Integrated Infrastructure Services

Infrastructure Delivery & Infrastructure Planning and Design

Edmonton

Cost Benefit Analysis and Cost Drivers on Comparative Capital Projects

Special Infrastructure Committee
June 25, 2025

IIS02537rev

Previous Council / Committee History

Motion 1 - approved June 11/12 Council Meeting

“That Administration provide a report with a cost benefit analysis and cost drivers that influence comparative capital projects including Codes, Policies, Bylaws, Program or other factors, with a focus on Facilities and Renewal Projects; including a direct cost breakdown comparison of current fire hall and recreation centre projects completed in Edmonton and within regional municipalities.”

IIS02537 Report presented to Executive Committee on November 27, 2024

Previous Council / Committee History

Motion 2 - approved November 27, 2024 Executive Committee

"That the November 27, 2024, Integrated Infrastructure Services reports IIS02537 - Cost Benefit Analysis and Cost Drivers on Comparative Capital Projects and IIS02538 - Capital Project Planning and Design - Processes and Resources be referred back to Administration to:

- *establish baseline operational and capital costs for the selected projects outlined in the November 27, 2024, Integrated Infrastructure Services report IIS02537;*
- *provide the incremental cost and expected operational efficiencies associated with each cost driver outlined in Attachment 2 of the November 27, 2024, Integrated Infrastructure Services report IIS02537"*

Due Date: June 18, 2025, Executive Committee

Case Study - Fire Station

- Analysis of ‘Basic’ design vs ‘Full City Policy’ design
    - Identifying the cost difference between designs for
        - City Bylaws and Policies
        - Design Guidelines and Standards
        - Functional Program and End User Requirements
        - Operations and Maintenance
- Case Study results cannot be generalized but are directional and confirm trends observed by Administration

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Why Fire Stations?

- Chosen as a proxy to represent other City facilities
- Generally consistent / common functional program - including well defined standards and legislation
- Built with regular frequency - in the City and elsewhere
- Recent projects to draw experience and cost data from
- Interest from external stakeholders linked to Off-site Levy Bylaw 19340

Basic Design

- Meets Building & Energy Codes
- Meets basic functional program
- Basic envelope
- Basic mechanical and electrical systems and equipment.
- Equipment located externally where possible.

Full City Policy Design

- Meets/Exceeds Building & Energy Codes
- Meets enhanced functional program
- Improved envelope to lower energy consumption.
- Fully electrical, highly efficient systems to meet GHG emissions neutrality
- Enhanced architectural design
- Enhanced equipment specifications located primarily internally for speed, ease and safety of maintenance

Summary of Analysis

- City policies, standards and bylaws can contribute to an increased construction cost to facility projects - Case Study around 50%.
- Four City policies, standards, bylaws and practices are estimated to represent 98% of the cost difference between the station designs.
- Higher ongoing operational costs when applying policies.
  - Challenges previous projections of financial payback.
- The Climate Resilience Policy application results in significant improvements (reductions) of energy consumption and greenhouse gas emissions, as intended.

Benefits of Full Policy Design

- Integrated and efficient delivery of complex services.
- Enhanced workplace safety.
- Improved operational reliability.
- Architecturally aligned with the surrounding urban environment.
- Lower GHG emissions and positive environmental impact.
- Some benefits extend beyond the term of cost analysis chosen (>25 years)

Cost and Energy Analysis

	Basic	Full-Policy
Direct Construction Cost (+/-10%)	$13,347,000	$21,039,800
Operational Costs Including utility cost (est. 25 years)	$3,944,000	$5,587,000
Gross Energy Consumption (est. yearly)	514,000 ekWh	272,000 ekWh
Greenhouse Gas Emissions (est. yearly)	75,900 kg CO2e	0 kg CO2e

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Cost Drivers - Top 4

	Direct Construction Cost Difference
Climate Resilience Policy C627	$3,750,000
Fire Rescue Service Delivery Policy C523A	$1,738,000
City of Edmonton Facility Construction Standards	$1,192,000
Edmonton Design Committee Practices	$876,000

Council Commitment to Climate Resilience

- 2018 Edmonton Declaration
- 2019 City Council declared a climate emergency
- 2020 The City Plan Greener as We Grow
- 2021 Climate Resilience Policy C627 was approved
  (report: UFCSD00209, Updated Energy Transition Strategy and Action Plan)
  - Targets, in alignment with national and international commitments, to reduce greenhouse gas emissions and adapt to climate change.
  - Sustainability requirements for City buildings includes integration of climate adaptation planning and new City buildings are to be emission neutral
  - Expected increased project capital costs and decreased operational cost savings over the lifecycle of the building

Climate Resilience Policy C627

- Sustainable and resilient design and construction is the most notable cost driver.
- Operational costs higher due to utilities and lifecycle replacement.

Next Steps:

- Regularly scheduled review of the Policy is underway
- Potential to review the prescriptive direction of emissions neutrality and the intent of the exemption process
- Update Policy is anticipated to be presented to Council in 2026

City of Edmonton Facility Construction Standards & Fire Rescue Services Delivery Policy C523A

- Some requirements translate to increased facility size which translates to increased capital costs
- Other requirements are for enhanced systems
- Requirements support maintainability, durability, secuirity and operational efficiencies

Next Steps:

- Ongoing implementation of lessons learned
- Review underway of the Fire Rescue Services facility functional program
- Regular updates to the Facility Construction Standards

Edmonton Design Committee Practices

- Goal is to maintain and improve the quality of the City's urban design and level of architecture.
- Primarily affects building exterior envelope.

Next Steps:

- Ongoing review of the Edmonton Design Committee process and bylaw.
- Could include clarifying mandate, applicability and jurisdiction.
- Outside of EDC process, Administration may consider a standardized pallet of materials and forms for certain archetypes.

Overall Summary

- Alignment between the results of the November 2024 Comparative Analysis by Colliers and June 2025 Case Study by S2 Architecture

- Cost drivers include program and scope of the facility, sustainability requirements and City of Edmonton standards for design and construction

- City Policies, Standards, Bylaws and Practices deliver
  - Enhanced Energy Efficiency and Sustainability
  - Improved Reliability and Maintainability
  - Elevated Aesthetic Complementing Urban Environment
  - Enhanced Service Delivery Benefits

Lessons Learned and Active Projects

- Refinement of the program
  - Adjusting the size and scale of facilities to the service level
- Adjustment to design
  - Simplified designs using locally sourced, robust and durable materials
- Impact of sustainability
  - Utilize developing sustainability expertise and improved technologies to reduce costs
  - Evaluate alternative ways to meeting emission neutrality

Thank you.

Questions?

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