AGLG
PERSPECTIVES SERIES
DECEMBER 2020

AUDITOR GENERAL FOR LOCAL GOVERNMENT

ACCESSIBILITY • INDEPENDENCE • TRANSPARENCY • PERFORMANCE

PRIMER ON

A GUIDE TO THE PROJECT MANAGEMENT BODY OF KNOWLEDGE (PMBOK® GUIDE)

CONSIDERATIONS FOR
LOCAL GOVERNMENT COUNCIL
AND BOARD MEMBERS

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 management 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 Perspectives booklet is written mainly for elected officials; however, it also contains a number of sections which provide a level of detail that will prove useful to senior management and staff.

The booklet aims to:

- Highlight the importance of capital project governance
- Outline the fundamental concepts of capital project management

There are many principles of project management that apply to construction capital projects and other projects outside of construction, such as information technology (IT) projects. This booklet, however, focuses on the project management of construction projects.

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

HOW OUR AUDIT WORK CONTRIBUTED TO THIS BOOKLET

The AGLG recently initiated a new series of audits on the topic of capital project management. Previously, the AGLG conducted a series of audits on the topic of capital project procurement and asset management. From our current and past audit work as well as 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 have developed this Perspectives Series booklet in a format meant to help elected officials understand the key elements that lead to successful capital project management in a local government context.

ACKNOWLEDGEMENTS

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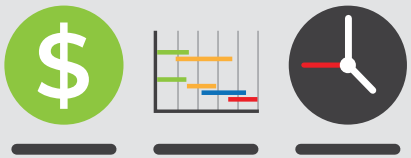
FUNDAMENTAL CONCEPTS

IN CAPITAL PROJECT MANAGEMENT



1 WHAT IS CAPITAL PROJECT MANAGEMENT?

CAPITAL PROJECT

Capital project is an undertaking by a local government to implement a significant investment in the development, maintenance or improvement of an infrastructure asset within a specified period of time.

Infrastructure assets can take many forms, including roads, facilities (e.g., recreation centres), structures (e.g., bridges), or utility assets (e.g., sewer mains). Capital projects typically involve the design and construction of new infrastructure assets, or the large-scale renovation, expansion or replacement of existing infrastructure assets.

A capital project should have clearly articulated goals and objectives, which will have been developed during the course of the capital planning phase leading up to a decision to fund the project, and it is important to evaluate whether those objectives were ultimately achieved.

Looking at a capital project through a capital project management lens, it is essential that any capital project is defined by a description of:

- What is to be physically delivered (the scope)
- How much it should cost (the budget)
- The timeframe within which it should be delivered (the schedule)

The need for a capital project is identified through the capital planning process of the asset management lifecycle.

13 **FOR MORE** - see question 13 for more information on how capital projects relate to capital planning and asset management.

18 **FOR MORE** - see question 18 for more information on benefits realization.

BENEFIT REALIZATION

Delivering a capital project scope on budget and on schedule does not necessarily mean that the capital project is successful.

Local governments should define goals and objectives, including public benefits the project will deliver once it is complete. A definition and quantification of benefits should be included in the project description. Elected officials can then hold the project team accountable for not only the traditional triple constraint (scope, schedule, budget) but also realization of benefits.

Figure 1: **ASSET MANAGEMENT LIFECYCLE**

A capital project will typically proceed through five clearly defined stages. The project stages and the associated activity level is summarized simplistically below.

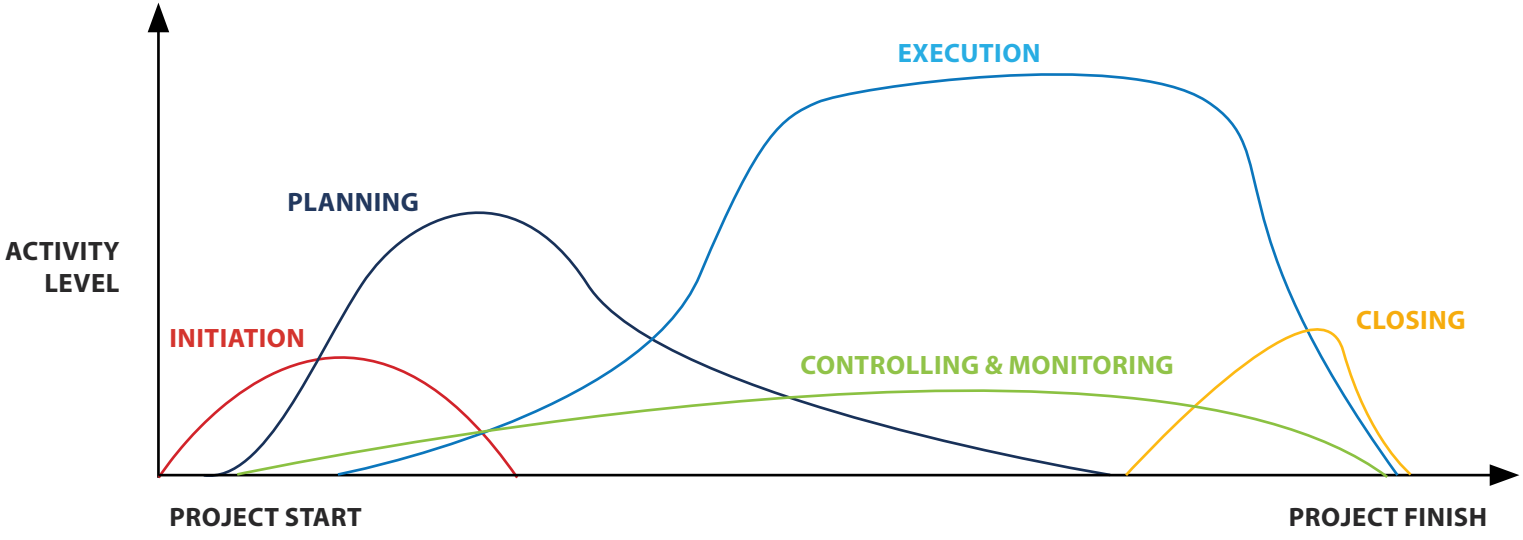
Each of these stages will be elaborated upon within this booklet.

CAPITAL PROJECT MANAGEMENT

This is the process of delivering a capital project and is achieved by directing and co-ordinating both human and material resources through the application of management techniques to achieve pre-defined objectives.

Since the concepts of capital planning and asset management are closely linked with capital project management, it is important to define what capital project management is not. It is not about choosing which capital project to invest in, it is about delivering the scope of a capital project within the constraints of its allocated budget and schedule once an investment decision has been made.

Figure 2: **CAPITAL PROJECT STAGES**



2 WHAT ARE THE KEY ROLES INVOLVED IN DELIVERING A CAPITAL PROJECT?

The key roles involved in local government capital project management are that of the project sponsor and the project manager.

PROJECT SPONSOR

The project sponsor is accountable for the success of the capital project. In a local government context, the project sponsor will typically be a senior member of the administration team, such as the general manager of the department delivering the capital project. Within a small- to medium-sized local government, the role of the project sponsor is sometimes performed by a council or board member (acting in a distinct role from their main duties), especially when the general manager of the department is an individual that focuses more on, for example, maintenance projects and does not have the expertise to lead a true capital project. The important factor is that the sponsor should have relevant qualifications to act in this role and when a qualified sponsor is not available, a third party can be engaged to advise the sponsor. See question 6 for examples of the project sponsor's responsibilities.

It is possible for the role of project sponsor to be shared among two or more individuals. Project Management Institute's *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)* defines project sponsor as "a person or group who provides resources and support for the project, program or portfolio and is accountable for enabling success." An example of a situation where sharing this role may be appropriate would be where one local government department is tasked with managing the delivery of a capital project, while another will be responsible for the operation and maintenance of the new asset.

It is good practice to formally identify the project sponsor and to define their role and responsibilities, which should include ensuring that adequate resources are assigned to the capital project, providing effective oversight, and approving key decisions.

A project sponsor is a "person or group who provides resources and support for the project, program or portfolio and is accountable for enabling success."

A Guide to the Project Management Body of Knowledge (PMBOK® Guide) , Project Management Institute

6 **FOR MORE** - see question 6 for examples of the project sponsor's responsibilities.

PROJECT MANAGER

The project manager reports to the project sponsor and is the individual responsible for achieving the objectives of a capital project and managing the project day-to-day.

It is good practice to formally identify the project manager along with the limits of their delegated authority, and to define their role and responsibilities, which should include management of all parties involved in the capital project, compliance with any documented project management procedures, reporting in a consistent and prescribed format to the project sponsor and, ultimately, ensuring delivery of the defined scope of the capital project within the assigned budget and schedule.

Since the role is such a pivotal one, which involves management of a team of contracted parties among other responsibilities, **it is generally not considered appropriate for the duties of the project manager to be shared among more than one individual.**

Many small- and 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 representative to manage the project, facilitate communication and ensure that the project aligns with the project objectives and the local government's operational mission.

SUPPORT FUNCTIONS

The project manager will rely upon a range of local government administrative support functions, principally purchasing and finance, but in some cases support from other administrative support functions such as public communications and legal will also be required. The project manager should plan for the engagement of all necessary administrative support functions and co-ordinate their involvement in support of the capital project.

In addition to requiring administrative support, larger capital projects can also place significant additional demands on a local government's operational resources, which need to be addressed to avoid any negative impact on the deliverability of the project within the established schedule.

3 IS CAPITAL PROJECT MANAGEMENT A REGULATED PROFESSION?

By their very definition, capital projects represent significant risk to a local government, and so entrusting responsibility for management of a capital project to an individual is a key decision.

Capital project management is not a regulated profession, unlike other established professions such as engineering and architecture. There is no professional body with a legal mandate to license project managers or to provide oversight of the knowledge, skills, conduct and legitimate practice of the profession. The project management profession is not governed by any provincial or federal authority in Canada, which means that anyone can legally call themselves a project manager.

What this means in practice is that project management might not be consistently understood or implemented by its practitioners. The onus is therefore on the local government to not only ensure that the project manager assigned has the necessary knowledge and experience to manage a particular capital project but also to provide a framework (or otherwise establish the expectations) for how capital project management should be practiced.

While capital project management is not a regulated profession, and there is no licensing body to oversee the profession, there are a number of organizations which seek to standardize and certify the knowledge, skills and practice of the profession. One such organization is the Project Management Institute (PMI), a global not-for-profit professional membership association for the project management profession. The PMI promotes common practices or standards in their publications, which include *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*, and administers the award of certifications, the most common of which is the Project Management Professional (PMP®) certification.

While certification can help validate whether an individual has training and understands the practice of project management as a professional discipline, local governments should understand that a good project manager may not have a certification, and that certification should not be seen as a guarantee that a project manager has the skills and experience to deliver a particular capital project.

8 **FOR MORE** - see question 8 for more information on project manager competencies.

4 WHAT ARE THE COMMON PHASES OF A CAPITAL PROJECT?

An intuitive way of understanding the components of capital project management is through project phases: initiation, planning, execution, monitoring and controlling, and closing. These are discrete phases over the life cycle of a capital project. Although the term "phase" implies that they are carried out in chronological order, in practice they can be performed out of order; for this reason they are officially called process groups in *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*. These project phases hold true for all capital projects; however, each local government may define its own phases, which may be at a more granular level.

Breaking down the life cycle of a capital project chronologically in this way enables hold points, or stage gates, to be implemented as a governance tool at clearly defined milestones in the development of a capital project. Stage gates are a very effective means of ensuring that each stage is complete and has been delivered in compliance with documented protocols before the project manager is authorized to proceed to the next stage.

6 **FOR MORE** - see question 6 for more information on stage gates.

PROJECT PHASES	EXAMPLE ACTIVITIES	EXAMPLE DELIVERABLES	
INITIATING The project is authorized, funded and defined. This phase occurs on the organizational level (i.e., above the project). The organization defines a business need the project is meant to satisfy.	Initial engagement with stakeholders Initial project scheduling Appointment of project manager and project sponsor Documenting capital project needs and objectives Confirming limits of delegated authority Developing project plan	Project plan Stakeholder management plan Risk register & risk management plan	Signed project charter, including: » Approved scope » Approved budget » Approved timeline/schedule » Defined project benefits based on strategic objectives
PLANNING The project manager develops a project management plan, which defines how the project will be carried out, who will do the work, how long it will take, etc. The project management plan must be approved by the project sponsor to become official, and changes must be re-approved according to the change management process.	Ongoing engagement with stakeholders Project delivery model evaluation Appointment of design & cost consultants Design Detailed project scheduling Project cost estimation	*Updates to above deliverables* Project delivery model identification Project schedule Project cost plan Human resource plan Monthly project reports Detailed design process	Community engagement External approvals (regulatory) Benefit realization plan Procurement strategy Purchasing approach aligned with local government category management strategy *(Note: likely relevant to more mature local governments with a large capital spend)*

PROJECT PHASES	EXAMPLE ACTIVITIES	EXAMPLE DELIVERABLES	
EXECUTION The project team gets to work producing the project's deliverables. 	Ongoing engagement with stakeholders Procurement (construction contractor) Permitting Design (*may continue into construction for some project delivery models*) Construction Contract management Testing & commissioning	*Updates to above deliverables* Construction tender Design deliverables Construction permits Construction contract	Inspections Payment certifications Testing & commissioning reports Monthly project reports Community interaction
MONITORING AND CONTROLLING The project manager ensures that the work is carried out according to the plan and tracks deviations in schedule and cost, as well as monitoring the scope, communications, vendors and all other items necessary to ensure the project goes according to plan. 	*Note: This phase occurs concurrently and parallel to the project execution phase* Monitor project status Respond to project risks and changes in project scope, schedule, budget and quality	Monthly project reports including: » Risk register » Change log » Issue log » Milestone list » Communication records » Quality control measurement	
CLOSING The project is officially closed, final details are determined, vendors released, etc. 	Ongoing engagement with stakeholders Deficiency management Handover to operations Lessons learned Finalize contracts Release of resources Monitoring & reporting Warranty/maintenance period support Benefits realization review and monitoring	*Updates to above deliverables* Deficiency list Completion certificates Occupancy permit (where required) As-built drawings	Operation & maintenance manuals Holdback release Lessons learned report Monthly project reports Warranty period support Benefits realization report

Source: Adapted from an article on www.ProjectEngineer.net "The PMBOK's Five Project Phases" March 20, 2017 by Bernie Roseke, P.Eng., PMP

5 WHAT ARE THE DIFFERENT MANAGEMENT COMPONENTS WITHIN CAPITAL PROJECT MANAGEMENT?

Project management has many processes that all need to be integrated and applied to manage a project. As per the Project Management Institute's (PMI) *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)* these processes are logically grouped into five process groups (initiating, planning, executing, monitoring and controlling, and closing) that are performed over the project life cycle. Within each process group, a number of knowledge areas (e.g., procurement management, quality management, cost management and others) will be exercised. **Each knowledge area has a different area of project control and is essential to the successful delivery of a capital project. It is important to state that a weakness in any one of the knowledge areas may lead to the failure of a capital project.**

It is also important to recognize that project management knowledge areas, for example, procurement management or cost management, may place demands on an organization's operational resources. This should be factored into the resourcing plan for the project.

The following table represents various project management knowledge areas as included in *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*.

Note that ISO 21500 Guidance on Project Management uses the terminology "Subject Groups," while *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)* uses "Knowledge Areas." However, these can both be broadly considered core management functions.

A Guide to the Project Management Body of Knowledge (PMBOK® Guide)			EXAMPLES OF NON-PMBOK® ACTIVITIES
KNOWLEDGE AREAS		PROCESSES	
PROJECT INTEGRATION MANAGEMENT	Includes processes and activities to identify, define, combine, unify and co-ordinate various processes and project management activities within the project management process groups. Includes making choices about resource allocation, balancing competing demands, examining alternative approaches, tailoring the processes to meet the project objectives, and managing the interdependencies among the Project Management Knowledge Areas. These actions should be applied from the start of the project through completion.	» Develop project charter » Develop project management plan » Direct and manage project work » Manage project knowledge » Monitor and control work » Perform change control » Close the phase or a project	
PROJECT RISK MANAGEMENT	Includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation and monitoring risk on a project.	» Plan risk management » Identify risks » Perform qualitative and quantitative risk analysis » Plan risk responses » Implement risk responses » Monitor risks	
PROJECT SCOPE MANAGEMENT	Includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully. Managing the project scope is primarily concerned with defining and controlling what is and is not included in the project.	» Plan scope management » Collect requirements » Define scope » Create work breakdown structure » Validate scope » Control scope	

A Guide to the Project Management Body of Knowledge (PMBOK® Guide)			EXAMPLES OF NON-PMBOK® ACTIVITIES
KNOWLEDGE AREAS		**PROCESSES**	
PROJECT SCHEDULE MANAGEMENT	Includes the processes required to manage the timely completion of the project.	» Plan schedule management » Define activities » Sequence activities » Estimate activity durations » Develop schedule » Control schedule	
PROJECT COST MANAGEMENT	Includes the processes involved in planning, estimating, budgeting, financing, funding, managing and controlling costs so that the project can be completed within the approved budget.	» Plan cost management » Estimate costs (see question 14 for more information on cost estimates) » Determine budget » Control costs	
PROJECT QUALITY MANAGEMENT	Includes the processes for incorporating the organization's quality policy regarding planning, managing and controlling project and product quality requirements in order to meet stakeholders' objectives. Project quality management also supports continuous process improvement activities as undertaken on behalf of the performing organization.	» Plan quality management » Manage quality » Control quality	
PROJECT PROCUREMENT MANAGEMENT	Includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team. Also includes the management and control processes required to develop and administer agreements such as contracts, purchase orders, memoranda of agreements or internal service level agreements.	» Plan procurement management » Conduct procurements » Control procurements	» Establish a policy which addresses capital procurement » Align procurement policy requirements with trade agreements » Establish evaluation criteria and evaluate tenders and proposals received. Conduct procurement » Evaluate and select the optimal project delivery model » Draft and approve contract terms and conditions » Prepare contract administration templates » Monitor contract performance » Administer the contract, including any disputes

A Guide to the Project Management Body of Knowledge (PMBOK® Guide)			EXAMPLES OF NON-PMBOK® ACTIVITIES
KNOWLEDGE AREAS		**PROCESSES**	
PROJECT RESOURCE MANAGEMENT	Includes the processes to identify, acquire, and manage the resources needed for the successful completion of the project. These processes help ensure that the right resources will be available to the project manager and project team at the right time and place.	» Plan resource management » Estimate activity resources » Acquire resources » Develop team » Manage team » Control resources	» Ensure the project manager and project sponsor have relevant and adequate skills, experience, and availability » Ensure all project team members understand roles and responsibilities (for example, having a responsibility assignment matrix) » Improve competencies, track performance » Ensure elected officials understand the burden a project places on the affected areas of the organization
PROJECT STAKEHOLDER MANAGEMENT	Includes the processes required to identify the people, groups or organizations that could impact or be impacted by the project, to analyze stakeholder expectations and their impact on the project, and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution. The processes support the work of the project team to analyze stakeholder expectations, assess the degree to which they impact or are impacted by the project, and develop strategies to effectively engage stakeholders in support of project decisions and the planning and execution of the work of the project.	» Identify project stakeholders » Plan stakeholder engagement » Manage stakeholder engagement » Monitor stakeholder engagement	» Document and implement a plan to align project objectives and stakeholder interests » Document and implement a public engagement plan » Conduct public engagement (critical in local government capital projects as it may delay the project if there isn't a focused effort)
PROJECT COMMUNICATION MANAGEMENT	Includes the processes necessary to ensure that the information needs of the project and its stakeholders are met through development of artifacts and implementation of activities designed to achieve effective information exchange. Project communications management consists of two parts. The first part is developing a strategy to ensure communication is effective for stakeholders. The second part is carrying out the activities necessary to implement the communication strategy.	» Plan communications management » Manage communications » Monitor communications	» Develop project communication plan based on stakeholder needs and requirements » Create, collect, distribute, share, retrieve and organize project information in accordance with the plan » Monitor and control communication to ensure stakeholder information needs are met

Source: Adapted from Project Management Institute: *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*

CAPITAL PROJECT GOVERNANCE

6 WHAT IS CAPITAL PROJECT GOVERNANCE?

Capital project governance may be defined as the exercise of oversight over those responsible for the success of a capital project by those who are accountable, ensuring that the capital project meets its objectives.

The challenge with project governance is often in ensuring that those who are accountable:

- Have the skill and experience (or access to the skill and experience) to ask the right questions
- Are provided with concise, reliable, complete, accurate and up-to-date project information in a format which enables timely and effective decision-making and intervention as required

Ineffective project governance arrangements can be hugely detrimental to a capital project.

COUNCIL AND BOARD MEMBERS

Council and board members are generally not involved in the day-to-day operations of the local government.

In capital project management this means elected officials should approve all capital plans, including decisions on what capital projects the local government will undertake, overall budgets, schedules and sources of financing. Staff has responsibility for carrying out these projects consistent with elected official's decisions and policies.

Elected officials are responsible for the policies used to identify, procure and deliver these projects. In creating policies and monitoring how they are carried out, it is important that elected officials account for the governance and oversight of these capital projects throughout their life cycle. Policies should require staff to report back to elected officials on the progress.

PROJECT BOARD OR STEERING COMMITTEE

It is common to establish a project board or steering committee (committee) for large scale, higher risk and/or higher value capital projects. This committee exercises the authority and oversight function on the project, as delegated by the local government's elected officials.

PROJECT BOARD OR STEERING COMMITTEE

The board or steering committee is a governing body that consists of key project stakeholders and empowers them to guide the project.

- It may consist of senior representatives from the local government, including the project sponsor and various subject matter experts or practitioners such as: accountants, engineers, architects, designers, or lawyers, and other internal and external stakeholders
- It is a temporary body
- It is established with a documented and approved terms of reference
- It is made up of experienced individuals able to fulfil an advisory role to the project manager

ROLE

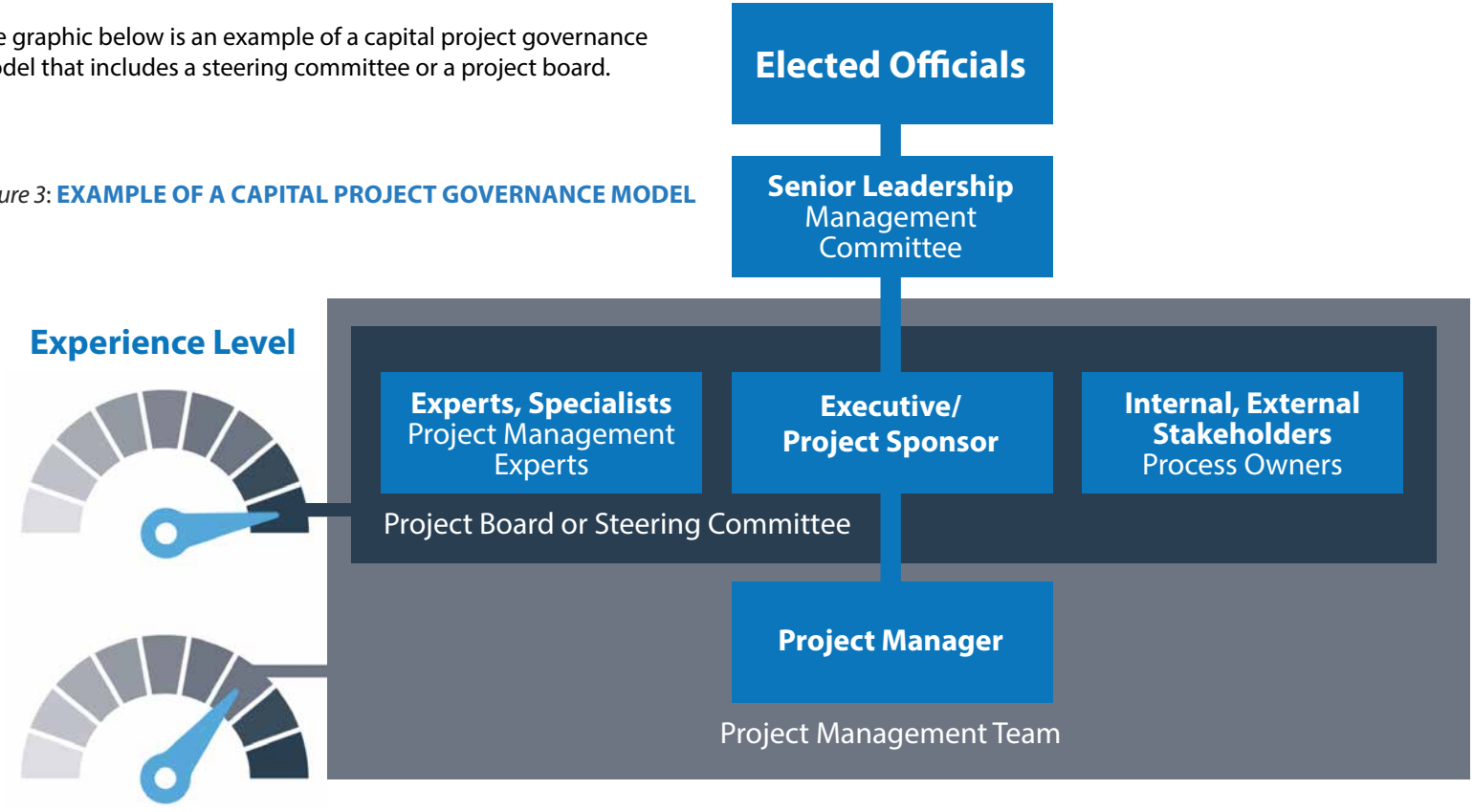
- Accountable for the success of the project
- Provides support and direction to the project manager
- Authorizes funds, and provides resources for the project
- Ensures effective internal and external communication is maintained

PROJECT BOARD OR STEERING COMMITTEE (CONTINUED)

Such a committee usually includes members of the council or the board, particularly those with knowledge, interest or experience in capital project management. It could also include experienced subject matter experts or stakeholders such as specialists, process owners, legal advisors, procurement advisors and other key individuals. Collectively the committee likely has more knowledge and experience than a project manager. Members of the steering committee do not usually work on the project themselves.

The graphic below is an example of a capital project governance model that includes a steering committee or a project board.

Figure 3: **EXAMPLE OF A CAPITAL PROJECT GOVERNANCE MODEL**



PROJECT BOARD OR STEERING COMMITTEE (CONTINUED)

It is important to recognize that local governments in British Columbia are varied in size and that the above model should be scaled based on the community and the size/complexity of the project. Smaller local governments have fewer layers in their organizations and senior management are likely to be much more directly involved with a project and potentially be more reliant upon the project manager as a subject matter expert. A formal project committee should have terms of reference that define its purpose, composition, meeting frequency, reporting structure and requirements. Usually such a committee reports to and makes recommendations to local government elected officials.

Examples of the steering committee's tasks include:

- Providing input to the development of the project, including the evaluation strategy
- Providing advice on the budget
- Defining and helping to achieve the project outcomes
- Identifying the priorities in the project–where the most energy should be directed
- Identifying potential risks
- Monitoring risks
- Monitoring timelines
- Monitoring the quality of the project as it develops
- Providing advice to local government elected officials about changes to the project as it develops
- Other - there could also be specific tasks for steering committee members to undertake relative to their functional areas, for example, property acquisition or communication

PROJECT SPONSOR

A project sponsor should be appointed as the individual ultimately accountable for the success of the capital project. To ensure independent oversight, this individual should not be involved in day-to-day management and control of the capital project. For a large or complex capital project, the project sponsor may either report to a chair of a steering committee or a committee as a whole to ensure that the requisite and appropriate skill and experience for effective oversight is secured.

Examples of the project sponsor's responsibilities include:

- Overseeing engagement and issue management with senior management and elected officials
- Acting as the first point of contact for decisions on escalated issues
- Providing guidance and assistance to the project manager
- Supporting project manager to ensure project is on track
- Liaising with stakeholders
- Approving project charter

OVERSIGHT ESSENTIALS

Formal governance and diligent oversight are essential if the local government hopes to execute its capital projects successfully. Some of the most important elements of project governance include documented:

- Project objectives—identifying what the local government is seeking to achieve
- Key assumptions made, including expectations as to variables that could affect the project outcome (for example, external agencies)
- Parameters of success—this includes a fixed project baseline (original scope, budget, schedule) against which to measure performance as the capital project progresses
- Team members' roles and responsibilities and lines of reporting from the project manager to the project sponsor and/or steering committee
- Authority limits of the project manager, project sponsor and/or steering committee (typically the project manager will be required to seek approval for defined key decisions)
- Reporting format and frequency

The above addresses oversight within local government administration, however, reporting from administration up to the elected officials should also be addressed, particularly for large and/or complex capital projects.

15 **FOR MORE** - see question 15 and 16 for more information on reporting to elected officials

STAGE GATES

Stage gates are governance hold points at the end of discrete project stages in the life cycle of the capital project. It is a leading practice that provides those accountable with a clear opportunity to make key decisions that are well-informed and ensures that the local government's documented capital project management processes are being implemented.

At each stage gate, the project manager would be required to demonstrate readiness and compliance, and to formally request permission from the project sponsor and/or steering committee to proceed to the next project stage. Note that elected officials are not expected to be involved in stage gate approval processes, just to understand what they are so that they can promote the governance concept.

STAGE GATES (CONTINUED)

A stage gate is an opportunity for the project sponsor and/or steering committee to:

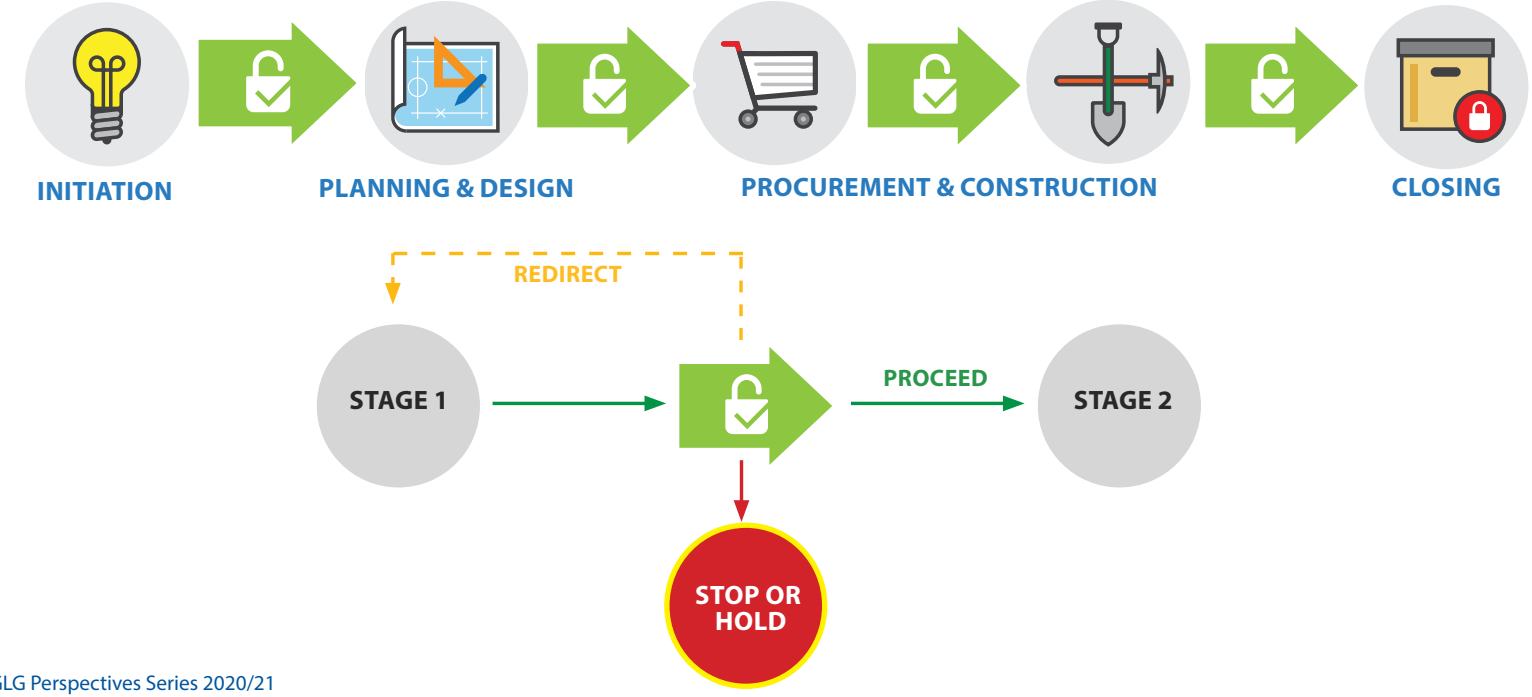
- Engage in a formal, structured and meaningful conversation with the project manager
- Probe the health of the capital project in question
- Ensure that the capital project is on scope, budget and schedule
- Validate that the project manager has complied with any documented capital project management processes the local government may have in place (i.e., a capital project management framework)

Where there are concerns, the project sponsor and/or steering committee may choose to withhold permission for the capital project to proceed to the next project stage pending implementation of certain actions. They may even recommend cancelling the capital project instead of committing additional funding.

This process identifies risks and issues earlier and manages them in a more efficient way. When resources allow, this concept can be applied at a more granular level, with reporting after reaching a milestone or finishing a major task such as the completion of a plan or a contract.

Understanding and support from the project sponsor and/or steering committee in terms of the importance and purpose of stage gates is critical to ensuring that issues are dealt with at the appropriate point in the life cycle of the project.

Figure 4: **EXAMPLE OF A SIMPLE STAGE GATE PROCESS FOR A CONSTRUCTION PROJECT**



7 WHAT CAN ELECTED OFFICIALS DO TO HELP ENSURE EFFECTIVE PROJECT GOVERNANCE IS IN PLACE?

Elected officials have an executive responsibility for oversight of all local government operations, including capital project management, with day-to-day oversight typically delegated to administrative staff.

With this in mind, included below are some common questions elected officials might ask to fulfil their executive responsibility for ensuring that effective project governance arrangements are in place. In addition, it is important to ask whether the project achieved its intended objectives and delivered the anticipated benefits.

18 **FOR MORE** - see question 18 for more information on project benefits realization.

PROJECT PLANNING STAGE QUESTIONS

1. Are the objectives of a particular capital project clearly defined in terms of the scope, budget and timeline/schedule of the capital project? (For example, what will be delivered, how much will it cost, when will it be completed, and what are our procurement policy provisions for capital projects)?

2. Is there a senior member of the administrative team (such as the city manager or department head) who is explicitly accountable for the capital project achieving its stated objectives (the project sponsor), and does this individual have the necessary skills and experience required to be successful?

3. Is there a named individual who is explicitly responsible for the capital project achieving its stated objectives (the project manager), and does this individual have the necessary skills, experience and availability required to be successful?

4. Does the size, complexity or risk of the capital project justify the establishment of a steering committee to ensure the local government has the skills and experience to provide effective oversight and to inform key decisions?

5. What level of confidence do we have in the cost estimate?
Note: This is typically expressed as a +/- percentage meaning that there is a known risk that construction pricing will exceed the stated dollar value. See question 14 for more information.

6. How much contingency is built into the budget for a particular capital project?

7. Has a risk register been provided and have the cost impact of risks been considered? (This can help inform what an appropriate contingency for the project should be).

8. Does the administrative team have documented procedures setting out how capital projects will be delivered (i.e., a capital project management framework), and what arrangements are in place to give assurance that these documented procedures are being implemented (e.g., a stage gate process)?

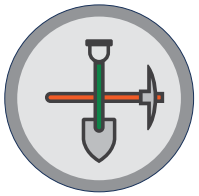
9. Do we have adequate conflict of interest and other ethical requirements for elected officials, staff and contractors and are these requirements implemented?

10. How does the capital project link to corporate strategic priorities?

11. Are interdependencies of the capital project with other community initiatives and the long-term capital plan defined?

12. Are operational impacts of the capital project, such are increased staffing, resources and operating costs, understood?

PROJECT EXECUTION STAGE QUESTIONS



13. Do we receive periodic updates on the status of major capital projects (for example, financial and non-financial progress, significant scope changes, budget increases above an identified amount, and others), and do those updates provide genuine transparency of the project performance?

14. Are we following our organization's procurement policy?

15. Have we established effective communications and are we engaging adequately with internal and external stakeholders?

16. How has procurement for the capital project been completed and what value-added objectives have been included, for example, social procurement, local preferences and others?

PROJECT CLOSING STAGE QUESTIONS

17. When a capital project is complete, will the project sponsor report to us on performance relative to the original scope/budget/schedule objectives, and where there was deviation, lessons learned and corrective measures as necessary?

18. Have there been any outcomes which will result in additional future works based on findings?

CAPITAL PROJECT CONTINGENCY

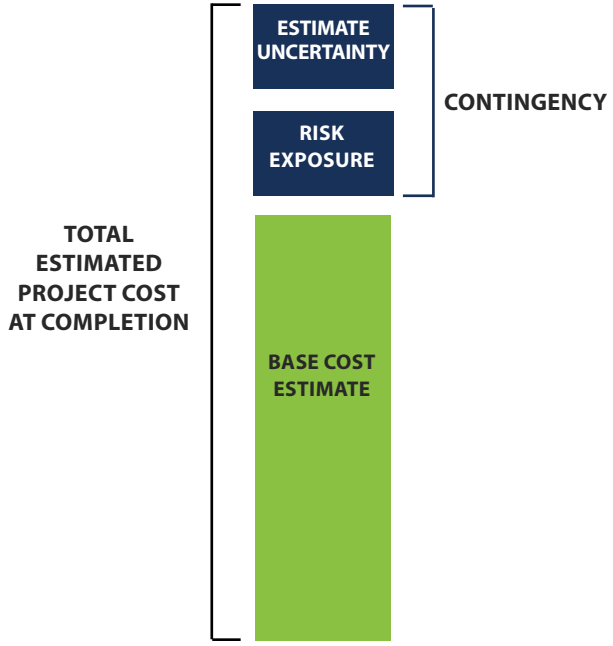
Contingency, an amount of funds added to the base cost estimate (expected cost of known project scope) to cover estimate uncertainty and risk exposure (contingency).

Contingency can vary widely depending on the type of project, market conditions, project locations and other factors.

Incorporation of contingency into authorized total project cost allows a project management team to cover estimate accuracy and risk exposure; thereby improving transparency and reducing the tendency for some projects to drive contingency underground. Supplying a project with a reasonable level of contingency also facilitates the creation of more realistic project business cases and cash flows. In addition, incorporation of contingency into a project budget discourages potentially harmful trade-offs in schedule and/or scope and functionality.

Source: England, K. & Moreci, J. (2012). Contingency—are you covered? Paper presented at PMI® Global Congress 2012—North America, Vancouver, British Columbia, Canada. Newtown Square, PA: Project Management Institute.

COMPONENTS OF TOTAL PROJECT COST AND CONTINGENCY



8 WHEN APPOINTING A PROJECT MANAGER, WHAT ARE THE MAIN COMPETENCIES TO LOOK FOR IN AN INDIVIDUAL?

As previously discussed, capital project management is not a regulated profession, and there is no professional body with a legal mandate to licence project managers or to provide oversight of the knowledge, skills, conduct and legitimate practice of the profession. This means that it is essential that a local government takes great care in validating an individual's experience and knowledge when appointing a project manager for a capital project.

A project manager is appointed by local government management. As an elected official, you will want to ensure that the necessary due diligence has been conducted in making this critical appointment, especially in respect of large, complex or particularly risky capital projects.

You may want to ask your administrative team whether the proposed project manager:

- Has successfully delivered multiple similar capital projects of equivalent or greater scale and complexity
- Has references attesting for their capability and performance
- Is a licensed industry professional such as a registered architect or professional engineer (which demonstrates technical subject matter competence)
- Has project management training or certification (e.g., certified project management professional)
- Has direct experience in the delivery model selected by the local government, for example, construction management vs. design-build vs. design-bid-build

Sometimes individuals within local government can be assigned a role of a project manager without being suitably considered. **One of the most common reasons for capital project failures is assigning an internal project manager with the wrong skill set. It is not a good practice to assign a project manager role to an individual lacking the necessary skills and experience.**

You should also bear in mind that your local government may need to hire an external project manager if internal staff do not have the requisite experience and knowledge. You may want to ask candidates about their:

- Past local government experience
- Public procurement experience
- History of projects delivered on time, on budget and within the scope

If this approach is selected, the project manager should be independent from the rest of the consulting team to avoid conflict of interest and ensure full objectivity.

9 WHAT LEVEL OF AUTHORITY SHOULD BE DELEGATED TO THE PROJECT MANAGER?

The risk inherent to the management of capital projects requires that careful consideration be given to the limits of delegated authority, and that they be formally documented.

It is considered good project governance practice for the project manager not to be delegated the authority to make certain pre-defined key decisions, however, the project manager should have the necessary authority to administer contracts and agreements (including changes to contracts) within the approved scope, schedule and budget of the capital project.

Examples of key decisions which good practice would dictate should be made by the project sponsor and/or steering committee are listed below. The project manager's role in these key decisions is to provide a recommendation to the project sponsor and/or steering committee.

The expectation on the level of involvement of the project sponsor requires that they have a high level of knowledge and experience in relation to capital project management, as well as the necessary capacity to perform the role.

It is important that the project manager does not have the authority to enter into financial commitments, for example, through issuance of purchase orders, contracts, or change orders on behalf of the local government. There are typically internal procedures relating to delegated financial authority in respect of commitments and expenditures which apply to the project manager and the project sponsor. For example, the project manager might have delegated authority to approve changes for up to $10,000 maximum per change and up to $100,000 cumulatively; providing blanket approval to the project manager to approve changes within the approved budget is only recommended on low-value capital projects.

However, the project manager should be designated in agreements and contracts as the local government's authorized representative. What this means is that vendors will have a single point of contact and so will know to accept the project manager's authority, however, the project manager will likely require internal signatures before issuing change orders or certifying payment, depending on the dollar value.

KEY DECISIONS THAT SHOULD BE MADE BY THE PROJECT SPONSOR AND/OR STEERING COMMITTEE

- Approval of the project scope, schedule and budget
- Approval of the project charter (see note below)
- Approval of changes to the project scope, schedule and budget
- Approval of the project delivery model (design-bid-build, design-build, construction management, etc.)
- Approval to proceed to procurement for a design team and construction contractor (issuance of a tender or a request for proposals)
- Approval of the terms and conditions of a proposed design or construction contract
- Approval to award a contract, or to enter into negotiations for the award of a contract
- Approval of a stage gate before proceeding to the next stage
- Authorization to enter into negotiations to settle construction claims or disputes over a defined dollar value

Note: You should differentiate a role of elected officials and a role of the project sponsor relating to the capital project budget approvals. Elected officials' role is to allocate funds to a capital project which, for example, can be done as part of the local government's approval of the organizational capital plan. Project sponsor's role includes approval of a project charter for a particular capital project, including approval of the project's budget, scope and schedule. The project charter can be signed only after the funds are allocated to the project.

10 HOW DOES ENTERPRISE RISK MANAGEMENT RELATE TO CAPITAL PROJECT MANAGEMENT?

Enterprise risk management is the structured, consistent and continuous process across the whole organization. It entails identifying, assessing, deciding on responses to and reporting on opportunities and threats that may affect the achievement of a local government's objectives, including those relevant to capital project management.

Local governments face a challenge of understanding, managing and communicating risk across different departments and a broad range of functions in a way that is consistent and relevant to each of those functions, but also meaningful at an organizational level.

One of the most significant areas of risk to a local government is infrastructure management, and capital project management is just one area that sits within infrastructure management. Capital project outcomes can have extraordinarily financial, operational, reputational and legal impacts on a local government, including the following:

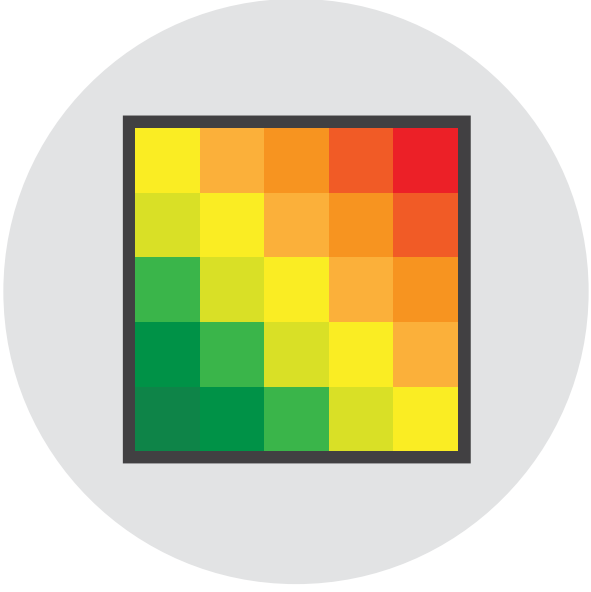
RISK TYPES	EXAMPLES OF CAPITAL PROJECT DELIVERY RISKS
OPERATIONAL	Newly constructed or refurbished capital assets are: » Not functioning properly or have shorter than expected economic useful life » Not completed on time for public use or service delivery » Not performing as expected after commissioning
FINANCIAL	» Cost overruns or incomplete or under-estimated budgets result in the project going over budget or a need to secure additional funding to complete the project » Funding sources are not secured to support completion of the project » Operational costs are greater than expected, or were otherwise not accounted for in the investment decision
REPUTATIONAL	» Public stakeholders are not properly consulted, resulting in a failure to properly address the expected need, impacting trust and reputation » Project delay and/or cost overrun reflects poorly on the local government's competence
LEGAL	» Construction defects or construction operations put the public at risk » Costly and time-consuming construction disputes or legal claims

ENTERPRISE RISK MANAGEMENT (CONTINUED)

The good news is that risk management is already embedded within the fundamental principles of capital project management as one of the principal project management functions. This means that:

- Project managers should ensure adoption of a structured, formalized approach to the identification, assessment, response planning, monitoring and reporting of risk throughout the life cycle of a capital project
  - **A project risk register should be completed prior to the start of a project and maintained throughout its lifecycle**
  - **Development of contingencies should be linked to risks**
- The project sponsor should ensure that the entire capital project management team understands the concepts of risk management and mitigates the project risks properly

It is important that these risk management processes are aligned with any enterprise risk management framework that may already exist within the organization.



11 WHAT CAPITAL PROJECT MANAGEMENT POLICIES AND PROCEDURES SHOULD LOCAL GOVERNMENTS ADOPT?

It is important that a local government establishes policies and procedures for staff to follow related to different aspects of capital project management.

CAPITAL PROJECT MANAGEMENT POLICY

Many local governments set the tone and direction for capital project management by adopting a formal policy. This enables elected officials to provide a statement of expectation regarding management of capital projects.

EXAMPLES OF CAPITAL PROJECT MANAGEMENT POLICY CLAUSES

- A statement of purpose/intent. For example, that the organization is committed to excellence in the management of capital projects and adherence to a documented framework of procedures appropriate to the scale, risk and complexity of each capital project
- What is considered an applicable capital project for the purpose of the policy
- Identification of who the policy applies to and conditions
- Definition of key roles, individual and departmental responsibilities and authorities
- Terminology
- Consequences for non-compliance
- Who is responsible for the policy's administration and oversight, etc.
- Identification of steps which require the approval of elected officials
- A requirement that a capital project management framework be developed and/or implemented (depending on whether the policy is implemented to spur the development of the framework, or to mandate its implementation)

CAPITAL PROJECT MANAGEMENT FRAMEWORK

Management of capital projects is complex and carries with it a significant degree of inherent risk. Without documented procedures to follow, the success of your capital projects will largely be a function of the knowledge and experience of your project managers, and how capital projects are managed will be inconsistent across the organization.

To achieve more consistent results, it is important that the local government adopts a consistent approach to how capital projects are managed. This can be achieved by developing and implementing a capital project management framework, a set of:

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

that formalize certain practices.

A CAPITAL PROJECT MANAGEMENT FRAMEWORK:

- Aligns all capital project management practices and project outcomes with strategic goals or direction
- Establishes common expectations and provides consistency across the local government in terms of how capital projects are delivered
- Increases compliance with industry good practices and reduces the risk of project management personnel not following good practices

CAPITAL PROJECT MANAGEMENT FRAMEWORK (CONTINUED)

The framework does not need to replicate existing procedures, rather it could bring all relevant procedures together in a coherent and structured manner.

Many local governments have recognized the value in bringing together what can be a disjointed set of existing procedures, templates and processes covering purchasing, financial management, governance, contract administration, reporting, public communication and stakeholder engagement into a capital project management framework, and supplementing this with newly documented best practices in capital project management.

Key elements for a successful capital project management framework include:

- Involvement of key stakeholders in the development of the framework—this ensures that subject matter expertise from across the organization is captured and secures the buy-in of those who will be implementing the framework.
- Incorporation of a stage gate process (refer to question 6). This brings all the procedures together at key milestones over the life cycle of a capital project and ensures that there is a means of ensuring that the framework is being followed.
- Addressing of all the management functions of capital project management (refer to question 5). Since the success of the framework depends on all of these functions being properly managed, ensuring that good industry practices (adapted to the needs of local government) are adopted across each of these functions will have a significant impact on the risk profile of each and every capital project.
- Classification of capital projects based on value, complexity and risks and establishing requirements, controls and procedural guidance for each class. This ensures that the framework is scalable, adds value and will not impose unwarranted bureaucracy on those routine capital projects where the local government has a history of success.

GUIDANCE IN THE FRAMEWORK COULD INCLUDE:

- Project governance, team roles and responsibilities
- Risk management
- Project charter
- Project management plan
- Stage gate
- Business case
- Value management
- Cost estimates and contingency
- Schedule
- Project change control
- Records and information management
- Progress reporting
- Project closure

There are different ways to classify capital projects, such as by dollar value, asset type, importance to the community, complexity and risks. A simple classification tool would assign a project to one of three categories – major, standard and routine – based on a simple series of questions and establish different requirements for each category.

12 WHAT SHOULD ELECTED OFFICIALS KNOW ABOUT CHANGE ORDERS?

Procuring a capital construction project is much different from procuring more off-the-shelf products such as works vehicles or street furniture: it requires a certain risk tolerance. This is largely because it would be economically unviable to transfer all the risks that could affect the project's price and schedule onto the contractor.

Construction contracts are therefore complicated legal, technical and financial documents. Project managers need to be experienced in managing those contracts and able to respond to and manage risks as the project proceeds. This also means that the actual cost and timeline of the project cannot be known with certainty at the outset; it will become clearer as the project proceeds.

Change orders are anticipated by the construction contract, which includes a set process for agreeing to changes. As change orders become part of the construction contract, they must be very clear in terms of:

- What the change is (the scope)
- How much it will affect the price (the cost)
- How much it will affect the schedule (the time)

It is possible to issue a change to a construction contract without first agreeing to the cost and time — this is known as a change directive. However, change directives should only be issued when absolutely necessary, as they are equivalent to agreeing to any cost and time implications.

Project managers should maintain a log of all change orders, and report on the cost and time implications periodically. Where a change order will result in the forecast cost or time exceeding the approved project budget or schedule, the project manager should seek authorization from the project sponsor. The project sponsor may then need to seek authorization from the project steering committee, or elected officials.

A COMMON CHANGE ORDER EXAMPLE:

Contractors could take the risk of unknown ground conditions, but they will price this risk in their bid or tender price. This means that the local government could end up paying for the worst-case scenario, even if there are no issues with the actual ground conditions.

A good project manager will typically seek to identify the likely ground conditions through testing and ensure that contractors can bid or tender with this information in hand. In this case, if the actual conditions end up being worse than expected, the local government would be required to pay the difference in cost and time by issuing a change order.

Keep in mind that when a risk arises that the local government is responsible for, there is a legal and contractual obligation to provide the contractor with a cost and time extension (via change order) within the agreed timeline of the contract. While internal approval processes may take time, you must adhere to this timeline, which may be very short.

CAPITAL PROJECT PLANNING

13 HOW DOES CAPITAL PROJECT MANAGEMENT RELATE TO CAPITAL PLANNING & ASSET MANAGEMENT?

Capital planning can be considered the pre-requisite stage prior to implementing capital project management. Capital planning defines an organization's capital investment priorities in support of the organization's strategic goals and objectives.

It is often said that the output of capital planning is *doing the right project*, whereas the output of capital project management is *doing the project right*.

Capital asset management informs capital planning and aims to maximize the value an organization obtains from investment in its physical infrastructure. Capital asset management takes a whole life cycle approach to inform key decisions on when and where to invest, maintain, upgrade and divest or decommission assets to deliver a defined level of service for the lowest cost. Our office released a Perspectives booklet, *Asset Management for Local Governments*, in 2015 that introduces this topic.

Effective capital planning and capital asset management facilitates successful capital project management through better decision-making in terms of which capital projects to invest in and when, and how much to invest. They are critical to defining the project baseline (the scope, schedule and budget of a capital project).

When elected officials are involved in the approval of capital project investment decisions, some of the key questions to consider are included below.

7 **FOR MORE** - see question 7 for more information on project contingency.

EXAMPLES OF KEY QUESTIONS ELECTED OFFICIALS COULD ASK DURING INITIATION PHASE:

- Where does the capital project sit relative to the local government strategic plan?
- Is investment in this capital project the best use of our financial resources?
- Does this capital project feature on the local government's long-term capital plan?
- Was the investment decision informed by capital asset management planning?
- Are the objectives of this capital project linked to the local government's long-term strategic objectives and service targets?
- Is the need for this capital project (relative to other projects) clear and well justified?
- Were other options to address the need for this capital project considered and assessed (for example, renovation of an existing asset, building in an alternate location)?
- Was a business case developed to support this investment decision?
- Does the local government have resources with the necessary skill and experience and time to successfully deliver this capital project?
- What degree of confidence does the administration have in the cost estimate?
- Has a project plan been created for this capital project?
- How much contingency is incorporated in the project budget?

14 WHY IS IT IMPORTANT TO ESTABLISH A BASELINE FOR A CAPITAL PROJECT?

A baseline defines a capital project by its three variables of scope, schedule and budget.

- **SCOPE** – description of the output of delivering the capital project
- **SCHEDULE** – description of the timeline for delivering the capital project
- **BUDGET** – description of the cost allocated to delivering the capital project

Looking at a capital project through this lens helps maintain focus on what you intend to achieve, what success looks like, and helps you evaluate whether your project was successful once complete.

A clearly defined and documented baseline enables the health of a capital project to be monitored and ensures that the project manager can be held accountable for their performance, but it also protects the project manager by ensuring that schedule and budget will be revisited in the event of an authorized change in scope.

A good practice is to document the project baseline in a project charter. By approving the project charter, the project sponsor sanctions the capital project and acknowledges ownership of the project baseline (i.e., that the scope, schedule and budget as defined in the project charter are appropriate and achievable).

It is important to understand that each of the three project baseline variables is a function of the other two—change the scope and you can also expect the cost and the schedule to be impacted. This is why an approved project baseline, project controls and governance arrangements should be implemented to ensure that any future change to the project baseline is properly authorized, and that the cost and time implications of any change in scope are factored into any decision to re-baseline a capital project.

Once the project baseline is approved, it should not be changed unless absolutely necessary. If a capital project is late or over budget, changing the project baseline to reflect this reality undermines the purpose of the project baseline as a means of ensuring performance transparency.

Circumstances under which the project baseline may need to be revisited include the addition of scope (e.g., expanding a water main renewal by five kilometres to serve an adjacent neighbourhood or increasing the size of a new community centre to accommodate children's daycare facilities). However, it should be remembered that such changes will likely cost disproportionately more the later in the project they are implemented, and they must always be accompanied by an appropriate adjustment in the budget and schedule to reflect any additional cost and time required to deliver the additional scope.

You should expect an appropriate level of detail in a project baseline:

- **SCOPE** – this would typically be defined as a narrative, and there should be enough detail to ensure that there can be no misunderstanding of what is included and what is excluded from the scope of the capital project.
- **SCHEDULE** – to enable meaningful monitoring of performance, the schedule should ideally set out the sequence and duration of key activities (when presented graphically this is known as a Gantt chart) rather than specifying a simple start and end date and show the interdependencies of key tasks.
- **BUDGET** – **it is usually appropriate for the budget to be defined as a simple dollar value, provided that there is a detailed cost estimate and reasonable contingency behind this figure, and it is clear what costs are included or excluded. Costs could include payable GST, internal management costs, IT support, fixtures, furniture and equipment, construction cost escalation, land, loan interest, design and project management fees, and others.**

It should be noted a capital project's budget is not the same as the cost estimate. The budget sets the resourcing limit of the capital project and thus requires an approval. A cost estimate reflects the resource expected to deliver a given scope.

WHAT IS A COST ESTIMATE?

A cost estimate is the best judgment of a qualified professional (such as a quantity surveyor) in light of the experience and information available at the time. Cost estimates have a limited life and are subject to inflation and fluctuating market conditions.

Large discrepancies between pre-tender estimates and actual bids for construction can have a serious impact on the viability of a project. Owners, architects, engineers, cost consultants, contractors and subcontractors all have a vested interest in ensuring a high degree of cost predictability.

The accuracy of estimates varies throughout the project design cycle and according to the complexity of the specific project and several other factors that may be unique to a project. Depending on the class of estimate and the complexity of the project, variances can range from 5 per cent to more than 30 per cent. If additional unique aspects or risks apply to a project, these variances should be analyzed and increased by an appropriate amount.

During the initiation and planning stages cost estimates range from Class A to Class D estimates. Class D being the least accurate to Class A being the most accurate.

The following matrix provides a range of estimate variances (plus or minus), based on the level of construction documents completed, in combination with an evaluation of the level of complexity of the project:

COST ESTIMATE VARIANCE MATRIX +/-%			
CLASS OF ESTIMATES	**Based on**	Project Complexity LOW →	HIGH
D	**Concept Sketch Design**	20 →	30
C	**33% Design Development**	15 →	20
B	**66% Design Development**	10 →	15
A	**100% Complete Tender Documents**	5 →	10
UNIQUE PROJECTS, CIRCUMSTANCES OR RISKS		Varies →	Add to Above %

Source: Canadian Construction Association: Guide to Cost Predictability in Construction: An analysis of issues affecting the accuracy of construction cost estimates

15 HOW CAN WE IMPROVE THE RESILIENCE OF OUR INFRASTRUCTURE THROUGH MANAGEMENT OF INFRASTRUCTURE ASSETS?

The resilience of our infrastructure to the many risks associated with changing climate and natural disasters is a key consideration for local governments. The common goals shared by the signatory local governments to the B.C. Climate Action Charter include the aim of reducing greenhouse gas emissions and "encouraging infrastructure and a built environment that supports the economic and social needs of the community while minimizing its environmental impact."[1] The degree of success a local government will have in achieving these goals is greatly influenced by how it manages its infrastructure:

- In the capital planning decisions it makes
- How those decisions are implemented through capital project management
- How the resulting infrastructure assets are operated and maintained

The decisions we make today will impact generations to come, which is why what we build, where we build it, and to what standard are all key resiliency considerations that should take into account issues such as flood risk, earthquake planning, promotion of clean transportation options and the reduction of greenhouse gas emissions throughout the life cycle of our infrastructure assets.

Elected officials are in a position to promote the specification of environmentally responsible design and construction practices through programs such as the Leadership in Energy and Environmental Design (LEED) and the BC Energy Step Code.

"Resilience is the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions."

United Nations Office for Disaster Risk Reduction,
UNISDR Terminology and Diaster Risk Reduction

[1] *B.C. Climate Action Charter (2007), section (4)*

INFRASTRUCTURE MANAGEMENT RESILIENCE (CONTINUED)

The following table includes examples of climate resiliency considerations in capital project management throughout the capital project life cycle.

CAPITAL PROJECT PHASE	EXAMPLES OF CLIMATE RESILIENCY CONSIDERATIONS	
INITIATION 	Align capital project needs with the organizational climate change adaption plan or a climate action strategy	Identify how the project can help meet climate action goals
PLANNING 	Consider environmental impacts of the capital project	Assess potential impacts on energy consumption, greenhouse gas emissions, pollution to surrounding area and others
	Incorporate risk factors from climate change into asset needs and project risk assessments	Assess the impact of more frequent severe weather conditions, higher average temperature and a rising sea level
EXECUTION 	Implement capital projects that are expected to translate to waste reduction and higher compliance with environmental goals	Implement a Leadership in Energy and Environmental Design (LEED) certified design and process to help reduce the negative impacts from climate change
	Manage risks driven by a climate change and implement risk mitigation strategies	Avoid construction during severe weather season, if possible
CLOSING 	Review project performance and outcome against the capital project goals, including environmental goals and climate action strategy targets	Assess if the expected goals (for example, energy saving or greenhouse gas emissions) are achieved As part of the capital project post-completion review, formally assess how the project outcome aligns with organizational climate action strategy or objectives

PERFORMANCE MANAGEMENT

16 WHAT SHOULD ELECTED OFFICIALS KNOW ABOUT THE STATUS OF THEIR CAPITAL PROJECTS?

One of the most significant challenges to the exercise of effective oversight is the quality and timeliness of reporting.

Local governments should incorporate capital project reporting requirements into their capital project management framework, with standards established in terms of the content, format and frequency of capital project reporting.

Elected officials should expect the local government's administration team to provide certain information on a regular basis and upon request for all capital projects to enable them to properly execute their oversight responsibilities.

Knowing whether a capital project is on time and on budget is fundamental, so this information should include the latest forecast of the actual cost against the approved budget as well as the schedule status, relative to one or more key milestones.

In addition, it is considered good practice for elected officials to receive regular status updates in a prescribed format in respect of major capital projects. Each local government may have its own definition of a major capital project, however, for guidance, these are typically projects of larger value and/or complexity, or which otherwise represent a higher level of risk.

An example of a simple project status dashboard is included below which provides the most basic information necessary to facilitate a meaningful discussion.

Project:
Date:
Reporting Period:

1. Is the project forecast to be delivered on budget? **Y/N**
   - **Approved Budget**
   - **Forecast Cost**
2. Is the project forecast to be delivered on time? **Y/N**
   - **Approved In-Service Date**
   - **Forecast In-Service Date**
3. Have there been any approved scope changes? **Y/N**
4. Progress since last report:
5. Key risks & mitigations:

Note that the capital project team should have a more detailed progress report that targets an audience of internal management, rather than elected officials, for the purpose of providing awareness and supporting decision-making. This progress report will cover in detail aspects such as project overview, project status, schedule, finances, procurement, risks, health and safety, stage gates, stakeholder engagement, constraints, dependencies and others.

17 HOW SHOULD CAPITAL PROJECT SUCCESS BE MEASURED?

Elected officials have an important duty to question the performance of capital projects, and they should not be daunted by the technical complexities. The key is to understand that all capital projects can and should be measured against a fixed baseline that sets out the objectives of the project in terms of three fundamental elements—scope, schedule and budget.

A typical problem local governments encounter with performance measurement is a failure to establish and document a baseline (for example, in a project charter). This is a failure to acknowledge the importance of performance transparency and means that success cannot be measured.

Another typical performance measurement problem that local governments encounter is unauthorized or undocumented changes to the baseline. This is when the goalposts are moved as risks materialize. For example, when tenders come in higher than expected and the budget is increased, or when a contractor is delayed and the schedule is extended. Additional funding or time may well be required, but changing the baseline means that the failure to deliver the capital project within the original budget and schedule constraints will not be acknowledged, and so the necessary lessons will not be learned.

Due to the complexities and risk involved in capital projects, it is not unusual for the scope, schedule and budget of a capital project to diverge from the baseline, and in extreme cases, re-baselining of a capital project may be necessary. However, we must never lose sight of the original baseline.

In addition to knowing whether capital projects were delivered successfully, and the reasons why, elected officials should expect information on the performance of capital projects throughout the life of a capital project. This may include information on the status of the capital project (for example, procurement, design, construction progress, etc.), but for a project update to be meaningful, it should always include a forecast of project performance relative to the project baseline (scope, schedule and budget).

In the absence of meaningful reporting, questions elected officials may wish to ask to evaluate performance might include:

EXAMPLES OF QUESTIONS ELECTED OFFICIALS COULD ASK OVER THE PROJECT'S LIFE

What is the project's baseline against which performance is being measured?

- How have we defined success?
- Where is the approved scope, schedule and budget documented?

Is the capital project forecast to be delivered within the original approved (baseline) budget?

- Are committed and forecast costs in line with the estimates?

Have there been any significant changes to the original approved (baseline) scope of the capital project?

- Have we changed our requirements and in doing so caused increased cost and time pressures?

Is the capital project forecast to be delivered within the original approved (baseline) schedule?

- Will the capital project be completed on time, and are key milestones being achieved?

CAPITAL PROJECT SUCCESS MEASUREMENT (CONTINUED)

Upon completion of a capital project, local government should assess the results. An example of questions elected officials could ask include:

EXAMPLES OF QUESTIONS ELECTED OFFICIALS COULD ASK UPON THE PROJECT'S COMPLETION

Has the capital project achieved its objectives, including service level objectives?

Has the physical asset met its technical performance objectives?

Has the capital project been well-managed?

- Was the project delivered on scope, schedule and budget?
- Were risks managed effectively over the capital project's life cycle?

Elected officials could also ask questions related to the capital project's benefit realization. See question 18 for examples.

These measures should be tracked in such a way that the project manager's role is respected and not undermined.

Elected officials should refrain from direct contact with the contractors or consultants and should attain these measures from the project sponsor otherwise it undermines the entire process.

EARNED VALUE MANAGEMENT

There are many tools and techniques for the management of a successful project. One such tool is called Earned Value Management (EVM) – a technique for measuring project performance and progress in an objective manner.

This technique is widely used by the private sector and federal government for large-scale projects, however, many local governments often overlook this technique.

The foundational principle of EVM is that it does not depend on the size or complexity of the capital project and lightweight implementations of EVM are achievable by any person who has basic spreadsheet skills.

An example is provided below that demonstrates the concept of EVM.

Example: Project A has been approved for a duration of one year and with a budget of X. According to the project plan, 50 per cent of the approved budget will be spent and 50 per cent of the work completed in the first six months.

If the project manager reports that they have spent 50 per cent of the budget after six months, one may initially think that the project is perfectly on schedule. However, that is not enough information to draw that conclusion. The project could spend 50 per cent of the budget and finish only 25 per cent of the work, which would mean the project is not doing well, or the project could spend 50 per cent of the budget and complete 75 per cent of the work, which would mean that project is doing better than planned. EVM is meant to address this and similar issues.

Elected officials might want to discuss the benefits of using the EVM tool with the project manager and consider if it would be beneficial to apply by the local government and to what extent.

Source: Adapted from Wikipedia

18 HOW SHOULD THE TRUE VALUE OF THE CAPITAL PROJECT BE MEASURED?

In addition to the question of whether the approved scope of the project was delivered within the approved budget and approved schedule, it is also important to ask whether the project achieved its intended objectives and delivered the anticipated benefits.

An example would be a project to construct bike lanes — the scope could very well have been delivered on time and on budget, but did the project result in achievement of a predefined target for a certain reduction in greenhouse gases (GHG)?

It is important for a local government to identify the anticipated benefits of each capital project and align them with their documented organizational goals and strategic direction, ensuring benefits are realized as capital projects are delivered, and that the benefits are sustainable after capital project implementation is complete.

A definition and quantification of benefits could be included in the project objectives, and elected officials should be aware of the benefit realization approach and be part of this discussion. This will allow elected officials to hold the project team accountable for not only the traditional triple constraint of scope, schedule and budget but also realization of benefits.

A set of questions is provided below that capital project management staff and project leaders can use to help guide the identification, analysis, delivery and sustainment of benefits that align to the organization's strategic goals and objectives.

1 IDENTIFY EXPECTED BENEFITS

- Are the benefits aligned with the organization's strategic goals?
- Are the benefits—tangible, intangible, short-term, and/or long-term—explicitly defined in the business case?
- Does the business case outline how the benefits will be measured and when benefits are forecasted to be delivered?
- Are all project or program benefits documented in a benefits register and benefits realization roadmap?
- Have key stakeholders signed off on the benefits realization plan?
- Does governance take into account benefits management, including relevant acceptance criteria?
- Are project selection and/or funding decisions based on the impact to expected benefits?
- Have the benefit owners been consulted and confirmed?

2 EXECUTE BENEFITS

- Have the expected benefits been clearly communicated to key stakeholders involved with delivery?
- Does the capital project team understand how project level outputs contribute to business benefits?
- Is progress regularly reviewed against the benefits realization roadmap?

  Note: A Benefit Realization Roadmap is a visual illustration that shows when and how benefits are expected to be enabled for the business owner to then utilize for benefits realization
- Are benefits frequently modified to reflect the most current information regarding changing business conditions?
- Is effective change control being utilized to close gaps between expected benefits and actual benefits?
- Is there a formal process to discover new benefit opportunities?
- Is the project or program still relevant based on what benefits can be realized against unexpected events or changes to the benefits realization plan?
- Are the benefit owners responsible, accountable, and evaluated for achieving benefit targets?

3 SUSTAIN BENEFITS

- Have the benefits—tangible, intangible, short-term, and/or long-term—been optimized?
- Have the benefits been transitioned to and approved by key stakeholders, including accountable operational/business owners?
- Have capital project outcomes and capabilities been handed over to operational/business owners?
- Are realized benefits being measured and verified against business and sustainment plans?
- Are actual benefits being delivered within the timeframe of the benefits realization plan?
- Were lessons learned captured and communicated?
- Have unanticipated benefits been realized and captured for the future?

Source: Project Management Institute (2016) "Benefits Realization Management Framework"

ADDITIONAL RESOURCES

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

Canadian Construction Association

Capital Asset Management Framework Guidelines, Government of British Columbia

City of Calgary Corporate Project Management Framework Standards & Guidance Documents

International Project Management Association

Project Management Association of Canada

Project Management Institute

Project Plan Template, Government of Canada

Successful Capital Project Delivery - the Art and Science of Effective Governance, PWC

UK Government Functional Standard GovS 002: Project Delivery

UK Government Project Delivery Guidance

GLOSSARY

BASELINE: The 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 – Project Management Institute: *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*)

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

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

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. The stage gate represents the end of the stage.

LESSONS LEARNED: The knowledge gained by reflecting on how project events were managed or should be managed in future for the purpose of improving project management practices.

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

PROJECT CHANGE: A deviation from the approved project plan that impacts scope, budget and/or schedule.

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 – Project Management Institute: *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)*)

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

PROJECT MANAGEMENT PLAN: A formal, approved document that defines how the project is executed, monitored and controlled and closed. It may be a summary, or detailed, and may be composed of one or more subsidiary management plans and other planning documents.

PROJECT REPORTS: Corporate records capturing a project's progress and project management due diligence.

PROJECT RESPONSIBILITIES: An assignment that can be delegated within a project management plan such that the assigned resource incurs a duty to perform the requirements of the assignment.

PROJECT ROLE: A defined function to be performed by a project team member.

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

RECORDS MANAGEMENT: Identification, classification, storage, organization, maintenance and disposition of records.

RESPONSIBLE: When you are the one to deliver the result. Responsibilities can be delegated to another individual for execution.

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.

RISK MANAGEMENT PLAN: The risk management plan is a component of the project plan and describes how risk management activities will be structured and performed. It includes, but is not limited to: roles, responsibilities and authority, the risk assessment model, a risk management method, a risk communication plan and the documentation of project risks.

GLOSSARY

RISK MANAGEMENT: Risk management is the systematic process of planning for, identifying, analyzing, responding to, monitoring, controlling and communicating project-related risks.

RISK REGISTER: A record of the project risk management approach.

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

STAGE: The time between gates designed to collect specific information to help move the project to the next stage or decision point.

STAKEHOLDERS: Are individuals, groups, organizations within the community and organizational departments which may be impacted by the capital project or may impact the project being delivered.

TOTAL PROJECT COST: Costs that include administrative, consulting and construction expenditures.

VALUE: An expression of the relationship between function and resources, where function is measured by the performance requirements of the customer and resources are measured in materials, labour, price and time required to accomplish that function.

VALUE MANAGEMENT: The application of value methodology by an organization to achieve strategic value improvement.

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