ASSET MANAGEMENT

LIFECYCLE COST WORKBOOK GUIDE

FLEET AND EQUIPMENT

nwtac
NWT Association of Communities
Connecting Community Governments Since 1966

Canada FCM

The Asset Management Toolkit was developed by the Northwest Territories Association of Communities. Work was completed by Kerr Wood Leidal Associates Ltd. in 2018. It has been updated by Jacobs, in partnership with KWL, in May of 2023 to reflect the realities of how the climate is impacting the ability of NWT communities to deliver services.

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Funded by:

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1. About this Guide

The Asset Management Lifecycle Cost Workbook Guides ("The Guides") was developed by the Northwest Territories Association of Communities (NWTAC). The Guides are designed to help local governments use the Lifecycle Cost Workbooks to evaluate projects based on their full cost.

This Guide is part of a set of two, and within a Toolkit of resources that have been developed to help communities build their capacity in asset management. The resources that make up this Toolkit include:

- Asset Management Policy Template & Supporting Guide
- Asset Management Plan Template, Inventory Template & Supporting Guide
- Lifecycle Cost Workbooks (2) & Supporting Guides (this document)
- Levels of Service Template & Supporting Guide
- Playbook Worksheet, Climate Vulnerability Assessment Worksheet, Annual Schedule Template & Supporting Guide
- Smart Management Practices (6)

Each component is designed to be used together with the other components of the Toolkit, which can be found online at: www.nwtac.com.

Purpose

This Guide is intended to provide a step-by-step information resource to support communities in the Northwest Territories as they evaluate a new capital purchase of vehicles or equipment, mid-life renewal (eg. engine overhaul) or acquisition based on the full lifecycle cost of that asset. It is designed to help communities walk through the excel-based spreadsheet tool that accompanies this guide.

Intended Audience

This Guide has been developed for representatives of communities in the Northwest Territories, including staff, senior management, and decision-makers such as Mayor, Chief, and Council.

Guide Structure

The Guide is designed to accompany the Lifecycle Cost Workbook for fleet and equipment, which provides a starting place for communities to evaluate new capital projects, mid-life renewals, or acquisitions. It includes sections describing each component of the workbook to help local governments tailor the template to meet their needs.

The Guide is made up of four major sections:

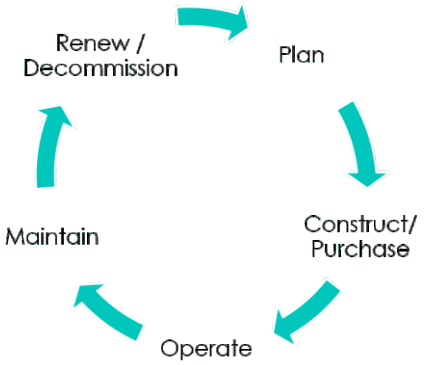
1. **About this Guide** — Information on the purpose and structure of this Guide.
2. **Background** — Details on what lifecycle costing is and how it fits with existing strategies and practices in the Northwest Territories.
3. **Using the Workbook** — A description of each of the four worksheets.
4. **Putting it into Practice** — An overview of next steps for using the results from the lifecycle costing workbook to support decision-making.

2. Background

One of the founding principles of asset management is that all assets exist to provide services needed by the users. Every community has competing needs for its resources, so every infrastructure investment decision also has implications for other infrastructure needs. The purpose and priority of the investment must be adequately described in order to make effective decisions – think of this as the project business case.

Lifecycle Costs

Lifecycle Costs are the true costs involved in owning and utilizing a community asset over its useful life: from initial planning, to purchase, to operations, to maintenance, to renewal and/or decommissioning. This is important because it:



- Provides a basis for maximizing the cost-efficiency of infrastructure-dependent services
- Enables fact-based decisions regarding a best value approach for providing services
- Helps understand and compare servicing alternatives, even when they may have markedly different initial capital costs and annual operation and maintenance costs
- Provides consistency and transparency in decision processes

Two workbooks have been developed to support local governments in assessing lifecycle costs, one focusing on fleet and equipment (which this Guide describes) and the other focusing on buildings, arenas and pools. These workbooks are intended to help staff, as well as elected officials, become more aware of the long term costs associated with infrastructure decisions within the Northwest Territories

3. Using the Workbook

You will need to save a new version of the workbook for each capital project being evaluated.

Worksheet 1: Introduction

This worksheet describes the building asset and the components that make up the full lifecycle cost using a combination of graphics and checklists.

Worksheet 2: Asset Purpose and Priority

If you had to answer why you need a capital asset or why it needs to be renewed with one or two sentences, what would you say? How can you evaluate several capital assets with varying drivers?

The workbook template guides the user through two key objectives under the Asset Purpose and Priority Tab:

- Creating a Capital Asset Purpose Statement; and,
- Developing a Capital Asset Priority Rating

Guiding Questions

As you develop your Capital Project Purpose Statement, think about the following questions:

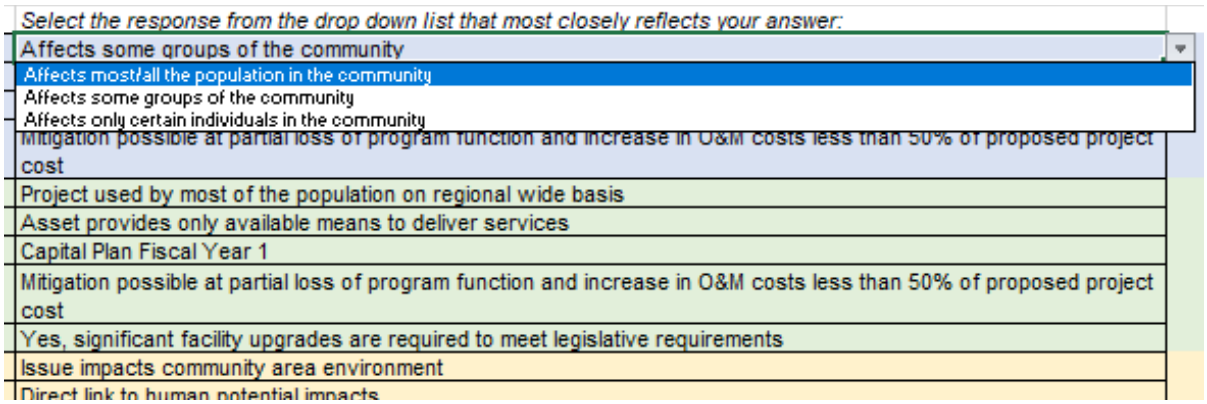
- What new services or level of service do you need to provide to your community members?
- Why do you need them?
- Can you provide the new service level or level of service with existing assets? If yes, what is the condition of the existing asset? Are major renewals required?
- What impacts or risks would your community be exposed to if you did not this asset? Does it make sense to let a vehicle or equipment run to failure, doing the minimum for safe operation?
- What new assets (vehicles or equipment) do you need to provide the proposed service or increased level of service?
- How does this vehicle or equipment fit into your overall community plan or objectives for community services?

Use the following sample sentence to prepare your asset purpose statement. Check your statement to see if it answers: What are we proposing to do? Why to we need to do it? What could happen if we didn't?

Our community needs to (description of project), **to** (service provided) **because** (current status of infrastructure and program need/protection). **This project aligns with our community goals/vision to** (insert relevant goals).

If we didn't purchase/renew this asset, we would experience the following impacts: (describe impacts, e.g. lost opportunity, people, assets, environment, financial)

To develop a capital asset priority rating, answer as many questions as possible by selecting the response from the drop down list that most closely reflects your answer:



Key Considerations

- Protection of People
- Protection of Assets
- Protection of Environment
- Financial Investments
- Program Need or Requirement

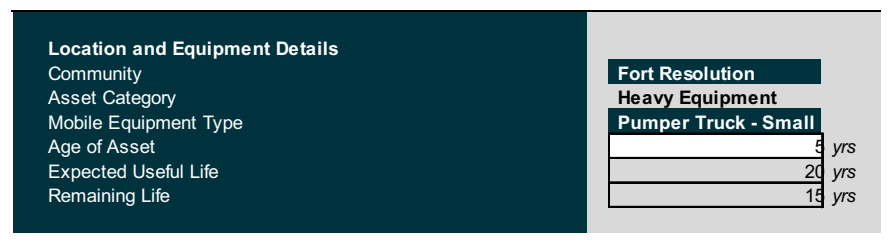
Worksheet 3: Lifecycle Costs

The workbook template is used to tabulate the estimated capital, operation and maintenance, administration and program delivery costs associated with the asset over its full lifecycle.

The worksheet has three different types of cells:

Input Cells	These cells allow you to manually type in your own values
Dropdown List	These cells allow you to select an option from a list
Automatically Calculated Cells	These cells are automatically calculated from the dropdown or input cells

SECTION 1 - Location and Equipment Details



1. Select your **Community** from the dropdown list
2. Select your **Mobile Equipment Type** from the dropdown list
3. Enter the **Age** of Asset (use a best guess if you aren't sure). In most instances you will be considering new assets and so the age will be 0 years.
4. Enter the **Expected Useful Life** (use a best guess if you aren't sure) – the remaining life will populate based on your selections. Please note that this is the length of time, in service, as opposed to the tangible capital asset life expectancy used for financial depreciation.

Quantifying the Cost of Climate Change

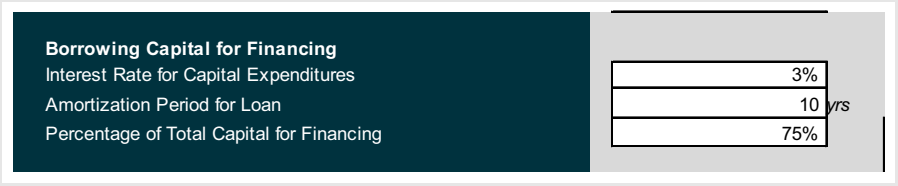
Climate change can affect the expected useful life of infrastructure, operations and maintenance costs, costs of retrofits, and potentially result in additional renewal costs.

The costs of not taking action to adapt to a changing climate should also be considered. Early investment in adaptation can substantially reduce the costs and impact to infrastructure.

Evaluating projects involves more than just looking at infrastructure costs, and this is even more important when considering solutions that will be effective as our climate continues to change. Adaptative solutions may cost more up front, but the resuling social, environmental and economic impacts over the long term shuld be considered. “Developing infrastructure for the future of the North will require transformative adaptations as well as incremental adaptations. In many cases, this will mean following the lead of Northerners to reimagine the way that infrastructure services are delivered and support education and community knowledge-sharing networks.” (Canadian Climate Institute, 2022)

Additional information on the costs of climate change for northern infrastructure can be found here: https://climateinstitute.ca/wp-content/uploads/2022/06/Due-North.pdf

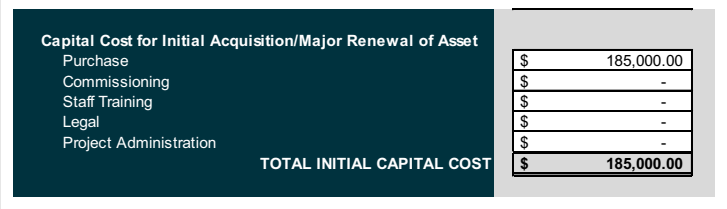
If you need to borrow money to finance the purchase the asset complete **SECTION 2 - Borrowing Capital for Financing.** Otherwise, set 'Percentage of Total Capital for Financing' to 0%.



Borrowing Capital for Financing	
Interest Rate for Capital Expenditures	3%
Amortization Period for Loan	10 *yrs*
Percentage of Total Capital for Financing	75%

1. Enter the **Interest Rate for Capital Expenditures** – this is the interest rate for any money spent on acquiring or maintaining the asset and applies to system capital renewals during the asset's lifecycle
2. Enter the **Amortization Period for Loan** – this is the time you think it will take to repay your loan in full
3. Enter the **Percentage of Total Capital for Financing** – what percentage of the asset are you financing?

Complete as much as you can about the asset in **SECTION 3 – Capital Cost for Initial Acquisition / Major Renewal of Asset.**

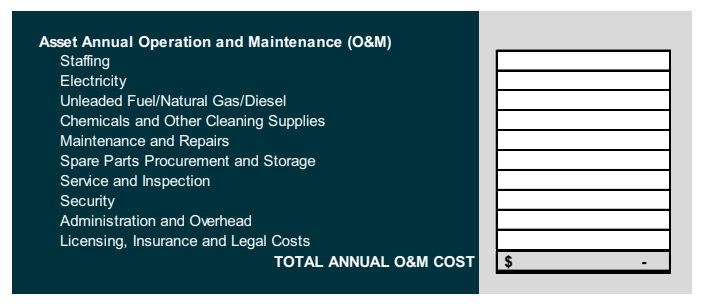


Capital Cost for Initial Acquisition/Major Renewal of Asset	
Purchase	$ 185,000.00
Commissioning	$ -
Staff Training	$ -
Legal	$ -
Project Administration	$ -
TOTAL INITIAL CAPITAL COST	**$ 185,000.00**

1. Enter the **Purchase** cost
2. Enter the **Commissioning** cost – how much will it cost to test and/or verify that the asset is in proper working condition?
3. Enter the costs associated with **Staff Training** – how much will it cost to train the necessary staff for this asset? Will you need to train staff to use the asset?
4. Enter the **Legal** costs – will there be any legal fees associated with acquisition or renewal of the asset?
5. Enter any **Project Administration** fees that will be incurred.

What does the asset cost to operate each year? Fill in any relevant blanks for the asset in **SECTION 4 – Asset Annual Operation and Maintenance (O&M).**

1. Enter the **Staffing** costs – talk to a person in your accounting department and/or look at past expenses for similar assets to determine this value
2. Enter the **Electricity** costs (if applicable) – installation, servicing, etc. Past electricity bills are a great resource

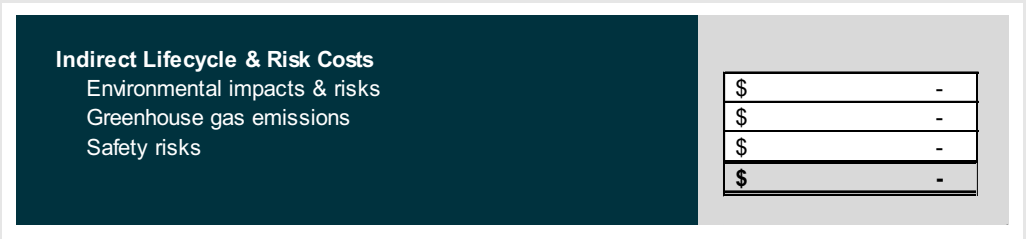


3. What does it cost in a year to fuel this asset? Enter the costs associated with one of the following: **Unleaded Fuel/Natural Gas/Diesel**
4. Are any chemicals or cleaning supplies required to keep this asset running? Enter the costs for any **Chemicals and Other Cleaning Supplies**
5. Enter any **Maintenance and Repairs** cost
6. Enter the costs associated with **Spare Parts Procurement and Storage** – do you need to have spare parts on hand? How much does it cost to source and store these parts? What servicing needs are anticipated to ensure safe operations? Are there costs associated with annual inspections? Do you need to store this asset while it's not being used? What are the associated costs?
7. Enter the costs related to **Service and Inspection**
8. Enter any **Security** fees
9. Enter any **Administration and Overhead** fees
10. Enter the **Licensing, Insurance, and Legal Costs**

Although less relevant for fleet and equipment than buildings, a table of cost estimate classifications has also been included as a supporting worksheet and reference. It is intended to be a guide for reference when using outside support to determine capital costs, and provides cost variances which are helpful benchmarks when considering contingencies.

SECTION 5 – Indirect Lifecycle & Risk Costs

Are there any other costs you might incur in terms of environmental impacts, greenhouse gas emissions, additional safety risk? If so, fill in any relevant blanks for the asset in **SECTION 5 – Indirect Lifecycle & Risk Costs.**



Carbon Pricing

Carbon pricing on infrastructure projects can be conisdered to make more informed decisions about new projects. There are three aspects of carbon pricing – the NWT carbon tax, and the embodied carbon (the total GHGs emitted during the construction of infrastructure) alongside the carbon footprint (activities such as electricity, fuel consumption, heating and lighting).

As a result of carbon pricing, the GNWT is providing an annual carbon tax revenue-sharing grant for communities that demonstrate efforts to adapt to climate change, reduce reliance on fossil fuels, and/or support the overall reduction of GHGs. This may be an opportunity for some projects your local government is considering.

For the purposes of the lifecycle model, it's possible to consider the carbon emitted during the construction and operations of the proposed infrastructure, either as a an amount of overall carbon or as a cost associated that carbon. There are various freely available models to assist in identifying the embodied carbon and carbon footprint of infrastructure projects.

Worksheet 4: Decision-Making Process

The workbook template contains questions that will help you decide whether to proceed with acquisition or renewal of the asset based on factors such as purpose, cost, and impacts on other infrastructure. You may wish to print out this page of the workbook to compare multiple options to one another.

The first section pertains to basic asset information; fill in as much as you can:

Department:				
Asset Number:			Class Estimate:	
Activity:			NTPC:	
Project Number			Previously Submitted:	
Project Title:			PPD:	
Approval Status:			Fiscal Year:	
Community:			Facility Condition Index Score:	
FY Approved:			Replacing an Existing Asset (Y/N)	
Land Availability:			Federal Fund (Y/N):	
Multiyear:			Date Prepared:	
Site Development:				

What is the driver for this asset? Why do you need this asset? Check all that apply:

What is the driver for this project?			
	Improvement order from authorized jurisdiction		Potential return on investment
	Legislated requirement from body with authority close infrastructure or impose penalties		Formal agreements for investment wich require matching funds from other jurisdications
	Immenent structural failure; critical infrastructure		Avoidance of cost for major repairs or replacements
	Catatrophic equipment failure		Avoidance of cost for environmental remediation
	Severe flood, fire or storm damage		Cost savings which exceed invement and payback period of 5-7 years
	Requirement for demolition of hazardous infrastructure		Energy conservation/energy achievement
	Advanced age of infrastructure		Environmental protection
	Essential legislative service to community		Demonstrable enviromental risk from inaction
	New/Expanded/Adapted infrastructure to address growth		Other:
	Exceeded capacity of infrastructure		Other:
	Failure to meet program requirements		Other:
	New/Expanded/Adapted infrastructure to address service level		Other:

The asset purpose statement you filled out in **1. Asset Purpose and Priority** is included to help you in the decision-making process:

Purpose
Our community needs to (description of project), to (service provided) because (current status of infrastructure and program need/protection). This project aligns with our community goals/vision to (insert relevant goals). If we didn't purchase/renew this (vehicle or equipment), we would experience the following impacts (describe impacts, e.g. lost opportunity, people, assets, environment, financial)

What are some of the potential **Impacts on Other Infrastructure**? For example, where there is a dependency on existing infrastructure such as a connection point for filling a water truck or disposing of sewage. Fill in this information in the box provided:

Impacts on Other Infrastructure

The following questions are related to **Asset Cost Estimate** and included to provide reflection prompts:

1. What needs are addressed, or benefits achieved by the assets? Are they justified with full lifecycle costs?

2. What are the lifecycle implications (O&M and renewals costs, risks, human resources) of acquiring the new asset and providing the new or expanded service?

3. How do you plan to pay for this asset?

A summary of the estimated costs for the project/asset is displayed, based on answers provided in worksheet 2: Lifecycle Costs.

Annualised Capital Cost for Initial Acquisition of Asset	What wou ld it cost if the total capital cost for an asset was divided up over each year for the life of an asset?
Annualised Cost for Borrowing for Initial Acquisition	What would it cost if the total cost of borrowing to purchase an asset was divided up over each year for the life of an asset?
Operation and Maintenance (O&M) Costs	What does it cost each year to keep the asset running for its expected life?
Annualised Indirect Lifecycle & Risk Costs	What other risk costs will impact the total cost of this asset o ver its expected life (e.g. greenhouse gases, safety, environmental risks, etc.)?

The next section explores alternatives as you evaluate more than one project

1. What alternatives have been considered?

2. Why is this asset the preferred alternative?

3. How does this asset address the described need?

Finally, the last section asks: what is the status of **Community Consultations?**

4. Putting it into Practice

This lifecycle costing workbook is an excellent tool to inform the prioritization of projects being considered within a local government's capital plan. It can also be helpful when looking at optimization strategies as part of the long term financial planning process. Sometimes these exercises will be undertaken as part of developing an asset management plan, while other times they may be done separately.

Sphere of Influence

This tool is most effective when used as early as possible in the capital planning process. When a local government first starts considering a new asset, you have 100% of the control regarding cost implications.

As you move into purchasing and then use of the asset, your ability to influence the costs related to this asset becomes minimal. Decisions have been made which remove some or all the flexibility in considering alternatives.

As your sphere of influence decreases, your investment in the asset grows. So, consider taking a bit of extra time at the beginning of the process to ensure your decision is affordable for the *full lifecycle* of the vehicles and equipment you are planning to purchase. Ensure you know – and can accept – the cost implications of this new asset.