KPMG

Building on success; learning from failure

Governance and executive management of major capital projects

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What can this paper do for you?

The paper aims to help board members and executive management tasked with delivering large projects to ask better questions about what good practice looks like. Drawing on the lessons of vastly experienced practitioners in the private and public sectors, the approach can improve governance, reduce the chance of projects exceeding budget or schedule, allocate risk effectively, and minimize costs.

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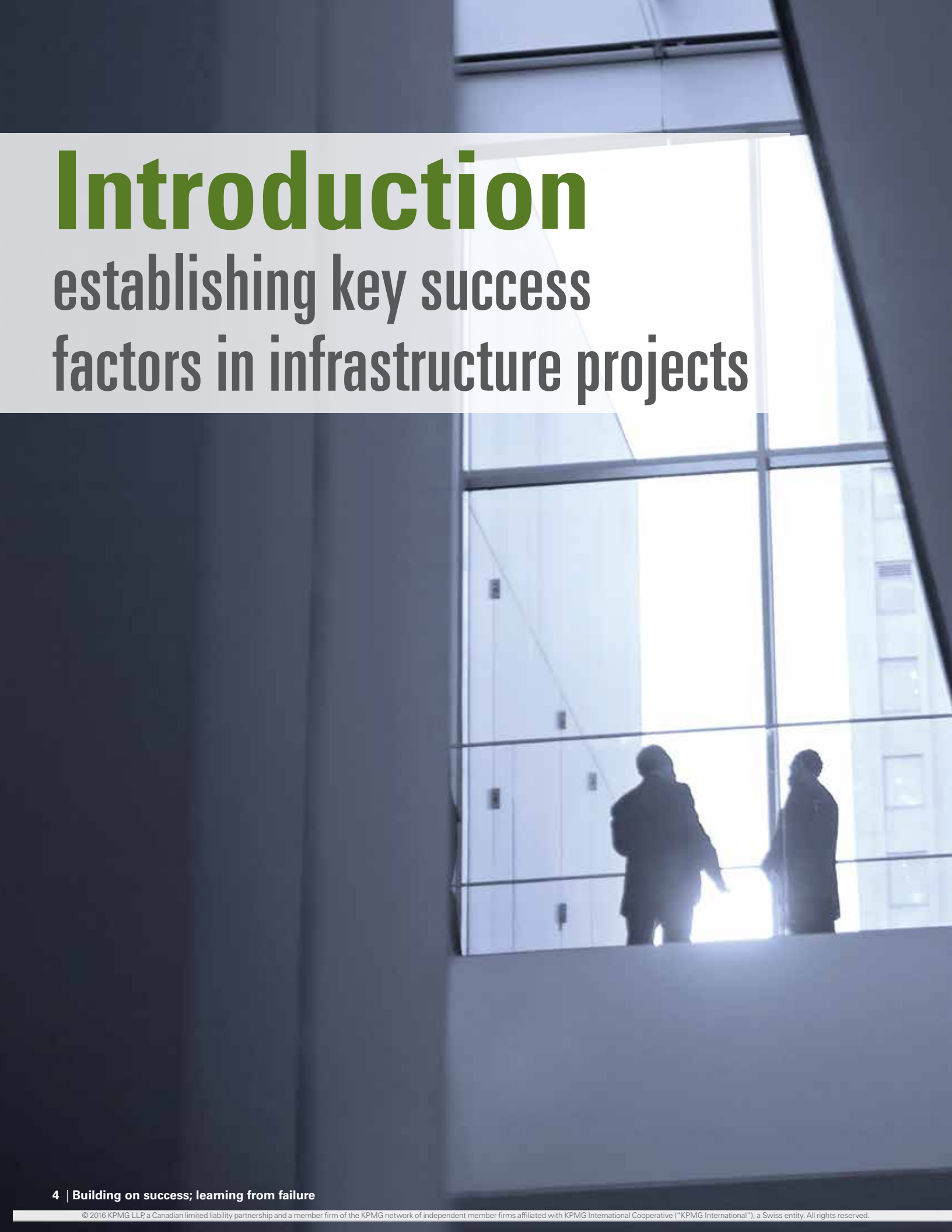
establishing key success factors in infrastructure projects



> With large projects come equally large risks, in the form of significant, unexpected financial costs for taxpayers and shareholders, and damaged reputations.

Conservative estimates predict a need for over 60 trillion US dollars (US$) of global infrastructure investment in the next 15 years, with more than US$400 billion in Canada alone. Forty percent of the top 100 Canadian corporations are already involved in one or more projects costing over US$250 million[1].

Yet, major infrastructure projects are failing at a dramatic rate in Canada and around the world, in the private sector reducing share prices and shareholder value, and, in the case of public initiatives, impairing governments' fiscal positions. Moreover, in both sectors, Boards are painfully aware that reputations are damaged following a cost overrun, putting their organizations under much closer scrutiny.

Economic development and population growth have fueled a huge demand for the development and renewal of major capital projects. The infrastructure boom in Canada encompasses private sector utilities, energy producers, telecommunications and mining companies, as well as public investment in transportation, healthcare, energy, water/wastewater, sports facilities and government services.

However, with large initiatives come large risks, in the form of significant, unexpected costs for taxpayers and shareholders, not to mention reputational damage, hindering the ability to attract the best partners for future business. Independent studies reveal that, the bigger and more complex the project, the greater the chance of both commercial and technical failure. Furthermore, projects that fail in one dimension (e.g. cost) are also more likely to fail in other dimensions (e.g. schedule). Project owners therefore need to balance the commercial and the technical risks[2].

Climbing the Curve, KPMG's 2015 Global Construction Project Owner's Survey[3] is a good indication of the way that capital infrastructure is managed. Based upon interviews with 109 leaders of private and public organizations, the report shows continued incidence of project failure:

- 53 percent suffered one or more underperforming projects in the previous year (this figure rose to 71 percent and 90 percent respectively for energy and natural resources respondents)
- of these, only 31 percent of projects came within 10 percent of budget in the past 3 years, and
- just 25 percent of projects came within 10 percent of their original deadlines in the past 3 years.

It's a similar story in Canada, where less than 50 percent of projects completed in the past 3 years came within 10 percent of planned budget and delivery dates. On a brighter note, Canada's increasing use of public private partnerships (PPPs) has led to internationally-acclaimed innovation in project planning, procurement and project governance, with a growing track record of 'on time/on budget' project delivery[4]. These varied experiences have created a set of lessons on good practice – as well as highlighting what can go wrong.

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[1] IJ Global and Top 100.

[2] Morrow and Independent Consultants Inc. paper.

[3] *Climbing the curve: 2015 Global Construction Project Owners' Survey,* KPMG International, 2015.

[4] Auditor General reports and Project Reports on various provincial agency websites.

Boards of directors of private sector companies typically delegate authority for project planning and delivery to senior management, and ultimately to a sponsoring senior executive and project team. Public sector responsibility usually rests with a Cabinet Committee (generally a Treasury Board), which then vests certain authorities in a Project Board, and ultimately to a project team. A private board's key role is to approve and deliver capital projects that maximize shareholder value, while public Treasury Boards aim to provide quality services while minimizing costs to taxpayers.

To meet shareholder and taxpayer expectations, executive management and boards must achieve a delicate balance between accountability and efficiency in project planning, which involves **clarity** over project risks, **predictability** in project monitoring, and **certainty** in project outcomes. All of this requires sound governance, risk management, partner selection, contracting and whole-life asset management.

About this paper

KPMG has sought to tap into the wealth of experience of those that have managed major private and public infrastructure projects in Canada, in order to establish key success factors. In mid-2015, we spoke to over 30 board members, senior executives and senior provincial government officials responsible for governance, planning and delivery of major capital projects. These individuals represent national and provincial government and ministries, as well as companies from the mining, industrials, oil, gas and utilities sectors. The findings have been augmented with learnings from our specialists in Canada and globally, as well as results of *KPMG's 2015 Global Construction Project Owners' Survey.*

We believe that this paper can help those tasked with large projects (i.e. more than US$500 million) to ask better questions on what good practice looks like. This in turn should lead to more effective governance, reduced risk of failure, and improved performance.

> Projects that miss their performance metrics, fall short of certain objectives, or fail completely, are rarely caused by 'force majeure' random events, or 'black swans.'

The end results could be very compelling: projects delivered on time and on budget; risks mitigated and allocated to partners best able to manage them; and whole-life asset management that raises long-term operating standards and minimizes cost.

Project failures are not 'black swan' events

Projects that miss their performance metrics, fall short of certain objectives, or fail completely, are rarely caused by 'force majeure' random events, or 'black swans.' The cause is more likely to be controllable factors such as:

- inadequate governance and reporting
- lack of advanced planning, project and risk management
- insufficient executive sponsorship
- lack of appropriate project leadership and skilled, experienced resources
- misalignment of approvals and construction schedules
- lack of stakeholder consultation and acceptance.

By simply assuming that a project failure is an uncontrollable 'black swan' event is to learn nothing from the experience and invite future failure. The reality is that failure can most often be attributed to poor planning, errors or misjudgments, and these need to be analyzed and understood to avoid a repeat.

Terminology

Job titles and project acronyms and descriptions can vary between private and public sector projects, and between different industries. In this paper we have tried to use generic terms where possible, to avoid sector-specific language.

Key project success factors
Give major projects the attention they deserve

When approaching a major capital project, organizations should first determine whether their previous experience has prepared them in terms of project scale and complexity. Boards will naturally be more concerned about those initiatives that are critical to future strategy and expose the organization to significant balance sheet and reputational risks. These projects tend to be comprised of integrated sub-projects, or a portfolio of major projects, as part of an ongoing capital program.

An ongoing capital program requires appropriate systems, as well as an ability to develop and retain good practices from one project to the next. Assessing projects, to learn from successes and mistakes, is an essential part of developing a 'corporate memory.'

Given their accountability, boards must therefore recognize the risks within projects, calling for a focus on:

- **Setting up the right governance structure:** to maintain control while ceding day-to-day responsibility.
- **Taking a life cycle approach:** to ensure that objectives and risks cover the life of the investment, not just the implementation.
- **Being aware of commonly occurring issues:** when setting objectives, planning, identifying approval stages, resourcing, and dealing with stakeholders.
- **Receiving, and acting upon, the right information on a consistent basis:** to ensure **predictable** progress and informed decision-making, thus increasing the **certainty** of project success.

Setting up the right governance structure

With ultimate responsibility for projects that may be worth billions of dollars, boards and decision-makers are accountable for the commercial and reputational consequences of failure. Although their prime role is to manage inherent commercial and stakeholder risks, they have neither the time nor the specific skills to govern on a day-to-day basis, and must therefore cede much of the planning and technical oversight to the project management teams. Another important way to reduce project risk is to cost-effectively transfer certain risks to contractors and sub-contractors.

Having delegated these critical tasks, boards need the reassurance of strong management controls and monitoring. KPMG's 2015 Project Owners' survey[5] strikes a positive note in this respect, with the majority of respondents believing that their management controls are either 'optimized' or 'monitored, suggesting that their investment in upgrading has had a positive impact.

Good governance gives boards a clear line of sight of project issues, and provides them with the right information, in the right format, to make the right decisions at the right time. Although approaches vary widely across both the public and private sectors, there are common themes for good practice:

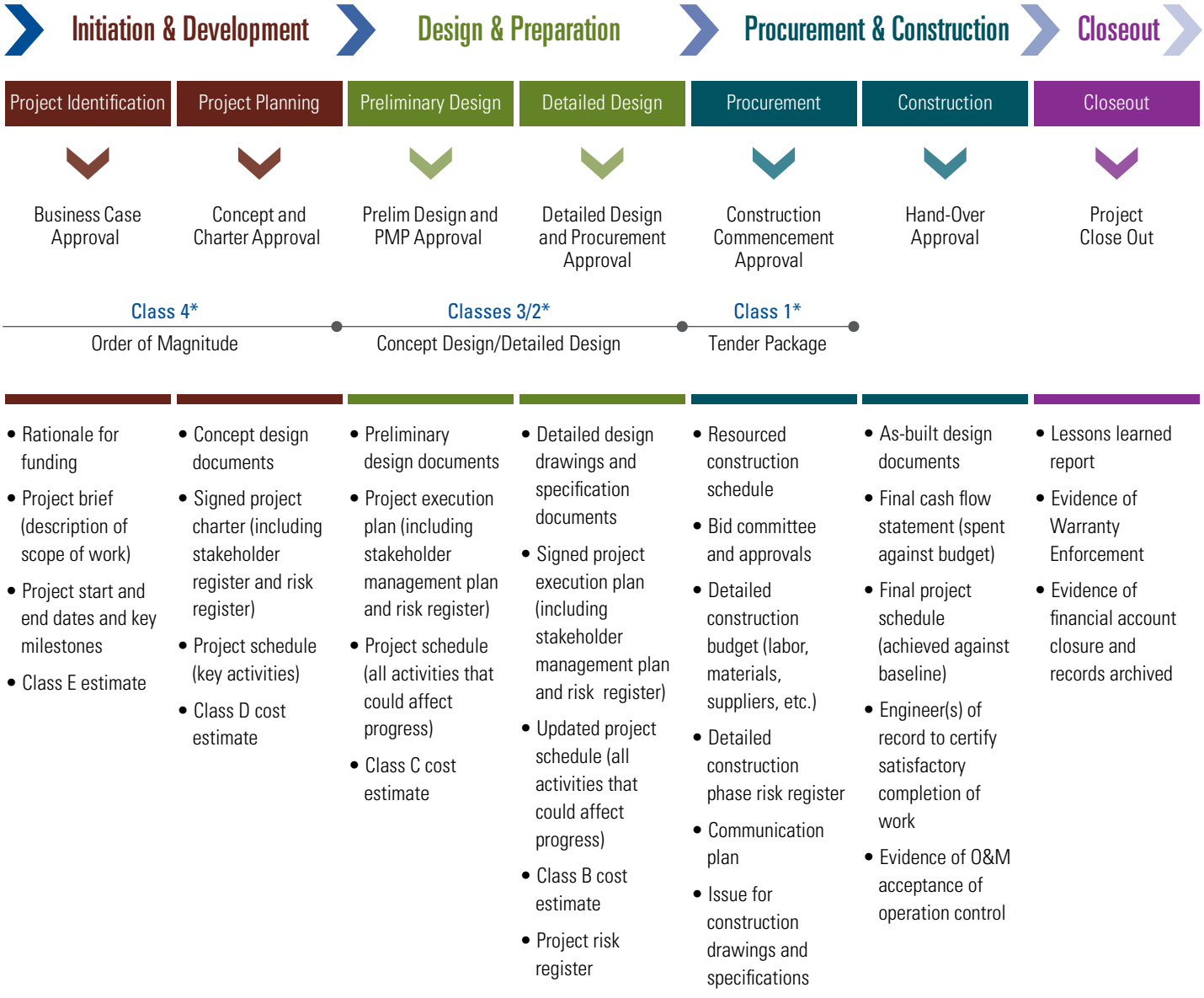
- **A broad platform:** governance is allocated to the various possible levels of responsibility (boards, sub-committees, executive management, project board or steering committees and the project team) and flows from a documented and agreed-upon project charter.

[5] *Climbing the curve: 2015 Global Construction Project Owners' Survey,* KPMG International, 2015.

- **Project charter:** this defines project objectives and the reporting system; clearly assigns decision-making roles and responsibilities; empowers the project team with delegated authority; defines the various contingency reserves, and who has authority for their use.
- **Stage gates:** if owners wish to get all they bargained for, governance should begin at the advanced planning phase, and continue through implementation/contracting, through to construction and commissioning. Governance should, therefore, include approval 'gates' that ensure that all project components (regulatory requirements, stakeholder acceptance, construction, and operations) are aligned and follow a critical path. A stage gate process divides a major capital project into stages, with specific points for executives and boards to make decisions, before continuing to ensuing stages. Each of these stages has different needs, and the individuals responsible for governance may change to meet differing commercial and technical requirements. See *Figure 1*.

Figure 1: Stage gating

Example of a Stage Gating Map (assumes a design/bid/build delivery approach) across a project life cycle:



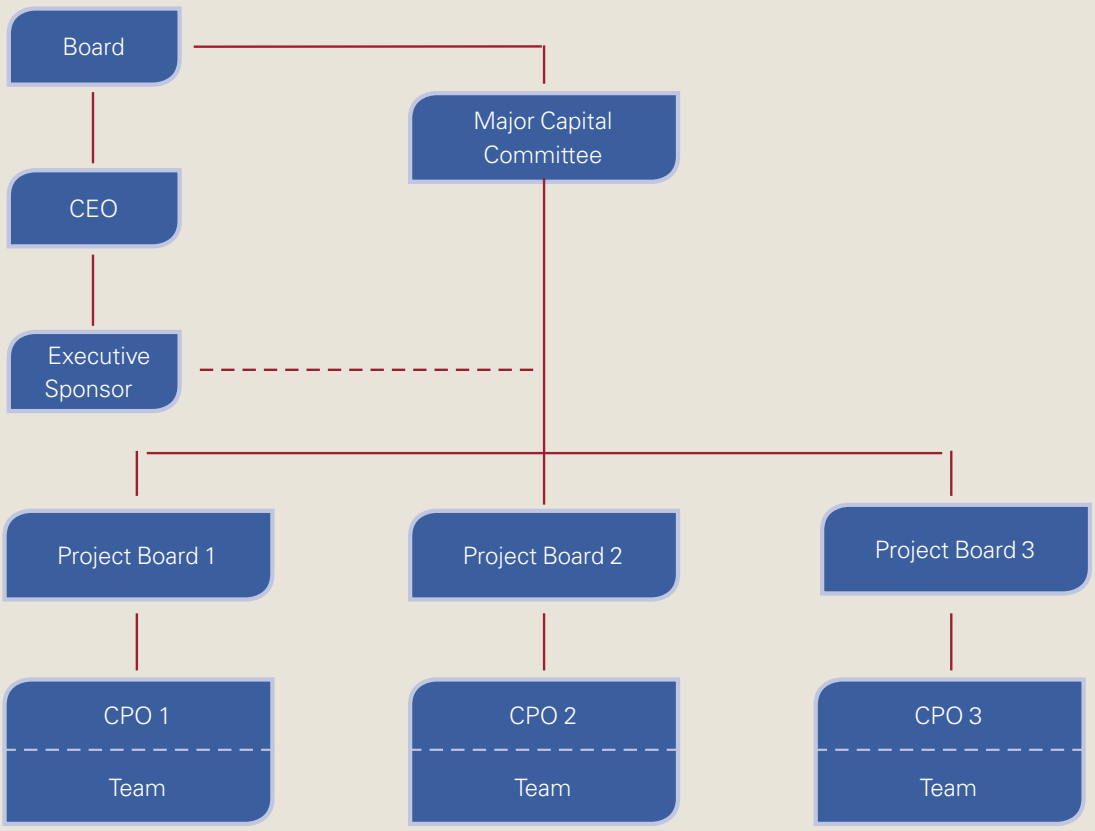
*AACE International Recommended Practice No. 18R–97: Cost Estimate Classification System – as Applied in Engineering, Procurement, and Construction for the Process Industries http://www.aacei.org/toc/toc_18R-97.pd

Source: KPMG International, 2015.

- **Project board:** the group that examines monthly performance metrics (board, board sub-committee, project board) should: be qualified and, as required, supplemented by commercial and technical experts; meet on a regular basis, with meeting agendas, minutes and actions. To increase its comfort with the structure and operations of project governance, the board should periodically consider obtaining independent assurance, in the form of best practice audits or a more comprehensive independent project assurance.
- **Lead/sponsor:** a senior executive or official is designated as executive lead or sponsor, with the sponsor facilitating the project, and integrating the project team within the owner organization. This is a critical role, both in terms of integration and external problem-solving. Private sector boards often have a Project Management Office (PMO) that consolidates major delivery functions and project teams, sets specific policies, procedures and controls. Each project is typically overseen by a Chief Project Officer (CPO) or Project Director. See *Figure 2 and 3* on page 10 and 11.
- **Risk management:** due to the size and complexity of major projects, commercial risks are as important as technical risks, something that should be reflected in the governance and resourcing.

Figure 2: Governance for an ongoing capital program

Crown Corporation 'On-Going Capital Program' Governance



Some Boards have established a specific sub-committee of the Board to address major capital projects.
The primary purpose of a Major Capital Projects Committee is to assist the Board in carrying out its oversight responsibilities with respect to:

a) the planning, development and construction of the Corporation's major capital projects
b) assisting, supporting and counseling management in developing short and long term policies and standards to ensure policies are being adhered to and achieved
c) environmental health and safety in relation to the Corporation's major capital projects
d) making recommendations to the Board as appropriate.

In this structure, an Executive Sponsor may be appointed to report on Major Capital Project matters directly to the Major Capital Projects Committee. His/her responsibilities would include prioritizing the projects within the program.
The Chief Project Officer (CPO) is responsible for delivery of the project and reports to the Executive Sponsor.

Source: KPMG International, 2015.

Public and private sector project boards have a similar project governance structure as noted in *Figure 3*. Public sector project boards generally consist of:

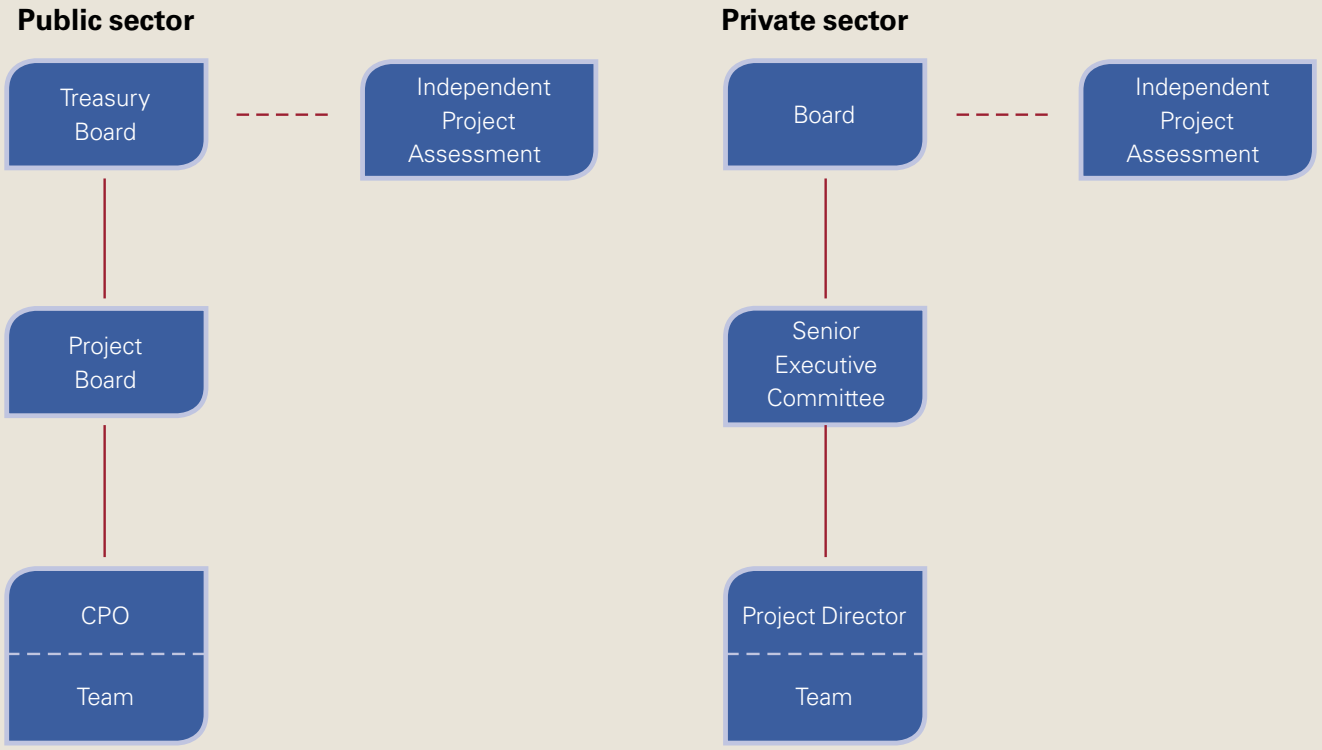
- Assistant Deputy Minister/Deputy Minister from the relevant Authority (Healthcare, Transportation, etc.), who acts as the Board Chair
- Senior Executive from the Operating organization, who acts as the Executive Sponsor for the project
- Senior Executive from the CPO
- Member of the funding organization (Partnerships BC, Infrastructure Ontario, etc.)

Private sector Boards often have a CPO or Project Director responsible for the delivery of major capital projects. The PMO consolidates the major delivery functions and project teams to be dedicated to a project. The PMO provides specific policies, procedures, systems and controls for major capital projects.

Boards may use Independent Project Assurance to provide the Board assurance services outside of the management team, including health checks, stage gate reviews, recovery services, and post implementation reviews.

Figure 3: Governance for an organization with a single, major project

Public and Private Sector Governance



Source: KPMG International, 2015.

How can a board be confident that a project is being run effectively?

Independent assurance can go a long way to providing comfort over governance, and confirming that controls are working, and being used systematically. Audits are best carried out by external specialists, although the next best option is the organization's Internal Audit team.

Taking a life cycle approach

Private sector business case planning for new infrastructure typically involves calculating the 'economic payback' of financial return on investment. However, the long economic life of an asset means that ongoing costs will be incurred, along with commensurate risks to performance. Payback analysis simply looks at revenue versus costs, and whether return on equity meets company expectations. A whole-life approach, on the other hand, seeks to minimize the cost of the asset while optimizing its economic life, and should incorporate the potential benefits of (factors such as) partnerships and supplier arrangements. A life cycle approach encompasses the following:

- **warranties:** this involves creating whole-life cost and operational objectives rather than shorter-term, "fit for purpose" performance objectives. For example, in the standard Canadian long-term PPP model, asset performance is, in effect, warrantied for the life of the contract, with significant financial penalties for under-performance. In private sector engineering, procurement and construction (EPC) contracts, on the other hand, warranties are provided under a very specific, limited legal definition for certain pieces of equipment, for a short period after substantial completion.
- **asset condition:** ensure project objectives include the asset condition at long-term milestone dates.
- **costs:** base the project budget upon whole-life costs including operations, maintenance and rehabilitation costs.
- **risk transfer:** take a long-term perspective on risk transfer opportunities such as asset performance, operations and maintenance cost, and rehabilitation cost.

How can I estimate the whole-life costs of an asset?

Through a combination of personal experience, supplier advice, durability certification and published sources, it is possible to predict the lives of materials and equipment. Discounted cash flow can be used to estimate present day value, while sensitivity analyses will give you a range of values for best- and worst-case scenarios.

> There will inevitably be trade-offs between objectives such as cost and schedule, and boards need to be informed of the options.

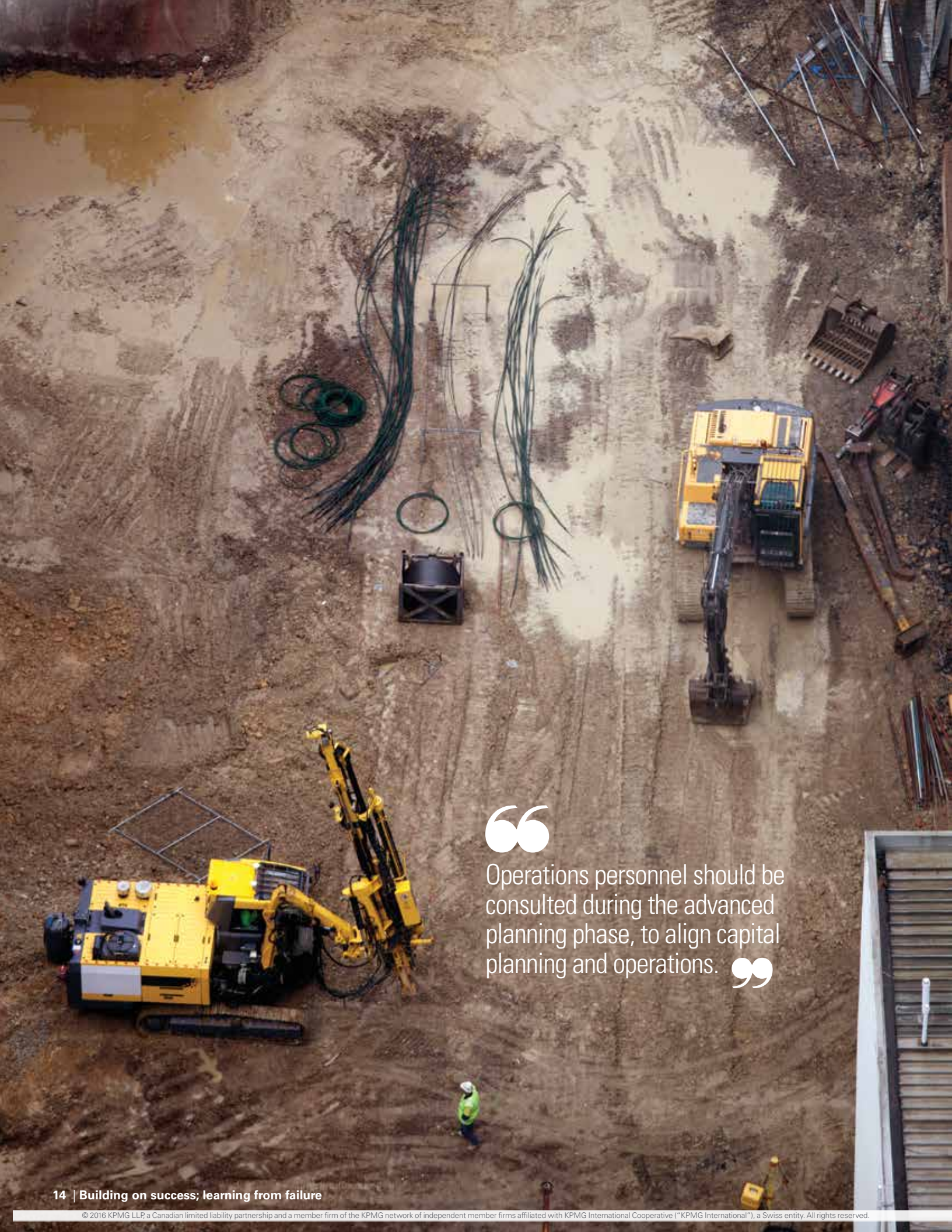
Awareness of commonly occurring issues

By understanding why projects fail, owners can build learning into future good practice. Some of the most common problems, and the subsequent lessons learned, involve:

Project objectives

Although they are aware of the importance of monitoring capital cost, schedule and safety, boards often have less appreciation of the more subtle trade-offs between conflicting objectives, particularly between cost and schedule. Nor do they fully understand the potential risks that could slow down a project or cause extra costs. They should therefore ensure that:

- **Project objectives and deliverables are aligned with the owner's strategic vision and business goals and are not in conflict with each other:** for example, in order to minimize whole-life cost, the project team may wish to invest significantly in high quality capital assets. However, the business may want to reduce the impact of the project on the balance sheet, by keeping capital costs low, which could restrict the project from achieving its longer-term aims.
- **Key risks are identified and monitored:** this will help spot early warning signs. For example, inability to secure the right human resources, or labor disputes, can cause construction delays; geotechnical results that deviate from baseline commitments can lead to cost increases; delays in site preparation can increase costs and prolong schedules.
- **Assess trade-offs between objectives (such as cost and schedule):** this should happen during the advanced planning phase, to enable informed decision-making should performance metrics not be met. Examples include: determining whether to maintain schedule, even when it means higher capital costs; or deciding to reach substantial completion ahead of schedule, which can increase operating budgets.
- **Identify the need for long-term flexibility of capital assets:** although longer-term outsourcing contracts transfer risk to a third party, they can also be fairly rigid, and may not allow sufficient flexibility to make changes, such as closing facilities in the face of competition. The cost of unwinding such arrangements may cancel out the overall cost-benefit of the partnership.



> Operations personnel should be consulted during the advanced planning phase, to align capital planning and operations.

Advanced planning

Our research from this and other surveys[6] shows a high correlation between advanced planning and project success in the private sector. The same studies also demonstrate the benefits to the public sector of PPPs, which embrace increasingly comprehensive and sophisticated advanced planning, and analysis of procurement options. These approaches emerged to meet the long-term commitments inherent in a PPP partnership agreement, and the financial and other consequences of these commitments.

State-of-the-art advanced planning includes good program and scope definition, high quality and reliable input data, and comprehensive line-by-line risk assessments, as well as a cost-benefit assessment of the potential retention or transfer of key project risks.

Comprehensive advanced planning may cost more, but should be viewed as an investment of time and money to mitigate project risk and increase the certainty of realizing project objectives.

The main elements of advanced planning are:

- **A clear statement of program requirements:** (i.e. the purpose of the new asset), service delivery alternatives and project and supply chain objectives – including some assessment of the trade-offs between these objectives.
- **Budget and expenditure consequences and financial modelling:** this is based upon realistic budgets set with sufficient information: Front-end engineering design (FEED) or indicative design and American Association of Cost Engineers (AACE) Class 3 cost estimates, with a whole-life, asset management perspective. The budget includes a contingency reserve, based upon the potential for errors in estimation and expected outcomes of retained and transferred risks.
- **A comprehensive risk register:** this reflects a line-by-line assessment of key commercial and technical risks, and includes the probability of risks occurring and the consequences, and the estimated costs of transfer versus retention of risks, plus a mitigation strategy for retained risks. Geotechnical risk, for example, affects large infrastructure projects, as challenging subsurface conditions can dramatically increase costs and prolong schedules. Allocating such risks effectively, by transferring, sharing or retaining, can help ensure that costs are more closely aligned with risks. *Table 1* below indicates how several rapid transit PPP projects in Canada have managed geotechnical risks with their contractors:

Table 1: Examples of Canadian Rapid Transit PPP Projects

#	Risk Allocation	Method/Formula
1	Transferred	Private partner assumed geotechnical risks for a price adjustment
2	Transferred	Geotechnical risks identified as a bid item in exchange for price adjustment
3	Shared	Geotechnical risks transferred subject to baseline reports
4	Retained	All geotechnical risks retained by public owner

- **Realistic project schedules:** giving sufficient time for a thorough planning process.
- **Assessment of a variety of relevant contracting models:** these are evaluated via an overall quantitative and qualitative multi-criteria assessment of value-for-money, including simulations[7].

[6] *Climbing the curve: 2015 Global Construction Project Owners' Survey,* KPMG International, 2015.

[7] Construction management (CM), engineering, procurement, and construction management (EPCM), Construction Management @ Risk (CM@R), engineering, procurement, construction (EPC), design, build (DB), design-build-finance-operate-maintain (DBFOM), full concession, etc.

Table 2 below displays three different contracting models – public-private partnerships (PPP), engineering, procurement, contracting/design, build (EPC/DB), and design, bid, build (DBB) – and assesses the various projects risks allocated between owner and contractor:

Table 2: Risk Allocation

Risk	PPP		EPC/DB		DBB	
	Owner	Private Partner	Owner	Contractor	Owner	Contractor
Approvals & Property Acquisition	✓		✓		✓	
Design & Constructability		✓		✓	✓	
Construction Schedule		✓		✓		✓
Geotechnical Risk	✓	✓	✓	✓	✓	
Utilities	✓	✓	✓	✓	✓	
Multi-Contractor Integration		✓		✓	✓	
Construction Costs		✓		✓	✓	
Proof of Performance						
• Commissioning		✓		✓		✓
• On-Going		✓	✓		✓	
Operations & Maintenance & Rehabitation Costs		✓	✓		✓	
Compensation Events	✓		✓		✓	
Force Majeure (Relief Events	✓	✓	✓	✓	✓	✓

- **Involvement of operations personnel:** these individuals should be consulted more frequently during the advanced planning phase, to align capital planning and operations (and capital and operations budgets). Their advice should also be sought on an ongoing basis throughout the project.
- **Market feedback from potential project proponents:** regarding the contracting model and competitive selection process.
- **Develop an execution plan:** such plans should reference a proposed project charter, work plan, schedule and budget, and a clear statement of exactly what decision-makers are being asked to approve. They should provide management with a roadmap on how the project team will implement the project, and be the team's mandate, once approved.
- **Balance the use of project financing with other forms of security, such as parental guarantees, bonding and letters of credit:** project financing is more expensive than corporate or public financing, so should be minimized, with its use primarily to facilitate risk transfer, via partnership contracts. In this way, organizations can achieve an optimum balance of project and other financing.
- **Put all aspects of the plan in place:** by ensuring that: 'show-stopper' events that could delay or cancel procurement or construction have been identified and mitigated: all funding is committed; project financing is viable; land is acquired or acquirable; permits and other external approvals are in place – or the associated risks are transferable.

Stakeholder needs

The prospects of success are greatly enhanced by the acceptance and support of influential stakeholders such as shareholders, public interest groups, aboriginal citizens, employees and unions. A stakeholder engagement plan should:

- **Identify all relevant stakeholders:** determine their specific needs, hold consultations, gain approval and agree benefits to be shared
- **Articulate a strategy:** this should engage and meet the needs of each stakeholder, and overcome any challenges
- **Include macro and micro communications plans:** macro plans develop a social license to operate and inform the public how the project benefits the public interest; micro plans enable effective correspondence with individual stakeholder groups.

Partnering and supply chain management

Any partners must be carefully vetted, and the team should achieve robust contracts and aligned objectives. For joint venture equity partnerships, the owner's return/risk balance should fit with its corporate business strategy, with the combined team strengthened for project delivery. Any decision to self-perform (as opposed to entering into a joint venture) is critical, and should be based upon:

- **Equity commitment:** the equity commitment for a specific infrastructure project must be aligned with the organization's overall corporate equity and risk/return strategy. If the project equity commitment creates too great a corporate risk, then additional equity partners should be considered. Ideally, such partners have the specialist capabilities to assume specific project risks.
- **Internal expertise and self-performance for an ongoing capital program:** organizations should not contract out every part of a project without retaining expertise in-house, or else essential knowledge will be lost. This gives the option to operate across business units, where this brings efficiencies. And, by keeping certain activities within the organization, cultural and leadership clashes are avoided.
- **Packaging aspects of the project:** thus providing the scope to realize the potential benefits of a joint venture, by combining various aspects of the project into a package for a partner or external supplier. For example, a joint venture partner might be a construction contractor, and it could make sense to combine design and maintenance and/or operations into a single, integrated contract.
- **Risk allocation and sharing:** can risks be allocated to the partner best able to manage/mitigate those risks (thereby increasing value for money) or, alternatively, can the risks be shared in line with the partner's equity share? Some key risks that can be transferred to partners/suppliers include: constructability risk (by integrating project design and construction); construction cost risk (through the use of a fixed price contract); and schedule risk (through the use of supplier-originated private financing).
- **Going local:** tap the potential to enhance the strength and stakeholder acceptance of the team by including local suppliers.

> "Risks may be allocated to the partner best able to manage/ mitigate those risks, or, alternatively, shared in line with the partner's equity share."

Contracting and competitive selection

Effective supply chain contracts are usually associated with strong long-term relationship and/or competitive, manageable selection processes that attract prospective suppliers. An effective process must meet the following criteria:

- **A clear contracting process:** bidders should understand the project and the owner's objectives, and have a "roadmap to victory." This calls for an objective evaluation process, with pass/fail criteria. To encourage innovation, bidders can be offered price incentives for exceeding owners' expectations in priority areas.
- **Discipline:** it is vital that the owner avoids scope changes and completes the process on time, while also being flexible enough to cope with unanticipated developments.
- **Fairness and transparency:** in larger and more complex contracting, a fairness monitor and a conflict of interest adjudicator can increase confidence in the process.
- **Encourage collaboration between owners and bidders:** this will help achieve mutually-beneficial adjustments to the contracts and/or selection process, and ensure that any problems are raised early and resolved quickly. A collaborative environment also reduces the need to negotiate pricing and deal points, once the preferred partner has been chosen.
- **Aggressive but realistic procurement schedules:** any deviations should have a clear commercial rationale.
- **Focus on performance and output:** where possible or applicable, rather than stressing more traditional input specifications, the process should aim to encourage innovative, cost-reducing solutions, and more efficient and effective risk allocation and mitigation.
- **Clear supplier contracts:** payments should be based on performance, and aligned with the owner's project objectives. In KPMG's 2015 Project Owner's Survey, 68 percent of owners cite poor contractor performance as a major factor underlying project underperformance[8]; a situation likely to be caused in part by poor contracting. There should also be a clear process for managing claims, in instances of under-performance.
- **Appropriate risk allocation:** commercial arrangements for supply chain contracting should cost-effectively allocate risks and responsibilities to the party most able to manage/mitigate the risk. However, non-commercial risks, such as environmental–or aboriginal groups' approvals, should only be transferred when the owner has complete liaison with senior management, and full confidence in the supplier/partner.

[8] *Climbing the curve: 2015 Global Construction Project Owners' Survey,* KPMG International, 2015.

> A focus on performance and output in contracts encourages innovative, cost-reducing solutions.

The right people

Here are the main characteristics of a well-resourced team:

- **Project team leader CPO or Project Director and executive sponsor:** the leader needs to have relevant experience, and an ability to manage both technical and commercial risks. Perhaps most importantly, she or he coordinates and integrates all the various aspects of a project, including technical, commercial, legal, and program management. The executive sponsor advocates the project at the senior management and Board tables, and provides clarity and focus downstream.
- **A highly qualified project team:**
  - the team should use the latest good practice in advanced planning and create fair, transparent, competitive selection processes for suppliers. Contract negotiations with bidders must be balanced, and the team members' qualifications and capacity should at least match those of the proponent
  - the team should have the right combination of commercial and technical expertise, to plan and negotiate issues with very significant financial implications
  - the team must be stand-alone with dedicated team members, ideally working in a separate office.

What is the best way to keep your stakeholders informed?

Once the main groups and individuals have been identified, regular meetings should be arranged, to ensure that everyone is up to speed, and feels that she or he has an opportunity to voice any concerns. Consultations are a good way to agree on benefits and confirm approval of decisions. It is important to meet with all groups, not just people that support the project.

How can organizations better handle geotechnical risk?

Make sure that all appropriate risk information is fully communicated to suppliers during the negotiation phase, and either transfer risk fully or partially in return for a price premium, or retain the risk in-house, with an appropriate value associated to it.

> Reports should be provided to a strict schedule in a specified and consistent format.

How can you ensure that good information is acted upon?

All decision makers should agree on actions based upon important findings from dashboards and reports, with a member of the program management team tracking the implementation of these decisions.

Receiving, and acting upon, the right information

Given their relative lack of technical expertise and minimal day-to-day exposure to the project, boards and decision-makers need to receive regular, reliable, **predictable** information in order to make good decisions that bring greater **certainty** of reaching project objectives, as well as clarity over the progress and challenges. It's not enough simply to get reports; information must be acted on and challenged through various project phases. Leaders, therefore, must ask the right, often difficult, questions about the project and ensure that:

- the business case, and the corresponding risk profile, matches the overall strategic direction.
- the company has the right resources, and skills, to assess and manage risk throughout the project.

Predictability comes from effective monitoring and reporting systems, and requires information that is not just historic, but dynamic and forward looking, complete with strategies for addressing any risks or challenges that may occur. **Certainty,** meanwhile, means that leaders should have a narrow range of possible outcomes, making final decisions simpler.

Systems should offer:

- **Consistency and clarity:** reports are provided to a strict schedule in a specified and consistent format, using dashboards that compare status to performance objectives and metrics for a wide range of variables, highlighting any variations.
- **Performance versus plan:** reports should compare comparisons of expenditure categories against plan or budget, but also provide estimates of "earned value" against plan.
- **Change protocol:** report and dashboard variables should not be revised without board approval.
- **Early warnings:** clearly-presented, concise dashboards that include comparisons of status against broad project objectives, as well as key risk factors, provide upfront information regarding any potential pressures on performance metrics. See *Table 3* below.

Table 3: Sample Board Reporting Dashboard for Major Projects

Boards often rely on project dashboards that identify the status of key project parameters. Boards may focus the strategic discussions on the project parameters that are higher risk.

#	Project Parameters	Metric	Status	Potential Impact	Mitigation Strategy
1	Cost	Planned vs Actual	✗	Cost overruns due to inaccurate estimating	Improved contingency planning and risk analysis
2	Scope	Design vs Actual	⚠	Scope creep caused by poor integration with Operations	Consult Operations personnel during advanced planning
3	Schedule	Milestones reached	✓		
4	Procurement	Approvals	✓		
5	Regulatory	Approvals	✓		
6	Stakeholders	Acceptance	✓		
7	First Nations Relations	Acceptance	✓		
8	Safety	# of Incidents	✓		
9	Environmental	Approvals	⚠	Geo-technical delays could hinder project schedule	Review contracting model

Other characteristics of a good information process:

- **Contingencies:** Project budgets should carry contingencies: (a) for risks in estimating budget items such as labor and material costs; and (b) for costs associated with `event' risks that are retained and not transferred to another partner. Examples of event risks include unavailability of labor and materials, and failure to get approvals on schedule. Where contingency approvals have been delegated to the project team, boards should be informed how these contingencies have been used, and the cost of usage. An early warning system should alert the Board of any possible need for contingency funds well in advance, and provide options for dealing with the related risks, with associated business cases.
- **Alternative options:** to be provided when performance metrics fall short of objectives.
- **Highlight relevant issues:** regarding key stakeholders and the status of the communication plan.
- **Independent assurance:** periodically, boards should request independent assurance that good practices are being followed on the project delivery, either through focused independent audits, or through more comprehensive independent project assurance.

Key takeaways

The issues raised in this paper have been borne out of real-life experience across a multitude of major capital projects, both in Canada and globally. By learning the lessons of both success and failures, companies and governments have a golden opportunity to dramatically reduce the high failure rate of projects, and thus contribute immensely to creating 21st century infrastructure that meets the needs of both public and private stakeholders and does not put an unnecessary strain on taxpayers or clients.

By planning more methodically, those tasked with large projects can gain greater **certainty**. By learning to ask better questions, they can ensure more **clarity** over projects. And, by recognizing that projects that perform poorly are not 'black swans,' but the consequence of errors and poor planning and execution, leaders can build more **predictability** into governance and management.

Setting up the right governance structure

- A project charter defines objectives and reporting, separates decision-making and responsibility, and empowers the project team with delegated authority.
- Stage gates provide a roadmap to success.
- The project board should be carefully selected and well-qualified, with governance beginning at the advanced planning phase.

Taking a life cycle approach

- Create whole-life cost and operational objectives.
- Consider the longer-term risk transfer opportunities.

Awareness of commonly occurring issues

- Project objectives should be aligned with the owner's business goals and with those of any partners and suppliers; contracts should focus on performance and output.
- Key risks should be identified and monitored, with potential risk sharing with partners.
- An advanced plan involves a wide range of internal and external personnel, and considers wider stakeholder needs.
- Build a highly qualified team, with a great director.
- Ensure a clear and fair contracting process, with collaboration between owners and bidders and, possibly, an independent fairness auditor.

Receiving, and acting on, the right information

- Create effective monitoring and reporting systems, with use of dashboards showing performance versus plan.
- Reports should be consistent, and provide early warnings and offer contingencies.
- Consider independent assurance over project delivery.

How KPMG can help

with planning and delivering major capital projects

KPMG has identified the planning and delivery of major capital projects as one of the great global challenges of the 21st century. The firm has made it a top priority and invested heavily in growing its competencies. KPMG has played a central part in the Canadian experience, both in an advisory capacity and as external auditor, and has accumulated valuable lessons and good practices, which can be shared with organizations involved in major capital projects. KPMG professionals are leaders in the acceleration of infrastructure, which has helped to stimulate internationally-acclaimed innovation in project planning, procurement and oversight.

Services provided by KPMG firms

We can help Boards and Executive Management:

- Establish effective project governance to provide clarity and transparency in oversight and certainty for project delivery.
- Make the right strategic and investment decisions by developing a strong business case, analyzing project and procurement options.
- Develop mitigation strategies to manage potential project risks and ensure compliance.
- Manage a fair, competitive, and effective procurement process.
- Anticipate and navigate contractor and service provider issues.
- Develop and implement a robust stakeholder engagement strategy.
- Provide periodic independent project assurance.

Climbing the curve, KPMG's 2015 Global Construction Survey

About the 2015 survey

KPMG's ninth Global Construction Survey looks at the challenges facing major project owners as they strive to achieve greater maturity in preparation, risk, controls and governance, performance and relationships.

KPMG interviewed 109 executives from a wide range of public and private companies worldwide, with annual turnover of less than US$1 billion to more than US$5 billion, covering sectors such as energy and natural resources, healthcare, manufacturing, retail, mining, technology and government.

Highlights

Maturity in preparation: planning and prioritizing appear to be rigorous

- Most respondents say their organizations use formal screening, prioritizing and approval process for projects, including financial and risk analysis
- 30 percent favor design-bid-build; 32 percent use engineer-procure-construct (EPC)–both of which shift project risk onto the contractor

However, talent shortages remain a challenge

- 44 percent struggle to attract qualified craft labor and 45 percent lack planners and project managers
- 69 percent hire external resources equivalent to more than 5 percent of the total workforce.

Maturity in risk, controls and governance: owners express confidence in their project controls

- 64 percent state that their management controls are either 'optimized' or 'monitored'
- 74 percent feel investment in controls and governance has reduced costs

However, half of the respondents say their organization has yet to introduce an integrated Project management information systems (PMIS).

- 32 percent of those that use PMIS have yet to integrate it with their accounting and procurement software.

Maturity in performance: owners continue to experience project failures

- 53 percent suffered one or more underperforming projects in the previous year - for energy and natural resources and public sector respondents the figures were 71 percent and 90 percent respectively
- Only 31 percent of all respondents' projects came within 10 percent of budget in the past 3 years
- Just 25 percent of projects came within 10 percent of their original deadlines in the past 3 years

There is also a mixed approach to contingency planning:

- Only 30 percent perform quantitative risk analysis to calculate contingencies
- 49 percent use both a project-level contingency and a management reserve.

Maturity in relationships: the push towards contractor collaboration may need more impetus

- Just 32 percent have a high level of trust in their contractors
- 69 percent say poor contractor performance is the single biggest reason for project underperformance

Contracts continue to emphasize the divide between contractors and owners

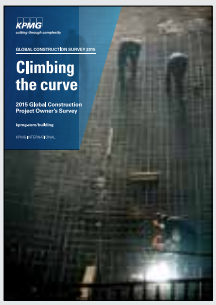
- 58 percent are lump sum (fixed price) contracts
- 72 percent hold full competitive tenders when awarding contracts, which maximizes risk transfer and further reflects a lack of trust.

Bookshelf

To access the publication listed here, visit: **www.kpmg.com/infrastructure** or email us at: **infrastructure@kpmg.com**

GLOBAL CONSTRUCTION SURVEYS SERIES

KPMG conducts the Global Construction Survey to monitor Engineering & Construction issues and provide timely summaries and insights to help professionals make more informed business decisions in today's rapidly changing environment.



2015 Global Construction Survey: Climbing the curve

In the ninth edition, we focus on the challenges facing owners as they strive for a balance between power, responsibility and control. This report gauges the views of over 100 senior executives of leading private and public organizations from around the world.

2013 Global Construction Survey:

The 2013 report catches the industry in a more upbeat mood after gauging the views of 165 senior executives of leading Engineering & Construction firms from around the world to determine industry trends and opportunities for growth.

2012 KPMG Global Construction Survey: The great global infrastructure opportunity

The 2012 survey focuses on the insatiable demand for energy and infrastructure in all forms, and the resulting fundamental shifts in focus for nearly all E&C firms.

2010 KPMG Global Construction Survey: Adapting to an uncertain environment

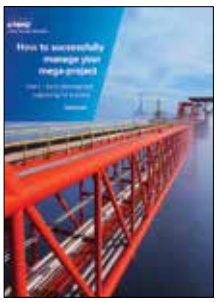
The 2010 survey highlights the cautiously optimistic outlook of many E&C companies about their immediate prospectus and discusses key industry issues and the measures adopted to seize the new opportunities identified.

MAJOR PROJECTS THOUGHT LEADERSHIP

KPMG's Infrastructure and Major Projects Advisory professionals conduct research and develop thought leadership for a variety of clients and industry leaders. This information focuses on current issues facing infrastructure owners and contractors in a rapidly changing construction environment, provides key insights and tangibly contributes to their decision making procesess.

Preventing black swans: Avoiding major project failure

This paper highlights characteristics of major capital projects that can lead to catastrophic failure for owners and contractors, alternative approaches for screening projects, and red flags and triggers for early identification of troubled projects.



How to successfully manage your mega-project

Effective management of mega-projects relies on three key concepts: early planning and organizing, stakeholder communication and project controls integration, and continuous improvement. This three part series covers best practice for managing mega-projects.

Integrated project delivery: Managing risk and making it work for all parties

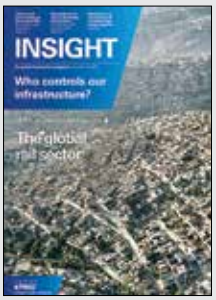
This paper provides an overview of the current practices and challenges involving IPD and its evolving risk profile. It also offers guidance on how to prepare an IPD strategy and describes the tools and methodologies currently used to facilitate successful IPD.

Next wave: Continuous monitoring and compliance

This report reviews the framework for developing a continuous project monitoring and compliance program that integrates the positive features of project performance monitoring, project risk and controls monitoring, and computer aided auditing.

INSIGHT: THE GLOBAL INFRASTRUCTURE MAGAZINE

Insight is a semi-annual magazine that provides a broad scope of local, regional and global perspectives on many of the key issues facing today's infrastructure industry.



Issue No. 7 – Who controls our infrastructure?

This edition of Insight explores some of the big challenges and trends influencing the debate around infrastructure control. It also includes our Special Report on Rail, a sector that is often at the epicenter of the debate around control.

Issue No. 6 – Population

This edition of Insight takes a closer look at the link between unprecedented population changes and demographic shifts currently underway and the infrastructure needed to meet these challenges.
It also includes a Special Report on Asia Pacific's infrastructure market.

Issue No. 5 – Resilience

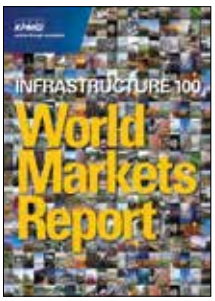
This edition of Insight explores some of the world's most impactful stories of resilience. It also includes an exciting Spotlight Special Report on the important changes and opportunities within Latin America's infrastructure market.

Issue No. 4 – Megaprojects

This edition of Insight magazine explores some of the key challenges and opportunities impacting megaproject delivery, and includes a Spotlight Special Report on Africa's infrastructure market, a key growth area.

KPMG GLOBAL INFRASTRUCTURE PUBLICATIONS AND REPORTS

KPMG member firms are priviledged to be involved in many of the exciting changes that are happening in every corner of the world, across many sectors and at various stages of the lifecycle of infrastructure. We continuously seek to share the insights we are gaining in the process.



Infrastructure 100: World Markets Report

In the third Infrastructure 100, KPMG highlights key trends driving infrastructure investment around the world and a global panel of independent industry experts identify 100 of the world's most innovative, impactful infrastructure projects.

KPMG Toll Benchmarking Study 2015: An evolution in tolling

This study helps toll road owners, operators and governments compare key metrics such as cost to collect and operational efficiency. Based on in-depth survey data collected from more than 40 tolling agencies world-wide, it provides organizations with an unprecedented view into the challenges, risks, costs and opportunities facing the tolling sector today.

ISO 55001: A new era for asset management

This paper discusses the benefits of an integrated holistic approach to asset management, looks at the requirements of ISO 55001 and explains how companies comply with the standard and improve asset performance.

SPECIAL EDITION: Emerging Trends in 2015

In the complex world of infrastructure, hot topics of conversation and industry 'buzz' are constantly changing. *Foresight: A Global Infrastructure Perspective* is a series of articles that feature our take on some of the hot topics, trends and issues facing our firms' clients.

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