KPMG

Haldimand County

Public Works Operations Facility Locations and Service Review

Final Report

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January 16, 2025

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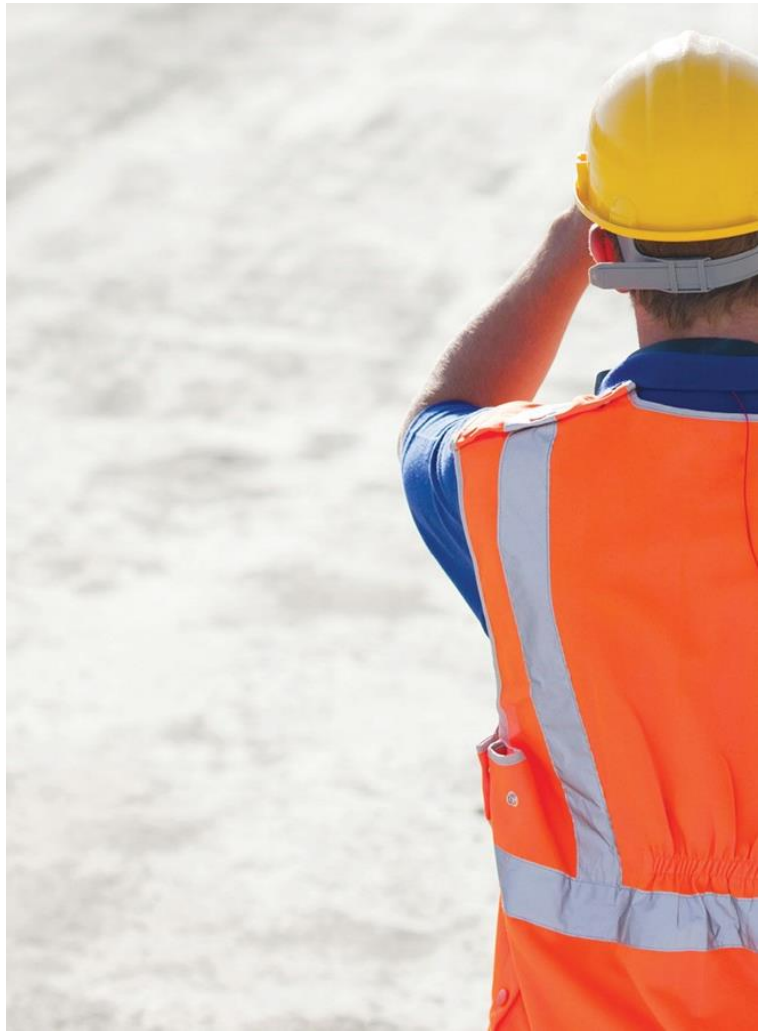

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01

Project overview

Project overview

Project objectives – *How did we define success?*

The overall project objective was to conduct a service delivery model and yard optimization review of the County's Public Works department to enhance the efficiency, effectiveness, and sustainability of service delivery. Specifically, the project looked to address the following key objectives:

1. **Optimize operations** – streamline workflows, processes, and resource allocation to maximize operational efficiency and minimize waste.
2. **Improve service quality** – enhance the quality and reliability of services provided to residents, businesses, and other key stakeholders.
3. **Align services to community needs**– ensure the service delivery model is responsive to the anticipated growth, evolving needs, priorities, and expectations of the community.
4. **Optimize resource management** – effectively manage human, financial and technological resources to achieve optimal outcomes within budgetary constraints.
5. **Embed continuous improvement** – establish mechanisms for ongoing monitoring, evaluation and adjustment of the service delivery model to foster a culture of continuous improvement.

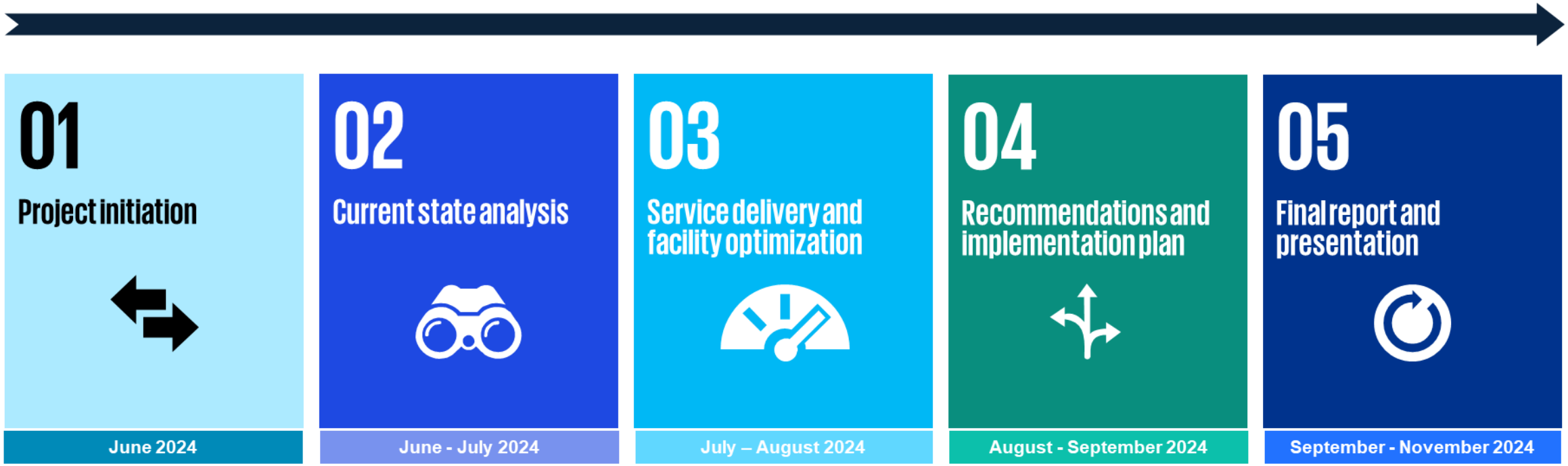
Project drivers – *What problem were we trying to solve?*

Haldimand County Roads Operations is one of four divisions within the Public Works Operations Department. The Roads Division is currently responsible for operations and maintenance of the county road network including most assets within the municipal Right of Way.

As Haldimand County experiences growth and the demand for service increases, the County sought consulting services to conduct an operations and facilities review to ensure the efficient and effective delivery of Public Works services today and into the future. The review assessed the future needs for all Public Works divisions and identified future state facility requirements (e.g., office space, service bays) to accommodate the needs of each division.

Project phases

Our approach to the project was divided into five phases. Each phase is focused on the achievement of specific, tangible objectives and activities.



02

Current state analysis

Approach to assessing the current state

To assess the current state of service delivery, KPMG assessed both quantitative and qualitative information related to the delivery of administrative assistance. The current state analysis includes:

01

Collect and review Public Works data and documentation

KPMG conducted a review of information related to the County's equipment inventory, maintenance services, budgetary and actual financial data, Standard Operating Procedures (SOPs), including those for excess soil, building assessments, Geographic Information System (GIS) maps, office layouts, boundary agreements, organizational structures, growth statistics, and updates on planning development. Haldimand County supplied an export from Pearl with a listing of all assets including disposed, rentals, auction, surplus, planned, replacing, and active assets. From this list, KPMG conducted an analysis of 190 active and replacing larger pieces of equipment, specifically those related to Roads Operations, Facilities, Parks, Cemeteries & Forestry, and Water and Environmental Operations.

02

Conduct site visits to review current state of Public Works facilities

KPMG conducted on-site assessments at nine Public Works facilities, including the Cayuga Memorial Arena, Hagersville Arena, Dunnville Cemetery, Cayuga Roads Yard, Dunnville Roads Yard, Oneida Roads Yard, Walpole Roads Yard, and Kohler Yard. The primary objective of these visits was to evaluate the appropriateness of each site for the necessary equipment and to identify potential areas for improvement and expansion.

03

Validate service delivery requirements to prepare the *Optimization Model*

KPMG executed two rounds of validation sessions, comprising seven individual meetings with Managers and other personnel from the Roads Operations, Facilities, Parks, Cemeteries & Forestry Operations, Environmental Operations, and Fleet divisions. The objective of the first round of validation sessions was to confirm the activities undertaken by each division, along with the projected working days and equipment related to each activity. In the case of the Fleet division, we confirmed the equipment that we had mapped, as well as the classifications of the equipment. The second round of meetings involved Managers and pertinent staff from the Roads Operations, Facilities, Parks, Cemeteries & Forestry Operations, and Environmental Operations divisions. These sessions were utilized to validate the equipment mapped to each of the tasks and to re-confirm the estimated working days for each task.

Overview of Haldimand County Public Works

Public Works Operations

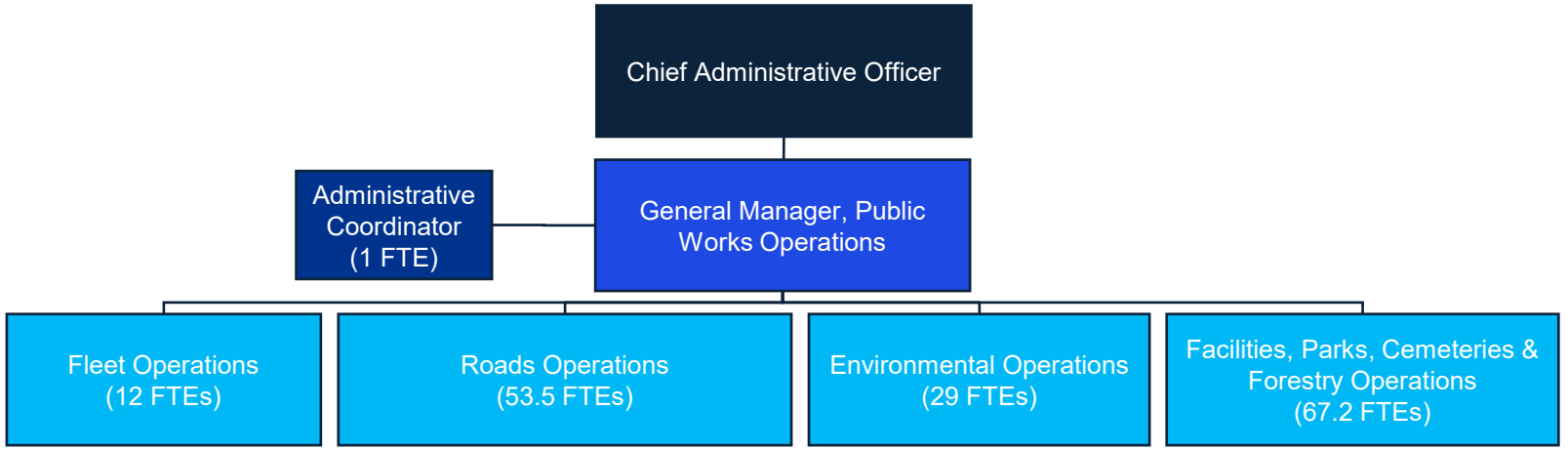
Public Works operations encompasses a variety of essential operations aimed at maintaining community infrastructure and services. Based on current organizational structure, the Public Works departments contains approximately 162 FTEs. Each portfolio is highlighted below:

In Roads Operations, the division focuses on ensuring road safety and maintaining sidewalks, boulevards, parking lots, and road surfaces, while also maintaining winter control, drainage, and roadside upkeep.

Facilities, Parks, Cemeteries & Forestry Operations maintains public spaces, including arenas, cemeteries, community centers, parks, pools, and forestry management. The division ensures the areas are well-maintained for community use.

Environmental Operations manages drinking water, wastewater, solid waste and urban sewer systems, contributing to the overall health and cleanliness of the environment.

Fleet Operations ensures the maintenance and efficiency of the County's fleet and equipment pool, supporting all operational activities.



- Manager
- Division Support
- Fleet Supervisor
- Coordinator, Fleet Safety and Training
- Parts & Service Coordinator
- Fleet Foreperson
- Automotive Technician (6 FTEs)

- Manager
- Division Support
- Administrative Assistant
- Supervisors (4 FTEs)
- Operations Tech/ Contract Admin
- Foreperson (4 FTEs)
- Sub-Foreperson (4 FTEs)
- Heavy Equipment Operators (8 FTEs)
- Roadway Maintenance Operators (20 FTEs)
- 17 Temp. Winter Staff (9 FTEs)

- Manager
- Administrative Assistant
- Division Support (2 FTEs)
- Supervisor (3 FTEs)
- Chief Operator in Charge (2 FTEs)
- Water & Wastewater Operators (13 FTEs)
- Technologist (3 FTEs)
- Solid Waste Staff (3 Full-Time, 2 Part-Time)

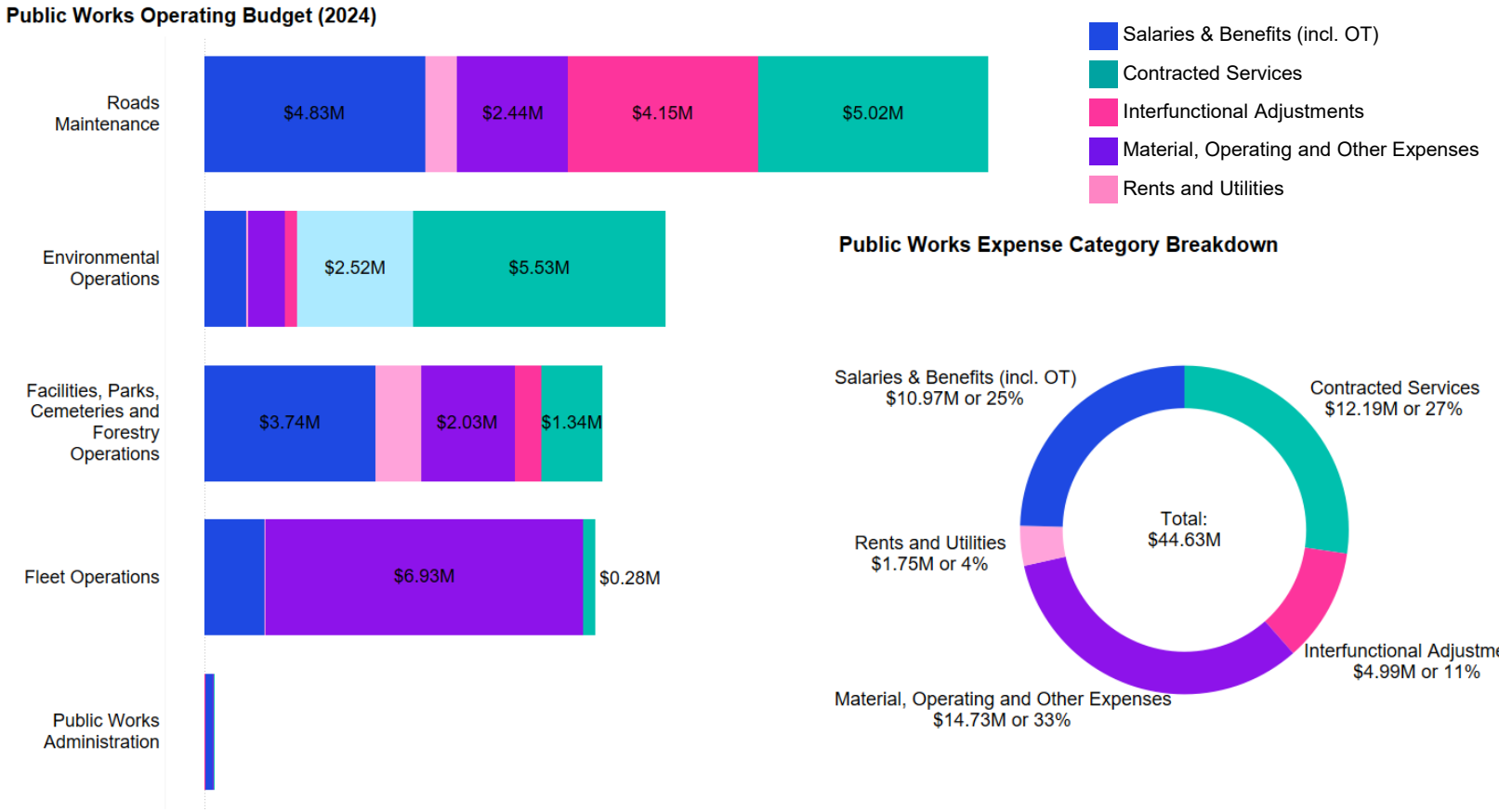
- Manager
- Supervisor (2 FTE)
- Administrative Assistant
- Facilities Clerk
- Division Support
- Lead Hand (5 FTEs)
- Facilities Maintenance (2 FTEs)
- Custodians (2 FTEs)
- Parks and Rec (22 FT, 5 PT)
- Annual Students (21 FTEs)
- Project Manager Forestry
- Urban Forester
- Horticultural Students (0.7 FTEs)
- Inclusive Hires (4 FTEs)

Overview of Haldimand County Public Works

Divisional budgets

As stated previously, the County's Public Works department is split into four divisions: Environmental Operations, Fleet, Facilities, Parks, Cemeteries & Forestry Operations, and Roads Operations. The County provided KPMG with its 2024 operating budget, activity working days, and number of staff for each Public Works division. The below summarizes the current sate for each division:

2024 Budget (millions)[1]	
Salaries & Benefits (incl. OT)	$10.97M
Material, Operating and Other Expenses	$14.73M
Contracted Services	$12.19M
Rents & Utilities	$1.75M
Interfunctional Adjustments	$4.99M
Total Cost	**$44.63**
Total Revenue	**($13.57)**
Net Levy	**$31.06**



Operations Overview

Roads Operations

Divisional Summary

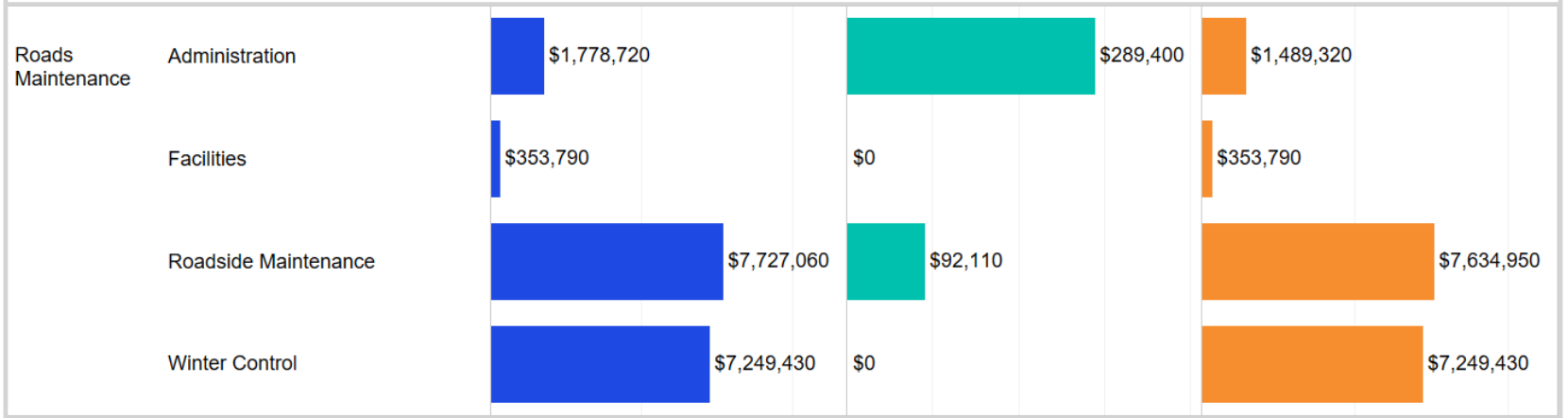
Based on 2023 actual revenues and expenditures, Roads Operations had a total operating expense of $17.1 million, revenue of $381 thousand, resulting in a net levy of $16.7 million.

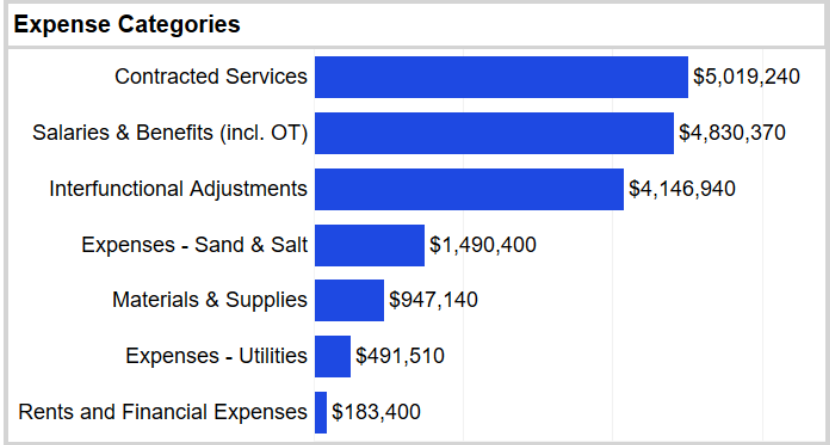
As part of its mandate, the division performs a number of activities. These include, but are not limited to, activities related to road safety, sidewalks and boulevard maintenance, parking lot maintenance, winter control, road surface maintenance, road drainage maintenance, and roadside maintenance.

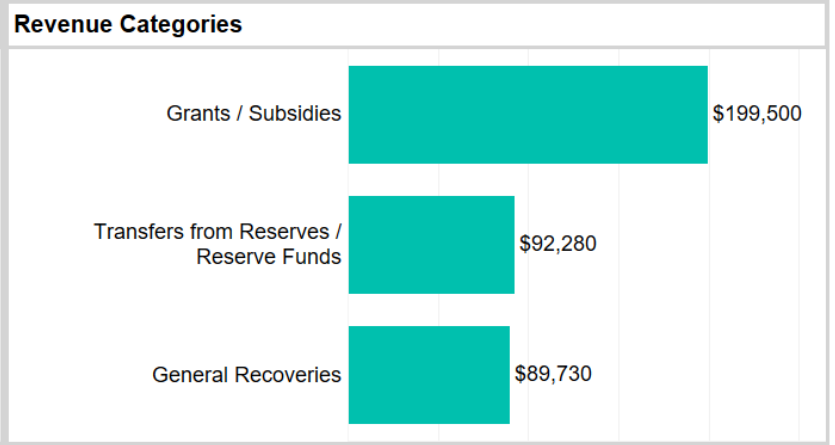
Based on stakeholder consultations, the following key divisional challenges were noted:

- A lack of data to support an asset-linked maintenance plan has resulted in more reactive maintenance activities.
- The County's salt management plan is outdated, with several key risk highlighted by a recent audit.
- General growth within the County and additional infrastructure will require differing skill sets and additional resources to maintain service levels.

Total Expenses	Total Revenue	Total Staff (FTE)	Activity Working Days
$17,109,000	($381,510)	53.5	4,459







Facilities, Parks, Cemeteries & Forestry Operations

Divisional Summary

Based on 2023 actual revenues and expenditures, Facilities, Parks, Cemeteries & Forestry Operations had a total operating expense of $8.7 million, revenue of $1.9 million, resulting in an estimated net levy of $6.8 million.

As part of its mandate, the division performs a number of activities. These include, but are not limited to, activities related to the maintenance of arenas, cemeteries, County Facilities, forestry, parks, and pools.

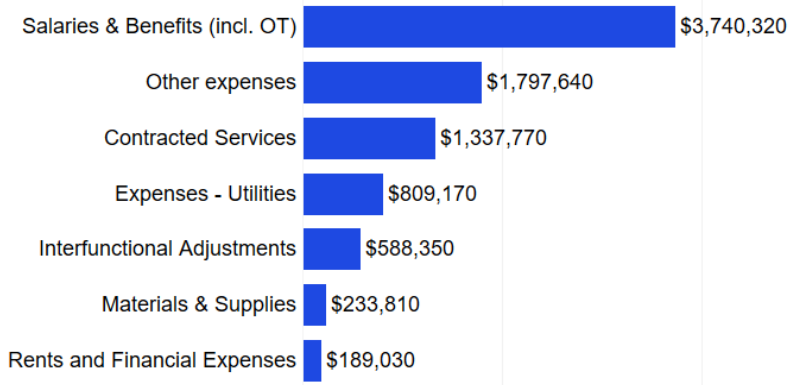
Based on stakeholder consultations, the following key divisional challenges were noted:

- Recruiting and retaining skilled staff due to the division's diverse service portfolio.
- Increased workload of current service levels has strained current resources.

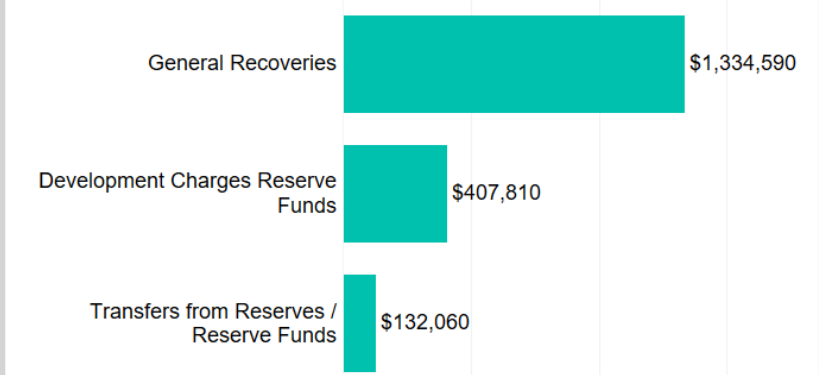
Total Expenses	Total Revenue	Total Staff (FTE)	Activity Working Days
$8,696,090	($1,874,460)	67.2	5,648

Budget Activity Breakdown		Operating Expenses	Revenues	Net Levy
Facilities, Parks, Cemeteries and Forestry Operations	Arenas	$3,975,910	$1,495,660	$2,480,250
	Cemeteries	$451,590	$212,150	$239,440
	County Facilities	$400,950	$0	$400,950
	Facilities, Parks, Cemeteries & Forestry Operations	$720,210	$0	$720,210
	Forestry Maintenance	$948,470	$5,290	$943,180
	Parks & Parkettes	$1,994,330	$161,360	$1,832,970
	Pools	$204,630	$0	$204,630

Expense Categories



Revenue Categories



Environmental Operations

Divisional Summary

Based on 2023 actual revenues and expenditures, Environmental Operations had total operating expenses of $26.1 million, revenue of $10.4 million, resulting in an estimated net levy of $15.7 million.

As part of its mandate, the division performs a number of activities. These include, but are not limited to, activities related to water operations, solid waste and urban storm sewer.

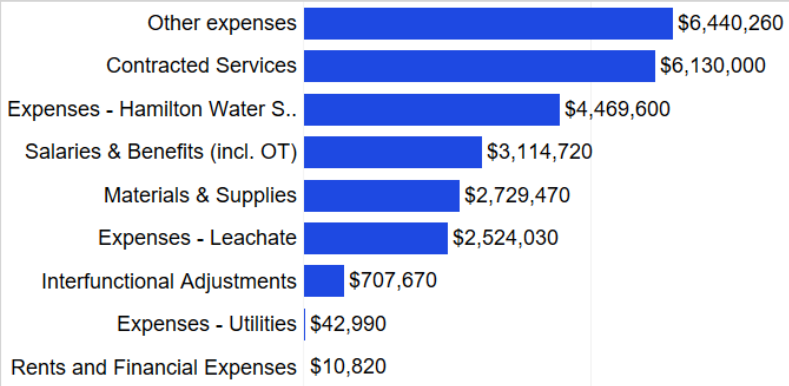
Based on stakeholder consultations, the following key divisional challenges were noted:

- As the County continues to grow, the division may require additional staff to manage increases to the service portfolio and respond to ongoing regulatory changes in the portfolio.

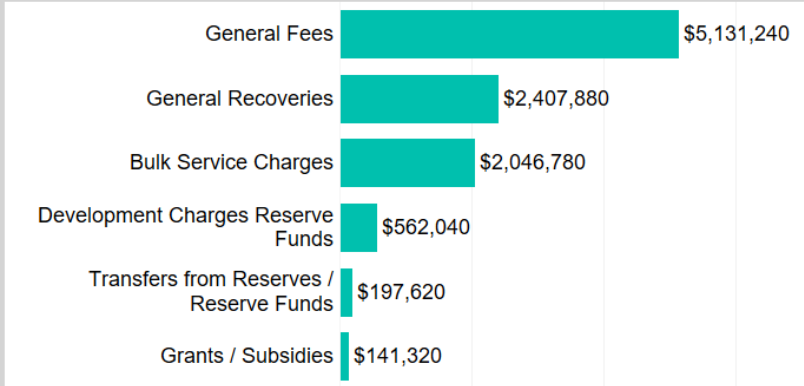
Total Expenses	Total Revenue	Total Staff (FTE)	Activity Working Days
$26,169,560	($10,486,880)	29	2,618

Budget Activity Breakdown	Operating Expenses	Revenues	Net Levy
Environmental Operations – Water Operations	$16,087,720	$7,751,910	$8,335,810
Solid Waste Administration	$1,487,200	$1,171,930	$315,270
Solid Waste Collection	$3,102,480	$0	$3,102,480
Solid Waste Disposal Sites	$4,019,490	$1,298,220	$2,721,270
Solid Waste Reduction	$739,040	$169,490	$569,550
Urban Storm Sewer	$733,630	$95,330	$638,300

Expense Categories



Revenue Categories



Fleet Operations

Divisional Summary

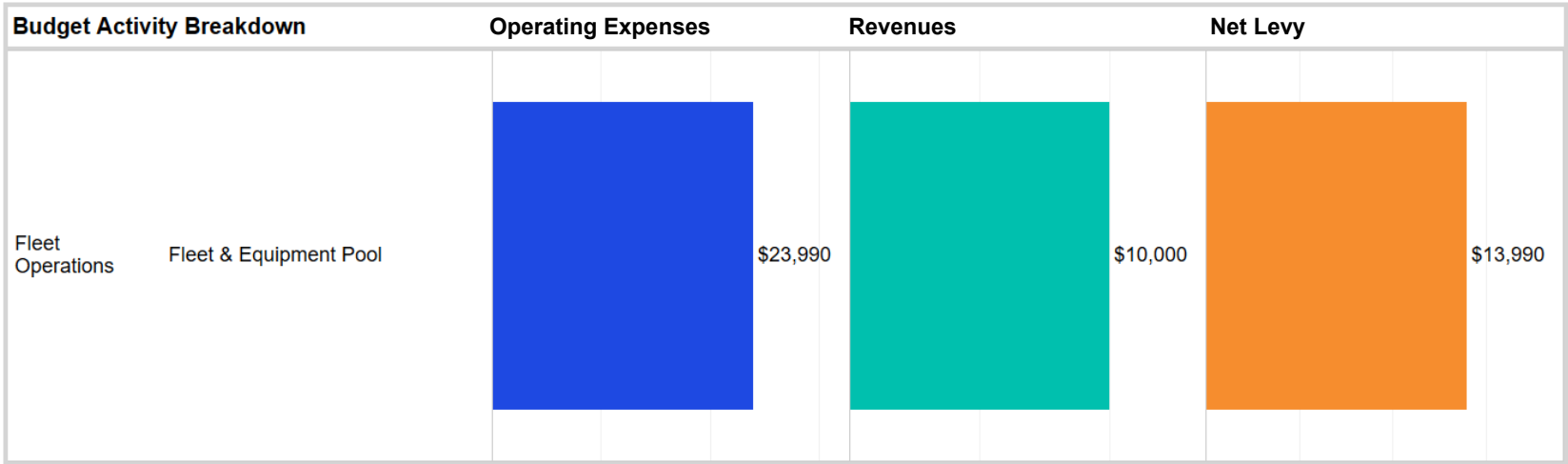
Based on 2023 actual revenues and expenditures, Fleet Operations had total operating expenses of $23.9 thousand, revenue of $10 thousand, resulting in an estimated net levy of $13.9 thousand.

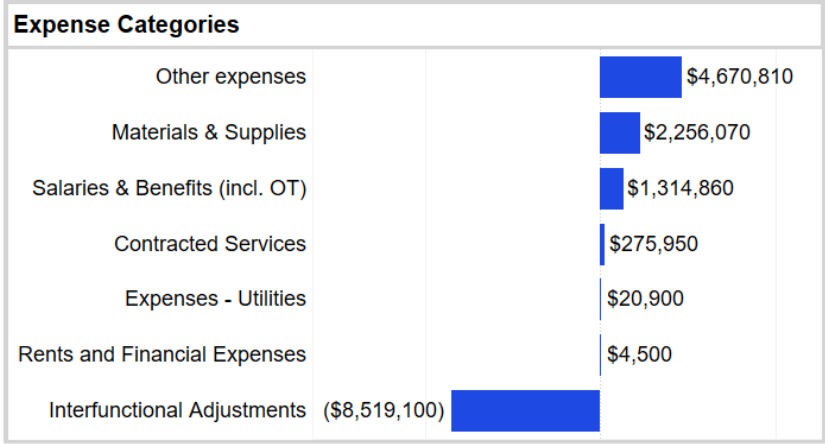
As part of its mandate, the division performs a number of activities. These include, but are not limited to, activities related to the maintenance of fleet and equipment pool.

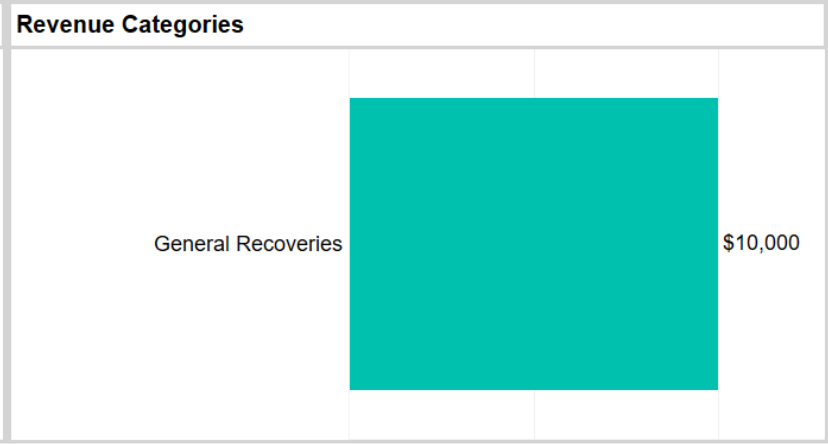
Based on stakeholder consultations, the following key divisional challenges were noted:

- There may be a risk of future vacancies due to imminent retirements within five years. While recruitment hasn't been problematic, the County will require effective succession planning to proactively identify at risk positions.
- The current fleet management system, Pearl, lacks the capacity to provide essential data, underscoring the need for a system that can monitor labour, vehicles, and parts.
- The County's facilities lack appropriate wash bays to help maintain vehicle lifespan.

Total Expenses	Total Revenue	Total Staff (FTE)
$23,990	($10,000)	12







03

Comparator Analysis

Comparator municipalities

Purpose of the benchmarking analysis

The primary purpose of the benchmarking analysis is to compare Haldimand County's delivery of public works services to comparable municipalities.

To conduct the benchmarking analysis, KPMG conducted interviews with each comparator municipality and reviewed the 2022 Financial Information Returns (FIR).

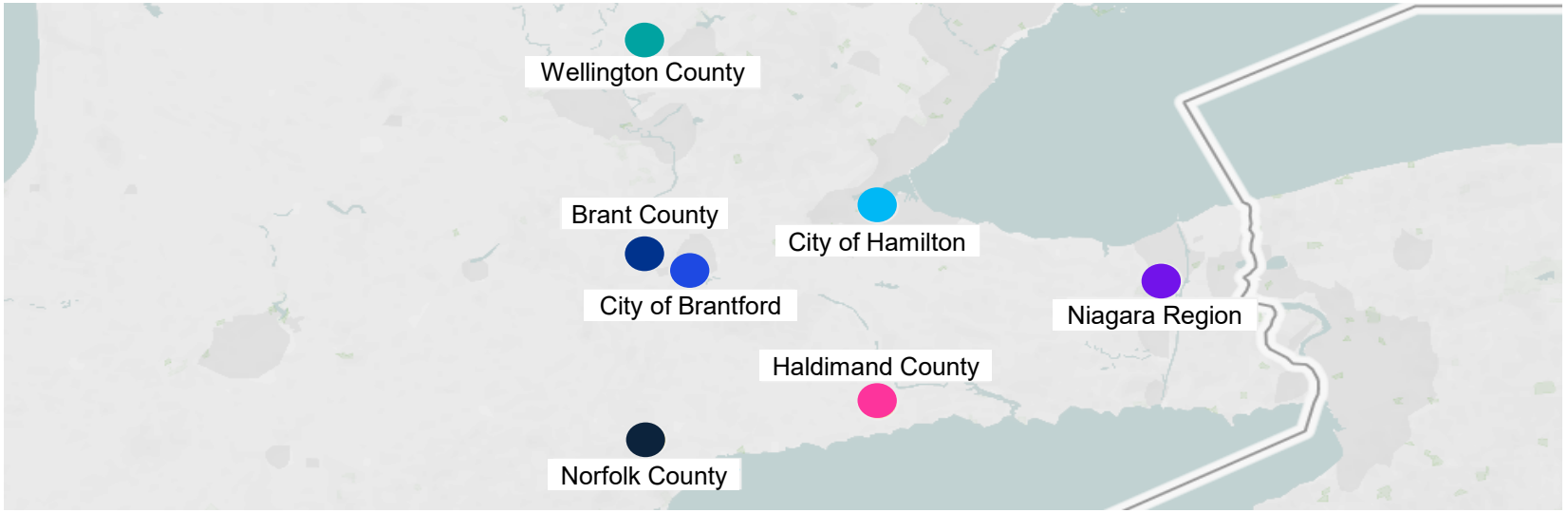
Based on information obtained within each interview, KPMG summarized key themes in the following section.

In addition, KPMG provided a summary of the analysis of the FIR. It should be noted that comparing financial performance has both benefits and risks:

- Provides insights into what a comparator municipality can achieve with the same resources
- Assumes that all variables are the same (e.g., assessment base)
- Assumes that taxation and service levels in other communities are 'optimal" or "right".

** Population and Area data received from Statistics Canada 2021 Consensus; Household data received from Ontario FIR*

For the purposes of the project, six comparator communities were selected as municipal service delivery comparators based on characteristics such as population and geographic characteristics.



Municipality	*Population	*Land Area (square kilometres)
Haldimand County	49,216	1,250.45
Brant County	39,474	1,094.10
City of Brantford	104,688	98.65
Norfolk County	67,490	1,597.68
City of Hamilton	569,353	1,118.31
Niagara Region	477,941	1,852.82
Wellington County	241,026	2,665.36

Comparator analysis – Public Works Operations

The below table summarizes key themes related to the public works operations at each comparator municipality. Full details for each comparator can be found in the appendix.

Theme	Summary
Overview of Public Works Operations	• All comparators manage significant infrastructure, including roads, drains, parks, and community services. However, the organizational structures of the comparators vary. Some comparators are divided geographically (due to large service area), while others operate from a single central operations facility. • Comparators noted a transition from contracted services to in-house operations. One comparator noted they transitioned winter control activities back to in-house (from contracted services) due to rising insurance costs. Another transitioned roadside mowing in-house, resulting in significant cost savings (when compared to the contracted service). • All comparators are actively planning to respond to forecasted growth within their respective municipalities. One comparator noted that the municipality will require additional staff and equipment to maintain service levels. Another comparator noted that aging infrastructure will require modernization in order to maintain the expected level of service. • One comparator indicated that they are implementing activity-based costing through Cartegraph to analyze costs related to equipment and human resources, aiming to benchmark performance and enhance financial planning. Another comparator is linking operational costs to assets for improved capital planning. However, the second comparator has faced challenges in implementation and are striving for a more integrated approach to budgeting.
Facilities	• Many comparators are facing challenges with aging operation facilities. Three comparators reported that their facilities are approaching end-of-life, prompting discussions about replacements or renovations. • One comparator is actively replacing garages as part of a 10-year capital plan, integrating modern features to enhance operational efficiency and employee satisfaction. • Some comparators are incorporating energy-efficient upgrades in their facilities. The upgrades include the integration of geothermal heating systems and the use of mass timber for building structures, as well as replacing garage doors to enhance insulation and reduce energy consumption. • Comparators highlighted current staffing areas as a risk in aging operation facilities. As a result, some comparators have modernized lunch rooms and locker rooms to align with current requirements (i.e., barrier free). • As part of facility modernization, some comparators are adding space in facilities for other departments to promote synergies. This includes departments such as Property Maintenance and Parks, operating out of Public Works facilities.

Comparator analysis – Public Works Operations

The below table summarizes key themes related to the public works operations at each comparator municipality. Full details for each comparator can be found in the appendix.

Theme	Summary
Staffing	• Comparators noted that forecasted growth and increased service expectations from residences as key risks that may constrain current staffing resources. • Several comparators are investing in technology to improve service delivery and increase the productivity of existing staff. This includes mobile workstations and technology to reduce reliance on manual processes and create capacity. • Several comparators emphasized the importance of technological integration, however noted that they require additional staff to manage and monitor data. Comparators highlighted a risk of an inability to action data due to insufficient resources. • Some comparators have implemented new services that will require additional staffing in the future. This includes the expansion of a traffic technology program and management systems, which necessitates additional staff to manage the increased workload associated with traffic signal upgrades and maintenance. • Some comparators highlighted challenges in supplementing the current workforce with seasonal staff. They identified challenges in hiring reliable seasonal staff, which has led to a reliance on existing full-time employees to cover additional routes during winter operations. They also noted that the cumbersome hiring process can impact their ability to maintain service levels during peak times.

Comparator analysis – Technology

The below table summarizes key themes related to technology used within public works operations at each comparator municipality. Full details for each comparator can be found in the appendix.

Theme	Summary

Digital platforms	• Several comparators indicated that they have moved from paper-based systems to digital platforms for work order management using technologies such as MESH (solution by Go-Evo)and iris integrated with GIS.
	• Various digital solutions are utilized by comparators including:
	  • CityWide is Used for service requests and work order management, helping to track costs by operation and improve inventory control for fleet services.
	  • MESH (by Go-Evo) allows staff to create and dispatch work orders while at maintenance sites.
	  • Iris is an application used for collecting data in the field, allowing road patrols to create work orders and log observations efficiently.
	  • Geotab is used for fleet management, tracking vehicle performance and material distribution, enhancing operational efficiency.
	  • MioVision is embedded in traffic signals to adjust traffic flow based on real-time data, improving traffic management.
	  • QuickCapture is a tool for capturing line and point data for asset management, facilitating compliance tracking and reporting.
	  • CityWorks for work order and inventory management
	  • Field Maps for inspections and logging repairs

Data collection	• Comparators noted that the use of technology has enabled real-time data collection for road maintenance and asset management. This allows for better tracking of repairs and operational metrics. In addition, this data has supported the development of asset-linked maintenance programs within comparator municipalities. • Some comparators face challenges in effectively linking time and materials due to inefficient processes.

Comparator analysis – Technology

The below table summarizes key themes related to technology used within public works operations at each comparator municipality. Full details for each comparator can be found in the appendix.

Theme	Summary
Dedicated data management resources	• Several comparators noted a lack of dedicated data management resources (i.e., staff), limiting the ability to leverage data for strategic initiatives. One comparator noted that the 2025 budget will propose a new data management position with operations to address this gap. • Comparators noted that the lack of a dedicated Technologist position has been a barrier to proactively utilizing data to optimize operations (e.g., refine the asset-linked maintenance program, optimize salt management).
Implementation of artificial intelligence (AI) in operations	• Some comparators are exploring AI technologies to enhance operational efficiency. For example, one comparator has implemented AI in traffic signals to adjust timings based on traffic volume, while another is testing AI for condition assessments and operational planning. In both instances, the technologies have enable the municipality to proactively respond to service demand in order to better service the community. • Despite the potential benefits, there are challenges in effectively implementing AI solutions. One comparator faced issues with how much information a solution gathered and how the data was extrapolated to create reports, highlighting the need for further refinement before full-scale adoption. • Two comparators have not adopted any AI solutions within Public Works operations at the time of this report. • Several comparators have implemented tools to improve operational efficiency. For instance, one comparator has adopted a system called Mesh, which automates work order generation based on road patrol observations, thereby improving the tracking of maintenance tasks. The system is designed to integrate maintenance management standards, allowing for precise measurements and timelines for tasks like pothole repairs. Another comparator utilizes CityWide for work order management, which streamlines cost tracking and service request management. A third comparator has developed software that detects flooding events, significantly enhancing road patrol operations by providing real-time alerts for timely road closures and safety measures.

Comparator analysis – Climate Change

The below table summarizes key themes related to climate change risks at each comparator municipality. Full details for each comparator can be found in the appendix.

Theme	Summary
Persistent climate change challenges	• Comparators identified an increased risk of flooding as a key climate change concern. As a result, comparators have responded by implementing proactive stormwater management and drainage programs, including assessments for flood mitigation measures and ongoing maintenance of municipal drains. It has also led to some comparators implementing initiatives to prevent water from rushing through storm sewers, alongside collaborations with conservation authorities to model flood scenarios and conduct drainage inspections aimed at reducing water waste. • Comparator has highlighted an increased risk of flash freezes as a climate change concern. As a result, comparators have mitigated the risk through increased pre-treatment on roads with brine and salt in advance of a winter event.
Monitoring climate events	• One comparator indicated that, in an effort to improve storm sewers, Wastop bells have been introduced, and collaboration with local agencies is ongoing to model flood scenarios and develop effective mitigation strategies. Wastop bells are an innovative device installed in stormwater management systems that automatically close during heavy rainfall to prevent excess water from entering the drainage system, thereby reducing the risk of flooding in urban areas. • One comparator noted that they have installed sensors on street lights to monitor snow accumulation on roads. This has increased the efficiency of winter control operations as due to more proactive snow clearing. • To enhance public safety in high-risk flooding areas, municipalities are utilizing advanced technology that monitors conditions and proactively closes roads when necessary. For instance, one municipality has developed machine learning software that recognizes flooding events, allowing supervisors to be alerted in real-time, which enables timely road closures and other safety measures. This proactive approach significantly improves public safety during adverse weather conditions.

Comparator analysis – Climate Change

The below table summarizes key themes related to climate change risks at each comparator municipality. Full details for each comparator can be found in the appendix.

Theme	Summary
Climate change action plans	• Several comparators have established dedicated climate change roles with the mandate to mitigate the effects of climate change through climate change strategies. Some strategies identified by comparators include retrofitting aging infrastructure with energy efficient solutions and and increasing funding for drainage and planned treatments. • To reduce carbon footprint caused by operation facilities, comparators noted that new constructions are incorporating sustainable practices. This includes geothermal heating and mass timber. Geothermal heating systems significantly reduce energy consumption by utilizing the earth's stable temperature, leading to lower greenhouse gas emissions and long-term cost savings, while mass timber construction sequesters carbon and has a lower embodied carbon footprint compared to traditional materials like concrete and steel, promoting sustainable building practices. Together, these technologies contribute to green plans by enhancing energy efficiency and reducing environmental impact.
Electrification of Fleet	• Comparators have established climate action plans to reduce carbon footprints. Some initiatives that have been implemented include electrification of heavy equipment (e.g., street sweepers), installing electric vehicle charging infrastructure, purchasing battery-powered equipment (replacing gas powered equipment). • One comparator identified a pilot project to purchase of an electric pickup and a hybrid pickup, indicating a cautious but progressive approach towards electrification. Another comparator has begun transitioning to electric vehicles, having purchased two electric vehicles for their by-law department and up to 10-12 hybrid SUVs, with plans to continue this trend. They are also exploring the feasibility of hydrogen as a future option for their fleet.

Comparator analysis – Traffic Management

The below table summarizes key themes related to traffic management at each comparator municipality. Full details for each comparator can be found in the appendix.

Theme	Summary

Transportation initiatives	• Many comparators have implemented traffic initiatives in an effort to increase the efficiency of operations and enhance public safety. These initiatives include:
	  • Constructing roundabouts (where appropriate). This is a leading practice in reducing both the number and severity of accidents.
	  • Implementing AI technology in traffic signals to collect data on vehicle speed and traffic patterns. This data is used to inform adjustments to traffic signal timing to enhance safety and efficiency. This initiative is part of a broader traffic management system aimed at improving traffic flow and mitigate congestion.
	  • Developing an active transportation master plan to increase accessibility through the introduction of more multi-use paths.
	  • Implementing the Vision Zero plan, which emphasizes the safety of vulnerable road users and aligns with active transportation initiatives.

Traffic management assessments	• Some comparators have conducted a traffic management assessment. The assessment has resulted in significant enhancements including the inclusion of technology into traffic lights to allow for real-time adjustments based on traffic flow and monitor conditions. As a result, comparator municipalities have realized benefits including the streamlining of traffic operations and improved public safety. • Comparators have also introduced countdown timers at intersections for accessibility compliance, battery backups for traffic lights, and automated speed cameras. Each initiative improved overall public safety within each comparator municipality.

Modernization of roadways	• Comparators are implementing a number of initiatives to modernize their roadways. These include:
	  • One comparators Council approved a Complete Streets Design Manual that established consistent guidelines and tools for the design, implementation, maintenance, and monitoring of Complete Streets within the municipality. Complete Streets are defined as roadways that are planned and designed to balance the needs of all road users. The goal is to allow people to move safely within the municipality.
	  • The trend across some comparators is to incorporate multi-use paths into their infrastructure planning to promote sustainable transportation options. This aligns with many comparators broader goals of reducing reliance on vehicles, improving public safety, and encouraging healthier lifestyles through increased physical activity. One comparator has focused on multi-use paths as part of their active transportation initiatives. They are working on a master plan that aims to create better connections between neighbourhoods and improve access to areas within the municipality. This plan includes the development of multi-use paths to facilitate safe and efficient travel for all users.

Comparator analysis

Road Maintenance Expense per Lane KM

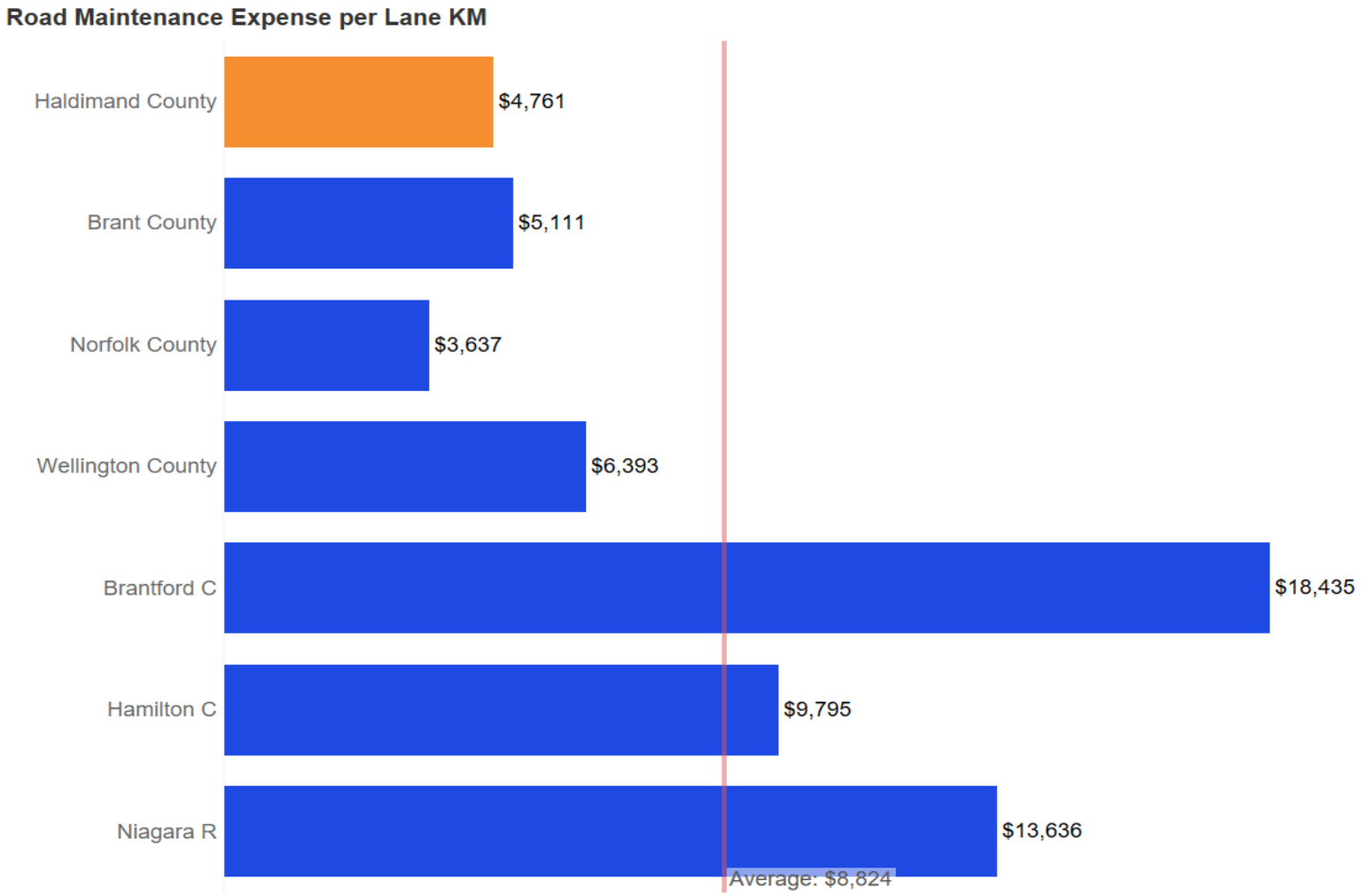
The analysis highlights the total road maintenance expense per lane kilometre maintained.

A lane kilometer is calculated by multiplying the total number of kilometres in the municipal road network by the number of lanes.

Haldimand County has the second lowest Roads Operations expense per lane KM amongst the comparator group. Total paved and unpaved lane KM can be found below (sourced from FIR schedule 80D line 1710 + 1730)

Municipality	Paved & Unpaved Lane KMs
Haldimand County	2,750
Brant County	2,332
Norfolk County	4,176
Wellington County	1,433
Brantford	1,163
Hamilton	6,544
Niagara Region	1,741

Source:
KPMG analysis of 2022 FIR, Schedule 40, Transportation Services (lines 611-614) and Schedule 80D, line 1710+1730)



Comparator analysis

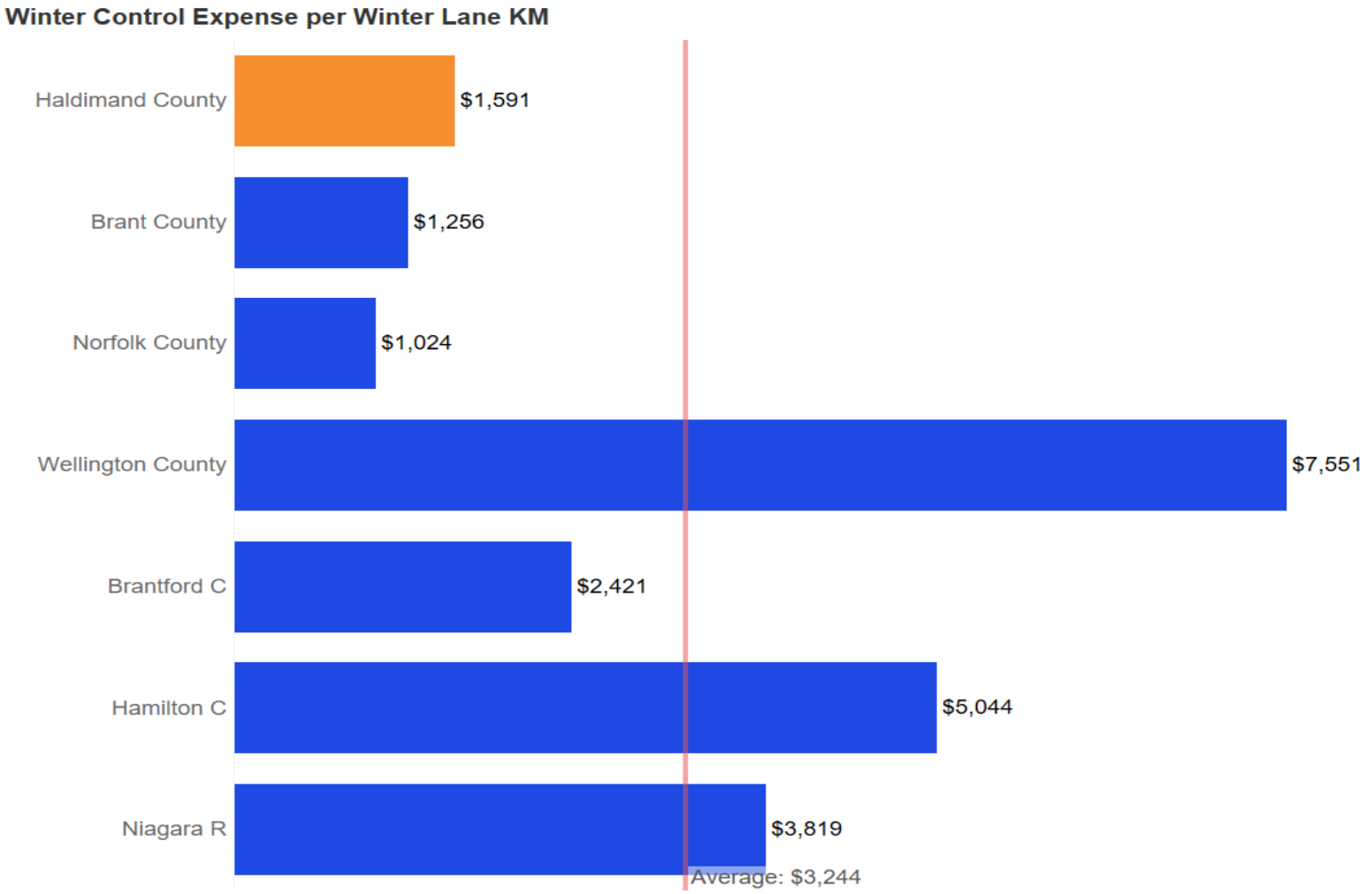
Winter Maintenance Expense per Lane KM

Winter maintenance expense per lane kilometre is calculated by taking the total expense for winter maintenance divided by the total lane kilometres of roads maintained during the winter.

Haldimand County's expense per lane kilometre for winter maintenance ($1,591) is the third lowest amongst the comparator group.

Municipality	Winter Control Lane KMs
Haldimand County	2,994
Brant County	2,162
Norfolk County	4,176
Wellington County	1,433
Brantford	1,157
Hamilton	6,423
Niagara Region	1,803

Source:
KPMG analysis of 2022 FIR, Schedule 40, Transportation Services (lines 621,622) and Schedule 80D, line 1740)



Comparator analysis

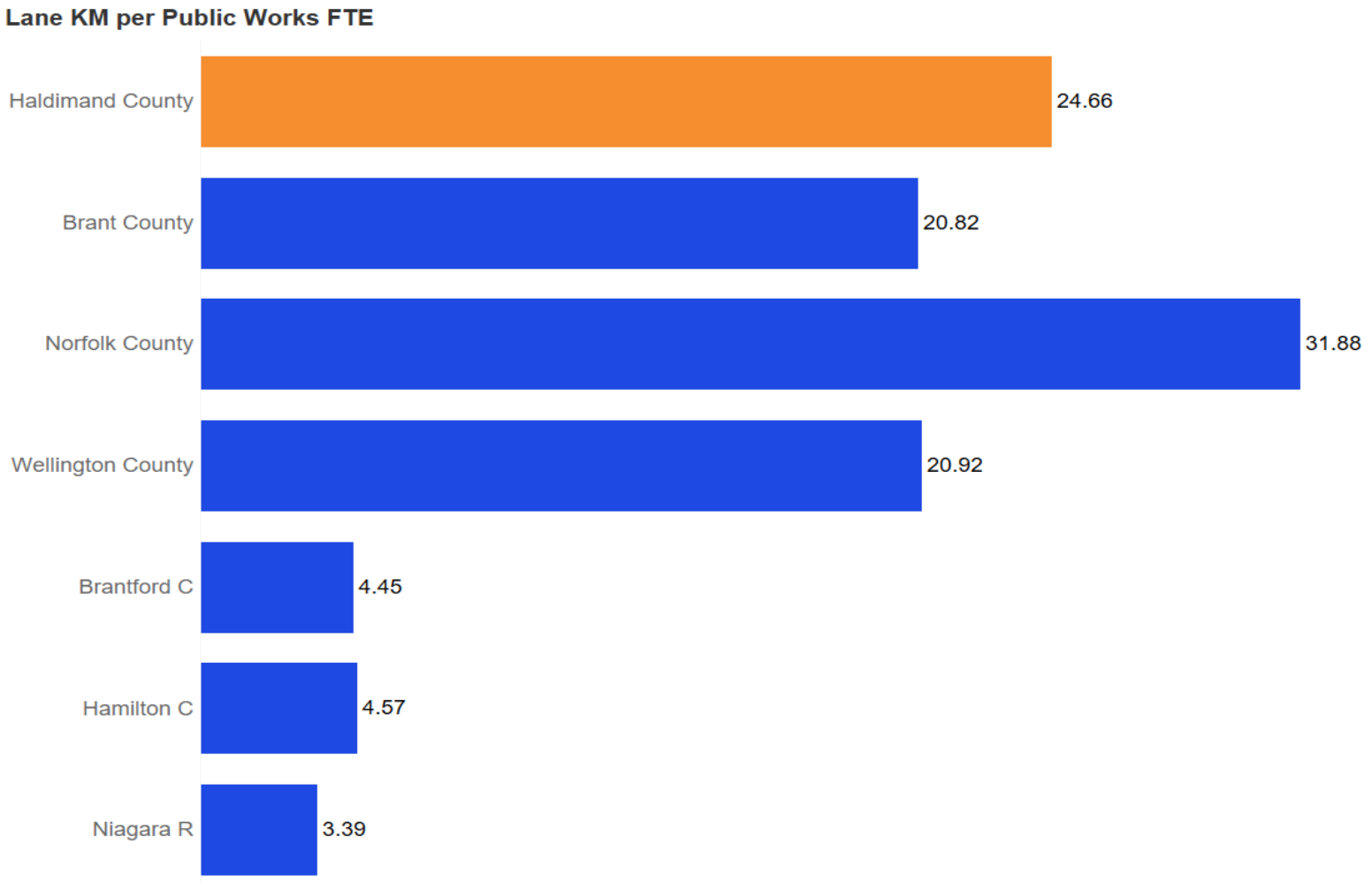
Lane KM per Public Works Staff

This analysis highlights the total lane KM maintained within the municipal road network per public works FTE. This metric provides insight into workload of public works staff. The calculation assumes part-time funded positions are 0.5 FTE and does not include seasonal staff. Staffing values were sourced from the FIR schedule 80A and may include staff not responsible for roads operations. Total Public Works FTE for each municipality can be found below:

Municipality	Public Works FTE
Haldimand County	112
Brant County	112
Norfolk County	131
Wellington County	69
Brantford	262
Hamilton	1,432
Niagara Region	514

Overall, the lane KM per Public Works FTE for Haldimand County (24.66 KM) is the second highest amongst the comparator group.

Source:
KPMG analysis of 2022 FIR, Schedule 80D, line 1710+1730) and Schedule 80A, line 225 column 1 and 2



Comparator analysis

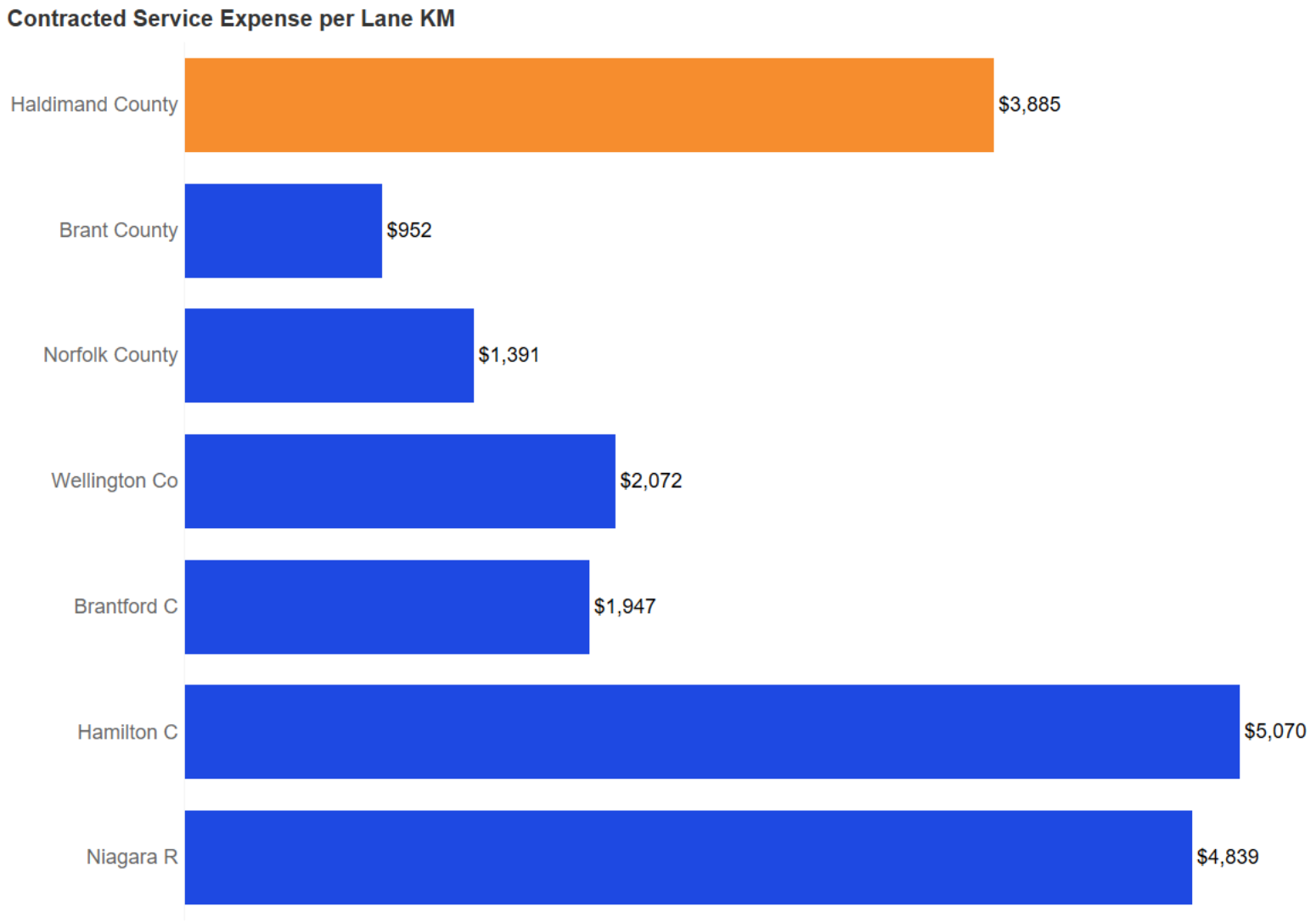
Contracted Service Expense per Lane KM

This analysis examines total contracted service expenses for transportation services.

Overall, the County has the third highest contracted services expense per lane KM in the comparator group. It was noted that a large portion of the County's service delivery is performed by contractors. This includes, snow plowing (class 1-3), roadside grass cutting, and other road maintenance activities.

Municipality	Total Contracted Services
Haldimand County	$10,684,832
Brant County	$2,220,377
Norfolk County	$5,807,576
Wellington County	$2,969,570
Brantford	$2,264,832
Hamilton	$33,176,085
Niagara Region	$8,424,013

Source:
KPMG analysis of 2022 FIR, Schedule 40, Transportation Services (lines 611-622, 640, 650) and Schedule 80D, line 1710+1730)



04

Overview of the Public Works Optimization

What is the *Optimization Model?*

The *Public Works optimization model* analyzes public works operations through the assessment of the current service delivery portfolio. The model analyzes **current Public Works activities (inputs)** and **forecasts growth (outputs) to deliver data-driven insights and actions (outcomes).** This framework is highlighted below.

Inputs
What goes in?

- Asset register (i.e., equipment used to deliver services)
    - Model is limited to light and heavy duty trucks and equipment used in service delivery
- Operational budgets
- Service delivery portfolio (i.e., activities performed by each division)
- Facility space
- Forecasted growth in key drivers

Outputs
What comes out?

- Current state assessment of operations based on leading practices
    - Equipment requirements (i.e., total pieces of equipment required to execute the service delivery portfolio)
    - Space requirements (i.e., the types of preferred storage for equipment)
- Future state assessment of operations based on forecasted growth
    - Equipment required over the growth period
    - Facility space required over the growth period
    - Staff required over the growth period

Outcomes
What is the result?

- Facilities are improved through the identification of gaps in current space and aligned to storage practices that can improve the efficiency and effectiveness of service delivery.
- More efficient operations by addressing current and forecasted gaps in equipment, space and staffing
- Relevant data on the current service delivery portfolio
- Forecasted growth in all activities

Impact
What is the value?

- Provide management with data on current operations
- Initiate discussions with staff on an asset linked maintenance programs (i.e., activity based costing)
- Align operations to leading practices
- Effectively plan for forecasted growth
- Ensure staff are equipped to efficiently and effectively deliver services
- Modernization facilities for current and future operations

Ultimately, the ***Public Works Optimization Model*** is a planning tool to project the potential impact of growth on current operations. The model relies on current service delivery information (i.e., activities, equipment, space) and projected growth drivers to provide outputs. Should growth projections change, the output highlighted by the optimization model will be impacted.

How does the model work?

In planning scenarios, there are a number of different types of models. Two common models are workforce planning models and equipment planning models. In this review, we utilized an equipment and facilities planning model to project future equipment and facility space requirements. This model utilizes activity working days to estimate the required amount of equipment and space to delivery the current service delivery portfolio. While both of these models are used for future planning in businesses, key differences exist. These include:

Public Works Optimization Model – Equipment and Facilities (Activity Working Days)

- The Public Works Optimization Model utilizes activity working days to project the impact to equipment and facility space based on future growth. Activity working days measure activity duration regardless of the workforce size.
  - This refers to the duration required to complete a specific activity or task, typically measured in calendar or working days (excluding weekends, holidays, etc.).
  - Activity Working Days are independent of the number of people working on the activity. For example, an activity may take 10 working days to complete, regardless of whether 1 person or 10 people work on it.

Workforce Planning Model (People Working Days)

- A Workforce Planning Model utilizes people working days to estimate the required amount of people resources to deliver the service portfolio. People working days are defined as the cumulative effort of all team members to deliver a task.
  - People working days refers to the total number of workdays contributed by individuals. This is calculated as: number of people × number of working days per person.
  - For example, if 5 people work for 10 days, that equals 50 people working days.

How do Activity Working days differ from People Working days?

In summary, activity working days measures activity duration whereas people working days measure total effort contributed. An example is provided below:

- Activity working days: The task will take 10 working days to complete.
- People working days: If two people work on it every day for those 10 days, the total is 20 people working days. If five people work, it's 50 people working days.

An illustrative example of the calculation is provided below:

Activity	Labour Dollars (a)	Hourly Rate (b)	Working Hours (a/b=c)	Shift Length (d)	Person days (c/d=e)	Crew Size (f)	Activity Working Days (e/f=g)
Roads Operations	$100,000	$40	2,500	8 hours	312 days	2	156 activity days

Person days represents the total effort required for the activity.

Crew size tell us how many people are contributing to the work simultaneously.

Total time it takes to complete the activity based on crew contributions.

Data preparation

KPMG received the County's Public Works maintenance standards and operations policies, division activity lists, division budgets, equipment registry, and facility floor plans, in order to gather the following data inputs for entry into the optimization model:

Current Asset Registry

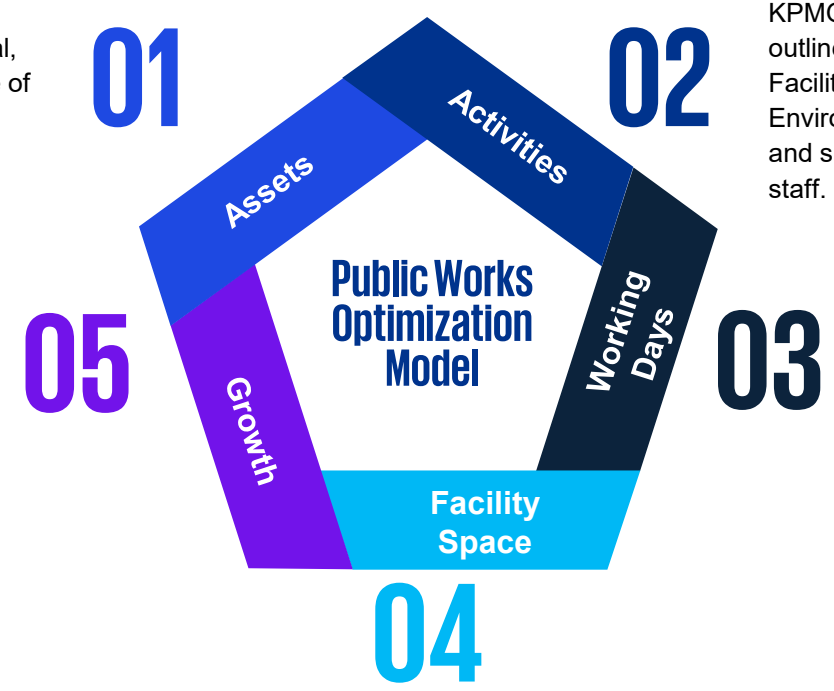
KPMG worked with key stakeholders to obtain a current inventory of Public Works equipment. In total, 190 pieces of equipment were relevant to the scope of the project and were included in the model.

Current Activities Performed

KPMG obtained operational budgets for Public Works divisions that outlined the core activities performed by Roads Operations, Facilities, Parks, Cemeteries & Forestry Operations, and Environmental Operations. In total, our model analysed equipment and spacing requirements for 35 activities performed by County staff.

Growth Drivers

KPMG applied projected growth to key drivers to understand the impact on activity working days. This was used to determine equipment and spacing requirements from 2025-2051.



Number of Working Days

KPMG worked with County staff to understand the number of working days for each activity performed by staff. This data was used to identify the equipment surplus and deficiencies and spacing requirements at in-scope Public Works facilities.

Facility Space

KPMG conducted site visits to each in-scope public works facility to understand total space and capacity at each facility.

Summary of Equipment Storage Leading Practices

Equipment Storage Leading Practices

This slide presents the leading practices in storage space for the Public Works divisions, focusing on the types of storage solutions identified for various equipment categories. The goal is to optimize space utilization while ensuring the safety and longevity of the equipment.

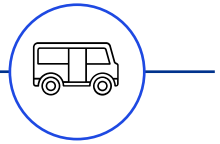
In addition to the categorization of items and alignment with optimal storage locations, as described to the right, implementing leading practices is key to improve operational efficiency. This includes effective inventory management, staff training, and regular audits.

Overall, categorizing equipment based on sensitivity, durability, and exposure requirements ensures that it is well-protected, accessible, and properly maintained.

To effectively manage equipment and ensure its longevity, it is crucial to categorize storage locations based on the specific needs and characteristics of the items being stored. For example:

- Vehicle parking areas are designated for light and some heavy-duty vehicles, emphasizing accessibility and security.
- Indoor heated storage is essential for sensitive equipment that requires stable temperatures, protecting it from environmental factors.
- Indoor unheated storage is suitable for more durable equipment that can withstand temperature fluctuations, providing security against theft and damage.
- Covered outdoor storage is designed for heavy-duty equipment needing some protection from the elements.
- Uncovered outdoor storage is the most economical option, suitable for robust equipment that can endure exposure to the elements.

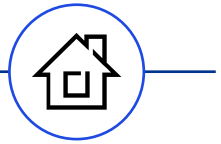
Vehicle Parking



Light Duty Vehicles
- Pickup trucks
- Cars
- Compact SUVs

Heavy Duty Trucks
- One Ton Sign Trucks

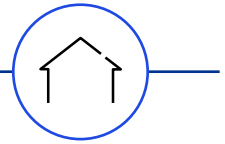
Indoor Storage - Heated



Heavy Duty Equipment
- Forklift
- Tandems
- Snow Plow/ Dump Trucks

Light Utility Vehicles
- Utility Machines
- Pressure Washers

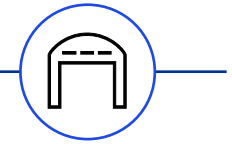
Indoor Storage - Unheated



Light Duty Equipment
- Groomers
- Leaf Blowers
- Sidewalk Grinders

Other Equipment
- Generators
- Compressors
- Grinders
- Mowers
- Anti-Icing Tanks

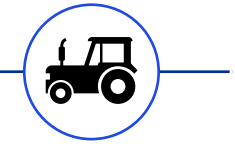
Outdoor Storage – Covered



Heavy Duty Equipment
- Loaders
- Spreaders
- Chippers
- Backhoes
- Cranes
- Utility Trailers

Other Equipment
- Float
- Tandem Trailers

Outdoor Storage – Uncovered



Heavy Duty Equipment
- Graders
- Tractors
- Gravel Reclaimers
- Asphalt Trailers

Model assumptions

The first step in the development of the public works optimization model was to identify and validate assumptions that will form the baseline of the analysis. As such, the following model assumptions were validated by County staff and built into the optimization model:

Model Element	Assumption
Standard work hours per day	8
Annual summer maintenance days	126
Population (2021 census)	49,216
Total Road Lane KM	2,750 KM
Total number of Public Works sub-activities	39 sub-activities
Current Equipment Inventory*	190
Total Activity Working Days	12,725

*The current equipment inventory includes the following in-scope equipment: heavy equipment used within service delivery (i.e., small handheld equipment not included) within Roads Operations, Facilities, Parks, Cemeteries & Forestry Operations, and Environmental Operations.

Working Day Assumptions	
Standard work hours per day	8
Working days per Year	
Statutory Holidays	9
Weekends	104
Total Working Days / Year	**252**
Working Days per Season	
Summer Season	50%
Winter Season	50%* November to April Winter Control
Total Summer Season Days	**126**
Total Winter Season Days	**126**

Spacing Factors

KPMG forecasted the County's space requirements by totaling the individual areas required to store each piece of equipment. However, this initial assessment did not take into account the accessibility of the equipment once it was stored. To address this requirement, KPMG introduced an additional consideration known as the "spacing factor", which effectively increased the overall space requirements to ensure adequate accessibility.

Without a spacing factor, the modelling would assume that every piece of equipment is packed tightly together. In reality, space is required between pieces of equipment, to allow access passageways for people and equipment (e.g., a forklift), prevent damage and ensure safety. A spacing factor of 40% indicates that an additional 40% of space is required for access above the footprint of the piece of equipment.

Calculating Requirements – An Illustrative Example

In order to determine public works requirements, KPMG conducted workshops with County staff in order to identify the number of working days per Public Works activity and the equipment required to execute each activity. KPMG used these inputs, along with the current fleet inventory, to calculate total equipment required by equipment type. A theoretical example is provided below. This example calculates both future equipment requirements assuming a 40% increase in service (working days).

An Example: Current/Forecasted Equipment and Facility Space Requirements

	Ref.	Current	Growth	Forecast
Activity Working Days	(A)	126	40%	176
Working Days per Summer Season	(B)	126	-	126
Pieces of Equipment Required	(C) = A / B	1	-	1.4
Space per equipment (sq. m)	(D)	15 sq. m	-	15 sq. m
Total space required	(E) = C x D	15 sq. m	-	21 sq. m

05

Current state output

Summary of the Current State Results

KPMG obtained operational budgets for Public Works divisions that outlined the core activities performed by Roads Operations, Facilities, Parks, Cemeteries & Forestry Operations, and Environmental Operations. In total, our model analysed equipment and spacing requirements for 39 activities performed by County staff. The model also analysed the current space available at the County's Public Works yards. Overall, the results of the current state provide insight into current equipment and facility spacing gaps prior to applying forecasted growth. Based on this output KPMG noted the following:

01

Current service delivery portfolio

- KPMG reviewed and analysed 39 activities within the Public Works optimization model.
- When reviewing activities it was noted that the County does not have an asset-linked maintenance plan. As such, KPMG worked with stakeholders to validate total working days assigned to each activity.
- It should be noted that the model does not project potential impact on contracted services as these services are not delivered by County resources.

02

Utilization of equipment

- The model highlighted equipment requirements in the current state. Currently, the County is supplementing equipment with rental and the regular use of surplus equipment to deliver services.
- Given the large geography serviced by Public Works operations, the County must maintain a specific inventory of equipment to execute the service delivery portfolio within each servicing area.

03

Facility space

- The County has enough aggregate space at facilities, however does not have enough space in the recommended space categories (e.g., covered storage). As a result, equipment is stored in uncovered storage which can lead to unexpected wear on equipment or inefficient operations.
- Some facilities have aging infrastructure that require replacement. Given the age and condition, modernization may not be an option.
- All facilities lack wash bays which pose a risk to equipment maintenance and condition.

Current State Results

Total Activity Working Days

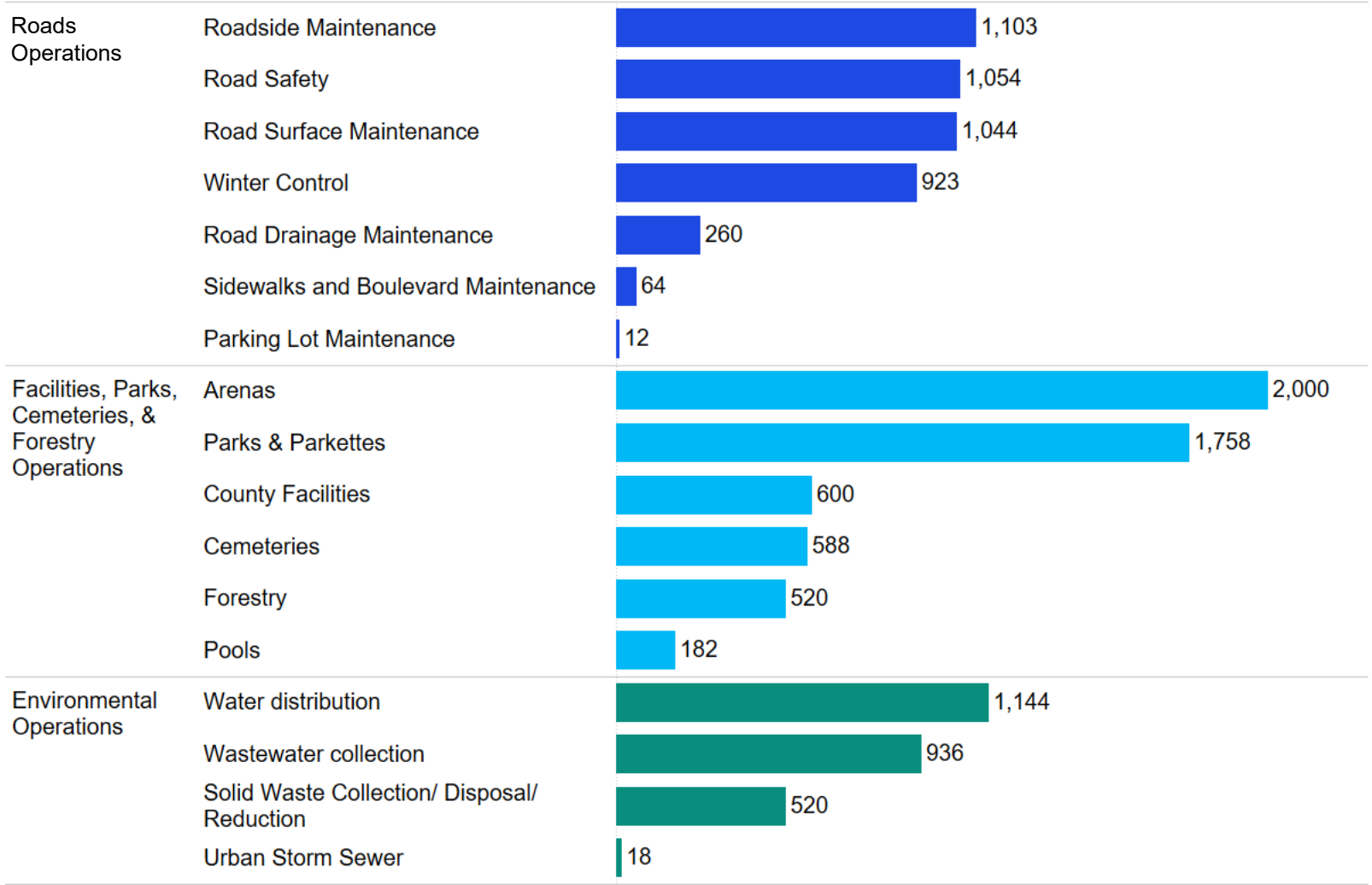
KPMG obtained operational budgets for Public Works divisions that outlined the core activities performed by Roads Operations, Facilities, Parks, Cemeteries & Forestry Operations, and Environmental Operations. In total, our model analysed equipment and spacing requirements for 35 activities performed by County staff.

KPMG then worked with County staff to understand the number of working days for each activity performed by staff.

The bar graph to the right highlights to total working days for each division by activity category. Each activity category is broken down further into specific activities. For example, within road safety there are three sub-activities including road patrol, sign maintenance and guide rail maintenance. Aggregate working days for each division are noted below:

Division	Total Working Days
Roads Operations	4,460
FPC Operations	5,648
Environmental Operations	2,618

Total Activity Workings Days by Division



Current State Results – Equipment

Based on the current working days and equipment requirements for the County's activities, the *Public Works optimization model* analyzed the current state of operations. The output noted that the County is able to provide a high level of service by optimizing the utilization of its current equipment. However, given the large geography serviced by Public Works operations, the County must maintain a specific inventory of equipment to execute the service delivery portfolio within each servicing area. Specifically, the County must maintain a minimum inventory at each location to avoid service delivery inefficiencies resulting from continuously transferring equipment to each location. These requirements are considered when analyzing equipment surplus and deficiencies.

Equipment	Working Days	Inventory Surplus (Deficiency)
Heavy Duty Truck - RDS	2,275	10 ◆ 41
Heavy Duty Truck - FPC	1,348	6 ◆
Pickup Truck - RDS	1,504	11 ◆
Pickup Truck - ENV	3,138	◆ 13
Pickup Truck - FPC	2,070	5 ◆ 9
Backhoe - ENV	520	1 ◆ 5[1]
Backhoe - RDS	510	4 ◆ 5
Grader - RDS	53	◆ 1 4
Grinder - RDS	64	◆ 2
Hotbox - RDS	251	◆ 2 4[2]
Mower - FPC	1,911	◆ 17
Tractor - FPC	190	◆ 2 5
Tractor - RDS	269	2 ◆ 3
Trailer - FPC	909	6 ◆
Utility Machine - ENV	520	1 ◆ 5[1]
Van - FPC	180	◆ 2
Ball Diamond Groomer - F..	228	◆ 2
One Ton Sign Truck - RDS	699	2 ◆ 3
Pickup Truck (Patrol) - RDS	700	2 ◆ 3
Trailer - RDS	463	◆ 2 11

*Note – working days and required inventory for heavy duty trucks are calculated based on planned summer activities. Heavy duty trucks also support winter control, which is not included in this analysis (due to reactive nature of the activity). Winter control analysis can be found on slide 42.

Legend

- Current Inventory
- Required Summer Inventory (current state)
- Required Winter Inventory (current state)

1– Based on discussions with staff, Environmental Operations only requires one backhoe and one utility machine to service the current location.
2 – Based on discussions with staff, Roads Operations maintains a minimum inventory of four hotboxes (one at each patrol yard) to avoid service delivery inefficiencies resulting from continuously transferring equipment to each location

Winter Maintenance Service Levels

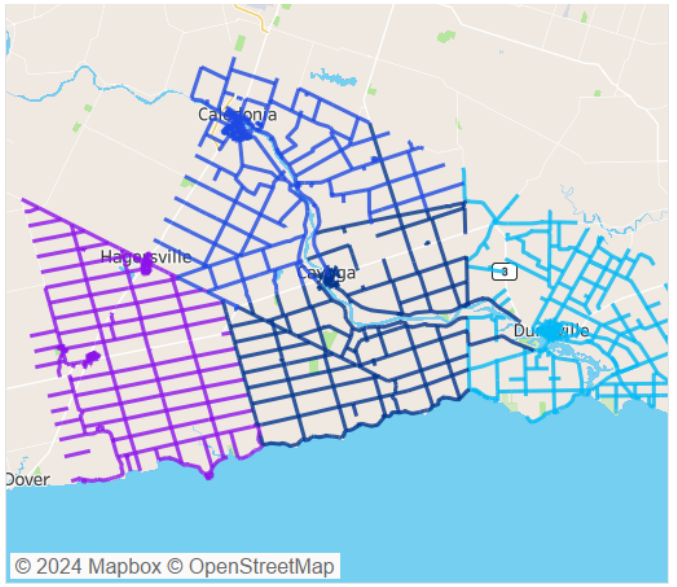
Winter Maintenance services are dictated by the Public Works department's Winter Control service levels with a primary focus on event-driven snow removal and ice control. The province's minimum services standards are detailed by *Ontario Reg. 239/02: Minimum Maintenance Standards for Municipal Highways* according to highway traffic classification (class 1-5, 1 being highest).

As a part of our modelling, KPMG determined the 'target' service level for snow removal based on the County's existing plow routes and speeds. All winter control plow routes were modelled using assumptions for distance, plow/salt speeds as well as start-up and turnaround times. As is common in jurisdictions both across Ontario and in other provinces, the County's target (current) service levels exceed the province's minimum maintenance standards. The image to the right highlights the areas and roads that serviced by the County's winter control. It should be noted that the County currently contracts all snow plowing on class 1, 2 and 3 roads. As such, the County's winter control is responsible for servicing class 4 and below.

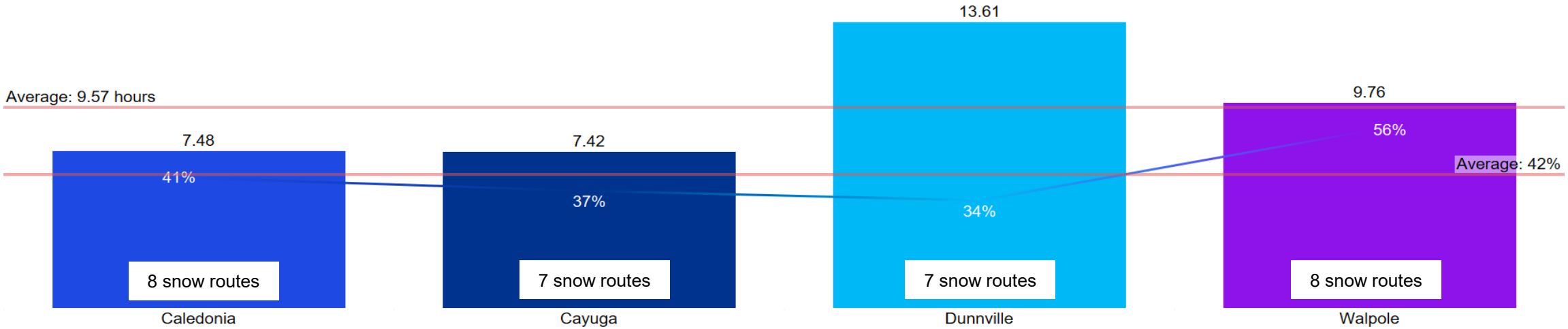
There is some variance in the presumed time to complete each area. Currently, the time to complete each area ranges from 7.42 hours (Cayuga) to 13.61 hours (Dunnville), as shown in the bar chart below. Overall, our model shows that the County exceeds the winter maintenance MMS level of service by an average of 42%. Given this level of service, should the County add additional roads to the winter control network, it will be within the expected MMS (approximately 4 – 6 routes per yard).

KPMG also analyzed the current level of service for contracted plow routes using the same assumptions. Based on this analysis it was noted that current contractors are exceeding the minimum maintenance standards by an average of 21%. This is below the County's target of 42%, however it should be noted that contractors are responsible for the maintenance of a higher service class of roads (i.e., 3 and above).

County's Winter Control Plow Areas



Plow Times and Service Levels by Area



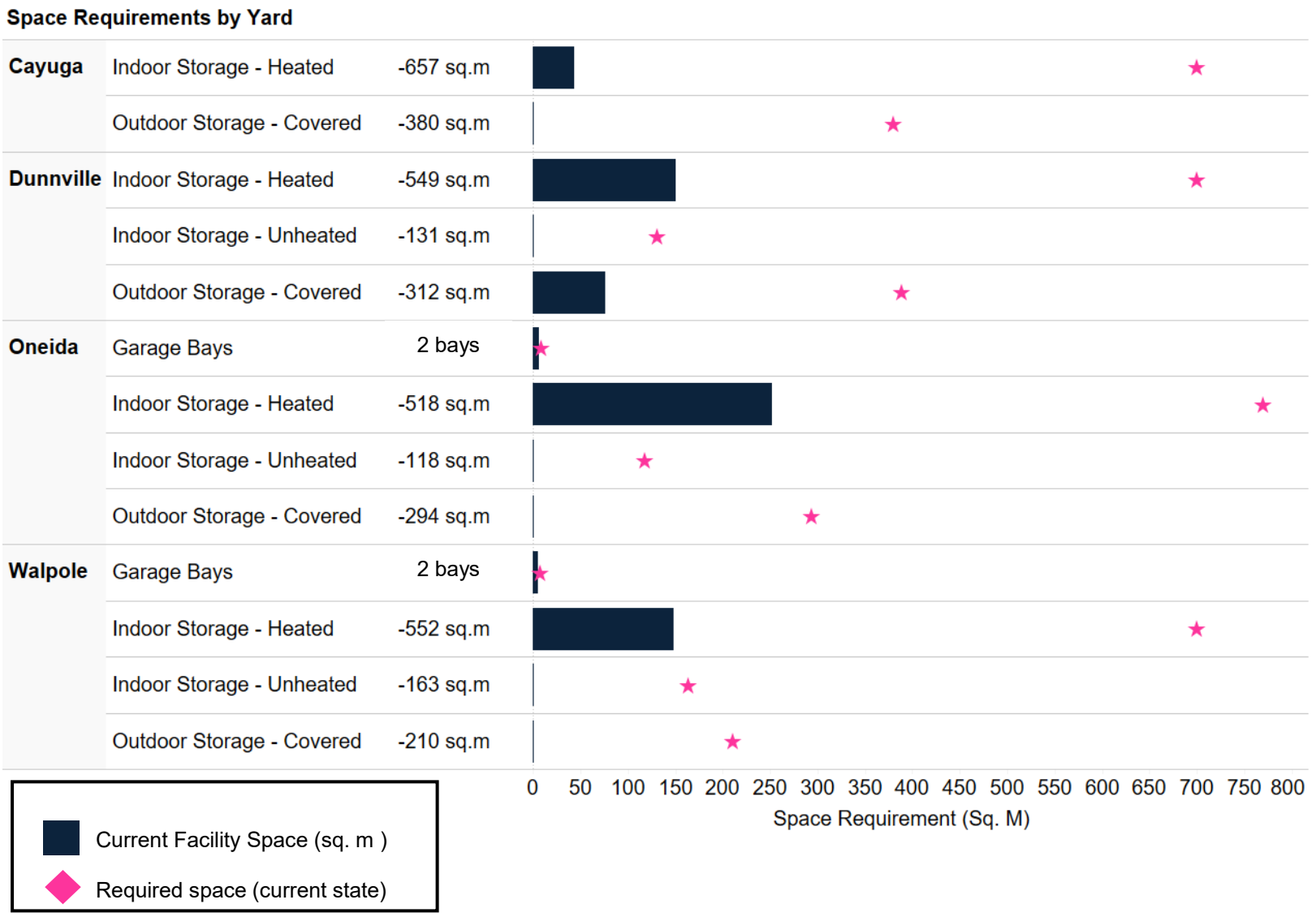
Current State Results – Road Operations Facilities

Facility Space Requirements

For each piece of equipment included in the activity modelling, KPMG calculated the floor area required to store that equipment. Each piece of equipment was also categorized by its ideal storage location. A spacing utilization factor was also applied to each location to allow access to the equipment. Space categories and factors are noted below:

Space Type	Spacing Factor
Garage Bays - Heated	30%
Indoor Storage - Heated	30%
Indoor Storage - Unheated	30%
Material Storage - Unheated	40%
Office/ Employee	62%
Outdoor Storage – Covered	40%
Outdoor Storage – Open	40%
Vehicle Parking	40%

In the current state for Road Operations facilities, there is a gap of approximately 3,800 sq. m of covered space (e.g., indoor heated, unheated, and outdoor covered).

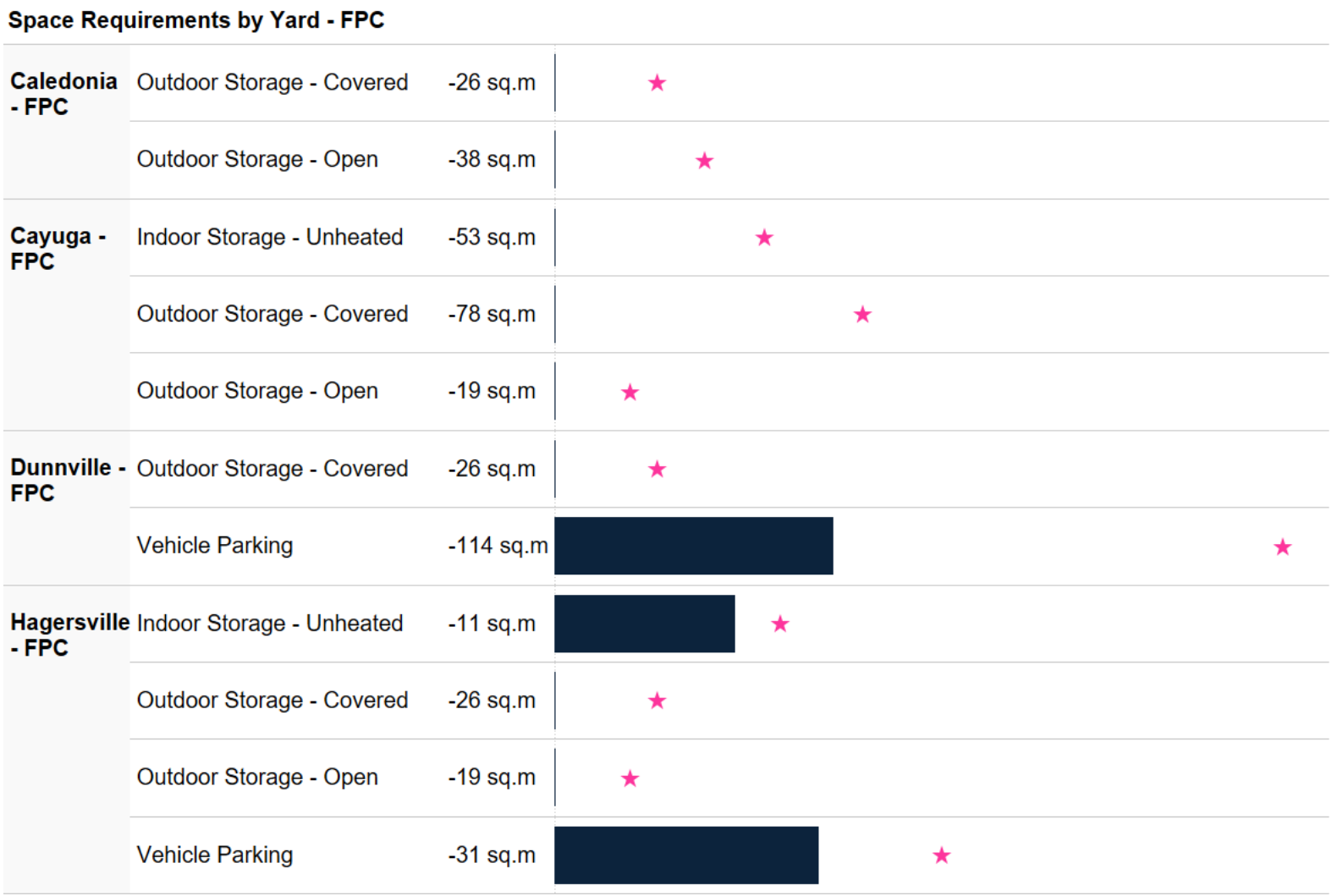


Current State Results – FPC Facilities

Facility Space Requirements

Using the methodology noted on the previously slide, the modelling noted that FPC is short the following space in the current state:

- Indoor storage – unheated: 64 sq. m
- Outdoor storage covered: 78 sq. m
- Outdoor storage – open: 76 sq. m
- Vehicle parking: 145 sq. m



Current Facility Space (sq. m)

Required space (current state)

06

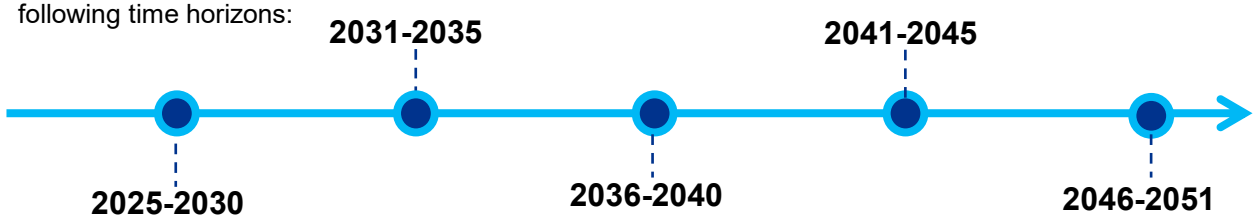
Projected Growth

Drivers of Growth

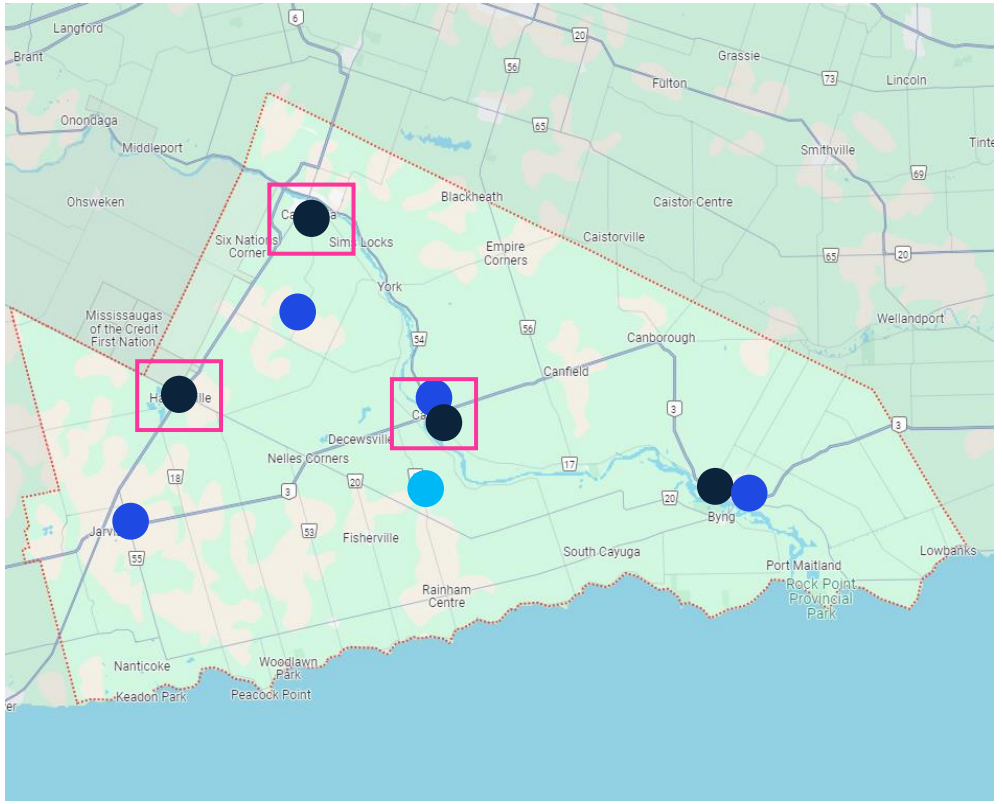
To gain an understand of future growth within the County, KPMG reviewed the County's Growth Strategy. The strategy forecasts population and household growth in key areas within the County to the year 2051. KPMG utilized the drivers of growth to forecast the impact on Public Works service delivery, specifically the impact on equipment and facility requirements. The Growth Strategy forecasts growth in the following areas:

Area	2021 Population	2051 Population	2051 Population Growth	2021 Households	2051 Households	2051 Households Growth
Caledonia	11,754	31,340	19,590 (166%)	4,434	12,230	7,900 (178%)
Cayuga	1,848	3,420	1,570 (85%)	717	1,370	650 (91%)
Dunnville	6,772	8,770	2,000 (30%)	2,673	3,530	860 (32%)
Hagersville	3,276	8,920	5,640 (172%)	1,263	3,510	2,250 (178%)
Jarvis	2,555	3,230	670 (26%)	958	1,250	290 (30%)
Townsend	1,345	1,610	260 (19%)	510	630	120 (24%)
Remaining Rural	23,622	25,420	1,800 (8%)	**8,185**	8,940	750 (9%)
Total	**51,172**	**82,710**	**31,530**	**18,640**	**31,460**	**12,820**
Growth %	-	-	*62%*	-	-	*69%*

The Growth Strategy forecasts that by the year 2051, the County will see the population increase by approximately 31,000 residents and over 13,000 households. Given this forecast, the service delivery portfolio of the Public Works department will increase. To reflect this increase, the Public Works Optimization model applies growth rates to each activity to understand the impact on overall working days. Based on the model output, the impact on Public Works equipment and facility space is provided over the following time horizons:



Public Works Facilities and Key Growth Areas



Roads Yard	Parks Facility
Fleet Yard and Maintenance Shop	Key Growth Area

Projecting Future State Requirements based on Growth

The County is able to provide a high level of service by optimizing the utilization of its current resources (i.e., facility and equipment). However, given projected growth and aging infrastructure, the County may need additional equipment and facility space to meet the growing needs of the County. As such, the *Public Works optimization model* was built using growth drivers that lead to an increase in activity working days as outlined below:

Top Drivers of Forecasted Service Delivery Growth

As per the County's Growth Strategy, the population is projected to increase by 62% between 2025-2051. Using this anticipated population growth as a baseline, KPMG identified the impact on key drivers that would increase working days as a result of growth:

62%

Population

The County's population is expected to increase by 62% or 31,530 people by 2051.

475 units

Dwellings

The County's Growth Strategy anticipates dwellings to grow by approximately 475 new units per year.

100 KM

Road KM

In line with anticipated population growth, the County will have to add approximately 100 lane KM of roads to support new development.

46 Ha

Parks Space

As per the County's Parks and Recreation Service Plan, the County requires 3 hectares of community park space per 1000 residents. As such, the County will increase community park space by 46.01 Ha.

Growth In Working Days by Division

		Growth in Working Days[1]				
Division	**Current State Working Days**	**2025-2030**	**2031-2035**	**2036-2040**	**2041-2045**	**2046-2051**
Roads Operations	4,459	4,618	4,753	4,888	5,023	5,182
Facilities, Parks, Cemeteries & Forestry	5,648	5,810	6,006	6,103	6,200	6,311
Environmental Operations	2,618	2,618	2,618	2,618	2,618	2,618
Total	**12,725**	**13,046**	**13,377**	**13,609**	**13,841**	**14,111**
Growth %		*3%*	*5%*	*7%*	*9%*	*11%*

1 – Growth in working days is based on forecasts highlighted in the County's Growth Strategy

It should be noted that the Public Works Optimization Model projects growth in services delivered by County staff. Therefore, the impact of County growth on contracted services is not highlighted in the model output. As such, the County will have to enhance that the budget for contracted services increase in alignment with the projected growth in the Optimization Model.

Growth in Service Delivery

Growth in Service Delivery

Based on the forecasted growth within the County, the *Public Works optimization model* highlighted the potential growth to the current service delivery portfolio.

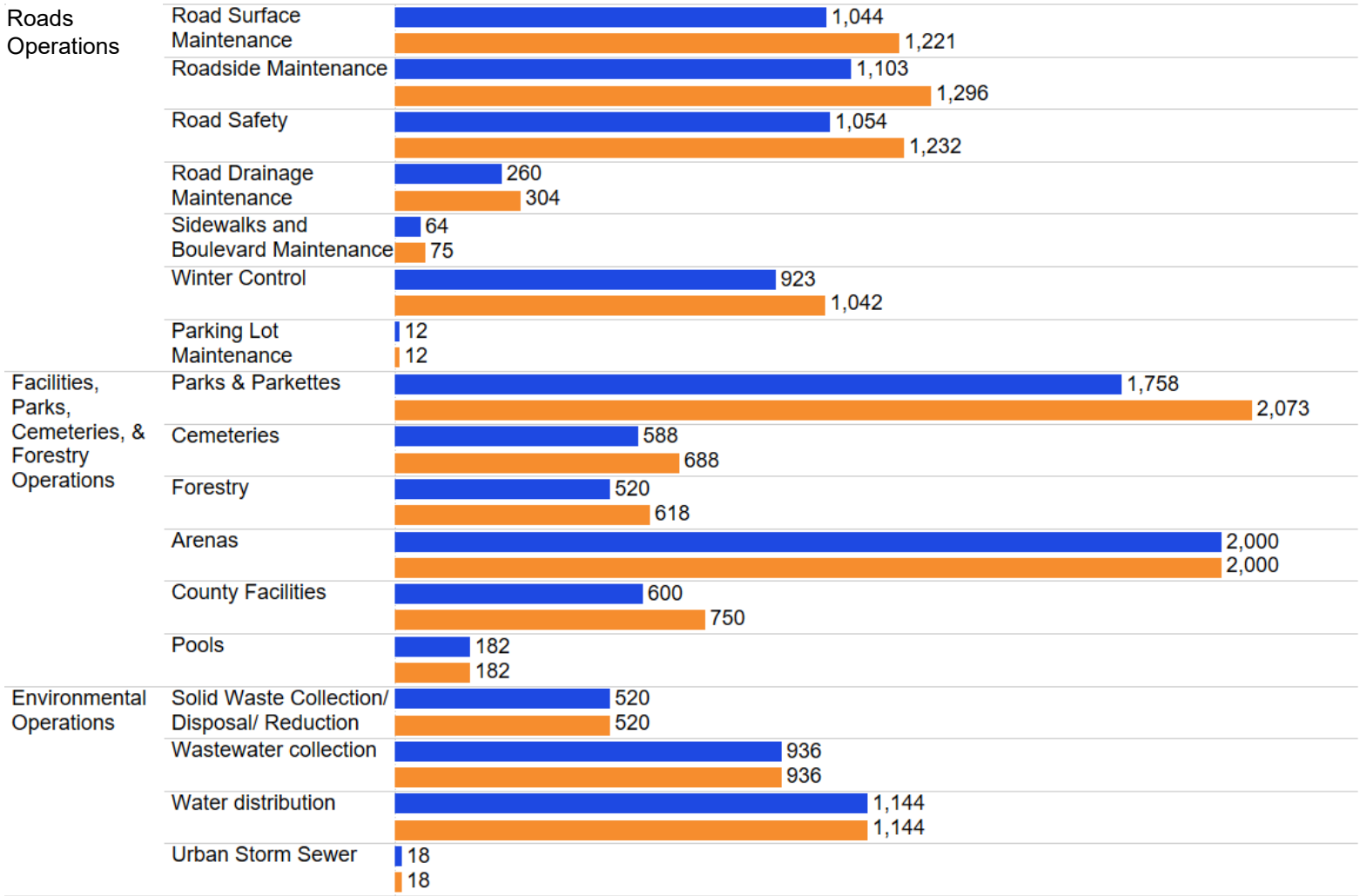
The bar graph to the right highlights the growth in total working days for each activity category to 2051. For example, based on the forecasted growth, it is projected that road surface maintenance work will increase by approximately 177 working days by 2051.

Current state working days

Future state (2051) working days

1 – Growth in working days is based on forecasts highlighted in the County's Growth Strategy

Total Growth in Working Days by Department



1- Based on discussions with County staff, the increase in population will not impact service delivery within Environmental Operations. Currently, the division has enough staff and equipment to deliver services and do not anticipate the projected population to impact services. As such, growth drivers utilized within the optimization model were not applied to Environmental Operations.

Forecasting Facility Space Requirements

KPMG forecasted the growth in yard space from 2025 to 2051. Based on KPMG's activity modelling, the County will require approximately 5,345 sq. m of yard space to accommodate the leading practices in equipment storage and the forecasted growth in service delivery resulting from the projected population increase. In terms of aggregate space, this represents an additional 1,309 sq. m of covered storage space. This increase pertains only to equipment included within the activity modelling.

		Forecasted Facility Space Requirements (sq. m)					
Spacing Category	**Current State Space (Sq. m)**	**2025-2030**	**2031-2035**	**2036-2040**	**2041-2045**	**2046-2051**	**Total Incremental Space Requirement 2051**
Garage Bays	27 bays	31	31	31	31	31	**(4)**
Indoor Storage – Heated	942	2,953	2,953	2,970	2,970	2,970	**2,028**
Indoor Storage – Unheated	306	746	746	746	776	776	**470**
Outdoor Storage – Covered	76	1,502	1,502	1,567	1,567	1,567	**1,491**
Outdoor Storage – Open	4,383	347	347	347	347	347	**-**
Vehicle Parking	1,740	2,346	2,379	2,524	2,675	2,768	**1,028**
Material Storage	952	988	1,018	1,048	1,078	1,113	**161**
Office / Employee Space	285	424	432	440	440	452	**167**

As stated previously, the Public Works optimization model utilized leading practice storage types to determine space requirements. This assumes that the County will use indoor heated storage as the preferred storage method. Given management may not choose this option moving forward, KPMG also considered the impact of growth on current storage types (i.e., how would forecasted growth impact facilities based on current storage types). The total incremental space requirements to 2051 maintaining current storage practices are presented below. Noted that material storage and office/employee space would not be impacted:

- Indoor Storage – Heated: No impact
- Indoor Storage – Unheated: 950 sq. m.
- Outdoor Storage – Covered: 75 sq.m.
- Outdoor Storage - Open: No impact

The difference between leading practice space requirements and current state can be explained by the available outdoor open storage. Given the availability of outdoor open storage space, the County could continue to store equipment to accommodate growth with minimal impact to the total footprint, whereas leading practice would require net new storage types.

Forecasting FTE Requirements

KPMG forecasted the projected increase in labour budgets and employees for each Public Works division from 2025 to 2051. The modeling included mapping budgeted labour expenses to division activities and assigning growth rates to the activities based on anticipated demand increases to determine the future budget and FTEs. Based on the modelling, KPMG identified an increase of just over $3 million in labour costs and 48.5 FTEs across the divisions.

			Forecasted FTE and Budget Requirements		
Division	**Current Labour Budget (000's)**	**Current FTEs**	**2046-2051 Labour Budget (000's)**	**Forecasted 2051 FTEs Requirement**	**Incremental FTE increase**
Roads Operations	$2,265.21	53.5	$2,944.77	69.5	**16 FTE**
Facilities, Parks, Cemeteries & Forestry Operations	$3,089.10	67.2	$4,015.83	87.4	**20.2 FTE**
Environmental Operations[1]	$3,836.04	29	$3,836.04	29	**0 FTE**
Fleet	$1,314.86	12	$1,709.32	15.6	**3.6 FTE**
Total	**$10,505.21**	**161.7**	**$13,656.77**	**210.2**	**48.5 FTE**

1- Based on discussions with County staff, the increase in population will not impact service delivery within Environmental Operations. Currently, the division has enough staff and equipment to deliver services and do not anticipate the projected population to impact services. As such, growth drivers utilized within the optimization model were not applied to Environmental Operations. It should be noted that the division should expect an increase in labour budget due to inflation, however that is not included within the optimization model.

07

Optimization Opportunities

Facility Options Considered

To address the forecasted gaps highlighted by the *Public Works optimization model*, KPMG identified four facility opportunities for the County. Based on analysis, KPMG opted not to recommend the consolidation of the facilities into either one mega yard, or two yards due to the costs, the area serviced by the County, and the anticipated distribution of growth.

Consolidate Cayuga and Caledonia yards	Modernize and expand the existing facilities	Consolidating all yards to a single mega yard	Consolidating all four yards into two yards
The option would combine operations at the current Cayuga and Caledonia yards into a single facility.	When required, modernize and expand Dunnville and Walpole facilities to support forecasted growth to service delivery. Benefits and challenges are detailed below:	Consider the development of a single mega yard to consolidate all the County's Public Works operations.	Consider the consolidation of all four yards into two yards to support the forecasted growth. .
Is this applicable to the County?	**Is this applicable to the County?**	**Is this applicable to the County?**	**Is this applicable to the County?**
The option to consolidate operations at the Cayuga and Caledonia yards into a single facility is highly applicable to the County as it enables the creation of a new, purpose-built facility that aligns with long-term operational goals. This ensures that the new facility meets both current and future needs. By integrating divisions such as Roads Operations and Facilities, Parks, Cemeteries & Forestry Operations, the County can improve collaboration and efficiency, leading to better service delivery and resource sharing. Additionally, this consolidation allows for the decommissioning of older facilities like the Cayuga Roads facility, reducing maintenance costs and reallocating resources to modern operations. Overall, this consolidation supports efficient design, operational synergy, and facility modernization for the County.	The option to modernize and expand the existing Dunnville and Walpole facilities is highly applicable for the County as it allows for necessary upgrades and additional space to accommodate forecasted growth with minimal disruption to current operations. This approach presents a lower capital expenditure compared to the costs associated with purchasing and developing a new facility. Furthermore, it eliminates the need to relocate vehicles, equipment, and materials, thereby streamlining the transition and maintaining operational continuity. Overall, this strategy not only supports the County's growth objectives but also enhances efficiency and resource management.	The option to consolidate all yards into a single mega yard is not applicable for the County due to several risks. First, establishing such a facility would necessitate a substantial capital investment, which may not be feasible given budget constraints. Additionally, the consolidation could lead to longer travel times for employees and equipment to reach job sites, potentially impacting operational efficiency and service delivery. Furthermore, a larger facility may pose greater environmental challenges, requiring comprehensive assessments and adherence to regulations, which could result in project delays. These factors collectively suggest that the consolidation into a mega yard may not be the most practical or beneficial approach for the County.	The option to consolidate all yards into two is not applicable for the County due to several risks. First, the majority of the growth within the County is concentrated in Caledonia. As such, there is no need to disrupt operations in Dunnville and Walpole to respond to limited growth. Second, the current facilities have enough space to accommodate growth and are in good working order. As such, there is no benefit to consolidate operations. However, it should be noted that these facilities require investment (modernization and routine maintenance) to ensure efficient operations (as per option 2). These factors collectively indicate that consolidating into two yards may not be the most practical or beneficial approach for the County.

Opportunities to Address Forecasted Growth

To address the forecasted gaps highlighted by the *Public Works optimization model*, KPMG identified a number of opportunities for the County. The County can consider the following, along with their respective benefits, challenges and risks, in order to address forecasted growth in operations.

01

Purchase additional equipment to support forecasted growth

Based on the County's projected growth and expected increase in working days for each equipment category, KPMG outlined the potential impact and additional equipment requirements.

Benefits:

- Proactively respond to increase demand in service levels through the procurement of additional equipment.

Challenges and Risks

- Capital cost of equipment likely to increase over the forecasted time period.
- Equipment used to delivery services may change over the forecasted time period.
- Introduction of green options may have an impact to service delivery.

02

Invest in changes to facilities through consolidation and modernization

To ensure the County's Public Works facilities can support the projected future growth, the following should be considered:

A. Consolidate Cayuga and Caledonia yards.

Consolidating operations at the Cayuga and Caledonia yards into a single facility is beneficial for the County. It allows for a new facility that meets current and future needs, enhances collaboration among divisions, reduces maintenance costs by decommissioning older facilities, and optimizes fleet management, improving overall service delivery.

B. Modernize and expand the remaining facilities

The County can modernize and expand the Dunnville and Walpole facilities, allowing for necessary upgrades and additional space with minimal disruption. This option requires lower capital expenditure than building a new facility and maintains operational continuity, supporting growth objectives while enhancing efficiency and resource management.

#1: Purchase additional equipment to support forecasted growth

Additional Equipment to Support Forecast

Based on the County's projected growth and expected increase in working days for each equipment category, KPMG outlined the potential impact and additional equipment requirements. In addition to equipment requirements, appropriate spare ratio per type of equipment needs to be considered based on historical availability. The below table highlights the incremental equipment requirements in each forecasted time period.

	Forecasted Time Periods				
	2025 – 2030	2031 – 2035	2036 – 2040	2041 – 2045	2046 – 2051
Roads Operations					
• Pickup Truck	2 required units			1 required unit	
• Backhoe	1 required unit				
• One Ton Sign Truck	1 required unit		1 required unit		
• Pickup Truck (Patrol)	1 required unit		1 required unit		
Facilities, Parks, Cemeteries & Forestry					
• Pick-up Truck	6 required units			1 required unit	
• Mower				1 required unit	
• Trailer	2 required units		1 required unit		
• Heavy Duty Truck				1 required unit	
• Ball diamond groomer	1 required unit			1 required unit	
Estimated Capital Costs*	**$1,206,000**	**$ -**	**$198,000**	**$440,000**	**$ -**

* All estimated capital costs are expressed in 2024 dollars as per the County's estimated replacement cost.

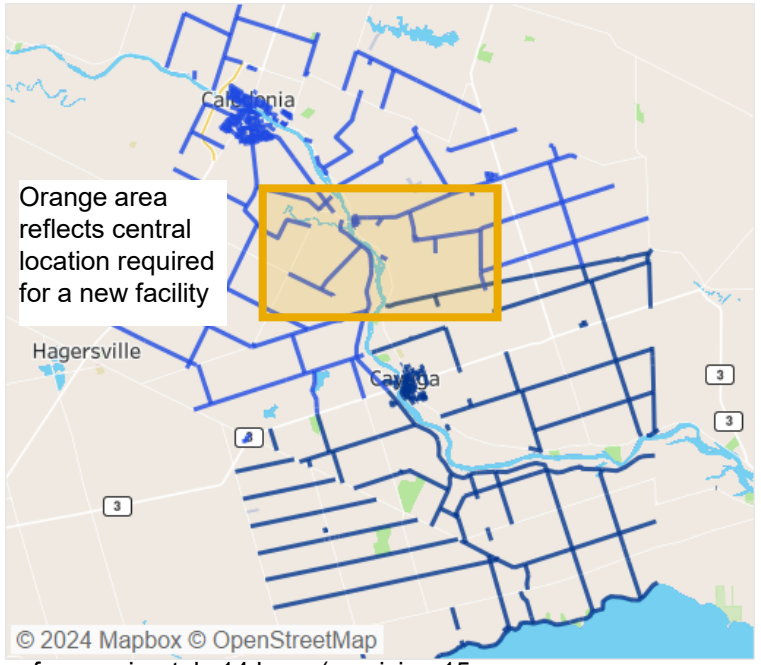
#2a: Consolidate Cayuga and Caledonia operations

New Central Facility – Cayuga / Oneida

Caledonia and Cayuga will be the drivers for future growth within the County, with **over 70% of population growth concentrated in those areas**. The existing yards servicing those areas also represent the most constrained (Oneida) and oldest (Cayuga) facilities within the County.

The Oneida yard is constrained by adjacent properties, removing any possibility of expansion, and the existing layout makes for operational and safety challenges when dealing with fueling and vehicle movements simultaneously. The material storage on site is also outside of the fenced area, raising the risk of salt being stolen in off-hours.

The Cayuga facility is the oldest in the County and in need of replacement. Its location on a non-municipally serviced site, its lack of proper wash facilities and its adjacency to new residential development suggest it may not be suitable for redevelopment.



Wellington County's Drayton Garage was completed in 2019, with a budget of $7.2 million for a 10 bay (5 x double-depth) facility, with an adjacent shared wash bay with the Township of Mapleton.

A consolidated replacement yard would require a new facility of approximately 14 bays (servicing 15 plow routes), plus a wash bay. Given the plow routes serviced by each facility, a central facility between Caledonia and Cayuga would be required. The map above highlights current plow routes serviced by each yard, including where a central facility could be located. It should be noted that determining an optimal spot of land was out-of-scope for the review.

An efficient layout would likely mirror that of Wellington County's Drayton Garage (above left, 10 bays) or Central Garage (12 bays), with double-depth drive-thru bays flanking employee space. Both Wellington's Drayton and Wellington facilities have separate salt/sand domes, similar to Haldimand County's existing layouts. A similar model is being used by Huron County for their Wingham Yard redevelopment.

The additional storage outlined to the right (beyond the bays) could be accommodated by unheated outbuildings or a lean-to on the main garage, or they could be addressed within a single footprint. A case study of a consolidated facility can be found on pg. 59, referencing Wellington County's under-construction Arthur Garage.

	Available Facility Space Analysis (~ area in sq. m.)	
	Cayuga	**Oneida**
Office / Employee	35	50
Garage Bays	8 bays	6 bays
Indoor Storage - Heated	143	840
Indoor Storage - Unheated	1,019	-
Outdoor Storage - Covered	-	-
Material Storage - Unheated	774	161
Outdoor Storage - Open	1,607	387
Vehicle Parking	791	608

Cost considerations for new facility

Based on the County's requirements for a facility that consolidates the Cayuga and Caledonia yards and comparable facilities constructed by other municipalities, the County should consider a facility that is approximately 3,150 sq.m. in size. This facility would include 8 double depth heated storage bays, a dedicated wash bay, indoor storage, attached material storage, and office space. Based on these requirements, the following represents a high-level estimate of the cost of construction for the facility.

Facility Details			Low cost[1]	High cost[1]
New Facility Element	**Requirement**	**Approximate size**		
Main Facility			**$515 / sq.ft**	**$610 / sq.ft**
Heated Garage Bays	8 double depth heated garage bays	800 sq.m or 8,600 sq.ft.	$4,429,000	$5,246,000
Wash Bay	One attached wash bay	50 sq.m or 550 sq. ft	$283,250	$335,500
Material storage	Combined salt / sand storage into a single structure, with drive-thru loading of both salt and brine.	1000 sq.m or 10,750 sq.ft.	$5,536,250	$6,557,500
Office Space	Office space to include male and female locker and washrooms, dedicated meeting rooms, boardroom, lunchroom, and dedicated and shared office space.	500 sq.m or 5,400 sq.ft	$2,781,000	$3,294,000
Outbuildings or additional storage			**$80 / sq.ft.**	**$180 / sq.ft**
Indoor storage	Additional indoor heated storage for light duty equipment, tools, maintenance, etc.	800 sq.m or 8,600 sq.ft.	$688,000	$1,548,000
		Total	**$13,717,500**	**$16,981,000**
		Cost of hydro, gas, water/wastewater, administration (e.g., phone)	**$27,010 (per year)**	

1 - Cost of construction is based on AltusGroup 2024 Canadian Cost Guide for public sector facilities maintenance building and warehouses in the GTA. These construction costs include hard construction costs only and do not include land, legal or other costs. The costs associated with facilities maintenance buildings are for the main facility only (e.g., maintenance, material storage, and administrative areas). Any outbuildings would be an additional cost. The costs associated with outbuildings or additional storage considers the construction cost of heated shell space.

The total costs shown are high-level estimates based on similar projects completed at other municipalities in Ontario in the past 5 years. These costs do not include the acquisition of land required for a new facility. It should be noted that land acquisition costs could potentially be partially offset through the sale of existing Cayuga and Caledonia sites. Furthermore, a detailed schematic design and specification from a registered engineering firm should be complete prior to making investment decisions, to confirm requirements of a chosen site.

Leading practice for employees and facilities

Compared to newer facilities among Haldimand County's peers, a lack of adequate employee space was confirmed with KPMG's site visits to each patrol yard. Although there are no specific guidelines for space planning for public works facilities, the Ontario Ministry of Health & Long-Term Care's published *Space Standards for Community Health Care Facilities* provides a useful starting point. For non-clinical and administrative space, the Ministry's Health Capital Investment Branch recommends the allocations shown on the right.

Site visits noted that locker rooms are particularly crowded, and would likely be more so during winter operations, driven by the heavier layers of clothing, while in summer there is significant personal protective equipment (PPE). Looking at the US Military's guidelines for fire stations, they prescribe 2.3 m^2 per person for locker rooms. As it stands, the majority of the County's lunchrooms would not meet space guidelines based on the facilities' maximum occupancy during a given shift, and nor would the locker rooms (particularly if those are carved out of garage space). Additionally, the existing locker room facilities do not provide for comparable female shower and locker facilities. Although some regional municipalities have developed new facilities with 2-level employee space (e.g. Wellington County), the cost of adding an elevator to make them AODA compliant can be significant. As a result, others have developed new facilities with single-level employee space (Huron County) with mezzanine storage.

Ontario MHLTC - Space Type	Space (sq. m)	Notes
Barrier free washroom	5	2-piece barrier free
Office Senior Management	14	1 person w/ meeting space
Office Management - Private	11	2 person w/ meeting space
Office Management - Shared	17	2 person w/o meeting space
Office Administrative - Private	9	1 person w/o meeting space
Office Administrative - Shared	14	2 person w/o meeting space
Staff Meeting Room	14	6 person capacity
Washroom - Staff	3	2-piece
Washroom - Staff	7	3-piece barrier free
Housekeeping closet	7	
Workstation - Administrative	6	
Mechanical / electrical	6	
Lunchroom	1	Per employee

US Military - Space Type	Space (sq. m)	Notes
Locker room (fire station)	2.3	Per employee

KPMG would suggest the following considerations related to employee space:

- Walpole and Dunnville yards: explore ability to expand locker room space and improve female facilities.
- Oneida maintenance shop: explore ability to provide secondary/female facilities within main building.
- Replacement central yard: include larger and male/female or designated gender neutral locker rooms for new facility and consider single level staff space.

To address gender imbalance in facilities, particularly in washrooms and change rooms, it is essential to have both male and female facilities.

From a facility perspective, the following leading practices from other municipal and regional municipality facilities across southern Ontario have informed the assumptions for the recommendations that follow:

- Heated garage bays for snow plows and patrol vehicles have multiple benefits including faster mobilization (up to 30-60 minute earlier departure as vehicles do not have to be warmed up or de-iced), ability for vehicles to dry after being washed, reliability due to temperatures and comfort of employees at start-up.
- Double-depth drive-thru garage bays optimize operational efficiency and improve safety, removing the need for employees to back up plow trucks.
- Dedicated wash bays allow easier containment of water and contaminants and allow proper cleaning of salt post-shift, prolonging the life of the equipment.

Should the County considers a centralized replacement garage for Cayuga and Oneida, a new unconstrained site could allow the incorporate of the leading practices above.

New Facility – Case Study – Wellington County

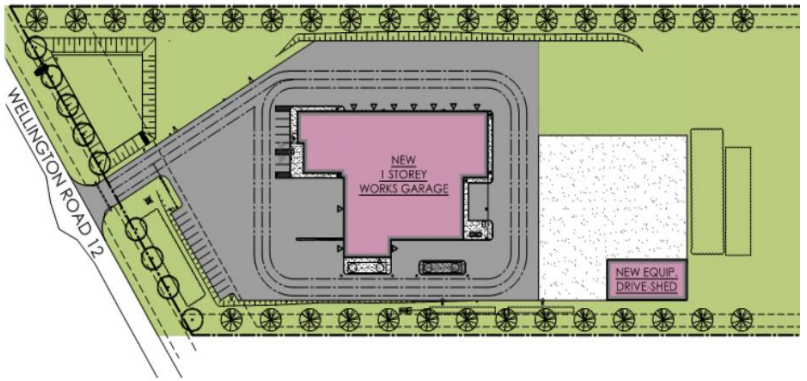
Wellington County is in the midst of construction of a new yard in Arthur. With the older garage both too small and on a constrained site, the County chose a new site that will, in future, also accommodate a new paramedics station.

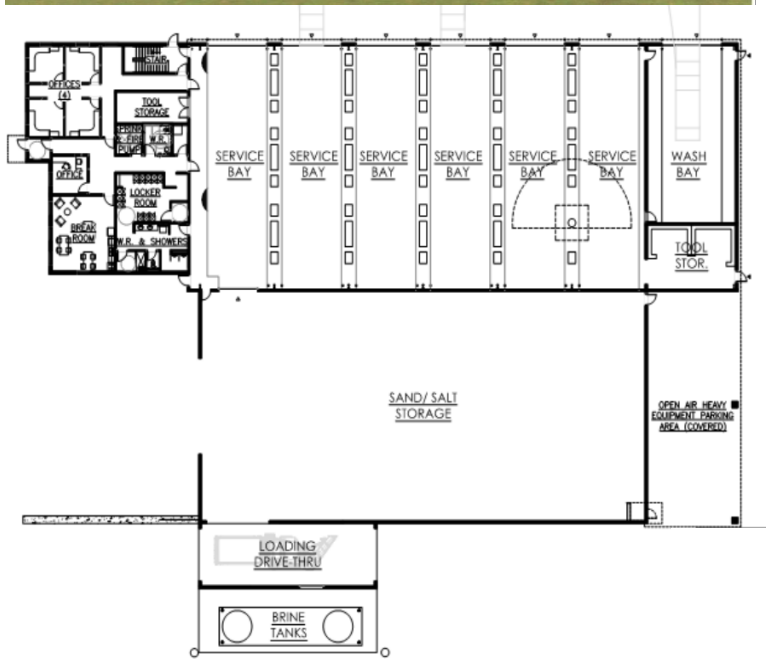
The facility, shown at right, combines the sand/salt storage and operations bays into a single structure, with drive-thru loading of both salt and brine.

There is an additional external enclosed (but unheated) equipment shed, and a covered storage area.

The building contains 6 heated service bays, as well as a dedicated wash bay. The bay count allows for heated storage of the trucks for the 3 current plow routes and 1 for the patrol vehicles. Allowing for future growth, the additional 2 bays will in the interim be used for the spare plow and heated storage.

This facility is currently under construction with opening planned in spring 2025, with an approved budget of **$16.8 million**.





PROPOSED 1st FLOOR PLAN (SCALE: 1:300)

Images from County of Wellington Arthur Garage Project Presentation, council meeting February 23, 2023. (https://pub-wellington.escribemeetings.com/filestream.ashx?DocumentId=6908)

New Facility – Case Study – Huron County

Huron County is part way through the redevelopment of its Wingham patrol yard. With the older garage both too small and the two salt domes beyond their useable life, the County chose redevelop on the ample site.

Unlike Wellington County, Huron's new material building is separate from the operations building. As seen in the satellite image at right, a new salt/sand storage building has been built in the top left corner of the property as a part of Phase 1 and at a cost of **$3.66M** (awarded May 2023).

There is an additional external enclosed (and largely unheated) equipment shed in the lower left of the property, used for the bridge crew.

The proposed Phase 2 operations building contains 6 heated service bays, as well as a dedicated wash bay. The bay count allows for heated storage of the trucks for the 3 current plow routes and 1 for the patrol vehicles. Allowing for future growth, the additional 2 bays will in the interim be used for the spare plow and heated storage.

The approved budget for all phases of the project, with completion of Phase 2 slated for 2025, is

$9.35 million.

Budget information from Huron County council meeting February 21, 2024. (https://agendas.huroncounty.ca/agendapublic/CoverSheet.aspx?ItemID=6452&MeetingID=549)

Completed new material storage building
Source: Google maps

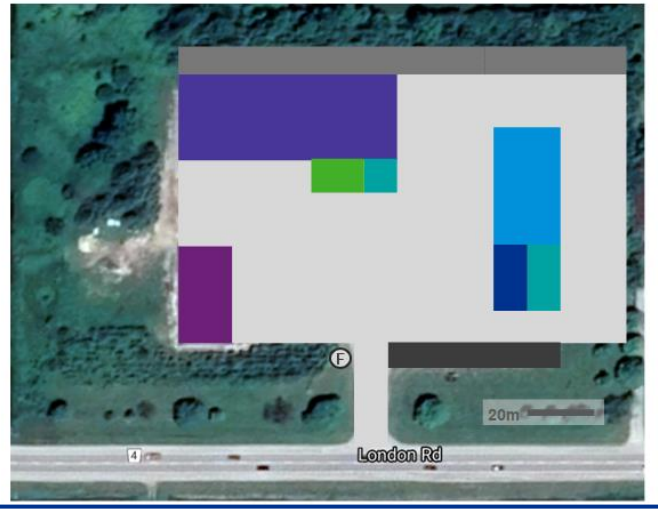
Per KPMG's 2020 report, the new Wingham operations building will include 6 bays, allowing for the transfer of an additional plow route to the site, heated storage for patrol vehicles, and indoor heated storage space that can in future support an additional snow plow route as needed.

The facility will also include a new sign shop and employee space.

Source: 2020 KPMG Report.

Future State - Yards

Wingham Yard



Facilities Recommendations

- New material storage facility of similar dimensions and layout to Auburn (without vestibule). Similar to Auburn, a shed structure would provide for covered and heated storage.
- New 6-bay vehicle storage building with offices and new sign shop
- No changes to existing unheated storage building (bridge crew)
- The County has put a high level estimate of the new facility's costs at approximately $2.7 million.

Ⓕ Fueling station	~ Area (m^2) Current	Req'd	Proposed
Office / Employee	31	215	*215*
Garage Bays - Heated	532 [6 bays]	5 bays	*6 bays*
Indoor Storage – Heated (equip.)	0	96	*~100*
Indoor Storage – Heated (Sign Shop)	0	203	*200*
Indoor Storage - Unheated	410[1]	406	*NC*
Material Storage - Unheated	1,479	1,479	*1,978*

#2b: Expand other facilities as required

Expand and Modernize Roads Facilities

Projected Growth to Roads Facilities

Based on the forecasted growth within the County, KPMG highlighted the impact on the Walpole and Dunnville Roads Operations facilities.

Both the Walpole yard and the Dunnville yard contain ample outdoor uncovered storage space. However, each facility does not have enough covered (e.g., indoor heated and unheated and outdoor covered) space to store equipment based on leading practices.

By 2051, each facility may require:

- Approximately 1000 sq.m. of covered storage for vehicles (yellow).
- Additional material storage (approximately 50 sq. m) to store salt / sand required for service delivery (green).
- Additional staff/employee space (approximately 50 sq. m) to support increases to staff (blue).

It should be noted that this space forecast is an addition to regular / scheduled facility upgrades as per facility condition reports.

Walpole yard

Dunnville yard

	Available Facility Space (~ area in sq. m.)	Incremental Need (~ area in sq. m.)
Office / Employee	70	50
Garage Bays	5 bays	2 bays
Indoor Storage - Heated	149	925
Indoor Storage - Unheated	-	-
Outdoor Storage - Covered	-	-
Material Storage	324	50
Outdoor Storage - Open	1,682	-
Vehicle Parking	332	-

	Available Facility Space (~ area in sq. m.)	Incremental Need (~ area in sq. m.)
Office / Employee	130	-
Garage Bays	8 bays	-
Indoor Storage - Heated	151	995
Indoor Storage - Unheated	-	-
Outdoor Storage - Covered	76	-
Material Storage	347	50
Outdoor Storage - Open	1,750	-
Vehicle Parking	269	-

Expand and Modernize Parks Facilities

Projected Growth to FPCF Facilities

Based on the forecasted growth within the County, KPMG highlighted the impact on each of the current parks facilities.

By 2051, each facility may require an additional 85 sq. m. of space to store equipment and staff required for service delivery. The yellow highlight in each image represents this space requirement relative to each current location.

Similar to road facilities, the parks facilities do not have enough covered space to store equipment in alignment to leading practices. KPMG also highlighted to current state requirements based on leading practices (highlighted in blue).

It should be noted that this space forecast is an addition to regular / scheduled facility upgrades as per facility condition reports.

Cayuga

Caledonia

Dunnville[1]

Hagersville

1 – It was noted that the Dunnville PFC is currently being replaced by a new facility in 2026.

Cost considerations for modernization

The table below highlights the low and high cost of modernizing and expanding the County's roads facilities (outside of Caledonia and Cayuga) and PRC facilities. Based on forecasted growth, each road's facility will require an additional 1,050 sq.m of indoor heated storage, while each PRC facility will requirement an additional 85 sq.m of indoor heated storage. Facility requirements and approximate costs are provided below:

Facility Details			Low cost[1]	High cost[1]
Facility	**Modernization Requirement**	**Approximate size**		
Roads Facilities			**$80 / sq.ft.**	**$180 / sq.ft**
Walpole Patrol Yard and Dunnville Patrol Yard	Additional indoor heated storage for light duty equipment, tools, maintenance, etc.	1,000 sq.m. or 10,765 sq.ft.	$861,200	$1,937,700
	Combined salt / sand storage into a single structure, with drive-thru loading of both salt and brine.	50 sq.m. or 540 sq.ft.	$43,200	$97,200
		Total (each roads facility)	**$904,400**	**$2,034,900**
		Additional cost of hydro, gas	$5,010	
PRC Facilities				
Cayuga, Caledonia, Hagersville	Additional indoor heated storage for light duty equipment, tools, maintenance, etc.	85 sq.m or 915 sq.ft.	$73,200	$164,700
		Total (each parks facility)	**$73,200**	**$164,700**
		Additional cost of hydro, gas	$406	
		Total (facility cost only)	**$2,028,400**	**$4,563,900**

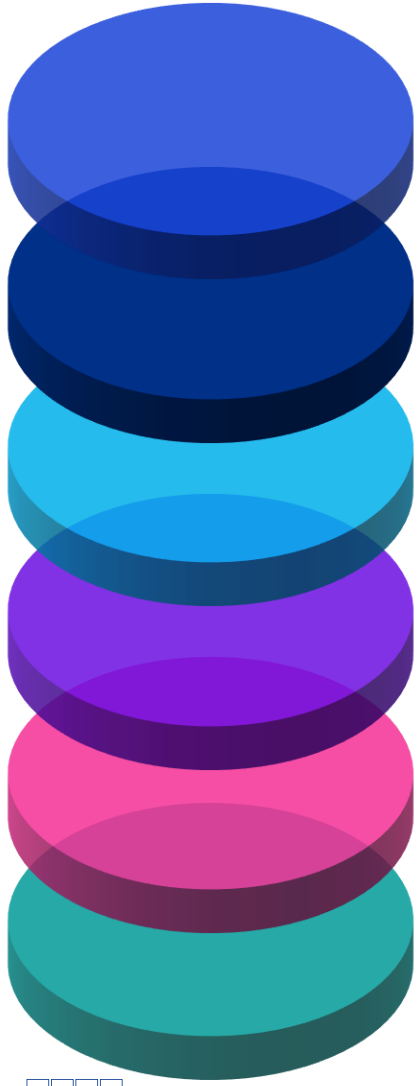
1 - Cost of construction is based on AltusGroup 2024 Canadian Cost Guide for public sector facilities maintenance building and warehouses in the GTA. These construction costs include hard construction costs only and do not include land, legal or other costs. The costs associated with outbuildings or additional indoor storage considers the construction cost of heated shell space.

08

Service Delivery Opportunities

Service Delivery Opportunities

In addition to opportunities highlighted by the Public Works Optimization Model, KPMG also identified opportunities to improve the efficiency and effectiveness of Public Works service delivery. Each opportunity is highlighted below:



01

Implement Activity Based Costing Model

Activity-based costing focuses on identifying the specific activities required to maintain the County's assets. By analyzing the costs associated with these activities, the department can gain insights into the true cost of maintaining each asset. This enables the County to allocate resources more efficiently and effectively.

02

Explore Implementation of Work Order Management System

A work order management system would allow the County to automate manual tasks including job assignments, tracking and reporting, enhance communication between service areas and central administration, more efficiently allocate resources and equipment, and scale to accommodate the projected growth within the County.

03

Explore Best Practices in Salt Management

Based on the comparator analysis, highlighted best practices employed by other municipalities to support effective salt management practices. This includes the installation of wash bays, and the implementation of road weather information system.

04

Consider the Development of a Green Fleet Strategy

Municipalities in Ontario have initiated the transition to green fleet through the development of a green fleet strategy. This is a strategy identifies zero emissions fleet options to replace existing gas-powered vehicles. r each

05

Review Fleet Maintenance Staffing

The review of staffing in fleet maintenance noted that the department may require additional maintenance staff to meet service delivery requirements today and into the future.

06

Maintain Community Partnerships

The County currently partners with 10 community organizations to complete maintenance activities at select sportfields and facilities within the County. Should these partnerships end, the County would be required to absorb the service delivery requirements into the current portfolio, resulting in an increase to operating and capital budgets.

Asset Linked Maintenance Program

Implement Activity Based Costing

During KPMG's collection of activity data for the optimization model, it was noted that the County does not utilize a formalize asset linked maintenance program, or activity-based costing. As a result, the County may be missing an opportunity to increase the service portfolio and optimize the frequency of planned maintenance activities.

Activity-based costing focuses on identifying the specific activities required to maintain the County's assets. By analyzing the costs associated with these activities, the department can gain insights into the true cost of maintaining each asset. This approach enables the County to allocate resources more effectively, ensuring that funds are directed toward the most critical activities that enhance asset performance and public safety.

Action for Haldimand County:

The County should take initial steps to develop an asset linked maintenance program. The diagram to the right highlights key steps, using catch-basins as an example.

01 Identify key assets

Identify a complete inventory of assets including condition and maintenance history.

To develop a detailed asset linked maintenance program for catch basins, the County would develop a detailed inventory of all catch basins, their current location, and historical maintenance record.

02 Define specific activities

Define specific activities per asset (e.g., inspections, maintenance, etc.), required staff and required equipment.

Key activities associated with catch basins may include inspection, flushing, maintenance, etc. Staffing to carry out catch basin inspections may include one crew of two plus a pick-up truck.

03 Prioritize based on risk assessment

Evaluate the likelihood and impact of asset failure to allocate resources.

When assessing catch basins for an inspection program, best practices suggest that catch basins in high-traffic areas or low areas (prone to flooding) may require more frequent inspection (quarterly). Low risk areas may require semi-annual inspections.

04 Integrate with technology and train staff

Establish clear performance metrics and continuously monitor and adjust the maintenance schedule based on data.

Each asset should be linked to the County's GIS to track conditions and maintenance activities. Further, performance metrics may include # of catch basins inspected over the period.

Outcome: Data-driven approach to managing all assets, while optimizing service delivery portfolio based on available resources. In addition, the County may be able to identify additional work that can be completed given available resources.

Work Order Management System

Potential Work Order Management Solutions

As part of the current state assessment, it was noted that the County does not have a digital solution for work order management. Currently, the County relies on hand written work orders which are manually entered into the system and assigned to the relevant service area.

Digital work order management systems would allow the County to:

- Automate manual tasks including job assignments, tracking and reporting
- Enhance communication between service areas and central administration
- More efficiently allocate resources and equipment
- Scale to accommodate the projected growth within the County.

As part of the benchmarking analysis, comparator municipalities identified the current work order management system deployed in their operations. Based on this, KPMG conducted desktop research and summarized each system.

Action for Haldimand County:

The County should explore each system for potential implementation. It should be noted that the annual cost for a solution typically include a base license costs, user licenses, and implementation costs.

Work Order System	Overview and Features
Oracle Netsuite Work Order Management Solution	Oracle NetSuite Work Order Management is a comprehensive solution designed to streamline manufacturing processes and enhance operational efficiency. It integrates seamlessly with other NetSuite modules, providing a unified platform for managing work orders, inventory, and production schedules. Some key features of the solution include: • **Work order creation and management**: Users can create, track and monitor the status of work orders • **Routing and Scheduling**: The system allows users to customize the workflow based on operations. In addition, scheduling tools help optimize timelines via visibility in equipment and staff availability. • **Resource Allocation:** Allows for the allocation of resources, including labour and equipment, to specific work orders. Can track labour hours and equipment utilization to provide insights into productivity and efficiency. • **Reporting and analytics**: The solution provides reporting tools for insights into performance, resource allocation, and inventory levels. Can also create custom reports based on available data to support data-driven decision making.
GoEVO Operation Management (MESH)	Go Evo's MESH work order management solution provides a comprehensive tool for handling work orders, specifically designed for government and municipal organizations. Key features include: • **Mobile Work Orders & Service Requests**: This allows teams to bridge the gap between incoming service requests and new work orders. Users can forward a service request to multiple departments or create standalone work orders for other tasks. This flexibility enhances communication and collaboration across teams. • **Proactive Scheduling**: Supervisors can schedule tasks in advance, creating custom maintenance programs for assets, which helps reduce downtime and improve efficiency. • **Real-Time Notifications**: Push notifications are sent directly to field technicians, ensuring they receive updates on new or modified work orders instantly, which boosts response times. • **Desktop and Mobile Accessibility**: MESH is accessible both on desktop and mobile platforms, making it easier for field employees to document and complete tasks without relying on paper-based methods. • **Cost Savings and Accountability**: The system helps reduce operational costs through better workflow visibility and control, while tracking labor and resource use helps in budgeting and improving accountability.

Salt Management

Addressing Risks Highlighted in the Salt Management Plan

The Salt Management Plan (SMP) was adopted by Haldimand County Council in 2010 as the official policy for managing the use of road salts. However, an audit of the plan indicated that the SMP has not been adequately monitored or updated since its implementation. The audit also revealed that some practices, such as using the bucket of front-end loader to determine the amount of salt used, were outdated and have been abandoned. The audit also noted that some current practices are not in compliance with outlined leading practices, particularly in salt / sand storage, snow removal and disposal locations.

Given these findings, KPMG has highlighted best practices employed by other municipalities to support effective salt management practices.

01

Installation of Wash Bays

The cost of installing wash bays at the County's current roads operations facilities can vary widely depending on several factors, including:

- **Size of the Wash Bay**: The larger the facility, the higher the cost. For example, a single-bay facility will cost less than a multi-bay setup. Typical guidelines suggest that a facility that services less than 25 vehicles should contain 1-2 wash bays, 25-50 vehicles should contain 2-3 wash bays and 50+ vehicles should contain 3-5 wash bays.
- **Type of Equipment**: High-pressure washers, water recycling systems, heating systems for water, and other equipment can add to the overall cost.
- **Environmental Compliance**: Municipalities need to follow environmental regulations, such as wastewater treatment and disposal. Adding systems for water filtration and oil separation can significantly increase the costs.
- **Building Modifications**: If the facility needs modifications, such as new drainage systems, concrete pads, or enclosures, these can also add to the expense. Given the County's aging infrastructure, current facilities may require significant modifications to support wash bays.

For a standard public works facility wash bay in Ontario, the cost can range from **$150,000 to $500,000** or more, depending on these factors. A detailed site assessment and quote from a contractor or engineering firm would provide more accurate pricing.

02

Implementation of Road Weather Information System

Road Weather Information Systems (RWIS) are networks of sensors and tools designed to monitor and forecast weather and road conditions in real-time. These systems help improve road safety and efficiency, especially in challenging weather. A RWIS typically includes:

- **Sensors:** Installed on or near roads to measure key parameters like temperature (air and pavement), humidity, wind speed, precipitation, and surface conditions (dry, wet, icy)
- **Weather Stations**: These stations collect the sensor data and transmit it to central systems for analysis.
- **Cameras**: Some systems include cameras to provide visual confirmation of road and weather conditions.
- **Communication Systems**: These transmit data to central administration, which can then share information with drivers, maintenance crews, and other stakeholders.
- **Data Analysis Tools**: The data collected is often used to create forecasts or alerts about potential hazards like ice, fog, or heavy rain.

The benchmarking analysis noted that some comparator municipalities have implemented RWIS software the monitor high risk road flooding areas. These systems have allowed them to proactively react to an event while increasing public safety. In addition, they are leveraging traffic camera data to report winter road conditions to improve response time.

Transition to Green Fleet

Green Fleet Case Study

Electric vehicles have become more common on Canadian roads as they are more widely available and affordable for both municipalities and the general public. According to Transport Canada, the market share of light-duty zero-emissions vehicles in Canada was 5.7% in 2021, 8.7% in 2022, and 11.7% in 2023. In addition, Transport Canada has set a target for all light duty vehicles in Canada to be zero-emission by 2040. The County's Public Works operations can support the reduction in greenhouse gas emissions by transitioning end-of-life vehicles to zero-emissions options. The below represents a cost analysis of transitioning the County's pick-up trucks to zero-emission options. KPMG completed the analysis using the Ford F150 Lighting as an example electric vehicle and Ford F150 HEV as a hybrid electric option. The analysis shows a 1% saving for electric and 13% saving for hybrid in cost per KM of use over 10 years.

Action for Haldimand County:
Municipalities in Ontario have initiated the transition to green fleet through the development of a green fleet strategy. A strategy identifies zero emissions options for each category of fleet vehicle based on service delivery requirements. As such, the County should consider the development of a green strategy to support potential transition.

Cost comparison per KM of use – ICE vs ZEV

Sources:
1: F-150 XL 4x4 MSRP (https://shop.ford.ca/inventory/f150/)
2: F-150 Lighting MSRP Starting (ford.ca/trucks/f150/f150-lightning/models/f150-xlt/)
3: Based of Average Electricity rates and EV energy efficiency (https://www.energyhub.org/electricity-prices/)
4: Based on Retail Gas Prices at $1.35/L
5: Based on Ford's claim of 40% maintenance savings vs. gas (link).
6: Taxes excluded due to PSB GST rebate and 78% PST rebate for Ontario.

	½ Ton Gasoline Pickup	½ Ton Electric Pickup	½ Ton Hybrid Pickup
Representative Vehicle	Ford F-150 Crew XL 4x4 3.3 V6	Ford F-150 Lightning Standard range battery	Ford F150 Pickup 4WD HEV
Manufacturer's Suggested Retail Price (excl. taxes)[8]	$59,580[1]	$79,000[2]	$52,000
City Fuel Economy (L/100 km)[1] Electric Vehicle Energy Economy $/1000kWh x kWh/km)[4]	12.4	40.0	10.1
CO2 Emissions (g/100km)	466	0	0.2
Annual Maintenance Cost (Comparable Data-Driven Average)	$2,114	$1,286[5]	$2,114
Annual Kilometers (Assumed)	15,544	15,544	15,544
Annual Fuel/Energy Cost	$2,602[4]	$622.38[3]	$2,119[4]
Annual Depreciation Expense (10-year depreciation)	$5,958	$7,900	$5,200
Annual Cost	$10,674	$10,636	$9,433
Avg. Annual Cost of Ownership per Kilometer	**$0.69**	**$0.68**	**$0.60**
Total Cost per unit of use ($/km) – Savings compared to gasoline	-	**$0.01**	**$0.09**
	-	**1%**	**13%**

Fleet Maintenance Staffing

Fleet Maintenance Staff

The County currently employs 12 full-time fleet maintenance staff, which includes six automotive technicians and one foreperson that are responsible for servicing the County's fleet. It was noted that the County's automotive technicians complete some minor and major repairs on the County's fleet, with some repairs outsourced to local contractors. The first table to the right displays the maintenance expenses for the County.

In 2024, the cost of maintenance labour for automotive technicians and foreperson was approximately $719,440. To understand the capacity of the County's Fleet Operations, KPMG completed a bottoms-up analysis on current working days for maintenance activities.

The results of the capacity assessment suggest that the County requires one additional FTE to support fleet maintenance.

To validate this requirement, KPMG compared the analysis to a previously completed fleet staffing assessment. The previous assessment was based on current fleet and the estimated maintenance and repair time for various equipment categories. This analysis indicated that the County will require an additional 0.23 automotive technician FTEs to maintain the recommended fleet increases.

Fleet Staffing Assessment	
Total Cost of Maintenance Labour *(a)*	$605,400
Hourly Rate *(b)*	$43.95
Total Maintenance Hours Required *(a/b)*	13,775 hours
Productive Working Hours / FTE *(d= provided by County's operating position cost summary – fleet staff)*	2,080 hours
FTEs Required	7 FTE
FTE Available	6 FTE
Surplus / (Deficiency) FTE	**(1) FTE**
Current Maintenance Hours Available	12,480 hours
Surplus / (Deficiency) Hours	**(1,295) hours**

Community Partnerships

Maintaining Community Partnerships

The County currently partners with 10 community organizations to complete maintenance activities at select sportfields and facilities within the County. This is a long-standing partnership between the County and each community organization. However, should partnerships end, the County would be responsible for absorbing the maintenance activities within the existing service portfolio. As such, KPMG analyzed the impact of ending the partnerships on current operations.

Based on the analysis, it was noted that ending all partnerships would add an additional 540 working days to the FPCF service portfolio.

In addition, this would increase existing operating and capital (i.e., equipment) budgets by approximately $580,000 per year.

Field Management Groups	Total County Cost	Total Labour Hours	Activity Working Days[2]
Caledonia Athletic Softball Association (CASA)	$46,947	1,032	65
Dunnville Soccer Park Corporation	$21,205	190	12
Fisherville Parks Committee	$75,871	1,318	82
Haldimand Youth Soccer-Caledonia (McClung)	$144,998	1,810	113
Haldimand Youth Soccer-Cayuga (Broecheler)	$69,164	718	45
Jarvis Parks Committee	$98,745	1,656	104
Nanticoke Parks Committee	$16,610	198	12
Selkirk Parks Committee	$61,749	928	58
Townsend Lions Parks Committee	$44,269	796	50
Totals	**$579,558**	**8,646**	**540**

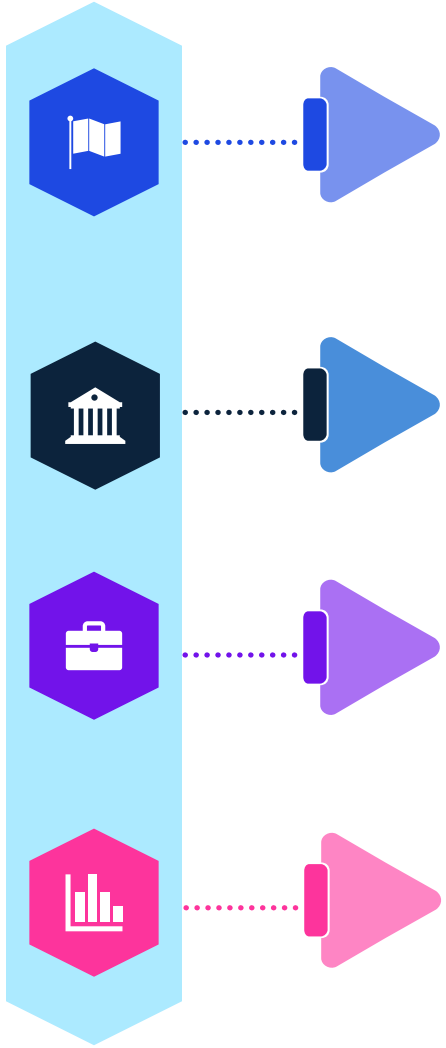
2 – Activity working days assumes an 8 hour shift length and a crew of two workers (e.g., FT Maintenance and Student)

09

Conclusion

Conclusion

Overall, anticipated growth in the County is going to impact Public Works infrastructure, equipment, and service delivery. The work completed as part of this review will serve as a foundation to assist management in addressing key risks resulting from anticipated growth while ensuring the efficient and effective delivery of Public Works services today and into the future.



How should the County respond to anticipated growth?

The County's population is expected to grow by 31,500 (or 62%) by 2051. In addition, two thirds of the anticipated growth will be localized to Caledonia and Cayuga. Given the aging public works operations facilities supporting these areas, the public works optimization model identified an opportunity to consolidate operations in a new purpose-built facility that aligns with anticipated growth. A new facility, supported by equipment and staffing, will ensure the County appropriately responds to anticipated growth without impacting the efficiency and effectiveness of service delivery.

Is it the right time?

Across the province and across Canada, municipalities are investing in public works facilities to respond to aging assets, population growth, and service delivery requirements. These investments are critical to ensure the municipality has modern facilities (e.g., include women's change rooms, adequate staff space), improve operational efficiency, and meet the evolving needs of the community. Given the projected growth in the County and the aging public works infrastructure, it is the right time to consider replacement and upgrades of facilities to accommodate growth while maintaining safety and functionality.

What are the current risks and anticipated benefits?

Current aging infrastructure poses several key risks to the County. This includes service disruption risk resulting from inefficient facility layouts and outdated specifications (e.g., start-up time for snow plowing), staff safety risk resulting from outdated facility layouts or equipment failure, financial risk resulting from increased maintenance costs from poor condition, and environmental risks resulting from ineffective material management practices (e.g., salt management). Constructing and upgrading public works facilities enables the County to mitigate these risks through the adoption of modern technology and operational practices, leading to more efficient service delivery and better resource management.

What are the next steps?

For next steps, the County should seek Council approval to begin the process of developing and constructing a new facility for Caledonia and Cayuga. This includes conducting a design feasibility study to assess protentional locations, develop conceptual layouts and architectural designs, and ensure compliance with environmental regulations. Further, the County should formalize anticipated equipment and staffing requirements identified by the optimization model into departmental plans.

10

Appendices

Appendix A: Scope of Review

Scope of Review

KPMG's approach to this project was divided into five (4) phases. Each phase was focused on the accomplishment of specific tangible objectives and activities.

Phase 1: Project Initiation June	**Phase 2: Current State Analysis** June to July	**Phase 3: Service Delivery and Facility Optimization** July to August	**Phase 4: Recommendations and Implementation Plan** August to September	**Phase 5: Final Report and Presentation** September to December
This phase laid a strong foundation for the project. We spent a brief, but necessary, period of time at the beginning of the project to confirm the scope, establish expectations, and validate our approach with the County.	This phase included the collection, review, and analysis of key qualitative and quantitative data sources that validate the current state and begin to identify recommendations for the future state.	This phase built on the current state analysis through the identification of future equipment, resources, and infrastructure requirements for the County's Public Works operations.	In this phase, we developed recommendations to optimize Public Works operations, improve service quality, effectively manage resources, and align to community growth and demand.	In this final phase, we consolidated all work completed during previous phases and developed a final report and high-level implementation plan.

Documents Reviewed

Document Title	Document Title	Document Title
2021 HCFPCP Inventory	HC-PW-FLE-Work Orders 2024-2019	Haldimand County Growth Statistics
HC-PW-FLE-Equipment List JN272024	Maintenance Hours Time Entry	Haldimand County Boundary Agreements
PW-FLE=V&E Class Info JN272024	2023 Budget & Final Actuals	Public Works Organizational Charts
Sold Asset Report	2024 Fleet Operating Review – 5 Year Average	Haldimand County Development Updates – KPM 2024
V&E Class Cost Life1	Operating Budget	Snow Plow GIS Maps
2023 Workorders Sorted	SOP Excess Soil – Final	Public Works Building Assessments
2024 Equipment Yearly Cost Projections (Charge Rates) JA0524		

Stakeholders Engaged

Stakeholders Engaged
Manager – Roads Operations
Administrative Assistant – Roads Operations
Manager – Environmental Operations
Manager – Facilities, Parks, Cemeteries & Forestry Operations
Manager – Fleet Operations

Appendix B: Facilities Overview

Facilities

Public Works Facilities Overview

The County's Public Works Division is responsible for supporting activities related to roads, facilities, cemeteries, parks, and trails. The Public Works activities are operated from nine unique facilities. These include:

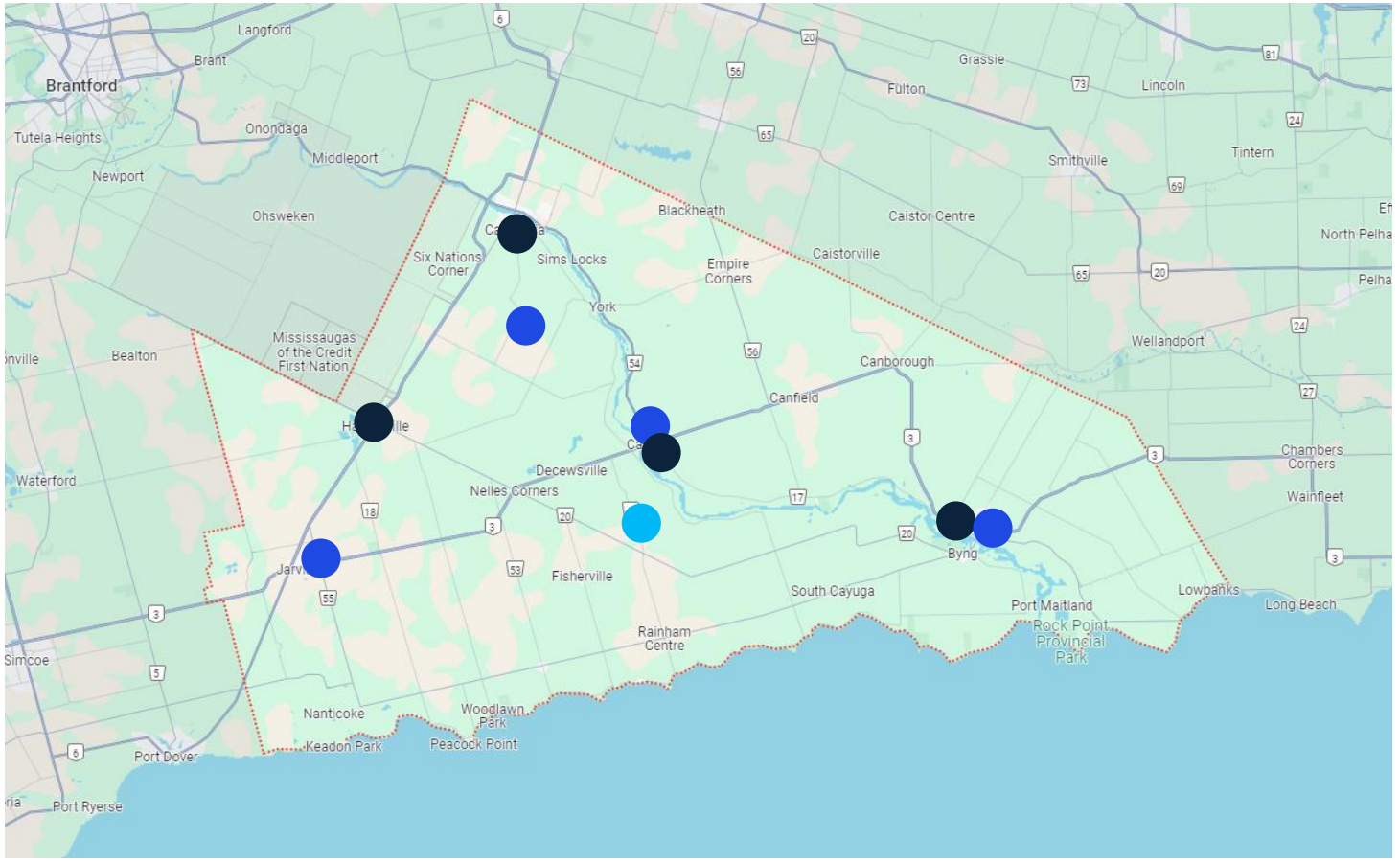
- Cayuga Roads Yard
- Dunnville Roads Yard
- Oneida Roads Yard
- Walpole Roads Yard
- Kohler Yard
- Cayuga Memorial Arena
- Hagersville Arena
- Dunnville Cemetery
- Haldimand County Caledonia Centre

Together, these facilities contain various heated and unheated indoor storage space, outdoor storage space, and open space. The following slides contain more information on each of the sites. In total, the County stores approximately 400 pieces of equipment at these facilities.

KPMG analyzed the current operations at each facility and completed facility tours to identify what the existing space and amenities can accommodate at the current service level. KPMG used the following metrics as part of this analysis:

- Current service levels and inventory of equipment
- Total space (sq.m) per piece of equipment
- Required equipment to meet service levels

Based on this analysis, KPMG identified gaps with respect to current facility capacity, equipment, and staffing.

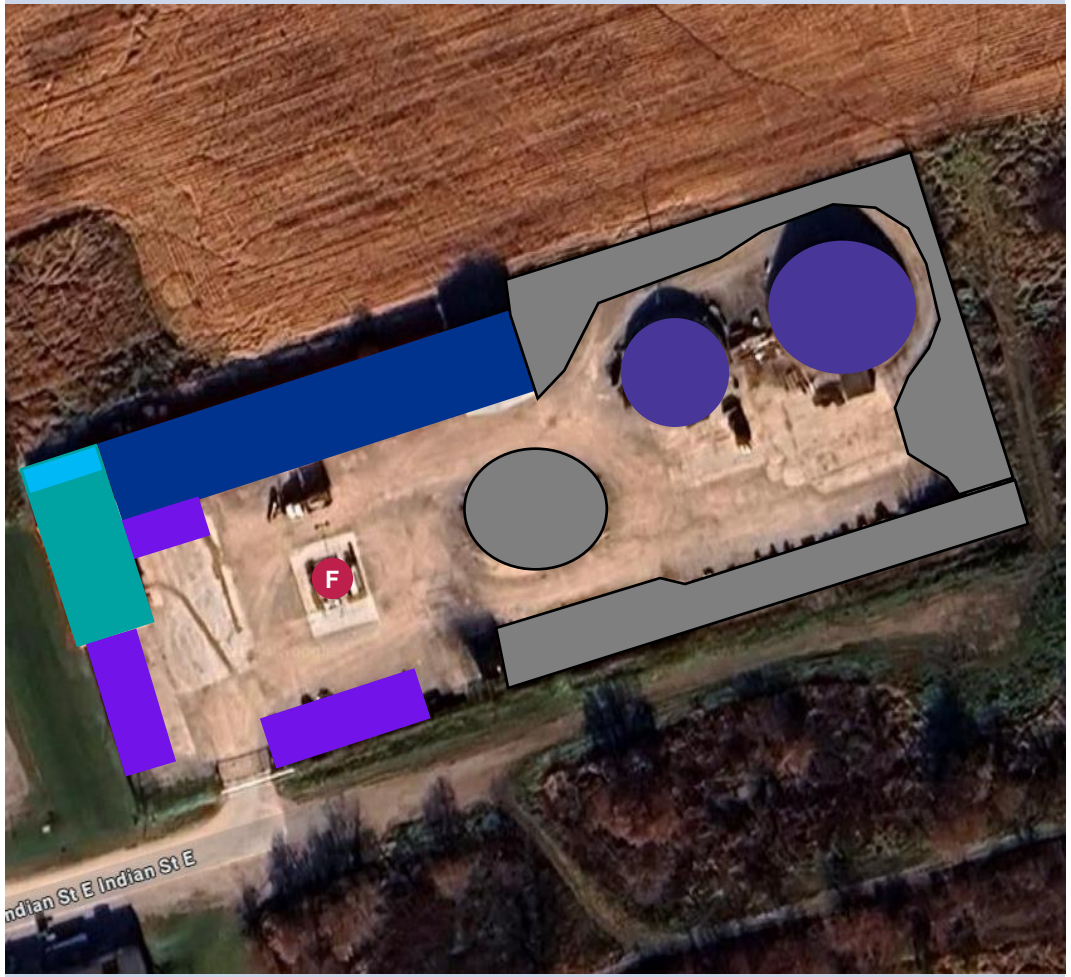


	Roads Yard
	Fleet Yard and Maintenance Shop
	Parks Facility

Roads Operations Facilities

Cayuga Roads Yard

Cayuga Roads Yard: Aerial View



Address: 20 Indian St. East, Cayuga

Facilities Summary

- Built in 1940, the most recent building assessment found the facility to be in poor condition.
- The facility includes:
  - Main enclosed building with work shops and employee spaces
  - Six-bay, open garage area
  - Two-bay garage addition
  - Fueling station
  - Two sand/ salt domes

KPMG noted that the facility faces several challenges. This includes the lack of a legal wash area and the current salt storage. The yard is connected to municipal water, but not municipal sewer, which could pose issues.

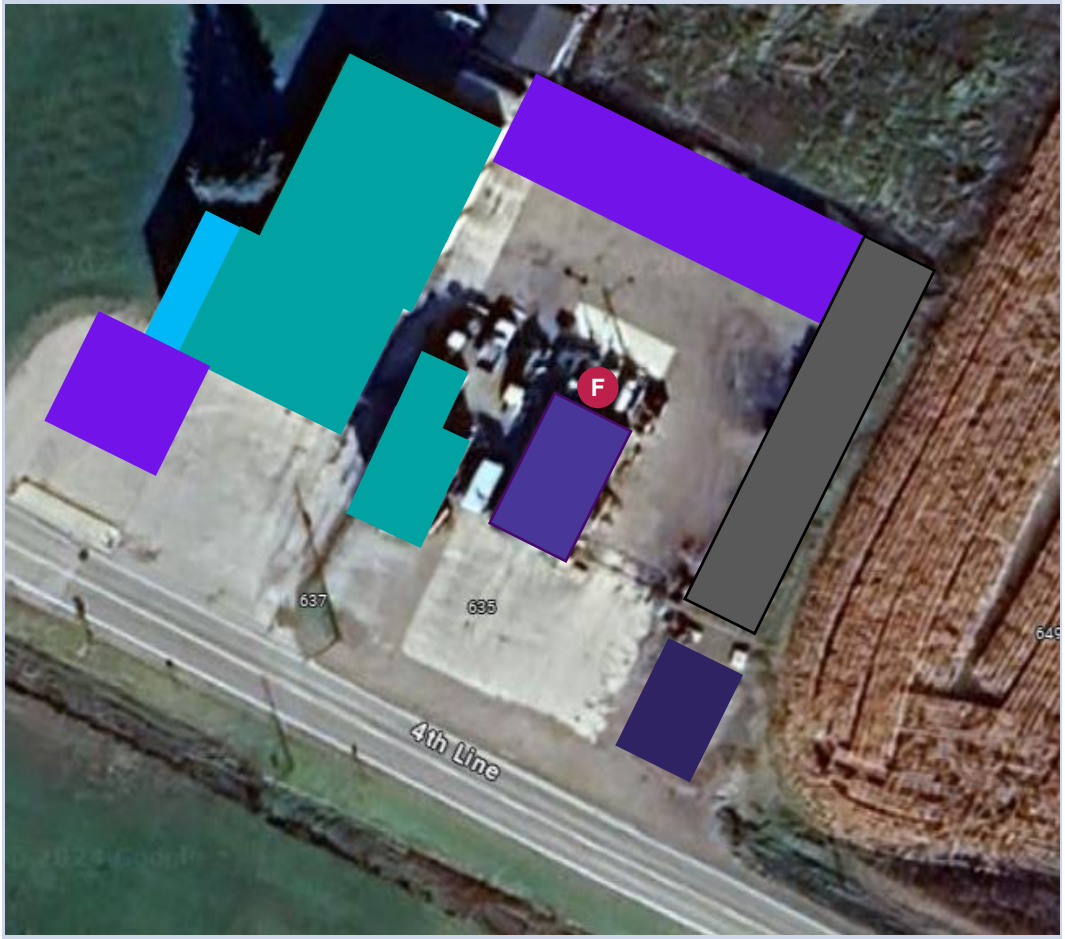
The yard is centrally located and serves as the winter control centre for the County, operating 24 hours a day for six months of the year. Despite its challenges, the yard's location is ideal, being centrally located with minimal deadhead. However, the future of the yard is uncertain due to potential subdivision plans and the lack of sewer, wash bays, and adequate storage facilities.

F Fueling Station

	Facility Space Analysis (~ area in sq. m.)
	Available[1]
Office / Employee	35
Garage Bays	8 bays
Indoor Storage - Heated	143
Indoor Storage - Unheated	1,019
Material Storage - Unheated	774
Outdoor Storage - Covered	-
Outdoor Storage - Open	1,607
Vehicle Parking	791

Oneida Roads Yard

Oneida Roads Yard: Aerial View



Address: 634 4th Line, Caledonia

Facilities Summary

- Built in 1960, the latest building assessment found the facility to be in fair to good condition.
- The facility includes:
  - Six garage bays
  - Sign building
  - Building with employee spaces
  - Fueling station

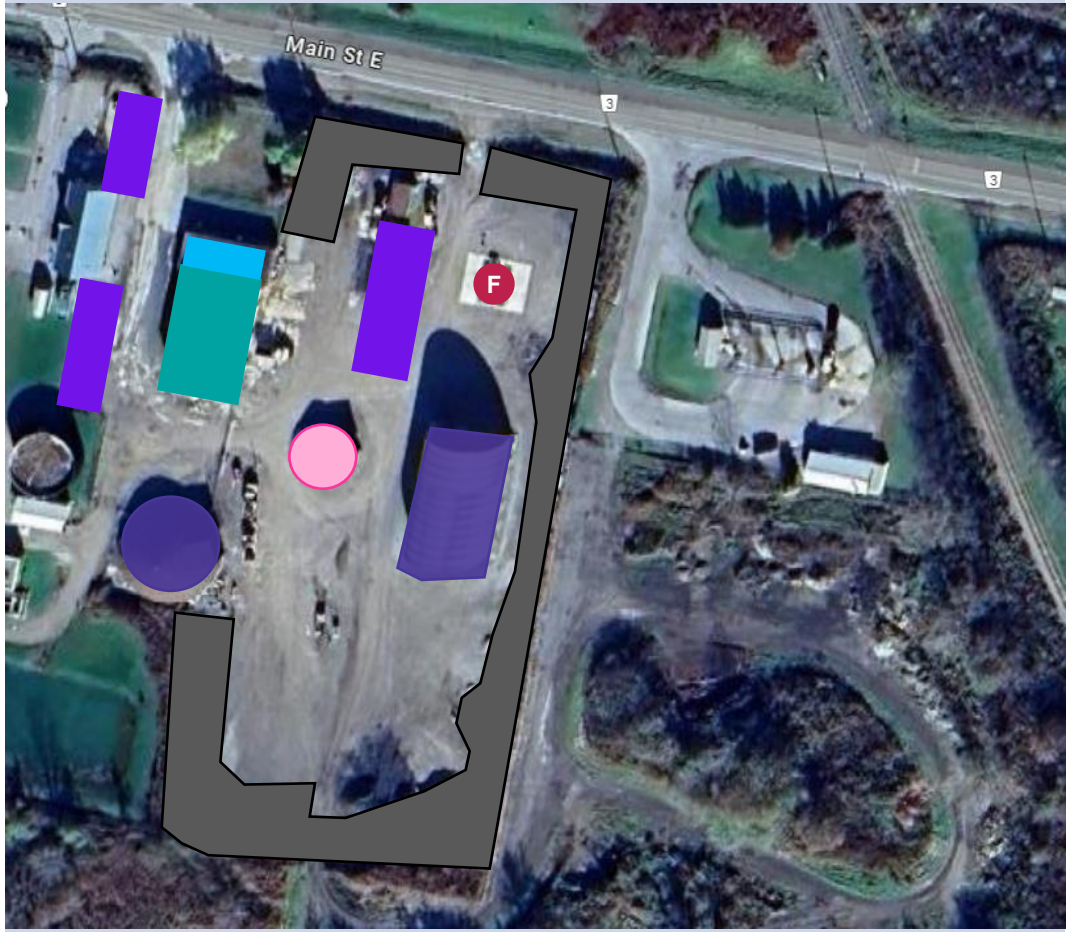
The building is used for office work and has a locker room upstairs. KPMG noted that parking is at a premium, and the layout of the building can be challenging to navigate especially when fueling. The building is large enough to accommodate a hoist for trucks, but it is not large enough to accommodate all the necessary operations during a storm and the land around the yard is not available to the County. The building's location is optimal, however, the area is prone to storms, which can disrupt operations. Additionally, the building does not have access to municipal water, therefore equipment must to go to Cayuga to wash. Further, there is no covered sand storage and it resides outside the security fence, making it susceptible to theft.

F Fueling Station

	Facility Space Analysis (~ area in sq. m.)
	Available[1]
Office / Employee	50
Garage Bays	6 bays
Indoor Storage - Heated	840
Indoor Storage - Unheated	-
Material Storage - Unheated	161
Material Storage – Open	135
Outdoor Storage - Covered	-
Outdoor Storage - Open	387
Vehicle Parking	608

Dunnville Roads Yard

Dunnville Roads Yard: Aerial View



Address: 710 Main Street East, Dunnville

Facilities Summary

- Built in 1965, the latest building assessment found the facility to be fairly good condition.
- The facility includes:
  - Eight-bay interior service garage
  - Building with employee spaces
  - Sign building
  - Salt storage
  - Fueling station

The location is a large, multi-purpose facility. It contains ample real estate and eight bays, making it a versatile space for various operations. Some equipment is parked outside during the winter, and staff noted challenges fitting trucks with plows in the service garage. The facility also includes two washrooms, small offices, and storage spaces.

F Fueling Station

	Facility Space Analysis (~ area in sq. m.)
	Available[1]
Office / Employee	130
Garage Bays	8 bays
Indoor Storage - Heated	502
Indoor Storage - Unheated	-
Material Storage - Unheated	1,158
Outdoor Storage - Covered	189
Outdoor Storage - Open	4,374
Vehicle Parking	895

Walpole Roads Yard

Walpole Roads Yard: Aerial View

Address: 1433 Nanticoke Road (Rd 55), Jarvis

Facilities Summary

- Built in 1965, the latest building assessment found the facility to be in fair condition.
- The facility includes:
  - Five-bay service garage
  - Two salt storage buildings
  - Building with employee spaces
  - Fueling station

The location is the westernmost yard, situated near Highway 6 and in close proximity to an industrial area. Currently, the building is undergoing renovations that include the addition of a new washroom and lunchroom. The yard has ample room for expansion, with the possibility of adding more domes and no restrictions from the conservation authority. However, the use of containers for storage is restricted by county bylaws. There is no sign shop on site, with all signs being ordered out.

F Fueling Station

	Facility Space Analysis (~ area in sq. m.)
	Available[1]
Office / Employee	70
Garage Bays	5 bays
Indoor Storage - Heated	495
Indoor Storage - Unheated	-
Material Storage - Unheated	1,080
Outdoor Storage - Covered	-
Outdoor Storage - Open	4,205
Vehicle Parking	1,108

Facilities, Parks, Cemeteries & Forestry

Haldimand County Caledonia Centre

Haldimand County Caledonia Centre: Aerial View

Address: 100 Haddington Street, Caledonia

20m

Facilities Summary

- Built in 2004, latest assessment found the building to be in good condition.
- The facility includes:
  - Heated indoor storage area

The location was described as suitable for its current use, however, concerns exist regarding its ability to adapt to future development. The location is not heavily used for storage, with the exception of parks and other miscellaneous items.

F Fueling Station

	Facility Space Analysis (~ area in sq. m.)
	Available[1]
Office / Employee	-
Garage Bays	-
Indoor Storage - Heated	429
Indoor Storage - Unheated	-
Material Storage - Unheated	-
Outdoor Storage - Covered	-
Outdoor Storage - Open	-
Vehicle Parking	-

Cayuga Memorial Arena

Cayuga Memorial Arena: Aerial View

Address: 55 Thorburn St S, Cayuga, ON N0A 1E0

20m

Facilities Summary

- The facility includes:
  - 3 Heated Bays
  - Loft currently used for storage with the potential to be transformed into office space

The Cayuga area is notable for its park shop, which was described as the best among all staffed locations. The location also has a heated bay, but lacks outdoor storage. There is a pond and a cemetery shed meant for picnic storage, but no storage for trucks.

F Fueling Station

	Facility Space Analysis (~ area in sq. m.)
	Available[1]
Office / Employee	-
Garage Bays	3 bay
Indoor Storage - Heated	282
Indoor Storage - Unheated	-
Material Storage - Unheated	-
Outdoor Storage - Covered	-
Outdoor Storage - Open	-
Vehicle Parking	-

Hagersville Arena

Hagersville Arena: Aerial View

Address: 36 Sherring Street North, Hagersville

20m

Facilities Summary

- Built in 1958, the latest building assessment found the it to be in fair to good condition.
- The facility includes:
  - Heated indoor storage area

KPMG noted that the space was tight, but works based on the current equipment stored in the facility.

F Fueling Station

	Facility Space Analysis (~ area in sq. m.)
	Available[1]
Office / Employee	-
Garage Bays	-
Indoor Storage - Heated	152
Indoor Storage - Unheated	-
Material Storage - Unheated	-
Outdoor Storage - Covered	-
Outdoor Storage - Open	-
Vehicle Parking	-

Dunnville Cemetery

Dunnville Cemetery: Aerial View

Address: 660 Main Street West, Dunnville

Facilities Summary

- Built in the 1980s, the latest building assessment found the maintenance building to be in fair to good condition, however, some repairs were required immediately.
- The facility includes:
  - Building housing office
  - Heated indoor storage area

The location is currently under consideration for replacement, with a preference for a model similar to Cayuga. The existing structure is recommended for demolition if replaced, although the auxiliary building may be retained for storage purposes. The location serves as an office and storage for park maintenance staff, who also maintain the local cemetery and numerous baseball diamonds in Dunnville. Despite the manageable size and scale of the location, KPMG noted that its age presents challenges. Some equipment, such as trucks, are parked outside due to space constraints, and there are issues with offseason storage of picnic tables. The location operates 24/7, with all pickups parked at this location at night.

F Fueling Station

	Facility Space Analysis (~ area in sq. m.)
	Available[1]
Office / Employee	-
Garage Bays	-
Indoor Storage - Heated	298
Indoor Storage - Unheated	-
Material Storage - Unheated	-
Outdoor Storage - Covered	-
Outdoor Storage - Open	385
Vehicle Parking	-

Challenges with current facilities

Limitations and challenges

KPMG performed site visits at the six identified facilities to assess current space availability, the property line, and limitations with the facilities. KPMG observed that …

KPMG also observed the following key challenges based on the site visits and discussions with County staff:

01

Insufficient space

Many of the sites visited have issues with space, either for parking, storage, or operations. This includes lack of room for turning vehicles, insufficient staff space, and inadequate room for expansion.

02

Aging infrastructure

KPMG noted that several of the facilities have been in use for decades and are at risk of becoming outdated. This can lead to issues with maintenance, efficiency, and safety.

03

Inadequate facilities

KPMG noted that some sites lack necessary facilities such as legal wash areas, proper salt storage, and access to Town/ Municipal water. This can hinder operations and potentially lead to regulatory issues.

04

Environmental concerns

KPMG noted that some sites are facing environmental issues, such as salt storage near water sources and potential contamination from wash areas. These could lead to environmental damage and regulatory violations.

05

Inefficient operations

KPMG noted that there are some inefficiencies in operations due to the locations of the facilities and equipment. This includes long travel times for maintenance and overloading of routes.

06

Uncertain future growth

KPMG noted that there is uncertainty about future growth and development within the County, which could impact the suitability and capacity of current sites. This includes potential population growth, industrial development, and changes in service requirements.

Appendix C: Equipment Overview

Equipment overview

For our analysis, 190 pieces of equipment were included in the activity modeling and allocated space analysis. The remaining balance of equipment from the export of the were excluded from the analysis for reasons of size (e.g., chainsaw). The County's equipment is current stored across six locations with more storage at the four dedicated roads yards. The equipment analyzed includes the following:

Equipment category	Quantity	Equipment category	Quantity	Equipment category	Quantity
Attachment – Ball Diamond Groomer	2	Ice Resurfacer	5	Roller	1
Backhoe	5	Loader	4	Specialized Trailer (Sign Closure)	8
Chipper	2	Loader Attachment – Diamond Boom Mowers	4	Specialized Trailer (Brine)	2
Compact SUV	4	Mower	20	Specialized Trailer (Valve)	1
Flusher/ Vactor	1	One Ton Sign Truck	2	Sweeper	2
Grader	4	Packer	1	Tractor	7
Sidewalk Grinder	2	Pickup Truck	28	Trailer	23
Heavy Duty Truck	46	Pickup Truck (Patrol)	2	Utility Machine	1
Hotbox	4	Pickup Truck (Supervisor)	4	Van	2

Note:
Specialized Trailer includes sign road closure, valve maintenance, and Brine trailers
Heavy Duty Trucks includes ¾ ton pickups, ton pickups, single axle and tandem axle dump plows

For each piece of equipment in the table above, KPMG calculated the floor area required to store that equipment, and assumed 30% or 40% space utilization factor to allow access to stored equipment. Each piece of equipment was also categorized by its ideal storage location, specifically:

- **Indoor Garage Bay**
- **Indoor Heated**
- **Indoor Unheated**
- **Outdoor Covered**
- **Outdoor Open**
- **Parking Space**

Appendix D: Facility Space Requirements

Forecasting Facility Space Requirements

KPMG forecasted the growth in yard space from 2025 to 2051. Based on KPMG's activity modelling, the County will require approximately 4,597 sq. m of additional yard space to accommodate the forecast growth in service delivery resulting from the projected population increase. This increase pertains only to equipment included within the activity modelling (see slide 57 for listing of included equipment). Additional space is required for employee space including parking, lunch rooms and other related spaces (see next slide).

		Forecasted Facility Space Requirements (sq. m)					
Spacing Category	**Current State Space (Sq. m)**	**2025-2030**	**2031-2035**	**2036-2040**	**2041-2045**	**2046-2051**	**Total Space Requirement 2051**
Garage Bays	27 bays	29	29	29	29	29	**(2)**
Indoor Storage – Heated	942	2,870	2,870	2,870	2,870	2,870	**1,928**
Indoor Storage – Unheated	306	902	902	902	902	936	**630**
Outdoor Storage – Covered	76	1,427	1,427	1,427	1,427	1,427	**1,351**
Outdoor Storage – Open	4,383	347	347	347	347	347	**-**
Vehicle Parking	1,740	2,406	2,439	2,505	2,571	2,637	**739**
Material Storage	952	988	1,018	1,048	1,078	1,110	**158**

Forecasting Facility Space Requirements

Current Facility Space Observations

There are two potential drivers for increased yard space. The first is County growth and corresponding increase in service levels (detailed in the above section *Growth in Equipment Utilization*)

The second stems from the potential need for a new facility. This would address current facility shortages, aging infrastructure, and improve operational efficiency by storing more equipment indoors.

In the current state, the *Public Works optimization model* suggests that the County has a shortage of indoor heated and unheated storage and outdoor covered storage area.

In addition, the County is short net 2 garage bays across all facilities. The shortage of garage bays can be attribute to lack of space to store patrol trucks. Typically, roads facilities maintain 1 bay per snow plow route and an additional bay for patrol trucks.

	Current State Facility Space Requirements (sq. m)					
Facility	**Garage Bays**	**Indoor Storage – Heated**	**Indoor Storage – Unheated**	**Outdoor Storage – Covered**	**Outdoor Storage – Open**	**Vehicle Parking**
Cayuga Roads	1	(657)	222	(380)	570	39
Dunnville Roads	1	(549)	(131)	(312)	1,696	84
Oneida Roads	(2)	(518)	(118)	(294)	101	50
Walpole Roads	(2)	(552)	(163)	(210)	1,609	148
Cayuga FPC	-	85	(53)	(78)	(19)	(29)
Caledonia FPC	-	129	(90)	(26)	(38)	-
Hagersville FPC	-	46	(57)	(26)	(19)	(98)
Dunnville FPC	-	89	(70)	(26)	135	(184)
Total	**(2)**	**(1,928)**	**(460)**	**(1,351)**	**4,036**	**9**

Forecasting FTE Requirements

KPMG forecasted the projected increase in labour budgets and employees for each Public Works division from 2025 to 2051. The modeling included mapping budgeted labour expenses to division activities and assigning growth rates to the activities based on anticipated demand increases to determine the future budget and FTEs. Based on the modelling, KPMG identified an increase of just over $1 million in labour costs and 48.5 FTEs across the divisions.

			Forecasted FTE and Budget Requirements	
Division	**Current Labour Budget (000's)**	**Current FTEs**	**2046-2051 Labour Budget (000's)**	**Incremental 2051 FTEs Requirement**
Roads Operations	$2,265.21	53.5	$2,944.77	16 FTE
Facilities, Parks, Cemeteries & Forestry Operations	$3,089.10	67.2	$4,015.83	20.2 FTE
Environmental Operations	$3,836.04	29	$4,986.85	8.7 FTE
Fleet	$1,314.86	12	$1,709.32	3.6 FTE
Total	**$10,505.21**	**161.7**	**$13,656.77**	**48.5 FTE**

Forecasting Facility Space Requirements

KPMG forecasted the growth in employee space at each of the yards pace from 2025 to 2051. Based on KPMG's modelling, all of the roads yards meet the requirements for the employee space through 2051. However, it was noted that some facilities require updates to comply with AODA or to ensure suitable washroom facilities are available for all staff members.

				Forecasted Facility Space Requirements (sq. m)				
Road Yard	**Spacing Category**	**Current Space (sq. m)**	**Actual Requirements (sq. m)**	**2025-2030**	**2031-2035**	**2036-2040**	**2041-2045**	**2046-2051**
Cayuga Road Yard	Locker Room/ Lunchroom	15	76	78	80	82	83	85
	Office Space	20	28	28	28	28	28	28
Dunnville Road Yard	Locker Room/ Lunchroom	90	76	78	80	82	83	85
	Office Space	40	28	28	28	28	28	28
Oneida Road Yard	Locker Room/ Lunchroom	20	76	78	80	82	83	85
	Office Space	30	28	28	28	28	28	28
Walpole Road Yard	Locker Room/ Lunchroom	40	76	78	80	82	83	85
	Office Space	30	28	28	28	28	28	28
	Total	**514**						

Appendix F: Detailed Results of Comparator Analysis

Brant County

Theme	Responses

Overview of Public Works Operations	• The Public Works department manages municipal drains, fleet, parks, community services, and emergency services. They maintain approximately 2,200 lane kilometers of road, and 300 kilometers of municipal drains. The County also maintains over 100 pieces of equipment and has it forecasted on a 10-year interval.
	• The Public Works department is divided geographically among four yards. The County has five Supervisors, one at each yard and one dedicated to the sign program. The County has also an Operations Manager, Fleet Manager, 29 equipment operators, 13 temporary winter staff, two full-time mechanics, one admin, one part-time Municipal Drain Superintendent, and four technologists. The technologists each are responsible for their own assignments. These include:
	  • Traffic technology,
	  • Public engagement for road safety,
	  • Gravel pits, public roads permits, and Municipal consents,
	  • Tendering claims and special projects
	• The department has 29 snow plow routes with each operator responsible for their own route. The County previously contracted out winter control, however, they brought the service back in-house two years ago. They identified the increased insurance costs as a main factor to bringing the service in-house.
	• The County noted that two of the roads yards are in good share with recent upgrades to improve energy efficiency and employee satisfaction (e.g., new lunchroom, etc.). They also noted that the two other yards are antiquated. The County has discussed consolidating the operations into two yards, however, they expressed concerns related to productivity. The County is looking at future development plans that may include a designated area for a sign program and property management staff.
	• The County indicated that they will require additional personnel, equipment, and funding due to growth and increased service expectations.

Technology used to deliver services	• The County transitioned from paper-based systems to digital platforms like MESH from Go-Evo for work order management. These software provide staff with the ability to create workorders in the field and automatically dispatches the workorders to the appropriate yards. The MESH system is also prepopulated with MMS and will identify if the service dates for specific repairs has passed. The MESH program operates on a subscription-based model, with fees assessed on a per-user basis. • The County implemented radar monitoring river levels, independent of the GRCA. • The County uses a software called Field Maps for an inspection program as well as to log pictures and locations of repairs.
Use of AI in operations	• In 2023, the County implemented AI technology from Miovision in traffic signals to adjust timing based on traffic volume, enhancing intersection efficiency. The system allows for remote monitoring and troubleshooting, improving response times during high-traffic situations. • Implemented in 2023, the AI system has shown positive results in managing traffic at critical intersections.

Brant County

Theme	Responses
Impact of Climate Change on Public Works Service Delivery and mitigating actions	• The County indicated that climate change has led to increased flooding risks, prompting the department to adopt proactive stormwater management and drainage programs as well as assess the need for flood mitigation measures, including drainage upgrades. They have also established ongoing maintenance programs for municipal drains to mitigate flooding and improve water management. • The County is performing an annual sign audit and only replacing signs that do not meet MMS to minimize waste.
Strategy for use of Electric Fleet	• The County noted that the by-law department introduced two electric vehicles and the County has installed private chargers for those vehicles. The County has also introduced approximately 10 hybrid SUVs in the by-law and Building departments. These hybrids are solely used for transporting tools and equipment, not towing. They did note concerns regarding the infrastructures ability to handle a significant number of electric vehicles as well as their ability to sustain consistent operations over a longer time period.
Strategies for Traffic Management	• The County has implemented AI technology in traffic signals to improve flow and reduce congestion. They have also built roundabouts that have significantly decreased the number and severity of accidents. The County is also piloting different wireless crosswalk technologies. • Utilizing MESH from Go-Evo for road patrol and maintenance management, integrating various operational standards. • The County has worked with tourism and local cycling clubs to promote bike routes, although dedicated bike lanes have not yet been introduced.

City of Brantford

Theme	Responses
Overview of Public Works Operations	• The City's Public Works department operates out of one central yard facility that also houses all winter materials. The winter maintenance yard has two domes, room for the whole fleet which includes 25 dump trucks, three loaders, four sweepers, and four three-ton plows. The City also noted that this facility is at end-of-life and they have started the process to replace the entire yard. • The City has one winter maintenance contract in place with trucks made available to them, along with a sidewalk and intersection contractor providing skid steers, while additional snow-clearing equipment is retained through a roster system. The operations across Hamilton and Brantford have been simplified, leading to a significant reduction in time spent on routes and deployment, with improvements achieved primarily through operational knowledge rather than technology. • The City indicated that the facility's location is ideal with easy access to the entire City within 15 minutes. However, they noted that the first step to managing boundary expansions and growth will be to move contractors across the river. • The City noted that they employ 43 operators. They also indicated that additional staff will be required to improve service levels and manage upcoming growth. • The City is in the process of designing the new yard, they indicated that the new yard will be built on the existing site. They are also looking to bring in parks maintenance into the yard due to the ability to increase efficiency through the centralized storage of shared equipment. • The City noted that the ROW team manages road permits and oversees road patrol. • The City indicated that they have added staff to manage the technology innovations and have five traffic technologists performing studies as well as managing other technologies.
Technology used to deliver services	• The City utilizes iris for real-time data collection and Cartegraph for building work orders. Iris is integrated with GIS, so all data collected is automatically uploaded. This supports the City in tracking reports and customer service records. • The City is implementing activity-based costing using Cartegraph to analyze costs related to equipment and human resources, aiming to benchmark performance accurately. • The City indicated that they pay a base rate contract for iris and Cartegraph. • The City noted that the challenges is the customization of solutions to effectively meet the needs of both management and customers as well as ensuring communication channels are established and maintained.
Use of AI in operations	• The City implementing iris that is a camera attached to road patrol trucks to track real-time data related to road maintenance.

City of Brantford

Theme	Responses
Impact of Climate Change on Public Works Service Delivery and mitigating actions	• Climate change poses challenges, particularly with increased rainfall and flooding risks. The City has introduced Wastop bells as a second coverage to ensure water is not rushing through storm sewers and is work with the GRCA to model flood scenarios and mitigate the impacts. • The City is initiating drainage inspections and workplans to address water waste throughout the City, particularly concerning the Grand River and its waterways. • The city has a dedicated climate change role focusing on retrofitting buildings and purchasing battery-powered equipment. • The City has installed sensors on some street lights to monitor air and noise quality. • The City is focusing on climate change mitigation by retrofitting buildings and purchasing battery-powered machines, while also considering the cost-effectiveness of options such as batter street sweepers.
Strategy for use of Electric Fleet	• Over the next few years, all supervisor and road patrol vehicles are expected to transition to electric vehicles. The City has also investigated transitioning buses to electric, however, they indicated that this would require them to double their fleet.
Strategies for Traffic Management	• The City indicated that they have completed an active transportation master plan and are trying to introduce more multi-use paths to increase the City's accessibility. • The City is introducing assessments on traffic management which may result in replacing lights with stop signs, installing preemptive lights for emergency services, introducing countdown timers for AODA, battery backups for lights along with the implementation of red light and automated speed cameras. • The City ahs implemented technology that collects speed and car data, such as cameras at intersections, to perform studies and adjust light timings to improve overall traffic flow and safety.

Norfolk County

Theme	Responses
Overview of Public Works Operations	• The County's Public Works operations include routine patrols, pothole repairs, sidewalk inspections, ditching, and sign replacements, however, they do not complete full road reconstructions. They also perform shouldering, maintain all County trees and tree clean up. • The County indicated that the operations are reactive due to a large geographical area, with no set annual programs but a shift towards piloting programs for prioritization. • The County's Public Works operations are split into four areas, each having a yard with staff, and eight satellite locations. The satellite locations are used as storage for equipment, materials, and signage to reduce the travel time for staff. However, the County indicated that many facilities are at their end-of-life, and that the County is currently reviewing their facilities. They have considered consolidating some of the areas to have a primary yard in two areas with additional locations for material storage. • The County indicated that some limitations has led to the current yards not meeting their needs. They noted that the majority of yards have four to five bays, resulting in most equipment being stored outside. They identified the ideal scenario as the introduction of a shop and separate facility for equipment storage. While the shop would not required heating, it would include features such as a hoist. The equipment storage facility would be designed to accommodate vehicles inside. • The County currently has 41 county-managed plow routes and contracts out 20 routes. The County has contracted out the higher priority routes and keeps the lower priority routes in-house. They noted that a review was performed and it was determined that contracting out those routes remains the most cost-effective option. The county-managed routes are serviced using a combination of tandems, single axles, one-tons, and sidewalk machines. They noted that there are only two spares in the fleet, leaving them deficient to manage growth. • The County indicated that every area has two to three loaders. They also identified the need for them to have multiple uses for each machine, this includes implementing brusher heads on loaders. • The County's Operations Division includes the Roads, Parks, Marinas, Facilities, and Fleet.
Technology used to deliver services	• The County indicated that they remain behind on implementing technology. However, they are implementing MESH from Go-Evo in October for road patrol and internal workorders. It is cloud and app based, it will also allow the County to input custom controls and road classifications which will feed into a tracker of services against MMS. MESH is adaptable with a number of modules for different Public Works activities. • The County has also implemented Salesforce that allows the public to direct workorders to staff. They indicated that staff remains hesitant of new technologies. • The County utilized Geotab for fleet management and material tracking. Otherwise, they use Field Maps and GIS to track repairs, inspections, and audits.
Use of AI in operations	• The County has not currently explored the implementation AI for operations.

Norfolk County

Theme	Responses
Impact of Climate Change on Public Works Service Delivery and mitigating actions	• The County identified the increased occurrences of flash freezes and flooding as a result of climate change. This has led to more proactive measures such as pretreating roads with brine and salt. The County previously made their own brine, however they now purchase.
Strategy for use of Electric Fleet	• Currently, there is no formal strategy for an electric fleet; however, the department is piloting a Ford Lightning to assess its viability for different departments. As of now, the pilot was identified as successful for supervisors. The County • The County has acquired some electric chain and pole saws due to improvements in the technology.
Strategies for Traffic Management	• The County identified the implementation of more roundabouts to replace controlled intersections as a method for traffic management. They indicated that this will impact the maintenance plan for some assets. The County is also reducing some driving lanes and including multi-use paths in some capital projects when feasible.

City of Hamilton

Theme	Responses
Overview of Public Works Operations	• The Public Works department is organized under transportation, managed by a Director and a team of approximately 40 staff members managing the budget, processes and day-to-day administration. The Roads department is split into four districts, has one manager, six superintendents, and approximately 320 staff. The department is responsible for the maintenance of roads, sidewalks, and traffic operations. The department manages 879 kilometers of the total 2,400 kilometers of sidewalk in the City. The City also manages 85 snow plow routes, contracting out major highways, and and close to 8,000 metres of snow fencing. • Each of the four districts in the City has a facility, with the exception of one district that has two facilities. The contracted staff work out of two facilities to deploy and service locations. The City also maintains various satellite locations to increase efficiency. They indicated that all facilities are approaching end-of-life, however they have currently only identified one location for future development.
Technology used to deliver services	• The City noted that, while the processes have been digitized, they remain manual. • The City experienced challenges with a cyberattack which contributed to the implementation EAM as a new workorder management system. • The City uses GIS to track assets and repairs. Staff are then able to track the completion of workorders through iPads, which generates a dashboard for management.
Use of AI in operations	• The City is exploring the use of AI to assist with road patrols. They ran a test with one vendor, however they identified issues with how much information was gathered and how it extrapolated data to create reports. This technology utilized a camera phone in a windshield and gathered information through the camera. • The City is also exploring the use of AI for salt management programs that would provide real-time monitoring of salt piles. This would allow the City to accurately estimate stock levels as materials are added or removed.

City of Hamilton

Theme	Responses
Impact of Climate Change on Public Works Service Delivery and mitigating actions	• The City has identified climate change as a significant factor affecting operations, leading to the development of a climate change action plan. • The City has implemented a climate change action plan aimed at reducing its carbon footprint annually, which includes initiatives such as electrifying street sweepers, deploying EV chargers, and increasing funding for ditching and planned treatments. Despite these efforts, the challenges posed by climate change continue to escalate.
Strategy for use of Electric Fleet	• The City has started moving towards electrifying smaller units for sidewalk sweeping. They also started transitioning front line vechicles, such as passenger vehicles, to electric. They noted that service vehicles are currently not viable, however, they do stay up-to-date on innovations in the space and have explored options such as Hyundai Kona and Ford Lighting. • The City indicated that Most facilities have either added charging infrastructure or are in the process of doing so. However, the overall electrical capacity has been a limiting factor. Currently, we have four fast chargers, while the remainder consists of Level 2 chargers.
Strategies for Traffic Management	• The City is looking for Bluetooth to monitor traffic flows and traffic cameras for the winter. • The City is implementing the Vision Zero plan, focusing on vulnerable road users and aligning with active transportation initiatives, which have emerged as significant concerns. The Council has approved a complete streets manual that addresses existing roadway cross-sections, lane narrowing, and enhanced protective measures, although an injury incident highlights the need for ongoing safety improvements and preventive strategies. • The City's traffic management strategies include the implementation of complete streets guidelines, which focus on lane narrowing and increased protection for pedestrians and cyclists. It also includes cyclists, pedestrian and vehicle detection systems (i.e., inductance loops, overhead detection) along with a central traffic control system and related ITS devices to manage traffic signals remotely. This ensures the City is able to accurate monitor traffic and make changes to traffic signals remotely to improve efficiency. However, the City has identified challenges with the maintenance of detection systems and the traffic signal devices. The City has also faced challenges such as road diets that reduce capacity, hindering the integration of complete streets elements like bike lanes and forcing transit to remain in live travel lanes instead of utilizing bus bays.

Niagara Region

Theme	Responses
Overview of Public Works Operations	• The Public Works division encompasses five business units, including Transportation Operations, which is responsible for operations and maintenance of regional roads, small to medium assets, and forestry. • The Region's Roads and Forestry business unit operates out of four facilities with a fifth Public Works Service Centre facility. Two of the facilities are jointly housed by mechanic staff. One of the yards was built 15 years ago and has a new salt dome, the other three yards are older buildings, not compliant with AODA, and reaching their end of life. Currently the Region is investing in a Thorold Yard. This investment includes a renovation that will allow both Road staff and Forestry staff to work within the building, as opposed to the current situation where Forestry staff work out of an on-site trailer. The Region is undertaking a feasibility study to assess whether one facility would be able to house both regional staff and Town of Pelham staff. The Region is looking to understake a similar review for the facility in Smithville and the Town of West Lincoln. • The Region's service delivery philosophy focuses on the maintenance and operations of regional roads, which are impacted by urban growth and changes in road classifications. • The Region performs winter maintenance with their own staff and equipment and contracts specific road network portions such as the City of St. Catharines which the Region contracts out to the City. In all contracts, the contractor is required to have their own facilities close to the routes and are also responsible for maintenance and road patrol. • The Region does not have a formal shared service agreement for the summer, however there are one-off activities performed for ditching and street sweeping. The sidewalk clearing is the responsibility of the municipalities. • The Region employs approximately 84 Roads Operations and Forestry staff which includes six students.
Technology used to deliver services	• The Region utilizes CityWorks for work order and inventory management. It has helped with activity-based budgeting and operational planning since its implementation in 2015. The Region has attached operational costs to assets for better capital planning, however it aces challenges in practically linking time and materials due to cumbersome processes. They aim to enhance their pothole patching strategy by splitting costs across all potholes rather than focusing on individual road segments, while also improving their service request system to transition towards a problem, cause, and remedy approach, with a new road patrol program that integrates seamlessly with CityWorks for efficient work order creation. This program was developed in-house in collaboration with technologists. The goal is to move away from hardcopy processes to processes utilizing QuickCapture on iPads for supervisors, enabling the tracking of line and point data related to asset management. This automation allows for the generation of work orders linked to various deficiencies, such as curb and gutter repairs and tree trimming. Although they initially considered using CityRover to fulfill MMS needs, they opted for a manual observation process to ensure thoroughness in documenting deficiencies. This program also provides the Region with a running total of compliance metrics, specifically focusing on the compliance of the MMS. This includes the development of a deficiency map that categorizes deficiencies by type and geographic area. • The QuickCapture technology is a subscription-based pricing model, with fees determined by the number of users. • The Region also developed dashboards using GIS and Field Maps for condition assessments on small and medium sized assets. • The Region lacks a dedicated technologist to provide critical data insights for informed decision-making, which hinders the ability to proactively leverage data for strategic initiatives. In an effort to resolve this, the Roads Operations is including budget for data management staff in the 2026 budget. They noted that other regions, such as Waterloo, have technologists optimizing salt application rates and analyzing key performance indicators, while this organization lacks similar resources. Addressing this gap is crucial for improving operational efficiency and effectiveness in salt management.

Niagara Region

Theme	Responses
Use of AI in operations	• The Region is leveraging AI through the iris platform to collect sign data for condition assessments and operational planning through a camera on a phone. They are also experimenting with barriers and trees. Following the completion of road patrolling, they are now validating this process for effective data collection, with plans to incorporate Lumineers next. • The Region is facing operational challenges due to increased rainfall, which may not be solely related to maintenance but could involve capacity issues. To address flooding at low points, two new bases have been established at train overpasses, and a machine learning system has been developed in collaboration with Wood to recognize flooding events. This AI technology has undergone beta testing with 99% accuracy in detecting flooding through image uploads, enabling on-call supervisors to receive timely alerts for necessary actions such as pumping, debris removal, or road closures. • The Region identified the utilization of traffic cameras as a next step to improve reporting capabilities, integrating imaging data to assess road conditions prior to response actions, thereby increasing the efficiency of our road response strategies.
Impact of Climate Change on Public Works Service Delivery and mitigating actions	• Increased rainfall and flooding have posed challenges for maintenance and capacity management, necessitating proactive measures and technological solutions.
Strategy for use of Electric Fleet	• The Region's Roads Operations department is in the early stages of transitioning to a green fleet, having already adopted electric small tools such as chainsaws, blowers, and line trimmers. They have piloted the use of electric zero-turn mowers but have not yet implemented electric vehicles for small or pickup trucks, which is an area that Integrated Services is currently developing. There is a recognition of the need for infrastructure to manage this transition effectively, along with an awareness of the associated costs that have not yet been fully addressed.

Wellington County

Theme	Responses
Overview of Public Works Operations	• The County's current staffing includes approximately 60 full-time employees, with an additional 20 to 24 seasonal workers for winter shifts. • The County has initiated a 10-year plan to replace a total of eight garages, with the current replacement being the third since the first was completed in 2012. The timeline for the replacements includes Arthur this year, Erin in 2027, Brucedale in 2029, Harriston in 2031, and Aberfoyle in 2034. Additionally, the Elora garage, built in the 1980s, will undergo refurbishments to extend its lifespan until 2050. • In the new builds, the County is integrating salt and sand storage within the garage facilities, along with interior loading systems to enhance salt management efficiency. Additionally, all garages will feature wash bays and improved employee facilities, addressing the lack of female washrooms in older structures and ensuring compliance with modern standards. • The County based the footprint of a new garage from Huron which has a garage incorporated with a salt and sand barn under one roof. • In an effort to increase the County's full-time complement, it has transitioned from outsourcing grass cutting to managing these activities in-house, resulting in the hiring of an additional ten full-time operators. This shift has eliminated $300,000 in contractor expenses and allowed for the purchase of two trucks, trailers, and mowers, enabling crews to maintain grass throughout the year.
Technology used to deliver services	• The County utilized CityWide for service requests and workorder management. They have found that the system has a number of modules to perform a a variety of activities. One of the modules has provided the County with the ability to track costs more accurately, allowing for better management of work orders and inventory for internal repairs. The system efficiently manages work orders, generates reports that serve as timesheets, and facilitates time approvals. It acts as a double-check mechanism and integrates with 15 accounting software solutions, including JDE and FMW. This comprehensive platform functions as a one-stop shop in the field, ensuring that all processes are streamlined and centralized. This system has also enabled them to provide fleet services to other departments, enhancing efficiency and generating billings, although they acknowledged that the system is not yet perfect. • The County has equipped every vehicle with an iPad that allows for real-time tracking of operations through Geotab, which monitors spinners and the rate of material distribution. Additionally, the vehicles are fitted with forward-facing cameras that record activities, enhancing operational oversight and data collection.
Use of AI in operations	• The County indicated that they have not adopted any AI solutions yet.

Wellington County

Theme	Responses
Impact of Climate Change on Public Works Service Delivery and mitigating actions	• The new garages will incorporate geothermal heating and be constructed using mass timber, reflecting our commitment to sustainable practices, although this approach entails higher costs.
Strategy for use of Electric Fleet	• The County identified two pickups that could be transitioned to electric and hybrid models, which were presented to the Council for approval of a pilot program. While there is support for the pilot, there is some hesitation regarding the transition, with considerations for future alternatives like hydrogen fuel. This strategy has also highlighted the necessary infrastructure requirements for such transitions, prompting further discussions on the best approach moving forward. • The County plans to install three charging units for electric vehicles, with one designated for a fleet vehicle used by nurseries and another at the administration center for general use. Additionally, new garages will feature outdoor charging stations to accommodate future electric vehicle needs.
Strategies for Traffic Management	• The County indicated that it has switched to microwave detection for signalization and moved away from traditional methods. • The County is improving its road inventory by constructing one roundabout ourselves this year and collaborating with the MTO on another, along with two additional roundabouts. A contract has been secured for three more roundabouts next year, focusing on county road intersections to address traffic flow and speeding issues. By implementing roundabouts, the County aims to reduce the severity of collisions and lower vehicle speeds at these critical interfaces. Additionally, while adding roundabouts increases maintenance tasks, the long-term costs are reduced due to decreased liability exposure and the elimination of hydro expenses.

Appendix G:
Raw data export from Optimization Model

Equipment Inventory

Equipment Inventory

The table below outlines equipment in the model. The equipment column reflects the mapping of the equipment based on the County's reference number.

No #. Ref. Code	Equipment Name	KPMG Equipment Mapping	Department	Location	Count
FLE-10b	Loader	Loader	RDS	Dunnville	1
FLE-10b	Loader	Loader	RDS	Walpole	1
FLE-10b	Loader	Loader	RDS	Cayuga	1
FLE-10b	Loader	Loader	RDS	Oneida	1
FLE-12b	Loader/Bhoe	Backhoe	RDS	Walpole	1
FLE-12b	Loader/Bhoe	Backhoe	RDS	Dunnville	1
FLE-12b	Loader/Bhoe	Backhoe	RDS	Cayuga	1
FLE-12b	Loader/Bhoe	Backhoe	RDS	Oneida	1
FLE-13b	Tractor-w/cab	Tractor	RDS	Cayuga	1
FLE-13b	Tractor-w/cab	Tractor	RDS	Walpole	1
FLE-14b	Sweeper/Vac	Sweeper	RDS	Dunnville	1
FLE-14b	Sweeper/Vac	Sweeper	RDS	Oneida	1
FLE-15a	Mower	Mower	RDS	Walpole	1
FLE-15a	Mower	Mower	RDS	Dunnville	1
FLE-15e	Loader Attachment--Diamond boom mower	Loader Attachment - Diamond Boom Mowers	RDS	Walpole	1
FLE-15e	Loader Attachment--Diamond boom mower	Loader Attachment - Diamond Boom Mowers	RDS	Cayuga	1
FLE-15e	Loader Attachment--Diamond boom mower	Loader Attachment - Diamond Boom Mowers	RDS	Dunnville	1
FLE-15e	Loader Attachment--Diamond boom mower	Loader Attachment - Diamond Boom Mowers	RDS	Oneida	1
FLE-16d	Brush Chipper	Chipper	RDS	Oneida	1
FLE-16d	Brush Chipper	Chipper	RDS	Cayuga	1
FLE-20a	Hotbox	Hotbox	RDS	Walpole	1
FLE-20a	Hotbox	Hotbox	RDS	Dunnville	1
FLE-20a	Hotbox	Hotbox	RDS	Oneida	1
FLE-20a	Hotbox	Hotbox	RDS	Cayuga	1
FLE-3c	P-Up-standard 4x4	Pickup Truck	RDS	Oneida	1
FLE-3c	P-Up-standard 4x4	Pickup Truck	RDS	Cayuga	1
FLE-3c	P-Up-standard 4x4	Pickup Truck	RDS	Dunnville	1
FLE-3c	P-Up-standard 4x4	Pickup Truck (Supervisor)	RDS	Walpole	1
FLE-3c	P-Up-standard 4x4	Pickup Truck	RDS	Walpole	1
FLE-3d	P-Up-extended	Pickup Truck (Supervisor)	RDS	Dunnville	1
FLE-3d	P-Up-extended	Pickup Truck (Supervisor)	RDS	Cayuga	1
FLE-3d	P-Up-extended	Pickup Truck (Supervisor)	RDS	Oneida	1

Equipment Inventory

The table below outlines equipment in the model. The equipment column reflects the mapping of the equipment based on the County's reference number.

No #. Ref. Code	Equipment Name	KPMG Equipment Mapping	Department	Location	Count
FLE-3e	P-Up-crew cab	Pickup Truck	RDS	Oneida	1
FLE-3e	P-Up-crew cab	Pickup Truck	RDS	Dunnville	1
FLE-3e	P-Up-crew cab	Pickup Truck	RDS	Walpole	1
FLE-3e	P-Up-crew cab	Pickup Truck	RDS	Dunnville	1
FLE-3e	P-Up-crew cab	Pickup Truck	RDS	Cayuga	1
FLE-3e	P-Up-crew cab	Pickup Truck	RDS	Oneida	1
FLE-3e	P-Up-crew cab	Pickup Truck	RDS	Walpole	1
FLE-3j	P-Up- 4x4 high milage (road patrol)	Pickup Truck (Patrol)	RDS	Cayuga	1
FLE-3j	P-Up- 4x4 high milage (road patrol)	Pickup Truck (Patrol)	RDS	Cayuga	1
FLE-4a	Ton-Sign Truck	One Ton Sign Truck	RDS	Dunnville	1
FLE-4a	Ton-Sign Truck	One Ton Sign Truck	RDS	Walpole	1
FLE-4d	Ton-Crew dual whls	Heavy Duty Truck	RDS	Dunnville	1
FLE-4h	Ton 4x4 with plow / sander	Heavy Duty Truck	RDS	Dunnville	1
FLE-4h	Ton 4x4 with plow / sander	Heavy Duty Truck	RDS	Oneida	1
FLE-4h	Ton 4x4 with plow / sander	Heavy Duty Truck	RDS	Walpole	1
FLE-4h	Ton 4x4 with plow / sander	Heavy Duty Truck	RDS	Oneida	1
FLE-4h	Ton 4x4 with plow / sander	Heavy Duty Truck	RDS	Cayuga	1
FLE-4h	Ton 4x4 with plow / sander	Heavy Duty Truck	RDS	Walpole	1
FLE-4h	Ton 4x4 with plow / sander	Heavy Duty Truck	RDS	Cayuga	1
FLE-5b	S/A-Dump Plow Sander	Heavy Duty Truck	RDS	Cayuga	1
FLE-5b	S/A-Dump Plow Sander	Heavy Duty Truck	RDS	Oneida	1
FLE-5b	S/A-Dump Plow Sander	Heavy Duty Truck	RDS	Dunnville	1
FLE-5b	S/A-Dump Plow Sander	Heavy Duty Truck	RDS	Oneida	1
FLE-5b	S/A-Dump Plow Sander	Heavy Duty Truck	RDS	Walpole	1
FLE-5b	S/A-Dump Plow Sander	Heavy Duty Truck	RDS	Dunnville	1
FLE-5b	S/A-Dump Plow Sander	Heavy Duty Truck	RDS	Oneida	1
FLE-5b	S/A-Dump Plow Sander	Heavy Duty Truck	RDS	Walpole	1
FLE-5b	S/A-Dump Plow Sander	Heavy Duty Truck	RDS	Oneida	1
FLE-5b	S/A-Dump Plow Sander	Heavy Duty Truck	RDS	Oneida	1
FLE-5b	S/A-Dump Plow Sander	Heavy Duty Truck	RDS	Dunnville	1
FLE-5b	S/A-Dump Plow Sander	Heavy Duty Truck	RDS	Walpole	1
FLE-5b	S/A-Dump Plow Sander	Heavy Duty Truck	RDS	Cayuga	1

Equipment Inventory

The table below outlines equipment in the model. The equipment column reflects the mapping of the equipment based on the County's reference number.

No #. Ref. Code	Equipment Name	KPMG Equipment Mapping	Department	Location	Count
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Walpole	1
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Oneida	1
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Oneida	1
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Walpole	1
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Dunnville	1
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Walpole	1
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Dunnville	1
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Oneida	1
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Cayuga	1
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Oneida	1
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Cayuga	1
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Dunnville	1
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Cayuga	1
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Dunnville	1
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Cayuga	1
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Cayuga	1
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Walpole	1
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Cayuga	1
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Dunnville	1
FLE-6c	T/A Dump Plow Sander	Heavy Duty Truck	RDS	Walpole	1
FLE-7a	S/A Trailer	Trailer	RDS	Cayuga	1
FLE-7a	S/A Trailer	Trailer	RDS	Cayuga	1
FLE-7a	S/A Trailer	Trailer	RDS	Walpole	1
FLE-7b	T/A Trailer	Trailer	RDS	Dunnville	1
FLE-7b	T/A Trailer	Trailer	RDS	Dunnville	1
FLE-7b	T/A Trailer	Trailer	RDS	Walpole	1
FLE-7b	T/A Trailer	Trailer	RDS	Oneida	1
FLE-7b	T/A Trailer	Trailer	RDS	Cayuga	1
FLE-7c	Trailer--small float	Trailer	RDS	Dunnville	1
FLE-7d	Trailer-Heavy Float	Trailer	RDS	Oneida	1
FLE-7d	Trailer-Heavy Float	Trailer	RDS	Dunnville	1

Equipment Inventory

The table below outlines equipment in the model. The equipment column reflects the mapping of the equipment based on the County's reference number.

No #. Ref. Code	Equipment Name	KPMG Equipment Mapping	Department	Location	Count
FLE-7f	Trailer-sign road closure	Specialized Equipment (Sign Closure)	RDS	Cayuga	1
FLE-7f	Trailer-sign road closure	Specialized Equipment (Sign Closure)	RDS	Oneida	1
FLE-7f	Trailer-sign road closure	Specialized Equipment (Sign Closure)	RDS	Dunnville	1
FLE-7f	Trailer-sign road closure	Specialized Equipment (Sign Closure)	RDS	Cayuga	1
FLE-7f	Trailer-sign road closure	Specialized Equipment (Sign Closure)	RDS	Walpole	1
FLE-7f	Trailer-sign road closure	Specialized Equipment (Sign Closure)	RDS	Oneida	1
FLE-7f	Trailer-sign road closure	Specialized Equipment (Sign Closure)	RDS	Dunnville	1
FLE-7f	Trailer-sign road closure	Specialized Equipment (Sign Closure)	RDS	Walpole	1
FLE-7h	Trailer-Anti-icing (Brine)	Specialized Equipment (Brine)	RDS	Cayuga	1
FLE-7h	Trailer-Anti-icing (Brine)	Specialized Equipment (Brine)	RDS	Cayuga	1
FLE-8b	Roller--Ride On	Roller	RDS	Walpole	1
FLE-9a	Grader	Grader	RDS	Dunnville	1
FLE-9a	Grader	Grader	RDS	Walpole	1
FLE-9a	Grader	Grader	RDS	Cayuga	1
FLE-9a	Grader	Grader	RDS	Oneida	1
FLE-16j	Side Walk Grinder	Grinder	RDS	Dunnville	1
FLE-16j	Side Walk Grinder	Grinder	RDS	Oneida	1

Equipment Inventory

The table below outlines equipment in the model. The equipment column reflects the mapping of the equipment based on the County's reference number.

No #. Ref. Code	Equipment Name	KPMG Equipment Mapping	Department	Location	Count
FLE-13b	Tractor-w/cab	Tractor	FPC	Caledonia - FPC	1
FLE-13b	Tractor-w/cab	Tractor	FPC	Hagersville - FPC	1
FLE-13b	Tractor-w/cab	Tractor	FPC	Cayuga - FPC	1
FLE-13b	Tractor-w/cab	Tractor	FPC	Dunnville FPC	1
FLE-13c	Tractor	Tractor	FPC	Caledonia - FPC	1
FLE-15a	Mower	Mower	FPC	Caledonia - FPC	1
FLE-15a	Mower	Mower	FPC	Dunnville FPC	1
FLE-15a	Mower	Mower	FPC	Cayuga - FPC	1
FLE-15a	Mower	Mower	FPC	Caledonia - FPC	1
FLE-15a	Mower	Mower	FPC	Hagersville - FPC	1
FLE-15c	Mower	Mower	FPC	Cayuga - FPC	1
FLE-15c	Mower	Mower	FPC	Dunnville FPC	1
FLE-15c	Mower	Mower	FPC	Caledonia - FPC	1
FLE-15c	Mower	Mower	FPC	Cayuga - FPC	1
FLE-15c	Mower	Mower	FPC	Caledonia - FPC	1
FLE-15c	Mower	Mower	FPC	Dunnville FPC	1
FLE-15c	Mower	Mower	FPC	Cayuga - FPC	1
FLE-15c	Mower	Mower	FPC	Caledonia - FPC	1
FLE-15c	Mower	Mower	FPC	Hagersville - FPC	1
FLE-15d	Mower-Gang	Mower	FPC	Caledonia - FPC	1
FLE-15d	Mower-Gang	Mower	FPC	Hagersville - FPC	1
FLE-15d	Mower-Gang	Mower	FPC	Dunnville FPC	1
FLE-16a	Lawn/Att Ball Diamond Groomer	Attachment - Ball Diamond Groomer	FPC	Hagersville - FPC	1
FLE-16a	Lawn/Att Ball Diamond Groomer	Attachment - Ball Diamond Groomer	FPC	Dunnville FPC	1
FLE-22a	Ice Resurfacer	Ice Resurfacer	FPC	Hagersville - FPC	1
FLE-22a	Ice Resurfacer	Ice Resurfacer	FPC	Cayuga - FPC	1
FLE-22a	Ice Resurfacer	Ice Resurfacer	FPC	Dunnville FPC	1
FLE-22b	Ice Resurfacer twin pad	Ice Resurfacer	FPC	Caledonia - FPC	1
FLE-22b	Ice Resurfacer twin pad	Ice Resurfacer	FPC	Caledonia - FPC	1
FLE-2c	Van	Van	FPC	Cayuga - FPC	1
FLE-2c	Van	Van	FPC	Caledonia - FPC	1
FLE-3a	Suv--Compact	Compact SUV	FPC	Caledonia - FPC	1
FLE-3a	Suv--Compact	Compact SUV	FPC	Dunnville FPC	1
FLE-3b	P-Up-standard-	Pickup Truck	FPC	Dunnville FPC	1
FLE-3c	P-Up-standard 4x4	Pickup Truck	FPC	Caledonia - FPC	1

Equipment Inventory

The table below outlines equipment in the model. The equipment column reflects the mapping of the equipment based on the County's reference number.

No #. Ref. Code	Equipment Name	KPMG Equipment Mapping	Department	Location	Count
FLE-3e	P-Up-crew cab	Pickup Truck	FPC	Cayuga - FPC	1
FLE-3e	P-Up-crew cab	Pickup Truck	FPC	Caledonia - FPC	1
FLE-3e	P-Up-crew cab	Pickup Truck	FPC	Hagersville - FPC	1
FLE-3g	P-Up-3/4 ton crew 4x4 with plow/sander	Heavy Duty Truck	FPC	Cayuga - FPC	1
FLE-3g	P-Up-3/4 ton crew 4x4 with plow/sander	Heavy Duty Truck	FPC	Hagersville - FPC	1
FLE-3g	P-Up-3/4 ton crew 4x4 with plow/sander	Heavy Duty Truck	FPC	Dunnville FPC	1
FLE-3g	P-Up-3/4 ton crew 4x4 with plow/sander	Heavy Duty Truck	FPC	Caledonia - FPC	1
FLE-4a	Ton-Sign Truck	One Ton Sign Truck	FPC	Dunnville FPC	1
FLE-4h	Ton 4x4 with plow / sander	Heavy Duty Truck	FPC	Caledonia - FPC	1
FLE-4i	Side Loading Packer	Packer	FPC	Caledonia - FPC	1
FLE-7b	T/A Trailer	Trailer	FPC	Cayuga - FPC	1
FLE-7b	T/A Trailer	Trailer	FPC	Caledonia - FPC	1
FLE-7b	T/A Trailer	Trailer	FPC	Cayuga - FPC	1
FLE-7b	T/A Trailer	Trailer	FPC	Cayuga - FPC	1
FLE-7b	T/A Trailer	Trailer	FPC	Hagersville - FPC	1
FLE-7b	T/A Trailer	Trailer	FPC	Dunnville FPC	1

Equipment Inventory

The table below outlines equipment in the model. The equipment column reflects the mapping of the equipment based on the County's reference number.

No #. Ref. Code	Equipment Name	KPMG Equipment Mapping	Department	Location	Count
FLE-10d	Utility Work Machine	Utility Machine	ENV	ENV	1
FLE-12b	Loader/Bhoe	Backhoe	ENV	ENV	1
FLE-13a	Mower	Mower	ENV	ENV	1
FLE-3a	Suv--Compact	Compact SUV	ENV	ENV	1
FLE-3a	Suv--Compact	Compact SUV	ENV	ENV	1
FLE-3b	P-Up-standard-	Pickup Truck	ENV	ENV	1
FLE-3b	P-Up-standard-	Pickup Truck	ENV	ENV	1
FLE-3b	P-Up-standard-	Pickup Truck	ENV	ENV	1
FLE-3b	P-Up-standard-	Pickup Truck	ENV	ENV	1
FLE-3b	P-Up-standard-	Pickup Truck	ENV	ENV	1
FLE-3c	P-Up-standard 4x4	Pickup Truck	ENV	ENV	1
FLE-3c	P-Up-standard 4x4	Pickup Truck	ENV	ENV	1
FLE-3c	P-Up-standard 4x4	Pickup Truck	ENV	ENV	1
FLE-3c	P-Up-standard 4x4	Pickup Truck	ENV	ENV	1
FLE-3d	P-Up-extended	Pickup Truck	ENV	ENV	1
FLE-3d	P-Up-extended	Pickup Truck	ENV	ENV	1
FLE-3d	P-Up-extended	Pickup Truck	ENV	ENV	1
FLE-4a	One Ton Truck	One Ton Truck	ENV	ENV	1
FLE-4a	One Ton Truck	One Ton Truck	ENV	ENV	1
FLE-4e	Flusher/Vactor	Flusher/ Vactor	ENV	ENV	1
FLE-7a	S/A Trailer	Trailer	ENV	ENV	1
FLE-7a	S/A Trailer	Trailer	ENV	ENV	1
FLE-7a	S/A Trailer	Trailer	ENV	ENV	1
FLE-7b	T/A Trailer	Trailer	ENV	ENV	1
FLE-7b	T/A Trailer	Trailer	ENV	ENV	1
FLE-7b	T/A Trailer	Trailer	ENV	ENV	1
FLE-7g	Trailer-Valve Maintenance	Specialized Trailer	ENV	ENV	1

Activities and Working Days by Division

Activity List and Working Day Assumptions

Based on stakeholder consultations, the following activities and sub-activities were identified for the Roads Operations division. Total working days were validated with each division during stakeholder consultations.

No #.	Division	Activity	Sub-Activity	Total Working Days
Act-01	Roads Operations	Road Safety	Road Patrolling	700
Act-02	Roads Operations	Road Safety	Sign maintenance	288
Act-03	Roads Operations	Road Safety	Guide rails patrol and maintenance	66
Act-04	Roads Operations	Sidewalks and Boulevard Maintenance	Curb and gutter annual inspection and restoration	64
Act-05	Roads Operations	Winter Control	Winter road patrol	699
Act-08	Roads Operations	Road Surface Maintenance	Pothole repairs	943
Act-09	Roads Operations	Road Surface Maintenance	Bridge maintenance	60
Act-10	Roads Operations	Road Drainage Maintenance	Catch basin cleanout and restoration	200
Act-11	Roads Operations	Road Drainage Maintenance	General maintenance	60
Act-12	Roads Operations	Roadside Maintenance	Roadside and urban mowing	269
Act-13	Roads Operations	Roadside Maintenance	Tree brush trimming and removal	100
Act-14	Roads Operations	Roadside Maintenance	Maintenance and reconstructive ditching	100
Act-15	Roads Operations	Roadside Maintenance	Entrance and cross road culvert maintenance	192
Act-16	Roads Operations	Roadside Maintenance	Shoulder maintenance (resurfacing)	58
Act-17	Roads Operations	Roadside Maintenance	Shoulder maintenance (grading)	53
Act-36	Roads Operations	Road Surface Maintenance	Bridge flushing	42
Act-38	Roads Operations	Winter Control	Winter Control and Preparation	215
Act-39	Roads Operations	Parking Lot Maintenance	Parking Lot Maintenance	12
Act-41	Roads Operations	Roadside Maintenance	Street Sweeping	331
Act-42	Roads Operations	Winter Control	Snow Fencing	9

Activity List and Working Day Assumptions

Based on stakeholder consultations, the following activities and sub-activities were identified for the Facilities, Parks, Cemeteries & Forestry Operations division. Total working days were validated with each division during stakeholder consultations.

No #.	Division	Activity	Sub-Activity	Total Working Days
Act-18	Facilities, Parks, Cemeteries, & Forestry Operations	Parks & Parkettes	Parks maintenance	1,040
Act-19	Facilities, Parks, Cemeteries, & Forestry Operations	Parks & Parkettes	Playground equipment maintenance/ inspection	55
Act-20	Facilities, Parks, Cemeteries, & Forestry Operations	Parks & Parkettes	Sport field maintenance (Dunnville)	95
Act-21	Facilities, Parks, Cemeteries, & Forestry Operations	Parks & Parkettes	Sport field maintenance (Caledonia)	19
Act-22	Facilities, Parks, Cemeteries, & Forestry Operations	Parks & Parkettes	Sport field maintenance (Hagersville)	76
Act-23	Facilities, Parks, Cemeteries, & Forestry Operations	Parks & Parkettes	Sport field maintenance (Cayuga)	38
Act-24	Facilities, Parks, Cemeteries, & Forestry Operations	Parks & Parkettes	Trail maintenance	55
Act-25	Facilities, Parks, Cemeteries, & Forestry Operations	Parks & Parkettes	Garbage collection (Parks)	380
Act-26	Facilities, Parks, Cemeteries, & Forestry Operations	Arenas	Arenas	2,000
Act-27	Facilities, Parks, Cemeteries, & Forestry Operations	Pools	Pools	70
Act-28	Facilities, Parks, Cemeteries, & Forestry Operations	Pools	Splash pad maintenance	112
Act-29	Facilities, Parks, Cemeteries, & Forestry Operations	County Facilities	Facility maintenance	600
Act-30	Facilities, Parks, Cemeteries, & Forestry Operations	Cemeteries	Cemetery maintenance	468
Act-31	Facilities, Parks, Cemeteries, & Forestry Operations	Cemeteries	Cemetery maintenance (Cayuga)	120
Act-37	Facilities, Parks, Cemeteries, & Forestry Operations	Forestry	Forestry	520

Activity List and Working Day Assumptions

Based on stakeholder consultations, the following activities and sub-activities were identified for the Environmental Operations division. Total working days were validated with each division during stakeholder consultations.

No #.	Division	Activity	Sub-Activity	Total Working Days
Act-32	Environmental Operations	Urban Storm Sewer	Urban Storm Sewer	18
Act-33	Environmental Operations	Solid Waste Collection/ Disposal/ Reduction	Solid Waste Collection/ Disposal/ Reduction	520
Act-34	Environmental Operations	Water distribution	Water distribution	1,040
Act-35	Environmental Operations	Wastewater collection	Wastewater collection	1,040

Equipment and Activity Mapping by Division

Equipment Mapping

In the table below, KPMG mapped the required equipment to complete each activity. The equipment mapping was validated with each division during stakeholder consultations.

KPMG Equipment Mapping	Activity	Sub-Activity	Actual Equipment Working Days
Pickup Truck (Patrol) - RDS	Road Safety	Road Patrolling	700
Pickup Truck - RDS	Road Safety	Sign maintenance	288
Pickup Truck - RDS	Road Safety	Guide rails patrol and maintenance	66
Pickup Truck - RDS	Sidewalks and Boulevard Maintenance	Curb and gutter annual inspection and restoration	64
Grinder - RDS	Sidewalks and Boulevard Maintenance	Curb and gutter annual inspection and restoration	64
One Ton Sign Truck - RDS	Winter Control	Winter road patrol	699
Heavy Duty Truck - RDS	Road Surface Maintenance	Pothole repairs	943
Hotbox - RDS	Road Surface Maintenance	Pothole repairs	236
Heavy Duty Truck - RDS	Road Surface Maintenance	Bridge maintenance	60
Hotbox - RDS	Road Surface Maintenance	Bridge maintenance	15
Heavy Duty Truck - RDS	Road Surface Maintenance	Bridge flushing	42
Trailer - RDS	Road Surface Maintenance	Bridge flushing	42
Heavy Duty Truck - RDS	Road Drainage Maintenance	Catch basin cleanout and restoration	200
Pickup Truck - RDS	Road Drainage Maintenance	General maintenance	60
Pickup Truck - RDS	Road Drainage Maintenance	General maintenance	60
Trailer - RDS	Road Drainage Maintenance	General maintenance	60
Backhoe - RDS	Road Drainage Maintenance	General maintenance	60
Tractor - RDS	Roadside Maintenance	Roadside and urban mowing	269
Pickup Truck - RDS	Roadside Maintenance	Roadside and urban mowing	269
Backhoe - RDS	Roadside Maintenance	Tree brush trimming and removal	100
Pickup Truck - RDS	Roadside Maintenance	Tree brush trimming and removal	100
Heavy Duty Truck - RDS	Roadside Maintenance	Maintenance and reconstructive ditching	100
Heavy Duty Truck - RDS	Roadside Maintenance	Maintenance and reconstructive ditching	100
Backhoe - RDS	Roadside Maintenance	Maintenance and reconstructive ditching	100
Pickup Truck - RDS	Roadside Maintenance	Maintenance and reconstructive ditching	100
Trailer - RDS	Roadside Maintenance	Maintenance and reconstructive ditching	100
Heavy Duty Truck - RDS	Roadside Maintenance	Entrance and cross road culvert maintenance	192
Heavy Duty Truck - RDS	Roadside Maintenance	Entrance and cross road culvert maintenance	192

Equipment Mapping

In the table below, KPMG mapped the required equipment to complete each activity. The equipment mapping was validated with each division during stakeholder consultations.

KPMG Equipment Mapping	Activity	Sub-Activity	Actual Equipment Working Days
Backhoe - RDS	Roadside Maintenance	Shoulder maintenance (resurfacing)	58
Pickup Truck - RDS	Roadside Maintenance	Shoulder maintenance (resurfacing)	58
Trailer - RDS	Roadside Maintenance	Shoulder maintenance (resurfacing)	58
Grader - RDS	Roadside Maintenance	Shoulder maintenance (grading)	53
Pickup Truck - RDS	Winter Control	Winter Control and Preparation	215
Pickup Truck - RDS	Parking Lot Maintenance	Parking Lot Maintenance	12
Pickup Truck - RDS	Parking Lot Maintenance	Parking Lot Maintenance	12
Trailer - RDS	Parking Lot Maintenance	Parking Lot Maintenance	12
Pickup Truck - RDS	Roadside Maintenance	Hot Mix Patching/ Padding - Roads and Culverts	-
Trailer - RDS	Roadside Maintenance	Hot Mix Patching/ Padding - Roads and Culverts	-
Heavy Duty Truck - RDS	Roadside Maintenance	Street Sweeping	331
	Winter Control	Ice Blading	-
Pickup Truck - RDS	Winter Control	Snow Fencing	9

Equipment Mapping

In the table below, KPMG mapped the required equipment to complete each activity. The equipment mapping was validated with each division during stakeholder consultations.

KPMG Equipment Mapping	Activity	Sub-Activity	Actual Equipment Working Days
Pickup Truck - FPCF	Parks & Parkettes	Parks maintenance	1,040
Mower - FPCF	Parks & Parkettes	Parks maintenance	1,040
Pickup Truck - FPCF	Parks & Parkettes	Playground equipment maintenance/ inspection	55
Pickup Truck - FPCF	Parks & Parkettes	Sport field maintenance (Dunnville)	95
Trailer - FPCF	Parks & Parkettes	Sport field maintenance (Dunnville)	95
Mower - FPCF	Parks & Parkettes	Sport field maintenance (Dunnville)	95
Attachment - Ball Diamond Groomer - FPCF	Parks & Parkettes	Sport field maintenance (Dunnville)	95
Tractor - FPCF	Parks & Parkettes	Sport field maintenance (Dunnville)	95
Pickup Truck - FPCF	Parks & Parkettes	Sport field maintenance (Caledonia)	19
Trailer - FPCF	Parks & Parkettes	Sport field maintenance (Caledonia)	19
Mower - FPCF	Parks & Parkettes	Sport field maintenance (Caledonia)	19
Attachment - Ball Diamond Groomer - FPCF	Parks & Parkettes	Sport field maintenance (Caledonia)	19
Tractor - FPCF	Parks & Parkettes	Sport field maintenance (Caledonia)	19
Pickup Truck - FPCF	Parks & Parkettes	Sport field maintenance (Hagersville)	76
Trailer - FPCF	Parks & Parkettes	Sport field maintenance (Hagersville)	76
Mower - FPCF	Parks & Parkettes	Sport field maintenance (Hagersville)	76
Attachment - Ball Diamond Groomer - FPCF	Parks & Parkettes	Sport field maintenance (Hagersville)	76
Tractor - FPCF	Parks & Parkettes	Sport field maintenance (Hagersville)	76
Pickup Truck - FPCF	Parks & Parkettes	Sport field maintenance (Cayuga)	38
Trailer - FPCF	Parks & Parkettes	Sport field maintenance (Cayuga)	38
Mower - FPCF	Parks & Parkettes	Sport field maintenance (Cayuga)	38
Attachment - Ball Diamond Groomer - FPCF	Parks & Parkettes	Sport field maintenance (Cayuga)	38
Trailer - FPCF	Parks & Parkettes	Sport field maintenance (Cayuga)	38
Pickup Truck - FPCF	Parks & Parkettes	Trail maintenance	55
Mower - FPCF	Parks & Parkettes	Trail maintenance	55
Trailer - FPCF	Parks & Parkettes	Trail maintenance	55
Pickup Truck - FPCF	Parks & Parkettes	Garbage collection (Parks)	380
Heavy Duty Truck - FPCF	Parks & Parkettes	Garbage collection (Parks)	380
Heavy Duty Truck - FPCF	Parks & Parkettes	Garbage collection (Parks)	380
Pickup Truck - FPCF	Pools	Pools	70
Pickup Truck - FPCF	Pools	Splash pad maintenance	112
Van - FPCF	County Facilities	Facility maintenance	180
Mower - FPCF	Cemeteries	Cemetery maintenance	468
Trailer - FPCF	Cemeteries	Cemetery maintenance	468
Heavy Duty Truck - FPCF	Cemeteries	Cemetery maintenance	468
Mower - FPCF	Cemeteries	Cemetery maintenance (Cayuga)	120
Trailer - FPCF	Cemeteries	Cemetery maintenance (Cayuga)	120
Heavy Duty Truck - FPCF	Cemeteries	Cemetery maintenance (Cayuga)	120
Pickup Truck - FPCF	Forestry	Forestry	130

Equipment Mapping

In the table below, KPMG mapped the required equipment to complete each activity. The equipment mapping was validated with each division during stakeholder consultations.

KPMG Equipment Mapping	Activity	Sub-Activity	Actual Equipment Working Days
Pickup Truck - ENV	Urban Storm Sewer	Urban Storm Sewer	18
Pickup Truck - ENV	Solid Waste Collection/ Disposal/ Reduction	Solid Waste Collection/ Disposal/ Reduction	520
Pickup Truck - ENV	Solid Waste Collection/ Disposal/ Reduction	Solid Waste Collection/ Disposal/ Reduction	520
Backhoe - ENV	Solid Waste Collection/ Disposal/ Reduction	Solid Waste Collection/ Disposal/ Reduction	520
Utility Machine - ENV	Solid Waste Collection/ Disposal/ Reduction	Solid Waste Collection/ Disposal/ Reduction	520
Pickup Truck - ENV	Water distribution	Water distribution	1,040
Pickup Truck - ENV	Wastewater collection	Wastewater collection	1,040

Projected Growth

Projected Growth

The table below outlines the projected growth that was applied to each of the in-scope activities. Growth in working days is based on projections by the County's Planning division.

Department	Activity	Sub-Activity	Base	2025-2030	2031-2035	2036-2040	2041-2045	2046-2051
Roads Operations	Road Safety	Road Patrolling	700	4%	7%	10%	13%	17%
Roads Operations	Road Safety	Sign maintenance	288	4%	7%	10%	13%	17%
Roads Operations	Road Safety	Guide rails patrol and maintenance	66	4%	7%	10%	13%	17%
Roads Operations	Sidewalks and Boulevard Maintenance	Curb and gutter annual inspection and restoration	64	4%	7%	10%	13%	17%
Roads Operations	Winter Control	Winter road patrol	699	4%	7%	10%	13%	17%
Roads Operations	Road Surface Maintenance	Pothole repairs	943	4%	7%	10%	13%	17%
Roads Operations	Road Surface Maintenance	Bridge maintenance	60	4%	7%	10%	13%	17%
Roads Operations	Road Drainage Maintenance	Catch basin cleanout and restoration	200	4%	7%	10%	13%	17%
Roads Operations	Road Drainage Maintenance	General maintenance	60	4%	7%	10%	13%	17%
Roads Operations	Roadside Maintenance	Roadside and urban mowing	269	4%	7%	10%	13%	17%
Roads Operations	Roadside Maintenance	Tree brush trimming and removal	100	4%	7%	10%	13%	17%
Roads Operations	Roadside Maintenance	Maintenance and reconstructive ditching	100	4%	7%	10%	13%	17%
Roads Operations	Roadside Maintenance	Entrance and cross road culvert maintenance	192	4%	7%	10%	13%	17%
Roads Operations	Roadside Maintenance	Shoulder maintenance (resurfacing)	58	4%	7%	10%	13%	17%
Roads Operations	Roadside Maintenance	Shoulder maintenance (grading)	53	4%	7%	10%	13%	17%
Roads Operations	Road Surface Maintenance	Bridge flushing	42	4%	7%	10%	13%	17%
Roads Operations	Winter Control	Winter Control and Preparation	215	0%	0%	0%	0%	0%
Roads Operations	Parking Lot Maintenance	Parking Lot Maintenance	12	0%	0%	0%	0%	0%
Roads Operations	Roadside Maintenance	Street Sweeping	331	4%	8%	11%	15%	19%
Roads Operations	Winter Control	Snow Fencing	9	0%	0%	0%	0%	0%

Projected Growth

The table below outlines the projected growth that was applied to each of the in-scope activities. Growth in working days is based on projections by the County's Planning division.

Department	Activity	Sub-Activity	Base	2025-2030	2031-2035	2036-2040	2041-2045	2046-2051
Facilities, Parks, Cemeteries, & Forestry Operations	Parks & Parkettes	Parks maintenance	1,040	4%	7%	10%	13%	17%
Facilities, Parks, Cemeteries, & Forestry Operations	Parks & Parkettes	Playground equipment maintenance/ inspection	55	4%	7%	10%	13%	17%
Facilities, Parks, Cemeteries, & Forestry Operations	Parks & Parkettes	Sport field maintenance (Dunnville)	95	4%	7%	10%	13%	17%
Facilities, Parks, Cemeteries, & Forestry Operations	Parks & Parkettes	Sport field maintenance (Caledonia)	19	4%	7%	10%	13%	17%
Facilities, Parks, Cemeteries, & Forestry Operations	Parks & Parkettes	Sport field maintenance (Hagersville)	76	4%	7%	10%	13%	17%
Facilities, Parks, Cemeteries, & Forestry Operations	Parks & Parkettes	Sport field maintenance (Cayuga)	38	4%	7%	10%	13%	17%
Facilities, Parks, Cemeteries, & Forestry Operations	Parks & Parkettes	Trail maintenance	55	11%	19%	28%	37%	47%
Facilities, Parks, Cemeteries, & Forestry Operations	Parks & Parkettes	Garbage collection (Parks)	380	4%	7%	10%	13%	17%
Facilities, Parks, Cemeteries, & Forestry Operations	Arenas	Arenas	2,000	0%	0%	0%	0%	0%
Facilities, Parks, Cemeteries, & Forestry Operations	Pools	Pools	70	0%	0%	0%	0%	0%
Facilities, Parks, Cemeteries, & Forestry Operations	Pools	Splash pad maintenance	112	0%	0%	0%	0%	0%
Facilities, Parks, Cemeteries, & Forestry Operations	County Facilities	Facility maintenance	600	50%	92%	133%	175%	225%
Facilities, Parks, Cemeteries, & Forestry Operations	Cemeteries	Cemetery maintenance	468	4%	7%	10%	13%	17%
Facilities, Parks, Cemeteries, & Forestry Operations	Cemeteries	Cemetery maintenance (Cayuga)	120	4%	7%	10%	13%	17%
Environmental Operations	Urban Storm Sewer	Urban Storm Sewer	18	4%	8%	11%	15%	19%
Environmental Operations	Solid Waste Collection/ Disposal/ Reduction	Solid Waste Collection/ Disposal/ Reduction	520	10%	18%	26%	34%	43%
Environmental Operations	Water distribution	Water distribution	1,040	11%	19%	28%	37%	47%
Environmental Operations	Wastewater collection	Wastewater collection	1,040	11%	19%	28%	37%	47%
Facilities, Parks, Cemeteries, & Forestry Operations	Forestry	Forestry	520	4%	8%	11%	15%	19%

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