

## Introduction

The objective of the City of Burlington's Asset Management Program is to implement asset management leading practices for infrastructure investment and management decision making. The ultimate goal of asset management is to optimize reinvestment in the life cycle of the City's infrastructure by understanding and delivering levels of service to customers and stakeholders while balancing the tradeoffs between cost of service and risks associated with asset failure. Asset management is a way of doing business and ultimately needs to be integrated into day-to-day operations and decision making. The City is moving forward with the selection and implementation of an enterprise asset management (EAM) system, which is a technology enabler used to advance asset management best practices.

The scope of work and approach described herein is an extension of the work to help the City *evaluate* and *procure* Enterprise Asset Management software. The scope of work described herein focuses on supporting the City during the software *implementation* phase by providing GIS and asset management professional services. KCI will perform work on an on-call, as-needed basis. The tasks described below have been identified as possible areas of need by the City of Burlington and will serve as the foundation for the work performed by KCI. Additional professional services may also be provided on a time and materials basis.

The following scope of services and work plan assumes the Asset Management Administrators will coordinate and schedule meetings, workshops, etc. and will secure adequate resources as needed. Due to COVID-19 restrictions and precautions, it is assumed the following scope of work will be delivered remotely, unless otherwise stated herein.

## Scope of Work - Implementation Phase

### Task 3.0: Project Management, Coordination and Reporting (Implementation Phase)

#### Project Management, Coordination and Reporting

KCI's project manager will work closely with the Asset Management Administrators and the KCI team members to ensure all tasks are completed on schedule, within budget, and are of high quality.

The project manager will perform these key activities:

- Prepare monthly project status reports. The status report will report work accomplishments, planned activity, issues for resolution, and the project's financial status.
- Maintain formal and informal communication in the form of progress meetings and update calls with the Asset Manager and appropriate stakeholders.
- Update the project schedule.
- Coordinate all tasks within the scope of work.

### Task 3.1: On-Call Implementation Support

KCI will serve as a trusted advisor during the implementation of the selected software to verify the CMMS / EAM solution is well planned. The nature of the work will vary based on the system selected by the City of Burlington and the services included in the vendor's implementation plan. However, regardless of the solution chosen, proper planning leads to efficient implementation. In addition, KCI will help translate end-user needs discussed during the needs assessment phase with the selected vendor to maximize user satisfaction. During implementation, KCI will assist the City in making informed decisions, evaluate options presented by the vendor, and assist with written and oral technical communication. The selected software will serve divisions funded by water enterprise funds and those funded by the general fund. It is assumed the tasks required to the implementation for each division will be similar.

Work performed under this task may include preparing agendas; documenting meeting minutes; preparing position statements; and / or facilitating meetings. Implementation oversight and support work performed by KCI may include, but is not limited to:

## Vendor negotiations

KCI will provide support to the City while negotiating scope and fee with the selected software vendor. Experience has shown that in some cases, it is beneficial to have a neutral third party facilitate discussion and negotiation to ensure both sides are fairly represented, and the project commences amicably. KCI will act on the behalf of the City of Burlington and facilitate meetings with the vendor, share KCI knowledge gained from other similar implementations, and review documents. Work will be performed upon request and as needed.

## Participation in vendor meetings

KCI will participate in and facilitate (if requested) onsite and remote meetings on an as needed basis to support vendor information gathering and progress meetings. In addition, if or when issues arise, KCI will participate in meetings and guide the City in an objective way to resolve them. In addition, KCI can help translate the City's needs and priorities into technical jargon that the software vendor can relate to and execute. KCI will act on the City's behalf, as needed by providing detailed requirements to the chosen vendor, which will result in efficient mobilization and startup of the implementation.

## Technical review

KCI can act as a key reviewer of any communications, documents or decisions presented to the City by the CMMS vendor. KCI will evaluate and always present to the City an honest and objective opinion based on industry standards, best practices and experience.

## Task 3.2: Configuration Preparation

The selected software vendor assumes the City's data is ready to load into the system and is ready to make key decisions about configuration. In some cases, the data may be vendor-ready, but in other cases, the City will need to prepare data or make decisions related to configuring the software to support existing and future business processes. Under this task, KCI will assist the City prepare for software configuration. Configuration preparation work performed by KCI may include, but is not limited to:

**Definition of WO prioritization codes.** KCI will provide as needed support and advisory services to develop a universal framework for prioritizing reactive and proactive work orders. KCI will help the City decide on a numbering convention and associated descriptions that can be used by all business units and associated work orders. This work will result in a written framework that can be shared with end users and used when creating work orders.

**Condition framework.** The condition of an asset contributes to the likelihood the asset will fail. Different asset classes have different failure modes that should be considered when defining and quantifying the condition of the asset. In addition, the CMMS software is highly configurable and should support how the City wants to capture and quantify asset condition in a way that will be most useful for planning for future maintenance and renewal activities. KCI will help the City define the condition framework by considering and answering questions relative to the software configuration such as:

- What is the highest level asset in the *asset inventory* that all ratings should roll up to?
- What categories should be considered to quantify functional, physical, operational, maintenance, and / or service-related characteristics?
- What rating factors should be used? And should they be weighted?

The outcome of this task is a framework to serve as the basis for configuring inspections of all asset classes.

**Risk framework.** This task will result in a City-wide definition of asset risk. Formalizing the concept of risk across all asset classes helps the City manage risk, compare risk amongst asset classes, and maintain an acceptable level of risk that does not compromise level of service and cost. This task will begin by defining the general framework for consequence of failure at a level that can be applied across all asset classes. A standard rating scale will be discussed and decided upon to ensure uniformity throughout the process of risk modeling across various asset groups. The risk framework will build upon past studies performed for Water Resources, as appropriate. Likelihood and consequence of failure matrices will be developed for a piloted asset class identified by the City using best available data.

**Formalize asset class lifecycle management strategies.** Under this task, KCI will assist the City develop guidelines for replacement, renewal, O&M and inspection/condition assessment strategies for asset class(es) identified by the City. This task will

identify what the appropriate treatment options for each asset class (e.g. open trench replacement, lining, periodic flushing, and/or condition assessment for water mains). In collaboration with the relevant business units, KCI will develop a list of appropriate treatment options and the criteria to be used to trigger the intervention. KCI will facilitate workshops/meetings with the asset “owners” to develop treatment criteria viable for Burlington. For each asset class, the following will be determined:

- Candidate assets and associated asset attributes (e.g. install date, size, effective life, material, and replacement cost)
- Replacement strategies
- Rehabilitation strategies
- Operations management strategies
- Maintenance management strategies

**PM Program planning.** Planning a preventive maintenance program results in a clear definition of what the objectives of the program are, how the work will be prioritized and implemented, and how the efficacy of the program will be measured. Under this task, KCI will help the City formalized existing or new preventive maintenance programs with two objectives in mind: 1. Is there asset data that the City desires to collect that can / should be collected during routine activities and 2. Determination of how the City’s business units want to load preventive maintenance work orders into the new system. KCI will assist the city answer these questions for select asset classes identified by the City. KCI will then help the City align the outcomes with the objectives, while instilling industry standards and best practices.

### Task 3.3: Asset Register Development

KCI will augment City staff as needed to manage the work load associated with preparing the asset register for the new CMMS implementation and associated asset management decision making. This includes preparing the asset inventory and associated attributes that make up the asset registers. Types of tasks that support moving the data from the source format to the target format may include:

- Further refinement of the asset hierarchies including identification of detailed attribution, relationships and appropriate system levels.
- Mapping of source to target in the case of migrating existing data into the proposed asset hierarchy. Individual data elements will be mapped from the current source systems to the new hierarchy and format.
- Extract-transfer-load (ETL) routines to migrate data from existing sources to the new hierarchy and format.
- Manual conflation of data sources.
- Definition of critical assets.
- Quality assurance and quality control of existing data sources.
- Documentation of data inventories as well as processes and procedures.

In addition, KCI is available to help advise and review work already performed by the City to define and quantify asset-level consequence of failure.

### Asset inventory compilation/clean-up

Many CMMS / EAM solutions rely upon GIS to be the authoritative asset inventory, which requires an accurate and complete asset registry. This task involves evaluating Burlington’s existing inventories for accuracy / completeness and assisting the City enhance the existing GIS by compiling and cleaning-up data as needed. The objective is to provide the cleanest data possible to the CMMS/ EAM. Under this task, KCI will evaluate what is stored as attributes; how the assets are uniquely named; what information is needed for future asset management initiatives; and how assets are organized in hierarchies. Hierarchical organization is important for the configuration of the software, especially when implementing complex facilities such as buildings, treatment plants, traffic intersections, etc. Ease of use is greatly dependent upon these decisions; therefore, KCI will guide the City through this process.

### Task 3.4: GIS System Architecture / Data Governance / Organizational Development Support

#### GIS System architecture

Depending on the City’s needs, KCI can help Burlington stand up the required GIS system architecture either by providing the City with guidance and recommendations or providing actual implementation support. Implementation services performed under this task

may include selection of an appropriate GIS hosting platform, negotiation of services, implementation of Esri software, configuration of Esri software, documentation and training to utilize the new environment. If Burlington chooses a cloud-hosted solution, then connectivity between the CMMS solution and the City's GIS data is required. If the solution is implemented on premise, then KCI can provide recommendations or actual implementation support for staging the appropriate system architecture needed. KCI may also prepare network diagrams to illustrate final configuration. If chosen to do so, KCI will act as the GIS Administrator and coordinate with IT and Asset Managers on a regular basis to monitor the infrastructure, perform Esri software upgrades, develop GIS editing and publication workflows and be relied as a resource for GIS administration.

### Organizational Development

Because GIS is intended to be the central inventory of record for the City, KCI will help the City implement organizational changes recommended in the Asset Management Program Development Organizational Structure Report prepared by Barton and Loguidice. KCI will draw from past experiences planning and implementing GIS / data management programs for other clients to develop a long-term strategy for managing and administrating GIS on behalf of the entire City.

As the use of GIS expands deeper and wider, there is a need to establish a business unit to manage all city-owned assets in a consistent manner that aligns with industry best practice. Currently, the business units must provide their own resources to implement and maintain GIS within their respective organizations, which requires more resources than a centralized approach. Typical services required to sustain GIS include on-going support to end users, maintenance, end-user and administrative-level training, and expansion.

To improve upon current conditions, KCI has the experience and know-how to bridge existing gaps, set policy, and develop a sustainable roadmap that fulfills the short-term and long-term vision for GIS data management. **The outcome of this task is a written memo that brings all elements of the “system” (i.e. people, process, technology and culture) together to create a sustainable, viable organization whose function is to maintain the integrity of the City's GIS data.**

### 3.5 Workflow Enhancement

KCI will conduct cross functional workflow workshops with water resources and general-fund divisions to discuss and enhance workflows identified by the City. Following each workflow analysis workshop, KCI will draft the existing workflows, including relevant service request types and workflows using Visio. Along with the creation of the existing workflows, an improved “to-be” workflow will be drafted based on the workshop feedback, identified inefficiencies in the existing workflows, and implementation of the selected CMMS. The enhanced to-be workflows will focus on shifting the process from reactive to proactive and maximizing total benefit. The **CIP planning process** is one workflow that may be evaluated under this task. Elements of this workflow to be considered include:

- Process for adding projects to the CIP
- Consideration of whole lifecycle costing
- Tying LOS to future investments – maintain, heighten, or decrease?
- Performance guidelines for CIP to measure improvements

### 3.6 Performance Management

One of the key components of asset management is identifying and defining the Levels of Service (LOS) that customers and other stakeholders require. LOS connects the strategic direction of the City of Burlington to the performance requirements established within the various business units. LOS includes specific, measurable indicators that provide the organization with a focus when planning the physical (asset) infrastructure and functional (organizational) infrastructure required to deliver the service.

This task focuses on refining existing and identifying new performance measures for Burlington, with an emphasis on aligning them with BTV Stat. The AWWA Benchmarking Survey will serve as the foundation for this task, as appropriate.

Collaboratively with City staff, KCI will compile existing metrics and develop new metrics that Burlington desires to track formally. This list will be maintained in Excel format (referred to as the Performance measure inventory sheet).

### 3.7 Written Plans / Procedures

To assist the City of Burlington successfully and sustainably implement the enhanced workflow(s), KCI will prepare supporting documents, including but not limited to standard operating procedures (SOPs), policy documents, asset specific Asset Management

Plans and / or user reference guides. KCI will work collaboratively with the City Asset Managers to identify the desired documents before proceeding with this task. KCI will tailor the content to the intended audience so that it is user friendly and useful for day-to-day operations. KCI will share draft documents and solicit feedback from the intended audience and the Asset Managers, at a minimum. Draft documents will be revised to incorporate feedback and a final draft will be submitted in a format requested by the City (e.g. MS Word, pdf).

## Deliverables

The deliverables associated with this task are dependent on the nature of the work performed. Each deliverable will be discussed in detail with the Asset Management Administrators at the beginning of each work assignment. Example deliverables are shown below but are subject to change. KCI will provide updates and deliverables in a format that is consistent with systems used by the City of Burlington.

<p><i><b>Tentative Project Deliverables</b></i></p>	<ul style="list-style-type: none"> <li>• Project Schedule</li> <li>• Monthly Invoices and Progress Reports</li> <li>• Meeting Notes, as needed</li> <li>• Meeting facilitator</li> <li>• Participation in meetings</li> <li>• Written and/or oral opinions</li> <li>• Written framework for prioritizing work orders</li> <li>• Condition framework</li> <li>• Risk framework</li> <li>• Lifecycle management strategies for select asset classes</li> </ul>	<ul style="list-style-type: none"> <li>• Asset hierarchies</li> <li>• Data mapping</li> <li>• GIS-based asset register(s)</li> <li>• Data Migration Plan(s)</li> <li>• Functionality Migration Plan(s)</li> <li>• Organizational Development Technical Memo</li> <li>• As-is and To-be Workflows</li> <li>• Performance Management Framework</li> <li>• Performance metric computation and visualization</li> <li>• Standard Operating Procedures</li> <li>• Asset Management Plan(s)</li> </ul>
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## Project Schedule

KCI will provide up to 12 months of on-call professional services, which aligns with the tentative software implementation schedule. It is assumed professional services will be provided remotely due to the ongoing COVID-19 pandemic. Conditions associated with the outbreak are continuously evolving but are not likely to impact the project schedule.

## Cost Estimate

The professional services provided by KCI will be billed on a time and material basis (including reimbursable expenses), not to exceed a total fee of \$123,000. Project costs will be tracked and managed by funding source assuming the following:

- General Fund = 50% (\$61,500)
- Drinking Water SRF = 25% (\$30,750)
- Clean Water SRF = 25% (\$30,750)