

Summary of Findings from November 27, 2024, Integrated Infrastructure Services Report IIS02537

Program and Design Scope

Infrastructure is built to provide service, and its complexity influences its cost. The size of the facility, specialized spaces, specific program needs, legislated requirements and service levels impact a capital project's final budget. Integrated facilities, such as large recreation centres, have other services, such as libraries, additional community spaces and commercial retail areas, which add to the cost and complexity of a facility.

When comparing project budgets, overall costs for a facility project may include different items. When other aspects of the program are considered, the facility itself may only represent 70 to 90 percent of the total budget. The budget also may or may not include other tangible costs such as fleet, specialized equipment, land, or other off-site service-related expenses. Public infrastructure generally has a significantly longer design and service life than other commercial infrastructure, as evidenced by the legacy and historic buildings in the City's asset portfolio.

Sustainability and Climate Resilience Goals

The City of Edmonton has ambitious sustainability and climate resilience goals, reflected in its evolving policies and building standards. Meeting these requirements often requires the use of newer, more expensive technologies and building materials. For instance, the shift towards emissions-neutral standards in 2021 impacted the design and cost of projects such as the Windermere Fire Station. However, the result is an environmental impact that supports sustainability and climate resilience goals with significantly reduced energy consumption and net zero greenhouse gas emissions.

Capital investments in sustainability and climate resilience assume a payback in operations and maintenance over the total lifecycle of the asset. The analysis conducted suggested this could be an incremental capital cost increase of up to 15 per cent. The payback period for this capital cost increase may vary depending on the type of building design and the public service being delivered. When taking into account the total cost of ownership, the payback period for investments like solar photovoltaic microgeneration, local ground source heat pumps, or enhanced building envelope upgrades can generally vary from 10 to 25 plus years.

Complexity of Policies, Bylaws, Standards and Regulatory Responses

The City of Edmonton has a comprehensive and detailed set of policies, bylaws and standards that govern the design and construction of its facilities (see Attachment 2). These regulations ensure high-quality construction, public safety and compliance with various environmental and accessibility requirements. However, this complexity can also lead to higher administrative, legal, and design costs than municipalities with less stringent regulations.

This should not suggest that these additional policies, bylaws and standards are not effective, necessary, or do not provide public value. They are the product of institutional experience and lessons learned from past projects and help to create alignment between Administration, Council and the public about their unique values, priorities and expectations for the project.

Business Partner Involvement

The City of Edmonton highly emphasizes collaboration with business partners throughout the project development process. Business partners are an inclusive term representing the operators, maintainers, users and other interested parties that may have a vested interest in the outcomes of a project. This ensures that all design requirements are met, future operating costs are considered, and the facility meets the community's needs. This collaborative approach can lead to more complex and expensive designs upfront. Still, it enhances the long-term value and benefits of the facility by incorporating user feedback and expertise.

Collaboration with business partners mitigates risk by establishing a higher degree of confidence in ensuring that the facility meets the service provider's long-term operational needs and avoids any rework over the facility's lifecycle.

Timing and Market Escalation

Construction projects are highly susceptible to economic fluctuations. Unexpected events, such as the COVID-19 pandemic and tariffs, can trigger significant cost escalations due to supply chain disruptions, labour shortages and inflation. The Building Construction Price Index (BCPI) highlights the impact of such events, with a notable surge in costs in 2021 and 2022. Projects with longer timelines are particularly vulnerable to these market volatilities.

It is important to consider the timing of projects when making cost comparisons between projects that span different time periods. Normalizing costs to a single consistent year ensures the analysis is more equitable and fair. For example, a

project built after the COVID-19 pandemic may be up to 30 per cent more expensive than a comparable project built before the pandemic.

Longer construction projects extend over several years, exposing them to broader market fluctuations. This significantly increases the risk associated with cost forecasting. For instance, procuring lockers at the project's outset (three years before installation) necessitates either:

Immediate Purchase:

This requires significant upfront capital expenditure and storage costs, tying up funds that could be used elsewhere. It also carries the risk of damage, obsolescence, or changing project specifications/needs, resulting in waste.

Just-in-Time Delivery:

This approach relies on future market stability. However, as the Building Construction Price Index (BCPI) demonstrates, costs can surge dramatically. Delaying procurement until needed exposes the project to potentially inflated prices, directly impacting the budget. Furthermore, contractors and subtrades often hedge their risk in volatile markets by adding significant cost premiums to future supply and installation quotes, anticipating potential price increases. This further exacerbates the financial impact on the owner.

Essentially, the longer the project, the greater the exposure to the time value of money and the increased probability of unforeseen market volatility affecting material and labour costs. This necessitates a larger risk contingency to mitigate these uncertainties.