5B

HALTON REGION
Integrated Master Plan

APPENDIX 5B

Transportation Costing Framework Technical Memo

Halton Region

Integrated Master Plan

Water, Wastewater and Transportation

Transportation Costing Framework Technical Memo

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Halton REGION

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1.0 Introduction

Halton Region has undertaken an Integrated Master Plan (IMP) to develop the next region-wide Water, Wastewater and Multi-Modal Transportation Master Plans. The outcome of this work is a long-term integrated servicing strategy for Regional infrastructure to accommodate future growth to 2051. This provides the strategies and tools required to meet the future water, wastewater, and transportation infrastructure needs beyond 2031.

The IMP ensures that water and wastewater infrastructure and services are effectively planned and implemented to maintain appropriate levels of service for residents and businesses as the Region continues to grow. In parallel, the development of a robust multimodal transportation network supports Halton Region's long-term vision by accommodating increasing travel demand and enhancing connectivity. Together, these infrastructure strategies are being developed to align with Local growth priorities and remain flexible to adapt to evolving needs through Halton's Enhanced Growth Monitoring process.

A key component of this IMP is the development of a consistent and transparent costing framework. The IMP costing framework builds upon the methodology used in the Region's 2022 Development Charges (DC) Update, while incorporating refinements, for example updated unit rates.

This Technical Memorandum provides an overview of the costing framework for transportation infrastructure projects. A separate memorandum will address the costing framework for water and wastewater infrastructure projects.

1.1 Master Plan Level Cost Estimates

Cost estimates evolve over the course of a project as the level of definition increases. At the IMP stage, estimates are generally considered Class 4 or Class 5 under the Association for the Advancement of Cost Engineering (AACE) classification system, with the majority of estimates prepared at the Class 4 level. These estimates provide order-of-magnitude costs that are suitable for long-range planning but carry a wider accuracy range given the limited project definition available at the planning stage.

As projects advance through the MCEA study process, preliminary design, and detailed design, the level of project definition increases and the accuracy of cost estimates improve.

This relationship between project definition and estimate accuracy is illustrated in **Figure 1**.

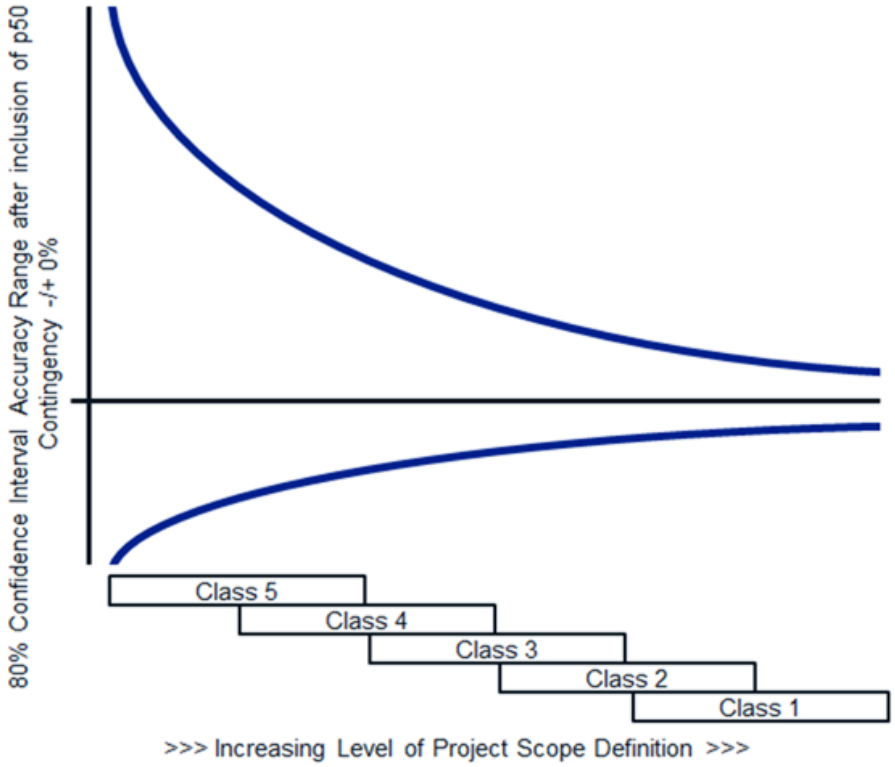

Figure 1-1 – Cost Estimate Accuracy vs Level of Project Definition

Source : AACE® International Professional Guidance Document No. 01. GUIDE TO COST ESTIMATE CLASSIFICATION SYSTEMS

1.2 Cost Estimates Classification

To provide consistency and clarity, the IMP cost estimating classifications generally follows the AACE (Association for the Advancement of Cost Engineering) International cost estimate classification system. This framework defines the level of accuracy that can be expected at different stages of project development, based on the maturity of project definition, the intended purpose of the estimate, and the methods used to prepare it.

Table 1 summarizes the five estimate classes based on the AACE International Cost Estimate Classification System, including their typical purpose, methodology, and expected accuracy ranges.

Table 1-1 – Cost Estimates Classification

Class	Project Definition (% of design complete)	Typical Use	Methods Used	Expected Accuracy Range
Class 5 – Order of Magnitude	0%–2%	Early screening, long-range planning, feasibility studies	Parametric models, capacity factors, analogy to past projects	-20% to -50% / +30% to +100%
Class 4 – Conceptual	1%–15%	Feasibility studies, concept evaluation, preliminary business planning	Parametric models, some unit costs, factored estimates	-15% to -30% / +20% to +50%
Class 3 – Budget	10%–40%	Budget authorization, initial cost control	More detailed unit costs, partial quantity take-offs, vendor budget quotes	-10% to -20% / +10% to +30%
Class 2 – Control	30%–75%	Project control during design, detailed budgeting	Detailed unit costs, quantity take-offs, vendor/fabricator quotes	-5% to -15% / +5% to +20%
Class 1 – Definitive	65%–100%	Tendering, contract award, final control estimate	Detailed unit pricing, contractor bids, fully developed quantities	-3% to -10% / +3% to +15%

2.0 Transportation Cost Estimation Framework Overview

The following sections describe the costing framework developed for transportation projects in the IMP. The framework describes the cost estimate components that together form the total project cost, including preliminary planning, environmental assessments, detailed design, property, utility and construction for roadway, active transportation and Transit Priority Corridor (TPC) infrastructure. In addition, updated unit rates reflecting recent market conditions and available tender data have been incorporated to represent current construction trends.

2.1 Transportation Costing Methodology

The costing methodology for transportation projects follows a structured, benchmark-based approach. The process begins with updating unit costs covering roadworks, drainage, structures, property, utilities, and other project components, to reflect current construction market conditions. Using these updated unit rates, benchmark costs are developed for each roadway cross-section based on typical design standards and construction elements.

For each project, the appropriate benchmark cost is selected according to the roadway improvement and applied to the project length to establish the Base Construction Cost (Base Construction Cost = Benchmark Cost × Project Length). This base value is then refined based on individual corridor improvements to determine the overall construction cost. The total project cost is subsequently established by adding other cost components, including environmental assessment costs, property requirements utility relocation, and the costs associated with active transportation and TPC infrastructure. Collectively, these steps provide a master planning-level transportation project cost.

2.2 Cost Estimates Components

As outlined in Section 2.1, the transportation costing framework is organized into a series of components that together form the total project cost. These components capture the full range of project activities from early planning through construction, ensuring that estimates reflect both direct construction costs and the supporting factors required to implement projects.

The key cost estimate components for transportation projects include:

- **Preliminary Planning** – Costs for feasibility or early planning studies that define project scope.
- **Environmental Assessment (EA)** – Costs associated with Schedule B and Schedule C Class EA studies.
- **Detailed Design** – Cost for detail design and related activities required to advance a project to construction.
- **Property** – Cost for land acquisition
- **Utility** – Cost for relocation of utilities

- **Construction** – Cost to implement a project, including base construction and other infrastructure items such as structures, culverts, bridges, grade-separations, intersection improvements, etc.
- **Active Transportation Infrastructure** – Cost for active transportation infrastructure including on-road and off-road facilities as well as other items such as protected intersections, pavement markings and signage
- **Transit Priority Corridor Infrastructure –** Cost for Transit Priority Corridor infrastructure such as queue jump lanes, transit signal priority technology, pavement markings and signage

The detailed breakdown of transportation cost estimate components applied in the IMP is summarized in **Table 2**.

Table 2-1 – Transportation Cost Estimate Components

Component	Approach
D.1. Preliminary Planning	
Pre-Planning / Feasibility Study	Lump sum - $500,000
D.2. Environmental Assessment	
Environmental Assessment	Schedule B - $1,000,000 Schedule C - $1,500,000
D.3. Detailed Design	
Detailed Design Study	15% of Total Construction Cost and Utilities Cost
D.4. Property	
Property/Land Acquisition	Based on unit cost per land use categories
D.5. Utility	
Utilities Relocation Cost	Based on unit cost per km
D.6. Construction	
D.6.1. Project Set-Up & Management	Cost per lane-kilometre of roadway x project length
D.6.2 Base Construction Cost	Cost for other construction items structures, culverts, bridges, grade-separations, intersection improvements, etc.
D.6.3. Other Items	Cost for other construction items
Total Construction Cost	***15% contingency***
D.7. Active Transportation Infrastructure	
Active Transportation Infrastructure	Unit cost for proposed facility type and project length *15% contingency*
D.8. Transit Priority Corridor (TPC) Infrastructure	
Transit Priority Corridor (TPC) Infrastructure	Unit cost for proposed facility type and project length *15% contingency*

2.3 Unit Rates Update

Unit rates are a fundamental input to project cost estimates, representing the cost of constructing a unit length of transportation infrastructure.

Recent tender information served as the primary basis for rate development. All values were normalized to 2025 dollars for consistency across project types.

3.0 Conclusion

Overall, the costing framework developed for the Integrated Master Plan provides a clear and consistent basis for estimating transportation infrastructure costs at the master planning level. The framework reflects the appropriate level of project definition available at this stage and applies a structured approach that considers project complexity, construction environment, project type, and updated unit rates.

By establishing a consistent methodology across the capital program, the framework supports informed decision-making, long-range financial planning, and prioritization of infrastructure investments to support growth to 2051. As projects advance through subsequent planning, environmental assessment, and design stages, the framework is intended to be refined using more detailed, project-specific information, ensuring that cost estimates continue to evolve alongside project definition.