Subject: Draft Solid Waste Master Plan (Phase 3)

File Number: ACS2023-PWD-SWS-0005

Report to Environment and Climate Change Committee on 21 November 2023

and Council 6 December 2023

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Ward: Citywide

Objet : Plan directeur de la gestion des déchets solides (phase 3)

Numéro de dossier : ACS2023-PWD-SWS-0005

Rapport présenté au Comité de l'environnement du changement climatique

Rapport soumis le 21 novembre 2023

et au Conseil le 6 décembre 2023

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Quartier : À l'échelle de la ville

REPORT RECOMMENDATION(S)

That the Environment and Climate Change Committee recommend that Council receive, for information, the Draft Solid Waste Master Plan in advance of staff commencing the third Solid Waste Master Plan engagement series with residents, stakeholders and members of Council.

RECOMMANDATION(S) DU RAPPORT

Que le Comité de l'environnement et du changement climatique recommande que le Conseil municipal prenne connaissance, pour information, de la version provisoire du Plan directeur de la gestion des déchets solides avant que le personnel de la Ville entame, avec les résidents, les parties prenantes et les membres du Conseil municipal, la troisième série de consultations portant sur ce plan.

EXECUTIVE SUMMARY

The purpose of this report is to provide the Draft Solid Waste Master Plan (SWMP) to Committee and Council for information. Staff are not seeking approval on the SWMP at this time; instead, staff are presenting the Draft to allow Council and the community time to review and provide feedback on the recommendations, through Engagement Series 3, before the Final SWMP is presented for approval in Q2 2024.

The sustainable management of solid waste is a universal issue. The safe, efficient, and sustainable management of waste directly affects the health and cleanliness of all communities. The management of solid waste is made more complex with growing populations, changing waste composition, and industry and lifestyle trends that are impacting the quantities and contents of waste requiring management.

Ottawa is Canada's sixth largest city with an increasing population that is expected to reach 1.5 million people by 2053. More people means more waste and the amount of waste the City will need to manage is forecasted to increase by 31 per cent over the next three decades. The City's owned and operated Trail Waste Facility Landfill (TWFL) is almost full and most recent projections estimate that it could reach capacity between 2034 – 2035 if immediate changes are not made to alter the course of Ottawa's disposal habits.

The SWMP provides the framework for how the City will tackle these challenges and ensure its responsibilities for waste management services can be met in a sustainable way over the next 30 years. The SWMP recognizes that there is no one solution or silver bullet to address ongoing and future challenges. Addressing these issues will require a multi-pronged approach through a combination of regulation, collection management, innovation, technology, and behavioural change in the public and in industry.

The SWMP has been developed over the last four years using an industry best practice phased approach, with each phase being based on a solid foundation of research, data, best practices and extensive engagement with key stakeholders and the public.

In July 2019, Council approved the Solid Waste Master Plan Roadmap report (ACS2019-PWE-GEN-0007), officially starting the development of the City's next 30-year plan for managing waste within the current social, economic and environmental context.

The Phase 1 Solid Waste Master Plan report (ACS2020-PWE-SWS-0001) was received by Council in June 2020. Phase 1 provided Council with key baseline information and data on the City's current waste management system, mechanisms available at the municipal level to influence waste reduction and diversion, an overview of detailed international research on emerging policy, program and technology trends and provided Council with an overview of the proposed engagement approach.

In July 2021, Council received the Phase 2 report (ACS2021-PWE-SWS-0003) and approved the vision statement, guiding principles and goals for the SWMP. Phase 2 involved identifying future waste management needs, the long list of options to be considered to meet future waste management needs and the evaluation methodology to evaluate each option to develop a recommended short list of actions for consultation and future consideration.

Phase 3 is the development of the Draft SWMP and the tabling of recommended actions for Council to receive prior to the final round of SWMP stakeholder and public engagement. The Draft SWMP includes 50 proposed actions to capture what needs to be accomplished to achieve the SWMP goals. Combined, the proposed actions create an opportunity to significantly reduce the amount of waste going to landfill, reduce GHG emissions, divert valuable resources to be recycled and repurposed into new products, and further preserve and expand capacity at the TWFL, providing time for the City to choose, plan and implement its next residual waste disposal solution.

The proposed waste reduction, reuse and recycling actions combined with diverting 30 per cent of waste to private landfill, expanding the TWFL within its existing footprint, and preserving capacity at the TWFL for residential use by banning IC&I waste is estimated to result in an estimated additional 14 years of landfill life to 2048-2049 (according to most recent capacity projections). This further delays the need to invest in a new landfill in the immediate term but does not extend the life of the landfill beyond the term of the

SWMP (2053) without investment in some form of alternative residual waste management technology.

In the first five years of the proposed SWMP, the actions are expected to reduce waste to landfill by an estimated 2,750 tonnes and divert approximately 85,780 tonnes of divertible materials from landfill. Over the 30-year term of the SWMP, the proposed actions are estimated to reduce waste to landfill by a total estimated 31,050 tonnes and divert approximately 970,520 tonnes of waste from landfill. For context, in 2022, a total of 352,200 tonnes of waste was managed by the City, with the average household producing almost one tonne of waste each year. The estimated cumulative reduction in GHG emissions from landfill resulting from the proposed waste reduction and diversion actions over the 30-year span of the SWMP is 138,620 tonnes of CO2e. This is a yearly estimated reduction of 4,620 tonnes of CO2e which is equivalent to the emissions from 1,415 passenger vehicles driven for one year.

In terms of alternative residual management technologies, three actions are proposed through the Draft SWMP. The first of the three actions is specifically directed at organic waste which explores an Anaerobic Digestion (AD) facility that could process organic waste and develop renewable natural gas (RNG). This has the potential to reduce community emissions by an estimated 4,390 tonnes of CO2e emissions per year by 2053, which is equivalent to the emissions from 1,344 passenger vehicles or 1.87 million litres of gasoline per year.

The two further alternative residual management technologies explore Waste to Energy (WTE) Incineration and Mixed Waste Processing (MWP). Both technologies present differing opportunities to further reduce waste from landfill, thereby increasing landfill life. Both WTE Incineration and MWP technologies come at a higher cost compared to traditional landfilling but would support the City in achieving the Council-approved SWMP goal of extending the Trail Waste Facility Landfill beyond the term of the plan.

The Draft SWMP includes preliminary high-level cost estimates for the recommended actions. These estimates were developed with the Solid Waste Master Plan’s Technical Consultant, KPMG, in consultation with the City’s Financial Services Department. The estimates highlight a need for ongoing necessary capital expenditures over the next ten years (2023-2032), with a significant portion needed to cover regulatory costs for the existing landfill and to maintain existing waste services. Even without implementing the SWMP actions, funding will be required to cover the cost of the forecasted 10-year capital needs and a new landfill or alternative waste management technology. To provide a more comprehensive financial strategy, a Solid Waste Long Range Financial

Plan is being developed to accompany the Final SWMP which will propose a sustainable funding model to fund current and future solid waste service needs.

Following the tabling of the Draft SWMP, a third round of engagement will take place seeking public feedback on the Draft SWMP which will support the development of the Final SWMP that will be presented to Committee and Council for approval in Q2 2024. Given the juncture that the City is at with the current remaining life of the TWFL and with key processing contracts coming to an end within the next 10 years, decisions will need to be made during this term of Council to determine next steps to ensure the City can continue to provide core regulated waste management services to residents.

If the Final SWMP is approved by Council in 2024, it would give direction to staff to begin the planning, implementation and execution of the SWMP's Actions. This will be followed by multiple touch points with Council to seek further approval before moving forward with implementing the various initiatives and strategies. This will include further refined financial estimates to ensure they fit within the affordability framework that Council will approve with the tabling of the Long Range Financial Plan with the Final SWMP.

RÉSUMÉ

L'objectif de ce rapport consiste à soumettre pour information, au Comité et au Conseil municipal, la version provisoire du Plan directeur de la gestion des déchets solides (PDGDS). Le personnel de la Ville ne demande pas, pour l'instant, d'approuver le PDGDS; il dépose plutôt la version provisoire de ce plan afin de donner au Conseil municipal et à la collectivité le temps de revoir et de commenter les recommandations dans le cadre de la série de consultations 3, avant de soumettre pour approbation, au deuxième trimestre de 2024, la version finale du PDGDS.

La gestion durable des déchets solides est un enjeu universel. La sécurité, l'efficience et la durabilité de la gestion des déchets ont des incidences directes sur la santé et la propreté de toutes les collectivité. La gestion des déchets solides est aujourd'hui plus complexe en raison de l'accroissement des populations, de l'évolution de la composition des déchets, ainsi que des tendances de l'évolution de l'industrie et des modes de vie, qui se répercutent sur les quantités et le contenu des déchets à gérer.

Ottawa est la sixième ville en importance du Canada : la population de cette ville devrait atteindre 1,5 million d'habitants en 2053. Puisqu'il y aura plus d'habitants, il y aura plus de déchets à gérer : le volume de déchets que la Ville sera appelée à gérer devrait augmenter de 31 % dans les trois prochaines décennies. La décharge contrôlée du

chemin Trail (DCCT), dont la Ville est propriétaire et exploitant, a presque atteint le maximum de sa capacité, et selon les projections les plus récentes, on estime que ce maximum pourrait être atteint entre 2034 et 2035 si on n'apporte pas de changements immédiats pour modifier l'orientation des habitudes d'Ottawa dans l'élimination des déchets.

Le PDGDS définit la structure-cadre des moyens grâce auxquels la Ville résoudra ces difficultés et veillera à s'acquitter durablement de ses responsabilités dans les services de gestion des déchets au cours des 30 prochaines années. Le PDGDS confirme qu'il n'y a pas de solution universelle ou miracle pour résoudre les difficultés actuelles et projetées. Pour se pencher sur ces difficultés, il faudra adopter une approche qui se décline en plusieurs volets en faisant appel à la fois à la réglementation, à la gestion de la collecte des déchets, à l'innovation, à la technologie et au changement de comportement dans le public et dans l'industrie.

Nous mettons au point le PDGDS depuis les quatre dernières années en faisant appel à une approche échelonnée et aux règles de l'art de l'industrie; chaque phase de cette approche se fonde sur un solide socle de travaux de recherche, de données et de règles de l'art et sur une vaste consultation auprès des principales parties prenantes et du public.

En juillet 2019, le Conseil municipal a approuvé le rapport sur la Feuille de route du Plan directeur de la gestion des déchets solides (ACS2019-PWE-GEN-0007), ce qui lançait officiellement l'élaboration du prochain plan de la Ville sur 30 ans pour la gestion des déchets dans le contexte social, économique et environnemental actuel.

Le rapport sur la phase 1 du Plan directeur de la gestion des déchets solides (ACS2020-PWE-SWS-0001) a été déposé auprès du Conseil municipal en juin 2020. La phase 1 apportait au Conseil municipal l'information et les données référentielles essentielles sur le système actuel de gestion des déchets de la Ville, ainsi que sur les mécanismes disponibles à l'échelle municipale pour orienter la réduction et le réacheminement des déchets, une vue d'ensemble des travaux de recherche internationaux détaillés sur les tendances émergentes dans le domaine des politiques, des programmes et des technologies, de même qu'un tour d'horizon de l'approche proposée pour la consultation.

En juillet 2021, le Conseil municipal s'est saisi du rapport sur la phase 2 (ACS2021-PWE-SWS-0003) et a approuvé l'énoncé de la vision, les principes-cadres et les objectifs du PDGDS. La phase 2 consistait à recenser les besoins projetés dans la

gestion des déchets, à établir la liste détaillée des options à étudier pour répondre à ces besoins et à établir la méthodologie permettant d'évaluer chacune des options pour dresser la liste détaillée recommandée des actions à adopter pour la consultation et pour étude éventuelle.

La phase 3 consiste à élaborer la version provisoire du PDGDS et à déposer les actions recommandées dont le Conseil municipal doit prendre connaissance avant le dernier tour des consultations des parties prenantes et du public sur le PDGDS. La version provisoire du PDGDS comprend 50 actions proposées, destinées à capter ce qu'il faut réaliser pour atteindre les objectifs du PDGDS. Dans l'ensemble, les actions proposées offrent l'occasion de réduire considérablement le volume de déchets à enfouir dans la décharge contrôlée, de diminuer les émissions de GES, de réacheminer de précieuses ressources à recycler et à convertir pour en faire de nouveaux produits, et de mieux préserver et étendre la capacité de la DCCT, ce qui donnera à la Ville le temps de choisir, de planifier et de mettre en œuvre sa prochaine solution pour l'élimination des déchets résiduels.

Grâce aux actions proposées pour réduire, réutiliser et recycler les déchets, de concert avec le réacheminement de 30 % des déchets dans les décharges contrôlées du secteur privé, avec l'extension de la DCCT dans son périmètre existant et avec la préservation de la capacité de la DCCT pour les déchets résidentiels, en interdisant l'enfouissement des déchets ICI, on estime que l'on gagnera, sur la durée utile de la décharge contrôlée, 14 années supplémentaires, pour prolonger cette durée utile jusqu'en 2048 - 2049 (d'après les projections de capacité les plus récentes). On pourra ainsi retarder encore la nécessité d'investir dans une nouvelle décharge contrôlée dans l'immédiat, sans toutefois prolonger la durée utile de la décharge contrôlée audelà de l'horizon du PDGDS (2053) sans investir, sous une forme ou une autre, dans les technologies de substitution pour la gestion des déchets résiduels.

Dans les cinq premières années du PDGDS proposé, on s'attend à ce que ces actions permettent de réduire d'environ 2 750 tonnes les déchets à enfouir dans la décharge contrôlée et de réacheminer approximativement 85 780 tonnes de matières réacheminables au lieu de les enfouir dans la décharge contrôlée. Sur la durée de 30 ans du PDGDS, on estime que les actions proposées réduiront de l'ordre de 31 050 tonnes au total les déchets à enfouir dans la décharge contrôlée et de réacheminer approximativement 970 520 tonnes de déchets au lieu de les enfouir dans la décharge contrôlée. Pour préciser le contexte, la Ville a géré en 2022 un total de 352 200 tonnes de déchets, et le ménage moyen produisait presque une tonne de déchets par an.

On estime que la réduction totale des émissions de GES provenant des décharges qui resulterait des mesures proposées dans le cadre du Plan directeur de la gestion des déchets solides (PDGDS) visant à réduire et à réacheminer les déchets sur une période de 30 ans serait de 138 620 tonnes d'équivalent en dioxyde de carbone (éq. CO2). Cette estimation représente une réduction annuelle de 4 620 tonnes d'éq. CO2, ce qui équivaut aux émissions de 1 415 véhicules particuliers roulant pendant un an.

S'agissant des technologies de substitution pour la gestion des déchets résiduels, nous proposons trois actions dans la version provisoire du PDGDS. La première de ces trois actions, qui porte expressément sur les déchets organiques, consiste à étudier une installation de digestion anaérobie (DA) qui pourrait traiter les déchets organiques et produire du gaz naturel renouvelable (GNR). Cette action permettrait de réduire les émissions de la collectivité de l'ordre de 4 390 tonnes de CO_2e émis par an d'ici 2053, soit l'équivalent des émissions de 1 344 voitures particulières ou de 1,87 million de litres d'essence par an.

L'incinération pour la transformation des déchets en énergie (TDE) et la transformation des déchets mixtes (TDM) sont les deux autres technologies de substitution auxquelles on pourrait faire appel pour la gestion des déchets résiduels. Ces deux technologies offrent différentes possibilités de mieux réduire les déchets à enfouir dans la décharge contrôlée, ce qui augmenterait la durée utile de cette décharge. Les technologies de l'incinération pour la TDE et de la TDM donnent lieu à un surcoût par rapport à l'enfouissement traditionnel des déchets; or, ces deux technologies permettraient à la Ville de réaliser l'objectif, approuvé par le Conseil municipal, du PDGDS, soit étendre au-delà de l'horizon du Plan la durée utile de la décharge contrôlée du chemin Trail.

La version provisoire du PDGDS comprend les estimations préliminaires des coûts de l'ensemble des actions recommandées. Ces estimations ont été mises au point avec KPMG, l'expert-conseil technique du Plan directeur de la gestion des déchets solides, de concert avec la Direction générale des finances et des services organisationnels de la Ville. Ces estimations mettent en lumière la nécessité d'investir, dans les 10 prochaines années (2023-2032), les dépenses en immobilisations nécessaires et permanentes, dont une part importante servira à financer des coûts réglementaires de la décharge contrôlée existante et à continuer d'assurer les services existants dans la gestion des déchets. Même si on ne met pas en œuvre les actions du PDGDS, il faudra financer le coût des besoins en infrastructures prévus sur 10 ans et aménager une nouvelle décharge contrôlée ou faire appel à une technologie de substitution pour la gestion des déchets. Pour mettre au point une stratégie financière plus globale, nous sommes en train d'élaborer le Plan financier à long terme des Services des déchets solides, qui accompagnera la version finale du PDGDS et dans lequel nous

proposerons un modèle de financement durable pour financer les besoins actuels et projetés dans les services de gestion des déchets solides.

Dans la foulée du dépôt de la version provisoire du PDGDS, nous mènerons un troisième tour de consultations pour demander au public de commenter la version provisoire du PDGDS, ce qui viendra étayer l'élaboration de la version finale du PDGDS à présenter au Comité et au Conseil municipal pour approbation au deuxième trimestre de 2024. Puisque la Ville se situe à la croisée des chemins du point de vue du reliquat de la durée utile actuelle de la DCCT et parce que d'importants contrats de traitement des déchets arriveront à terme dans les 10 prochaines années, il faudra prendre des décisions, durant l'actuel mandat du Conseil municipal, pour déterminer les prochaines étapes à suivre afin de s'assurer que la Ville pourra continuer d'offrir aux résidents les services réglementés essentiels de gestion des déchets.

Si le Conseil municipal approuve en 2024 la version finale du PDGDS, il donnerait au personnel pour consigne de lancer la planification, la mise en œuvre et l'exécution des actions du PDGDS. Cette étape sera suivie de nombreux points de contact avec le Conseil municipal, qui sera invité à délivrer d'autres approbations, avant d'enchaîner avec la mise en œuvre des différentes initiatives et stratégies. Il s'agira entre autres de continuer de mettre au point des institutions financières pour s'assurer qu'elles concordent avec la structure-cadre de l'abordabilité, que le Conseil municipal approuvera au moment où le Plan financier à long terme sera déposé avec la version finale du PDGDS.

BACKGROUND

The City of Ottawa, the Nation's capital, is the second largest municipality in the province of Ontario and is the sixth largest city in Canada after Toronto, Montreal, Vancouver, Calgary and Edmonton. The City is home to over one million people and is made up of distinct urban, suburban and rural communities that spans 2,800 square kilometers.

The City has a complex and integrated solid waste management system that maintains public health and supports environmental sustainability by offering a number of programs and services to residents. The City provides waste management services to seven sectors, all of which fall within the scope of the Solid Waste Master Plan:

- 306,700 curbside residential properties
- 2,200 multi-residential properties

- 5,400 waste bins in City parks
- 750 on-street waste bins
- 500 City facilities
- 309 schools through the Green Bins in Schools Program
- 300 small businesses and places of worship through the Yellow Bag Program

The majority of Ottawa's waste collection services are provided to curbside residents as mandated by the Province of Ontario. Curbside residential properties include both single homes and town homes. Multi-residential properties are also serviced by the City, although the City is not mandated to do so, and are generally properties that have more than six units, such as low-rise and high-rise buildings as well as some townhome complexes. Further details on the roles of government as it pertains to waste management can be found on the Solid Waste Master Plan's Engage Ottawa page. All waste collection services are overseen by the City of Ottawa's Solid Waste Services team to ensure operations are executed in a safe and efficient manner.

In September 2003, the City of Ottawa approved the Integrated Waste Management Master Plan; the first and only plan to date that has guided the City of Ottawa's waste management system. The Integrated Waste Management Master Plan (IWMMP) was designed for a 20-year horizon and prioritized increasing waste diversion, launching a source-separated organics program and a multi-residential program, and maximizing the Trail Waste Facility Landfill's (TWFL) capacity.

Now, twenty years later, the City of Ottawa (the City) is presenting a new Solid Waste Master Plan (SWMP) which will provide the overall framework, direction, goals and targets for solid waste management, diversion, and reduction over the short-, medium- and long-term horizon. The City's waste management system is highly integrated and complicated, and requires planning, proper management and forward-thinking initiatives to ensure the City is providing safe, efficient and environmentally sound services in this sector and is well positioned to provide this core regulated service to residents.

The City needs to prepare for increased population growth and therefore, increased levels of waste to manage. Additionally, the City's owned and operated TWFL is quickly filling up and preserving its airspace is essential for delaying increased costs to the City and its residents. With this in mind, the Draft SWMP defines an aspirational Zero Waste Vision for the future. Its recommendations create a roadmap to reach this vision with

concrete actions that focus on decreasing the amount of waste requiring management, diverting as much waste as possible from landfill, recovering the most amount of resources as possible from all waste streams and disposing of waste in an environmentally sustainable way. In line with municipal best practices on Solid Waste Planning, the Draft SWMP takes lessons learned from current and past programs to recommend a system that is financially sustainable while remaining flexible to adapt to an ever-changing industry.

The Path to the Solid Waste Master Plan

Solid Waste Services staff initiated the process to develop a new SWMP in 2019. With the waste management sector evolving rapidly and all levels of government introducing initiatives which impact the waste management sector, staff sought to develop an adaptable and attainable SWMP to best position Ottawa for a successful future.

Roadmap

On July 10, 2019, Ottawa City Council approved the Solid Waste Master Plan Roadmap Report (ACS2019-PWE-GEN-0007). This included approval for the scope and framework to develop the SWMP and for the establishment of a Council Sponsors Group to support the development of the new SWMP. The scope of this SMWP includes curbside and multi-residential households, parks and public spaces, city facilities and other partner programs currently provided by the City of Ottawa.

In Canada, municipalities are the front-line governments responsible for the bulk of residential waste collection and management. However, all three levels of government have a role to play in waste management and new municipal policies, programs and by-laws must align with federal and provincial waste management legislation. At a high level, the federal and provincial governments establish waste reduction and diversion policies and programs, and provide regulations, standards, approvals and monitoring of waste management facilities and operations. Municipalities are responsible for the collection, recycling, composting and disposal of residential household waste which must be compliant with standards set from upper levels of government.

Over recent years there has been a significant amount of new solid waste-related policy and legislative updates from both the federal and provincial governments, and there are indications that initiatives related to waste reduction and diversion will continue to increase, particularly with growing interest and concerns about the greenhouse gas (GHG) impacts of current waste management programs and practices, and the challenges and opportunities for waste related GHG mitigation at all levels of

government, businesses and society. Key initiatives underway at various levels of government include the Federal Government's *Single-use Plastic Prohibition Regulations*, the Provincial *Transition to Individual Producer Responsibility*, and Ontario's *Food and Organic Waste Policy Statement*. Further details on how these initiatives have influenced the development of the Draft SWMP can be found in Supporting Document 1.

The Solid Waste Master Plan, as approved through the Roadmap report, is being developed using a phased approach and, in line with industry best practices, will be refreshed every five years following its completion. These refreshes will include performance assessments and detailed subsequent short-term implementation plans; all to ensure the City is achieving the SWMP's goals and targets. Additionally, refreshes will ensure the SMWP remains adaptable and flexible to new and emerging trends and technologies, regulatory changes imposed by all levels of government, and new directions as desired by stakeholders, residents or members of Council. Input from all stakeholder groups has and will continue to be vital in the success of the development and execution of the SWMP.

Below is an overview of the three phases by which the SWMP is being developed:

1. **Phase 1 (Where We Are)**: to provide Council with the City's current state as it pertains to waste management as a baseline of information for discussion in future phases, as well as to inform Council of what tools are available to influence Ottawa's waste management system and programs.

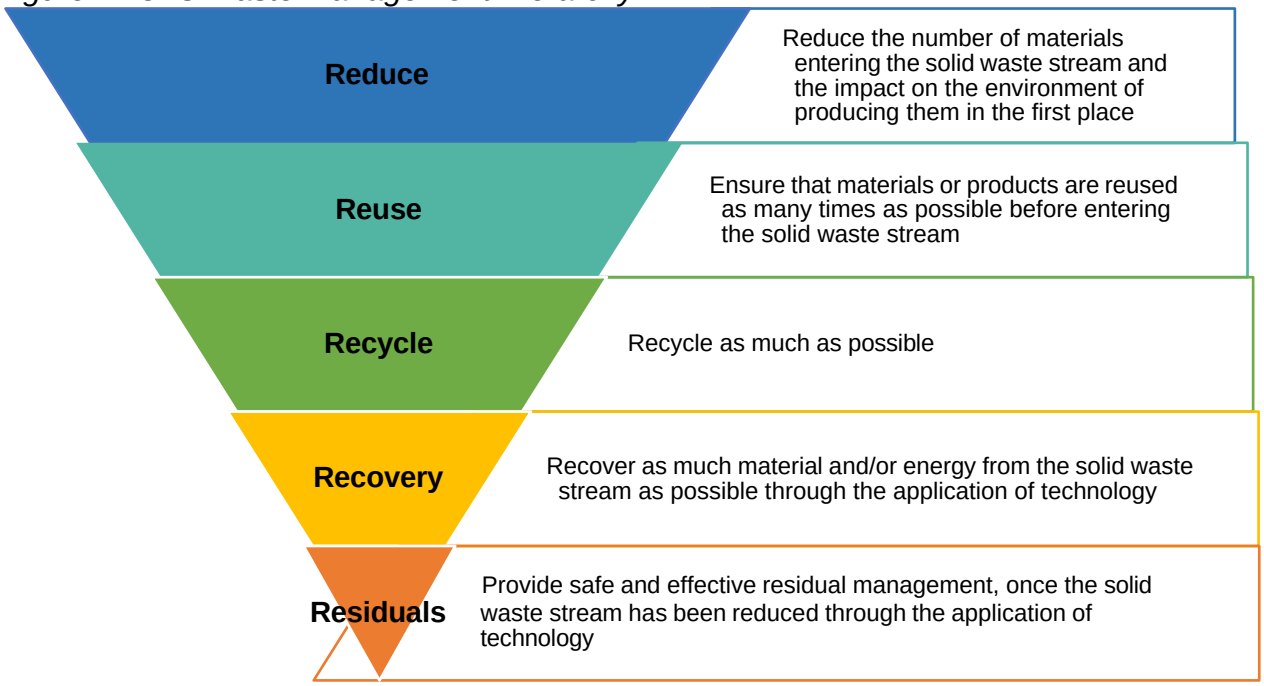
2. **Phase 2 (Where We Are Going)**: to engage with stakeholders and seek input on the vision statement, guiding principles and goals for the SWMP. Also, to identify future waste management needs, the long list of options to be considered to address future waste management needs, the evaluation methodology to evaluate each option, and the short list of options as a result of said evaluation to be consulted on and considered by Council.

3. **Phase 3 (How We Are Going To Get There)**: to outline the recommended options and short-term (five-year) implementation plan and targets for the Final SWMP. Where appropriate, input on the draft SMWP will be incorporated into the Final SWMP, which will be presented to Committee and Council for consideration in 2024.

Through the Roadmap report, Council approved the 5Rs Waste Management Hierarchy as a guide for developing the SWMP. This conceptual framework rethinks the well-

known 3Rs Waste Management Hierarchy of “Reduce, Reuse, Recycle” and looks at the totality of a product or services’ environmental impact – from raw material extraction, processing and manufacturing, to distribution, usage and disposal. Staff have worked with the SWMP’s technical consultant to ensure this philosophy is embedded in the SWMP and is being followed throughout the development of and forthcoming refreshes of the SWMP.

Figure 1: 5Rs Waste Management Hierarchy



A Council Sponsors Group for the Solid Waste Master Plan was established and approved on September 25, 2019 (Motion No. EPWWM 5/4), made up of Councillors from the 2018-2022 Term of Council which provided vital input and strategic advice to staff to support developing the SWMP and champion the project while seeing it through to completion. Following the 2019 approval of the Solid Waste Master Plan Roadmap report, and the establishment of the associated Council Sponsors Group, Solid Waste staff began work on Phase 1 – Where We Are.

Phase 1

The Solid Waste Master Plan Phase 1 report (ACS2020-PWE-SWS-0001) provided key baseline information and data on the City’s current waste management system, mechanisms available at the municipal level to influence waste reduction and diversion, and an overview of emerging policy, program and technology trends. Additionally, this report provided a thorough overview of the anticipated approach to engage and consult

with members of Council, key stakeholders and members of the public on the SWMP and its associated actions and component projects.

On April 30, 2020, staff provided a Technical Briefing on Phase 1 of the Solid Waste Master Plan on YouTube for members of Council, media and the public to learn:

- Ottawa's current waste state with regards to waste composition, collection, diversion, processing and landfilling (Supporting Document 1);
- Roles of other levels of government as it pertains to waste management and what's in and out of span of control for the City of Ottawa as a municipality (Supporting Document 2);
- How Ottawa's waste management practices and programs compares to other municipalities (Supporting Document 3);
- Current policies and trends available for exploration within the waste management industry (Supporting Document 4);
- What technologies and approaches are emerging in the waste industry that may be considered for the SWMP (Supporting Document 5); and,
- Which key stakeholder groups have been identified for engagement alongside Council members and the general public throughout the SWMP's development (Supporting Document 6).

Through Phase 1 staff also identified ongoing work underway or anticipated for the City of Ottawa that would be impacted by the SMWP's development. This included component projects to the SWMP as outlined in the Phase 1 report, and entailed collaboration with teams from the:

- **New Official Plan**: In May 2020, a moderate growth strategy was approved that will require 51 per cent of new dwellings to be built in already developed areas (increasing to 60 per cent by 2046) and will add between 1,350 to 1,650 hectares of residential and employment land to Ottawa's urban area. The Province approved the City's New Official Plan in November 2022.
- **Climate Change Master Plan (CCMP) and the Energy Evolution Strategy**: The Climate Change Master Plan provides direction for addressing the impacts of climate change on the community and City operations. It includes initiatives to reduce GHG emissions and build climate resilience in Ottawa. Furthermore, the

Energy Evolution Strategy, a component of the CCMP, lays out pathways for getting to 100 per cent reduction of GHG emissions in Ottawa.

- **Greenspace Master Plan and Urban Forest Management Plan**: The Green Space Master Plan and the Urban Forest Management Plan provide direction on maintaining and increasing green space in the City and tree canopy protection policies, which can have an impact on quantities of leaf and yard waste (LYW) that the City will need to manage in the future.

Upon completion of the technical briefing for Phase 1, staff immediately started work on Phase 2 which sought to understand stakeholder's current waste state satisfaction and gain input to develop the SWMPs vision statement, guiding principles, and goals.

Phase 2

On July 7, 2021, Ottawa City Council approved the Solid Waste Master Plan Phase 2 report (ACS2021-PWE-SWS-0003). There were four distinct parts to this Phase, including:

1. The vision statement, guiding principles and goals for the Solid Waste Master Plan;
2. An overview of Ottawa's anticipated long-term waste management needs;
3. The high level long list of options to meet future needs; and,
4. A triple bottom line evaluation tool, considering the social, financial and environmental element of each option, to be used to evaluate potential options for Ottawa's future waste management needs.

The vision statement, guiding principles and goals were developed through extensive stakeholder consultation, were designed to be reflective of recent and future trends in the waste management industry, and gave consideration to City policies, projects and strategies including the Climate Change Master Plan. Through the Phase 2 report, Council approved the following vision statement, guiding principles and goals for the SWMP:

Vision Statement:

A Zero Waste Ottawa achieved through progressive, collective and innovative action.

Guiding Principles:

- **Honouring the 5Rs waste management hierarchy** by prioritizing options that support waste reduction, reuse, recycling and recovery so that minimal residual waste is sent to landfill.
- **Changing community values** so that residents and stakeholders view waste as a resource, share the responsibility of waste management and play a role in achieving the goals of the Solid Waste Master Plan.
- **Protecting the environment for future generations to come** by mitigating the environmental impacts of managing waste.
- **Leading by example** when managing waste as a corporation by incorporating the 5Rs waste management hierarchy across the City's entire operations.
- **Adopting circular economy principles** to minimize the use of raw materials, recognize waste as a resource, maximize the value of waste and keep products and materials in use, and advocate for industry and other levels of government to take action that supports the transition to this economic model.
- **Embracing innovation** and being open to opportunities to adopt to emerging technologies, policies and industry trends.
- **Keeping waste local** by treating residential waste within the City's boundaries, wherever operationally and economically feasible.
- **Utilizing the triple bottom line** to balance environmental sustainability, City and community desires, and fiscal responsibility.

Goals:

1. Extend the life of the Trail Waste Facility Landfill significantly beyond its existing anticipated end of life to eliminate the need for a new residential landfill.
2. Reduce the amount of waste generated by residents and the City as a corporation.
3. Maximize the reuse of waste generated by residents and the City as a corporation.

4. Maximize the recycling of waste generated by residents and the City as a corporation.
5. Maximize the recovery of materials and energy from the remaining waste stream.
6. Aspire to achieve 100 per cent GHG emission reductions produced by the City's integrated waste management system.
7. Support, influence, and partner with the Industrial, Commercial and Institutional (IC&I) sector, including multi-residential, small businesses, the agriculture sector, and the Construction & Demolition sector, to reduce, reuse and divert waste in the broader community.
8. Maximize participation by enhancing the accessibility, convenience, consistency and affordability of waste management programs and services.
9. Maximize cost containment, revenue generation and the efficient use of waste management resources to help minimize costs to taxpayers.
10. Make sustainable waste management design an essential part of the City's planning process.
11. Collaborate with external stakeholders, including industry and other levels of government, to advance waste management practices.

The vision for a *zero waste* Ottawa is aspirational, a philosophy and a call to action rather than an absolute target. Zero Waste cannot be achieved by a municipality on its own but requires a concerted effort and coordination between all levels of government as well as industry, businesses and consumers. While a true Zero Waste future is not anticipated to happen within the term of the SWMP, the proposed actions are expected to move the City much closer to that goal.

The Council-approved vision statement, guiding principles and goals set the strategic framework for the SWMP and allowed staff to advance work specifically pertaining to options analysis, as explained below.

The Phase 2 report sought to identify anticipated short (1-5 years)-, medium (6-15 years)-, and long (16-30 years)-term waste management needs for the City. To do this, the SWMP's technical consultant conducted a comprehensive needs assessment analysis that looked at anticipated population growth and the future quantities of waste that the city will need to manage over the course of this SWMP. The needs analysis

also took into consideration the changing legislative landscape affecting waste management, policies and programs influencing waste management in the city of Ottawa, as well as best practices affecting solid waste management as identified in Phase 1 of the SWMP.

The waste projections were based off the City's new Official Plan which states that by 2053, Ottawa's population is expected to surpass 1.5 million people. This, in conjunction with current disposal habits remaining status quo, estimates that approximately 487,000 tonnes of waste will be generated and require proper disposal come 2052. This is a 31 per cent increase over the amount of waste requiring management at the time of the calculations (2020). Waste projections are further explained and broken down by waste stream, with details on the methodology used to develop the waste projections, as well as the multiple variables affecting the projections, and appended to the Phase 2 report.

The needs assessment also identified future waste management system needs, as well as gaps, constraints and opportunities associated with the potential needs. This sets the stage for identifying options to address needs that Council will consider. The needs assessment looked at the existing or upcoming waste management opportunities and trends to be incorporated into Ottawa's future waste management system. A total of 21 needs were identified, which were broken down into seven categories, as explained in Supporting Document 2 of the Phase 2 report.

Through the analysis, staff anticipated uncovering instances where the City's practices and processes were not following best practices. One such area that was identified for the City is the manner in which landfill life expectancy is estimated and then used to predict future impacts of policy changes. To date, the City has relied on the Annual Monitoring Report (AMR), a compliance methodology used for annual reporting to the Ministry of Environment, Conservation and Parks (MECP), which uses historical/lagging indicators, such as previous years' airspace consumption, to estimate remaining landfill life. While this methodology is acceptable for compliance purposes, it is not recognized as a best practice for long term waste planning purposes as it does not take into account various factors that influence the longevity of landfill life.

Recognizing that the TWFL is approaching the end of its life, staff were directed to advance the development of a focused Residual Waste Management Strategy (ACS2021-PWE-SWS-0005). This strategy was approved by Council in October 2021 and specifically looks to adopt a best practice calculation methodology that gives a more reliable range in terms of years of airspace remaining at the TWFL. The most recent AMR estimates that if changes are not made to residential disposal and diversion

habits, the TWFL could reach capacity between 2034 – 2035. This highlights the urgency for action to preserve valuable airspace. Since the Residual Waste Management Strategy approval in 2021, staff have worked with technical experts to develop a methodology to predict and evaluate airspace preservation based on the success of policy changes. This methodology looks at estimated potential for tonnes diverted and then uses the current AMR estimate to calculate estimated extensions to landfill life. Additional information on the Residual Waste Management Strategy can be found in the Discussion section below.

With an understanding of the City's potential future waste management needs, a long list of options was developed using consultant expertise, stakeholder input, and information available from other municipalities and knowledge bases. A total of 73 options were identified to address said needs. The high-level list of options, including description and further details, can be found appended to the Phase 2 report.

The final component of the Phase 2 report was the technical evaluation process. This technical tool objectively and transparently evaluated the long list of options to short list them and generate a list of preferred options and different waste systems to be consulted on with all stakeholders and considered in the Draft SWMP.

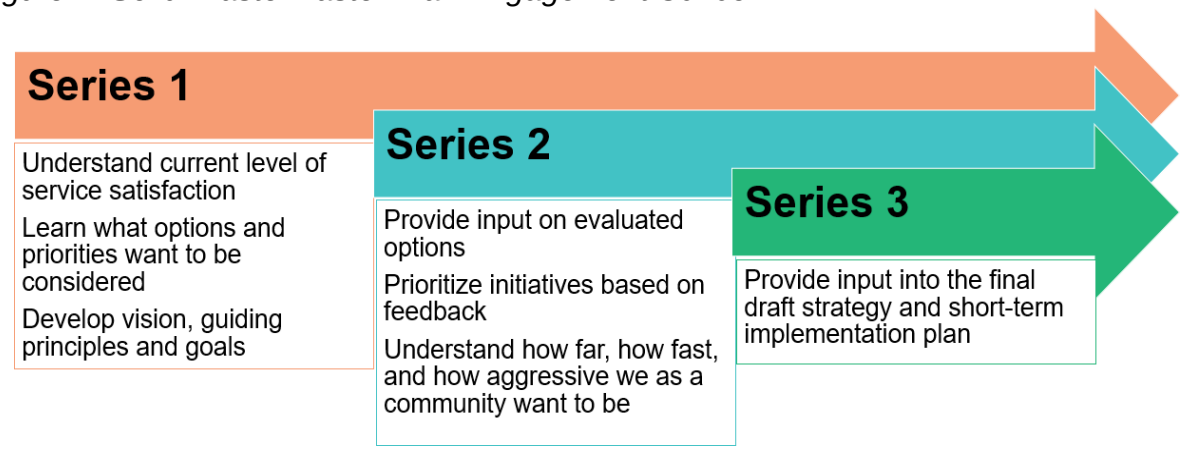
Following Council's July 2021 receipt and approval of Phase 2, the technical consulting team began evaluating the long list of options. Options that did not make it through the technical evaluation process are recommended to be reconsidered through the 5-year SWMP refreshes. The options that did make it through the evaluation were then used to develop proposed actions for Council's consideration. These actions make up the Draft Solid Waste Master Plan, as proposed in this report.

Community and Stakeholder Engagement

This Solid Waste Master Plan has been developed with input from members of Council, key stakeholders and residents. When the SWMP was in its early stages of development, staff worked with the SWMP's Council Sponsors Group and in conjunction with the City's Public Information and Media Relations (PIMR) team to develop a thorough Communications and Engagement Strategy. This strategy involves three different series for engagement activities to ensure members of Council, stakeholders and residents all have ample opportunities to provide their inputs and insights on each phase of the plan.

The following figure depicts the three engagement-series', and what they aim to achieve.

Figure 2: Solid Waste Master Plan Engagement Series'



With an understanding of how broad the range of stakeholders and residents are who may be looking to be involved in the SWMP's development, staff are using a wide variety of communication tools to raise awareness of the opportunities for engagement. Information on the SWMP and its associated engagement series were distributed through:

- Advertising;
- Backgrounders and technical memorandums;
- Councillor briefing packages;
- Creation of a project specific Engage Ottawa page;
- Earned media;
- Feature stories and web banners posted to Ottawa.ca;
- Infographics;
- Newsletters;
- News releases/Public Service Announcements (PSAs);
- Short videos explaining the importance of the Solid Waste Master Plan; and,
- Social media posts on the City of Ottawa's Facebook, Twitter, LinkedIn, and Instagram.

Key stakeholder groups were identified by staff to be included in SWMP consultation, in addition to Councillors and residents, to ensure specific sectors had opportunities to contribute to the SWMP's Development. This included:

- **City Champions Group (CCG)**: A collective of City staff whose work impacts or is affected by the SWMP. Members support the project by providing input at specific junctures of the plan when their work may be impacted by decisions being made. They are also consulted to ensure the SWMP aligns with their respective departmental objectives and operational requirements.
- **Stakeholder Sounding Board (SSB)**: A group consisting of individuals and organizations from across the city who represent a broad range of resident and stakeholder perspectives.

Staff also applied the City's Equity and Inclusion lens to develop connections with various groups that are at risk for exclusion in order to disseminate information about engagement opportunities and encourage participation This was done through working with several community groups to reach equity-seeking groups and providing communications and educational materials in multiple languages and using images instead of text. In addition, a range of engagement methods were utilized to encourage broad participation, including focus groups with specific equity-seeking groups.

As outlined above, Engagement Series 1 looked to understand participants level of service satisfaction, learn what options and priorities participants wanted to see considered in the SWMP, and solicit input to develop the SWMP's vision statement, guiding principles and goals. Details on what we learned through this Engagement Series can be found in Supporting Document 1 appended to the Phase 1 legislative report.

The information received through Engagement Series 1 was used to develop the SWMP's vision statement, guiding principles and goals that were approved by Council through Phase 2. These have acted as guides for the SWMP's development since said approval. Feedback was also used to develop the long list of options for consideration in the SWMP.

Engagement Series 2 launched in Q1 2022 and sought feedback on the proposed short listed options that were generated as a result of the evaluation process done following the approval of Phase 2. This series allowed staff to gather as much information as possible around how much change residents are willing to undertake and how much the community is willing to pay to cover the financial costs of the new integrated waste

management system. Key findings from Engagement Series 2, including how feedback factored into the Draft SWMP's development, are detailed in Supporting Document 2 appended to this report.

Since Engagement Series 2 wrapped up in Q2 2022, staff have been working to develop the Draft SWMP. This has included analyzing feedback learned through Engagement Series 2 and working extensively with the SWMP's technical consultant to develop the Draft SWMP in accordance with the Council-approved vision statement, guiding principles and goals.

As noted above, a Council Sponsors Group (CSG) dedicated to supporting the Solid Waste Master Plan and corresponding component projects was established by the former and has again been established by the current Term of Council. Acting as Council-experts on various waste files while representing the public to ensure staff are aware of current thinking and community concerns; this CSG has and will continue to provide crucial guidance as work to finalize the SWMP nears completion.

With an understanding of work done to date to develop the Solid Waste Master Plan, and awareness of work being done by other levels of government and by City teams that will have an impact on how Ottawa's future waste management system is designed, staff are providing the Draft Solid Waste Master Plan. This has been built on a solid foundation of stakeholder input and engagement, research, data analysis and best practices review, and is being presented for Council's information before staff complete the final round of community and stakeholder engagement.

DISCUSSION

The purpose of this report is to provide members of Committee and Council with the Draft Solid Waste Master Plan for information. This report outlines the recommended actions for Ottawa's future waste management system. Following Council's receipt of this report, staff will complete the third and final round of engagement for the SWMP prior to staff finalizing the SWMP for Council approval in 2024.

The Draft SWMP provides the recommended framework and actions for how the City will tackle the many waste-related challenges and needs faced by the City and will ensure this core regulated service can be met in a sustainable way over the next 30 years. It was built with input from key stakeholders and the public throughout each stage of its development and recognizes that there is no one solution or silver bullet to address the ongoing and future industry challenges.

Addressing waste issues will require a multi-pronged approach through a combination of regulation, collection management, technology, advocacy for change with upper levels of Government and behavioural change among the public and in industry. The recommendations in the SWMP span the collection and management of waste from curbside-residential and multi-residential properties, parks and other public spaces, City facilities and operations and existing partner programs. A total of 50 actions are being recommended following the comprehensive evaluation process and community and stakeholder engagement.

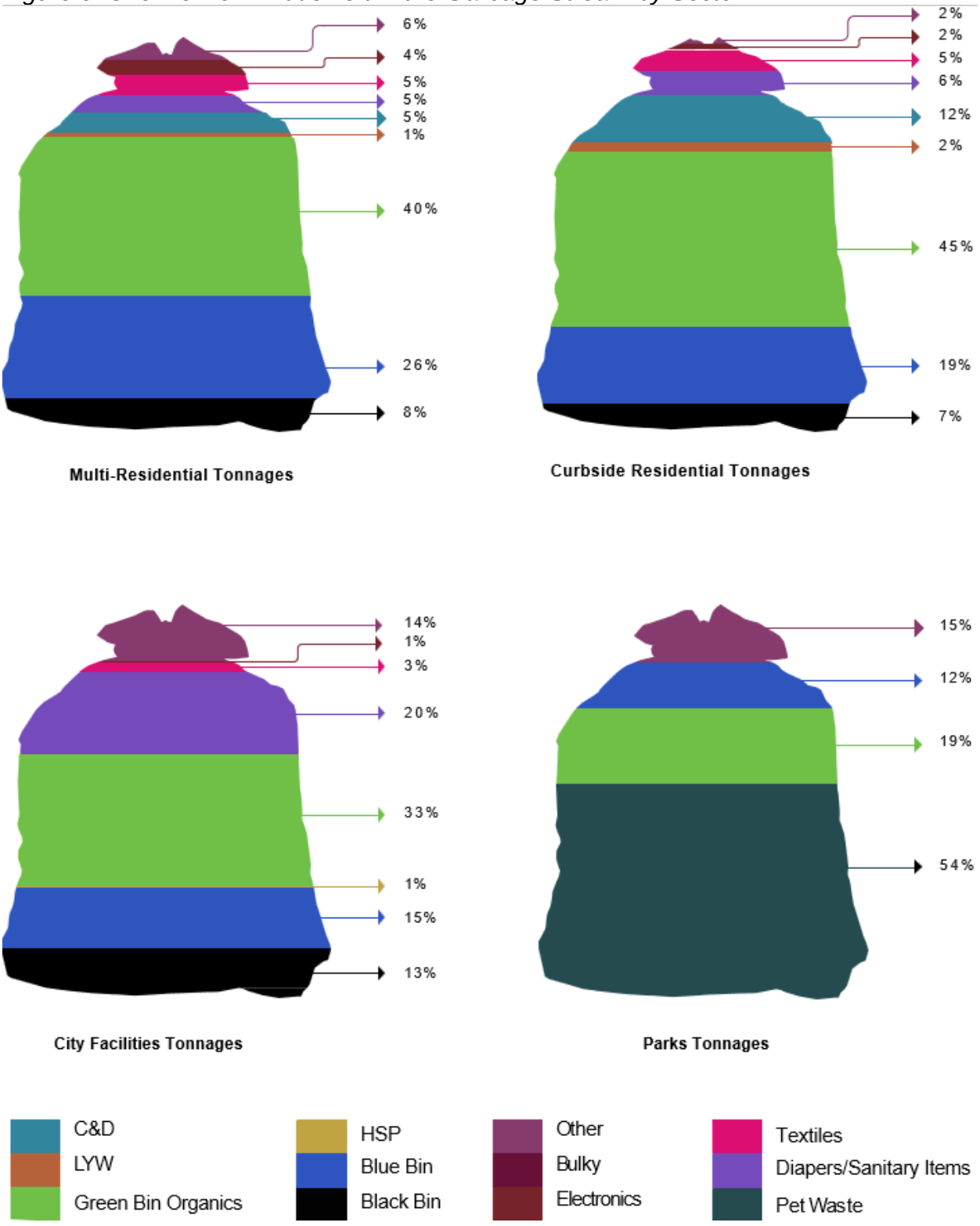
Ottawa's Waste Projections and Disposal Habits

The recommended SWMP actions and proposed order of implementation were heavily influenced by stakeholder input, current disposal trends, overall waste composition, and projections of waste volumes if no changes were made. The below projected tonnages are high-level estimates based on data available at the time of the SWMP's development, and can be influenced by many factors including regulation, changes to product design or packaging, changes in resident consumption and disposal behaviour, severe weather events, amongst other things.

In 2022, a total of 352,200 tonnes of waste was managed by the City: 190,200 tonnes of garbage, 97,500 tonnes of organics and leaf and yard waste and 64,500 tonnes of recyclables. The City's overall diversion rate was 46 per cent, with curbside residential properties diversion rate being 53 per cent, and multi-residential properties diversion rate being 17 per cent.

In 2018 and 2019, waste composition studies were completed for curbside and multi-residential households and City facilities to understand program participation rates. An updated 4-season waste audit study is currently underway. The studies also provided a better understanding of what's in Ottawa's garbage. Figure 3 provides an illustration of the composition of the waste that is left in the City's garbage stream for curbside residential, multi-residential, City facilities and parks. Of the categories still left in the garbage stream, leaf and yard waste, green bin organics, hazardous and special products, electronics, blue bin materials and black bin materials could have been diverted with existing programs offered by the City.

Figure 3: Overview of What's Left in the Garbage Stream by Sector

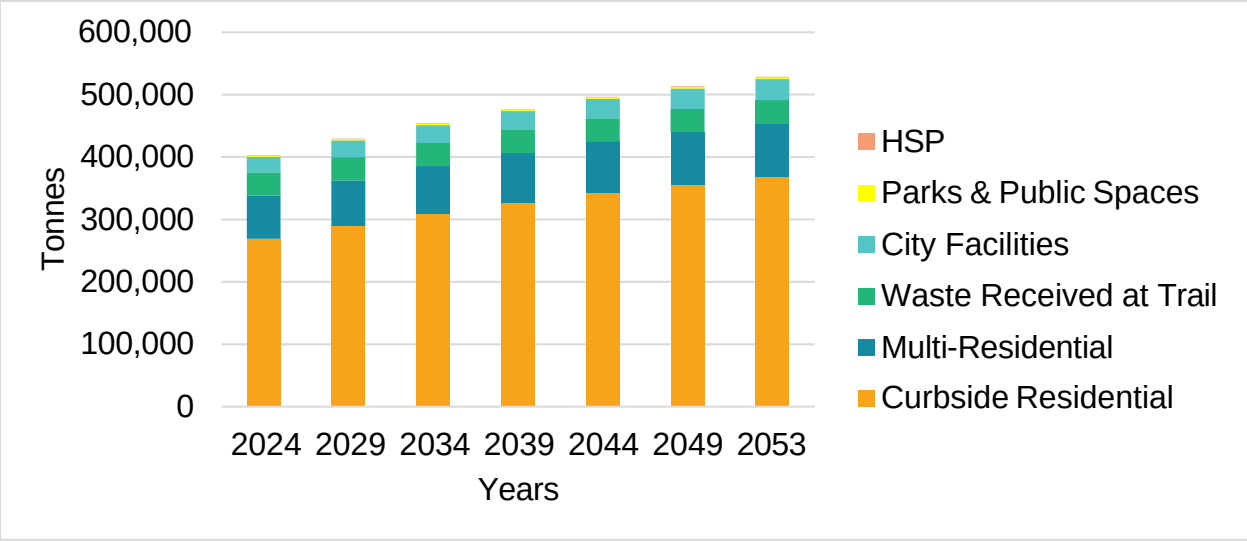


Ottawa's population is projected to grow to approximately 1.5 million people in 2053. With this growth in population, the number of households in Ottawa is expected to

increase by almost 40 per cent from 2024 levels (from anticipated total of 445,000 in 2024, to 623,00 in 2053).

Waste projections include total estimated waste generation from curbside residential households, multi-residential households, City facilities, parks and public spaces, hazardous and special products (HSP), and waste that is disposed of directly at the TWFL. The projections, as shown in Figure 4, estimate the quantity of waste that the City will need to manage over time, based on the City's status quo waste management system, i.e. assuming no changes are made to the City's programs.

Figure 4: Projected Waste Generation by Source



As is the case today, over the next 30 years, curbside-residential households are expected to continue to generate the largest amount of waste requiring management (70 per cent), followed by multi-residential households (16 per cent), waste that is disposed of directly at the TWFL (7 per cent), City facilities (6 per cent), waste disposed of in parks and public spaces (0.5 per cent) and hazardous and special waste (0.2 per cent). This sets the stage on how the City will need to expand Ottawa's capacity for processing waste and reinforces that the TWFL will not have enough capacity to manage this amount of waste into the future unless SWMP actions are advanced. In analyzing the information within Figure 4, it is clear that curbside residential properties will continue to provide the greatest opportunity for waste reduction and diversion in order to lessen the amount of waste requiring processing and landfilling.

Objectives Overview

In understanding the estimated amount of waste Ottawa will need to manage over the term of this SWMP, five Objectives were identified that will help measure how the 50

recommended actions work towards achieving Ottawa's Zero Waste vision and capture what needs to be accomplished to achieve the SWMP's goals:

1. **Maximize the Reduction and Reuse of Waste**: Actions under this Objective are prioritized in the short-term (0-5 years) and are recommended to begin immediately to decrease waste generated in the first place. Managing less waste is cost-effective for taxpayers, prevents the extraction of natural resources and minimizes the amount of waste that needs to be managed at a disposal facility.

2. **Maximize the Recycling of Waste**: Actions under this Objective that have the biggest impact on keeping waste out of the landfill are recommended for prioritizing in the short-term (0-5 years). Diverting more waste not only extends the life of the landfill but decreases GHG emissions and can help generate revenue opportunities to offset the cost of those programs.

3. **Maximize the Recovery of Waste and Energy and the Optimal Management of Remaining Residuals**: There will still be waste that can't be reduced, diverted, or recycled and the City's landfill doesn't have enough space to meet the City's future needs. This Objective includes actions that will be explored and implemented in the short (0-5 years), medium (5-10 years) and long-term (10+ years) to address the immediate and future need to free and expand landfill capacity and extract maximum resources and energy from this remaining waste stream.

4. **Maximize Operational Advancements**: Actions within this Objective support maximizing operational advancements through innovation and new technology to make operations more efficient and less impactful on the environment.

5. **Develop a Zero Waste Culture Across the City**: Getting to Zero Waste will require guiding and supporting the community to change their lifestyles and waste management practices. Actions under this Objective will help residents understand what they can do to work toward Zero Waste, and influence industry and the wider community to reduce, reuse and divert waste.

In order to take advantage of cost and resource efficiencies, actions that address similar challenges and opportunities were grouped together into Action Suites and actions within those suites are recommended to be implemented simultaneously. Each Action Suite includes a description and list of which actions it includes, as well as planning and implementation timelines, affected sectors and waste streams, anticipated tonnages diverted from landfilling (if applicable), considerations and limitations, and high-level

estimates for capital and operating costs. Further details, including costs are explained later in this report.

The proposed Action Suites of the SWMP are strategically designed to be planned and implemented in the short-term (0-5 years), medium-term (5-10 years) and long-term (10+ years) timeframes of the 30-year planning period (2024 to 2053). Combined, they create an opportunity to support behaviour change in the community, significantly reduce the amount of waste going to landfill, divert valuable resources to be recycled and repurposed into new products, and further preserve and expand capacity at the TWFL, providing time for the City to choose, plan and implement its next residual waste disposal solution.

Most of the short-term Action Suites explained below have the potential to immediately impact the amount of waste going to the landfill and provide lasting benefits over the term of the SWMP. These include actions within Objectives 1, 2 and 3 as shown below. Many of the medium-term and longer-term actions categorized within Objectives 4 and 5 will require further study, data insights and planning in the short term to better understand their estimated potential but are expected to also reduce the amount of waste requiring disposal when implemented. As a result, system impacts are solely provided for Objectives 1, 2 and 3 at this time. Updated estimates for actions will be included in the 5-year SWMP refresh once more work on the initiatives in Objectives 4 and 5 take place (in the shorter term).

Performance measures, which will be used internally by staff to measure the effectiveness and efficiency of individual Action Suites and corresponding actions, are also highlighted below. Data to be used to evaluate performance measures will be gathered through waste audits, processing facility and collections operations data, and annual surveys.

Details of each Objective, associated Action Suite(s), and estimated systems impacts can be found below and in further detail in Supporting Document 1 appended to this report.

Objective 1: Maximize the Reduction and Reuse of Waste

Reducing and reusing waste helps to prevent the extraction of natural resources and the generation of waste in the first place. Engagement participants frequently mentioned the importance of prioritizing reduction and reuse to protect the environment and help keep waste management costs down. Respondents also encouraged the City to start these initiatives early in the Waste Planning process to align with the SWMP’s guiding

principles and to keep costs down/defer the requirement for major investments for future waste management and processing. Three Action Suites consisting of a collective nine actions have been identified to achieve this objective.

Action Suite 1 - Waste Avoidance, Reduction, and Reuse Initiatives	
Description:	Increasing waste avoidance, reduction, and reuse across the city through strategic partnerships with community and industry, financially incentivizing innovative ideas and programs, and expanding or improving existing programs.
Included Actions:	• Sharing Space/Swaps/ Library/Repair Cafes (for various materials) • Community Reuse Events • Develop community strategies, opportunities and partnerships to increase reuse and recycling and avoid waste • Subsidies, Rebates, Grants for Options that Avoid, Reduce or Reuse Waste • Expand the Take It Back! Program • Textile Waste Diversion Enhancement
Planning & Implementation Timing:	2024-2027

Action Suite 2 - Food Waste Reduction Strategy and Reduction Education Initiatives	
Description:	Reducing the amount of food waste generated in the city through reduction strategies, supported by education of residents to build awareness of food waste and its impacts.
Included Actions:	• Implement a Food Waste Reduction Strategy

	• Develop and Implement Food Waste Reduction Education Initiatives
Planning & Implementation Timing:	2024

Action Suite 3 - Waste Minimization and Diversion at Special Events	
Description:	Developing a plan to phase in additional reduction, reuse and recycling waste management requirements at small and large special events in the city
Included Actions:	• Supporting Waste Minimization and Diversion at Special Events
Planning & Implementation Timing:	2025-2028

Estimated Impacts

In total, the recommended actions supporting Objective 1 are estimated to reduce landfill disposal by an estimated 2,750 tonnes over the first five years of the SWMP. Over the 30-year term of the SWMP, these recommended actions are estimated to reduce a total of 31,050 tonnes requiring disposal. In the short term, the reduction actions are not expected to have a significant impact on the life of the TWFL, but the long-term reduction totals may slightly increase landfill life. Most of the estimated waste reduction in the short-term is through action on reducing textile waste, followed by bulky waste and household construction and demolition waste, as well as a small reduction in household electronic waste. These estimates are based on the actions where City or industry data was readily available to make estimates.

In addition to tonnage decreases, there are foundational benefits to these Action Suites as they encourage behaviour change – advancing these actions will set the City up for success for implementing future actions. There also remains a significant opportunity to target food waste reduction, which is an emerging area of focus in the industry where little data is available. As the proposed Food Waste Reduction Strategy and Reduction

Education Initiatives planning is undertaken in the short term, estimated impacts will be assessed at that time and provided to Council and updated as part of the 5-year SWMP refresh. More details on the estimated impacts to waste streams can be found in the Draft Solid Waste Master Plan, appended to this report as Supporting Document 1.

The total short term (Year 1 to 5) costs for the Action Suites supporting Objective 1 are estimated to be $4.35 million. The cost breakdown per Action Suite can be found in Supporting Document 4 appended to this report.

Objective 2: Maximize the Recycling of Waste

Maximizing the recycling of waste by improving existing initiatives and investing in new recycling programs will reduce materials currently going to landfill. Staff learned through public engagement that there is a preference for prioritizing waste diversion early on in the SWMP to delay the need for a new landfill or alternative technology, primarily due to cost. Recycling materials also results in lower lifecycle GHG emissions and creates opportunities to gain revenue to help offset waste management costs. Eight Action Suites have been identified to contribute to this Objective.

Action Suite 4 - Enhanced Source Separation of Waste	
Description:	Implementing actions to maximize diversion of waste from the landfill, including a new curbside diversion policy and actions to encourage participation.
Included Actions:	• Firm Garbage Limit • Disposal Bans • Enforce Source Separation Requirements for Recycling and Organics
Planning & Implementation Timing:	2024-2027

Action Suite 5 - Supporting Additional Diversion in Multi-Residential Buildings

Description:	Implementing strategies to decrease waste generation and maximize diversion of waste in multi-residential buildings.
Included Actions:	• Making Green Bin a Prerequisite to Receive City Waste Management Services • Multi-residential Building Development Standards • Chute Closure/Conversion to Organic Chutes Program at Multi-Residential Buildings (Pilot)
Planning & Implementation Timing:	2024-2027

Action Suite 6 - Waste Diversion Initiatives and Strategies at City Facilities	
Description:	Implementing strategies to decrease waste generation, maximize diversion and implement circular solutions in City-owned facilities.
Included Actions:	• Develop a Corporate Strategy to Increase Waste Reduction, Reuse and Recycling • Single-Use Item Reduction Initiative • Mandatory Waste Diversion in all City Facilities • Expanded Diversion Program at City Facilities and Operations
Planning & Implementation Timing:	2024-2028

Action Suite 7 - Waste Diversion in Parks and Public Spaces

Description:	Implementing a broad-scale, comprehensive waste diversion program, with recycling and organics bins in parks and public spaces across the City.
Included Actions:	• Waste Diversion Program in Parks and Other Public Spaces
Planning & Implementation Timing:	2025-2028

Action Suite 8 – Residential C&D Waste Diversion Strategy	
Description:	Developing a strategy to review construction and demolition (C&D) waste that focuses on decreasing waste generation and maximizing diversion of residential generated C&D waste from the landfill.
Included Actions:	• Mandatory Residential C&D Waste Diversion Strategy Development
Planning & Implementation Timing:	2024-2028

Action Suite 9 - Bulky Waste Diversion Strategy	
Description:	Developing a strategy to review bulky waste that will focus on decreasing waste generation and maximizing diversion of bulky waste from the landfill.
Included Actions:	• Separate Bulky Waste Collection and Recycling Strategy
Planning & Implementation Timing:	2024-2028

Action Suite 10 – Hazardous and Special Product (HSP) Strategy Development	
Description:	Developing a strategy to focus on decreasing HSP generation and maximizing the diversion of HSP from the landfill that the City is responsible for given the transition of a majority of HSP to the Provincial Individual Producer Responsibility Program.
Included Actions:	• HSP Strategy Development
Planning & Implementation Timing:	2024-2026

Action Suite 11 - Sustainable Development Initiatives	
Description:	Implementing financial mechanisms for new developments and redevelopments to encourage waste reduction and diversion during the planning and development phase and to offset growth-related capital costs for providing additional municipal services.
Included Actions:	• Waste Diversion Infrastructure Fee for New Development • Development Charges for Waste Diversion Growth • Bonds for Green Buildings
Planning & Implementation Timing:	2025-2027

Estimated Impacts

The actions supporting Objective 2 are estimated to divert approximately 85,790 tonnes of additional waste from the landfill over the first five years of the SMWP**.** Over the 30-year term of the SWMP, these Action Suites are estimated to divert a total of 970,520 tonnes from landfill. By 2053, the City is anticipated to produce approximately 197,300 tonnes of garbage per year (assuming that SWMP actions are implemented), and therefore the anticipated tonnage savings that could result from implementing all actions

supporting Objective 2 are equivalent to an estimated four to five years of additional landfill life. The greatest impact is expected from the Enhanced Source Separation of Waste Action Suite, which primarily targets enhanced waste diversion in the curbside sector, followed by enhancing waste diversion from multi-residential properties, City facilities, and parks and public spaces. Similar to Objective 1, these estimates are based on actions where City or industry data was readily available, and the actions within will encourage resident and community behaviour change by supporting increased use of existing diversion programs, and developing strategies to encourage further diversion of waste from the TWFL.

Once the proposed actions listed above have been implemented, bulky waste and C&D waste are expected to account for nearly 28 per cent of the remaining waste going to landfill. Due to the high prevalence of bulky materials and C&D in the waste stream, the proposed C&D Waste Strategy for residential waste and Bulky Waste Strategy are intended to identify available potential recycling markets at which time potential diversion for these actions can be quantified.

It is estimated that the cost of the above eight Action Suites will be approximately $15 million within the short term (Year 1 to Year 5) period of this SWMP. Further detail on the costs per Action Suite can be found in Supporting Document 4 appended to this report.

Objective 3: Maximize the Recovery of Waste and Energy and the Optimal Management of Remaining Residuals

While reduction and diversion actions will reduce the amount of waste going to landfill, there will still be waste that cannot be captured under the first two objectives that the City will need to manage. These recommended Action Suites look at recovering resources and energy in keeping with the SWMP guiding principle to treat waste as a resource. Through Engagement Series 2, staff learned that residents understand the need for future options for waste disposal and support the advancement of feasibility studies as they pertain to alternative technologies for waste management. Additionally, respondents agreed with exploring technologies that align with the City’s Energy Evolution Strategy. Short-term and long-term actions to find new disposal capacity for the remaining residual waste stream are outlined within the Action Suites below.

Action Suite 12 – Anaerobic Digestion (AD) and/or Co-digestion

Description:	Using anaerobic digestion to process household organics and generate renewable natural gas (RNG) in alignment with the goals outlined in the City's Energy Evolution Plan.
Included Actions:	• Anaerobic Digestion (AD) and/or Co-digestion of Sewage and Organics at ROPEC or Co-location of Anaerobic Processing Facility for Organics at ROPEC
Planning & Implementation Timing:	2024-2030

Action Suite 13 – Separate Collection of Leaf and Yard Waste (LYW)	
Description:	Increasing the amount of LYW separately collected and composted by the City.
Included Actions:	• Separate Composting of LYW
Planning & Implementation Timing:	2024-2026

Action Suite 14 – Waste Recovery and/or Treatment Facility Feasibility Study	
Description:	Advancing the feasibility study and business case development to implement either Mixed Waste Processing or Waste to Energy Incineration, evaluating the pros and cons of each of these technologies, and analyzing how Mechanical Biological Treatment may be used in conjunction with a chosen technology.
Included Actions:	• Mixed Waste Processing (Mechanical Pre-sort only) • Mechanical Biological Treatment • Waste to Energy Incineration (Direct Combustion)

Planning & Implementation Timing:	2024-2026 (feasibility and business case development only) Total planning and implementation period could take upwards of 10 to 15 years to become operational.

Action Suite 15 – Landfill Gas Management Strategy	
Description:	The development of a Landfill Gas Management Strategy that considers the generation of renewable natural gas (RNG) after the current landfill gas management agreement expires in 2027.
Included Actions:	• Landfill Gas Management Strategy
Planning & Implementation Timing:	2024 to 2027

Action Suite 16 – Residual Waste Management Strategy	
Description:	A strategy developed to extend the life of the TWFL, while the other options in the SWMP work to reduce waste generation and remove waste from going to landfill. This Action includes expansion of the current TWFL, redirecting a portion of waste to private landfills, and a supplemental option developed during Engagement Series 2 to prolong the life of the TWFL by no longer accepting IC&I waste.
Included Actions:	• TWFL Expansion within existing footprint • Use of Private Landfill(s) • Ban Industrial, Commercial and Institutional (IC&I) Waste from the TWFL
Planning & Implementation Timing:	2024-2026 2024-2032 (Landfill Expansion within existing footprint)

Estimated Impacts

The Draft SWMP is recommending the City advance a feasibility study for both Waste to Energy (WTE) Incineration and Mixed Waste Processing in the first five years of the SWMP as they have been deemed viable and proven technologies to further reduce the amount of waste requiring landfilling and both create opportunities to either generate energy and/or recover additional materials for recycling. The feasibility study will include further analysis on waste stream compatibility, a business case detailing more refined costs and revenue opportunities, environmental impacts, and community support for these technologies. The feasibility study will also include a market sounding to understand the various contracting and project delivery models the City can consider, taking into account the lessons learned from other major City infrastructure projects and the ever evolving market. A recommendation for a preferred technology and delivery approach would be brought forward for approval within this term of Council. Further details on the impacts of WTE Incineration and MWP can be found in Supporting Document 1 appended to this report.

Assuming the implementation of all recommended SWMP reduction and diversion actions, WTE Incineration would allow the TWFL to continue beyond the 30-year planning period. WTE Incineration presents some revenue generation opportunities, but the revenues generated are not expected to fully cover the cost of operating such a facility, as evidenced by existing facilities in operation. In terms of GHG emissions, a WTE Incineration facility could be used to generate steam to power a district energy system and offset the use of fossil fuels based natural gas to heat homes and buildings. This could reduce community emissions compared to the City's current approach of landfilling with electricity generation from landfill gas.

Mixed Waste Processing (MWP) facilities are proven technologies that mechanically separate garbage collected by the City into materials that can be diverted and materials that can be landfilled or further processed using alternative waste management technologies. MWP has the potential to divert an additional 30,000 tonnes of organic waste from landfill every year, assuming that the recovered organics are not overly contaminated and can proceed to processing. MWP, by itself, has the potential to expand the life of the TWFL by approximately four years, falling short of achieving the goal of extending the life of the TWFL beyond the term of the SWMP. The increased diversion of recyclables and organics from landfill associated with MWP can help reduce GHG emissions and increase revenues, as explained in Supporting Document 3 appended to this report.

Proposed Anerobic Digestion of Organics, Separate Collection of Leaf and Yard Waste

and Landfill Gas Management Strategy Actions do not directly result in waste reduction, diversion, or increased landfill life. However, they create significant opportunity for the City to reduce GHG emissions from the waste management system, increase opportunities to lower community carbon emissions through the generation of renewable energy, contributing to the achievement of the goals outlined in the CCMP, and generate new revenue streams that will help offset waste management costs.

If Provincial approval is granted for the expansion of the TWFL, this could result in up to eight years of landfilling capacity. This approval and execution could take up to 10 years to complete which is why this specific action is being recommended through a separate legislative report (ACS2023-PWD-SWS-0006) alongside the Draft SWMP.

Another component of the Residual Waste Management Strategy includes the action of re-directing approximately one third of residential waste to private sector landfills in the Ottawa and the greater Ottawa region. This aims to improve collections efficiencies, reduce collection costs and GHG emissions, and add life to the TWFL. This action was parsed out of the SWMP given its alignment with the 2026 Residential Curbside Collection Contract (ACS2023-PWD-SWS-0004) and was approved in September 2023.

The Action Suites working to achieve this Objective are estimated to cost approximately $22 million from Year 1 to Year 5. It is important to note that this $22 million includes the cost of three feasibility studies for alternative waste management technologies. The City will have a better understanding of anticipated capital and operating costs, as well as potential revenue generation, once these feasibility studies are complete. At this time, high-level cost estimates have been projected by the SWMP's technical consultants, however, more accurate estimates will be presented to Council prior to staff seeking direction to implement one or numerous technologies. These high-level cost estimates can be found in Supporting Document 4.

Objective 4: Maximize Operational Advancements

The first three Objectives include actions to support the SWMP's goals associated with the direct management of waste and the five levels of the waste management hierarchy. Actions within Objective 4 support maximizing operational advancements through innovation and new technology to make operations more efficient and less impactful on the environment. In discussing the following Actions with participants of Engagement Series 2, stakeholders encouraged early planning for these actions; as a result, planning would be the focus for the first three years with subsequent implementation occurring in line with proven technologies becoming available and appropriate

infrastructure in place. Further details on how Engagement Series 2 impacted the development of the actions within this objective can be found in Supporting Document 2.

Action Suite 17 – Pilot Alternative Collection Containers	
Description:	Use of pilot alternative collection containers in parks and public spaces, and multi-residential properties, such as in-ground collection, plastic front-end load containers, multi-stream containers, and waste bins with solar compactors to improve collections efficiency, enhance accessibility and/or aesthetics.
Included Actions:	• Pilot Alternate Collection Containers in Parks, Public Spaces and Multi-residential Properties
Planning & Implementation Timing:	2024-2026

Action Suite 18 - RFID Technology on Waste Containers	
Description:	Equipping containers with radio-frequency identification (RFID) capabilities to gain real-time information about collection services and performance, and ensure systems are in place to capture the information on vehicles or programs.
Included Actions:	RFID Technology on Waste Collection Containers
Planning & Implementation Timing:	2028-2029 (Multi-Residential) 2032-2033 (Curbside-residential)

Action Suite 19 - Identifying Curbside Collection Efficiencies

Description:	Undertaking studies to review efficiencies in curbside collection in relation to costs, services, and GHG reductions, and reviewing the potential of offering collection for additional materials not currently collected at the curb.
Included Actions:	• Collection of More Materials at the Curb • Identify Curbside Collection Efficiencies
Planning & Implementation Timing:	2030

Action Suite 20 - Yellow Bag Program for Small Businesses Review	
Description:	Undertaking a review of the City's Yellow Bag Program for businesses, including eligibility requirements and impacts of Individual Producer Responsibility (IPR) for the recycling portion of the program.
Included Actions:	• Undertake a review of the Yellow Bag program for Small Businesses
Planning & Implementation Timing:	2024-2027

Action Suite 21 - Automated Cart Collection for Curbside Garbage	
Description:	Switching from bags to automated cart-based curbside collection of garbage.
Included Actions:	• Automated Cart Collection for Curbside Garbage
Planning & Implementation Timing:	2030-2033

Action Suite 22 - Innovation and Technology	
Description:	Development of a strategy to integrate innovation into solid waste technologies and approaches to help drive the City towards its Zero Waste, Circular Economy and Climate Change Master Plan Goals, and includes completing a review of potential alternate and additional uses for the bufferland properties adjacent to the TWFL.
Included Actions:	• Innovation and Technology Strategy • Future Use of Bufferlands Around TWFL and Nepean Landfill
Planning & Implementation Timing:	2025

Action Suite 23 - Working Toward a Zero Emissions Solid Waste Fleet	
Description:	Building on the City's past and future Green Fleet related work and the Energy Evolution Strategy, it would consider opportunities such as different fuel types, including Renewable Natural Gas (RNG) and hybrid or electric vehicles for the solid waste fleet.
Included Actions:	• Working Towards a Zero Emissions Solid Waste Fleet
Planning & Implementation Timing:	2027-2033

Estimated Impacts

As these Action Suites primarily speak to future planning and potential service enhancements, their impacts on waste reduction, diversion and expanded landfill capacity are difficult to predict at this time. Through the planning phase, staff will identify how actions under this objective will support improving customer service, program accessibility, operational efficiency and overall success. The SWMP estimates

approximately $4 million will be required to support these Action Suites between Year 1 and Year 5.

Objective 5: Develop a Zero Waste Culture Across the City

While the SWMP will require the community to change how they view and manage waste in order to be successful, reaching the vision of Zero Waste will also require a significant shift in social norms. As a result of Engagement Series 2 feedback, staff are recommending these action suites be implemented early in the waste planning process to support residents in making changes to how they manage their waste which is necessary for successful and sustainable future waste management.

Action Suite 24 - Promotion & Education to Support Plan Implementation	
Description:	Enhancing the City's investment in Promotion and Education (P&E) and outreach to match comparator municipality investment is a major key to success for the various recommended actions of the SWMP, to educate residents and businesses, and help promote the behavioural change needed to achieve the City's vision toward a zero waste City and circular economy.
Included Actions:	• Develop and implement New/Expanded Outreach Initiatives • Behavioural Change Management Strategy • Develop and Implement Educational Initiatives • Develop and Implement Marketing & Communication Tools
Planning & Implementation Timing:	2024-2025

Action Suite 25 - Circular Economy Strategy	
Description:	Developing a Circular Economy Strategy that would align with Provincial and Federal efforts and be the primary framework and action plan for how Ottawa will work toward its aspirational vision of becoming a Zero Waste and circular city. This option would involve the development of a dedicated cross-

	departmental Circular Economy Committee, with support from external stakeholders and industry experts, to develop a community and organization Circular Economy Strategy and Action Plan. At a high level, the strategy would: • Explore the integration of circular economy principles into City procurement frameworks and develop implementation plans that can be implemented across departments. • Investigate municipal policy levers, initiatives and actions the City could implement to support the community transition to a circular economy. • Explore opportunities to become an innovation hub for circular economy innovations to accelerate industry and community transition to a circular economy.
Included Actions:	• Develop a Circular Economy Strategy & Implementation
Planning & Implementation Timing:	2025-2027

Estimated Impacts

Similar to Objective 4, these Action Suites are not expected to directly result in waste reduction, diversion and expanded landfill capacity, but are intended to support the various actions in achieving full success and improving customer service and operational efficiency. The anticipated Year 1 to Year 5 costs for these Action Suites is $7 million.

Further information on all proposed Action Suites can be found in greater detail within the Draft Solid Waste Master Plan, appended to this report as Supporting Document 1. As it pertains to implementation, all Action Suites are set to be planned and implemented in the short-term (0-5 years), medium-term (5-10 years) and long-term (10+ years) timeframes of the 30-year planning period (2024-2053). Several factors were considered when developing these timelines, including:

- The vision, guiding principles, goals and objectives of the SWMP;
- The 5Rs waste management hierarchy framework;
- Public and stakeholder engagement feedback;
- Potential behaviour change required for success of some of the Action Suites;

and

- Costs associated with implementing each Action Suite and the recommended system as a whole.

The What We Learned from Engagement Series 2 report (appended to this report as Supporting Document 2) presents the details of the consultation feedback. In addition, Appendix B within the Draft Solid Waste Master Plan presents how this consultation feedback was used, alongside operational and cost considerations, to prioritize and adapt Actions Suites.

Landfill Life Calculations

As noted in the Background section of this report, the Residual Waste Management Strategy directed staff to develop a Landfill Life Calculation Methodology that used more predictive indicators, to accurately assess the remaining life of the TWFL for use in long term planning for Solid Waste Services.

As Council is aware, landfill life is a very variable measurement. As explained through a Memo to Council on June 12, 2023:

> *"Estimating landfill site life is always subject to significant uncertainty and only the remaining airspace is known with reasonable certainty. The rate at which that air space is consumed in the future is dependent on the quantities of future waste received for landfilling, and the efficiency of landfilling. The efficiency of landfilling varies based the types of waste received and several operational variables. For example, completing landfill final cover projects on a more expedited basis to mitigate regulatory concerns may result in lower landfilling efficiency as airspace settlement cannot be utilized. Alternatively, future waste quantities received could vary significantly from the average values seen previously (e.g., if greater waste diversion were to be achieved)."*

Understanding that landfill life is dependent on many complex factors in addition to solely the amount of waste received, Solid Waste Services worked with technical experts to develop a methodology that can be used to predict and evaluate the success of policy changes. This methodology focuses on the amount of waste that can be diverted from landfill and what that translates into in terms of estimated additional airspace that could be gained from implementing a new policy or program. By focusing on additional airspace that can be gained by implementing a new policy or program, staff can estimate landfill life impacts, if desired, by using the most current AMR

estimates as the baseline for remaining landfill life. However, more importantly, this methodology can be used to measure the success of diversion initiatives through waste audits and to tweak programs to be more effective if their performance is not meeting intended outcomes. It is important to note that as the AMR estimate changes due to the many factors listed above, the impact of the policy change will also change proportionally.

By calculating and reporting on tonnages diverted, Council and staff will have an approach that provides a more relatable and measurable criteria for monitoring and reporting on diversion and waste disposal, and for predicting the impact of future policy decisions on landfill airspace capacity and how that translates into potential additional life which is critical for Council decision-making.

System Impacts to Greenhouse Gases

As outlined in the background section of this report, the development of the SWMP will coincide and compliment the City's Climate Change Master Plan (CCMP) and Energy Evolution (EE) Strategy. Energy Evolution projected that diverting organic waste from the landfull and creating renewable natural gas was one of the top five actions to achieving the Council-approved GHG emission reduction targets.

Four key areas of the SWMP that support the goals of the CCMP and EE are:

- Reducing, avoiding and reusing waste;
- Increasing organics waste diversion;
- Generating renewable natural gas from organic food waste; and,
- Transitioning to a zero emissions fleet.

The Draft SWMP, appended to this report as Supporting Document 1, details the GHG emissions reduction potential associated with each of these key areas.

Further, the proposed residual waste management technologies explored through the SWMP and recommended to advance to feasibility and business case development also present opportunities to reduce GHG emissions. A WTE Incineration facility could be used to generate steam to power a district energy system and offset the use of fossil fuel based natural gas to heat homes and buildings. This could reduce community emissions compared to the City's current approach of landfilling with electricity generation from landfill gas. MWP could also reduce the City's carbon footprint by diverting extra organic waste from landfill. The Draft SWMP, appended to this report as Supporting Document 1, provides estimates for the GHG reduction potential associated

with these two technologies; with additional information included in the GHG Technical Memorandum appended to this report as Supporting Document 3.

Financing and Funding

Financial Estimates

The Draft SWMP includes 50 actions to drive change and work towards meeting the Council-approved vision statement and goals of the SWMP. Most of the proposed actions focus on reducing the amount of waste being generated and requiring disposal, involve providing enhanced services to the community, and look at reducing the environmental impact of managed waste. While some of these actions will generate new revenue for the City, most will require substantial investment and funding to be executed successfully. Since the Draft SWMP is a high-level planning exercise, the financial analysis provides an estimated cost for the recommended system as a whole and a relative cost comparison between the recommended actions. These estimates were developed with the Solid Waste Master Plan's Technical Consultant, KPMG, in consultation with the City's Financial Services Department.

Due to the difficulty in predicting future costs, and given the significant impacts of a range of market and macroeconomic factors, cost escalation and inflation are not considered in the estimates below. Therefore, it is important to note that actual costs incurred if the recommended actions are implemented will likely differ/increase from those presented herein. More refined financial estimates will be developed as part of the Solid Waste Long Range Financial Plan that will accompany the Final Solid Waste Master Plan in 2024. Cost estimates will also be refreshed on a 5-year basis and for each term of Council, as per Long Range Financial Plan standards set by Financial Services.

Baseline Budget Needed to Maintain Solid Waste Services

Over the next ten years (2023-2032), there is a need for capital expenditures of approximately $200 million; a significant portion, around $130 million, is needed to cover regulatory costs for the existing landfill and to maintain existing waste services for residents. These figures do not reflect funding for Draft SWMP actions – they are solely for status quo services and encompass various capital investments, including asset renewal, fleet renewal, technology upgrades, long-term planning and landfill-related expenses. These estimates are based on the City's 10-year Capital Plan which is updated annually as part of the City's budget process to reflect updated cost estimates. There is, additionally, an estimated cost of $350 million - $400 million for a new landfill

or alternative technology to be considered, which is not currently included in the City's 10-year Capital Plan.

The Solid Waste capital reserve is currently in a deficit, without funding to support these future needs to maintain current services. Furthermore, over the past number of years, the proportion of municipal property taxes allocated to Solid Waste Services, which funds diversion programs, has not fully covered the cost of providing these programs. This has resulted in user rate surpluses being used to support diversion programs rather than being used to contribute to the Solid Waste capital reserve. Even without implementing the recommended SWMP actions, rate increases will be required to cover the cost of the City's current forecasted budget needs.

Since 2020, Council has approved rate increases between $8 and $12 per household per year to support funding needs to make solid waste operations whole and to bring the capital reserve into a positive position. Despite these recent investments, the City's 10-year Capital Plan and historical rate increases will not be sufficient to fund future operations. A Long Range Financial Plan (LRFP) is being developed to present a sustainable and affordable funding model to fund current and future solid waste service needs and Waste Pan actions. The scope of the LRFP will include:

- Exploring the debt limit restrictions to determine whether the waste program costs can be reasonably spread out over the decades to come;
- Assessing the potential to spread the significant capital costs anticipated in 2030 and 2044 across several years to ease the financial burden in those years;
- Assessing the policy, social and financial implications of raising user fees for City residents; and,
- Reviewing any planned user fee increases and considering making adjustments based on the anticipated waste program costs and within affordability parameters.

The LRFP will be presented to Committee and Council for approval alongside the Final Solid Waste Master Plan in Q2 2024.

Estimated Financial Impacts of Potential Actions

The recommended SWMP actions will require around $280 million in new capital investments on top of the investments required to maintain status quo waste management services and meet regulatory requirements, as outlined above. Operating

costs are expected to rise by up to $20 million annually by 2031. By reducing the amount of waste requiring landfilling, based on 2023 dollars, there is an estimated average asset value savings of approximately $4.3 million per year by preserving air space at the TWFL.

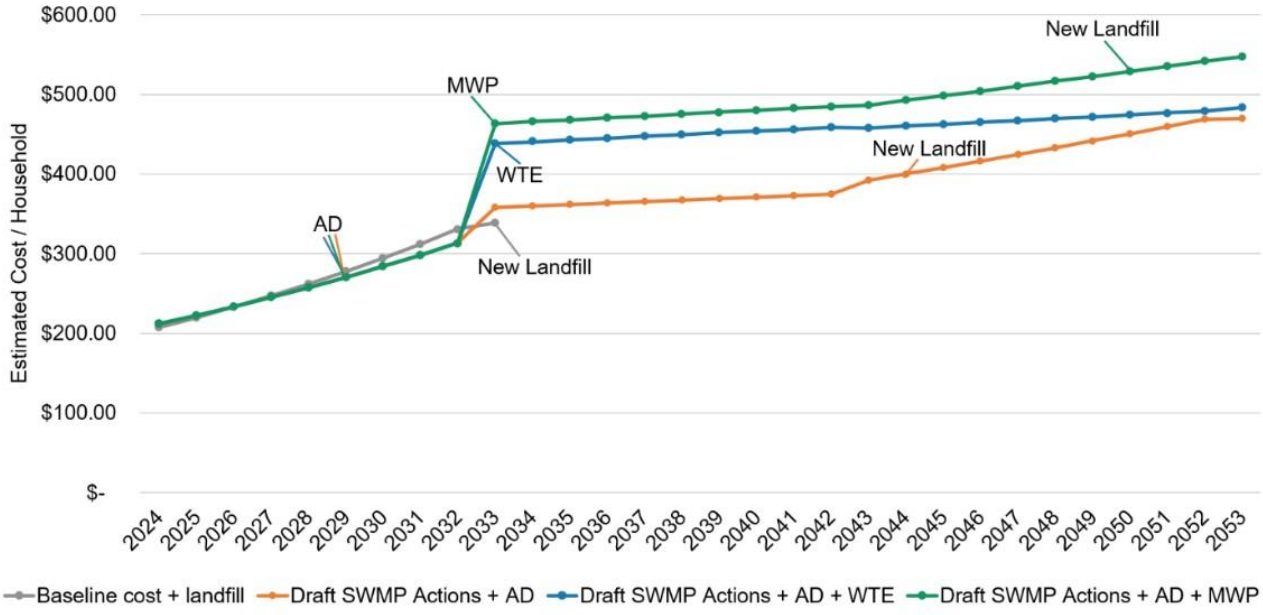
If the City decides to pursue an alternative waste management technology such as WTE Incineration or MWP, there will be additional costs, with WTE Incineration being the more cost-effective option due to its higher capital cost but lower operating costs and higher revenue potential. Both technologies could further delay the need for a new landfill, resulting in greater cost savings or deferral.

The capital cost for a WTE Incineration facility is estimated to be between $450 and $500 million; annual operating costs are estimated to be $25 million per year and annual revenue offsets are estimated to be approximately $14 million per year. The capital cost for a MWP facility is estimated to be between $60 and $70 million, annual operating costs are estimated to be $41 million per year and annual revenue offsets are estimated to be $2 million per year. Both of these technologies would further delay the need to invest in a new landfill/landfilling capacity.

Even without implementing the recommended SWMP actions, rate increases would be required to cover the cost of the forecasted 10-year capital needs, as currently identified, and a new landfill. Figure 5 below presents the anticipated funding increases required for four potential scenarios:

- Funding for baseline (status quo) services plus the need for a new landfill;
- PLUS Funding for Draft SWMP actions;
- PLUS Funding for Draft SWMP actions plus a Waste to Energy (WTE) Incineration Facility; and,
- PLUS Funding for Draft SWMP actions plus a Mixed Waste Processing (MWP) Facility.

Figure 5: Anticipated Costs/Household



Note: Points indicate year facilities identified will be operational

As shown above, the most significant cost increases over the 30-year SWMP would be required within the first 10 years when the majority of initiatives are planned for implementation. Cost increases are anticipated to flatten out by 2034, with the exception of the need for a significant capital investment in the mid-2040s to develop a new landfill.

Because the Solid Waste Master Plan is a high-level planning strategic framework, it should be noted that the financial projections outlined above are based on 2023 dollars and represent a starting point to understand the magnitude of investment required to further pursue these actions and are subject to change. Through the Final Solid Waste Master Plan coming next year, staff may receive direction from Council to begin implementation planning where financial estimates can be further refined based how programs and infrastructure are designed and the service delivery model chosen (i.e. public-private partnerships, community led, or City owned and operated). There will be multiple touch points with Council following the final Waste Plan's approval to seek further approval before moving forward with implementing the various initiatives and strategies. Additionally, the development of the Solid Waste Long Range Financial Plan will consider multiple funding strategies to minimize large swings in cost increases for residents, while providing more reasonable and predictable cost increases and to balance capital investments within affordable parameters. For further details on the cost breakdown per Action Suite, please review Supporting Document 1 appended to this report.

Keys to Success

Implementing the Solid Waste Master Plan's 50 actions and achieving the Zero Waste vision will require participation and collaboration from stakeholders across the City and the entire community. In particular, success of the SWMP will be dependent on:

- **Community participation and behaviour change:** Many of the Solid Waste Master Plan's reuse, reduction and diversion actions will require significant participation from residents across the city. Participation can be encouraged and improved by expanding outreach and education programs and initiatives, but full community involvement will require a shift in behaviour away from the current practice of waste creation and disposal to waste avoidance, reduction, reuse and recycling.

- **Successful partnerships:** Many SWMP actions require partnering with various stakeholders, such as businesses, community organizations and Non-governmental Organizations, for optimal success. Engagement with these groups was key during development of the SWMP and these partnerships will continue to be crucial, particularly as the various reuse, reduction and recycling initiatives are planned and implemented.

- **Internal collaboration:** The Solid Waste Master Plan's scope includes the collection and processing of waste from curbside residential and multi-residential homes, parks and other public spaces, City facilities and operations and existing partner programs. Managing and enhancing waste programs needs to align with other City projects, operations, and initiatives led by various internal departments.

- **Cooperation from all three levels of government:** Achieving Zero Waste will require the ongoing implementation of various policies and legislation on multiple levels of governance. Cooperation will continue to be an important part of working towards Zero Waste to help ensure the various tools and instruments used by all three levels of government align and build on each other's efforts.

Next Steps to Finalize the Solid Waste Master Plan

Following Council's receipt of this legislative report, staff will embark on the third and final round of engagement for the Solid Waste Master Plan's development – Engagement Series 3. This engagement series will focus on informing stakeholders of what the Draft SWMP entails, how stakeholder feedback from Engagement Series 1 and 2 has been integrated into the SWMP's development so far and will provide an

opportunity for residents and stakeholders to ask questions of staff and provide comments and feedback on the Draft SWMP before the tabling of the Final Solid Waste Master Plan in Q2 2024.

Engagement Series 3 will begin with stakeholder sessions following Council's receipt of the Draft Solid Waste Master Plan on December 6. Beginning mid-January and into February, a series of in-person public open houses across the city as well as virtual sessions will take place. Staff will also meet individually with all members of Council to seek their feedback on behalf of their residents and the input will be considered in the Final SWMP. This timeline respects and makes efforts to accommodate ongoing public engagement series related to other City projects such as Lansdowne 2.0, the 2024 Budget, and Council led Service Reviews. The series dates also account for the typical decline in public engagement experienced during peak winter holidays between the end of December and early January.

Along with tabling the Final Solid Waste Master Plan in Q2 2024, staff will also provide members of Committee and Council with the proposed Long Range Financial Plan for Solid Waste, for consideration and approval, and noted within this report.

Should Council approve the Final Solid Waste Master Plan in 2024, staff would initiate the actions within the corresponding Action Suites. Updates would be provided to Council on an as-required basis as actions are planned, prior to implementation, and through annual performance reports. Additionally, updates on the Solid Waste Master Plan as a whole would be provided through every five years, commencing in 2029.

FINANCIAL IMPLICATIONS

There are no financial implications associated with the report recommendation.

LEGAL IMPLICATIONS

There are no legal impediments to Committee and Council's receipt of this report.

COMMENTS BY THE WARD COUNCILLOR(S)

This is a City-wide report.

ADVISORY COMMITTEE(S) COMMENTS

There are no advisory committee comments for this report.

CONSULTATION

The Solid Waste Master Plan Phase 1 report outlined the SWMP's Communications and Engagement Strategy which involves three different series' for engagement activities to ensure member of Council, stakeholders and residents all have ample opportunities to provide their inputs and insights on each phase of the plan.

With an understanding of how broad the range of stakeholders and residents are who may be looking to get involved in the SWMP's development, staff are using a wide variety of communication tools to raise awareness of the opportunities for engagement. Staff also applied the City's Equity and Inclusion lens to develop connections with various groups that are at risk for exclusion in order to disseminate information about engagement opportunities. Individuals were encouraged to participate in either online workshops or during focus groups to ensure their perspective was heard and considered.

This Draft Solid Waste Master Plan is built on a solid foundation of stakeholder feedback which was provided through Engagement Series 1 and 2, as described in this report and in further detail within Supporting Document 2 appended to this report.

ACCESSIBILITY IMPACTS

The actions within the Draft Solid Waste Master Plan, if received in Q2 2024, would be implemented according to *the Integrated Accessibility Standards Regulation* (IASR) of the *Accessibility for Ontarians with Disabilities Act*, 2005, (AODA) in addition to the City's Accessibility Design Standards (ADS), where applicable.

Any educational initiatives and promotional campaigns will include accessible formats and communication supports, including but not limited to closed captioning on videos and alt-text on images. Additionally, any web content regarding the Solid Waste Master Plan will conform with the World Wide Web Consortium Web Content Accessibility Guidelines (WCAG) 2.0 Level AA.

The City recognizes that many people with disabilities in Ottawa live in multi-residential properties, due to the proximity of medical centres and other amenities, as well as the general accessibility of these units, such as wide accessible entryways and lobbies, access to elevators, and having barrier free access to all rooms in apartments. The City also recognizes that waste-disposal rooms in multi-residential buildings are small and often lack accessible features, such as automatic door openers, which can limit the ability of people with disabilities to independently dispose of their waste. As such, the City will continue to work with the property management sector to ensure success in the

roll-out of the mandatory Green Bin program, as well as the Chute Closure/ Conversion to Organic Chutes Pilot Program at all multi-residential buildings. This will include encouraging property management groups to consider how their residents with permanent or temporary disabilities will access these services.

Additionally, the use of alternative collection containers, such as in-ground collection, front-end load containers, multi-stream containers, and waste bins with solar compactors will have accessibility features and improve the overall accessibility of waste collection in parks, public spaces and multi-residential buildings. Following approval of the recommendations outlined in the report, staff would continue engaging with stakeholders, including staff in the Accessibility Office and the Accessibility Advisory Committee, as well as a wider community of accessibility-related stakeholders to receive feedback on the implementation, development, and delivery of services in the Plan. Continuing to engage with these stakeholders with disabilities will help identify and mitigate barriers and challenges prior to implementation from a cross-disability perspective and understand the unique needs and feedback from residents with disabilities, thus reducing or eliminating barriers and challenges faced by these residents.

ASSET MANAGEMENT IMPLICATIONS

The recommendations documented in this report are consistent with the City's Comprehensive Asset Management Program objectives. The implementation of the Comprehensive Asset Management Program enables the City to effectively manage existing and new infrastructure to maximize benefits, reduce risk, and provide safe and reliable levels of service to community users. This is done in a socially, culturally, environmentally and economically conscious manner. The proposed actions outlined in this report support extending the life of the Trail Waste Facility Landfill and reducing greenhouse gas emissions.

CLIMATE IMPLICATIONS

Solid Waste Services has worked closely with the City's Climate Change and Resiliency team to understand and align where possible with the Climate Change Master Plan and the Energy Evolution Strategy.

The SWMP is recommending a series of actions that will improve the environmental impacts of Solid Waste Services, these actions can be put into 3 categories: Diversion from Landfill, Renewable Natural Gas and Energy Production, and Fleet.

Diversion from Landfill

Methane emitted from landfills results from the decaying of organic waste over time under anaerobic conditions. Because methane is both a powerful GHG and short-lived compared to carbon dioxide, increasing diversion from landfill, particularly of organic material, would have a significant effect on reducing GHG emissions. Energy Evolution projected that diverting organic waste from the landfill and creating renewable natural gas was one of the top five actions to achieving the Council-approved GHG emission reduction targets.

The first five years of the SWMP will focus on landfill emissions diversion of organics from landfill for GHG reductions. Over the 30-year SWMP, the emission reductions from those early actions is an estimated cumulative 138,620 tonnes of CO2e, equivalent to the emissions from 1,415 passenger vehicles driven for one year, according to calculations available through Natural Resources Canada.

The Actions that will take place in the first 5 years are:

- Action 1: Waste Avoidance, Reduction, and Reuse Initiatives
- Action 4: Enhanced Source Separation of Waste
- Action 5: Supporting Additional Diversion in Multi-Residential Buildings
- Action 6: Waste Diversion Initiatives and Strategies at City Facilities
- Action 7: Waste Diversion in Parks and Public Spaces

These actions will support the goal set out by the Energy Evolution Model to remove 98% of organics from landfill.

Renewable Natural Gas and Energy Production

The SWMP additionally assessed three possibilities for processing waste that have the potential to further reduce emissions and were compared using Environment and Climate Change Canada's Organic Waste GHG Calculator tool. They are:

1. Anaerobic digestion to process household organic waste and generate renewable natural gas

2. Waste to Energy, specifically mass-burn incineration/thermal combustion

3. Mixed Waste Processing to further divert materials to their designated stream

While the various processes were found to have potential for further emission reductions (summarized in Document 3), it is recommended that these actions undergo further analysis as part of a feasibility study and business case development to inform Council decision-making (noting the feasibility study for anaerobic digestion is already underway). This includes further analysis on waste stream compatibility, a business case detailing more refined costs and revenue opportunities, environmental impacts, market sounding and community support for these technologies.

Fleet

The SWMP action of Working Toward a Zero Emissions Solid Waste Fleet supports the SWMP Objective to Maximize Operational Advancements. The action includes reviewing emissions from the City's current solid waste fleet vehicles and researching vehicles that use low-carbon fuels.

The estimated total amount of GHG emissions from City-owned or contracted waste collection vehicles is 13,040 CO_2e annually, which the Action aims to reduce to zero by reviewing emission reducing fleet technologies and fuel types. Opportunities with electrification, RNG, and CNG are all on the table – the SWMP commits to adjusting plans for a zero-emissions fleet based on the rapid change and development of the industry and as new fuel sources become available and scalable.

ENVIRONMENTAL IMPLICATIONS

The Solid Waste Master Plan will explore various options for achieving the City's environmental goals with respect to waste management, reduction and diversion.

INDIGENOUS, GENDER AND EQUITY IMPLICATIONS

The City of Ottawa, along with Hill+Knowlton Strategies (H&K), carried out an extensive public consultation series with people across Ottawa on the development of the City's new Solid Waste Master Plan. This is referred to as Engagement Series 2, and it involved the following engagement opportunities:

- A survey open to residents and stakeholders through the Engage Ottawa website in 10 different languages;
- A supplemental public opinion research sample (panel) of representative Ottawa residents;
- A series of public workshops and Question & Answer style events; and,
- Five focus groups with equity-deserving groups.

The online survey was open to all residents of Ottawa between March 7 and May 8, 2022 and generated 3,556 responses. Respondents were provided with the option of responding to the survey in a number of languages, including English, French, Farsi, Spanish, Arabic, Chinese (simplified), Nepali, Somali, Inuktitut or Anishinaabemowin. Overall, most respondents replied in English (94 per cent), followed by French (three per cent) and Farsi (one per cent). The online survey aligns with current Ottawa demographic trends, with over half (53 per cent) of respondents identify as female, while eight per cent identify as someone with a disability.

The public opinion research sample was solicited through Leger, a market research firm. In total, 1,002 respondents completed the survey between March 14 and 22, 2022. Of the respondents, 37 per cent were over the age of 55, and 34 per cent identified as being a part of an equity-deserving group.

Five focus groups were held with residents who identified as new immigrants and BIPOC, persons living with disabilities, older adults, youth and 2SLGBTQQIA+. Each session has four discussion rounds, and included topics of avoidance, reduction and reuse waste options, recycling and collection of waste, parks, City facilities and events and Multi-residential waste options. These groups were open to any residents who self-identified and were hosted by City Staff; invitational focus groups were hosted by H&K. The groups that were engaged through invitational focus groups were groups who had previously agreed to participate in focus groups with either H&K or Solid Waste Services.

The City provided contact information for various equity deserving groups throughout the City and H&K made contact and sent invitations to those who expressed interest. Feedback garnered through focus groups were incorporated in to the “What We Learned Report” and has been incorporated into the Draft SWMP.

During Engagement Series 2, participation from a broad range of residents from across Ottawa was encouraged. This included ensuring residents were able to participate regardless of primary language, ability or familiarity with the issues. The engagement survey and background content were made available in 10 languages, while engagement event participants were offered the option of participating in English or French and were also provided with closed captioning or sign language interpretation where required. Feedback received from residents who identified as a member of an equity-deserving group is captured within Supporting Document 2 appended to this report.

RISK MANAGEMENT IMPLICATIONS

All risks and associated mitigation measures have been outlined within the body of the report.

TERM OF COUNCIL PRIORITIES

The Solid Waste Master Plan aligns with the proposed 2022-2026 Term of Council priority: a city that is green and resilient. Outcomes that support this priority include:

- Reducing emissions associated with the City’s operations and facilities; and,
- Increasing waste reduction and diversion.

SUPPORTING DOCUMENTATION

Document 1: Draft Solid Waste Master Plan

Document 2: What We Learned Report (Engagement Series 2 Feedback)

Document 3: GHG Technical Memorandum

This document is available in English only and may be translated in whole or in part upon request. For more information, please contact Nichole Hoover-Bienasz at 613-580-2424, extension 25145.

Ce document n’existe qu’en anglais et pourrait être traduit en partie ou en totalité sur demande. Renseignements : Nichole Hoover-Bienasz, 613-580-2424, poste 25145.

Document 4: Draft Solid Waste Master Plan System Action Suite Financial Estimates

DISPOSITION

Upon receipt of this report, Solid Waste Services will move forward with the of engagement for the Solid Waste Master Plan, before finalizing the Solid Waste Master Plan and seeking Council approval of it in 2024.