approximately $92,619.68. Note that every year the tax increment is based on actual taxes for that year.

Alternatives for Consideration – See Page 6

FINANCIAL – STAFFING – LEGAL IMPLICATIONS

Financial: The City will collect full property taxes on the property and, in turn, provide a Grant for four (4) years, declining each year after the first year by 25%, based on the increase in the municipal portion of the taxes, post-redevelopment completion of 16 West Avenue South, Hamilton. Following year one of the Grant Payment, the City will start to realize the positive results of the Program from a financial perspective. Based on the projected figures, the estimated tax increment over four (4) years totals $148,191.48, of which the Applicant would receive a Grant totalling approximately $92,619.68 and the City retaining taxes totalling approximately $55,571.81.

Staffing: Applicants and subsequent Grant Payments under the RHTIG are processed by the Commercial Districts and Small Business Section and Taxation Section, Corporate Services Department. There are no additional staffing requirements.

Legal: Section 28 of the *Planning Act* permits a municipality, in accordance with a Community Improvement Plan, to make loans and grants which would

otherwise be prohibited under Section 106(2) of the *Municipal Act*, to registered/assessed owners and tenants of lands and buildings. A Community Improvement Plan can only be adopted and come into effect within a designated Community Improvement Project Area. Changes to a Community Improvement Plan or Community Improvement Project Area require formal amendments as dictated by the *Planning Act*.

The Applicant will be required to execute a Grant Agreement prior to the Grant being advanced. The Grant Agreement will be developed in consultation with the Legal Services Division.

As construction projects move forward, it is sometimes necessary to amend previously approved Grant Agreements and any ancillary documentation. Therefore, staff recommends that the General Manager of Planning and Economic Development be authorized to amend Grant Agreements and any ancillary documentation, provided that the terms and conditions of the HTIGP are maintained.

HISTORICAL BACKGROUND

City Council, at its meeting held on August 22, 2001, approved an amendment to the Downtown and Community Renewal Community Improvement Plan which introduced the Hamilton Tax Increment Grant Program. The RHTIG Program is currently established through the updated Revitalizing Hamilton's Commercial Districts Community Improvement Plan (RHCD CIP) which was approved by City Council on September 29, 2021 by way of By-law No. 21-164.

The RHTIG is intended to incentivize property owners located in Downtown Hamilton, Community Downtowns, Business Improvement Areas, the Mount Hope/Airport Gateway, the corridors of Barton Street and Kenilworth Avenue as identified in the Revitalizing Hamilton's Commercial Districts Community Improvement Project Area and to properties designated under Part IV or V of the *Ontario Heritage Act* to develop, redevelop or otherwise improve properties and/or buildings in a manner that will support the broader revitalization of these districts as well as generate new municipal property tax revenue through increased property assessments. The exact geographic boundaries within which the RHTIG is available are defined through the associated Revitalizing Hamilton Community Improvement Project Area By-law No. 21-163.

POLICY IMPLICATIONS AND LEGISLATED REQUIREMENTS

Urban Hamilton Official Plan

The subject site is municipally known as 16 West Avenue South and is located within the "Downtown Urban Growth Centre" on Schedule "E" – Urban Structure.
The site is located within the Downtown Hamilton Secondary Plan area (OPA 102) and designated "Downtown Mixed Use" on Map B.6.1-1 – Downtown Hamilton Secondary Plan – Land Use Plan which is intended to maintain the governmental, institutional, educational, cultural, and residential centre of Downtown Hamilton and to support intensive, urban-scale mixed use developments.

The planned use of the site and existing building conforms to the designation.

Zoning By-law No. 05-200

The subject site is zoned "Downtown Central Business District (D1) Zone" which is intended to support a wide variety and mix of uses in both stand-alone and mixed-use buildings.

The planned use of the site and existing building is permitted.

RELEVANT CONSULTATION

Staff from the Taxation Section and the Finance and Administration Section, Corporate Services Department and the Legal Services Division, Corporate Services Department was consulted, and the advice received is incorporated into Report PED22115.

ANALYSIS AND RATIONALE FOR RECOMMENDATION

Commercial Districts and Small Business staff, in co-operation with staff from the Taxation Section and Legal Services Division, developed an estimated Schedule of Grant Payments under the terms of the Program. The final Schedule of Grant Payments will be contingent upon a new assessment by MPAC following completion of the project. The Applicant will be required to sign a Grant Agreement. The Grant Agreement contains provisions for varying the Grant payment in each, and every year based on MPAC's assessed value. By signing, the Applicant will accept the terms and conditions outlined therein prior to any Grant Payments being made. The Agreement outlines the terms and conditions of the Grant Payments over the four (4) year period.

The estimated Grant shall be calculated according to the following formulas:

Grant Level:	100%	
Total Eligible Costs (Maximum):	$3,134,262	
Total Pre-project CVA:		Year: 2021
CT (Commercial)	$288,000	
Pre-Project Property Taxes		
Municipal Levy:	$6,019.26	
Education Levy:	$2,534.40	
Pre-project Property Taxes	$8,553.66	
*Post-project CVA:		
NT (New Multi-Residential)	$4,080,000	Year: TBD
Estimated Post-project CVA		
Post-Project Property Taxes		
****Estimated** Municipal Levy:	$43,067.13	
****Estimated** Education Levy:	$ 6,242.40	
****Estimated** Post-Project Property Taxes:	$49,309.53	

*The actual roll number(s) assessed value(s), tax classification(s) and value partitioning (where applicable) are to be determined by the Municipal Property Assessment Corporation (MPAC).

**2021 tax rates have been used for calculation of the estimated post-development property taxes.

Pre-project Municipal Taxes = Municipal Levy = $6,019.26
Municipal Tax Increment = $43,067.13 - $6,019.26 = $37,047.87
Payment in Year One = $37,047.87 x 1.0 = $37,047.87

ESTIMATED GRANT PAYMENT SCHEDULE for redevelopment of a house of worship into a multi residential building containing 19 residential rental units.

Year	Grant Factor	Tax Increment*	Grant
1	100%	$37,047.87	$37,047.87
2	75%	$37,047.87	$27,785.90
3	50%	$37,047.87	$18,523.94
4	25%	$37,047.87	$9,261.97
Total		**$148,191.48**	**$92,619.68**

*Note that the tax increment is based every year on actual taxes for that year. The figures above are estimates. In other words, for each year a Grant Payment is paid, the actual taxes for the year of the Grant Payment will be used in the calculation of the Grant Payment.

Details of the proposed renovation and its estimated assessment and municipal tax increments are based on the project as approved, or conditionally approved, at the time of writing this report. Any minor changes to the planned renovation that occur prior to the final MPAC reassessment of the property may result in an increase/decrease in the actual municipal tax increment generated and will be reflected in the final Grant amount.

ALTERNATIVES FOR CONSIDERATION

Declining a Grant and/or approving a reduced amount would undermine the principles of the RHTIG and regeneration efforts in general. This alternative is not recommended.

Financial: Grants totalling $92,619.68 over a four (4) year period would not be issued.

Staffing: Not applicable

Legal: Not applicable

ALIGNMENT TO THE 2016 – 2025 STRATEGIC PLAN

Economic Prosperity and Growth
Hamilton has a prosperous and diverse local economy where people have opportunities to grow and develop.

APPENDICES AND SCHEDULES ATTACHED

Appendix “A” to Report PED22115 – Location Map

Appendix "A" to Report PED22115
Page 1 of 1

● Site Location

Key Map - Ward 3

Location Map

Hamilton

PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT

File Name/Number: 16 West Av S		Date: July 9, 2021
Appendix "A"	Scale: N.T.S	Planner/Technician: CG/NB

Subject Property

16 West Avenue South, Hamilton (Ward 3)

Hamilton

ADVISORY COMMITTEE FOR PERSONS WITH DISABILITIES
REPORT 22-006
4:00 p.m.
Tuesday, May 24, 2022
Due to COVID-19 and the Closure of City Hall, this meeting was held virtually.

Present: A. Mallett (Chair), J. Kemp (Vice-Chair)
S. Aaron, J. Cardno, L. Dingman, A. Frisina, L. Janosi, P. Kilburn, T. Manzuk, C. McBride, M. McNeil, K. Nolan, T. Nolan

Absent with Regrets: Mayor F. Eisenberger, P. Cameron, M. Dent, T. Murphy, R. Semkow

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Chair Mallett called the meeting to order and recognized that the Committee is meeting on the traditional territories of the Erie, Neutral, HuronWendat, Haudenosaunee and Mississaugas. This land is covered by the Dish with One Spoon Wampum Belt Covenant, which was an agreement between the Haudenosaunee and Anishinaabek to share and care for the resources around the Great Lakes. It was

further acknowledged that this land is covered by the Between the Lakes Purchase, 1792, between the Crown and the Mississaugas of the Credit First Nation. The City of Hamilton is home to many Indigenous people from across Turtle Island (North America) and it was recognized that we must do more to learn about the rich history of this land so that we can better understand our roles as residents, neighbours, partners and caretakers.

THE ADVISORY COMMITTEE FOR PERSONS WITH DISABILITIES PRESENTS REPORT 22-006 AND RESPECTFULLY RECOMMENDS:

1. Resignation of Paula Kilburn from the Outreach Working Group of the Advisory Committee for Persons with Disabilities (Item 7.3)

That the resignation of Paula Kilburn from the Outreach Working Group of the Advisory Committee for Persons with Disabilities, be received.

2. Resignation of Kim Nolan from the Transportation Working Group of the Advisory Committee for Persons with Disabilities (Item 7.4)

That the resignation of Kim Nolan from the Transportation Working Group of the Advisory Committee for Persons with Disabilities, be received.

3. Resignation of Paula Kilburn from the Strategic Planning Working Group of the Advisory Committee for Persons with Disabilities (Item 7.5)

That the resignation of Paula Kilburn from the Strategic Planning Working Group of the Advisory Committee for Persons with Disabilities, be received.

4. Reimbursement for the Purchase of Plants as Get-Well Gifts (Item 11.1)

That reimbursement to Aznive Mallett, in the amount of $37.26, including HST, for the purchase of plants from House of Flowers in Ancaster as get-well gifts for two members of the Advisory Committee for Persons with Disabilities, be approved.

That a plant be purchased for Patty Cameron on behalf of the Advisory Committee for Persons with Disabilities to express the Committee's condolences on her loss.

5. Policies and Procedures to Rescue and Safely Transport Stranded Pedestrians and their Mobility Devices (Item 11.2)

WHEREAS, there have been an alarming increase in encounters between pedestrians and vehicles in recent months;

WHEREAS, persons with disabilities, especially those who use mobility devices, are particularly vulnerable as pedestrians;

WHEREAS, persons who use mobility devices are susceptible to having their devices malfunction, stranding them in precarious traffic situations; and

WHEREAS, the Advisory Committee for Persons with Disability (ACPD), have advised stakeholders including the Police Service, Fire Department, Paramedic Service, Hamilton Street Railway (HSR), Disabled and Aged Regional Transportation Service (DARTS), Taxicab Companies and Mobility Device Repair Contractors of the need for a coordinated rescue plan in the City of Hamilton for persons who experience an incapacitated mobility device.

THEREFORE, BE IT RESOLVED:

That staff be directed to investigate developing policies and procedures to rescue and safely transport stranded pedestrians and their mobility devices to an appropriate secure location.

6. Advisory Committee for Persons with Disabilities Guidance to Hamilton BIA Communities on How to Make Outdoor Dining Locations Fully Accessible (Item 11.3) *(REVISED)*

WHEREAS, Council approved the Permanent Program for Temporary (seasonal) Outdoor dining Patios in the City of Hamilton, effective in 2022;

WHEREAS, the Temporary Outdoor dining Patios Program was made permanent by City Council in spite of the concern of the Advisory Committee for Persons with Disabilities (ACPD) that there were no specific provisions or obligations for outdoor dining facilities to be accessible and no prohibition to occupying pedestrian pathways; and

WHEREAS, there are opportunities to help make outdoor dining facilities accessible through consultation with the ACPD and its Accessible Outdoor Spaces and Parklands Working Group.

THEREFORE, BE IT RESOLVED:

That the Advisory Committee for Persons with Disabilities (ACPD), in collaboration with the ACPD Outreach Working Group, work with staff to develop print materials***, to come back to ACPD for approval,*** for dissemination to Hamilton BIA communities to provide guidance on how to ensure outdoor dining is fully accessible including space, facilities, amenities and services; and

That the Hamilton BIA communities be advised that the ACPD and its Accessible Outdoor Spaces and Parklands Working Group are available to

establishments that have outdoor dining facilities should they require advice or guidance on how to make their outdoor dining locations fully accessible including their space, facilities, amenities and services.

7. Correspondence to the General Issues Committee Respecting Homeless Encampments (Item 11.4)

That the correspondence to the General Issues Committee from the Advisory Committee for Persons with Disabilities respecting Homeless Encampments attached as Appendix “A”, be approved.

8. Invitation to Dr. Lovaye Kajiura, McMaster IMPACT Initiative, to Attend a Future Meeting of the Advisory Committee for Persons with Disabilities (Item 11.5)

WHEREAS, the McMaster IMPACT Initiative is an interdisciplinary collaboration that engages students and volunteer clients in a learning process whereby students come together to understand, appreciate and address challenges experienced by our aging population and people living with disabilities; and

WHEREAS, Dr. Lovaye Kajiura is one of the co-leaders of the McMaster IMPACT Initiative.

THEREFORE, BE IT RESOLVED:

That Dr. Lovaye Kajiura be invited to attend a future meeting of the Advisory Committee for Persons with Disabilities to present respecting the McMaster IMPACT Initiative.

9. Invitation to the Director of Transit, City of Hamilton, to Attend a Future Meeting of the Advisory Committee for Persons with Disabilities (Item 11.6) *(REVISED)*

WHEREAS, the Advisory Committee for Persons with Disabilities will benefit from meeting with the City of Hamilton's Director of Transit to discuss topics of interest to the Advisory Committee for Persons with Disabilities related to Transit Services;

THEREFORE, BE IT RESOLVED:

That the City of Hamilton's Director of Transit be invited to attend a future regular or special meeting of the Advisory Committee for Persons with Disabilities to discuss topics of interest to the Committee related to Transit Services.

FOR INFORMATION:

(a) CHANGES TO THE AGENDA (Item 2)

The Committee Clerk advised of the following changes to the agenda:

General Issues Committee – June 15, 2022

5. COMMUNICATIONS

5.1 Correspondence from Andrea Michaluk respecting deafness and discrimination

5.2 Correspondence from Sophie Geffros respecting Resignation from the Advisory Committee for Persons with Disabilities

12. NOTICES OF MOTION

12.1 Operation of Vehicles in Public Parks and Green Spaces

The agenda for the May 24, 2022 meeting of the Advisory Committee for Persons with Disabilities, was approved, as amended.

(b) DECLARATIONS OF INTEREST (Item 3)

There were no declarations of interest.

(c) APPROVAL OF MINUTES (Item 4)

(i) April 12, 2022 (Item 4.1)

The minutes of the April 12, 2022 meeting of the Advisory Committee for Persons with Disabilities, were approved, as presented.

(d) COMMUNICATIONS (Item 5)

(i) Correspondence from Andrea Michaluk respecting deafness and discrimination (Item 5.1)

The correspondence from Andrea Michaluk respecting deafness and discrimination, was received.

The motion was ***amended*** by adding recommendation (b), to read as follows:

(b) That staff be directed to work with Andrea Michaluk to determine what the City can undertake to address her concerns and report back to the Advisory Committee for Persons with Disabilities.

Main Motion, ***as Amended***, to read as follows:

(a) The correspondence from Andrea Michaluk respecting deafness and discrimination, was received; and

(b) Staff were directed to work with Andrea Michaluk to determine what the City can undertake to address her concerns and report back to the Advisory Committee for Persons with Disabilities.

(ii) Correspondence from Sophie Geffros respecting Resignation from the Advisory Committee for Persons with Disabilities (Item 5.2)

The correspondence from Sophie Geffros respecting resignation from the Advisory Committee for Persons with Disabilities, was received.

Having received the resignation of Sophie Geffros from the Advisory Committee for Persons with Disabilities, the membership number of the Committee was adjusted accordingly to obtain quorum.

Staff were directed to send a letter to Sophie Geffros to thank her for her time volunteering with the Advisory Committee for Persons with Disabilities and to wish her well in the future.

(e) CONSENT ITEMS (Item 7)

(i) Built Environment Working Group Update (Item 7.1)

(a) Built Environment Working Group Meeting Notes:

(1) February 2, 2022 (Item 7.1 (a))

(2) April 5, 2022 (Item 7.1 (b))

The Built Environment Working Group Meeting Notes of February 2, 2022 and April 5, 2022, were received.

(ii) Housing Issues Working Group Update (Item 7.2)

(1) Housing Issues Working Group Meeting Notes – March 15, 2022 (Item 7.2 (a))

The Housing Issues Working Group Meeting Notes of March 15, 2022, were received.

(iii) Outreach Working Group Update (Item 7.3)

(1) Update respecting the Ability First Accessibility Event – October 5, 2022 (Item 7.3 (a))

The update respecting the Ability First Accessibility Event – October 5, 2022, from the Outreach Working Group, was received.

(iv) Transportation Working Group Update (Item 7.4)

(1) Transportation Working Group Meeting Notes – April 26, 2022 (Item 7.4 (a))

The Transportation Working Group Meeting Notes of April 26, 2022, were received.

(v) Strategic Planning Working Group Update (Item 7.5)

(a) Strategic Planning Working Group Meeting Notes:

(1) February 10, 2022 (Item 7.5 (a))

(2) March 3, 2022 (Item 7.5 (b))

(3) March 16, 2022 (Item 7.5 (c))

(4) April 7, 2022 (Item 7.5 (d))

The Strategic Planning Working Group Meeting Notes of February 10, 2022, March 3, 2022, March 16, 2022 and April 7, 2022, were received.

(vi) Accessible Open Spaces and Parklands Working Group Update (Item 7.6)

(a) Accessible Open Spaces and Parklands Working Group Meeting Notes:

(1) February 23, 2022 (Item 7.6 (a))

(2) March 23, 2022 (Item 7.6) (b))

The Accessible Open Spaces and Parklands Working Group Meeting Notes of February 23, 2022 and March 23, 2022, were received.

(3) April 27, 2022 (Item 7.6) (c))

The Accessible Open Spaces and Parklands Working Group Meeting Notes of April 27, 2022, were received.

(f) PRESENTATIONS (Item 8)

(i) Presentation by Sherry Caldwell, Ontario Disability Coalition (Item 8.1)

Sherry Caldwell, Ontario Disability Coalition provided the Committee with a presentation respecting the Ontario Disability Coalition, with aid of a PowerPoint presentation.

The presentation by Sherry Caldwell, Ontario Disability Coalition respecting the Ontario Disability Coalition, was received.

(g) MOTIONS (Item 11)

(i) Reimbursement for the Purchase of Plants as Get-Well Gifts (Item 11.1)

A. Mallett relinquished the Chair to J. Kemp in order to introduce a Motion respecting reimbursement for the purchase of plants as get-well gifts.

For disposition of this matter, refer to Item 4.

A. Mallett assumed the Chair.

(ii) Invitation to Dr. Lovaye Kajiura, McMaster IMPACT Initiative, to Attend a Future Meeting of the Advisory Committee for Persons with Disabilities (Item 11.5)

A. Mallett relinquished the Chair to J. Kemp in order to introduce a Motion respecting an invitation to Dr. Lovaye Kajiura, McMaster IMPACT Initiative, to attend a future meeting of the Advisory Committee for Persons with Disabilities.

For disposition of this matter, refer to Item 8.

(iii) Invitation to the Director of Transit, City of Hamilton, to Attend a Future Meeting of the Advisory Committee for Persons with Disabilities (Item 11.6)

A. Mallett introduced a Motion respecting an invitation to the Director of Transit, City of

Hamilton, to Attend a Future Meeting of the Advisory Committee for Persons with Disabilities.

For disposition of this matter, refer to Item 9.

A. Mallett assumed the Chair.

(h) NOTICES OF MOTION (Item 12)

(i) Operation of Vehicles in Public Parks and Green Spaces (Item 12.1)

J. Cardno introduced the following Notice of Motion:

WHEREAS, parks and green spaces have been recognized as valuable, contributing to the good health of City residents and as a result of the COVID-19 Pandemic, use of these spaces has increased;

WHEREAS, any vehicular traffic moving through a park not only reduces such benefits but presents a threat that is unexpected in a park, particularly for those with disabilities and using mobility devices;

WHEREAS, invisible disabilities are not easily identified and operators of vehicles may not be sensitive to related fear and anxiety that results

when an unexpected vehicle suddenly comes near;

WHEREAS, the public in vehicles may mistake hard surface paths as roadways because of other vehicles or evidence of vehicle use and will enter and travel at speed presenting a very real danger to park users and especially those unable to move quickly out of the way due to mobility or disability limitations; and

WHEREAS, City staff should receive sensitivity and awareness training regarding those with disabilities as part of customer service when dealing with the public, particularly for new and seasonal staff.

THEREFORE, BE IT RESOLVED:

1. That staff be directed to review policies and procedures regarding vehicle traffic and presence of vehicles throughout parks and green spaces and recommend actions to keep the presence and operation of vehicles in parks and green spaces to a minimum, as follows;

    (i) Ensure the use of public roads rather than park pathways unless it is an emergency; and

(ii) Ensure that pathways are not easily accessible to vehicles and that the use of barriers to limit vehicles does not restrict or inhibit the use of mobility devices.

2. That staff be directed to provide regular sensitivity and awareness training for staff as part of customer service when dealing with the public, including new and seasonal staff, to include awareness of the benefits parks and green spaces offer and ways to decrease any activity that interferes with those benefits.

(i) GENERAL ISSUES / OTHER BUSINESS (Item 13)

(i) Accessibility Complaints to the City of Hamilton (Item 13.1)

No update.

(ii) *Accessibility for Ontarians with Disabilities Act, 2005* (AODA) Update (Item 13.2)

No update.

(iii) Presenters List for the Advisory Committee for Persons with Disabilities (Item 13.3)

(a) Invitation to The Honourable David Onley, former Lieutenant Governor of Ontario

That the Advisory Committee for Persons with Disabilities request that the City fund the $5,000 plus HST speaking engagement fee for The Honourable David Onley, former Lieutenant Governor of Ontario.

The above motion was DEFEATED.

(b) Invitation to Sherry Caldwell of the Ontario Disability Coalition

(a) The Invitation to Sherry Caldwell of the Ontario Disability Coalition was considered complete and removed from the Speakers List as this was addressed as Item 8.1 at today's meeting; and

(b) The updates to the Speaker's List, were received.

(iv) Donation in Memory of Christopher Cutler (Item 13.4)

This Item was referred to the Strategic Planning Working Group.

(j) ADJOURNMENT (Item 15)

There being no further business, the Advisory Committee for Persons with Disabilities, was adjourned at 6:13 p.m.

Respectfully submitted,

Aznive Mallett, Chair
Advisory Committee for
Persons with Disabilities

Carrie McIntosh
Legislative Coordinator
Office of the City Clerk