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The Regional Municipality of

Durham

Review of Underground
Locates Request Function

December 2022



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We confirm that all professional staff assigned to this engagement prepared this report acting independently and objectively. To the best of our knowledge, we have no conflicts of interest.

The feedback and information contained in this report is based on commentary provided in the consultation sessions. No responsibility is assumed for the accuracy of information furnished by others.

The report has also been developed in compliance with AODA guidelines. Figures are linked to additional image descriptions in Appendix E.



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Executive Summary

The Regional Municipality of Durham (the "**Region**") is conducting a review of its service delivery model for responding to an Underground Locate Request ("**ULR**"). ULRs are used by construction project owners and excavators to identify underground infrastructure that they may be interacting with and to prevent damage. Project owners are legislated by the Ontario Underground Infrastructure Notification System Act ("**OUIINS Act**") to submit a ULR to Ontario One Call ("**ON1Call**"), an organization that routes ULRs to its members. Members include the owners of underground infrastructure. The Region is a member of ON1Call and is required by the Legislation to submit a locate back to the project owner within five business days. A locate is documentation that identifies underground infrastructure.

Due to population growth and development throughout the Region, ULR volume has been increasing over the last several years and is continuing to increase. Additionally, the OUIINS Act has recently been amended to provide alternative processes for large infrastructure projects, and formally penalize any non-compliance using fines.

In this environment, the Region is concerned with: (1) maintaining compliance with Legislation as ULR volumes increase and (2) conducting other operations-as-usual asset maintenance, as shortage of staff caused the Region to reallocate resources from day-to-day activities to respond to ULRs.

Current State Review

The review consisted of desktop research and consultations with internal stakeholders in the Region to document the current state service delivery model and identify challenges, best-practices, and areas for improvement required for development of future state operating model. The current process through which the Region services ULRs can be found in Section 2 and Appendix A of this report.

In the current service delivery model, four themes were identified in the stakeholder consultations:

1. **Planning:** Current processes do not involve detailed planning to address the unpredictable flow of ULRs.
2. **Staffing:** The Region has a limited pool of staff to conduct ULRs.
3. **Process Standardization:** Processes for locates are not standardized, limiting the ability of the Region to complete ULRs efficiently and reducing the quality of locates.
4. **Information Technology ("IT") Integration:** Staggered implementation of software tools for servicing ULRs has created inefficiency in completing ULRs within the legislated timeframe.

Municipal Benchmarking

The benchmarking review included consultations with municipalities that have similar ULR functions to compare service delivery models and share any operational lessons. The Ontario locates industry was also analyzed to identify operational trends. Comparable municipalities and the wider locates industry are experiencing the same pressures caused by increasing ULR volumes and the changes in legislation. Further details on findings and applicable lessons learned from this outreach are provided in Section 5 of this report.

Target State

In consultation with the Region, a target state was defined to align ULR current state with the Region's objectives. The target state was defined as follows:

The Region will have a standardized and fully staffed ULR service delivery that operates in compliance with legislative requirements and considers damage prevention.

There were two overarching objectives for the proposed target state:

1. The Region will be compliant with Legislation to minimize penalties and enhance asset damage prevention through the timely provision of locates.
2. The “operations as usual” (e.g., maintenance activities and repairs) for the Region’s Works Department will not be compromised to achieve compliance.

Five opportunities for improvement were identified to achieve the target state. Each of these improvement opportunities included individual recommendations to support the Region to implement the target state. The table below summarizes each opportunity for improvement, the recommendations, and the section of the report where additional details and considerations can be found.

	Opportunity for Improvement	Recommendation	Details
1	Balance Legislation compliance with Works Department operations as usual to minimize penalties	1. Establish a centralized group within the Region’s Works Department, that is focused on locates, asset damage prevention and any other responsibilities in the Legislation and Amendments.	Section 7.1.1
2	Allocate adequate staffing/ resourcing levels to address availability concerns and locate requests volume	2. Hire an adequate number of resources to service the Region’s volume of locates within the legislated, five-day compliance timeframe.	Section 7.2.1
		3. Hire Damage Prevention Technicians to complete both water and wastewater locates and traffic signals locates.	Section 7.2.2
3	Define and implement standardized locate processes to improve efficiency and consistency of service delivery	4. Refine the current training program for locators to include more regular and standardized learning opportunities.	Section 7.3.1
		5. Develop a standardized process for completing locates and develop standard operating procedures (“SOPs”).	Section 7.3.2
		6. Develop a Key Performance Indicator (“KPI”) regime that aligns with the Region’s objectives and locates processes.	Section 7.3.3
4	Utilize continuous improvements to improve standard processes and customize systems and software	7. Identify and implement any further customizations to Maximo to align with current locates service delivery model.	Section 7.4.1
		8. Procure a locates management software to improve compliance and increase service delivery model efficiency.	Section 7.4.2
		9. Initiate a process improvement working group to regularly evaluate the Region’s ULR service delivery process and SOPs and suggest areas for improvement.	Section 7.4.3
5	Improve integration and relationship with ON1Call and other agencies to normalize locates volume and capitalize benefits of membership	10. Increase structured collaboration with industry (e.g., contractors, developers and ON1Call).	Section 7.5.1

The recommendations were ranked by evaluating the relative effort for implementation and impact on service delivery. Further details about evaluation framework for analysis and results are provided in Section 7 of this report. In summary, it was concluded that:

1. Creating a centralized group for damage prevention can have the greatest impact but will require a large investment.
2. Hiring more staff, investing in development of skills in damage prevention, and improving ULR processes within a working group can have a great impact and requires less investment.

1. Introduction

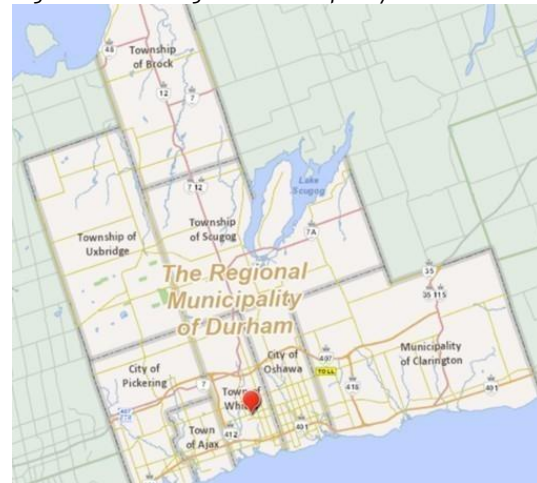
1.1 Background

The Regional Municipality of Durham (the “Region” and “Durham”) contains eight unique area municipalities with a mix of urban and rural areas over 2,500 km². The Region’s eight municipalities are outlined in Figure 1.

The population of the Region is nearly 700,000 as of 2021 and has grown significantly since the 1990s. In the ten years between 2008 and 2018, the Region experienced a population increase of nearly 13%. More specifically, the area municipalities including Ajax, Oshawa, and Whitby saw population growth rates of 22%, 14%, and 12% respectively¹.

To address this population growth, the Region has outlined an aggressive development action plan which introduces new housing and other infrastructure construction projects across its communities.

Figure 1: The Regional Municipality of Durham



1.1.1 The Legislation of Underground Locate Requests

Most construction projects require excavation. In Ontario, excavation may not commence before first obtaining a locate, which is documentation outlining all underground infrastructure that may be affected by the proposed excavation. Obtaining a locate prior to completing an excavation is a legislated requirement. In 2012, the Ontario Underground Infrastructure Notification System Act (“OUINS Act” or the “Legislation”) was enacted to specify the process for obtaining a locate. The Legislation also outlines the roles and responsibilities of the various stakeholders in a construction project excavation, including the project owner, excavators or diggers, and utility owners.

Under the Legislation, the Region is a utility owner. The Region receives underground locate requests (“ULRs”) for their water, wastewater, and traffic signals infrastructure. The Legislation requires the Region to process ULRs and provide underground infrastructure information in a timely manner which can minimize service interruptions, enhance safety, and prevent costly damages to critical underground infrastructure. The requirement for responding to most ULRs (i.e., standard ULRs) is five business days.

¹ Durham Region Health Department Population at a Glance: <https://www.durham.ca/en/health-and-wellness/resources/Documents/HealthInformationServices/HealthStatisticsReports/Population-at-a-Glance.pdf>

The process for obtaining a locate is shown in [Figure 2](#). A project owner (e.g., homeowner or developer) will submit an ULR through Ontario One Call (“**ON1Call**”). ON1Call is the single point of contact for all underground infrastructure locate requests in Ontario and the only entity capable of providing locate notification services. The request is then received by a locator, who works for a utility owner, and is responsible for identifying the buried infrastructure in a locate. Once the locate is completed and transmitted to the project owner, they are cleared to excavate.

Figure 2: ON1Call process for obtaining a locate ([View image description](#))



In April 2022, the OUIINS Act was amended by Bill 93, *An Act to amend the Building Broadband Faster Act, 2021 and the Ontario Underground Infrastructure Notification System Act, 2012* (“**Bill 93**” or the “**Amendments**”). The Amendments were intended to address late locates, an ongoing challenge throughout the industry, and other concerns as the provincial government and the construction industry embarked on significant infrastructure projects in the high-speed internet and transit sectors.

1.1.2 Summary of the Region’s Current Locates Service Delivery Model

The Transportation and Field Services Branch of the Region’s Works Department responds to ULRs. This includes providing locates for underground water, wastewater, and traffic signals infrastructure². Currently, locates are completed exclusively by Region Works Department staff. The total annual operating budget for processing ULRs related to water, wastewater and traffic infrastructure is approximately \$1.3 million (2022 approved budget).

The Region allocates responsibility for water and wastewater ULRs by location. The five Works Department Maintenance Depots each have staff that complete locates. The five depots are listed below, and their relative locations are shown in [Figure 3](#):

- ▶ Ajax/Pickering Depot
- ▶ Oshawa/Whitby Depot
- ▶ Orono Depot
- ▶ Sunderland Depot
- ▶ Scugog Depot

ULRs related to the Region’s traffic infrastructure are fulfilled separately out of the Traffic Field Services Depot.

Figure 3: Durham Region Water and Wastewater Maintenance Depots [view image description](#)



² Current asset inventory owned by the Region in this regard includes approximately 2,600 kilometres of watermains, 2,250 kilometres of sanitary sewers, 3,610 kilometres of stormwater sewers, 650 signalized intersections, and related infrastructure (i.e., manholes, chambers, conduits, fibre, etc.).

The process of preparing a locate includes reviewing the parameters of the ULRs; reviewing as-built drawings; scheduling field verification, including allocation of required fleet and equipment; undertaking field locating of buried assets utilizing appropriate equipment (e.g., electromagnetic utility locators); marking the underground assets to required spatial accuracy; and providing the locate information in an appropriate format to the requesting party.

The Region has recently implemented a software tool for automating and optimizing the completion of locates. The software is an Enterprise Maintenance Management System and is based in the IBM Maximo Application Suite (“**Maximo**”). The Region created a custom module within Maximo to assist locators in planning and completing locates.

1.2 Scope of the Review

The Region is conducting a review of the end-to-end process for completing locates. The review is being conducted in preparation of the aforementioned rapid development growth which is putting pressure on the Region’s ability to deliver ULR services.

The review aims to achieve the following objectives:

- ▶ Identify improvement opportunities in the Region’s current ULR service delivery model
- ▶ Clarify potential benefits that could be gained from implementation of the identified opportunities

1.3 Methodology for Conducting the Review

The review included a combination of desktop research of information provided by the Region, and interviews with stakeholders to map a current state process model. The current state model was then analyzed to identify opportunities for improvement.

Concurrently, the Region provided insight as to what the objectives of a future, target state for the ULR service delivery model would comprise. These objectives, combined with the opportunities for improvement were combined to develop recommendations that the Region could implement to achieve its target state.

[Figure 4](#) includes a description of the phases, objectives and activities used to deliver the review.

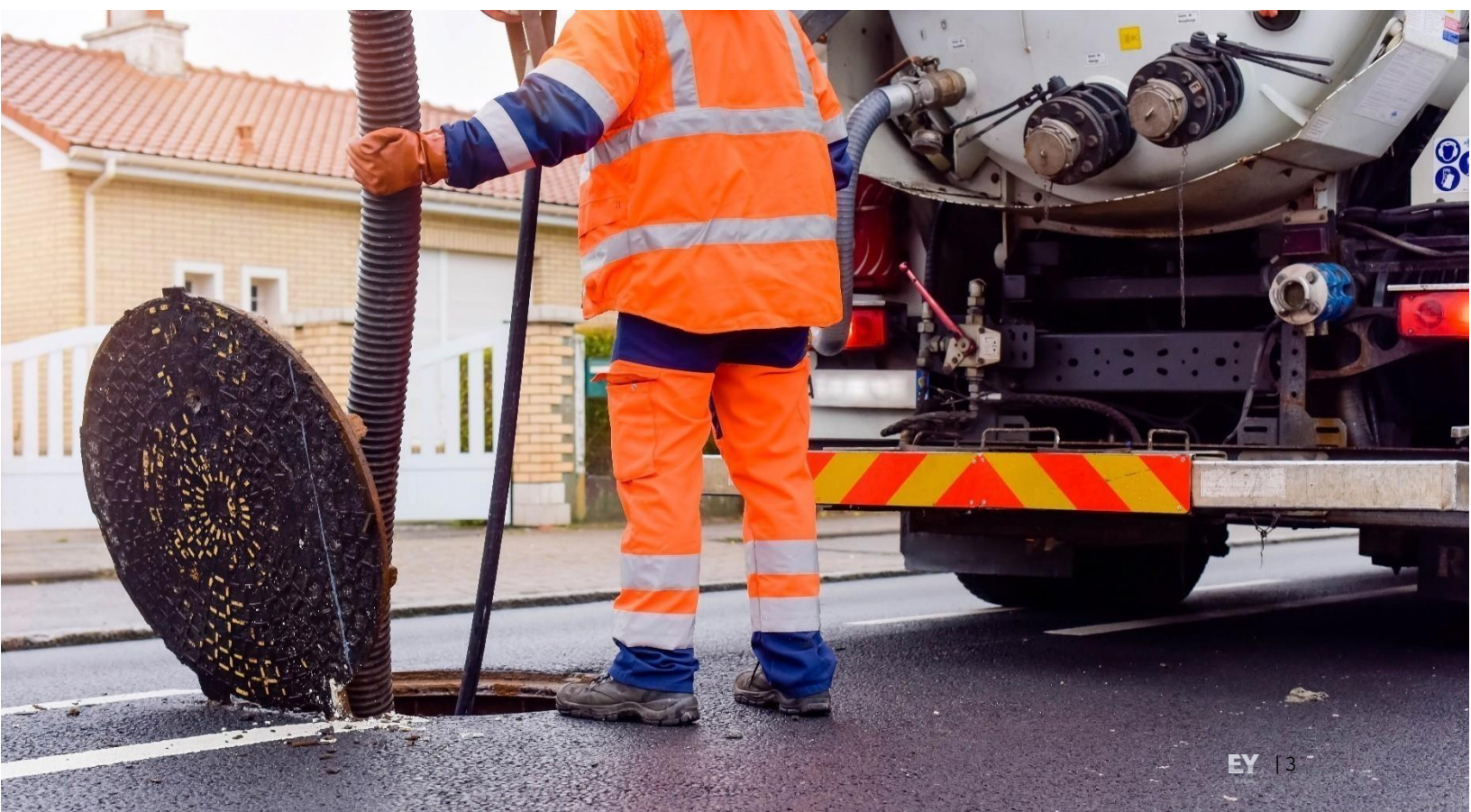


Figure 4: Methodology for Conducting the Review ([View image description](#))

	Assessment & Validation	Process Analysis	Recommendation & Next Steps
	<ul style="list-style-type: none"> Review existing planning processes and organizational structure Gain an understanding of the current state of Utility Locate Request (ULR) process and organizational capabilities Validate current state assessment findings through stakeholder consultation Complete best practices study using available data Document current process for Utility Locate Request services 	<ul style="list-style-type: none"> Review process map and other information received and complete results in a process analysis Identify a target state for the Region's ULR function Identify opportunities to improve existing process and focus areas to meet the target state Discuss identified opportunities and prepare a final list of improvement opportunities Document potential benefits derived by implementation of improvement opportunities 	<ul style="list-style-type: none"> Prepare a final report including existing process maps and opportunities for improving current process (40-pages maximum) Prepare an executive summary based on the findings of the review
Activities	<p>ULR request current state assessment:</p> <ul style="list-style-type: none"> Review existing planning processes Identify key strengths/weaknesses of the current process Document existing planning and execution processes in detailed process maps <p>Stakeholder engagement:</p> <ul style="list-style-type: none"> Validate process mapping and assessment results Collect point of view on the stakeholder landscape Discuss potential improvements and obtain feedback from various stakeholder groups <p>Benchmarking:</p> <ul style="list-style-type: none"> Identify key performance metrics from the Region and validate via research and stakeholder interviews Identify comparable two-tier municipalities and agencies Complete best practices study using available data <p>Reporting:</p> <ul style="list-style-type: none"> Document current process for ULR services Categorize strengths and weaknesses into focus areas 	<p>Analysis:</p> <ul style="list-style-type: none"> Identify key assessment measures, e.g. level of effort, impact on operations and compliance Complete the process analysis activities and discuss the results with the Region <p>Improvement Opportunities</p> <ul style="list-style-type: none"> Develop shortlist list of potential improvement opportunities and how they target the focus areas Review existing efficiency improvement initiatives at the Region to design a set of recommendations that is aligned with the existing objectives <p>Reporting:</p> <ul style="list-style-type: none"> Validate the target state with the Region Report final list of improvement opportunities after consultation with the Region Develop one-page summary that summarizes the opportunities 	<p>Develop final recommendations:</p> <ul style="list-style-type: none"> Develop a final report to document the existing process, the target state, improvement opportunities, and recommendations to achieve the target state Facilitate prioritization of identified key initiatives and recommendations against ULR strategy, risk factors, internal and external limitations in a heat map (impact vs effort required) <p>Next Steps</p> <ul style="list-style-type: none"> Discuss and document next steps required to potentially implement identified improvement opportunities for the ULR services

2. Scope of the Problem

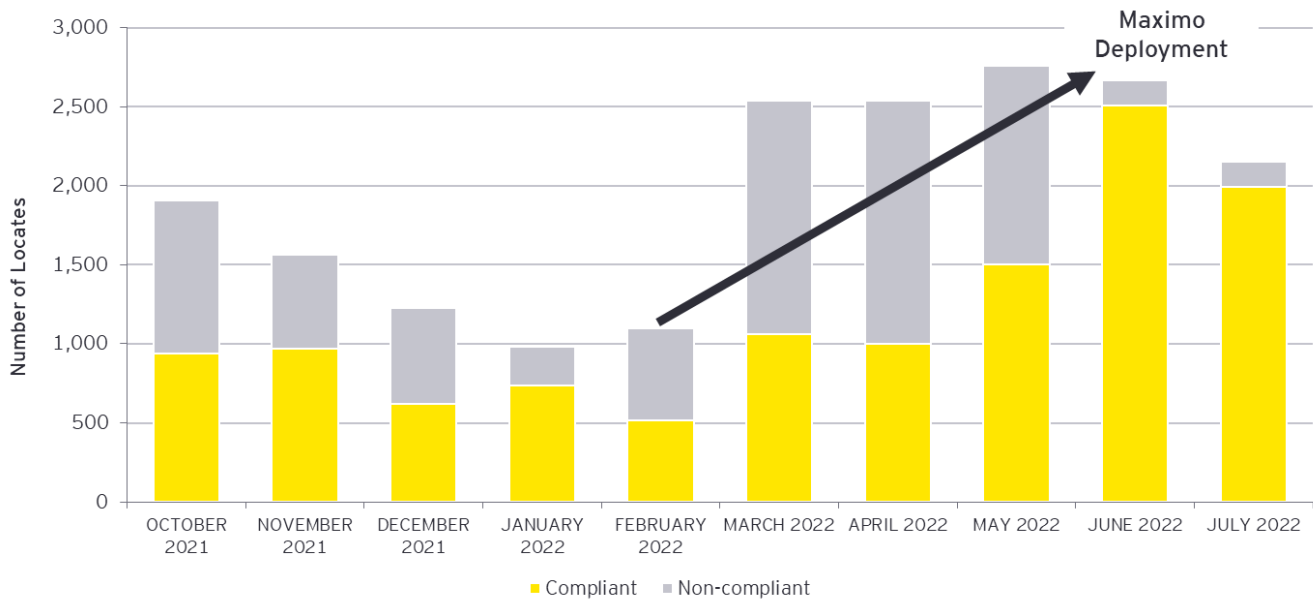
Driven by population and development growth, the Region's ULR response function has faced pressure over the past several years. Two distinct challenges have been identified:

1. The rising volume of ULRs and the forecasted growth are putting pressure on the Region to maintain compliance with the Legislation.
2. The Region started to re-allocate staff to complete locates at the expense of routine asset management activities.

2.1 Challenge 1: High Volume of ULRs Affecting Compliance

The monthly average quantity of locates has been rising across the Region over the past several years. As illustrated in [Figure 5](#) below, the current volume of ULRs in the Region has exceeded 2,000 locates per month in the summer months (peak construction season). Construction activity typically slows down in the winter months (i.e., October to February), which is why the volume of ULRs is lower in these months. Nonetheless, the Region indicated that this volume of locates is too high and the unavailability of staff for locates, among other factors, affects the ability to deliver locates in the legislated timeframe.

Figure 5: Locates compliance between October 2021 to July 2022 ([View image description](#))



The Region is in compliance with the Legislation if the following two conditions are met for each ULR:

1. The Region completes a standard locate within five business days of receiving a ULR from ON1Call.
2. The Region provides an update to the 360 Feedback³ application in ON1Call within three business days of completing a locate.

Historically, the Region was able to complete between 40% to 50% of their ULRs in the legislated timeframe, as illustrated in [Figure 5](#). In June 2022, the Region implemented Maximo to digitize and automate the process for completing locates. The implementation of Maximo provided the Region with the ability to complete the administrative component of locates faster. As shown in [Figure 5](#), compliance rate improved in June 2022 and the Region indicated that this was partly driven by locators using Maximo to complete locates. In addition, the Region also redeployed resources within the depots to complete locates and address compliance (as outlined in the next section).

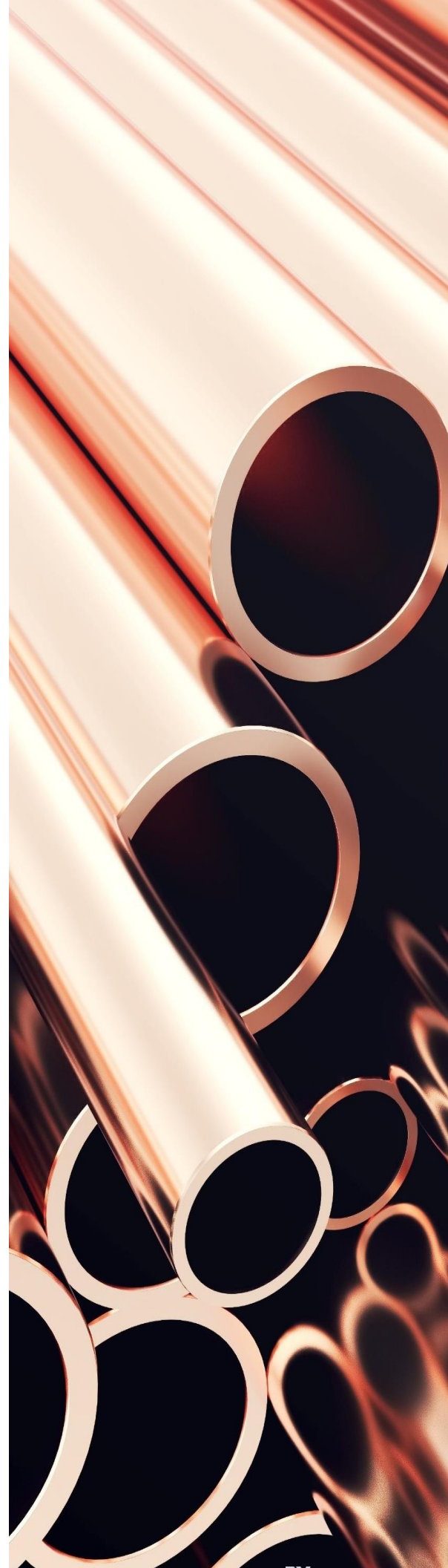
In addition to standard locates, The Region is responsible for responding to emergency locate requests within two hours of receiving the notification. Historically, the Region has demonstrated strong compliance with this requirement.

2.2 Challenge 2: The Region's Response to Address Non-Compliance

The Region indicated that in response to the low compliance rate for locates, staff were re-allocated from other Works Department programs, such as preventative maintenance, to complete locates. This approach for re-allocating staff is unsustainable, as the Region cannot continue to forgo maintenance of its infrastructure assets to maintain compliance with the Legislation.

Re-allocating staff was not the only method used by the Region to improve compliance. Other mitigation strategies were considered and implemented in some cases. One example is an automatic all-clear, which is when a requested locate meets certain parameters and provides the requestor the locate with limited restrictions without distributing the request to Region staff. Specifically, the Region has a locates policy with ON1Call that allows automatic all-clears for any excavations that use hydro-vacuum excavation techniques under 1,500psi. Some of the Region's depots are discussing increasing the parameters for the maximum allowable pressure for hydro-vacuum excavation to 3,000psi. Although this strategy could reduce the total volume of ULRs that the Region receives, it increases the risk of damage to the underground infrastructure assets.

³ The 360 Feedback is a program designed to allow the excavator to check the status of locates in the ON1Call system.



3. Current State Review

The Region’s current state process for completing locates was mapped to define functions, activities, milestones, and stakeholders. The process map is provided in Appendix A, and a condensed process overview is shown in [Figure 6](#). The process map and process overview were presented and validated with stakeholders from the Works Department’s depots during consultations.

3.1 Current State Process

The ULR process can be summarized in three phases:

1. The initiation of a Work Order (“WO”)
2. The WO lifecycle
3. Final close-out of the WO

The WO lifecycle can be further detailed by locate planning, completion, and administration. In order to complete the ULR process efficiently, four types of staff are required to participate in completing a locate WO as summarized in [Table 1](#).

Table 1: Region staff involved in completing a locate

Team Member	Responsibilities
Locator	<ul style="list-style-type: none">▶ Responsible for all activities associated with a WO at the excavation site.▶ Responsible for the administrative components of completing the WO.▶ Currently, the Depot’s Skilled Maintenance Worker (SMW) are tasked as the locators
Clerk ⁴	<ul style="list-style-type: none">▶ When needed, complete administration, planning, and organizational responsibilities on behalf of the locators.
Supervisor	<ul style="list-style-type: none">▶ Oversees the locators and communicates key priorities (compliance concerns, target completion, expectations).
Superintendent	<ul style="list-style-type: none">▶ Oversees the entire depot and the ULR function.

⁴ The depots have clerical staff for administration. Depending on the depot, the clerical staff are either clerks or coordinators. Throughout the report, the clerical staff are referred to as clerks for conciseness.

A high-level overview of the process developed during the current state analysis is presented in the [Figure 6](#) below.

Figure 6: ULR Process Overview



Further details on the ULR process are provided below:

- ▶ **WO Initiated:** As illustrated in [Figure 6](#), the legislated five-day compliance timeline begins once the ULR is received by ON1Call. Maximo has been customized to be integrated with ON1Call systems, such that when a locate request is initiated with ON1Call, it immediately generates a WO in Maximo. The WO is internally routed by Maximo to the depot responsible for responding to it. The queue of WOs is organized in the Start Centre, which is the landing page for Maximo users, by the expected completion date. The expected completion date is calculated as five business days after the WO initiation date.
- ▶ **WO Lifecycle:** Both the locators and supervisors are responsible for continuously monitoring the Start Centre to review the ULRs that need to be completed. In some cases, locators assign WOs for themselves, and in other cases, the WO is assigned to a locator by their supervisor. Once the WO has been assigned, the locator determines the work needed to complete the locate. The locator checks the Region's asset maps for infrastructure and determines whether a site visit is required to verify the asset maps. In addition, the site visit is used to mark and identify the underground infrastructure for the project owner. The locator then completes the locate sheet in the Maximo environment using the asset map and information gathered from the site visit. The locator logs their notes and reports their hours and changes the status of the WO to Work Done.
- ▶ **WO Close:** Once the status of the WO is changed on Maximo to Work Done, the locate sheet is automatically sent by Maximo to ON1Call. The 360 Feedback is also automatically completed by Maximo. Once this is completed, the compliance timeline for the ULR ends. The Region also verifies the accuracy of the locate and WO. The clerk verifies the hours used by the locator to complete the locate and the supervisor verifies the content of the locate sheet and the quality of information provided.

3.1.1 Additional Considerations in the ULR Process

Although a generalized process map was developed for the ULR process within the Region, there were underlying process differences in the rural depots (Sunderland, Orono and Scugog), and in the Traffic Field Services Depot. These differences are outlined in the following subsections.

3.1.1.1 Operations of Rural Depots

The differences in the ULR process for the rural depots are correlated with smaller volumes of ULRs. Rural depots do not have a dedicated locator like the urban depots (i.e., Ajax/Pickering and Oshawa/Whitby), however the work is still completed by Skilled Maintenance Workers (“SMWs”) to service the smaller volume of ULRs. These SMWs at the rural depots complete locates on an as-needed basis and are also responsible for activities in other Works Department programs (e.g., preventative maintenance). Whereas at the urban depots, the SMWs that are dedicated locators generally do not perform preventative maintenance. Their primary focus is completing locates, however this can change due to periodic decreases in ULRs or other operational needs such as preventative maintenance.

While the rural depots have experienced staffing challenges in the past due to various broadband infrastructure projects leading to high volumes of ULRs, stakeholders noted that there has not been issues with staffing levels since. This has created an opportunity for the urban depots to request support from rural depot staff during peak seasons. Coordinating staff is done on an ad-hoc basis. The coordination of resources is not defined in the Region’s process map as locators pick up or are assigned WOs based on their depot location.

3.1.1.2 Nuances of Traffic Field Services

The Traffic Field Services Depot operates the ULR function separately from the Region’s water and wastewater depots due to historical division of responsibility. The process used by the Traffic Field Services Depot is almost identical to the one used by water and wastewater depots; however, process responsibilities are slightly different due to low staff availability.

The Traffic Field Services Depot has an operational requirement that locates be completed by highly skilled work technicians (“**Work Tech 5**”). Traffic locates require opening high-voltage electrical cabinets, and Work Tech 5 staff have the qualifications and training to do so. Due to this operational requirement and the unavailability of Work Tech 5 staff, the Traffic Field Services Depot tend to place a lower priority for completing locates within the five-day compliance period. Stakeholders indicated that with proper training, staff with lower grades than Work Tech 5 can complete the locate requests.

Also due to the operational differences, a clerk supports WO planning for Traffic Field Services Depot locates. The clerk identifies the location of each ULR and prioritizes the requests. Using this information, the clerk plans the sequence to complete the locates and sets the locator’s queue in the Maximo Start Centre.

Traffic Field Services Depot locators have been slow to adopt Maximo for locates. Stakeholders indicated that the slow adoption rate was partly due to the lower priority for ULRs, and partly due to the clerk’s familiarity with the software. To maximize efficiency, locators completed on-site tasks outside of the Maximo environment (e.g., using hand-drawn sketches of infrastructure locations) and handed-off this data to the clerks, who completed the administrative tasks in Maximo to complete the locate.

The Traffic Field Services Depot is also responsible for traffic ULRs for the entire Region, as opposed to the water and wastewater depots who divide their ULRs by location. ULR responsibility for the entire Region increases the travel time required for the site visits required to complete a locate. Stakeholders noted that on average, approximately seven locates can be completed by the Traffic Field Services Depot daily when accounting for the higher travel time needed to get from site-to-site for each locate. As previously mentioned, this has required the clerk to identify the location of each ULR to minimize travel time for the locator.

3.2 Key Takeaways

While the overarching process for the delivery of locates is similar across the Region, there are differences between the depots and service areas. As such, there is an opportunity to further standardize locates service delivery and promote the use of existing IT platforms to ensure that processes and performance are more consistent across the Region.

4. Challenges in the Current Service Delivery Model

To better define the current state of ULR within the Region, consultations were facilitated with selected stakeholders. These stakeholders represented a diverse set of experiences in the planning, delivery, and administration of ULR.

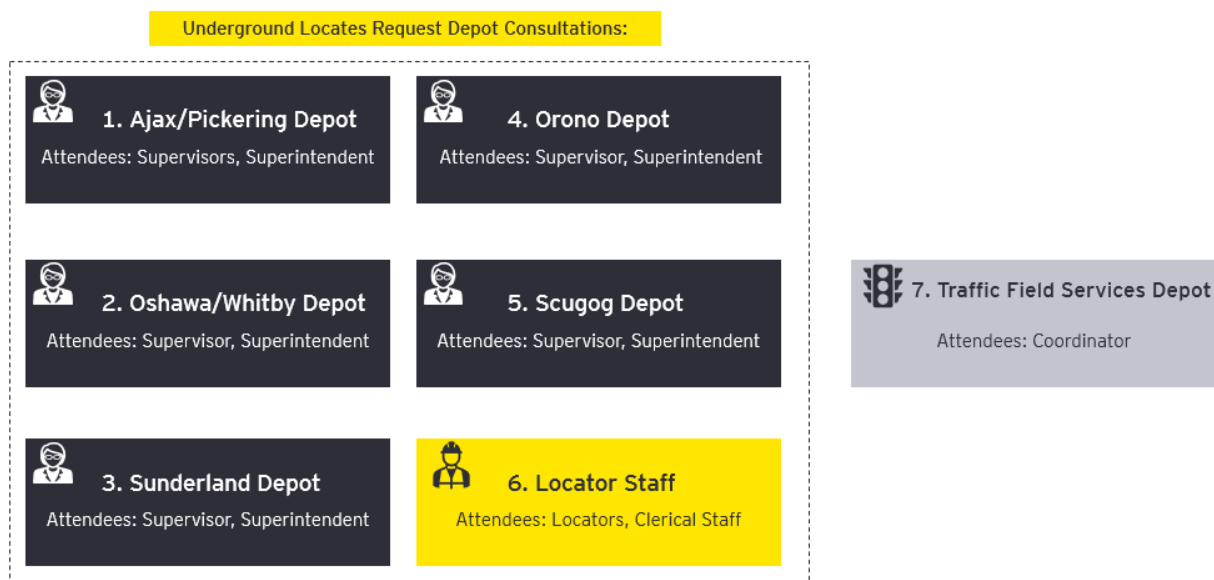
4.1 Stakeholder Consultation Approach

During the months of July and August 2022, seven in-person stakeholder consultations were conducted across all depots within the Region.

These consultations primarily comprised of interacting with supervisors and superintendents, and the representatives directly involved in the locates processes within the Region. Additionally, stakeholder consultations with representatives at the Traffic Field Services Depot and a final interview with field staff (locators and clerks) were held. These final consultations provided a more well-rounded understanding of the various types of locates as well as a better understanding of the process taken to complete a locate once selected.

A summary of key representatives from each interview can be found in the figure below.

Figure 7: Summary of participating stakeholder groups ([View image description](#))



The consultations encompassed similar conversation topics to ensure comparable commentary and benchmarking. The following topics were covered in each of the sessions:

- ▶ Discussion of the current processes for undertaking a ULR, including a review of the Current State Process Map.
- ▶ Identification of stakeholders involved in current state process for completing a ULR, including the roles and responsibilities of those involved in the current state process.
- ▶ Definition of an ideal, future state from the perspective of the stakeholders involved in the Region's ULR activities.
- ▶ Discussion of how the roles and responsibilities of the involved stakeholders may change with respect to the identified ideal, future state.
- ▶ Identification of which processes related to the current ULR process may be impacted by the transition to a potential ideal, future state.
- ▶ Details on the recent deployment of Maximo and the effects on day-to-day processes
- ▶ Identification of strengths and weaknesses of the Maximo platform that can be ultimately optimized in an ideal, future state.
- ▶ Discussion of additional challenges, risks, issues, and considerations related to ULR service delivery within the Region.

4.2 Key Findings of the Stakeholder Consultations

The key themes from the stakeholder consultations were grouped into four focus areas:

1. **Planning:** Current processes do not involve detailed planning to address the unpredictable flow ULRs.
2. **Staffing:** The Region has a limited pool of staff to conduct ULRs.
3. **Process Standardization:** Processes for locates are not standardized, limiting the ability of the Region to complete ULRs efficiently, and reducing the quality of locates.
4. **Information Technology ("IT") Integration:** Staggered implementation of software tools for servicing ULRs has created inefficiency in completing ULRs within the legislated timeframe.

Although the above noted key themes were prevalent throughout the Region's depots, the extent of challenge with each focus area were unique. The extent of challenge was dependent of the size of the depot, the number of available locator staff and several external constraints.

These challenge areas were compared on a relative scale (i.e., high, moderate, low), which represented the percentage of concerns/complaints that the stakeholders' discussed for each challenge area, relative to all the challenges noted throughout the consultations. The scale developed for this comparison is further defined in [Table 2](#) below:

Table 2: Level of challenge rating scale

Rating	Definition
High	A majority of complaints were associated with this focus area. The focus area was considered a primary concern by the stakeholders.
Moderate	An average number of complaints were associated with this focus area. This area was readily identified by stakeholders as a concern.
Low	A lower number of complaints were associated with the focus area. The area was discussed by stakeholders but was not considered a major concern.

Figure 8 compares level of challenge with each key theme of the larger urban depots, the smaller rural depots, and the Traffic Field Services Depot by the level of concern or priority associated with each challenge area.

Figure 8: Level of challenges associated with each focus area (View image description)

Key theme	Urban Depots Oshawa/Whitby, Ajax/Pickering	Rural Depots Sunderland, Orono, Scugog	Traffic Field Services Depot	Extent of Challenge:
1 Planning	High	Moderate	High	High
2 Staffing	High	Moderate	High	High
3 Process Standardization	Moderate	High	Moderate	Moderate
4 IT Integration	Moderate	Moderate	High	Moderate

All four identified focus areas were indicated as having to be a moderate or high level of priority for all depots; however, the planning and staffing focus areas were considered especially important.

For the Traffic Field Services Depot, planning, staffing, and IT integration were considered high priority areas by stakeholders. This aligned with the fact that the Traffic Field Services Depot is responsible for traffic related ULRs for the entire Region.

Urban depots were consistently faced with planning and staffing challenges, as they consistently saw large volumes of ULRs. The rural depots defined process standardization as a primary concern since they were not inundated with large volumes of ULRs. A summary of the challenges that were identified in the stakeholder consultation discussions are provided within the following sections.

4.2.1 Planning

The limited visibility of upcoming, regional projects and a lack of planning associated with locates volume have resulted in a service delivery that is reactive to ULRs. The Region does not actively forecast the expected volume of ULRs to estimate the need for resources. As well, there is no activity in the Works Department to identify major infrastructure projects and the timing of these projects to anticipate increases in ULR volume.

There is also limited planning and prioritization of locates within current processes. Most locates are planned based on the expected completion date, or the five-day compliance timeline for a standard locate. Generally, the location and travel associated with a ULR are not considered because this information is not immediately available in the locator’s queue. Stakeholders suggested that if location information were more readily available, locators could be more efficient in prioritizing locates and reducing travel time. Additionally, planning the sequence of locates can help optimize when the locator needs to do site visits, and when they can do desktop administrative tasks. Stakeholders indicated that locators were more efficient in completing administrative tasks in the office, as there was better connection to the internet and the repetition in completing locates sheets were quicker when done in sequence.

Stakeholders noted that using a map which outlined the location of ULRs, a functionality that is available in Maximo but was not deployed at the time of the review, will assist in planning locates and improve efficiency.

Stakeholders also indicated that there was also limited planning following emergency locate requests. Emergency locates occur when there has been an accident, resulting in damage to utility infrastructure. Emergency locates need to be provided more quickly than standard locates and require locators to forgo completing standard locates. Although it is difficult to plan for emergency locates, stakeholders noted that the backlog created due to emergency locates could be better planned for. The impacts of the backlog were evident in the larger, urban depots due to the higher volumes of ULRs. The smaller, rural depots did not have issues in planning around emergency locate requests, as they typically had lower volumes of standard ULRs.

4.2.2 Staffing

Stakeholders from all the depots indicated that there were inadequate levels of locator staff to address the volume of ULRs within the legislated compliance period. There was also no contingency plan if locators go on vacation or there are absences due to unexpected illnesses.

The consultations also revealed that the composition of the staff at the depots were not optimized for flexibility. The smaller, rural depots and the Traffic Field Services Depot only have one or two dedicated locators or SMWs. Most of the time, the SMWs were also responsible for other tasks related to preventative maintenance and are assigned to complete ULRs on an as-needed basis. In contrast, the larger, urban depots, have several dedicated locators but not enough to support the volume.

The administrative assistance for locates were also limited, as there were only two full-time clerks for the urban depots and one clerk for the Traffic Field Services Depot. The clerks are not dedicated to the ULR function and have additional responsibilities in the Works Department. Stakeholders noted that having administrative support, especially during peak season, would improve the ability of the Region to maintain compliance. Locators can be dedicated to activities at the excavation site, and clerks can provide parallel support for locates administration.

Depots occasionally shift locators to other depots for ULRs and other non-legislative tasks depending on ULR volumes. Locators are shared on an ad-hoc basis and there is no process defined to support the sharing of locators. Stakeholders noted that with more regular coordination, locator sharing could alleviate some of the staffing issues at the depots.

The Traffic Field Services Depot does not use water and wastewater locators, as they require additional training to access their infrastructure. Traffic signals infrastructure are usually located in high-voltage cabinets, which need additional training. Stakeholders from the Traffic Field Services Depot noted that access to traffic infrastructure was not overly complicated, and with proper training, resources such as SMWs could be suitable for traffic locates.

4.2.3 Process Standardization

Stakeholders in all the depots noted that there was an absence of standardized policies, processes, and procedures (e.g., standard operating procedures or "SOP") to complete locates. This has led to inefficiency and reduced the quality of the locates.

Stakeholders noted that a reliance on peer-to-peer training over formal training has led to inconsistent methods for completing locates. There is formal training that occurs once per year and is not enough to sufficiently train locators who are hired at various times. Consistency among locators could improve the quality of information provided in locates.

During the consultations, project locates and locate dumping were noted as a source of inefficiency. Standard procedures for these types of locates can help improve the ability of locators to complete these locates within the legislated timeframe. Project locates are for large, infrastructure projects where locates need to be provided for long distances (e.g., several kilometres along the project right-of-way). Locate

dumping occurs on projects where the project owner will request locates for a large area, and not complete the excavation within 90 days of receiving the completed locate. Standard procedures for recognizing these scenarios, and scheduling and resourcing them accordingly could allow the Region to obtain more time to complete the locates or allocate the right amount of staff to complete these locates in the legislated timeframe.

Stakeholders also indicated that there were varying policies for what constitutes an automatic all-clear for the Region's infrastructure in the ON1Call system. Typically, the Region sets up parameters that allow ON1Call to automatically clear ULRs when the project owner selects certain parameters. These parameters are established and maintained by each depot. If they are not set up and maintained correctly, ULRs that would otherwise be automatic all-clears are assigned to the Region, and resources are expended to clear it. Automatic all-clears account for approximately 20% to 50% of all locates. Stakeholders noted that having a defined policy and procedures for updating the ON1Call system can decrease the volume of ULRs that get assigned to the Region.

Finally, stakeholders indicated that there was a lack of procedures or best practices focused on asset damage prevention. For example, there have been instances where a locate was provided to an excavator, and there was damage to the Region's water infrastructure during an excavation. While it is the excavator's responsibility to obtain a locate and dig within the parameters in the locate, the Region has an interest in observing the excavation to ensure that Region assets remain protected. The asset damage prevention mechanism can be especially important in high-risk areas, where damage to water infrastructure can have significant impacts to the supply of water to the Region's residents.

4.2.4 IT Integration

Stakeholders noted that while the implementation of Maximo for ULR was largely successful and has led to an improvement in ULR compliance, full functionality within the locates module is not available yet, therefore creating inefficiency in the process.

Stakeholders noted that Maximo functionality was deployed in a staggered approach to avoid overwhelming locators with new systems, and to ensure that locators had sufficient time to get comfortable with the new software. It was evident from the consultations that while the functionality is being introduced, not all depots are made aware of the system functionality rollout.

Stakeholders also suggested that Maximo can be further customized to align with other Region's processes. The locators noted that Maximo is not optimized to be an asset mapping system for locates. It does not have the full set of data assets (e.g., utility maps) to complete ULRs. In addition, there is functionality that simply does not exist, such as the ability to zoom into maps for accuracy. This has reduced the efficiency for completing locates, as users are required to switch between software and transfer data to complete locates.

Some stakeholders noted that there is a broader IT challenge for instances in which infrastructure asset data has not yet been digitized. In these instances, locators spend time conducting lengthy site visits or consulting hardcopies of utility maps to complete locates, leading to inefficiency for completing locates. The Region had undertaken an internal project to digitize these hardcopies and historical data, however stakeholders indicated that the quality of information was lacking. Stakeholders noted that in conjunction with improvements to Maximo, making the digitization of asset information easier would significantly improve efficiency.



4.2.5 Summary of Findings

The findings from stakeholder consultations are also summarized in [Figure 9](#) below. As noted above, all identified challenges were noted as high or moderate⁵ priority issues.

Figure 9: Summary of Findings from Stakeholder Consultations ([View image description](#))

	Urban Depots Oshawa/Whitby, Ajax/Pickering	Rural Depots Scugog, Sunderland, Orono	Traffic Field Services Depot
Planning	<ul style="list-style-type: none"> ▶ Selecting WOs in Start Centre ▶ Rudimentary ticket prioritization (emergency) ▶ Locate route-planning limited ▶ Limited time for planning (compliance timeline vs. volume) Level of Challenge HIGH	<ul style="list-style-type: none"> ▶ Field connectivity limits planning ▶ No communication from contractors ▶ Planning not needed, capability under-developed ▶ Emergency WOs time-intensive ▶ Planning for re-marks ▶ Low preparedness for high volumes Level of Challenge MOD	<ul style="list-style-type: none"> ▶ Region-wide remit, single Clerk dedicates time for planning ▶ Location description added individually ▶ Locate route-planning rudimentary, but necessary due to remit Level of Challenge HIGH
Staffing	<ul style="list-style-type: none"> ▶ Locator availability limited and belong to Depot; no sharing ▶ Limited interaction with Traffic ▶ Incentives not aligned with volume ▶ Locator does end-to-end of Locate ▶ Limited equipment availability ▶ Clerks not efficiently utilized Level of Challenge HIGH	<ul style="list-style-type: none"> ▶ Limited dedicated Locators, utilize SMWs ▶ Locates prioritization vs. BAU ▶ Hiring Locators not easy; Borrow from other Depots is logistically challenging ▶ Limited formal training: quality concerns ▶ Forecasting high volumes in near future ▶ Supervisor checking sometimes unfeasible Level of Challenge MOD	<ul style="list-style-type: none"> ▶ Region-wide remit, single Clerk dedicates time for planning ▶ Location description added individually ▶ Locate route-planning rudimentary, but necessary due to remit Level of Challenge HIGH
Process Standardization	<ul style="list-style-type: none"> ▶ Administration backlog during peak seasons ▶ Inefficient completion of administration responsibilities ▶ Lack of SOP's and training ▶ Lack of group level performance indicators Level of Challenge MOD	<ul style="list-style-type: none"> ▶ Limited historical data within the Maximo system ▶ Short validity period for remarks ▶ Lack of policy procedures, SOP's, training ▶ Inconsistent all-clear parameters Level of Challenge HIGH	<ul style="list-style-type: none"> ▶ Compliance not prioritized ▶ Lack of performance indicators, specifically for compliance targets ▶ Lack of SOP's and training expectations Level of Challenge HIGH
IT Integration	<ul style="list-style-type: none"> ▶ Integration of Maximo staggered across depots ▶ Additional customization opportunities for Maximo identified Level of Challenge MOD	<ul style="list-style-type: none"> ▶ Data has not yet been digitalized or archived in the Maximo system ▶ Older software still used; whereas Maximo usage is not completely standardized ▶ Availability of key functionality a concern ▶ Connectivity issues at times Level of Challenge MOD	<ul style="list-style-type: none"> ▶ Older software still prioritized ▶ Lack of Maximo customization specifically for Traffic locates ▶ Maximo primarily used by Coordinators ▶ Slow integration of Maximo Level of Challenge HIGH

⁵ Moderate priority issues are identified as “MOD” in Figure 9.

The Region's stakeholders also identified opportunities for improvement in the ULR function provided in [Table 3](#) below.

Table 3: Opportunities for improvement identified by stakeholders.

Focus Area	Opportunities for Improvement
Planning	<ul style="list-style-type: none"> ▶ Improve communication between developers, ON1Call, contractors, excavators, and dedicated locators to support forecasting volumes. ▶ Improve training ▶ Ensure Locator job postings are more aligned with current responsibilities. ▶ Slowly adjust the Locators responsibilities and provide additional administration support across the WO life cycle.
Staffing	<ul style="list-style-type: none"> ▶ Identify opportunities to define locates responsibilities internally. ▶ Improve inter-depot coordination within the Region during peak seasons and when there are high ULR volumes. ▶ Limit excavation site administration responsibilities to improve locator efficiency and workplace health and safety (locates administration can be completed in a more suitable, ergonomic environment in the office, as opposed to the excavation site). ▶ Establish a dedicated locates group, with additional locators, clerks, and new designated positions to assist with planning and administration.
Process Standardization	<ul style="list-style-type: none"> ▶ Create SOPs and training materials for locates. ▶ Use best-practices from damage prevention literature to support operating procedures. ▶ Standardize ON1Call parameters for automatic all clears to lower ULR volumes across the depots.
IT Integration	<ul style="list-style-type: none"> ▶ Integrate additional Maximo functions to assist with location planning (e.g., implement the "locates map") ▶ Continue to roll-out the full set of Maximo capabilities and train locators more frequently. ▶ Develop and integrate end-to-end ULR processes with Maximo. ▶ Identify if any other Maximo sub-applications or customizations can assist with improving locates efficiency. ▶ Improve the connectivity of applications while in the field.

5. Municipal Benchmarking

5.1 Locate compliance rate in Ontario

Municipalities across Ontario are facing challenges related to an increased volume of locate requests and changes in the regulatory environment. Compliance has been recognized as a primary concern for most municipalities that provide locates for underground infrastructure. [Table 4](#) illustrates the degree to which various municipalities have had issues with compliance. On average, municipalities in Ontario have a non-compliance rate⁶ of 35%. GTA East, including Durham, has the lowest compliance rate when compared to similar sized regions (59% compliance rate, compared to an average of 65%). The considerations that other municipalities are making to tackle low compliance rates can therefore help the Region.

Table 4: August 2022 locates delivery performance report by municipality (Source: ON1Call).

Geographic Area	Cities Included	August Compliance	% of requests (days to close)
GTA East	<ul style="list-style-type: none"> ▶ Durham ▶ Kawartha Lakes ▶ Northumberland ▶ Peterborough 	Compliant: 59% Non-Compliant: 41%	0 - 5 days: 59% 6 - 10 days: 14% 11 - 15 days: 10% 15+ days: 18%
Hamilton-Niagara	<ul style="list-style-type: none"> ▶ Halton ▶ Hamilton-Wentworth ▶ Niagara ▶ Norfolk ▶ Haldimand 	Compliant: 66% Non-Compliant: 34%	0 - 5 days: 66% 6 - 10 days: 14% 11 - 15 days :11% 15+ days: 8%
Toronto	<ul style="list-style-type: none"> ▶ Peel ▶ Toronto ▶ York 	Compliant: 62% Non-Compliant: 37%	0 - 5 days: 63% 6 - 10 days: 12% 11 - 15 days: 9% 15+ days: 16%
Regional Averages	<ul style="list-style-type: none"> ▶ All 	Compliant: 65% Non-Compliant: 35%	0 - 5 days: 65% 6 - 10 days: 14% 11 - 15 days: 9% 15+ days: 12%

⁶ Compliance rate is the percentage of locates completed within the five-day compliance timeframe.

5.2 Municipal Outreach

Interviews were conducted with selected municipalities to assist with defining potential improvement opportunities for the Region. Based on availability, discussions were facilitated with both the Regional Municipality of Peel and the City of Kawartha Lakes to better understand current ULR related processes, challenges, lessons learned and best practices that could be applicable to the Region. Publicly available information from ON1Call was also used to assess the impacts of recent Legislation Amendments on the broader industry.

The table below notes the municipalities and organizations included in the benchmarking exercise:

Table 5: Listing of Municipalities / Organizations included in Benchmarking Review

Municipality / Organization	Rationale for Consideration
Regional Municipality of Peel (“Peel”)	Peel is similarly sized to the Region (population: 1.4M) with a similar operating structure (i.e., combination of several municipalities). Like the Region, Peel has experienced an increased volume of ULRs. This has created an urgency for process improvements and adjustments as compliance becomes a concern across the GTA. Peel outsources locates work, resulting in a different locates service delivery process. However, Peel is still experiencing challenges with compliance. The benchmarking exercise allowed for an opportunity to better understand challenges and potential lessons to be applied to the Region’s service delivery.
City of Kawartha Lakes (“Kawartha Lakes”)	Kawartha Lakes is considered a more rural municipality and shares similar geographical characteristics with some of the Region. The regional landscape as well as current municipal priorities, such as improving high-speed internet connectivity and infrastructure asset data availability, were seen as a learning opportunity for the Region. Specifically, Kawartha Lakes is prioritizing the improvement of locate completion technology. Although Kawartha Lakes are still determining what specific software and technology will be used, understanding their priorities was deemed imperative.
Industry-wide	Understanding the compliance performance of the Ontario locates industry would enable the Region to compare issues, challenges, and improvement areas with municipalities across Ontario.

Following the outreach discussions with Peel and Kawartha Lakes, the challenges that were discussed can also be categorized into planning, staffing, process standardization and IT integration. These challenges are further summarized in Appendix B.

5.2.1 Regional Municipality of Peel

Peel has moved to an outsourced model to assist with completing locates. Currently, approximately 90% of Peel's locate services are outsourced. Participants noted that for water and wastewater locates, locates for pipe diameters over 600mm were completed by Peel's in-house certified personnel. Peel's shift to an outsourcing model has improved the consistency of locates across the municipality, as both employees and contractors are able to properly complete all locate process requirements as per the set performance requirements.

In outsourcing locate services, Peel has experienced issues with properly defining the liability for the Locate Service Provider. While outsourcing some locates services provided higher efficiency and consistency of results, it was noted that Peel is still facing challenges in addressing the volume of ULRs and compliance. Participants noted that key performance indicators (KPIs) and transferring penalties may be a consideration for enhancing compliance and outcomes of outsourcing activities. Peel is currently focused on amending previously developed contracts to align with the Legislation Amendments, including allocating the risk of fines in the contracts. In the short-term, Peel will continue its outsourcing model and seek to further improve third-party relationships to improve compliance. In the long-term, Peel will re-evaluate alternatives such as increasing the number of locate completed by internal resources to minimize dependencies on external contractors.

5.2.2 City of Kawartha Lakes

Kawartha Lakes has two Damage Prevention Technicians ("DPTs") that are responsible for the completion of all locates. The DPT's are highly skilled employees that are responsible for supporting the end-to-end locate process. This includes providing locates as well as updating municipal infrastructure data and providing technical engineering support. Due to the seasonality of ULRs, the DPTs are reallocated to other municipal projects, such as auditing snow removal contracts to increase their productivity.

Even with two DPTs, Kawartha Lakes' has an average locates compliance rate of 74% and intends to hire an additional DPT to manage the expected growth in ULR volume. Similar to the Region, Kawartha Lakes has also recognized a need to leverage technology to improve the availability of infrastructure asset data and optimize the delivery of locates services.

5.2.3 Industry Perspective

The industry consensus is that an increased variety and complexity of infrastructure projects have led to an increased volume of locate requests and a decrease in locate compliance rates. Additional industry concerns include a lack of availability for locators in the labour market and challenges in employee retention. Feedback from ON1Call member indicates that low wages, a perception that completing locates carries a high degree of risk, and varying working conditions have discouraged people from taking locator jobs. Potential solutions to these issues include improving pay and improving awareness of the locator role, as well as training to reduce the perception of risk.

A lack of visibility for upcoming projects and limited access to information has impacted locates service delivery planning for municipalities. To improve forecasting, municipalities have introduced technology that improves planning and end-to-end service delivery, however, there is a lack of consistency in the types of systems implemented and information captured/shared.

5.2.4 Key Takeaways

Increased volume of ULRs, staffing limitations and inconsistency in service delivery were noted challenges across Ontario municipalities and industry participants. These concerns align with those of the Region.

Peel has adopted an outsourcing model with established KPIs for service delivery. While the Region is not considering outsourcing of locates at this time, the application of performance requirements and KPIs to specific processes or outcomes could be a useful tool in driving greater compliance and managing damage prevention.

Kawartha Lakes noted that implementation and integration of technology could improve service delivery and information management. The Region has implemented Maximo with noted improvements in compliance, however, stakeholders indicated that further integration could yield greater benefits.

Planning and forecasting ULR could benefit from more transparency and information sharing amongst industry members, including municipalities. These considerations and lessons are relevant to the issues faced by the Region and could support enhanced compliance in the future.





6. Defining the Target State

The target state represents the ideal service model for the Region's locates service delivery. The proposed target state for the Region is defined below:

The Region will have a standardized and fully staffed ULR service delivery that operates in compliance with legislative requirements and considers damage prevention.

6.1 Target State Objectives

The following objectives were noted for the proposed target state:

- 1 The Region will be compliant with Legislation to better manage locates, minimize penalties, and enhance damage prevention.
- 2 The "operations as usual" (e.g., maintenance activities and repairs) for the Region's Works Department will not be compromised to achieve compliance in the delivery of locates.

6.1.1 Compliance

As per the current state review, compliance with Legislation in the delivery of locates (i.e., completing locates in the five-day timeline) has been a noted issue for the Region. The recent Amendments to the Legislation also introduce financial implications (i.e., fines) related to locates compliance. The Amendments received Royal Assent in April 2022, however it is not currently known when the Amendments will be in practical effect. The target state will need to address the financial implications.

One of the financial implications is the new performance-based billing⁷ mechanism introduced by ON1Call. The performance-based billing mechanism can reduce membership fees in the short term, however, will likely not result in reduced fees in the long term. The mechanism incentivizes members to improve their compliance rate in the short-term, which can bring a temporary reduction in fees. In the long-term, all members will improve their compliance rates to take advantage of the mechanism. Once the compliance

⁷ The performance-based billing mechanism is a new billing structure implemented by ON1Call and will come into effect in 2023. The mechanism structure is summarized as follows: every locate completed on time receives one point. Late locates get two, three, or four points depending on how late they are. Every year, all members' points are added together, and each member's share of the "assessment amount" (i.e., the membership fee) is the portion of their points to the total.

rate amongst members has reached an equilibrium, membership fees will settle at a consistent amount that can be higher than the initial, reduced amount.

The more impactful financial implication is due to the Amendments to the Legislation. Under the new Legislation, ON1Call will be able to apply financial penalties for any non-compliance. In addition, ON1Call now has the authority to collect these penalties. To be effective, the Region's target state will need to minimize any potential financial penalties by maintaining a high compliance rate.

6.1.2 Maintaining Operations as Usual

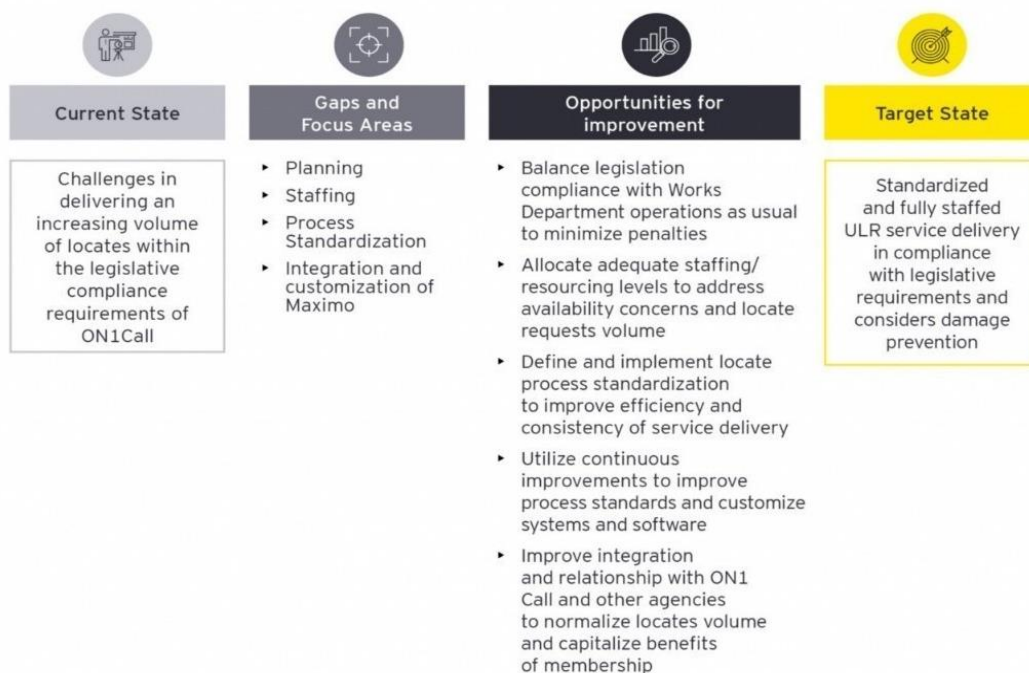
As locates volume have increased, Works Department management and staff have been required to forgo day-to-day preventative maintenance activities to ensure that locates are completed within the five-day compliance period. In many cases, the preventative maintenance activities are legislated by other provincial ministries. For example, the Traffic Field Services Department took resources off preventative maintenance activities mandated by the Ministry of Transportation to complete ULRs. The Region also noted that at times, it has outsourced preventative maintenance projects at a higher cost, so that the Region's staff remain compliant with locates delivery.

The target state will allow the Region to achieve sufficient resourcing, such that re-allocating resources is minimized, and that Works Department programs such as preventative maintenance continue to be completed within their required timelines.

6.2 Transitioning to the Target State

Based on the overarching objectives for the target state, analysis was conducted to map the gaps between the current state and the proposed target state. The gap analysis identified opportunities or actions to address identified issues, such that an ideal target state can be achieved. A summary of the gap analysis is illustrated in [Figure 10](#) below.

Figure 10: Summary of the target state and gap analysis [\(View image description\)](#)



The opportunities for improvement were developed based on inputs from the Region's stakeholders (as noted in [Section 4.2.5](#)) and municipal outreach. [Figure 11](#) illustrates how each identified opportunity for improvement addresses the focus areas from the current state assessment.

Figure 11: Key challenge areas in current service delivery model are addressed by opportunities for improvement ([View image description](#))

Opportunity for improvement	Focus areas addressed			
	Planning	Staffing	Process Standardization	IT Integration
1 Balance legislation compliance with Works Department operations as usual to minimize penalties	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2 Allocate adequate staffing/ resourcing levels to address availability concerns and locate requests volume	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Define and implement locate process standardization to improve efficiency and consistency of service delivery	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4 Utilize continuous improvements to improve process standards and customize systems and software	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5 Improve integration and relationship with ON1Call and other agencies to normalize locates volume and capitalize benefits of membership	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

For each improvement opportunity, there are specific recommended actions that could be undertaken to achieve the proposed target state.





7. Recommendations to Achieve Target State

A series of recommendations have been identified to allow the Region to improve the current state to the target state. Each recommendation is accompanied by considerations, including potential impacts, potential implementation considerations, a roadmap for implementation and an estimated implementation timeline.

The implementation timelines are defined as follows:

- ▶ Short Term: less than 1 year for implementation
- ▶ Medium Term: 1 year to 2 years implementation
- ▶ Long-term: greater than 2 years implementation

The recommendations were also assigned a level of potential impact to improve the ULR process and the required level of effort for implementation. The criteria are defined as follows:

- ▶ **Potential Impact:** The ability that the recommendations will address the defined focus areas identified in the current state. As illustrated in [Table 6](#), there are five impact levels (e.g., Very High to Very Low). The assigned impact level is an approximation based on an understanding of the Region’s operations.
- ▶ **Proposed Level of Effort for Implementation:** The amount of time, costs, and resources that would be needed to implement the recommendation. As illustrated in [Table 6](#), there are five levels of effort (e.g., Very High to Very Low). The assigned level of effort is an approximation based on an understanding of the Region’s operations.

Table 6: Impact and Level of Effort Criteria

Impact Level	Level of Effort
Very High Impact	Very Low Effort
High Impact	Low Effort
Moderate Impact	Moderate Effort
Low Impact	High Effort
Very Low Impact	Very High Effort

7.1 Balancing Legislated Activities

The Region is seeking to deliver ULRs and locates-related activities while still managing other Works Department maintenance programs. The recommendation under this improvement area can balance parallel responsibilities by reallocating the responsibilities for locates to a dedicated group.

7.1.1 Centralized Group for Damage Prevention

The Region's current service delivery model for servicing ULRs is reactive because resources from maintenance depots are allocated as Work Orders are created by ON1Call. There is an opportunity for the Region to take a more proactive approach to addressing ULRs and asset damage prevention.

Recommendation 1:

Establish a centralized group within the Region's Works Department, that is focused on locates, asset damage prevention and any other responsibilities in the Legislation and Amendments.

Description:

In order to better manage locates service delivery with respect to an increasing volume of ULRs, the Region could establish a centralized service area or group solely responsible for asset damage prevention. A key activity within the asset damage prevention group would be the planning and delivery of locates. This group would need to be fully staffed, including personnel with relevant skillsets and training/experience, and would primarily focus on all elements of locate service delivery, including planning, hiring, training, administration, data management, and overall service delivery in compliance with Legislation. It is important to note that the resources proposed for this group would prioritize locate service delivery and other damage prevention activities over other non-legislated activities or Works Department services.

Consideration	Description
Key focus area(s) addressed	Staffing, Planning, Process Standardization and IT Integration
Potential impact	The establishment of a dedicated group of resources for damage prevention can support focused management of locate volumes and additional activities required by the Legislation (e.g., inspections, administration of alternative locate and dedicated locator agreements, damage investigations and other general compliance audits and reporting to ON1Call).

Consideration	Description
Potential implementation considerations	<p>Budget and approval - Carving out a specific group for damage prevention and locates services will require approvals from council and senior leadership within the Region. In addition, the reporting and decision-making structure (i.e., governance) will need to be established, along with appropriate reporting protocols.</p> <p>Scope - The specific scope of the group will need to be well defined to prevent overlap or duplication of effort from the various service requirements associated with locates. For instance, the Traffic Field Services Depot already acts as a separate entity from the Region's water and wastewater depots. The ULR processes for the water and wastewater depots and the Traffic Field Services Depot tend to differ in terms of priorities and processes. These discrepancies will need to be addressed in establishing the scope of the centralized group.</p> <p>Timing - It may take time to establish a standalone group or service area. As such, high priority challenges related to planning for high volumes of ULR and staffing may not be addressed in the short-term.</p> <p>Hiring and allocation of resources - Resources will need to be allocated or hired specifically for the centralized group. Resource allocation and selection will need to be carefully managed to ensure that there is sufficient staff to carry out Works Department programs and operations-as-usual. Resources allocated to the dedicated damage prevention group will need to have the appropriate skills and experience to ensure that locate services are performed as per quality and compliance requirements.</p>
Roadmap for implementation	<p>A thorough review should be conducted to assess the need and parameters of the centralized group. The review should be used to establish the resourcing requirement, scope of services to be provided by the group, as well as the performance indicators for the services to be provided.</p> <p>In order to facilitate required approvals, a detailed business case would need to be developed in order to document the need for the centralized group, the resource and budget requirements, as well as the potential benefits of the proposed centralized group.</p> <p>The governance requirements related to the centralized group should be documented, including reporting structure and decision makers. A sample organization chart for a centralized group has been provided in Appendix C. The reporting structures and reporting requirements (i.e., KPIs, quality requirements, service delivery requirements, etc.) should be documented to ensure that all parties understand and accept the information to be collected and tracked. The SOP or processes should be documented such that all resources understand the activities, roles and responsibilities of the centralized group.</p> <p>Once approvals have been provided, resources/staff should be allocated and assigned roles in alignment with the needs assessment.</p> <p>The location of the centralized group should be identified. Currently, locate services are delivered out of the Region's depots located throughout the municipality. Centralized services would need to establish a location of operation, as well as a means to assign locates throughout the municipality. In addition, communication protocols would need to be established to ensure that workflows are effectively managed.</p>
Implementation Timeline	Long-Term
Impact Level	Very High
Level of Effort	Very High

7.2 Staffing and Resourcing

The Region is seeking a fully staffed ULR function that has effective hiring and training and can retain locators. The recommendations in this improvement area illustrate how the Region can hire more resources and the right type of resources to achieve its objectives.

7.2.1 Hiring More Resources

There are not enough trained and available resources within the Region to deliver ULRs in a timely manner. In addition, the current model does not optimize its staff mix to efficiently deliver locates.

Recommendation 2:

Hire an adequate number of resources to service the Region's volume of locates within the legislated, five-day compliance timeframe.

Description:

The Region should increase its staffing levels by hiring resources for water and wastewater depots as well as within the Traffic Field Services Depots.

Considerations	Description
Key focus area(s) addressed	Staffing and Planning
Potential impact	<p>Hiring more resources can increase compliance by allowing the Region to complete more locates for a given time. Accordingly, this can reduce the risk of penalties.</p> <p>During downtimes, the additional staff can also assist in process standardization and planning/implementation of preventative asset management in winter when demand for locates is low.</p>
Potential implementation considerations	<p>Budget and approval - The addition of staff will require budget and approval from the Region leadership. To justify the addition of staff, a business case showing the benefits of additional staff (e.g., improved compliance rates and minimized penalties) will need to be provided.</p> <p>Training of resources - any newly hired locate staff will require initial training and regular follow-up. Additional planning is required to ensure that training is completed before the high-volume seasons.</p> <p>Timing - Hiring resources may not be quick. Finding locator resources for an appropriate cost can take time. Once found, onboarding these resources, providing them with equipment and training and integrating them into the Region's ULR process can also take time. The Region will need to maintain their high locates compliance rate with other Works Department resources until new resources are onboarded.</p>

Considerations	Description
Roadmap for implementation	<p>A thorough review of the expected volume of ULRs throughout Durham will need to be completed to understand exact staffing needs and associated budget requirements. Appendix D provides a forecast approach that the Region could use to estimate the full-time staffing needs.</p> <p>Define the budget requirement needed to acquire the adequate number of staff.</p> <p>Define the role and job description that includes the desired qualifications.</p> <p>Assess whether there is capacity in the locator labour market, and whether any delays to hiring additional resources affect the Region's compliance rate.</p>
Implementation Timeline	Short-term
Impact Level	High
Level of Effort	Low

7.2.2 Hire Damage Prevention Technicians

The Region's current service delivery model splits the responsibility for locates by asset type (i.e., water and wastewater and traffic signals), which has resulted in two types of locators (i.e., water and wastewater locators and traffic locators).

As described in Section 3, the water and wastewater depots use SMWs or dedicated locators, who are generally hired without a diverse set of qualifications and receive training from the Region to complete locates and other Works Department maintenance activities. In the Traffic Field Services Group, Work Tech 5 resources, who are effectively highly skilled, certified electricians, complete traffic locates because of an old operational requirement.

Having two types of locator resources is inefficient because in the traffic group, the Work Tech 5 resources deprioritize locates as they have other tasks to complete. Once they start doing locates, the cost to the Region per traffic locate is high, as the resource completing the locate is highly skilled and overqualified. The Region can benefit from a resource that has qualifications in between the SMW in the water and wastewater depots and the Work Tech 5 in the Traffic Field Services Depot.

Recommendation 3:

Hire Damage Prevention Technicians to complete both water and wastewater locates and traffic signals locates.

Description:

A Damage Prevention Technician ("DPT") is a role that is generally standard throughout the utilities industry. DPTs typically have a more diverse set of qualifications than water and wastewater locators and SMWs and can also provide the Region with adaptable resources to support with other Works Department activities and damage prevention initiatives. A sample job description for the DPT role is provided in Appendix E. Hiring DPTs can improve the Region's ability to deploy locators for all locates. This

recommendation can also immediately address the low compliance rate in the Traffic Field Services Depot by providing more locators or DPTs to complete traffic locates.

Considerations	Description
Key focus area(s) addressed	Staffing, Process Standardization
Potential impact	DPTs can improve the overall performance of the ULR function. Using DPTs for locates can improve compliance rates by adding a new role that can complete locates throughout the Region regardless of asset type. Using DPTs can also bring potential cost-savings as the current resources used to complete traffic locates are highly skilled (i.e., Work Tech 5) and overqualified to do locates. Locate quality can be improved as DPTs have specialized qualifications and experience.
Potential implementation considerations	<p>High Skilled Worker Availability - Availability of this type of resource may be constrained due to the state of the current labour market.</p> <p>Training - A specific and unique training program may be required as the resource will be required for all locates.</p> <p>Coordination with unions - Using new types of resources for locates may require coordination with labour unions to identify if there are implications to current agreements.</p>
Roadmap for implementation	<p>Identify the role, responsibilities, and governance of the DPT.</p> <p>Develop a job description and highlight the required skill set, qualifications, and responsibilities (see Appendix E for a sample job description).</p> <p>Assess whether there is capacity in the locator labour market, and whether any delays to hiring additional resources affect the Region's compliance rate.</p>
Implementation Timeline	Short-term
Impact Level	High
Level of Effort	Low

7.3 Process Standardization

The Region is seeking a standardized service delivery model to deliver locates efficiently and with consistent quality. The recommendations in this improvement area illustrate the types of processes the Region can standardize to achieve its objectives.

7.3.1 Locator Training

A lack of sufficient standardized training with timely refresher sessions across depots has resulted in inconsistent quality of locates. The Region does not use regular training opportunities, which limits continuous learning for resources.

Recommendation 4:

Refine the current training program for locators to include more regular and standardized learning opportunities.

Description:

The Region should refine its locator training program. Currently, the depots require locators to complete a combination of in-class learning sessions at onboarding and peer-to-peer training on the job. The Region can incorporate regular refreshers of this training to allow locators to be up to date on the training.

Additionally, industry-standard training and certification that support the Region's objectives for asset damage prevention can be provided. For instance, the Ontario Regional Common Ground Alliance Damage Prevention training includes damage prevention best practices, and the Region should consider including this as part of the standardized training as it is currently not included.

Considerations for implementation	Description
Key focus area(s) addressed	Process Standardization
Potential impact	A refined training program with regular refreshes of training material can improve efficiency and quality of locates. Additionally, training that introduces and reinforces damage prevention best practices can achieve the Region's organizational objective of asset damage prevention.
Potential implementation considerations	<p>Budget - The cost associated with improving and refining the locator training program will need to be identified and approved. At a minimum, the budget will need to include the development of up-to date materials and training equipment.</p> <p>Timing - The program will need to select a suitable time to conduct training and refreshers. The Region can conduct training in the winter when construction and ULR volumes are low.</p> <p>The development of training resources can require substantial effort.</p> <p>The availability of resources to conduct the training program can require substantial planning.</p>
Roadmap for implementation	<p>Audit current training program to understand gaps and needs of the locators.</p> <p>Design a new training program (format and content).</p> <p>Identify external training sources and procure as needed.</p>
Implementation Timeline	Medium-term
Impact Level	Moderate

Considerations for implementation	Description
Level of Effort	Moderate

7.3.2 Standardized Processes

The Region does not have standardized policies, processes, or procedures for the ULR function.

Recommendation 5:

Develop a standardized process for completing locates and develop standard operating procedures.

Description:

The locate service delivery model should be standardized across depots to further consolidate process best practices. SOPs must be developed to define that all trained locate staff complete the locate consistently throughout the whole locate process.

Considerations for Implementation	Description
Key focus area(s) addressed	Staffing, Process Standardization
Impact	Defining standard processes and SOPs will enable locate staff to be more efficient at completing locates. SOPs can improve the consistency of locates.
Potential implementation considerations	<p>Aligning the process with the Region objectives - any processes or SOPs need to be aligned with the Region's target-state.</p> <p>Stakeholder Engagement - Coordinating with internal stakeholders can improve the quality and applicability of the SOPs as best-practices for all the depots.</p> <p>Stakeholders may resist standardization of processes and procedures as it may require changes to behaviours.</p> <p>SOPs training - Once the SOPs are finalized, supervisors will need training sessions to explain the SOPs. Additionally, the SOPs should also be included in onboarding training sessions when a new employee is hired.</p>
Roadmap for implementation	<p>Review the target state, end-to-end process for locates and identify what procedures are required.</p> <p>Draft the SOPs.</p> <p>Review the SOPs with all the depots.</p> <p>Communicate the SOPs to all relevant personnel and provide training as needed.</p> <p>Incorporate the SOPs into onboarding training.</p>
Implementation Timeline	Short-term
Impact Level	Moderate
Level of Effort	Very Low

7.3.3 Updated KPI regime

Process alignment has been negatively impacted due to the absence of standardized goals, missions, and responsibilities.

Recommendation 6:

Develop a Key Performance Indicators regime that aligns with the Region's objectives and locates processes.

Description:

Key Performance Indicators (“KPIs”) can be used to measure the Regions ULR performance and evaluate any process inefficiencies over time. Other than measuring compliance rate, the Region does not currently have any KPIs to track the efficiency of the ULR function. A standardized set of compliance expectations or performance requirements could result in improvements in compliance.

Considerations for Implementation	Description
Key focus area(s) addressed	Process Standardization
Potential impact	A KPI regime can improve process efficiency by tracking both depot and locator performance and identifying opportunities for performance improvement.
Potential implementation considerations	<p>Timing - Instituting a new KPI regime may require time to ensure internal review is thorough.</p> <p>Organizational Change - Introducing new performance expectations and tracking can require operational changes to incorporate regular review and feedback. The Region should also be prepared to address any resistance to performance expectations.</p>
Roadmap for implementation	<p>Identify potential KPIs and expectations that the Region, depots, and locators should be responsible for.</p> <p>Define how the KPIs will be measured and how the performance reports will be generated.</p> <p>Identify the data, processes and systems needed to create the KPI report.</p> <p>Build the process or allocate the responsibility for generating the KPI report.</p> <p>Analyze KPI reports to identify insights on the process efficiency.</p> <p>Review the reports with relevant resources (i.e., supervisors and locators) and provide feedback or opportunities for improvement.</p>
Implementation Timeline	Medium-term
Impact Level	Moderate
Level of Effort	Moderate

7.4 Continuous improvements of process and systems

Continuous improvements involve having the Region regularly compare their delivery model against the demands placed upon it, and considerations of ways to improve the service and compliance performance.

7.4.1 Maximo Customization

Maximo is not an off-the-shelf locate ticket and planning software. The software needs to be customized to be compatible with the end-to-end process. Although custom modules in Maximo have been created to support the ULR function, further customization is needed.

Recommendation 7:

Identify and implement any further customizations to Maximo to align with current locates service delivery model.

Description:

Enhancing the Maximo software through additional functionalities that better correlate with the locate process should be a top priority.

Considerations for Implementation	Description
Key focus area(s) addressed	Process Standardization and IT Integration
Potential impact	Further Maximo software customization can improve the efficiency of the ULR function. As the Region moves more of the locates data and asset information into Maximo, the time for completing locates will be shorter.
Potential implementation considerations	<p>Budget - The Region will need budget and approval from management to pursue customizations.</p> <p>Full capability of Maximo - The Region will need to understand the potential capability of Maximo. Understanding Maximo's capability will require consulting a representative or technology consultant who can provide advice.</p> <p>Timeline for customization - Implementing changes to Maximo can take time. The implementation of Maximo took 10 years. This timeline would include development, beta-testing, internal review, and regional roll-out.</p> <p>Training - The Region will need to allocate sufficient resources to training staff on any new Maximo software.</p>
Roadmap for implementation	<p>Conduct an internal review with users to identify any gaps and improvements areas in the current deployment of Maximo.</p> <p>Develop a list of functionalities that improve the delivery of locates.</p> <p>Engage Maximo experts to identify feasibility for implementing the improvements.</p>
Implementation Timeline	Medium-term
Impact Level	Low
Level of Effort	Low

7.4.2 ULR Management Software

Customizing Maximo for the Region’s ULR function has been slow and costly because Works Department staff and management have been spending valuable time identifying and recommending features for a software tool that is not intended for locates.

Recommendation 8:

Procure a locates management software to improve compliance and increase service delivery model efficiency.

Description:

The Region can explore implementing a locates management software package that can integrate with the ULR service delivery model and improve efficiency. The Region can explore integrating the ULR management software with Maximo to allow asset data to flow into the ULR program, and vice-versa.

Considerations for implementation	Description
Key focus area(s) addressed	Planning, Process Standardization, Systems Integration
Potential impact	<p>Using a purpose-built ULR management software can improve compliance by increasing the efficiency of the service delivery model. There are several readily available software packages such as UtiLocate and TelDig which are already used by other municipalities and private locates service providers for ticket and operations management. As a result, the tool has been optimized to work with ON1Call’s notification system. The software can come with built-in features that are made for improving ULR planning and delivery, such as artificial-intelligence suggested office-clears, route mapping for site visits, sketching support, and image management. Using these features can allow locators to minimize their time spent per Locate.</p> <p>As well, locates outputs can be standardized and the quality and consistency of the locates will improve. The optimized user-interface of the software can allow locators to capture information more easily and note any accidental errors or omissions before the locate is sent. This can reduce the time spent by the Region’s clerks to coordinate with excavators and project owners when the contents in a locate are inconsistent with site conditions.</p> <p>The Region will also benefit from the competition between companies developing ULR management software. Regular updates and features will be provided to improve compliance, as these features are what differentiates the available software.</p>

Considerations for implementation	Description
Potential implementation considerations	<p>Budget/approval - The Region will need to obtain budget and management approval to purchase new software, as this may require an additional budget. The extent of approvals required can depend on the cost of the ULR management software.</p> <p>Timing - The Region will need to account for the time it takes to implement new software tools within existing operations.</p> <p>Training - the Region will need to allocate resource and budget to train the users for this new software.</p> <p>Maximo integration - the extent to which the ULR management software needs to be integrated with Maximo will need to be defined. As well, personnel will need to be dedicated for liaising between the Maximo team and the ULR management software team to ensure that the integration is working, and Region asset information is being exchanged effectively.</p> <p>Procurement - Procuring a ULR management software would require the Region to abandon Maximo's ULR module. As such, the Region would need to explore the incremental cost-benefit that the ULR management software provides.</p>
Roadmap for implementation	<p>Identify the potential alternatives for the solution and develop a business case that identifies the costs and benefits of a purpose-built ULR software over the incremental cost of modifying Maximo.</p> <p>Select the tool best suited for the Region's ULR service delivery model.</p> <p>Procure the software and integrate within Region's processes and systems (e.g., Maximo).</p> <p>Update SOPs to identify how the users will interact with the software to complete their responsibilities.</p> <p>Train the users/Locators on using the ULR management software.</p> <p>Deploy and continually improve.</p>
Implementation Timeline	Long-term
Impact Level	High
Level of Effort	High

7.4.3 Process Improvement Working Group

The Region does not currently use its standardized method (i.e., the Opportunities for Improvement (OFI), under Drinking Water Quality Management Standard and Integrated Management System (DWQMS/IMS)) for identifying and implementing process improvements that can increase efficiency.

Recommendation 9:

Initiate a process improvement working group within the Transportation and Field Services department to regularly evaluate the Region’s ULR service delivery process and SOPs and suggest areas for improvement.

Description:

A working group can be established to identify opportunities for improving the ULR process.

Considerations for implementation	Description
Key focus area(s) addressed	Process Standardization, Systems Integration
Potential impact	<p>The working group will address compliance by identifying opportunities for improvement and implementing these improvements to increase efficiency. The working group can also identify ways to plan for locates volume, create new process standards, or explore new tools that improve efficiency.</p> <p>The working group can comprise of management, staff, and other stakeholders to provide equal representation from all user groups involved in the ULR service delivery process. In addition, the working group can also be used to discuss any impacts that updates to Legislation or ON1Call bylaws will have on the Region’s operations. The working group can also be leveraged to identify the Region’s adherence to industry best practices and response to trends, such as Damage Prevention.</p>
Potential implementation considerations	<p>Approvals - the working group will need approval from Works Department management as resources will be pulled away from operations-as-usual to conduct working group activities.</p> <p>Organization - To make the working group effective, the sessions, discussion and action plan will need to be organized by someone with a high degree of authority within the Region.</p> <p>Timing - the working group activities will need to take place when there is sufficient downtime to allow resources to step away from day-to-day activities to participate, and when there is enough time to develop and implement the improvement opportunities.</p>

Considerations for implementation	Description
Roadmap for implementation	<p>Develop a structure for the working group, including the purpose, terms of reference, working sessions, and performance indicators.</p> <p>Identify a working group sponsor, responsible for organizing discussion sessions based on the structure.</p> <p>Identify working group members, making sure that there is representation from all staff levels that have responsibilities for ULR service delivery.</p> <p>Set up sessions where the working group meets to discuss opportunities and initiatives for improving the service delivery model, considerations for implementing the improvements, and an action plan.</p> <p>Identify initiative owners from the working group and identify performance measures that indicate when improvement initiatives have been successfully deployed.</p> <p>Execute the initiative plan using ad-hoc working group sessions as needed to track progress of the implementation.</p> <p>Re-evaluate the working group's mandate on a regular basis (e.g., every year or every three years) and use the performance measures to track the working group's progress.</p>
Implementation Timeline	<p>Short-term for setup of working group.</p> <p>Long-term for implementation of opportunities for improvement.</p>
Impact Level	Very High
Level of Effort	Low



7.5 Integration with ON1Call and Other Industry Stakeholders

Notification parameters within the ON1Call system are not always up to date, resulting in challenges for the Region in managing the locate volume. By integrating with ON1Call, the Region can address planning for locate volume, and modify its delivery model and standard process based on industry intelligence.

7.5.1 Increase Structured Collaboration with Industry

Recommendation 10:

Increase structured collaboration with industry (e.g., contractors, developers and ON1Call)

Description:

The Region can appoint an individual or an industry working group to set up and conduct regular collaboration with industry stakeholders. Integrating representatives from the Region with the wider industry and collaborating with stakeholders using a structured approach can allow for enhanced planning of the Region's locates function. Better communication with industry participants can provide information that assists the Region and its service delivery partners to monitor the upcoming volume and schedule of locates, as well as changes to the industry that can impact the Region's operations.

Considerations for Implementation	Description
Key focus area(s) addressed	Planning, Staffing, Process Standardization
Potential impact	Improves planning for upcoming locates through enhanced communication and a better understanding of industry constraints, resourcing and pipeline of ULRs. Improve compliance through access to information and sharing of lessons learned and leading practices to enhance processes related to locates service delivery.
Potential implementation challenges	Direct communication and interaction with ON1Call may be a challenge, as they are a non-profit organization that deals with the entirety of the Ontario locates industry. Identifying key contacts, or key pieces of information that could be requested or accessed may provide a short-term solution to access and communication challenges. There may be challenges in requesting information from industry participants, (i.e., locators, developers, other municipalities, etc.). The Region should be willing to share information that they are also requesting from other parties in the spirit of collaboration.
Roadmap for implementation	Determine information and contacts within the industry that could support the enhancement of locate service delivery within the Region. Develop an interaction plan to conduct outreach and sourcing strategy for collecting and sharing required information.
Implementation Timeline	Short-term
Impact Level	High
Level of Effort	Very Low

7.6 Prioritization of Recommendations

To support the Region's implementation of the proposed recommendations, the following approach was applied to prioritize the recommendations that support transition to the proposed target state.

Using the level of potential impact to improve the ULR process and the required level of effort for implementation, the recommendations were scored using the following:

Score	Impact Level	Level of Effort
5	Very High Impact	Very Low Effort
4	High Impact	Low Effort
3	Moderate Impact	Moderate Effort
2	Low Impact	High Effort
1	Very Low Impact	Very High Effort

The highest score that a recommendation can be allocated is 10 points. This indicates a recommendation requiring the least number of resources (very low effort) that addresses the focus areas and improves the ULR function (high impact). In comparison, if both the associated impact and required effort is very high, lower scores are calculated because of the extensive resources required. The scores were applied to the defined recommendations as illustrated in [Table 7](#):

Table 7: Recommendation Scoring

Recommendation	Impact Level	Level of Effort	Totals
1. Centralized Group for Damage Prevention	Very High (5)	Very High (1)	6
2. Hiring More Resources	High (4)	Low (4)	8
3. Hire Damage Prevention Technicians	High (4)	Low (4)	8
4. Locator Training	Moderate (3)	Moderate (3)	6
5. Standardized Processes	Moderate (3)	Very Low (5)	8
6. Updated KPI Regime	Moderate (3)	Moderate (3)	6
7. Maximo Customization	Low (2)	Low (4)	6
8. ULR Management Software	High (4)	High (2)	6
9. Process Improvement Working Group	Very High (5)	Low (4)	9
10. Collaborate with Industry	High (4)	Very Low (5)	9

The recommendations are ranked in [Table 8](#). Rearranging the recommendations provides the Region with an indication on how implementation can be prioritized to achieve the target state.

Table 8: Prioritized list of Recommendation

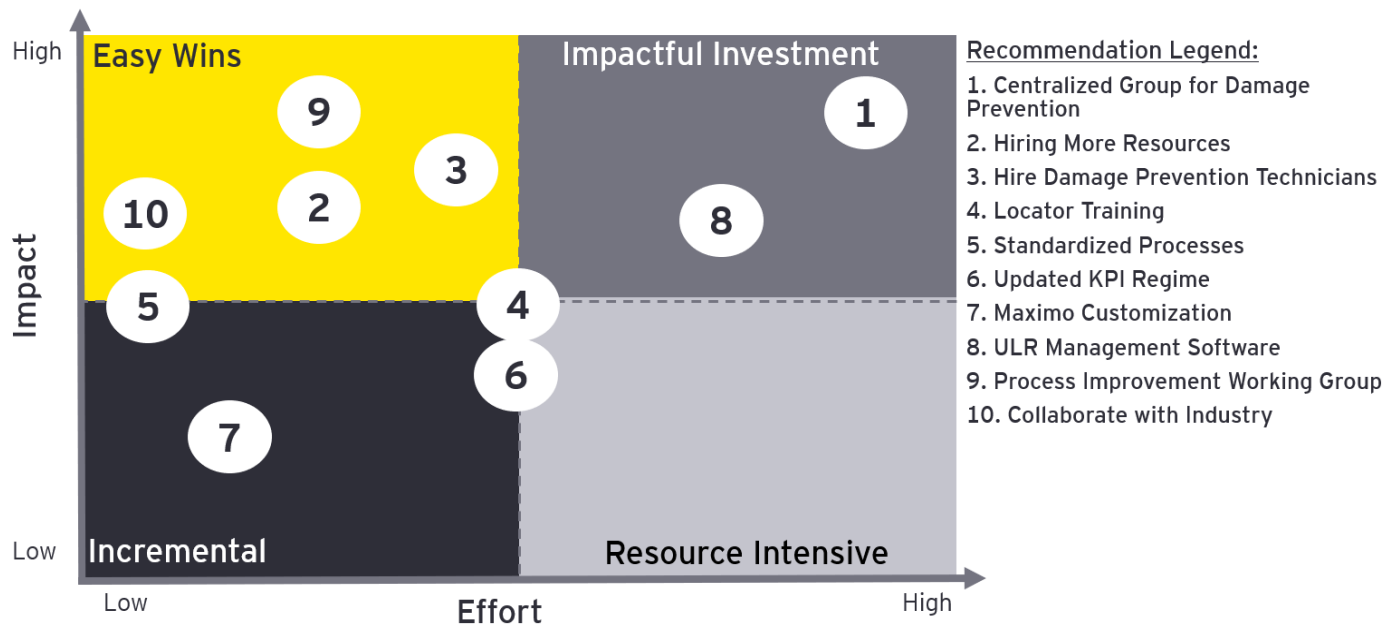
Rank	Recommendation	Impact Level	Level of Effort	Totals
1	Collaborate with Industry (#10)	High (4)	Very Low (5)	9
2	Process Improvement Working Group (#9)	Very High (5)	Low (4)	9
3	Hiring More Resources (#2)	High (4)	Low (4)	8
4	Hire Damage Prevention Technicians (#3)	High (4)	Low (4)	8
5	Standardized Processes (#5)	Moderate (3)	Very Low (5)	8
6	Centralized Group for Locates and Damage Prevention (#1)	Very High (5)	Very High (1)	6
7	ULR Management Software (#8)	High (4)	High (2)	6
8	Updated KPI Regime (#6)	Moderate (3)	Moderate (3)	6
9	Locator Training (#4)	Moderate (3)	Moderate (3)	6
10	Maximo Customization (#7)	Low (2)	Low (4)	6

The recommendations can also be grouped into four categories:

- ▶ **Easy wins:** recommendations that will create medium-to-high impact with a low-to-medium level of effort
- ▶ **Impactful investment:** recommendations that can create medium-to-high impact, but will also require medium-to-high level of effort
- ▶ **Resource intensive:** recommendations that will take medium-to-high level of effort to implement, but will yield a low-to-medium impact
- ▶ **Incremental:** recommendations that will take a low-to-medium level of effort to implement, but will also yield a low-to-medium impact

[Figure 12](#) illustrates the recommendations mapped to each of the four categories above.

Figure 12: Recommendations ranked by impact and effort ([View image description](#))



The easy wins (high impact and low effort) recommendations, as outlined in [Figure 12](#), that could be implemented in the near term by the Region include:

1. **Recommendation 10:** Improve the collaboration with industry representatives to support any related volume forecasting as larger projects proceed within the Region.
2. **Recommendation 9:** Develop an action plan that considers organizing a Process Improvement Working Group that regularly evaluate ULR service delivery and continuously define improvement opportunities.
3. **Recommendation 2:** Increase the number of available resources (with hiring and training) across Depots to deal with the larger volume of locates.
4. **Recommendation 3:** The Region should consider integrating a Damage Prevention Technician to support the compliance constraints for both water and wastewater and traffic signals locates.

The recommendations noted above can be considered immediate opportunities that the Region can prioritize to improve the ULR function. In the long-term, the Region can consider shifting towards a Centralized Group for Damage Prevention (Recommendation #1), which has a very high impact on the Region, however, can require significant time and costs for implementation.

8. Conclusion

A photograph of a construction site at dusk. Two workers in orange safety vests and white hard hats are in the foreground, looking towards the right. In the background, there is a red excavator and other construction equipment. To the left, there are stacks of blue and green pipes.

The Region has chosen an opportune time to implement changes to its ULR service delivery model. Increases in ULR volumes and pending changes to Legislation will affect the Region's ability to service ULRs within the legislated timelines and can result in financial penalties.

As discussed in [Section 4](#) of this report, four major themes were identified in the stakeholder consultations and assessment of the current ULR process in the Region:

1. **Planning:** Current processes do not involve detailed planning to address the unpredictable flow ULRs.
2. **Staffing:** The Region has a limited pool of locators and workers to conduct ULRs.
3. **Process Standardization:** Processes for locates are not standardized, limiting the ability of the Region to complete ULRs efficiently and reducing the quality of locates.
4. **Information Technology ("IT") Integration:** Staggered implementation of software tools for servicing ULRs has created inefficiency in completing ULRs within the legislated timeframe.

Additionally, it was noted that comparable municipalities and the wider locates industry were experiencing the same pressures caused by increasing ULR volumes and the changes in Legislations discussed in Section 5 of this report.

Considering the current state assessment and inputs provided by other jurisdictions, the Region has defined a target state for the locates function that includes a ***standardized and fully staffed ULR service delivery that operates in compliance with legislative requirements and considers damage prevention.***

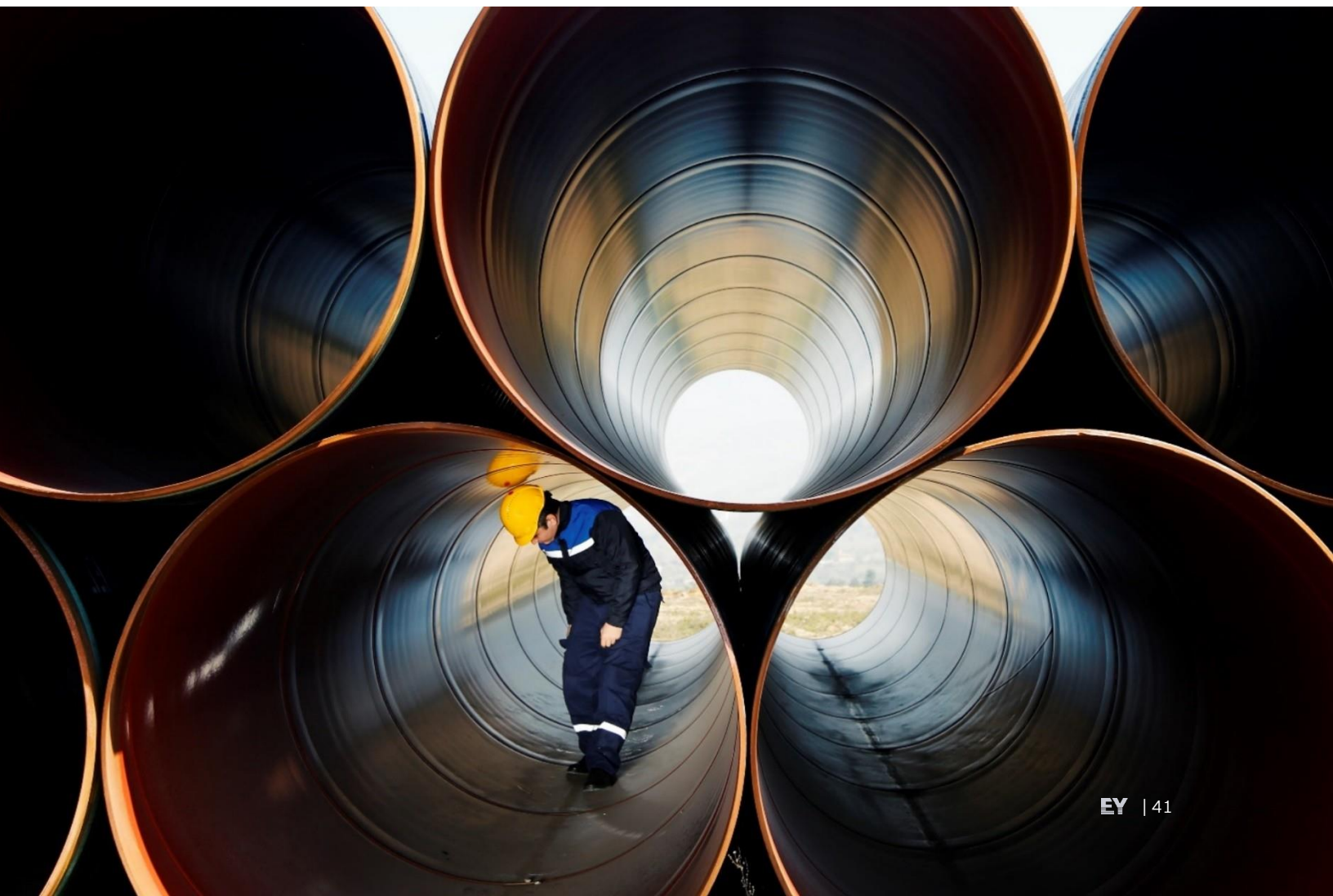


Targeted recommendations can be used to improve the service model and allow the Region to achieve the target state. The recommendations include centralizing the ULR function; increasing staffing; standardizing and improving processes and improving collaboration with other industry participants. The prioritized list of recommendations and the score allocated to each recommendation is provided in [Table 9](#) below:

Table 9: Prioritized list of Recommendation

Rank	Recommendation	Impact Level	Level of Effort	Totals
1	Collaborate with Industry (#10)	High (4)	Very Low (5)	9
2	Process Improvement Working Group (#9)	Very High (5)	Low (4)	9
3	Hiring More Resources (#2)	High (4)	Low (4)	8
4	Hire Generalist Locators (#3)	High (4)	Low (4)	8
5	Standardized Processes (#5)	Moderate (3)	Very Low (5)	8
6	Centralized Group for Locates and Damage Prevention (#1)	Very High (5)	Very High (1)	6
7	ULR Management Software (#8)	High (4)	High (2)	6
8	Updated KPI Regime (#6)	Moderate (3)	Moderate (3)	6
9	Locator Training (#4)	Moderate (3)	Moderate (3)	6
10	Maximo Customization (#7)	Low (2)	Low (4)	6

Further details about each recommendation are available in Section 7 of this report.



A photograph of a person wearing a light-colored winter jacket standing in a snowy, rocky landscape. The person is positioned in the center, looking towards the right. The background shows a mix of snow, rocks, and some bare trees under a clear sky. The image is partially obscured by a black banner at the top.

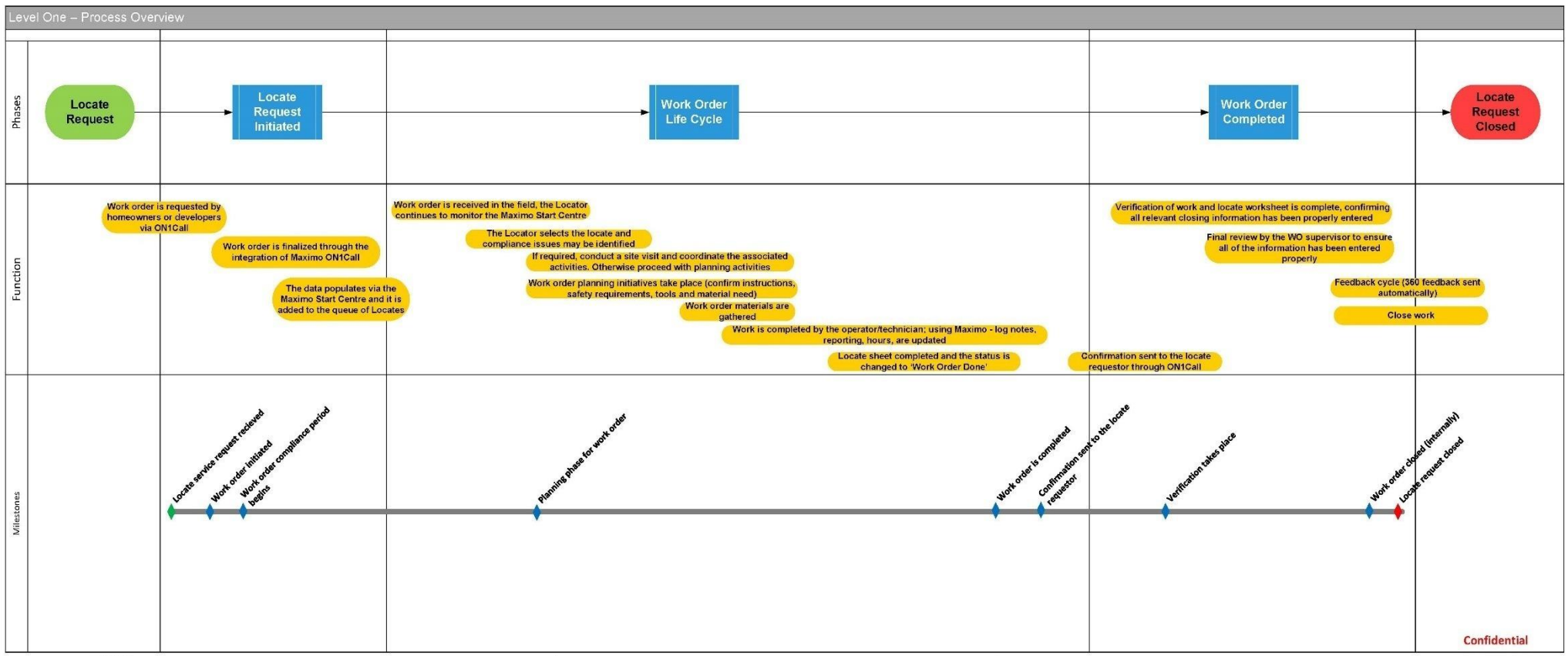
A. Appendix

Appendix A: Current State Process Map

Level One- Process Overview [\(View image description\)](#)

Durham Region: Locate Request Process Review

Process Overview

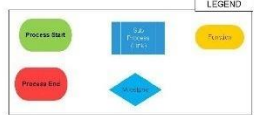


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Footnotes

Note: This draft process map was prepared based on discussions with Region staff.

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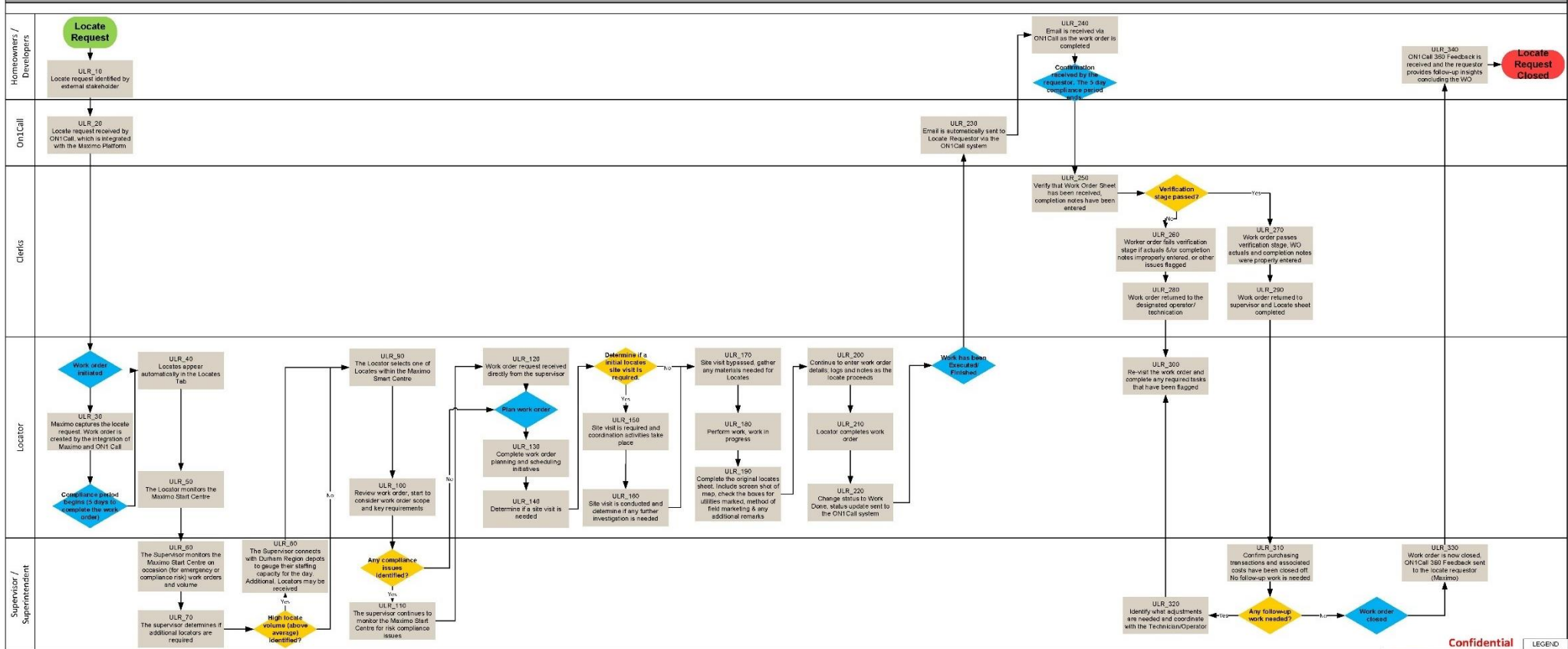


Level Two- Process Overview: Durham Region Locate Request [\(View image description\)](#)

Durham Region: Locate Request Process Review

Process Overview

Level Two – Process Overview: Durham Region Locate Request (Maximo and ON1Call)



Footnotes

Note: This draft process map was prepared based on discussions with Region staff.

Confidential LEGEND

- Process Start
- Process End
- Decision
- Pool
- Task
- Work Order
- Work Order
- Work Order
- Work Order

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B. Appendix

Appendix B: Table comparing the Municipalities

Table 10: Table Comparing Municipalities

Challenges	Peel	Kawartha	Industry Wide Comments:	Lessons Learned	Regional Opportunities
Planning	<ul style="list-style-type: none"> Locate volume is increasing within the Region annually Only deals with 10% of incoming locate requests and outsources the rest (90%) of outstanding volume Communication with the outsourced third-party is considered a challenge at times The liability that is associated with outsourced contracts requires additional attention; currently instituted contracts require amendments due to evolving legislation 	<ul style="list-style-type: none"> Locate volume is increasing due to larger sized projects Outstanding locate requests from April 2022 due to various communication barriers; improving communication with external parties (Promark) has been prioritized 'Locate dumping' commonly occurs and additional legislation is needed to limit occurrence 	<ul style="list-style-type: none"> Lack of visibility for projects which have high volumes of ULRs Project tickets exceeding the volume of homeowner tickets Projects are larger and more complex requiring additional available resources Improve communication with contractors that are working on the same dig site 	<ul style="list-style-type: none"> Locate volume is increasing across all municipalities The planning and communication that is required to efficiently complete high volume locates requires improvements Liability concerns may arise with external stakeholders when outsourced 	<ol style="list-style-type: none"> Outsource a portion of locates Improve communication with stakeholders Monitor volume of the locates sufficiently Mitigate any liability
Staffing	<ul style="list-style-type: none"> Previous training and staffing availability concerns Will add Damage Prevention Technicians Additional support staff considered a wish-list item as volume increases Locator Alliance Consortium or a Dedicated Locator model considered 	<ul style="list-style-type: none"> Recently hired two Damage Prevention Technicians (DPTs) and have put in a request for a third Hiring a supervisor to deal strictly with locates Hiring is a challenge for DPTs, requires a technical engineering background and sufficient experience is expected 	<ul style="list-style-type: none"> Scarce locator resource pool Diverse stakeholder group with various skill sets and education High-pressure and high-risk job has hindered availability of staff Wages are generally low Additional resources and funding needed to maintain compliance expectations Training and certification consistency needed Improved DPT training needed 	<ul style="list-style-type: none"> The availability of Locators is a concern across municipalities Hiring and training to conduct high-quality locates is a challenge Damage Prevention Staff needed across Regions as liability becomes more of a concern with regulation changes 	<ol style="list-style-type: none"> Improve training systems Define locator job descriptions to align with quality expectations Introduce Damage Prevention Staff
Process Standardization	<ul style="list-style-type: none"> Compliance is a primary concern because of budgetary precautions Standard Operating Procedure (SOP) has been developed to improve upon process discrepancies 	<ul style="list-style-type: none"> Compliance numbers are 50%, mitigating penalties seen as a challenge Recently defined an SOP to fine tune system challenges Performance based billing is expected to increase exposure to liability 	<ul style="list-style-type: none"> Reduce written documentation effort to allow for more efficient locator time Increase efficiency throughout the end-to-end process 	<ul style="list-style-type: none"> SOPs have been developed to improve the consistent quality of locates 	<ol style="list-style-type: none"> Define an SOP mandate to align expectations

Challenges	Peel	Kawartha	Industry Wide Comments:	Lessons Learned	Regional Opportunities
System Integration	<ul style="list-style-type: none"> ▶ Quality and accuracy of drawings have been improved with the outsource model ▶ Looking to integrate a new GPS system to improve locate tracing ▶ Uses Hansen asset management tool ▶ Ideally will purchase a ticket management system to better monitor compliance and integration with ON1Call 	<ul style="list-style-type: none"> ▶ Availability of data to complete locates efficiently is a primary concern, long-term plan will prioritize improving data availability ▶ Disconnect of information flow and the digitalization of assets 	<ul style="list-style-type: none"> ▶ Legacy IT systems that may not support legislation changes ▶ Leverage technology to support planning needs ▶ Adequate locate notification technology is needed and should be standardized 	<ul style="list-style-type: none"> ▶ Locate specific systems have been prioritized by both municipalities ▶ Data availability and sharing an issue across Regions 	<ol style="list-style-type: none"> 1. Introduce an off the shelf locate ticket system 2. Maximo can continue to be used as an asset management system



C. Appendix

Appendix C: Sample Organization Chart for the Centralized Utility Locates Group

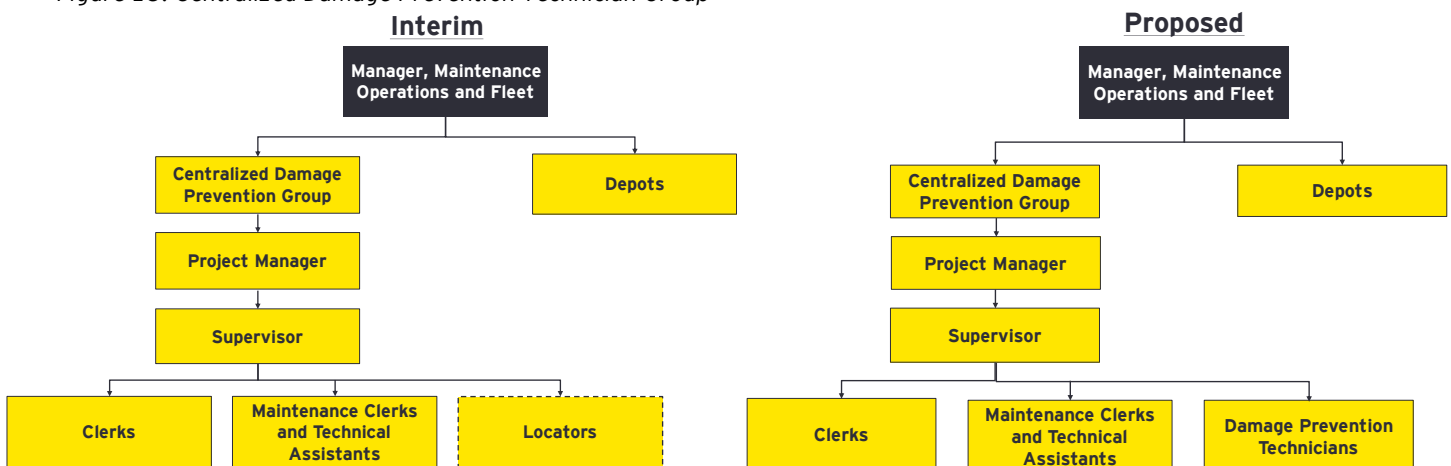
Recommendation 1 suggested to create a Centralized Damage Prevention Group. The sample organization chart illustrates an opportunity for the Region to combine various technical roles (e.g., Skilled Maintenance Worker/Locators, Damage Prevention Technicians) into a designated work stream. The recommended centralized group could include:

- ▶ A Manager, Maintenance Operations and Fleet to oversee the entire centralized group.
- ▶ A Project Manager, responsible for organization of group activities and outreach (e.g., communication with third-parties such as developers, ON1Call, excavators).
- ▶ A Supervisor, responsible for managing daily activities.
- ▶ Maintenance Clerks and Technical Assistants, responsible for assisting with the daily flow of locate requests.
- ▶ Damage Prevention Technicians (DPTs), responsible for completing utility locates (water and wastewater and traffic signals) across the Region. DPTs can also provide additional support to execute the Region's damage prevention program.
- ▶ Clerks, responsible for supporting the group with administration

The Region can integrate DPTs within the centralized group or use a combination of Maintenance Clerks and DPTs.

Figure 13 illustrates a two-stage approach for the Region to develop a Centralized Damage Prevention Group that recognizes hiring the right mix of resources will take some time. In the interim stage, dedicated locators from the depots can be reallocated to the Centralized Damage Prevention group to work with Maintenance Clerks on completing locates until either enough DPTs are hired in the proposed stage, or the dedicated locators are trained and qualified to become DPTs. Once the centralized group has enough DPTs, the locators can be reallocated back to the depots to support Works Department activities. In the interim stage, using a combination of both locators from the depots and Maintenance Clerks can be beneficial as there will be staff continuity for locates.

Figure 13: Centralized Damage Prevention Technician Group



D. Appendix

Appendix D: Sample Locate Volume Forecast to Identify Staffing Needs

The Region currently has a population of approximately 675,000 which is expected to grow 1.9% annually. In correlation, the utility locate services is expected to see an increase in volume, with an additional 500 locates per year as seen in [Figure 14](#). To calculate the required staff needed to support the increased volume, assumptions were defined for completion, travel, and administrative time taken for each individual locate. These assumptions, for both water and wastewater and traffic signals can be found in [Table 11](#).

Figure 14: Estimated Increase in Locate Volume ([View image description](#))

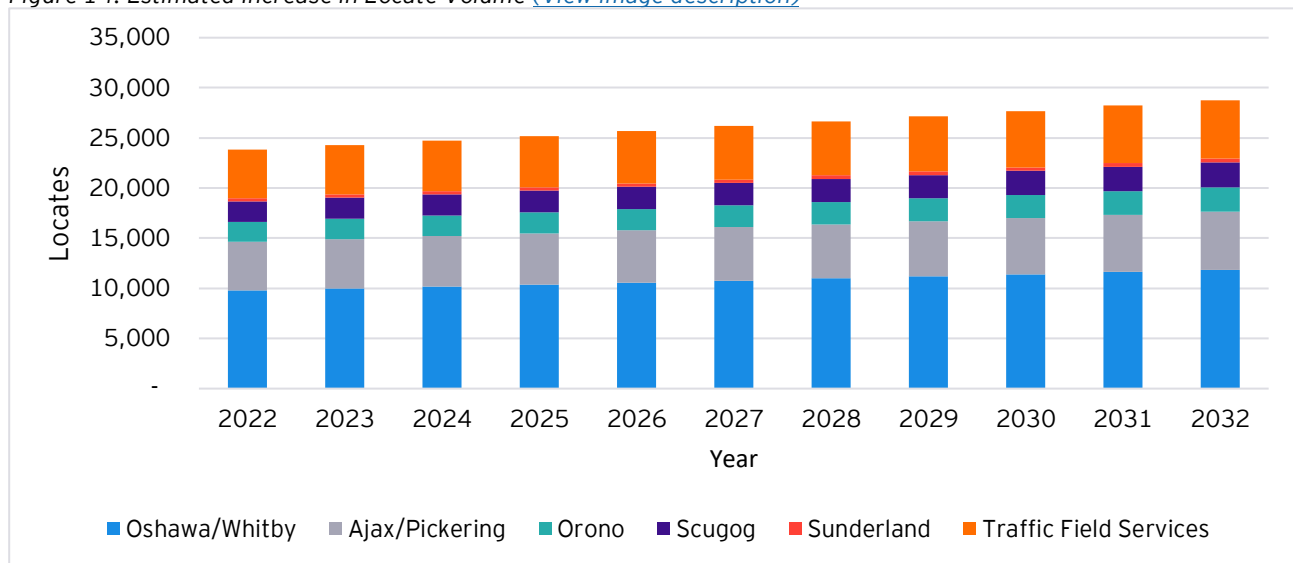


Table 11: Assumptions for time required to complete the various steps of a Locate

Assumptions (hr/locate)	Water and Wastewater	Traffic Field Services
Time to complete a locate (hr/locate)	0.5hr (30 mins)	0.5hr (30 mins)
Travel time (hr/locate)	0.5hr (30 mins)	0.75hr (45 mins)
Administration time (hr/locate)	0.25hr (15 mins)	0.25hr (15 mins)
Total (hr/locate)	1.25hr (75mins)	1.50hr (75mins)

Figure 15: Estimated Total Hours Required to Complete the Forecasted Locate Volume [\(View image description\)](#)

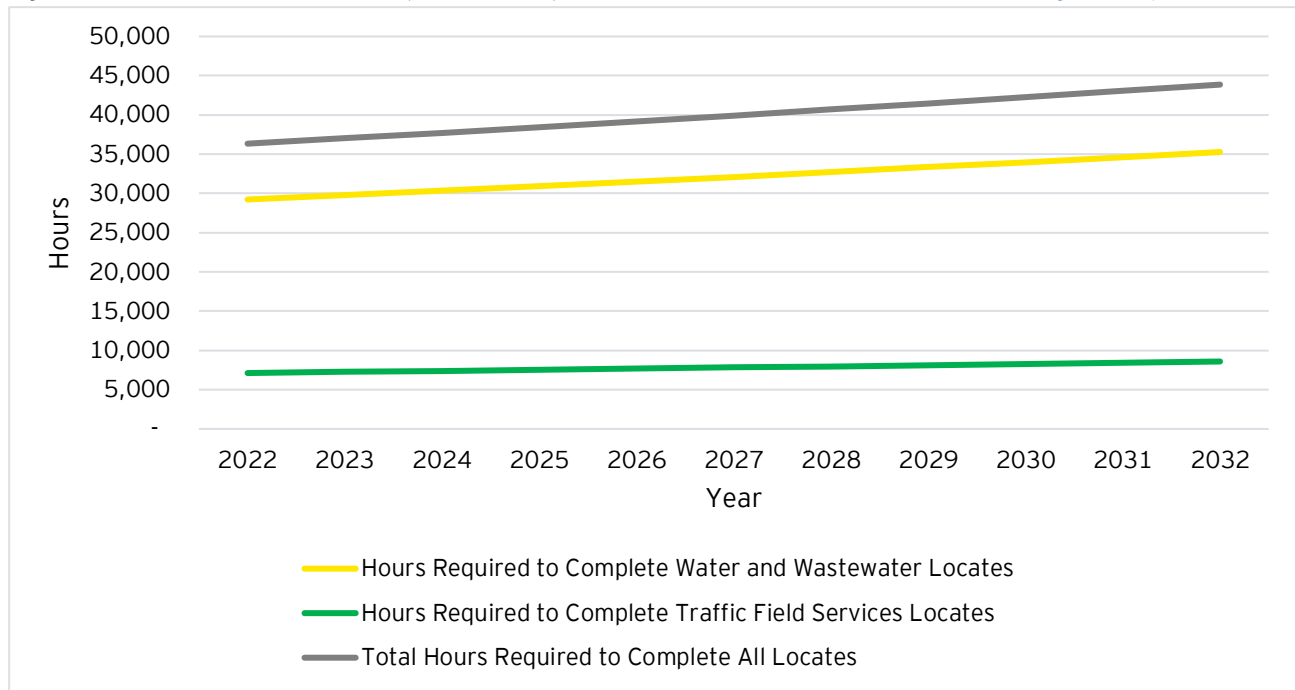
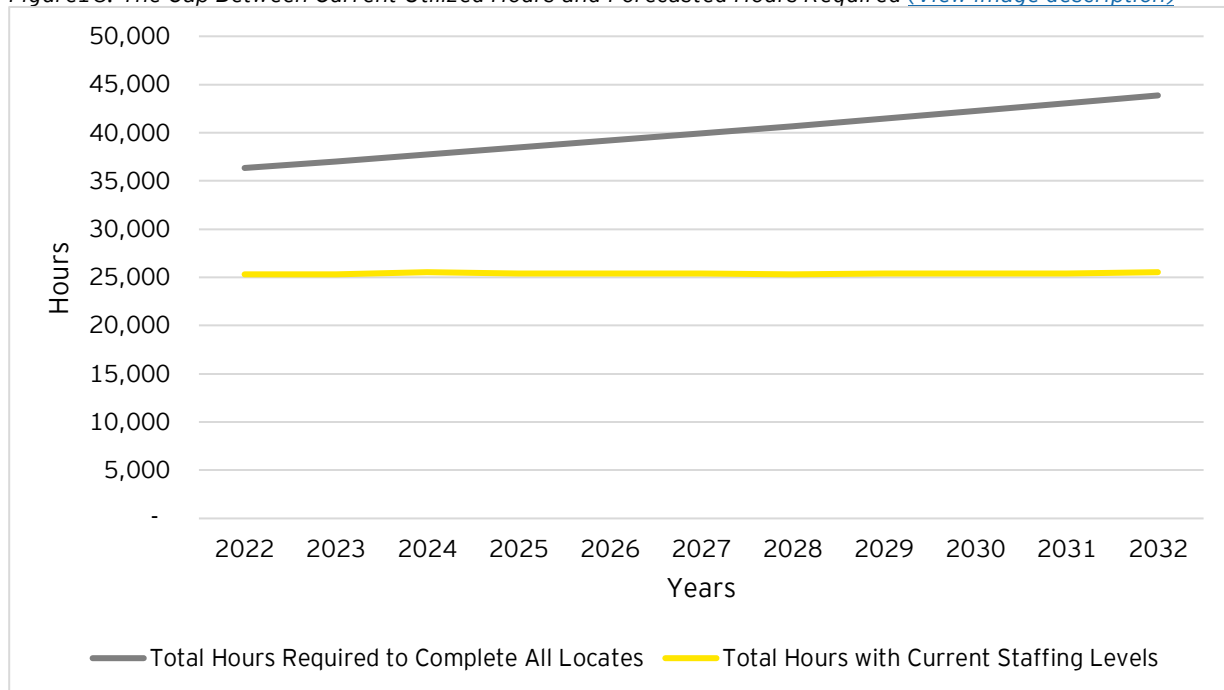


Figure 15 illustrates the total hours required to complete locates between the years 2022 and 2032, which is estimated between 36,000 and 50,000 hours annually. Similarly, as indicated in Figure 16 the Region currently has enough staff to effectively complete 25,000 locate hours. There is approximately a 11,000-hour gap between the current and forecasted required staffing levels.

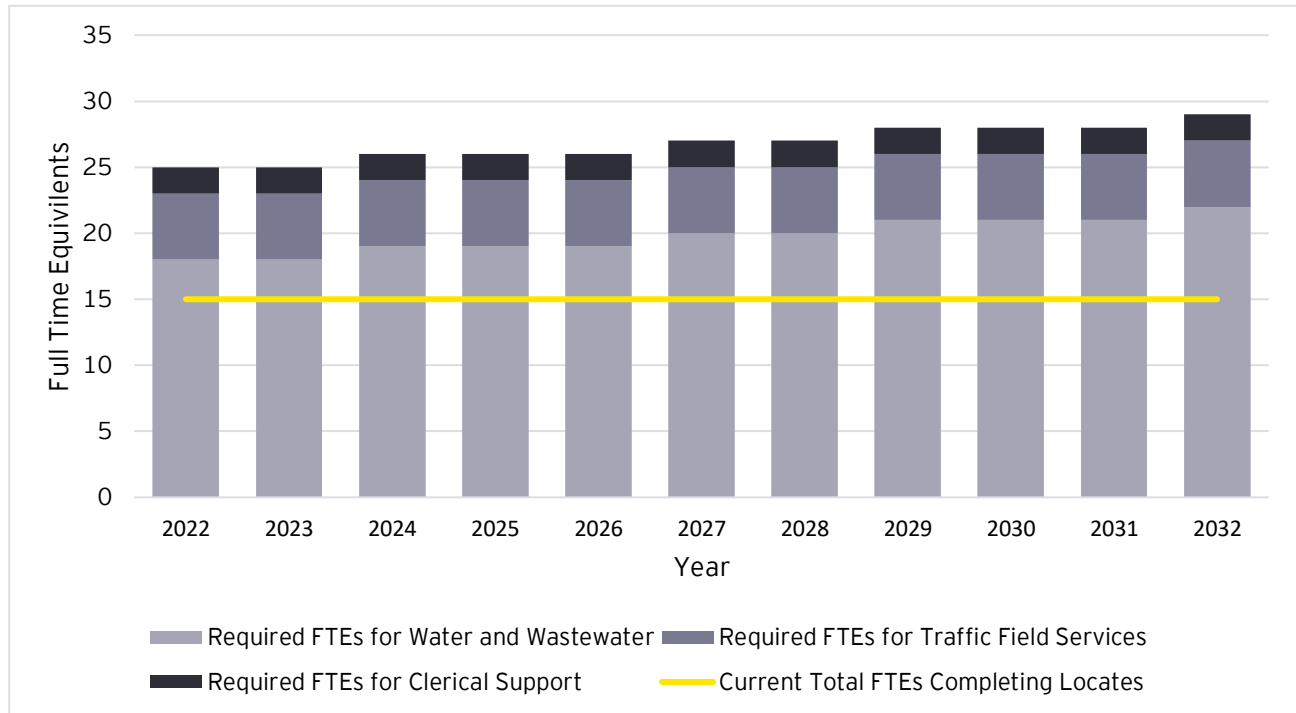
Figure 16: The Gap Between Current Utilized Hours and Forecasted Hours Required [\(View image description\)](#)



The required hours were calculated using the work hours after considering public holidays and vacations. Currently, Figure 17 illustrates that the Region uses **15 resources** (locators and clerks) that complete locates throughout the Region. However, the volume of ULRs received by the Region indicate 25 FTEs are

needed to complete locates efficiently. Specifically, **18 FTEs** for completing water and wastewater locates and **5 FTEs** for completing traffic signal locates, and **2 FTEs** for clerical support.

Figure 17: Current Locator Staff vs the Required Locator Staff ([View image description](#))



E. Appendix (Figure Descriptions)

Figure 18: ON1Call process for obtaining a locate

- Step 1: Contact - At least five (5) business days before digging, a homeowner or developers needs to submit a locate with ON1Call.
- Step 2: Locate - Once the request is received, locators from the underground infrastructure owners travel to the location of the excavation site and identify the buried infrastructure.
- Step 3: Excavate - With locations of underground infrastructures identified the homeowner or developer is clear to excavate safely.

[\(Back to Figure 2\)](#)

Figure 19: Methodology for Conducting the Review

Phase	Objectives	Activities
Assessment and Validation	<ul style="list-style-type: none"> • Review Existing planning process and organizational structure. • Gain an understanding of the state of the current Utility Locate Request (ULR) process and organizational capabilities. • Validate current state assessment finding through stake holder consultations. • Complete best practices study with available data. • Document current process for Utility Locate Request services. 	<ol style="list-style-type: none"> 1. ULR request current state assessment: <ul style="list-style-type: none"> • Review existing planning process. • Identify Key strength/weakness of the current processes. • Document existing planning and execution process in detailed process maps. 2. Stakeholder engagement: <ul style="list-style-type: none"> • Validate Process mapping and assessment results. • Collect point of view on the stakeholder landscape. • Discuss potential improvements and obtain feedback from various stakeholder groups. 3. Benchmarking: <ul style="list-style-type: none"> • Identify KEY performance metrics from the region and validate via research and stakeholder interviews. • Identify comparable two-tier municipalities and agencies. • Complete best practices study with available data. 4. Reporting: <ul style="list-style-type: none"> • Document current process for ULR services. • Categorize strengths and weaknesses into focus areas.

Process Analysis	<ul style="list-style-type: none"> Review process map and other information received and complete results in a process analysis. Identify a target state for the region's ULR function. Identify opportunities to improve existing process and focus areas to meet the target state. Discuss identified opportunities and prepare a final list of improvement opportunities. Document potential benefits derived by implementation of the improvement opportunities. 	<ol style="list-style-type: none"> Analysis: <ul style="list-style-type: none"> Identify key assessment measures, e.g.: level of effort, key impact on operations and compliance. Complete the process analysis activities and discuss the results with the region. Improvement opportunities: <ul style="list-style-type: none"> Develop shortlist of potential improvement opportunities and how they target the focus areas. Review existing efficiency improvement initiatives at the region to design a set of recommendations that is aligned with the existing objectives. Reporting: <ul style="list-style-type: none"> Validate the target state with the region. Report final list of improvement opportunities after consultation with the region. Develop a one-page summary that summarizes the opportunities.
Recommendation and Next Steps	<ul style="list-style-type: none"> Prepare a final report including existing process maps and opportunities for improving current process (40 pages maximum). Prepare an executive summary based on the findings of the review. 	<ol style="list-style-type: none"> Develop Final Recommendations: <ul style="list-style-type: none"> Develop a final report to document the existing process, the target state, improvement opportunities and recommendations to achieve the target state. Facilitate prioritization of identified key initiatives and recommendations against ULR strategy, risk factors, internal and external limitations in a heat map (impact vs effort required). Next Steps: <ul style="list-style-type: none"> Discuss and document next steps required to potentially implement- identified improvement opportunities for the ULR services

[\(Back to Figure 4\)](#)

Figure 20: Locates compliance between October 2021 to July 2022

Timeframe	Compliant Locate	Non-Compliant locate
October 2021	Approx. 900	Approx. 1900
November 2021	Approx. 950	Approx. 1600
December 2021	Approx. 600	Approx. 1200
January 2022	Approx. 700	Approx. 950
February 2022	500	Approx. 1100
March 2022	Approx. 1100	2500
April 2022	1000	2500
May 2022	1500	Approx. 2750
June 2022	2500	Approx. 2650
July 2022	2000	Approx. 2200

Note: The trend line shows that the compliance state improved in June 2022 partly because of Maximo implementation.

[\(Back to Figure 5\)](#)

Figure 21: Summary of participating stakeholder groups

The figure gives us a summary of the stakeholders across all depots within the region which includes all the Underground Locates Request Depot and the Traffic Depot, who participated in the in-person consultations.

Depot/Staff	Attendees
1. Ajax/Pickering	Supervisor, Superintendent
2. Oshawa/Whitby Depot	Supervisor, Superintendent
3. Sunderland Depot	Supervisor, Superintendent
4. Orono Depot	Supervisor, Superintendent
5. Scugog Depot	Supervisor, Superintendent
6. Locator Staff	Locators, Clerical Staff
7. Traffic Field Services Depot	Coordinator

[\(Back to Figure 7\)](#)

Figure 22: Level of challenges associated with each focus area

Key theme	Urban Depots (Oshawa/Whitby and Ajax/ Pickering)	Rural Depots (Sunderland, Orono and Scugog)	Traffic Field Service Depot	Extent of challenge:
1. Planning	High	Moderate	High	High
2. Staffing	High	Moderate	High	High
3. Process Standardization	Moderate	High	Moderate	Moderate
4. IT Integration	Moderate	Moderate	High	Moderate

[\(Back to Figure 8\)](#)

Figure 23: Summary of Findings from Stakeholder Consultations

Activity	Large Depots like Oshawa/ Whitby and Ajax/Pickering	Small Depots like Scugog, Sunderland and Orono	Traffic Field Services Depots
Planning	<p><i>Level of challenge: HIGH</i></p> <ul style="list-style-type: none"> • Selecting WOs in Start Centre. • Rudimentary Ticket Prioritization. (Emergency). • Locate Route-Planning Limited. • Limited time for Planning (Compliance timeline vs Volume.) 	<p><i>Level of challenge: MODERATE</i></p> <ul style="list-style-type: none"> • Field connectivity limits planning. • No communication from contractors. • Planning not needed, capability under-developed. • Emergency WOs time-intensive • Planning for re-marks. • Low preparedness for high volumes. 	<p><i>Level of challenge: HIGH</i></p> <ul style="list-style-type: none"> • Region-wide remit, single Clerk dedicates time for planning. • Location description added individually. • Locate route planning rudimentary, but necessary due to remit.

Staffing	<p><i>Level of challenge: HIGH</i></p> <ul style="list-style-type: none"> •Locator Availability limited and belonged to Depot: no sharing. •Limited interaction with Traffic. •Locator Incentives not aligned with Volume. •Locator does end to end of locate. •Limited equipment availability. •Clerks not efficiently utilized. 	<p><i>Level of challenge: MODERATE</i></p> <ul style="list-style-type: none"> •Limited dedicated Locators, utilize SMW's •Locates Prioritization vs BAU •Hiring Locators not easy; Borrow from other Depots is logistically challenging. •Limited formal training: Quality concerns. •Forecasting high volumes in near future. •Supervisor checking sometimes unfeasible 	<p><i>Level of challenge: HIGH</i></p> <ul style="list-style-type: none"> •Region-wide remit, single Clerk dedicates time for planning. •Location description added individually. •Location route planning rudimentary, but necessary due to remit.
Process Standardization	<p><i>Level of challenge: MODERATE</i></p> <ul style="list-style-type: none"> •Administration backlog during peak seasons. •Inefficient completion of administration responsibilities. •Lack of SOP's and training. •Lack of group level performance indicators 	<p><i>Level of challenge: High</i></p> <ul style="list-style-type: none"> •Limited historical data within the Maximo system •Short Validity period for remarks. •Lack of policy procedures, SOP's training inconsistent all-clear parameters 	<p><i>Level of challenge: HIGH</i></p> <ul style="list-style-type: none"> •Compliance not prioritized •Lack of performance indicators, specifically for compliance targets. •Lack of SOP's and training inconsistent expectation
IT Integration	<p><i>Level of challenge: MODERATE</i></p> <ul style="list-style-type: none"> •Integration of Maximo staggered across depots. •Additional customization opportunities for Maximo identified 	<p><i>Level of challenge: MODERATE</i></p> <ul style="list-style-type: none"> •Data has not yet been digitalized or archived in Maximo system. •Older software still used; whereas Maximo usage is not completely standardized. •Availability of key functionality is a concern. •Connectivity issues at times. 	<p><i>Level of challenge: HIGH</i></p> <ul style="list-style-type: none"> •Older software still prioritized. •Lack of Maximo customization specifically for Traffic Locates . •Maximo primarily used by Coordinators •Slow integration of Maximo.

[\(Back to Figure 9\)](#)

Figure 24: Summary of the target state and gap analysis

Current state	Gaps and Focus Areas	Opportunities for Improvement	Target state
Challenges in delivering an increasing volume of locates within the legislative compliance requirements of ON1Call.	<ul style="list-style-type: none"> • Planning • Staffing • Process Standardization • Integration and Customization of Maximo. 	<ul style="list-style-type: none"> • Balance Legislation compliance with Works Department operations as usual to minimize penalties. • Allocate adequate staffing/ resourcing levels to address availability concerns and locate requests volume. • Define and implement locate process standardization to improve efficiency and consistency of service delivery • Utilize continuous improvements to improve process standards and customize systems and software. • Improve integration and relationship with ON1Call and other agencies to normalize locates volume and capitalize benefits of membership. 	Standardised and fully staffed ULR service delivery in compliance with legislative requirements and considers damage prevention.

[\(Back to Figure 10\)](#)

Figure 25: Key challenge areas in current service delivery model are addressed by opportunities for improvement

Opportunities for Improvement	Focus area addressed
Balance Legislation compliance with Works Department operations as usual to minimize penalties	<ul style="list-style-type: none"> • Planning • Staffing • Process Standardization.
Allocate adequate staffing/resourcing levels to address availability concerns and locate requests volume	<ul style="list-style-type: none"> • Planning • Staffing
Define and implement locate process standardization to improve efficiency and consistency of service delivery	<ul style="list-style-type: none"> • Planning • Process Standardization.
Utilize continuous improvements to improve process standards and customize systems and software	<ul style="list-style-type: none"> • Process Standardization • IT Integration
Improve integration and relationship with ON1Call and other agencies to normalize locates volume and capitalize benefits of membership	<ul style="list-style-type: none"> • Planning, • Staffing • Process Standardization • IT Integration.

[\(Back to Figure 11\)](#)

Figure 26: Recommendations ranked by impact and effort

Recommendation mapping:

Category	Recommendations mapped
Easy Wins (High impact and low effort)	<ul style="list-style-type: none"> • Hiring more resources • Hire Damage prevention Technicians • Standardized processes • Process Improvement working group • Collaborate with industry
Impactful investment (High impact and high effort)	<ul style="list-style-type: none"> • Centralized group for Damage prevention • ULR Management Software
Incremental (Low impact and low effort)	<ul style="list-style-type: none"> • Maximo customization
Resource Intensive (Low impact and high effort)	<ul style="list-style-type: none"> • Locator Training • Standardized processes • Updated KPI Regime

[\(Back to Figure 12\)](#)

Figure 27: Estimated Increase in Locate Volume

Region	Locate volume in year 2022	Locate volume in year 2023	Locate volume in year 2024	Locate volume in year 2025	Locate volume in year 2026	Locate volume in year 2027	Locate volume in year 2028	Locate volume in year 2029	Locate volume in year 2030	Locate volume in year 2031	Locate volume in year 2032
Oshawa/Whiby	9814	10000	10190	10384	10581	10782	10986	11195	11407	11624	11845
Ajax/Pickering	4832	4923	5017	5112	5209	5308	5409	5512	5616	5723	5832
Orono	1982	2020	2058	2097	2137	2178	2219	2261	2304	2348	2392
Scugog	2059	2098	2137	2178	2219	2262	2304	2348	2393	2438	2485
Sunderland	307	312	318	324	331	337	343	350	356	363	370
Traffic Field Services	4834	4926	5019	5114	5212	5311	5411	5514	5619	5726	5834

[\(Back to Figure 14\)](#)

Figure 28: Estimated Total Hours Required to Complete the Forecasted Locate Volume

Year	Hours Required to complete water and wastewater locates	Hours required to Complete Traffic Field Services locates	Total Hours Required to Complete All Locates
2022	29228	7116	36344
2023	29783	7251	37034
2024	30349	7388	37737
2025	30925	7529	38454
2026	31512	7672	39184

2027	32111	7817	39928
2028	32720	7966	40686
2029	33342	8117	41459
2030	33975	8271	42246
2031	34620	8428	43048
2032	35277	8588	43866

[\(Back to Figure 15\)](#)

Figure 29: The Gap Between Current Utilized Hours and Forecasted Hours Required

Year	Total Hours Required to Complete All Locates	Total hours with current Staffing levels
2022	36344	25313
2023	37034	25313
2024	37737	25538
2025	38454	25425
2026	39184	25425
2027	39928	25425
2028	40686	25313
2029	41459	25425
2030	42246	25425
2031	43048	25425
2032	43866	25538

[\(Back to Figure 16\)](#)

Figure 30: Current Locator Staff vs the Required Locator Staff

Year	Required FTEs for Water and Wastewater	Required FTEs for Traffic Field Services	Required FTEs for Clerical Support	Current Total FTEs Completing Locates
2022	18	5	2	15
2023	18	5	2	15
2024	19	5	2	15
2025	19	5	2	15
2026	19	5	2	15
2027	20	5	2	15
2028	20	5	2	15
2029	21	5	2	15
2030	21	5	2	15
2031	21	5	2	15
2032	22	5	2	15

[\(Back to Figure 17\)](#)

Level One- Process Overview

Phase	Function	Milestone
Locate Request	<ul style="list-style-type: none"> • Work order is requested by homeowners or developers via ON1Call 	
Location request Initiated	<ul style="list-style-type: none"> • Work order is finalized through the integration of Maximo ON1Call. • The data populates via the Maximo Start Centre, and it is added to the queue of Locates 	<ul style="list-style-type: none"> • Locate service request received • Work order initiated • Work order compliance period begins
Work Order life cycle	<ul style="list-style-type: none"> • Work order is received in the field, the Locator continues to monitor the Maximo Start Centre. • The Locator selects the locate and compliance issues may be identified. • If required, conduct a site visit and coordinate the associated activities. Otherwise proceed with planning activities • Work order planning initiatives take place (confirm instructions, safety requirements, tools and material need) • Work order materials are gathered • Work is completed by the operator/technician; using Maximo - log notes, reporting, hours, are updated • Locate sheet completed and the status is changed to 'Work Order Done' • Confirmation sent to the locate requestor through ON1Call 	<ul style="list-style-type: none"> • Planning phase for work order • Work order is completed • Confirmation sent to locate requester
Work order completed	<ul style="list-style-type: none"> • Verification of work and locate worksheet is complete, confirming all relevant closing information has been properly entered • Final review by the WO supervisor to ensure all of the information has been entered properly • Feedback cycle (360 feedback sent automatically) • Close work 	<ul style="list-style-type: none"> • Verification takes place • Work order closed (internally) • Locate Request closed.
Locate request closed		

Note: This draft process map was prepared based on discussions with Region staff.

BY: EY

FOR: DURHAM REGION

DATE/VER: 12/19/2022 CONFIDENTIAL

[\(Back to Level One - Process Overview\)](#)

Level Two- Process Overview: Durham Region Locate Request

The different set of users are Homeowners/Developers, On1Call, Clerks, Locator, Supervisor/Superintendent.

Homeowners/Developers

Process Start - Locate Request

Process Step - ULR_10 Locate request identified by external stakeholder

ON1Call

Process step - Locate request received by ON1Call, which is integrated with the Maximo Platform

Locator

Milestone - Work order initiated

Process Step - ULR_30 Maximo captures the locate request. Work order is created by the integration of Maximo and ON1 Call

Milestone - Compliance period begins (5 days to complete the work order)

Process Step - ULR_40 Locates appear automatically in the Locates Tab

Process Step - ULR_50 The Locator monitors the Maximo Start Centre

Supervisor/Superintendent

Process Step - ULR_60 The Supervisor monitors the Maximo Start Centre on occasion (for emergency or compliance risk) work orders and volume

Process Step - ULR_70 The supervisor determines if additional locators are required

Decision - High locate volume (above average) identified?

If yes,

Process Step - ULR_80 The Supervisor connects with Durham Region depots to gauge their staffing capacity for the day. Additional, Locators may be received

Locator

Process Step - ULR_90 The Locator selects one of Locates within the Maximo Smart Centre

If no,

Process Step - ULR_90 The Locator selects one of Locates within the Maximo Smart Centre

Process Step - ULR_100 Review work order, start to consider work order scope and key requirements

Supervisor/Superintendent

Decision - Any compliance issues identified?

If yes,

Process Step - ULR_110 The supervisor continues to monitor the Maximo Start Centre for risk compliance issues

If no,

Locator

Process Step - ULR_120 Work order request received directly from the supervisor

Milestone - Plan work order

Process Step - ULR_130 Complete work order planning and scheduling initiatives

Process Step - ULR_140 Determine if a site visit is needed

Decision - Determine if a initial locates site visit is required.

If yes,

Process Step - ULR_150 Site visit is required, and coordination activities take place

Process Step - ULR_160 Site visit is conducted and determine if any further investigation is needed

Process Step - ULR_170 Site visit bypassed, gather any materials needed for Locates

If no,

Process Step - ULR_170 Site visit bypassed, gather any materials needed for Locates

Process Step - ULR_180 Perform work, work in progress

Process Step - ULR_190 Complete the original locates sheet. Include screen shot of map, check the boxes for utilities marked, method of field marketing & any additional remarks

Process Step - ULR_200 Continue to enter work order details; logs and notes as the locate proceeds

Process Step - ULR_210 Locator completes work order

Process Step - ULR_220 Change status to Work Done, status update sent to the ON1Call system

Milestone - Work has been Executed/Finished

On1Call

Process Step - ULR_230 Email is automatically sent to Locate Requestor via the ON1Call system

Homeowners/Developers

Process Step - ULR_240 Email is received via ON1Call as the work order is completed

Milestone - Confirmation received by the requestor. The 5 day compliance period ends.

Clerks

Process Step - ULR_250 Verify that Work Order Sheet has been received, completion notes have been entered

Decision - Verification stage passed?

If no,

Process Step - ULR_260 Worker order fails verification stage if actuals &/or completion notes improperly entered, or other issues flagged

Process Step - ULR_280 Work order returned to the designated operator/technician

Locator

Process Step - ULR_300 Re-visit the work order and complete any required tasks that have been flagged

If yes,

Process Step - ULR_270 Work order passes verification stage, WO actuals and completion notes were properly entered

Process Step - ULR_290 Work order returned to supervisor and Locate sheet completed

Supervisor/Superintendent

Process Step - ULR_310 Confirm purchasing transactions and associated costs have been closed off. No follow-up work is needed

Decision - Any follow-up work needed?

If yes,

Process Step - ULR_320 Identify what adjustments are needed and coordinate with the Technician/Operator

Locator

Process Step - ULR_300 Re-visit the work order and complete any required tasks that have been flagged

If no,

Milestone - Work order closed

Process Step - ULR_330 Work order is now closed, ON1Call 360 Feedback sent to the locate requestor (Maximo)

Homeowners/Developers

Process Step - ULR_340 ON1Call 360 Feedback is received, and the requestor provides follow-up insights concluding the WO

Process End - Locate Request Closed

Note: This draft process map was prepared based on discussions with Region staff.

BY: EY

FOR: DURHAM REGION

DATE/VER: 12/19/2022 CONFIDENTIAL

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