
CAPITAL PROJECT BUDGETING IN LOCAL GOVERNMENTS

CONSIDERATIONS FOR LOCAL
GOVERNMENT ADMINISTRATORS

RELATING TO AGLG AUDIT TOPIC:
CAPITAL PROJECT MANAGEMENT IN LOCAL GOVERNMENTS



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This booklet offers suggestions to all local governments interested in good capital project budgeting practices. We recognize that each local government faces unique circumstances, including their size, maturity and capacity as well as the characteristics of their communities. As a result, how each local government chooses to implement these suggestions will vary.



THE AGLG PERSPECTIVES SERIES

The office of the Auditor General for Local Government (AGLG) carries out performance audits of local government operations in British Columbia and provides local governments with useful information and advice. Our goal is to help local governments fulfil their responsibilities to be accountable to their communities for how well they take care of public assets and achieve value for money in their operations.

The AGLG Perspectives Series booklets are designed to help improve local government performance. These booklets complement our performance audit reports by providing local governments across the province with tools and more detailed information relating to the topics we examine.

Some AGLG Perspectives booklets are written mainly for elected officials, while others are directed more toward local government staff. These booklets are also helpful to others who take an interest in local government in British Columbia.

THIS BOOKLET

This AGLG Perspectives booklet is written mainly for local government senior management and staff; however, it also contains sections that may prove useful to elected officials.

The booklet aims to highlight:

- » The importance of capital construction project costing and budgeting
- » Key factors to consider when developing capital project budgets
- » Important information to provide to elected officials overseeing capital projects

Some principles of capital construction project costing and budgeting also apply to projects that do not involve construction, such as information technology (IT) projects. This booklet, however, focuses on the management of costs and budgeting for construction projects.

Section 5 provides a list of capital project budgeting pitfalls. The top 12 pitfalls have been highlighted with accompanying narrative throughout the document. We hope readers find this both user-friendly and helpful.

We hope this booklet will provide useful information to all local governments interested in enhancing their capital project budgeting practices.

HOW THE AGLG'S AUDIT WORK CONTRIBUTED TO THIS BOOKLET

The AGLG has produced a series of reports on the topic capital project management, and previously conducted audits on the topic of capital project procurement and asset management. From our audit work and research on the topic, we learned that local governments face many and varied challenges as they navigate the delivery of their capital projects.

With the support of subject matter experts, we previously developed an AGLG Perspectives series booklet – *Primer on A Guide to the Project Management Body of Knowledge* – in a format meant to help local government council and board members understand the key elements that lead to successful local government capital project management.

The primer incorporates materials produced by the Project Management Institute, Inc. (PMI), an organization that promotes common practices or standards in their publications and administers the award of certifications.

This booklet is intended to augment that previous publication with an enhanced focus on the important topic of capital project costing and budgeting. This area has been a source of challenges to project success in British Columbia as well as many other jurisdictions.

Capital projects will vary in both size and complexity. This booklet focuses on themes and issues common to all significant capital projects. Depending on project size and complexity, some components will be more relevant to certain projects than to others. We encourage local governments to consider each suggestion in this booklet and determine whether it is relevant to their circumstances.

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**BUDGETING
& FINANCIAL
POLICIES**



WHY IS A CAPITAL BUDGET IMPORTANT?

Local government infrastructure represents a significant investment that has a direct impact on the quality of life of residents. This infrastructure takes many forms, including roads, facilities (e.g. recreation centres), structures (e.g. bridges) or utility assets (e.g. water and sewer mains). Capital projects frequently involve the design and construction of new infrastructure assets, or the large-scale renovation, expansion or replacement of existing infrastructure assets.

Major capital projects are some of the most complex, costly and impactful work performed by local governments.

Delivering successful capital investment programs and projects can improve the quality of services that local governments provide. It can help achieve lasting outcomes, improve the overall efficiency of how local governments operate and reduce costs in the long-term.

However, if not planned and executed properly, major capital projects can have lasting negative consequences for a community. Poor planning and lack of accountability and leadership can undermine capital investment.¹

For this reason, local governments invest significant resources in planning the construction, renovation or replacement of these assets.

A key component of the planning process is the capital budget. Capital budgets are intended to cover the cost of major improvements to a local government's infrastructure and are separate and distinct from a local government's operating budget, which is intended to cover the day-to-day cost of service delivery.

Each capital project will have a budget which represents the total cost allocated to the project to cover all necessary work to deliver the infrastructure and bring it into service, including consulting fees, permits, construction and commissioning. Capital project budgets will include both "hard" and "soft" costs of construction - the "hard" cost is the cost of physical work undertaken by construction contractors, whereas the "soft" costs of construction are made up primarily of professional consulting fees for work undertaken by a diverse team of professionals, such as architects, engineers, project managers, quantity surveyors and lawyers.

Project Management Capacity

Many small- medium-sized local governments might not have the knowledge, skills or availability to effectively manage a particular capital project. In this case, local governments might choose to hire an external consultant to act as their rep-resentative to manage the project, facilitate communication and ensure the project aligns with the project objectives and the local government's operational mission.

AGLG's Perspectives series booklet *A Guide to the Project Man-agement Body of Knowledge*, December 2020, pg. 10

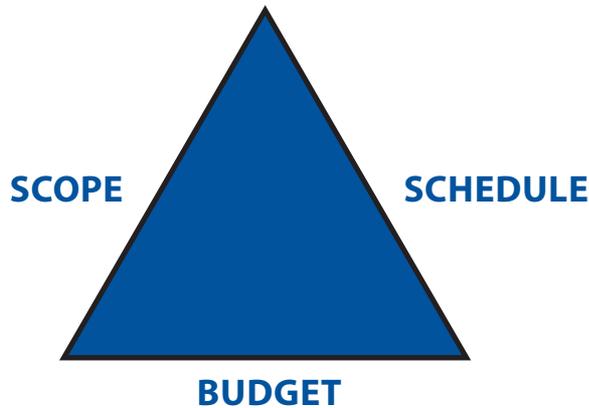
Once the need for a particular capital project has been identified, a capital budget is developed as part of the process of determining whether the project should proceed, and at what cost. Funding for a capital project may come from internal resources at the local government's disposal (operating funds or disposition of assets), or from external sources such as grants, interim financing or long-term debt. Once approved, the capital project budget provides the financial parameters within which the project is expected to be delivered.

¹ Adapted from "Major Capital Investment in Councils", Accounts Commission, Audit Scotland, March 2013, pg. 5

Alongside scope and schedule, the capital project budget rounds out the three essential components of a project baseline. Since a baseline defines the project, it also enables measurement of progress and success of a project.

The Project Management Triangle diagram below illustrates how a capital project is defined by scope, schedule, and budget. Local governments should be aware of the fundamental interdependency of a project's scope, schedule and budget – each directly impacts the other, and this has important implications for capital project budgeting. Each side of the triangle represents a competing priority and, in practice, project management is largely concerned with balancing these priorities.

PROJECT MANAGEMENT TRIANGLE SCOPE, SCHEDULE, BUDGET



Scope, schedule and budget form three sides of a triangle that defines the baseline of any major capital project. Because each side of the triangle is connected to the other two, no one side can be altered without impacting the other two.

There can be no certainty about what a project is likely to cost if its scope is uncertain². It is for this reason that - especially for major capital projects - expectations in respect of what a project will cost need to be very carefully managed until such time as the project scope has been finalized. This can involve a phased approach to approval where final approval of a project budget is withheld until sufficient work has been done to confirm the scope.

This principle is commonly applied by local governments in their five-year capital plans. Five years out, planning for a project may be only at a high level, and approvals are consequently only interim (e.g. design stage). Formal project and budget approval comes only after detailed planning, based on a defined project scope.

It is important to note that the degree of rigour that needs to go into planning a capital project depends on the size and complexity of the project. More rigour would typically be expected for the construction of a large facility than, for example, the routine replacement of side-walks or watermains (see pooling of risks, Question 2, page 12).

A project baseline that has been established and approved sets expectations of what scope will be delivered, when and for what cost. There should be strict controls to prevent any unauthorized change to that baseline. Deviations from the baseline – delays, higher than anticipated costs, scaled back scope or quality – detract from the project's success. That information can be lost if the baseline is changed, along with transparency of performance and opportunities to learn for the next project.



² UK National Audit Office, Survival Guide to Challenging Costs in Major Projects, 2018, pg.5

BUDGETS VS. COST ESTIMATES

It is important to understand that a capital project budget is not the same as a cost estimate.

A cost estimate is the best judgment of a qualified professional (typically, for major projects, cost estimates are prepared by a quantity surveyor, consulting engineer, or other design professional) based on projects of similar scope and complexity, in light of information available at a particular point in time. Often cost estimates only cover construction, or "hard" costs. Cost estimates have a limited life, are subject to cost escalation and fluctuating market conditions and are based on assumptions that should be clearly stated. For more information on cost estimates, see the AGLG's Perspectives series booklet *A Guide to the Project Management Body of Knowledge*.

Estimating the cost of construction of a capital project is an iterative process where uncertainties are incrementally reduced, and cost estimates become increasingly reliable. The fewer unidentified assumptions and unknowns in a cost estimate, the greater the certainty that can be applied to the estimated costs.

The level of certainty in a given cost estimate should be clearly stated and a contingency that is commensurate with this level of uncertainty should be allocated as part of the budget.



Early-stage cost estimates will be high-level and inherently less reliable than later estimates due to uncertainties regarding the scope of the project, the project design, finishing details and the reality of fluctuations in market prices for labour and materials. "An estimate produced from high-level information is unlikely to be suitable for setting a programme budget and schedule and should be used only in an indicative fashion to guide long-term planning."³ As designs and plans become better defined and more detailed, and as the time between planning and construction diminishes, the reliability of cost estimates should improve.



Uncertainty cannot be eliminated entirely since it is impossible to foresee all potential eventualities. For example, "hard" construction costs will ultimately be determined by the market and influenced by a range of factors which cannot be foreseen in their entirety; few would have predicted the impact of COVID on plans for 2020. Some residual uncertainty will always remain but should be reduced to the extent that is reasonable before a budget is finalized and presented to the council or board for approval.

Local governments should 'improve early-stage estimating of the cost and time of projects by ensuring assessment and quantification of risk and uncertainty are carried out.'

Audit Scotland, "Management of the Scottish Government's Capital Investment Programme," January 2011, pg. 26

³"Lessons Learned from Major Programmes", UK National Audit Office, November 2020, pg. 5

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WHAT ARE THE MAIN COMPONENTS OF BUDGETING FOR A CAPITAL PROJECT?

Capital budgeting consists of two primary components: an understanding of all of the costs associated with a given capital project and, just as importantly, understanding the uncertainties associated with those costs.

COSTS

In order to capture the full cost of any major capital project, all costs attributable to it need to be included in the project budget. Each capital project is unique and will have its own unique cost elements. On the right is a list of typical components that should be considered for inclusion or exclusion from a capital project budget.



This list is intended to be illustrative, not exhaustive. Some categories may not be relevant to a local government's specific project, whereas some projects may include unique elements outside of this list. For instance, land is often not included in a capital project budget if it is already owned by a local government, but that is not always the case.

Internal staff costs are not usually considered capital project costs. However, a local government may need to account for internal staff costs where internal staff are assigned to a project and temporary staff are brought-in to cover their day-to-day responsibilities.

Templates are available to assist local governments in building sound project budgets. Any template must include not just the amount of expenditures in each category but also, in order to forecast cash flow needs, the timing of expenditures by period, usually monthly (see simple Project Cost Report and Cash Flow Chart on the following page). This approach is consistent with the good practice of linking project financials with project deliverables and/or milestones, to improve the quality and objectivity of project progress at key points throughout the project.⁴

HARD COSTS
– Demolition of any existing structures
– Site remediation
– Construction
– Landscaping
– Contingency

SOFT COSTS
– Design
– Project management
– Public engagement
– Cost consulting (e.g., quantity surveyors)
– Surveys (geotechnical, environmental, hazardous materials)
– Testing and inspection
– Legal fees
– Furniture and fixtures
– Information technology/management, audio visual, security
– Signage
– Connection charges, utilities, certification fees
– Permits
– Insurance (liability, bonding)
– Excise taxes (including non-recoverable and, for cash flow purposes, recoverable)
– Internal staffing
– Financing
– Temporary relocation costs (swing space, leases)
– Moving costs
– Amenities (such as public artwork)

⁴Adapted from "Audit of Major Capital Project Management", National Research Council Canada, August 2018, pg. 18 Recommendation #4

Sample Project Cost Report

	Approved Budget	Actual Cost to Date	Future Forecast Cost	Forecast Cost at Completion	Variance to Budget
Consulting & engineering					
Material					
Equipment					
Labour					
Contingency					
Total	A	B	C	B+C	A-B-C

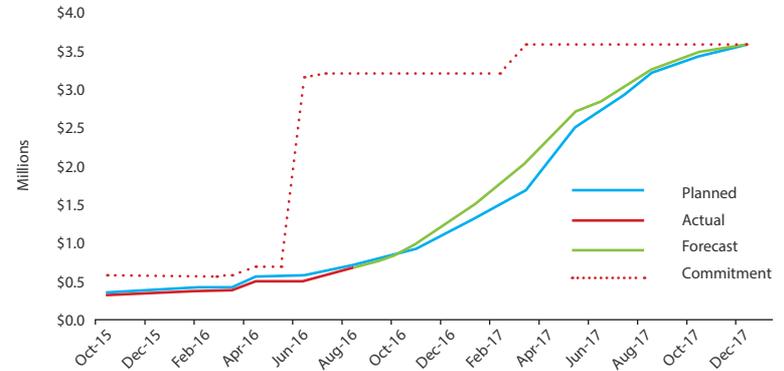
UNCERTAINTY

Each item included in the capital budget, be it materials or labour, will have associated with it a degree of uncertainty, both cost and quantity. For some items, cost is relatively stable and predictable, resulting in little uncertainty. But for others, for instance skilled labour where there is a history of significant market price fluctuation, the degree of uncertainty can be great. Greater uncertainty is also associated with purchase dates farther out in the future. For some items, for instance legal and consulting fees, the quantity required can also be difficult to predict, increasing uncertainty.

“One of the problems that the city faces with the perceived performance of capital projects is squaring the importance from an accounting and finance perspective of cost certainty with the reality that construction is an inherently uncertain activity.”

City of Nanaimo, *Project Management Framework*, October 2019, pg. 22

Sample Project Cash Flow Chart⁵



Ultimately, the uncertainty inherent in construction is reflected in the project budget’s contingency, which is an allowance that should be identified separately from actual estimates of cost. Establishing an appropriate value for a project contingency allowance takes experience, a solid grasp of the risk profile of the project in question and a detailed understanding of the uncertainties associated with each individual component of the budget.

Commensurate with the size, complexity and risk profile of the project, good practice is for contingencies in the budget to be broken down into separate line items. This approach enhances transparency, is easier to track and report on, and holds project managers more accountable than a single figure for the whole project. In turn, it is good practice for project managers to have a breakdown of what has been included in contingency and what assumptions have been used. This helps to ensure that various contingencies are not overlapping as well as helping ensure there are no omissions or unaccounted risks.



Since there is a direct relationship between project uncertainty and the value of the contingency allowance, as uncertainties are reduced and cost estimates are firmed up, the contingency allowance available to the project should also be reduced. (For more information on contingency, see the AGLG Perspectives series booklet *A Guide to the Project Management Body of Knowledge*.)



Capital construction projects often involve high value contracts with construction contractors and other vendors. Despite terminology such as "fixed price lump sum construction contract", the amount a local government is liable to pay under these contracts is rarely fixed and may increase as risk allocated to the

local government under the detailed terms and conditions of the contract materialize. For this reason, it is important that the project manager is able to access contingency funds to meet the local government's contractual obligations.

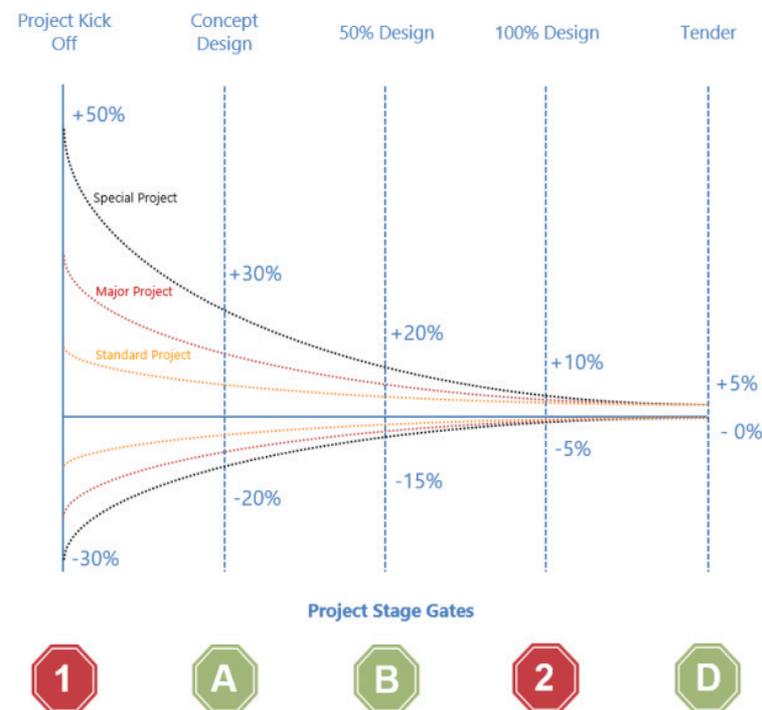
An emerging trend, that allows greater control over how contingency funds are drawn down under unforeseen circumstances, is to allocate a management reserve as a separate and additional contingency reserve. A management reserve is effectively a separate contingency allowance to which the project manager does not have automatic access. If the contingency allowance is established to provide for "known unknowns," the management reserve provides funds in the event a project encounters "unknown unknowns" – circumstances that could not be reasonably foreseen during planning (experience with delays related to the COVID pandemic are an example). Access to the management reserve should be contingent on the project manager presenting a compelling case.



Traditionally, project budgets have been presented for approval as discrete figures. Local governments should be aware that this practice can be misleading as it presents an unwarranted impression of cost certainty. Misunderstanding of the precision or certainty underlying early stage cost estimates can ultimately lead to the false

impression that a project was delivered over budget when in fact final costs were reasonable given the level of uncertainty involved at the time the estimate was prepared.

Anticipated Degree of Accuracy by Project Classification Relative to Project Stage Gates⁶



⁶ City of Nanaimo, Project Management Framework, October 2019, pg. 26

An emerging trend is to present costs as a range estimate, reflecting the reality of uncertainty regarding final cost.⁷ Early-stage estimates will tend toward a relatively wide range, reflecting a higher degree of uncertainty, and should decrease over time as uncertainties are resolved. Local governments should consider integrating information and messaging about cost uncertainties into their communications plans and determine how best to explain “estimated costs” in their public communication about a project. While less satisfying for those who want to point to a specific figure for the cost of a proposed project, the reality is that range estimates more accurately reflect the degree of confidence that should be placed in a project budget.

Another best practice, recommended by bodies such as Audit Scotland and put into practice by Canadian local governments such as the City of Nanaimo, is to adopt a program management approach and pool the risk associated with several capital projects, particularly those of a similar nature. For instance, Nanaimo pools the risks associated with refurbishing or replacing discrete segments of water or sewer lines, projects that tend to be done a number of times each year, by using standard units to predict costs based on historical averages. The risks historically faced in this work are well understood and quantifiable when spread across several projects, although any one project may differ. When variances do occur, the City allows funds to be transferred between projects. Pooling risk across a number of similar projects saves considerable time attempting to identify the risks associated with each individual segment and allows the city to minimize the overall amount of funds set aside for contingency – funds that are then available for other project work.

“On average, half the projects will come in above historical average cost, and half below. But overall, the average tends to be pretty close to actual.”

Poul Rosen, *Director of Engineering, City of Nanaimo*



WHAT FINANCIAL POLICIES SHOULD A LOCAL GOVERNMENT HAVE FOR CAPITAL PROJECT COSTING, BUDGETING & EXPENDITURES?

Good governance and good financial management are responsibilities that extend to all functions of local government and require controls and governance arrangements to be implemented across financial and corporate functions. Many of these, such as those relating to procurement and financial reporting, will apply to capital project management. However, there are specific risks inherent to managing capital projects that require additional controls and governance arrangements to address them. Some of the most important capital project management controls that local governments should have in place relate to cost and budget management.

These controls and governance arrangements, typically in the form of documented bylaws, policies, procedures and templates, can ensure that capital projects are managed consistently from project to project and across the organization, and that value for money is delivered.

To achieve consistent, high quality results it is important that local governments adopt a systematic approach to how capital projects are managed.

Policies enacted by local governments, along with related procedures, codify conduct related to specific activities. Policies a local government may have that apply to all corporate functions include procurement, borrowing, budgeting and conflict of interest, all of which apply to capital projects.

A CPMF is a good practice that builds on a local government's existing policies and procedures, establishing a coherent and consistent structure for conducting capital projects.

A CPMF formalizes practices through a set of:

- Processes and procedures (what should be done)
- Controls (how it should be done)
- Structures (who is responsible and who does it)

Good Practice Example of CPMF Policy – City of Nanaimo

The City of Nanaimo has a Council policy specifying that “the Capital Project Management Framework, as amended from time to time, is a mandatory Administrative Procedure which will be implemented pursuant to this Policy by all Departments undertaking capital construction projects at the City.”

The policy outlines three benefits of implementation and compliance:

“(i) support the goals stated in the Official Community Plan by making best use of available funds for the provision and maintenance of infrastructure;

(ii) support the City’s vision, community values and priorities as stated in Council’s Strategic Plans;

(iii) establish common expectations across the City in terms of how Capital Projects are delivered based on industry good practices which in turn will improve financial performance, and delivery of services that meet stakeholder expectations.”

City of Nanaimo, Council Policy Manual, Policy 11.5210.01

The best practice in this field is for local governments to develop and adopt a CPMF that is appropriate to the specific local government’s size, and to mandate compliance with it.

A robust CPMF will deal with how a local government develops budgets for its capital construction projects, how commitments and actual costs are controlled, recorded and managed, and how costing data informs future budget development. A CPMF ensures adoption of common terminology around cost, budget and contingency management, and sets standards for the preparation of cost estimates and the tracking and reporting of expenditures and commitments against budget.



Though all local governments may benefit from adopting a CPMF, smaller local governments that rarely undertake capital projects involving material risk may instead choose to rely on frameworks brought-in by external project managers. Regardless of the approach, a CPMF should address all project variables – cost and budget, schedule, scope, risk, stakeholders, resources, and others. See *Appendix A* for an example of a CPMF.



Strong policies and procedures are important; equally important is ensuring that staff understand and implement them in a consistent manner. A CPMF should be used as a project management training resource as much as an administrative procedure. To improve understanding, buy-in and by extension, compliance, a further good practice is to involve staff in the development of the CPMF. Initial and refresher training, accompanied by periodic compliance review, can help ensure the CPMF is followed.

In recent years some local governments in B.C. have developed CPMFs tailored to their individual circumstances and needs, based on generally accepted good project management practices.

For more information on CPMFs, see *Appendix A of this booklet* and the AGLG Perspectives series booklet *Primer A Guide to the Project Management Body of Knowledge*.



LIFECYCLE COSTS

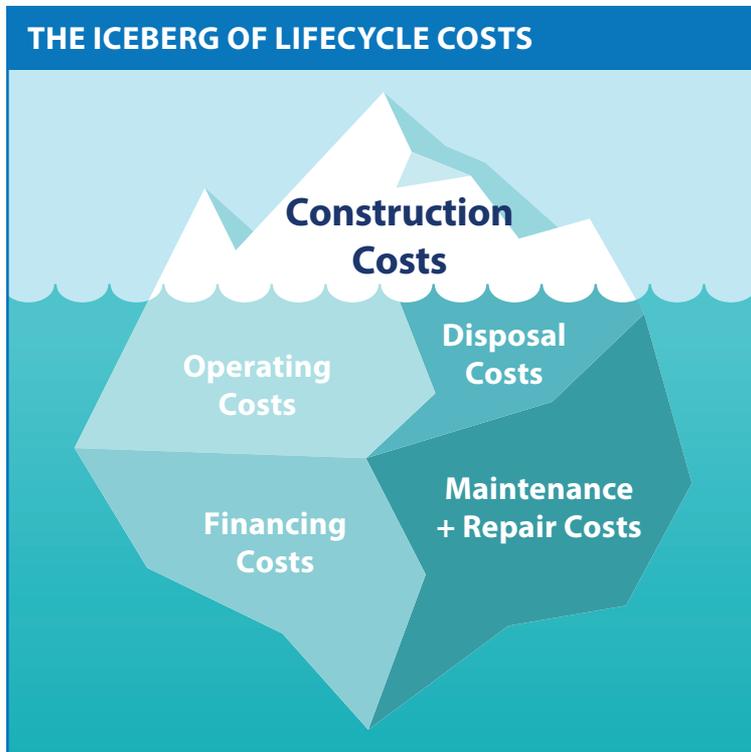
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WHY ARE LIFECYCLE COSTS CONSIDERED WHEN DETERMINING CAPITAL CONSTRUCTION COSTS AND BUDGETS?

LIFECYCLE COSTING

Lifecycle cost, or whole life cost, is the total cost associated with owning an asset. Lifecycle costing considers the entire cost of the asset, including all planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal costs. It is an important cost to understand, as it represents the entirety of the burden assumed when purchasing or building an asset, including the operating costs associated with owning the asset years after acquisition.

The distinction between construction and lifecycle cost is analogous to an iceberg. The initial costs associated with purchase and/or construction, the part that's above the water line, are readily seen. Whereas the long-term costs of ownership are just as, if not more significant, yet can remain hidden below the waterline.



IMPORTANCE OF LIFECYCLE COSTING

It is critical to understand the full lifecycle cost of all capital assets when developing the local government's capital asset management plan, since both capital and operating costs must be considered in the rolling five-year budget.

	Do Nothing	Renovate	New
Construction cost	\$0	\$5,000	\$40,000
Asset life	25 years	25 years	25 years
Operating cost/yr	\$1,500	\$1,000	\$500
Maintenance cost/yr	\$2,500	\$1,000	\$250
Present value cost (A)	\$78,094	\$44,047	\$54,643
Inflation rate = 2%			
Benefit/yr	\$2,500	\$2,500	\$3,000
Present value benefit (B)	\$48,809	\$48,809	\$58,570
Net benefit (B-A)	-\$29,285	\$4,762	\$3,928

This simple business case comparison of a renovation vs. new construction shows renovation with a slightly better return on investment than construction of a new building. Both are better options than doing nothing, which has a negative ROI due to significantly higher operating and maintenance costs.

Full lifecycle costs should also be understood when preparing a business case, or if considering significant changes to design or scope of a project. A business case sets the financial foundation for the project. It addresses the entire lifecycle of the asset, from the need being identified through its ongoing operational costs and ultimately to its decommissioning. The business case should be scaled to the size, value and complexity of the project and clearly show links between the proposed expenditure and the local government's strategic objectives. The business case should include a budget that considers the asset's full lifecycle costs, including operations and maintenance, as well as proposed sources of funding (both internal and external). A business case should present options,

allowing decision makers to compare and contrast different possible choices, such as renovating an existing asset as opposed to building a new one. The costs of each option should be presented in the business case, along with the cost of doing nothing.

It is at this time that the full cost of a proposed asset should be compared to the value of its expected benefits. Benefits should drive the investment decision. Where lifecycle costs exceed the expected benefits, a project should not proceed or should be revised so a positive return can be achieved. It is important to note that the benefits of community infrastructure include both financial benefits and non-financial, intangible benefits. Intangible community benefits are extremely important when considering the value of certain facilities, such as those supporting recreation and culture. Assessing the value of intangible benefits may be inherently subjective or difficult to quantify but is an important exercise to understand the value being obtained.

It is also critical to consider lifecycle costs when putting together long-term budgets, such as the five-year financial plan required of most local governments each year under the *Local Government Act* and the *Community Charter*. A fulsome lifecycle cost analysis of new



capital projects will allow a local government to understand the downstream impacts on future operating budgets. A good practice is to include end users and maintenance staff early on in the business case process to obtain their perspectives on long-term costs.

Understanding the full lifecycle costs of an asset will lead to better-informed and more rational decision making. If a local government only considers the up-front acquisition costs of a capital asset, it may make sub-optimal decisions, particularly where various options have significantly different downstream maintenance costs.

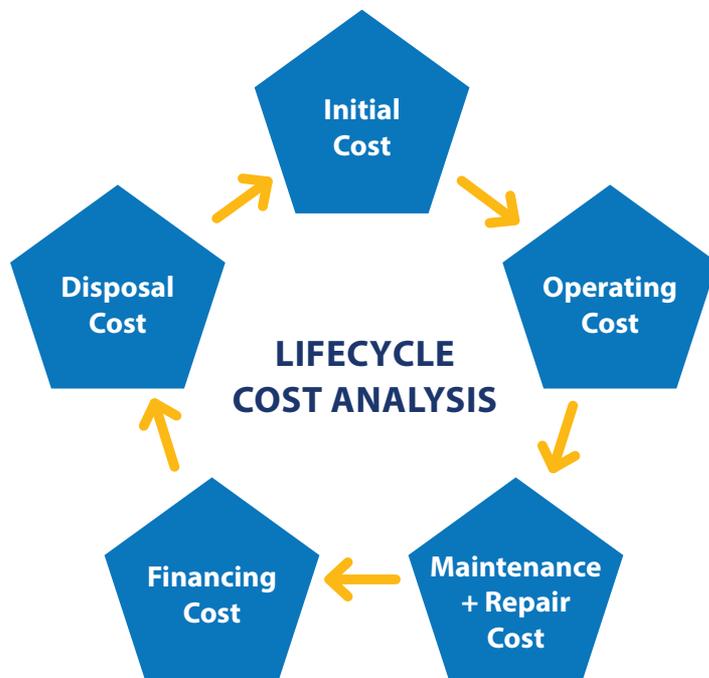
"It's important to take a long-term and lifecycle view when thinking about assets, and to consider factors which may impact an asset's future and the level of service it will provide as the urban context evolves. For instance, what will the impacts of increasing telecommuting be on urban transportation patterns in the future? How will this transformation inform planning for transportation assets?"

Jimmy Zammar, Director Integrated Strategy and Utility Planning, City of Vancouver

CALCULATING LIFECYCLE COST

The lifecycle cost of owning an asset is calculated by adding the initial cost of building, installing or acquiring the asset (from the cost estimate) to the present value of:

- Costs associated with operating the asset over its full lifetime (annual energy use, staffing costs, insurance, tax, etc. over asset life),
- Maintenance and repair costs over the asset's lifetime (annual labour, parts & materials to keep the asset in operating condition over asset life),
- Any financing costs incurred as a result of acquiring or building the asset (sum of annual interest costs incurred to build or acquire the asset over the term of the debt), and
- Costs for decommissioning, demolishing or disposing of the asset at the end of its life (including site rehabilitation, if applicable),



From this total, subtract the present value of:

- Revenues generated by the asset over its life (annual rent received from third parties over asset life), and
- Resale or salvage value of the asset.

Predicting long-term operating costs, such as the price of labour, materials and utilities, requires significant estimation. Historical average rates of increase for individual items may be helpful, such as the Building Construction Price Index (BCPI) published by Statistics Canada, as might the Bank of Canada's target inflation rate for the economy as a whole (currently two percent).

Lifecycle, Asset Management and Full-Cost

Tied to the concept of lifecycle costs is a sustainable financial management approach referred to as "full-cost." Full-cost is a process that records all of the costs incurred to provide a service (such as drinking water), including:

- Capital costs (initial and future)
- Debt servicing
- Reserves
- Operations and maintenance
- Overhead and administration
- Costs of compliance with regulations (where required)
- Environmental costs

The full-cost process involves a thorough analysis of internal and external costs, and may consider economic, environmental, health and social factors.

A robust analysis of lifecycle costs, documented in an asset management plan, can support the development of a full-cost approach that can have many benefits for a local government.

For more information on how to approach full-cost (including full-cost accounting, recovery, and pricing for drinking water systems), see the AGLG Perspectives series booklet *Sustainable Financing in Drinking Water Management*.



PITFALLS

5

WHAT COMMON PITFALLS SHOULD LOCAL GOVERNMENTS STRIVE TO AVOID?

COMMON CAPITAL BUDGETING PITFALLS

This list of commonly encountered pitfalls has been derived from various sources and may apply to different projects depending on the local government's approach to budgeting and the specific project.

1. Misunderstanding the reliability of cost estimates

It is important to have a proper understanding of the uncertainty related to estimates of cost, and the appropriate degree of confidence that should be placed in them, especially those made early in the budgeting process. Professionally prepared cost estimates should always be accompanied by a range (e.g. \pm 50%, 30%, 20%, 10% or 5%) which is a measure of the reliability of the cost estimate.

2. Use of point cost estimates rather than range cost estimates

Delivering a construction project is unlike purchasing other assets where the scope and price are known up front, and it is unrealistic to expect that a construction project will be delivered for an exact previously-known dollar value. Local governments should seek to understand and accept the reality of construction risk and uncertainty and to find ways to embrace open and transparent reporting of budgets and cost forecasts. Related to Pitfall #1, ensure that the \pm is communicated when seeking approval of, or reporting forecast costs against a project budget.

3. Fixed dollar budget

A fixed budget with a discrete dollar value, as opposed to a range encompassing an appropriate allowance for contingency as noted above, can incentivize unwanted or undesirable behaviours. An inadequate budget could lead to underreporting of forecast costs at completion and delayed knowledge of cost overruns until it is too late to intercept. It can also lead to omission of scope from the project, ultimately compromising levels of service and value for money. Conversely, if a budget is larger than is actually required, this could encourage overreporting of forecast costs or the addition of low-priority items to the project scope, as well as a less careful approach to cost control. It also leaves less money available for other projects.

“Setting the project budget at an inappropriate level is a common error in project management, and one which can set a capital project on a course to failure before it has even started.”

City of Nanaimo, *Project Management Framework*, October 2019, pg. 20

4. Insufficient contingency

Contingency should reflect uncertainty related to the cost of materials and labour, physical conditions, inflation and schedules. Failing to allocate appropriate contingency is not a cost saving measure – the risks and uncertainties remain, whether acknowledged or not.

5. Double counting contingency

Careful review and analysis of cost estimates should be undertaken to establish whether or not contingency has been factored into individual line items. If this analysis is not performed, it can lead to double counting of contingency when it is applied to the bottom line, resulting in an over-estimation of cost and leaving less funds available for other projects.

6. Insufficient project management expertise

Not having an experienced project manager who understands the subject matter, good project management processes and the requirements of the local government. Using underqualified internal staff instead of hiring project management expertise can lead to staff getting in over their heads unknowingly and then, later, being unfairly criticized.

7. Insufficient (or no) allowance for escalation

The cost of labour and materials can increase, and sometimes decrease, up to 10% per year and typically hovers in the 3-5% range per year depending on market conditions, supply and demand. Allowing an appropriate amount of contingency for escalation is very important for multi-year projects that may not go to tender for several years after the budget is approved.

8. Insufficient operating budget

The initial costs to acquire or build an asset are just the beginning. The ongoing impact on the operating budget of costs to operate and maintain the asset must be considered when quantifying the cost of the asset in any business case. Sufficient allowances should be made for these costs in future years' operating budgets.

9. Leaving the details for later

Managers may sometimes be driven to secure approval for major capital projects before important details are understood and without adequate contingencies in place. Project budgets should include enough contingency reserve to account for scope and schedule uncertainties, as well as risks. To the extent possible, project budget approval should be made with the highest level of knowledge of these parameters. Premature approval of projects, especially those subject to significant public scrutiny, can result in the setting of unrealistic expectations, setting a project up to fail from the outset.

10. Items missing from the budget

When handed a project, project managers need to validate the scope and carefully review the budget to ensure that all relevant items have been accounted for and flag any missing items. Commonly overlooked budget items that add cost include:

- o Land costs
- o Soft costs (see table in Question 2, page 9 for list)
- o Escalation
- o Premiums for maintaining on-going operations or services
- o Traffic control
- o Municipal permits and development charges
- o Insurance
- o Furniture and equipment
- o Commissioning, start-up and operational readiness
- o Decommissioning
- o Environmental contamination or hazardous materials

11. Developing a project to meet available funding

Unexpected funding is sometimes made available to local governments by other levels of government, intended as an economic stimulus, often available for only a limited period of time. It may be tempting to pursue such windfalls, but there are risks. In the rush to secure funding, important areas of scope can be missed and major risks overlooked in the rush to develop a project plan, budget and funding application. Such opportunities can look considerably less appealing in hindsight if funding proves inadequate, timeframes are unrealistic, or the project plan was flawed and the local government is left on the hook to make up a funding shortfall.

12. Inconsistent information

For elected officials to properly fulfill their oversight responsibilities, they must be provided with accurate and complete information regarding the financial status of capital projects. Inconsistencies between information available internally to management and that reported to elected officials, especially inconsistencies that obscure deviations from scope, schedule or budget, compromise the effectiveness of elected officials' decisions and undermines the accountability relationship between elected decision-makers and staff.

13. No cost forecasting

Project managers who do not forecast costs can only report on commitments or spend to date. Forward looking forecasting should be used to anticipate what the final project costs will be for all items, not just hard construction costs.

14. Over optimism

An overly enthusiastic push to get a project off the ground can lead to failure to sufficiently consider downside risks and/or over-estimation of benefits, which can lead to less-than-optimal decision making. This can be especially true where the financial component of a business case does not support going forward and the value of intangible benefits is over-estimated.

15. Not all risks can or should be transferred

Also known as the “fixed price fallacy.” It costs money to transfer risk, which is why contracts for construction are complex – they set out which risks are transferred, which are retained and which are shared. Even a “fixed price” or “guaranteed maximum” contract is fixed or guaranteed only to the extent that risks have been transferred to the contractor under its detailed terms and conditions. It is impossible to transfer all risk. Local governments should also remember that insurance and bonding are important mitigation tools, but do not guarantee that the local government will be made whole should a contractor fail. Contractors may choose to cut their losses and walk away from a project. A local government has no such option.

16. Inadequate or non-existing change management processes

When stakeholders want to add to or change the scope of a project but are not challenged to off-set these revisions with a reduction of corresponding value. A capital project budget is like a glass full of water. If you want to fit more in you either have to take some out or get a bigger glass (i.e. a larger budget).

17. Form or function

A local government should be clear on its priorities. Capital assets frequently incorporate both functional and style elements, the interests of which can sometimes conflict. Local governments must be clear on the relative priority of form and function.

18. Stealing from contingency

Using allocated contingencies for other functions, for example drawing down construction contingency to fund changes in scope, can leave insufficient funds when needed.

19. Use of unsuitable historical averages or comparable projects for benchmarking

Historical averages and benchmark costs can be a good starting point but these metrics should be adjusted, up or down, to account for the unique circumstances associated with individual projects. Benchmarking with projects from other organizations can be particularly risky when the baseline for the benchmark is unknown. For example, the cost per ft² may be construction costs only and not include soft costs, or cost per hour may not include the premium for after hours or weekend utility work.

20. Over-leveraging

Local governments frequently must borrow funds in order to finance major capital projects. However, such borrowing reduces a local government’s ability to borrow overall (most have a ceiling on borrowing) that may limit the ability to respond to an unforeseen future (emergency) expenditure. Borrowing decisions have long term implications for future councils and boards – long-term project costs & benefits should be thoroughly weighed before proceeding.

We derived and adapted many of the points in this section from the UK National Audit Office publication, “Lessons Learned from Major Projects.”



**INFORMATION
FOR ELECTED
OFFICIALS**

6

WHAT INFORMATION SHOULD BE PROVIDED TO ELECTED OFFICIALS?

Council and board members decide what capital projects a local government will undertake, and are ultimately accountable for their successful delivery. Elected officials review and approve all capital plans, including major capital project budgets, schedules and sources of financing. They oversee the progress of all capital projects as they are built, and review performance once completed. (For more information on the role of Council, see the AGLG Perspectives series booklet, *Oversight of Capital Project Planning & Procurement*, 2014, pg. 11.)

When decisions relating to capital projects come before elected officials, they should understand the full potential impacts on the community, including financial considerations, significant risks, expected benefits and desired outcomes. The challenge for local government staff is to anticipate the needs of decision-makers and to condense complex data into information that can be readily understood and analyzed.

It is important for staff, who are responsible for carrying out these projects, to provide sufficient and relevant information to enable elected officials to fulfill their oversight responsibilities, understanding that few elected officials are experts in project management, engineering or finance. There is a balance to be achieved between providing information that is both sufficiently comprehensive to support decision-making while also in a form that is readily understandable to non-experts.



Successful communication requires more than simply providing information – communication is not effective unless the message is received and understood. Detailed engineering or financial data, while potentially relevant, may not be easy to understand, and too much information, especially when not presented in a format that facilitates ease of analysis, can be overwhelming for elected officials who have many and varied issues to deal with.

One way to help ensure effective and coherent communication is to provide information in a consistent format. Adopting standard templates for project approval, progress and completion reporting can be extremely helpful for staff as well as elected officials.

Below is a list of information that should be provided to elected officials when being asked to consider approval of a major capital project. The amount, detail and timing of information will vary with the size and complexity of project, as described in the local government's CPMF.

INFORMATION TO PROVIDE	WHY IT IS IMPORTANT
A business case to support the project, documenting the need, expected benefits and desired outcomes.	A business case should demonstrate the case for investment – a positive return over the life of the asset.
A project charter that formally authorizes a project and provides the project manager with authority to apply local government resources to project activities.	The project charter establishes expectations, authority and organizational structure, and provides direction by specifying high level goals and key deliverables.
The project's priority in relation to the local government's multi-year capital asset plan.	The priority of any project should be assessed relative to other options. Ideally, capital projects will proceed in the order of priority identified in the multi-year capital plan (for instance, ranked "high, medium or low"). However, there may be circumstances when a project is proposed even though it is not the highest priority, such as when sufficient funding is not available for higher-priority projects or when external funding/ grants become available that apply to a specific category of asset or type of project (energy retrofits, for example).



INFORMATION TO PROVIDE	WHY IT IS IMPORTANT
<p>Highlights of the project plan such as:</p> <ul style="list-style-type: none"> • Scope, • Budget (see Question 2), • Cash flows, • Schedule and key milestones, • Key decision points, • Performance measures. 	<p>There cannot be certainty regarding the cost of a project if the scope has not been clearly identified (see pitfalls). Having sufficient cash flow to meet project needs is essential for avoiding additional, high cost, short-term financing charges. Performance measures provide a means of determining whether the project was successful.</p>
<p>A schedule of planned updates on project costs and forecast costs to completion (e.g. quarterly).</p>	<p>Elected officials have many priorities, including the oversight of capital projects, and should be confident they are being provided with timely information to allow them to carry out their responsibilities. They should know that they will receive regular updates on project status without having to ask.</p>

- An updated forecast of the “cost at completion” (the sum of the actual cost to date and forecast future costs to completion) against the total approved budget
- Analysis and explanations for significant variances
- A summary of key risks and potential impacts, including costs and current mitigation strategies
- A communication plan with information on anticipated impacts, how they might be mitigated and proposed engagement with business and neighborhood leaders.

For an example of a simple project status dashboard, see the AGLG Perspectives series booklet *A Guide to the Project Management Body of Knowledge*.

Once a project has been approved, elected officials should expect the local government’s administration team to provide information on a regular basis and upon request. Knowing whether a capital project is on time and on budget is fundamental to elected officials exercising their oversight responsibilities, so periodic updates should include:

- A dashboard summary of overall project status, scope, schedule and budget
- Project schedule status, relative to one or more key milestones, with analysis and explanations for significant slippages
- Budgeted spending to date compared to actual spending to date

APPENDIX A: CAPITAL PROJECT MANAGEMENT FRAMEWORK, CITY OF NANAIMO

The City of Nanaimo's CPMF provides standards and guidance in each of the following areas.

SUBJECT	EXPLANATION
Project Control & Governance	Successful development and delivery of any capital project requires both project control and project governance. Project control is the implementation of a set of processes, procedures and tools for the day to day execution of a project, whereas project governance is concerned with exercising oversight of the project and making key decisions.
Stage Gates	Each Capital Project will progress through a number of stages, which may vary depending on the project classification. Before a Capital Project embarks on a new stage, the Project Manager must submit an application to proceed for approval by the Project Sponsor. This is an opportunity for the Project Sponsor to exert oversight, and to monitor compliance with the Project Management Framework.
Procurement & Contract Management	Procurement management deals with how we engage with suppliers of goods, services or construction in an open, fair and transparent manner. Contract management refers to the use of terms and conditions to optimize value for money and mitigate risk, both before and after contract execution.
Cost Management	Setting the Project Budget at an inappropriate level is a common error in project management, and one which can set a Capital Project on a course to failure before it has even started. To tackle the risk of setting an inappropriately high or low budget, it is first necessary to understand and differentiate the three components that are essential to define when developing and communicating a project budget: the baseline cost estimate, the project risk reserve and the degree of confidence.
Schedule Management	The Project Manager is responsible for planning the Project, and for providing a Baseline Project Schedule prior to commencing design to cover the life of the Project through design, procurement and construction. Schedule management is no different to cost management – actual progress is monitored against a fixed baseline established at the outset.
Risk Management	Implementation of a structured and documented approach to the identification, evaluation, treatment, monitoring and reporting of Project Risk to ensure that there is transparency in how those risks are managed.
Stakeholder Management	The process of identifying individuals, groups, departments and organizations who may be impacted by the project and who in turn could impact the project; acknowledging their perspectives and expectations, and planning appropriate and effective engagement.
Scope Management	The baseline definition and subsequent control of both project scope and contract scope, as well as project close out procedures.
Project Charter	The Project Charter defines the project – it is the baseline against which performance is monitored and reported.
Project Reporting	To ensure that complete, accurate and up-to-date information flows from the Contractor to the Project Manager and up to the Project Sponsor.

SUBJECT	EXPLANATION
Resource Management	Outlining how the City ensures that Project Managers understand their role and responsibilities and have appropriate training and experience.
Templates	<p>Templates help to ensure consistency and save time.</p> <ul style="list-style-type: none"> • Project Budget • Planned Expenditure • Actual Expenditure • Invoice Tracker • Commitment Tracker • Forecast Expenditures • Project Risk Register • Project Risk Management Plan • Stakeholder Management Plan • Project Charter • Contemplated Change Notice • Change Directive • Change Order • Change Register • Project Report

ADDITIONAL REFERENCES AND RESOURCES

AGLG Perspectives series *"Primer on A Guide to the Project Management Body of Knowledge"*

AGLG Perspectives series *"Asset Management for Local Governments"*

AGLG Perspectives series *"Improving Local Government Procurement Processes"*

AGLG Perspectives series *"Oversight of Capital Project Planning & Procurement"*

Association for Project Management, United Kingdom

Audit Scotland, United Kingdom

Capital Asset Management Framework Guidelines, Government of British Columbia

National Audit Office, United Kingdom

Project Management Institute, Inc. (PMI)

DEFINITIONS/GLOSSARY OF TERMS

BASELINE: An approved work product (scope, schedule, budget) that is used as the basis for comparison to actual results. The baseline can be changed using change control procedures.

BUDGET: The approved estimate for the project or any work breakdown structure component or any schedule activity. (Source – PMBOK)

BUILDING CONSTRUCTION PRICE INDEX (BCPI): Quarterly historic index of construction costs by province, for residential and non-residential construction www150.statcan.gc.ca.

BUSINESS CASE: A document to capture the rationale for undertaking a project, presenting the lifecycle cost of competing options against the option of not doing the project.

CAPITAL PROJECT MANAGEMENT FRAMEWORK (CPMF): A set of processes and procedures, controls and structures that formalize project management practices.

CONTINGENCY: An allowance for possible scope/schedule/budget impact that is conditional on uncertainty, as determined by the project team's assessment. Every project has uncertain or known risks and/or opportunities that may impact the project.

COST: The expenditures necessary to achieve the desired scope within the given schedule.

COST ESTIMATE: The best judgment of the cost of a capital project by a qualified professional (typically, for major projects, a quantity surveyor, consulting engineer or other design professional) based on projects of similar scope and complexity, in light of information available at a point in time.

ESCALATION: The change (usually upward) in price of goods and services over time.

GATE: A formal checkpoint where decisions are made based on pre-set criteria to initiate funding, approve direction of the project and agree to a plan moving forward. A stage gate represents the end of a particular stage.

HARD COSTS: Costs for a capital project that are related to construction, such as building and site preparation.

LIFECYCLE COST: The total cost associated with owning an asset as calculated in the following generic formula. Different components may be needed for the circumstances of specific projects.

$$I + PV(Y(O+M+F)) + PV(D) - PV(Y(R)) - PV(S)$$

Where *I* = initial cost of building, installing or acquiring the asset
PV = present value

Y = the number of years the asset will be in operation

O = annual operating costs

M = annual maintenance and repair costs

F = annual financing costs

D = cost for decommissioning, demolishing or disposing of the asset
R = revenues generated by the asset

S = salvage or resale value of the asset

MANAGEMENT RESERVE: An allowance established for “unknown unknowns” to which project managers do not have automatic access.

MILESTONE: A significant specific point or event in a project.

PRESENT VALUE: The value today of an expected cash flow, or series of cash flows, at some time or times in the future.

PROJECT CHARTER: A document issued by the project initiator or sponsor that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities. (Source – PMBOK)

DEFINITIONS/GLOSSARY OF TERMS

PROJECT CASH FLOW REPORT: A forward-looking analysis of the timing of cash in- and outflows for a project. Essential to ensure sources of funding are sufficient to meet project expenditures.

PROJECT COST REPORT: A periodic update on the status of project expenditure and forecast cost to completion in relation to the approved budget, at a level of detail appropriate to its intended use. Internal reports for management use will be more detailed, whereas reports for council will be produced at a high level.

PROJECT GOVERNANCE: Authority levels and accountability at the project level that enable a project to achieve stated goals in alignment with corporate objectives.

PROJECT MANAGEMENT TRIANGLE: Capital project scope, schedule and budget.

PROJECT SCHEDULE: Linked activities with planned dates, duration, milestones and resources.

RISK: An uncertain event or condition that, if it occurs, has a negative or positive effect on at least one project objective. Characterized by its likelihood and its uncertain impact on project objectives.

SCOPE: A description of precisely what is to be delivered upon completion of the project. The scope is established through the approval of the project plan.

SOFT COSTS: Costs of a capital project that are not related to construction, and includes fees related to architecture, design, inspection, accounting and legal services, equipment rentals, insurance and communications.

STAKEHOLDERS: Individuals, groups and/or organizations within the community and organizational departments that may be impacted by the capital project or may impact the project being delivered.

UNCERTAINTY: The unknown variances in cost or quantity of goods and services that will be acquired at some time in the future. Uncertainty drives project contingency.

AGLG CONTACT INFORMATION

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