Participant's Guide

Critical Infrastructure Assessment Tool

December 2016

Production Version 2.2

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Abstract

This guide is intended to serve as a brief overview of the Critical Infrastructure Assessment Tool, and has been written as a complementary resource for the individuals that have been requested to participate in the process.

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Overview of the Process

Purpose

The primary purpose of the Critical Infrastructure (CI) Assessment Tool and associated process is to provide a single venue for participants from various local authority departments/agencies to discuss what services they feel are critical to provide to residents during an emergency, the assets they need to provide those services, and who/what they rely on in order to make those assets available. Specifically, the process is intended to be a medium to facilitate discussion that will lead to:

- Enhancing the overall awareness of critical infrastructure dependencies among key actors;
- Identifying and analyzing vulnerable goods & services;
- Identifying and analyzing the criticality of local assets;
- Identifying areas where there is a need to increase robustness and redundancies; and
- Improving the resilience of your community and CI by developing and implementing recommendations related to prevention / mitigation, preparedness, response and recovery.

Background

The CI Assessment Tool was developed jointly by Emergency Management BC, Defence Research and Development Canada, and the Justice Institute of BC. It was created specifically to:

- Focus on critical infrastructure analysis at the *local authority level*;
- Require minimal technical expertise, thus allowing for self-facilitation by the community; and
- Engage actors from all critical infrastructure sectors simultaneously.

Although the CI Assessment Tool has been tested and validated in several communities, there will be a continuous need for feedback regarding the process, the outputs, and the resources.

Intended Outputs

1. ***A better understanding of CI.*** Participants in the workshop will develop a better understanding of the assets owned by the municipality and the dependencies that exist between these assets, including external services. This understanding will be able to inform the asset management planning completed by individual departments

2. ***Partially completed dependency worksheets.*** Upon completion of the initial workshop, the community will have partially completed a set of worksheets that provide an overview of the dependencies between assets, including external services.

3. ***Data to generate a final report and recommendations.*** Following the workshop and subsequent completion of the worksheet, the Champion will utilize the information produced by the participants to generate a final report. This report will identify assets that are determined to have a high priority, and will identify several relevant recommendations for implementation.

Roles & Responsibilities

The ***Champion*** is primarily responsible for:

- Overseeing the CI Assessment Process from start to finish;
- Organizing and facilitating the workshop(s);
- Managing the CI Assessment Tool worksheets and any additional documents;
- Identifying and inviting appropriate Participants to contribute to the process;
- Keeping workshop conversations focused on critical infrastructure; and
- Ensuring each Participant's voice is heard throughout the process.

'Champion' is a project management term that refers to the individual who will see a project from beginning to end. In this case, the community Champion will have a good understanding of the community and municipal organizational structure to be able to guide and focus the process in order to accurately complete the CI Assessment Tool worksheets. As well, the Champion will be able to assist the participants to draw out the deliverables and intended outcomes required for the CI Assessment process to effectively provide informed and valuable results.

The Champion is provided with an 8-step process to help guide the CI Assessment process, and has access to additional materials to assist with the management of the process. The outlined process includes two workshops that Participants will attend – a "Kick-Off Meeting" and a "Follow-Up Meeting". However, this may change based on how the Champion chooses to manage the process.

The ***Participants*** are primarily responsible for :

- Participating in the scheduled workshop(s);
- Providing the necessary data and dialogue to guide the process and contribute to the completion of the CI Assessment Tool worksheets; and
- Continuing to provide information and dialogue in order to produce relevant recommendations that will be beneficial to emergency management planning activities: prevention / mitigation, preparedness, response and recovery.

Participants are the community stakeholders that will be vital to the success of the inputs/outputs for the CI Assessment process. Typical Participants for the CI Assessment process may include emergency program coordinators/managers, senior municipal managers, city planners, fire & police chiefs, engineers, etc.

Additional brief descriptions of the Participants' responsibilities are outlined throughout this document.

Key Terms

The following is a set of terms that should be considered and referred to consistently throughout the CI Assessment process:

Assets

The equipment or personnel used to deliver a service. People, structures, facilities, buildings, materials, and processes can all be considered Assets.

Goods & Services

The resources and services provided to the community by a local authority. Drinking water, fire & rescue, policing, public monuments, land-use planning, municipal websites, and garbage collection are all examples of Goods & Services.

Dependency

The term used to describe the relationship between an Asset and a Good or Service (ex. drinking water has a dependency on pumping stations). For the purposes of using the CI Assessment Tool:

- An *Internal Dependency* is considered to describe the relationship between a locally owned Asset and a locally provided Good/Service.
- An *External Dependency* is considered to describe the relationship between a locally owned Asset and an externally provided Good/Service (ex., provided by a private agency).
- Any identified dependencies will be considered to be either “Critical” or “Important”.

Critical

The term used to describe a dependency when a Good or Service requires a specific Asset and there are no alternatives to the Asset (ex. fire service has a Critical dependency on pumpers and engines because there are no alternatives available).

Important

The term used to describe a dependency when a Good or Service needs a specific Asset, but there are alternatives that could be accessed if needed (ex. the loss of road traffic controls would impact the maintenance of local networks, however there are other options to control traffic such as police officers, temporary lights, etc.).

Understanding the Tool

Overview

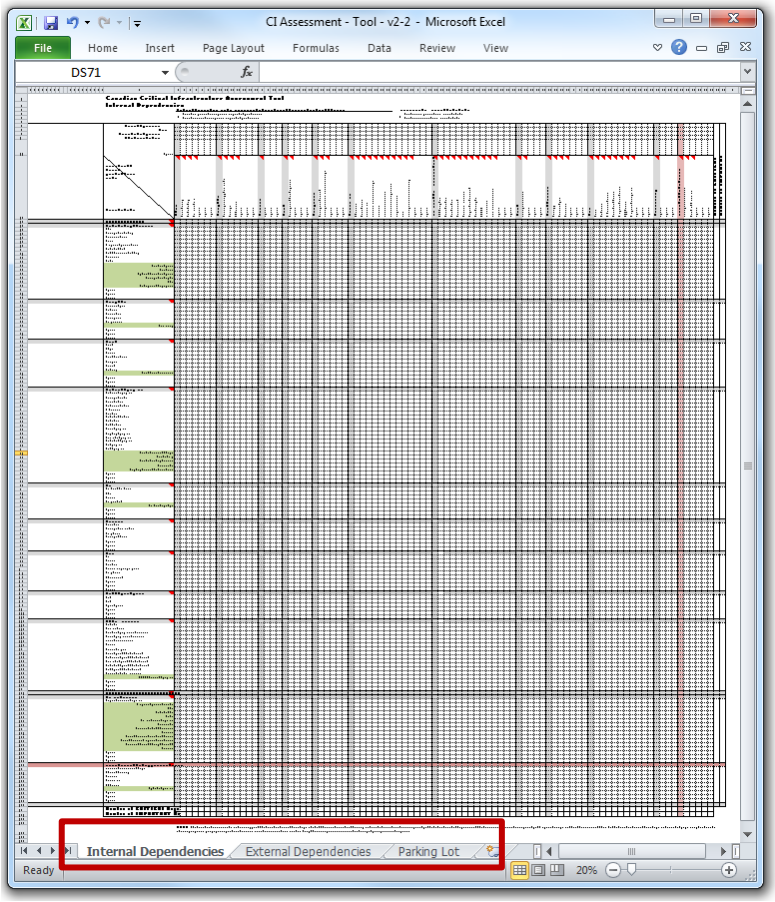
The CI Assessment Tool uses an Excel format in order to:

- Limit the need to download and learn new software;
- Allow for flexibility and individualization by maintaining the ability to add and remove rows/columns to ensure the process is appropriate each community; and
- Reduce the need for technical expertise.

The Tool is split into three distinct spreadsheets:

1) Internal Dependencies

- Used to identify which Local Assets are Critical or Important for providing specific Internal Goods & Services in the given scenario.
- When working on the *Internal Dependencies* worksheet, you should ask the question: *"What Assets do we need to offer these Goods & Services?"*



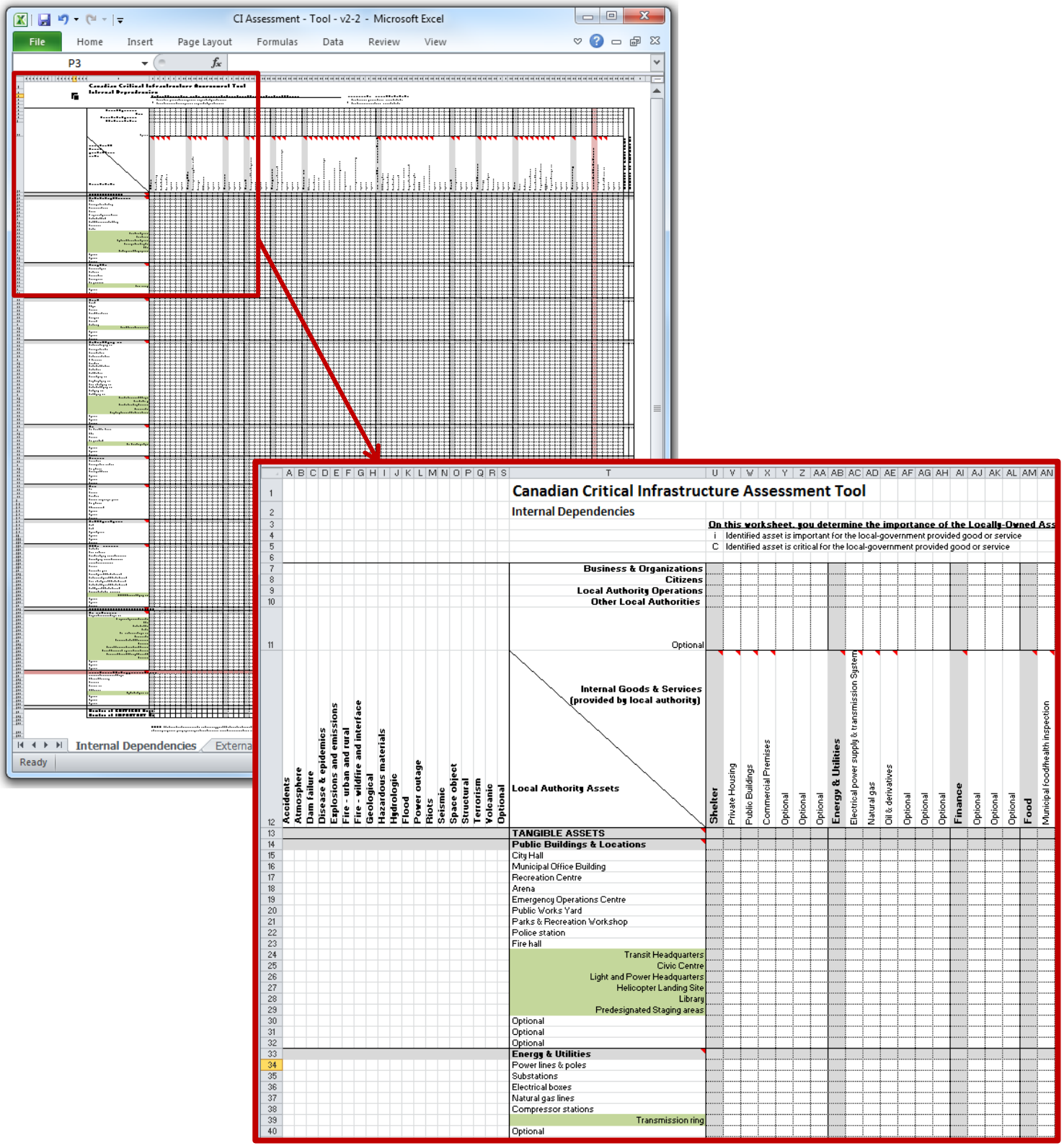
2) External Dependencies

- Used to identify which *Goods & Services* are Critical or Important to your community's assets.
- When working on the *External Dependencies* worksheet, you should ask the question: *"What Goods & Services do our Assets rely on?"*

3) Parking Lot

- This worksheet serves as a record of the context and factors that Participants have used to determine if a dependency was Critical or Important.
- Additionally, this worksheet provides an area for the Champion to capture ideas that need to be followed up after the workshop.

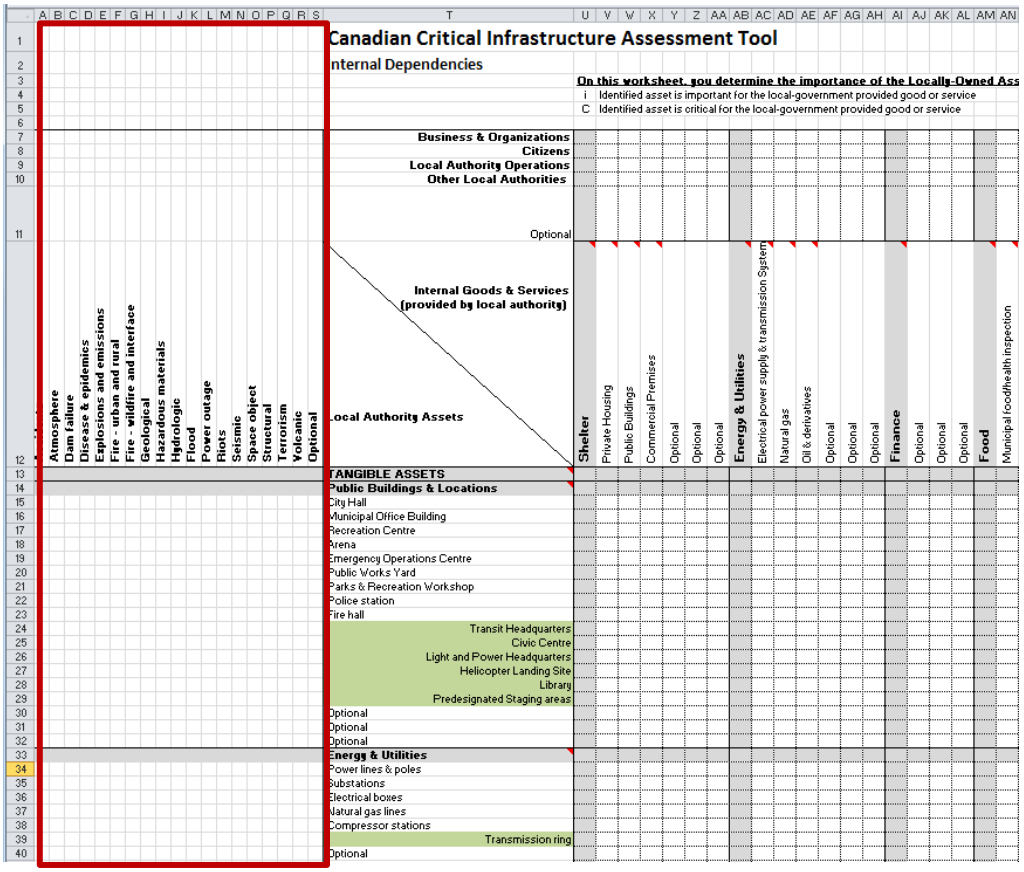
Visualizing the Contents of the Tool



Hazard Scenario

During the CI Assessment process, the Champion will lead the selection and crafting of a hazard scenario based off of your community's Hazard Risk Vulnerability Assessment (HRVA), which should produce a clear answer to relevant questions such as:

- What is the hazard?
- What time of the year does the hazard occur?
- What is the magnitude of the hazard and impact area?
- What are some specific damages that might be caused by this event?
- Are there any other factors that are locally relevant?
- What is the timeframe that will be discussed?



Since not all infrastructure is critical in all circumstances, the assessment process focuses on one scenario at a time. Once a hazard has been selected and a specific scenario has been clearly defined, the other hazard columns can be "hidden" (by right-clicking the column and selecting "Hide") for the remainder of the process (the Champion will be responsible for this).

Participants are responsible for… Helping the Champion clearly outline an appropriate hazard scenario that is reflective of your community's Hazard Risk Vulnerability Analysis (HRVA).

Local Authority Assets

The *Internal Dependencies* and *External Dependencies* worksheets come with a generic list of Local Authority Assets. These are the equipment, resources and personnel that are the critical infrastructure of the community (i.e., these are Assets that are owned and/or operated by your community). The Assets that are in a right-justified green box reflect Assets identified by other communities that have used the Tool.

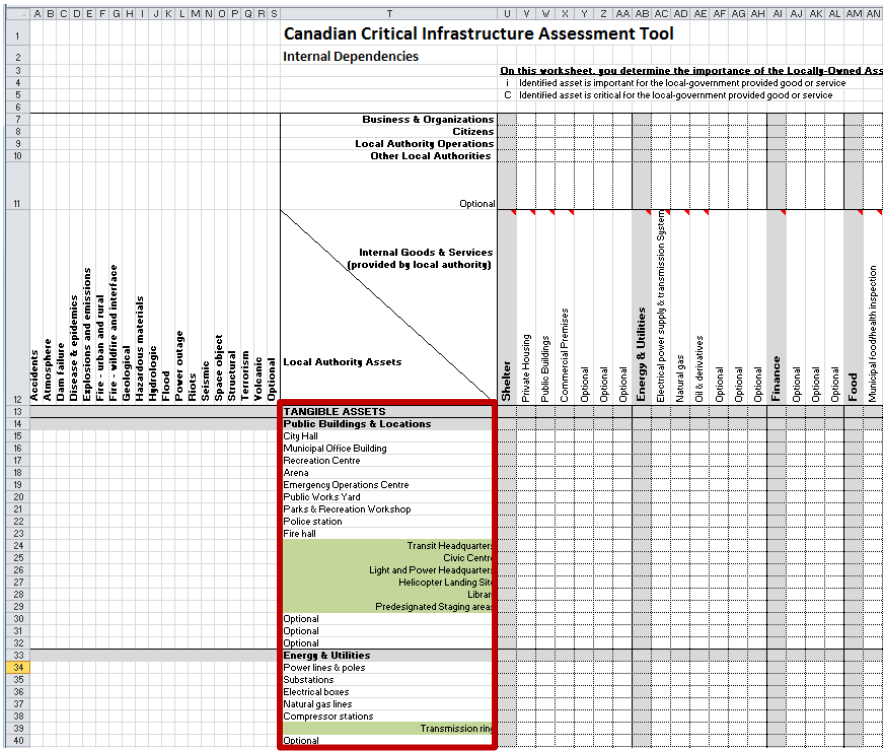
The current list provided within the Tool is by no means exhaustive, nor will all Assets listed be relevant to your community. Therefore, during the initial workshop, participants should advise the Champion of any Assets that should be removed or added.

Assets should be ***removed*** if they are:

- Not present within your community;
- Not owned/operated by your community;
- Not relevant to the scope of your community's assessment; and/or
- Not relevant to the hazard scenario.

Assets should be ***included*** if they are:

- Owned/operated by your community but are not already included in the generic list;
- Relevant to the scope of your assessment; and
- Relevant to the hazard scenario.



The list of Assets should be the same on all participants' spreadsheets and for both the *Internal Dependencies* and *External Dependencies* spreadsheets.

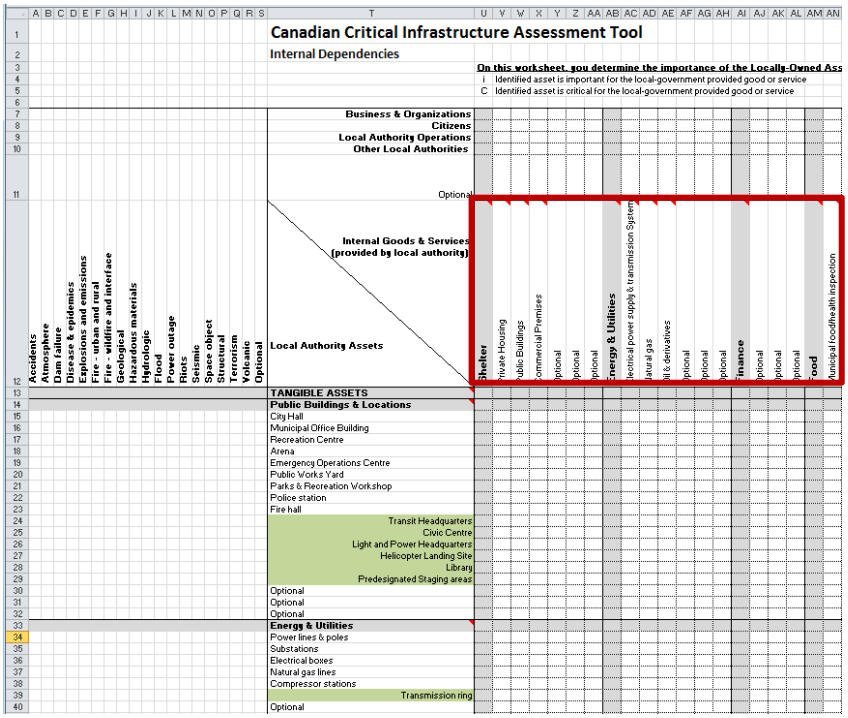
Therefore, this list should be finalized prior to any data inputs. The Champion will be responsible for adding/removing items from the list prior to providing the Tool for the Participants to begin identifying dependencies.

Participants are responsible for… Recommending Assets that should be added/removed from the list of Local Authority Assets.

Goods & Services

Both the Goods & Services sections on the *Internal Dependencies* and *External Dependencies* worksheets include the 10 Critical Infrastructure Sectors recognized by British Columbia and the Government of Canada:

- Energy & Utilities
- Finance
- Food
- Transportation
- Government
- Information & Communications Technology
- Health
- Water & Wastewater
- Safety
- Manufacturing

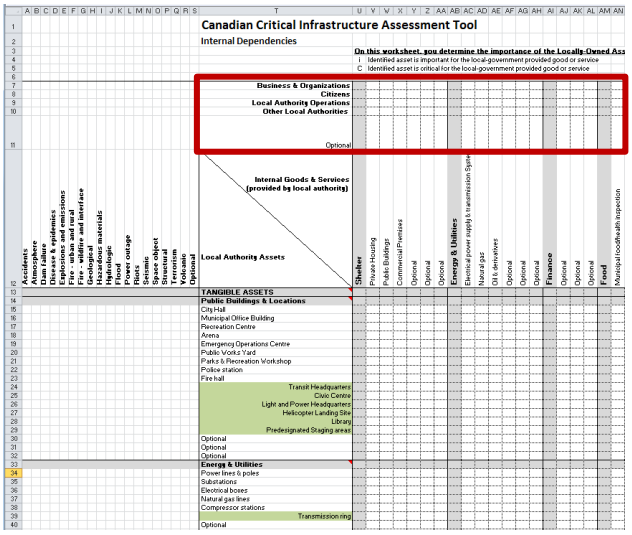


The list also includes ‘Shelter’ and ‘Internal Assets That Are Services’ as additional sectors.

Each of these sectors is further broken down into specific Goods & Services that are reflective of each category. The Champion should add any Goods and/or Services they feel are missing prior to the initial workshop, and delete any that do not apply to the community. If appropriate, the Champion should also change the names of the Goods and Services in order to reflect the terminology that is used locally. There is room on the worksheet to add several items in each category.

Participants are responsible for… Recommending Goods & Services that should be added/removed from the set of Internal Goods & Services that have been proposed by the Champion, as well as recommending any changes to the set of External Goods & Services.

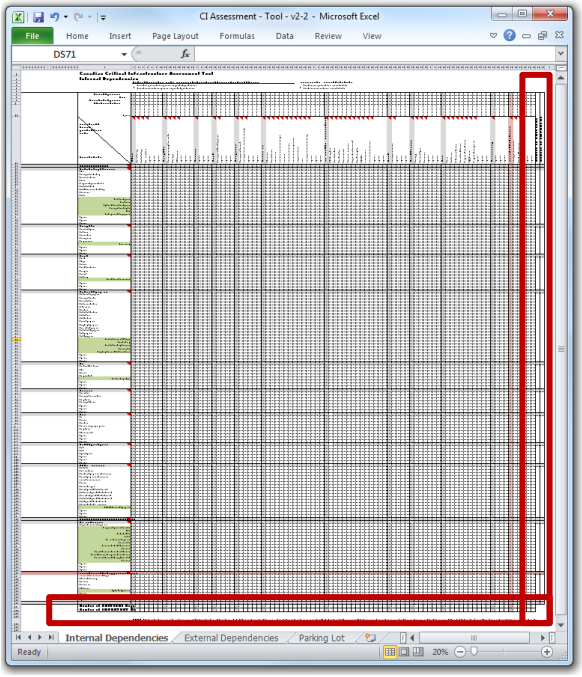
Stakeholder Impacts



At the top of the *Internal Dependencies* worksheet, there is a section that has been included as an **optional step** in the process, where the purpose is to identify the dependencies that specific stakeholder groups (*Business & Organizations*, *Citizens*, *Local Authority Operations*, and *Other Local Authorities*) may have on community Goods & Services.

The Champion may engage the Participants in identifying the specific residents, groups and stakeholders that may be impacted by the loss of a Good/Service. This is a subjective analysis which is meant to provide some additional information on which Goods/Services would have an impact if lost.

Data Inputs & Dependency Totals



The majority of both the *Internal Dependencies* and *External Dependencies* worksheets consist of blank cells that intersect between Local Authority Assets and Goods & Services. These cells will be used to record dependencies throughout the CI Assessment process:

To record a **Critical Dependency**,
the letter “C” will be typed in to the cell.

To record an **Important Dependency**,
the letter “i” will be typed in to the cell.

To record **No Dependency**,
the cell will be left blank.

As you record each dependency, the totals for Critical dependencies and Important dependencies will be tallied for both the Local Authority Assets (far right columns) and the Goods & Services (bottom rows).

Although the totals produce valuable insight when comparing the dependencies associated with specific Assets and Goods & Services, these totals are intended to be a point of discussion for the Champion and Participants and should not be considered an authoritative metric for determining the respective criticality and vulnerabilities of the Assets/Goods & Services. Therefore, it is recommended that additional metrics and dialogue be considered when conducting your analysis and producing recommendations.

Instructions for Using the Tool

Overview

Once the respective lists of Local Authority Assets and Goods & Services have been established and a "Master Copy" of the CI Assessment Tool has been produced, the Champion will guide Participants through the completion of the worksheets. Although the process is designed to be flexible to meet the needs of the Champion and Participants, the key tasks can be organized as follows:

1. Define Responsibilities
2. Schedule Time to Complete the Worksheets
3. Complete the Internal Dependencies Worksheet
4. Complete the External Dependencies Worksheet
5. Assess Results and Produce Recommendations

Task 1: Define Responsibilities

Prior to beginning the completion of the worksheets, the Champion should ensure that each Participant is aware of the specific set of Local Authority Assets and/or Goods & Services that they and the other Participants will be responsible for completing, so as to ensure appropriate coordination and collaboration throughout the process.

Participants are responsible for… Communicating to the Champion which Assets and/or Goods & Services they should be responsible for based on their expertise/day-to-day responsibilities.

Task 2: Schedule Time to Complete the Worksheets

Once you are aware of what sections of the worksheets you will be responsible before, you can schedule time to complete the worksheets. It typically takes 1-2 hours to complete your department or agency's portion of the worksheet, but this is likely to change depending on each Participant's respective responsibilities. The Champion will determine whether you will be completing the Tool:

- During the initial workshop;
- Following the initial workshop as "homework"; or
- A combination of during and following the initial workshop.

You may find it useful to invite/consult with some of your coworkers to help with this task, and some outreach to other stakeholders/departments may be necessary in order to produce accurate results.

Participants are responsible for… Determining how much time they will need to accurately complete their respective sections for both worksheets, and communicating their needs/expectations to the Champion for planning purposes.

Task 3: Complete the Internal Dependencies Worksheet

As stated previously, the *Internal Dependencies* worksheet is intended to identify which Local Authority Assets are Critical or Important for providing specific Internal Goods & Services in the given scenario. When working on the *Internal Dependencies* worksheet, you should ask the question:

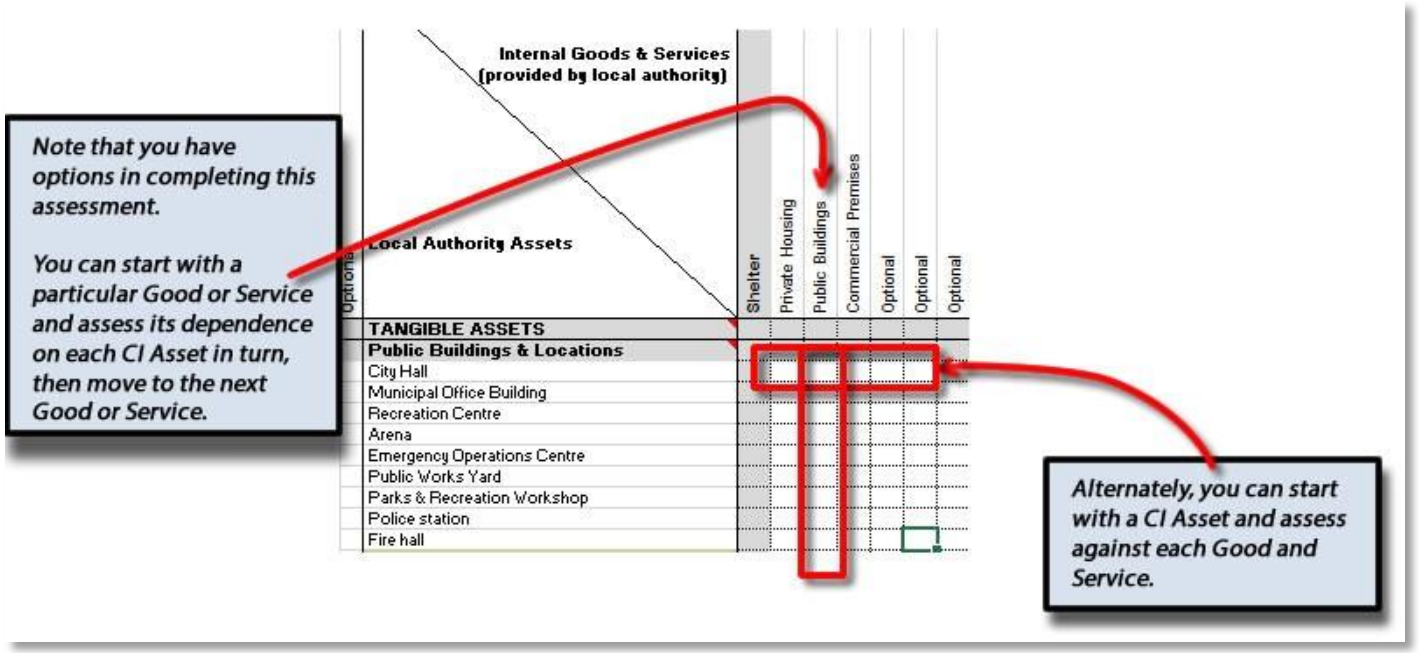
"What local Assets do we need to offer these Goods & Services?"

Also mentioned previously, the process was developed with the intention of requiring minimal technical expertise in terms of operating the CI Assessment Tool. However, if an issue arises while using the Tool, visit the "Troubleshooting Instructions" section of this guide, or request assistance from the Champion.

Participants are responsible for completing the following process…

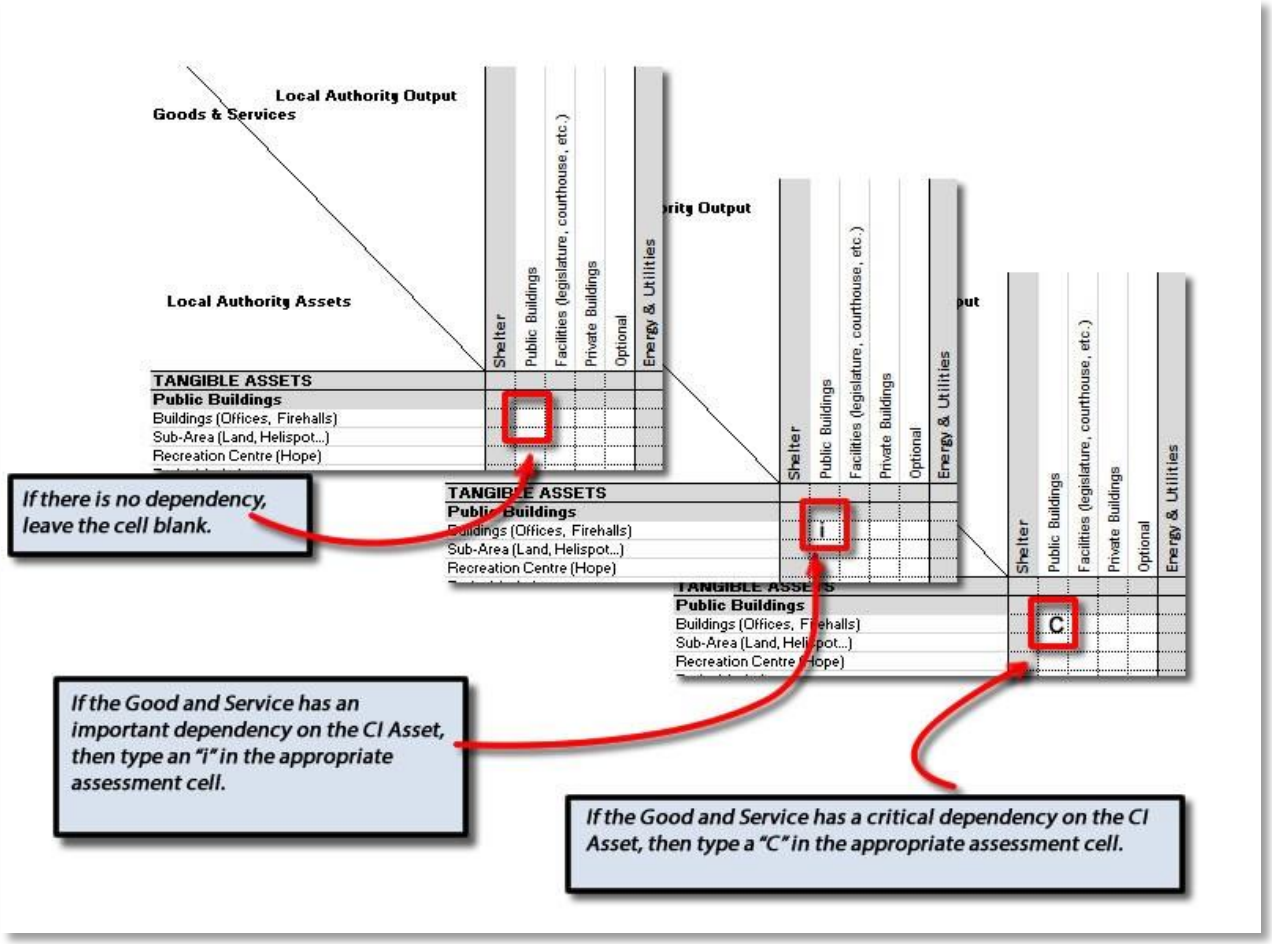
- ☐ First, revisit the definitions for Critical and Important (both definitions are also listed at the top of the worksheet).

- ☐ Next, decide whether it is more appropriate for you and those you will be conducting the assessment with to start by focusing on a particular Good & Service or start by focusing on a specific Asset:



- ☐ Once you have decided upon a particular method, begin identifying the dependencies that exist between your community's Assets and the list of Internal Goods & Services until you have concluded the sections of the worksheet you are responsible for. There are three options and respective actions to describe dependencies within the worksheet:

    1. **Critical Dependency**: Type the letter "C" into the cell.
    2. **Important Dependency**: Type the letter "i" into the cell.
    3. **No Dependency**: Leave the cell blank.



- ☐ Contextual information and key factors that were used to determine why a dependency was considered to be Important or Critical should be added to the *Parking Lot* worksheet.

- ☐ After completing the assessment of the Assets and/or Goods & Services that you are responsible for, you should review the results to ensure that they are accurate.

- ☐ Finally, "Save" the file and move on to the *External Dependencies* worksheet.

Task 4: Complete the External Dependencies Worksheet

The *External Dependencies* worksheet is intended to identify which externally provided Goods & Services are Critical or Important to your community's Assets in the given scenario. When working on the *External Dependencies* worksheet, you should ask the question:

"What external Goods & Services do our community's Assets rely on?"

This is the key difference between the *External Dependencies* worksheet and the *Internal Dependencies* worksheet; otherwise, the process for assessing and recording data is very similar.

However, prior to conducting the assessment, the Champion and Participants should confirm that the *External Dependencies* worksheet has been updated with any new Assets that were included on the *Internal Dependencies* worksheet so that the two lists are identical. Once this has been confirmed, the Participants can carry on with their responsibilities.

Participants are responsible for completing the following process:

- ☐ Revisit the definitions for Critical and Important (both definitions are also listed at the top of the spreadsheet).

- ☐ Next, decide whether it is more appropriate for you and those you will be conducting the assessment with to start by focusing on a particular Good & Service or start by focusing on a specific Asset.

- ☐ Once you have decided upon a particular method, begin identifying the dependencies that exist between your community's Assets and the list of External Goods & Services until you have concluded the sections of the worksheet you are responsible for. There are three options and respective actions to describe dependencies within the worksheet:

    1. **Critical Dependency**: Type the letter "C" into the cell.
    2. **Important Dependency**: Type the letter "i" into the cell.
    3. **No Dependency**: Leave the cell blank.

- ☐ Contextual information and key factors that were used to determine why a dependency was considered to be "Important" or "Critical" should be added to the *Parking Lot* worksheet.

- ☐ After completing the assessment of the Assets and/or Goods & Services that you are responsible for, you should review the results to ensure that they are accurate.

- ☐ Finally, "Save" the file and return the completed version to the Champion so that they can aggregate the results produced by other Participants.

Task 5: Assessment Results and Recommendations

Once the worksheets have been completed, the Champion and Participants will need to identify at least 4-5 recommendations related to the results of the assessment in a summary report.

Importantly, this assessment will be qualitative in that it is based primarily on Participants' interpretation of the CI Assessment Tool and its outputs. While an Asset may have a high number of dependencies, it is important to note that this does not necessarily mean the Asset is more or less critical than another. Rather, the relative criticality should be determined through discussion.

Once the data has been analyzed, the community Champion will then generate a summary report. The report will include a review of the findings as well as proposed actions that will be taken to address the management of "top priority" assets in context of the four pillars of emergency management. The report may provide specific planning decisions that need to be incorporated into planning efforts or it may present questions that should be addressed in future planning, such as:

Mitigation:	What financial & resource planning is required to support this Asset? Are there steps that can be taken to mitigate damage or loss in a future event?
Preparation:	What resources can be allocated to back-up or serve as a contingency in the event the Asset fails/is damaged/is unavailable?
Response:	What activities need to be performed to protect the Asset during an emergency? To assess damage to the Asset? To determine the length and extent of outages should the Asset be unavailable?
Recovery:	If damaged or destroyed, should the Asset be fixed? Replaced? Replaced with another option?

The report is not intended to be a large document. Rather, it is meant to provide a high level overview of the process so far and the actions that may be taken to address top priority assets.

Once completed, the report will be provided to workshop Participants and other stakeholders for review and comment. Following any revisions, this report can be used for community planning and decision making.

Troubleshooting Instructions

Issue	Solution
I can't decide if an asset is Critical or Important.	Err on the side of caution and indicate it is Critical.
We use one asset all the time but have two backups. I'm not sure which one is Critical.	Check with the community Champion/facilitator to identify whether the primary Assets or the backups are considered Critical.
One of our community Assets can also be considered a service. For example, the community website is both an asset but provides a service community.	Include the Asset in the Internal Assets that are Services column at the far left of the *Internal Dependencies* worksheet.
One of our community Services is a contracted Service. For example, the community is required to provide a Police Service. These Services are contracted from the RCMP.	First, add the Service to the Internal Goods & Services row on the *Internal Dependencies* worksheet. You do not need to identify any assets for this service. Then, add the Service to the Internal Services Directly Supported By External Services section on the *External Dependencies* worksheet. Put a C in the column of the Service provider (such as the Police).
One of our community-owned Assets is only Critical during an actual emergency. For example, the community has a large empty field. During a flood or earthquake, this field would be used as a staging area.	Add this Asset to the Local Authority Assets List.
One of our community Assets relies on an internally offered Service. For example, Police and Fire personnel use a specific model of radio. The maintenance of these radios is offered internally by our I.T. department.	Include the Service in the Internally Provided Services column at the far left of the External Dependencies spreadsheet.
One of our Services relies on other internally offered Services. For example, a number of our Services rely on the GIS Services – an internal Service.	First, include the Service on in the Internal Services that Support Internal Services column at the far left of the External Dependencies spreadsheet. Then, add the Services that rely on this Service to the Internal Services Directly Supported By External Services section on the External Dependencies worksheet.

One of our Assets is co-owned with another community. For example, the Police Station is co-owned with a neighbouring community. Both communities have 50% ownership.	Add the Asset to the Local Authority Assets List.
We own an Asset but it is managed by a different group or agency. For example, the community owns a building but it is managed by an external company.	Add the Asset to the Local Authority Assets List.
We don't own an Asset but have an agreement to access it during an emergency. For example, the community has an agreement to use a local business' offices in the event the Emergency Operations centre is unavailable.	Add the Asset to the Local Authority Assets List.
When consolidating the worksheets, two departments have reviewed the same Service. One department rated a dependency as Important; the second department rated the same dependency as Critical.	Indicate the dependency is Critical. Make a note of the two ratings in the Parking Lot.
When consolidating the worksheets, two departments have reviewed the same Service. Both departments have listed a dependency as Critical.	Indicate the dependency is Critical with a single C. Make a note of the two ratings in the Parking Lot.