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Guide to Assessing Cost Estimates

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Guide to Assessing Cost Estimates

1. Date of publication

This guide is effective as of July 24, 2025. It replaces the Cost Estimate Classification Definitions 1.0 (March 2020) previously available on the Government of Canada (GC) Costing Community of Practice network.

2. Application, purpose, and scope

This guide supports the organizations listed in section 6.1 of the *Directive on the Management of Projects and Programmes* (the *Directive*). It supports GC projects (and programmes) as defined in the *Policy on the Planning and Management of Investments*. It does not support initiatives funded by the GC using transfer payments. Considerations related to agents of parliament under section 6.7 of the *Directive* are also supported, including that the definition of a project does not include the performance of audits, investigations, or other statutory mandate activities of the agents of Parliament. It is recommended for use by individuals who cost, review, or assess cost estimates including costing practitioners, managers of programs or investments, and program sector analysts.

The purpose of this guide is to support a standard approach to assessing cost estimates across the GC.

This guide supports the *Directive* by defining rough order of magnitude (ROM), indicative, and substantive cost estimates and establishes the criteria for their assessment.

3. Context

The *Directive* requires specific classification levels for cost estimates that support Treasury Board (TB) submissions seeking project (or programme) approval, expenditure authority, or an amendment to these.

Defining the classifications and their criteria is necessary for consistent application across the GC and to ensure that TB considers initiatives that meet the required level.

The *Guide to Costing* outlines the GC costing process and includes additional information and techniques to strengthen costing and the credibility of cost estimates.

4. Cost estimate classifications

4.1 Brief descriptions

To support decision-making, the GC recognizes three cost estimate classifications: ROM, indicative, and substantive. Table 1 provides brief descriptions below:

Table 1: Summary of Cost Estimate Classifications

Classification	Brief description
Rough Order of Magnitude (ROM)	Cost estimate with a high probability of significant change over time. It is based on the availability of limited information, usually in the early stages of planning an initiative or defining its requirements.

	Its degree of alignment with the Costing process detailed in Section 7 of the *Guide to Costing* is used to assess its credibility as being in the ROM range or simply a preliminary estimate.
Indicative	Cost estimate with a medium probability of significant change over time. The estimate may be for an initiative whose requirements have yet to be fully defined; and/or there could be limitations in applying certain steps of the *Guide to Costing* process; and/or there could be other factors that lower its credibility, even if the costing process is generally followed.
Substantive	Cost estimate with a lower probability of significant change over time. It is based on well-defined requirements, often for mature initiatives in the advanced stages of development or implementation. The supporting costing information fully aligns with the Costing process in Section 7 of the *Guide to Costing*.
Note: For all classifications, the transparent disclosure of key limitations, ground rules, assumptions, risks, and uncertainties is imperative to support informed decision-making.	

A ‘preliminary estimate’ is a cost estimate that fails to, at minimum, meet the ROM requirements in a manner that conveys general alignment with the ROM classification and lacks the expected level of rigor and quality. These estimates are typically developed under time pressure, with limited access to costing resources and appropriate data, and can be expected to change significantly over time.

4.2 Classification assessment

The *Guide to Costing* lays out a process to produce credible costing information. The level of effort to develop the costing information should be consistent with the purpose, complexity, risk, and materiality of the initiative and its costing exercise.

As per Section 6 of the Guide, costing information is credible when it is process-driven, comprehensive, evidence-based, risk-assessed, validated, and documented. To determine if a cost estimate falls in the ROM, indicative, or substantive category, it should be assessed against these criteria, which are defined in Appendix A: Cost Estimate Classification Table.

The Cost Estimate Classification Table also has a set of questions that should be used for the assessment. The questions should be answered, and the answers compared to the "Classification level requirements" in the table to determine if they align with the ROM, indicative or substantive level. The answers may not all align with the same classification level. Individuals who cost, review, or assess the estimate should then exercise professional judgement to determine the cost estimate's general alignment to an overall classification.

The overall classification should not be based solely on the number of satisfied requirements for a given classification level. Rather, the assessment should consider the nature of these requirements, how rigorously they are met, how they impact or offset each other, and how they ultimately affect the results and their credibility. Depending on the particularities of each costing exercise, requirements will weigh differently in the overall assessment. Typically, requirements found under the comprehensive, evidence-based, and risk-assessed criteria will carry more weight in the assessment.

5. References

Legislation

- *Financial Administration Act*

Related policy and guidance instruments

- *Policy on the Planning and Management of Investments*
- *Directive on the Management of Projects and Programmes*
- *Guide to Costing*
- *Guidance for Drafters of Treasury Board Submissions*
- *Guideline on Chief Financial Officer Attestation for Cabinet Submissions*

Tools

- Government of Canada Costing Community of Practice

6. Enquiries

For interpretation of these definitions, relevant units should contact the Office of the Comptroller General Costing Centre of Expertise at CCE-CEEC@tbs-sct.gc.ca.

Appendix A: Cost Estimate Classification Table

Criteria	Assessment questions	Classification level requirements		
		Rough Order of Magnitude (ROM)	**Indicative**	**Substantive**
1. Process-driven *The Guide to Costing process is applied and includes the participation of a wide range of*	**A. Is the costing exercise process-driven?**	The purpose and plan of the costing exercise are well defined. All the steps of the *Guide to Costing* process are completed, but with less rigor **for some** because of time	The purpose and plan of the costing exercise are well defined. All the steps of the *Guide to Costing* process are completed, but with	The purpose and plan of the costing exercise are well defined. The steps of the *Guide to Costing* process **are all** rigorously

stakeholders [2] .		constraints or other factors. The cost model [1] and total life-cycle cost estimate (LCCE) are continuously updated, with data, risks, ground rules, and assumptions adjusted to reflect newly available information or changes. Errors are identified and corrected.	less rigor **for a couple** because of time constraints or other factors. Each cost element is estimated using the most appropriate costing technique for the data collected and the maturity of the initiative at that time. The cost model [1] and total LCCE are continuously updated, with data, risks, ground rules, and assumptions adjusted to reflect newly available information or changes. The total LCCE should reflect the risks associated with **all** project phases. Errors are identified and corrected, and **lessons learned** are recorded and applied throughout the process.	completed. Each cost element is estimated using the most appropriate costing technique for the data collected and the maturity of the initiative at that time. The cost model [1] and total LCCE are continuously updated, with data, risks, ground rules, and assumptions adjusted to reflect newly available information or changes. The total LCCE should reflect the risks associated with all project phases. Errors are identified and corrected, and lessons learned are recorded and applied throughout the process.
	B. Are key stakeholders [2]: • **Engaged in the costing exercise, and** • **In agreement on the applicability of ground rules and assumptions?**	• Engagement with key stakeholders [2] in the costing exercise (for example, in risk identification activities) is **limited** even if documented, and • The main ground rules and assumptions are **communicated**	• There is **in-depth** engagement in the costing exercise (for example, in risk identification activities) with **some** key stakeholders [2] and preliminary engagement with others, and	• The process includes **documented in-depth** engagement in the costing exercise (for example, in risk identification activities) with **all** key stakeholders [2], and • There is agreement with them on

		to key stakeholders [2].	• There is **agreement** with them on the applicability of ground rules and assumptions.	the applicability of ground rules and assumptions.
	C. Are results of the costing exercise communicated clearly?	A range of potential cost outcomes is clearly communicated to key stakeholders [2] who are informed of the classification of the cost estimate, and its strengths and limitations. This includes the transparent disclosure of: • Critical ground rules and assumptions and any disagreement over their application, • Risks and uncertainties, key limitations to their assessment, and any disagreement in that regard, • Limitations to scope definition, schedule accuracy and data quality, and the impact they have on the credibility of the estimate. For TB submissions, additional items listed in the *Guidance for Drafters of Treasury Board Submissions*	A range of potential cost outcomes is clearly communicated to key stakeholders [2] who are informed of the classification of the cost estimate, and its strengths and limitations. This includes the transparent disclosure of: • Critical ground rules and assumptions and any disagreement over their application, • Risks and uncertainties, key limitations to their assessment, and any disagreement in that regard, • Limitations to scope definition, schedule accuracy and data quality, and the impact they have on the credibility of the estimate. Also communicated are the **drivers of cost variations** since previous estimates,	A range of potential cost outcomes is clearly communicated to key stakeholders [2] who are informed of the classification of the cost estimate, and its strengths and limitations. This includes the transparent disclosure of: • Critical ground rules and assumptions and any disagreement over their application, • Risks and uncertainties, key limitations to their assessment, and any disagreement in that regard, • Limitations to scope definition, schedule accuracy and data quality, and the impact they have on the credibility of the estimate. Also communicated are the drivers of cost variations since previous estimates,

		under the 'Due diligence and validation of costing' section should also be communicated.	an **up-to-date total LCCE range**, and the results of any **validation** via alternative costing techniques (see row 5b). For TB submissions, additional items listed in the *Guidance for Drafters of Treasury Board Submissions* under the 'Due diligence and validation of costing' section should also be communicated.	an up-to-date total LCCE range, and the results of any validation via alternative costing techniques (see row 5b). For TB submissions, additional items listed in the *Guidance for Drafters of Treasury Board Submissions* under the 'Due diligence and validation of costing' section should also be communicated.
2. Comprehensive *The costing exercise considers all cost elements, with clear boundaries in terms of scope and schedule.*	**A. Is the scope of the cost estimate exhaustive?**	The level of detail in the initial cost breakdown structure captures **key** cost elements, but is **insufficient** and results in **limitations** to defining the scope and boundaries of the cost estimate. Where important gaps or costing limitations exist, ground rules and assumptions are put in place to frame the scope and schedule and to determine what is and is not included. A **preliminary** assessment of life-cycle costs is done using available data, including data on operational, sustainment, and disposal activities.	The **scope** of the cost estimate is **clearly** articulated, and the cost breakdown structure has **sufficient** detail to capture **all relevant** cost elements associated with the initiative. Where gaps or costing limitations exist, ground rules and assumptions are put in place to frame the scope and schedule and to determine what is and is not included. An **initial** assessment of life-cycle costs is done using available data, including data on operational, sustainment, and disposal activities.	The scope of the cost estimate is clearly articulated, and the cost breakdown structure captures **all** cost elements associated with the initiative, **with none omitted or double-counted**. Ground rules and assumptions are put in place to frame the scope and schedule and to determine what is and is not included. As the initiative matures, and more data becomes available, life-cycle costs related to all life-cycle phases are **solidified**.
	B. Are the initiative's requirements in the	The initiative's deliverables as well as its technical and other requirements are in	The initiative's deliverables as well as its technical and other requirements	The initiative's deliverables as well as its technical and other requirements

	mature [3] stages of development?	the **initial** stages of development.	are of **moderate** maturity [3] and definition.	are **mature** [3] and **fully defined**.
	C. Is the schedule thorough and realistic?	A **clear** and **high-level** schedule is developed for the initiative, outlining key milestones, deliverables, and timelines. Key schedule risks are identified.	A **comprehensive** schedule is developed at detailed levels of the initiative's work breakdown structure, using **appropriate** [4] data and an **initial** assessment of schedule risk and uncertainty.	A comprehensive schedule is developed at detailed levels of the initiative's work breakdown structure, using appropriate [4] data and a **full** assessment of schedule risk and uncertainty.
3. Evidence-based *Costs are based on appropriate [4] data and analysis.*	**A. Is there sufficient and appropriate [4] data to support evidence-based costing?**	The cost estimate is based on **limited** data or relies heavily on **less evidence-based** information such as subject matter expert (SME) opinion. Data is normalized to account for differences in time, volume, complexity, and other relevant factors.	The **majority** of the cost estimate is built on **sufficient** and **appropriate** [4] data. There is limited reliance on SME opinion. Data is normalized to account for differences in time, volume, complexity, and other relevant factors.	The cost estimate **almost entirely** relies on sufficient and appropriate [4] data with little or no reliance on SME opinion. Data is normalized to account for differences in time, volume, complexity, and other relevant factors.
	B. Are ground rules and assumptions relevant? Do they establish realistic baseline conditions?	The ground rules and assumptions are based on **lower** quality information or have **limited** input from qualified program and technical personnel.	The **majority** of the ground rules and assumptions that have a significant impact on the cost estimate are based on **appropriate** [4] data. They are not arbitrary and are developed **with** input from experienced program and technical experts.	**All** ground rules and assumptions that have a significant impact on the cost estimate are based on appropriate [4] data. They are not arbitrary and are developed with input from experienced program and technical experts.
	C. Are recognized data analysis techniques used to reduce subjectivity and strengthen the credibility of the estimate? *(for example, regression analysis, cluster*	There is **limited** use of data analysis techniques or **limited** quality of the underlying information or data. In the absence of reliable data sources	Recognized **data analysis techniques** are combined with **moderate** to **high** quality information and data to reduce subjectivity and improve the	Recognized data analysis techniques are combined with **high** quality information and data to reduce subjectivity and improve the credibility of the estimate.

	analysis, factor analysis, Monte Carlo analysis, etc.)	and to mitigate the subjectivity of SME opinion, qualitative evidence from SME is transformed into data using robust qualitative and quantitative **research techniques**, where possible.	credibility of the estimate.	
4. Risk-assessed *A rigorous cost risk and uncertainty analysis ensures the cost estimate is risk-adjusted. It examines risks and uncertainties related to schedule, technical requirements, programmatic factors, economic conditions, legal, organizational, and other factors.*	**A. Does the costing exercise consider how changes to critical assumptions, inputs, and parameters affect the point estimate** [5]?	A **high-level assessment** identifies how changes to key cost drivers, ground rules, and assumptions affect the point estimate [5].	A **sensitivity analysis** [6] is performed to help refine parameters and assumptions by seeing how sensitive the point estimate [5] is to changes in **key factors**.	A **sensitivity analysis** [6] is performed to help refine parameters and assumptions by seeing how sensitive the point estimate [5] is to changes in **allhigh cost and high-risk** factors.
	B. Is the cost estimate informed by a comprehensive and objective cost risk and uncertainty analysis?	A **high-level assessment** is completed relying primarily on **SME** opinion with **limited** involvement from other stakeholders [2] to: • Identify, prioritize, and describe the risks and uncertainties that could affect the project, • Quantify the likelihood and potential impact of key risks and uncertainties on cost and schedule, taking into account mitigation strategies, • Establish contingency within a range of possible costs,	A **comprehensive** risk and uncertainty **analysis** is completed using **mostly** appropriate **data** [4],best practices [7] **to varying degrees,** and **consultations** with key stakeholders [2] to: • Identify, prioritize, and describe the risks and uncertainties that could affect the project. For the **LCCE**, this includes risks associated with all phases of the initiative, such as risks to operational, sustainment, and disposal activities,	A comprehensive risk and uncertainty analysis that **fully** aligns with best practices [7] and involves **in-depthand documented** consultations with key stakeholders [2] is completed to: • Identify, prioritize, and describe the risks and uncertainties that could affect the project. For the LCCE, this includes risks associated with all phases of the initiative, such as risks to operational, sustainment,

		• Document the assessment, communicate its results, and disclose any disagreement in that regard with key stakeholders [2], and • Monitor risks and uncertainties, and the efficiency of mitigation strategies, to maintain up to date risk information.	• Quantify the likelihood and potential impact of key risks and uncertainties on cost and schedule by relying on **analogy** with comparable initiatives or data from other credible sources, taking into account mitigation strategies, • Establish contingency within a range of possible costs. For **complex** [8] initiatives, quantitative statistical models, such as Monte Carlo or method of moments analysis establish the base estimate cost range, contingency, and confidence level [9], • Document the analysis in a **risk register** (see row 6a), communicate its results, and disclose any disagreement with key stakeholders [2], and	and disposal activities, • Quantify the likelihood and potential impact of key risks and uncertainties on cost or schedule by relying on analogy with comparable initiatives or data from other credible sources, taking into account mitigation strategies, • Establish contingency within a range of possible costs. For complex [8] initiatives, quantitative statistical models, such as Monte Carlo or method of moments analysis establish the base estimate cost range, contingency, and confidence level [9], • Document the analysis in a risk register (see row 6a), communicate its results, and disclose any disagreement with key

			• Monitor risks and uncertainties, and the efficiency of mitigation strategies, to maintain up to date risk information and apply **lessons learned**.	stakeholders [2], and • Monitor risks and uncertainties, and the efficiency of mitigation strategies to maintain up to date risk information and apply lessons learned.
5. Validated *A quality assurance process [10] is applied to ensure the integrity of the costing exercise and validate the results.*	**A. Is there a quality assurance process [10] that ensures rigor was applied to the costing exercise?**	A quality assurance process [10], focused on **key** elements and meeting the minimum requirements was applied to verify the quality of the costing exercise.	A quality assurance process [10], focused on **key** elements and meeting the minimum requirements was applied to verify the quality of the costing exercise.	A **comprehensive** quality assurance process [10] meeting the minimum requirements was applied to verify the quality of the **entire** costing exercise.
	B. Were the results of the costing exercise validated as being reasonable?	There are **limited** efforts to validate that the cost estimate results are reasonable.	The cost estimate results for **high value cost elements** are validated by comparing them to historical data from similar initiatives, or by using alternative costing techniques. These can include a benchmarking analysis, reference class comparison, or similar approaches.	The cost estimate **results** are validated using alternative costing techniques that include a credible independent estimate or benchmarking analysis by a group outside of the project lead's influence. The cost estimate results can also be cross-checked by comparing them to historical data from similar initiatives.
6. Documented *Important costing information is rigorously documented so that the costing exercise is*	**A. Is the risk and uncertainty analysis (and sensitivity analysis, if separate) documented in a way that:**	All the risks events (threats and opportunities) having a potential impact on cost or schedule are documented in the **cost model** itself,	All the risk events (threats and opportunities) having a potential impact on cost or schedule are documented in a **risk**	All the risk events (threats and opportunities) having a potential impact on cost or schedule are documented in a risk

transparent, understandable, and traceable.	• **Helps monitor factors that could impact costs, and** • **Supports a review of their assessment?**	along with their assessment method and results. The cost model also **identifies key** cost drivers, ground rules, and assumptions and **explains** how they could affect the estimate. Any disagreement with key stakeholders [2] on the assessment or its results is documented.	**register** [11], along with their assessment method and results. The **sensitivity analysis** is also documented to show how results respond to changes to cost drivers, ground rules, assumptions, or other key factors. Any disagreement with key stakeholders [2] on the assessment or its results is documented.	register [11], along with their assessment method and results. The sensitivity analysis is also documented to show how the results respond to changes to cost drivers, ground rules, assumptions, or other factors. Any disagreement with key stakeholders [2] on the assessment or its results is documented.
	B. Is a cost report developed?	A cost report is **not** developed but there is sufficient documentation in the cost model itself to permit a reasonable review and understanding of the costing method and results.	A **cost report** is developed in line with The Basics: Costing Documentation requirements to facilitate a technical review of the exercise by cost analysts, key stakeholders [2] or auditors.	A **cost report** is developed in line with The Basics: Costing Documentation requirements to facilitate a technical review of the exercise by cost analysts, key stakeholders [2] or auditors. Documentation in the **cost model** itself is also sufficient to permit a reasonable review and understanding of the costing method and results.
	C. Is the communication of important costing information documented in a manner that supports informed decision-making?	Briefing materials are developed to provide decision makers with a clear summary of the results, including the items to be communicated under row 1c.	Briefing materials are developed to provide decision makers with a clear summary of the results, including the items to be	Briefing materials are developed to provide decision makers with a clear summary of the results, including the items to be

		For TB submissions, the communication of important costing information aligns with the expectations in TBS' Guidance for Drafters of Treasury Board Submissions, **where possible**; and the Costing Information Appendix template, when required.	communicated under row 1c. For TB submissions, the communication of important costing information aligns with the expectations in TBS' Guidance for Drafters of Treasury Board Submissions, **where possible**; and the Costing Information Appendix template, when required. The transparent communication of an up-to-date **total LCCE range** should be included, regardless of the decision or authorities being sought.	communicated under row 1c. For TB Submissions, the communication of important costing information aligns with the expectations in TBS' Guidance for Drafters of Treasury Board Submissions; and the Costing Information Appendix Template, when required. It includes the transparent communication of an up-to-date total LCCE range, regardless of the decision or authorities being sought.

1 A cost model is an estimating model that is developed to calculate the estimated future cost of an initiative. It should use appropriate [4] data and established costing methods and techniques for the calculations and, in the GC, should follow the *Guide to Costing* process.

2 Stakeholders may include and are not limited to: suppliers, third-party experts (including costing and other technical experts), project offices (also referred to as project management offices), chief financial officers, chief information officers, initiative leads, heads of human resources, those responsible for data, other organizations impacted by the initiative, and Central Agencies responsible for reviewing the information as applicable.

3 Requirements in the mature stages of development are expected to be based on the following factors: a mature design, technological readiness, industry capacity, maturity of supply chain engagement, internal planning efforts, remaining length of planning horizon, and available documentation on key technical, programmatic, and schedule considerations.

4 Data is appropriate when it is relevant to the purpose and scope of the initiative and its costing exercise, and it is:

- From a reliable source and known to be accurate as in the case of actual or historical costs,
- Directly comparable to what is being estimated,
- Recent enough to reflect changes that happen over time such as technological advances, evolution of industry standards, process changes, and changes to market dynamics, and
- Normalized or adjusted using a robust process to account for differences in time, volume, or complexity, including escalation with indices from reputable sources that are representative of

the specific goods or services being estimated.

5 The point estimate is the total of all the estimated cost elements in the cost breakdown structure, including escalation, before any adjustment is done to consider risk and uncertainty.

6 A sensitivity analysis assesses how sensitive the cost estimate is to changes in underlying factors by varying assumptions, inputs, and parameters, and examining how each factor independently affects the results. It is used to refine parameters and assumptions and identify cost drivers and critical factors. It can also be used to provide a range of costs from worst to best case scenarios. Underlying factors can include key cost elements, ground rules, assumptions (including schedule), costing methodologies, data, risk response strategies, and other parameters.

7 Best practices to analyze project risks and uncertainties and establish contingency within a range of possible costs include:

- Using appropriate data sources (see footnote 4),
- Analyzing risks and uncertainties on comparable projects (or programmes),
- Consulting with key stakeholders 2 (for example, the Project Management Office) for risk identification and prioritization activities, and obtaining their input on risk assessment methods and results,
- Using sensitivity analysis or other data analysis techniques to help refine parameters and assumptions, and
- Using quantitative statistical techniques to quantify the overall effect of risks and uncertainties on results, and the probability of completing the project within an estimated cost range.

8 Complex initiatives generally involve the purchase or sustainment of major assets or critical infrastructure, through multi-year contracts or projects. They can also be high-dollar value initiatives for which the total estimated cost represents a substantial amount in relation to the department's total budget; or critical initiatives that are key government priorities, under high scrutiny, or with high visibility, or that could have a major impact on Canada as a whole.

9 A confidence level expresses the probability that project cost will be less than or equal to the estimated cost. It is based on a cumulative probability distribution or S curve stemming from the risk and uncertainty analysis.

10 The Quality Assurance process should entail at minimum:

- Verifying that all the steps of the Costing process detailed in Section 7 of the *Guide to Costing* are completed;
- Ensuring ground rules, assumptions, risks, and uncertainties, or parts thereof, are explained, documented, reviewed, and deemed reasonable by technical experts, the chief financial officer, the initiative leads, Project Office, and other key stakeholders 2;
- Performing data quality checks, looking for errors, or omissions;
- Ensuring the data is validated as appropriate 4 by comparing it to a second source of data or, if a second source is not available, by technical experts;
- Cross-checking technical judgments made by the estimator(s) or SME by analyzing supporting data and examining documentation; and
- Validating the expert’s credentials when information is based on SME opinion.

11 The risk register contains at minimum the: risk title, description, likelihood and potential impact, and method used to quantify risk and establish contingency.

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