Attachment 1

Preparation of Construction Cost Index Study

Final Report

April 1, 2026

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1 Introduction

HDR has been engaged by the City of Vaughan's Development Engineering Department (the 'City') to support the development of cost projections for key municipal infrastructure through to 2028. This initiative focuses on critical components such as municipal roads, water, wastewater, and stormwater servicing, as well as landscaping and electrical infrastructure. The objective of this work is to assist the City in administering development agreements with private landowners to secure municipal infrastructure. As part of this effort, HDR is undertaking a Construction Cost Index Study to provide informed guidance on anticipated cost escalation over the next three years. This report outlines the study's methodology and presents the findings.

2 Methodology

The methodology for developing cost projections includes:

- Review of Current State
    - Review of the Subdivision Agreement Guide; Development Agreement Guide; DE: Subdivision, Spine, & Development Agreements: Current State Process Map (October 2024)
    - Assess City's current infrastructure asset categorization and costing approaches based on the Subdivision and Development Agreement Guide
    - Review of tender data and unit costs from 2021-2024. Tender data prior to 2021 was excluded due to incompleteness or insufficient detail for this study.
    - Determine historical unit costs and analysis of cost trends
    - Update costing model to determine benchmark costs for 2025 dollars based on the costing approach
    - Review of standards including City of Vaughan's Engineering Design Criteria & Standard Drawings (2020) and Consolidated Linear Infrastructure Environmental Compliance Approvals Permit
- Review of Future State
    - Forecast the unit costs through 2028 using cost projections from S&P Global Market Intelligence (S&P Global) forecast series
    - Assess price trends for key infrastructure variables over the 2025–2028 period to develop cost escalation indices
    - Conduct probabilistic risk analysis to address the inherent uncertainty in economic forecasting

3 Review of Current State

3.1 Cost Data Structure and Organization

The City's current subdivision agreement guide (the 'Guide') identifies 20 categories of key assets required by private landowners to provide a cost estimate as part of the subdivision agreement process with the City. Based on discussions with City staff, the current Guide presents challenges due to lack of granularity in the cost categories. HDR explored opportunities to update the Guide and proposed a breakdown that reflects a broader cost framework, organized first by infrastructure categories (water, roads, storm, pathway, etc.), followed by subcategories (linear, vertical, urban, rural), asset type and material specification. Each item is accompanied by a clear description of its attributes and recommended units of measure, enabling consistent interpretation and application across projects.

This enhanced cost structure supports more precise cost tracking, enables detailed comparative analyses across the City's Development Engineering portfolio and improves transparency in developer bid evaluation. The items identified in the enhanced cost structure have been carried forward in the costing.

3.2 Data Review

The City provided HDR with recent tender costs from development projects within Vaughan spanning between 2021 to 2024. Tender costs are contractor bid estimates to construct projects. Tender data prior to 2021 was excluded due to incompleteness or insufficient detail for this study. HDR reviewed these estimates and extracted itemized costs for typical new development project items. A total of 15 cost estimates were reviewed from 2021 to 2024, comprising the following:

- 2021: 1 tender
- 2022: 1 tender
- 2023: 7 tenders
- 2024: 6 tenders

HDR estimates were included for unit items in the enhanced cost structure that were unavailable from the tender data. The estimates were based on alternative sources including HDR's costing experience for several municipalities across the Greater Toronto Area.

3.3 Unit Prices ($2025)

Unit prices were developed in 2025 dollars (CAD) to cost out infrastructure identified in the Guide. For historical data collected from different years, price indices were applied to escalate costs to 2025.

3.3.1 Price Indices

Historical S&P Global series price index data were used to escalate prices to the 2025 year. Several categories of price indices were identified to capture the broad range of materials/labour that impact the price of different unit items. The price indices and total increase by category used in the study are provided in **Table 3-1**.

As illustrated in the table, most cost items saw significant price increases in 2022, coinciding with the COVID-19 period. For example, the producer price index for metal valves and pipe fittings increased by nearly 10 percent that year. Asphalt experienced an even sharper increase, surging by 34 percent in 2022, largely driven by socio-political and economic disruptions. While some categories saw price reductions between 2022 and 2025, these declines were not substantial enough to reverse the overall upward trend observed during that period.

Table 3-1. Historical Price Indices

		Index					Total Increase			
Cost Category (S&P Global)	**Source***	**2021**	**2022**	**2023**	**2024**	**2025**	**2021 to 2025**	**2022 to 2025**	**2023 to 2025**	**2024 to 2025**
Asphalt	StatsCan	107.7	144.6	129.5	123.9	126.7	18%	-12%	-2%	2%
Earthworks	StatsCan	102.7	110.6	114.3	116.4	116.4	13%	5%	2%	0%
Concrete	StatsCan	101.7	113.0	126.3	133.1	141.2	39%	25%	12%	6%
Masonry	StatsCan	101.6	112.6	125.6	133.0	140.3	38%	25%	12%	5%
Metals – Valves & Fittings	StatsCan	103.5	113.3	120.5	126.9	129.6	25%	14%	8%	2%
Metals – Structural Steel	MEPS International Ltd	1,633.2	2,080.9	1,967.9	1,904.8	2,026.8	24%	-3%	3%	6%
Nonferrous Metals and Metal Products	StatsCan	147.5	144.8	144.8	158.4	166.0	13%	15%	15%	5%
Woods and Plastics	U.S. Bureau of Labor Statistics (BLS)	483.4	660.8	651.8	627.8	617.4	28%	-7%	-5%	-2%
Cloth	Intratec Solutions LLC	164.1	220.5	203.8	169.9	165.9	1%	-25%	-19%	-2%
Finishes	U.S. Bureau of Labor Statistics (BLS)	410.1	523.4	561.9	567.3	589.8	44%	13%	5%	4%
Labour	StatsCan	41.0	42.9	44.1	45.8	47.6	16%	11%	8%	4%

*The source listed refers to the primary source of the data, as provided by S&P Global (secondary source).

3.3.2 Greenfield Unit Costs

Relevant items from recent tender data (**Section 3.2**) were summarized and indexed to 2025 dollars using price indices (**Section 3.3.1**) to develop unit costs. All costs are for greenfield conditions. A summary of unit costs is provided in **Table 3-2** for water infrastructure items and **Table 3-3** for road infrastructure items. For some items, costs are application specific and can vary depending on project context. These items are presented as a range as shown in **Table 3-4**.

Items unavailable from tender data (**Section 3.2**) were costed based on other available sources, including the Vaughan 2022 DC (developed by HDR), RS Means Online Data (construction industry database), and input from HDR subject matter experts (SMEs).

General notes include:

- All costs are for supply and installation and are inclusive of overhead.
- All costs (including those developed based on tender data) were reviewed by HDR SMEs.

Water project unit rates from the City of Vaughan Integrated Water Master Plan 2023 (IUWM), and Civica Infrastructure 2023 costing sheets were also reviewed. The watermain and gravity pipe installation rates from the IUWM are higher than the HDR estimates primarily due to broader inclusions (e.g., restoration, trench support/shoring, traffic control, excess soil management, dewatering, valves/appurtenances, maintenance holes). HDR estimates for pipe-lay unit rate includes only pipe materials, trench excavation, bedding, backfill, and joints. Valves, maintenance holes, tees, service connections, connections to existing mains, and final surface restoration are priced separately. Both costs are reasonable given their stated inclusions and assumptions. Comparison of applicable rates is included in **Table 3-5.**

Table 3-2. Summary of Greenfield Water Infrastructure Unit Costs ($2025)

ID	Item	Unit	Unit Cost ($2025)	Unit Cost ($2025) Tender Data	Cost Category (S&P Global)	Notes
Water Distribution Main Pipe (Greenfield Open Cut Installation)						Water distribution main (pipe) unit rates include pipe material, trench excavation, bedding, backfill, and joints. Rates are based on standard depth installation and assume rural/greenfield open cut installation.
1	150mm PVC DR18 Watermain	m	$200	$163.91	WOODS & PLASTICS	HDR estimates that unit cost is slightly higher than average tender rate.
2	200mm PVC DR18 Watermain	m	$250	$208.27	WOODS & PLASTICS	HDR estimates that unit cost is slightly higher than average tender rate.
3	250mm PVC DR18 Watermain	m	$316	$315.88	WOODS & PLASTICS	
4	300mm PVC DR18 Watermain	m	$380	$329.11	WOODS & PLASTICS	HDR estimates that unit cost is slightly higher than average tender rate.
5	400mm PVC DR18 Watermain	m	$606	$606.14	WOODS & PLASTICS	
Control Valve Chamber (with Drain Valve)						
6	150mm GV	ea	$6,246	$6,246.23	CONCRETE	
7	200mm GV	ea	$10,741	$10,741.00	CONCRETE	
8	250mm GV	ea	$13,129	$13,129.43	CONCRETE	
9	300mm GV	ea	$15,000	$12,956.19	CONCRETE	Tender data showed a lower unit cost for 300 mm gate valves compared to 250 mm, which was deemed unlikely. HDR adjusted the 300 mm rate upward to reflect expected pricing.
10	400mm GV	ea	$27,142	$27,141.74	CONCRETE	
Air Valve Chamber						
11	150mm AV	ea	$6,000	No Tender Data	CONCRETE	No Tender Data or RS Means data available. HDR estimates that unit cost is comparable to same size GV/Chamber.
12	200mm AV	ea	$10,000	No Tender Data	CONCRETE	
13	250mm AV	ea	$13,000	No Tender Data	CONCRETE	
14	300mm AV	ea	$15,000	No Tender Data	CONCRETE	
15	400mm AV	ea	$27,000	No Tender Data	CONCRETE	
Drain Valve						
16	50mm DV	ea	$5,000	No Tender Data	CONCRETE	No Tender Data or RS Means data available. HDR estimate based on SME / industry experience.
17	100mm DV	ea	$7,500	No Tender Data	CONCRETE	
Combined Control/Air Valve Chamber						
18	150mm GV-AV	ea	$8,120	No Tender Data	CONCRETE	No Tender Data or RS Means data available. HDR estimates that unit cost is 30% higher than air valve (& chamber) alone.
19	200mm GV-AV	ea	$13,963	No Tender Data	CONCRETE	
20	250mm GV-AV	ea	$17,068	No Tender Data	CONCRETE	
21	300mm GV-AV	ea	$19,500	No Tender Data	CONCRETE	
22	400mm GV-AV	ea	$35,786	$35,786.47	CONCRETE	

Note: Water unit costs are estimated to be up to 100% higher in intensification areas (see **Section 3.3.3)**.

Table 3-2. Summary of Greenfield Water Infrastructure Unit Costs ($2025)

ID	Item	Unit	Unit Cost ($2025)	Unit Cost ($2025) Tender Data	Cost Category (S&P Global)	Notes
Tee (and connection into existing watermain where required)						
23	150x150 Tee	ea	$1,000	No Tender Data	METALS - VALVES & FITTINGS	HDR estimate based on RS Means unit cost for tee, plus additional amount for connection into existing main (based on SME / industry experience).
24	200x200 Tee	ea	$2,000	$3,762.71	METALS - VALVES & FITTINGS	Note, HDR estimate lower than tender average, and is based on RS Means unit cost for tee, plus additional amount for connection into existing main (based on SME / industry experience).
25	250x250 Tee	ea	$4,500	No Tender Data	METALS - VALVES & FITTINGS	HDR estimate based on RS Means unit cost for tee, plus additional amount for connection into existing main (based on SME / industry experience).
26	300x300 Tee	ea	$10,213	$10,213.20	METALS - VALVES & FITTINGS	
27	400x400 Tee	ea	$16,281	$16,281.23	METALS - VALVES & FITTINGS	
Water Service (including curb stop in box)						
28	25mm Type K standard residential service	ea	$1,802	$1,802.34	NONFERROUS METALS & METAL PRODUCTS	
29	100mm PVC water service	ea	$3,220	$3,220.49	WOODS & PLASTICS	
Fire Hydrant Assembly						
30	Fire Hydrant Assembly	ea	$8,000	$7,201.17	METALS - VALVES & FITTINGS	HDR estimates that unit cost is slightly higher than average tender rate, based on project/industry experience.
31	Anti-tampering device	ea	$277	$277.45	METALS - VALVES & FITTINGS	
Watermain Commissioning						
32	Watermain swabbing, flushing, testing including pressure and bacteriological.	m	$21	$20.92	LABOUR	
Sanitary Collector Main Pipe (Greenfield Open Cut Installation)						Sanitary collector main (pipe) unit rates include pipe materials, trench excavation, bedding, backfill, and joints. Minimum size 200mm, and minimum depth 2.8m cover, as per City Design Criteria. Rates are based on standard depth installation and assume rural/greenfield open cut installation.
33	200mm PVC DR 35 Sanitary Main	m	$240	$195.04	WOODS & PLASTICS	HDR estimates that unit cost is slightly higher than average tender rate.
34	250mm PVC DR 35 Sanitary Main	m	$260	$206.70	WOODS & PLASTICS	HDR estimates that unit cost is slightly higher than average tender rate, based on RS Means (supply and install) cost data estimate.
35	300mm PVC DR 35 Sanitary Main	m	$360	$295.80	WOODS & PLASTICS	
36	375mm PVC DR 35 Sanitary Main	m	$460	$342.47	WOODS & PLASTICS	
37	450mm PVC DR 35 Sanitary Main	m	$578	$577.79	WOODS & PLASTICS	
38	300mm Reinforced Concrete Sanitary Main	m	$400	No Tender Data	CONCRETE	No tender data. Estimate based on RS Means data (supply and install).
39	375mm Reinforced Concrete Sanitary Main	m	$450	No Tender Data	CONCRETE	
40	450mm Reinforced Concrete Sanitary Main	m	$510	No Tender Data	CONCRETE	

Note: Water unit costs are estimated to be up to 100% higher in intensification areas (see **Section 3.3.3)**.

Table 3-2. Summary of Greenfield Water Infrastructure Unit Costs ($2025)

ID	Item	Unit	Unit Cost ($2025)	Unit Cost ($2025) Tender Data	Cost Category (S&P Global)	Notes
Sanitary Maintenance Holes						
41	1200mm Precast Concrete Maintenance Hole	ea	$6,833	$6,832.69	CONCRETE	
42	1500mm Precast Concrete Maintenance Hole	ea	$12,302	$12,301.60	CONCRETE	
43	2400mm Precast Concrete Maintenance Hole	ea	$24,985	$24,984.90	CONCRETE	
44	3000mm Precast Concrete Maintenance Hole	ea	$34,354	$34,354.24	CONCRETE	
Sanitary Service Pipe						
45	100mm PVC Residential Service - Single	ea	$1,296	$1,296.40	WOODS & PLASTICS	
46	125mm PVC Residential Service - Double	ea	$1,450	$1,449.60	WOODS & PLASTICS	
47	Cleanout Fixture	ea	$639	No Tender Data	WOODS & PLASTICS	No tender data, unit rate based on HDR estimates from other GTA municipalities.
Storm Collector Main Pipe (Greenfield Open Cut Installation)						Storm collector main (pipe) unit rates include pipe materials, trench excavation, bedding, backfill, and joints. Minimum size 300mm, and minimum depth 1.2m cover, as per City Design Criteria. Rates are based on standard depth installation and assume rural/greenfield open cut installation.
48	300mm PVC DR 35 Storm Main	m	$260	$256.34	WOODS & PLASTICS	
49	375mm PVC DR 35 Storm Main	m	$330	$306.93	WOODS & PLASTICS	HDR estimates that unit cost is slightly higher than average tender rate. Rate chosen is an average of the tender rate and rate estimated from RS Means (supply and install).
50	450mm PVC DR 35 Storm Main	m	$400	$318.21	WOODS & PLASTICS	HDR estimates that unit cost is slightly higher than average tender rate (based on SME/industry experience).
51	300mm Reinforced Concrete Storm Main	m	$320	No Tender Data	CONCRETE	HDR estimate based on RS Means data (supply and install).
52	375mm Reinforced Concrete Storm Main	m	$360	No Tender Data	CONCRETE	HDR estimate based on RS Means data (supply and install).
53	450mm Reinforced Concrete Storm Main	m	$415	$360.80	CONCRETE	Tender cost updated based on HDR SME/industry experience.
54	300mm Non-Reinforced Concrete Storm Main	m	$260	No Tender Data	CONCRETE	HDR estimate based on RS Means data (supply and install).
55	375mm Non-Reinforced Concrete Storm Main	m	$330	No Tender Data	CONCRETE	HDR estimate based on SME/industry experience.
56	450mm Non-Reinforced Concrete Storm Main	m	$400	No Tender Data	CONCRETE	HDR estimate based on SME/industry experience.
Storm Maintenance Holes						
57	1200mm Precast Concrete Maintenance Hole	ea	$6,430	$6,430.19	CONCRETE	
58	1500mm Precast Concrete Maintenance Hole	ea	$10,031	$10,030.72	CONCRETE	
59	1800mm Precast Concrete Maintenance Hole	ea	$15,124	$15,124.06	CONCRETE	
60	2400mm Precast Concrete Maintenance Hole	ea	$25,000	$15,444.96	CONCRETE	HDR estimates significantly more than tender data and estimates similar to sanitary maintenance hole of same size.
61	3000mm Precast Concrete Maintenance Hole	ea	$49,394	$49,393.61	CONCRETE	
62	3600mm Precast Concrete Maintenance Hole	ea	$174,936	$174,935.81	CONCRETE	

Note: Water unit costs are estimated to be up to 100% higher in intensification areas (see **Section 3.3.3)**.

Table 3-2. Summary of Greenfield Water Infrastructure Unit Costs ($2025)

ID	Item	Unit	Unit Cost ($2025)	Unit Cost ($2025) Tender Data	Cost Category (S&P Global)	Notes
Storm Catchbasins (complete with frame, grates, leads)						
63	Single Catchbasin	ea	$6,430	$6,430.19	CONCRETE	
64	Double Catchbasin	ea	$10,031	$10,030.72	CONCRETE	
65	Catchbasin control	ea	$300	$133.96	CLOTH	RS Means estimates approx. $450 for this item. HDR estimate is based on the average between tender and RS Means data.
Storm Subdrain						
66	100mm subdrain	m	$20	$20.23	WOODS & PLASTICS	
67	150mm subdrain	m	$22	$21.98	WOODS & PLASTICS	
Storm Service Pipe						Size/material based on City Design Criteria.
68	125mm PVC Residential storm service (single)	ea	$1,407	$1,406.70	WOODS & PLASTICS	
69	150mm PVC Residential storm service (double)	ea	$1,426	$1,426.24	WOODS & PLASTICS	

Note: Water unit costs are estimated to be up to 100% higher in intensification areas (see **Section 3.3.3)**.

Table 3-3. Summary of Greenfield Road Infrastructure Unit Costs ($2025)

ID	Item	Unit	Unit Cost ($2025)	Unit Cost ($2025) Tender Data	Cost Category (S&P Global)	Notes
Construction General						
70	Remove Catchbasin (single)	ea	$1,335	$1,334.73	LABOUR	
71	Remove Manholes (full depth)	ea	$3,289	$3,288.82	LABOUR	
72	No-post and crash barrier	m	$850	No Tender Data	CONCRETE	No tender data. Cost based on HDR estimate.
73	Sediment control fence	m	$24.42	$24.42	CLOTH	
74	Mud-mat / Stone pad	m2	$5.26	$5.26	EARTH WORKS	
75	Seeding / Stablization	m2	$3.57	$3.57	EARTH WORKS	
76	Mud tracking	ea	$10,000	No Tender Data	EARTH WORKS	No tender data. Cost is HDR estimate and assumes 10 m wide entrance and 10 m wide boulevard.
77	Clearing and Grubbing	m2	$6.66	$6.66	EARTH WORKS	
78	Excavation and Grading	m3	$50.94	$50.94	EARTH WORKS	
79	Remove Concrete Curb and Gutter	m	$30.98	$30.98	LABOUR	
80	Remove Existing Pavement	m2	$1.58	$1.58	LABOUR	
Roadway						
81	Two Way Stage Concrete Curb and Gutter	m	$140.07	$140.07	CONCRETE	
82	Concrete Median	m2	$321.21	$321.21	CONCRETE	Assume 5m median width
83	50mm - HL3 Top Asphalt	m2	$14.82	$14.82	MASONRY	
84	Tack Coat	m2	$0.96	$0.96	ASPHALT	
85	150mm-20mm CR limestone	m2	$13.26	$13.26	MASONRY	
86	75mm - HL8 Base Asphalt	m2	$19.47	$19.47	ASPHALT	
87	360-50mm CR limestone	m2	$26.99	$26.99	MASONRY	
88	Painted Markings	m	$6.00	$6.00	FINISHES	

Note: Road unit costs are estimated to be up to 15% higher in intensification areas (see **Section 3.3.3)**.

Table 3-3. Summary of Road Infrastructure Unit Costs ($2025, continued)

ID	Item	Unit	Unit Cost ($2025)	Unit Cost ($2025) Tender Data	Cost Category (S&P Global)	Notes
Boulevard and Driveway Works						
89	Asphalt Salt Pad	m2	$24.69	$24.69	ASPHALT	
90	Asphalt Driveway	m2	$24.69	$24.69	ASPHALT	
91	Boulevard Grading	m2	$61.12	$61.12	EARTH WORKS	
Active Transportation Facilities						
92	Multi-use Paths / Trails (3 m wide, one side)	km	$724,800	No Tender Data	ASPHALT	No tender data. Cost based on HDR estimate.
93	Cycle Tracks (1.8 m wide, both sides)	km	$721,500	$188,940.00	ASPHALT	Based on costs from other GTA municipalities (including reported values from the 2022 Vaughan DC), HDR SMEs estimate significantly higher costs than tender data.
94	Sidewalks	m2	$166.67	$166.67	CONCRETE	
Fencing and Noise Attenuation Features						
95	Noise attenuation	m2	$50.94	$50.94	WOODS & PLASTICS	
96	Fencing	m	$189.44	$189.44	EARTH WORKS	
Culverts						
97	300 mm Concrete Culvert	m	$526.00	No Tender Data	CONCRETE	
98	375 mm Concrete Culvert	m	$580.00	No Tender Data	CONCRETE	
99	450 mm Concrete Culvert	m	$655.00	No Tender Data	CONCRETE	
100	525 mm Concrete Culvert	m	$730.00	No Tender Data	CONCRETE	
101	600 mm Concrete Culvert	m	$842.00	No Tender Data	CONCRETE	
102	675 mm Concrete Culvert	m	$890.00	No Tender Data	CONCRETE	
103	750 mm Concrete Culvert	m	$955.00	No Tender Data	CONCRETE	
104	825 mm Concrete Culvert	m	$1,160.00	No Tender Data	CONCRETE	
105	900 mm Concrete Culvert	m	$1,304.00	No Tender Data	CONCRETE	
106	1050 mm Concrete Culvert	m	$1,563.00	No Tender Data	CONCRETE	
107	1200 mm Concrete Culvert	m	$1,821.00	No Tender Data	CONCRETE	
Other						
108	Wayfinding and Control Signs	ea	$382.45	$382.45	METALS - STRUCTURAL STEEL	
109	Bollards	ea	$310.00	$332.54	WOODS & PLASTICS	Assume 20m spacing
110	Signals	ea	$321,400	No Tender Data	METALS - STRUCTURAL STEEL	No tender data. HDR estimate based on review of unit costs from GTA municipalities. Cost is also consistent with Vaughan 2022 DC (indexed).
111	Roundabout	ea	$1,840,000	No Tender Data	ASPHALT	No tender data. HDR estimate is based on review of unit costs from GTA municipalities for roundabouts on collector/arterial roads.
112	Utility Relocation	km	$850,000	No Tender Data	LABOUR	No tender data. HDR estimate for average cost, including all hydro-poles, fibre optics, gas

Note: Road unit costs are estimated to be up to 15% higher in intensification areas (see **Section 3.3.3)**.

Table 3-4. Summary of Other Unit Costs ($2025)

ID	Categorization	Item	Unit	Material Category	Unit Price ($2025, lower range)	Unit Price ($2025, Upper range)	Notes
A	Water	Water Pump Station (Small, Capacity 10 to 150 L/s)	L/s	CONCRETE	$27,000	$150,000	Pump station costs are project-specific; depend on location, site requirements, off-site works, and construction market conditions. Typical scope (and major cost drivers) includes building/architectural; number/size of pumps (duty/standby); process piping; header, isolation/check/drain valves/bypasses; electrical (MCC/VFDs, VFDs, cabling, lighting); controls/SCADA; mechanical/HVAC; standby generator; civil/site works and off-site tie-ins; commissioning. Capacity bands used: Small Pump Station 10 to 150 L/s (typical of a small booster station); Medium Pump Station 150 to 600 L/s (typical of a standard municipal station); Large/Complex Pump Station 600 to 1,000 L/s. Unit cost ranges presented are order-of-magnitude estimates based on HDR SME industry experience; actual costs will vary project to project and may be different from the ranges provided.
B	Water	Water Pump Station (Medium, Capacity 150 to 600 L/s)	L/s	CONCRETE	$13,000	$27,000	
C	Water	Water Pump Station (Large / Complex Station, 600 to 1000 L/s)	L/s	CONCRETE	$13,000	$15,000+	
D	Water	Pressure Reduction Valve Station (Low complexity, ≤100mm diameter)	ea	METALS - VALVES & FITTINGS	$50,000	$100,000	Pressure reducing valve stations are project-specific; depend on location, site requirements, off-site works, and construction market conditions. Low complexity / small diameter (typically less than or equal to 100mm, assume simple bypass, shallow vault, basic telemetry). Higher complexity / larger diameter (typically 150mm+, multiple stage, PLC/Scada + metering, surge control, larger/deeper vault/building, more complex tie-ins). Unit cost ranges presented are order-of-magnitude estimates based on HDR SME industry experience; actual costs will vary project to project and may be different from the ranges provided.
E	Water	Pressure Reduction Valve Station (High complexity, ≥150mm diameter)	ea	CONCRETE	$100,000	$300,000	
F	Sanitary	Control Valve Station	ea	METALS - VALVES & FITTINGS	$5,000	$10,000	Cost depends on size of control valve / forcemain size, depth of installation.
G	Sanitary	Collector Forcemain Pipe	m	LABOUR	$500	$900	Cost depends on forcemain size, material, depth, method of installation (i.e. directional drilling, or open trench). In the order of $650 per meter installed (for 150mm HDPE, directional drilled). Order of magnitude indicated is pipe install only and does not include forcemain pump station.
H	Sanitary	Sanitary Pump Station (Small, Capacity 10 to 150 L/s)	L/s	CONCRETE	$27,000	$150,000	Pump station costs are project-specific; depend on location, site requirements, off-site works, and construction market conditions. Typical scope (and major cost drivers) include: building/architectural; number/size of pumps (duty/standby); wet well (size and depth); process piping; header, isolation/check/drain valves/bypasses; electrical (MCC/VFDs, VFDs, cabling, lighting); controls/SCADA; mechanical/HVAC; standby generator; civil/site works and off-site tie-ins; commissioning. Capacity bands used: Small Pump Station 10 to 150 L/s; Medium Pump Station 150 to 600 L/s; Large/Complex Pump Station 600 to 1,000 L/s. Unit cost ranges presented are order-of-magnitude estimates based on HDR SME industry experience; actual costs will vary project to project and may be different from the ranges provided.
I	Sanitary	Sanitary Pump Station (Medium, Capacity 150 to 600 L/s)	L/s	CONCRETE	$13,000	$27,000	
J	Sanitary	Sanitary Pump Station (Large or Complex Station, 600 to 1000 L/s)	L/s	CONCRETE	$13,000	$15,000+	
K	Storm	Stormwater Management Ponds (Low Complexity)	m^3	EARTH WORKS	$40	$80	Unit cost is per m^3 of storage volume. Stormwater management ponds are project specific, and the cost depends on various factors including whether it is a wet or dry pond. Low end: basic excavation and grading Medium complexity: includes outlet structures, armour/rip rap, erosion and sediment control, landscaping, access. High complexity: complex ponds with liners (clay or geomembrane), forebays, sediment cells, landscaping, fencing, safety features, dewatering, other site constraints.
L	Storm	Stormwater Management Ponds (Medium Complexity)	m^3	EARTH WORKS	$80	$150	
M	Storm	Stormwater Management Ponds (High Complexity)	m^3	EARTH WORKS	$150	$250	
N	Storm	Storm - Concrete Tank	m^3	CONCRETE	$100	$300	
O	Road	Noise Walls	km	CONCRETE	$1,000,000	$2,000,000	Cost is HDR estimate based on review of unit costs from GTA municipalities

All costs are for greenfield areas only. In intensification areas, water, sanitary, and storm costs are estimated to be up to 100% higher and road costs are estimated to be up to 15% higher (see **Section 3.3.3)**.

Table 3-5. Comparison of Unit Rates to Alternate Sources provided by City

ID	Item	Unit	Cost Category (S&P Global)	Construction Cost Index Study Unit Cost ($2025)	Alternate Source (Provided by City)	Alternate Source ($2025 Equivalent) *	Notes
1	150mm PVC DR18 Watermain	m	WOODS & PLASTICS	$200	IUWM Unit Rates (2023)	$568	IUWM unit rates represent open cut rural/greenfield watermain installation and include equipment, labour, materials, appurtenances, excavation, and bedding/backfill. The IUWM installation rates are higher than HDR estimates primarily due to broader inclusions. Unit rates presented in this study are more granular and separate out items such as valves and appurtenances. Both sets of rates are appropriate given their stated inclusions and assumptions.
2	200mm PVC DR18 Watermain	m	WOODS & PLASTICS	$250	IUWM Unit Rates (2023)	$568	
3	250mm PVC DR18 Watermain	m	WOODS & PLASTICS	$316	IUWM Unit Rates (2023)	$663	
4	300mm PVC DR18 Watermain	m	WOODS & PLASTICS	$380	IUWM Unit Rates (2023)	$2,179	
5	400mm PVC DR18 Watermain	m	WOODS & PLASTICS	$606	IUWM Unit Rates (2023)	$2,652	
34	250mm PVC DR 35 Sanitary Main	m	WOODS & PLASTICS	$260	Civica Infrastructure (2023)	$816	Civica Construction unit rates represent gravity pipe installation in urban open cut conditions at a 3m depth. Rates include excavation, backfill, restoration, dewatering, material installation, and maintenance holes. The Civica installation rates are higher than HDR estimates primarily due to broader inclusions. Unit rates presented in this study are more granular and separate out items such as maintenance holes. Both sets of rates are appropriate given their stated inclusions and assumptions.
35	300mm PVC DR 35 Sanitary Main	m	WOODS & PLASTICS	$360	Civica Infrastructure (2023)	$816	
36	375mm PVC DR 35 Sanitary Main	m	WOODS & PLASTICS	$460	Civica Infrastructure (2023)	$926	
37	450mm PVC DR 35 Sanitary Main	m	WOODS & PLASTICS	$578	Civica Infrastructure (2023)	$925	

* Alternate source $2025 equivalent unit rates derived by escalating using S&P Global series price index for the indicated cost category.

3.3.3 Intensification Areas

Construction costs for intensification areas are typically higher than those in greenfield conditions (**Section 3.3.2**). The estimated cost increases are summarized in **Table 3-6** based on input from HDR SMEs. These costs are intended for conceptual and planning-level estimating only.

For water, sanitary, and storm infrastructure, trenchless techniques are typically selected where open cut is not feasible or where avoiding surface impacts such as major roads, railways, rivers, developed areas, and environmental constraints, and can reduce total project cost and risk. Trenchless methods include microtunnelling, horizontal directional drilling (HDD), auger boring, and pipe ramming pipe installation methods and generally have higher direct installation unit rates. However, the overall project cost can often be competitive or lower when accounting for surface restoration, traffic control, environmental impacts, and social disruption.

Trenchless installation costs are heavily influenced by the following factors:

- Ground conditions (soil vs rock; cobbles/boulders)
- Groundwater levels and dewatering
- Installation depth
- Drive length
- Pipe diameter
- Launch and retrieval shaft construction
- Line/grade tolerance (gravity vs pressure)
- Rail/highway requirement

Table 3-6. Summary of Estimated Cost Increase for Intensification Areas

Item	Estimated Cost Increase*	Notes
Water, sanitary, and storm		
Open Cut	Up to +100%	
Microtunneling	Approx. +100%	Generally highest in cost of the trenchless methods, due to specialized equipment and active guidance; suited to tight line/grade and sensitive corridors
HDD	Approx. +50%	Lower than microtunnelling; good for longer/curved pressure pipes where precise grade is not critical.
Auger Boring	Approx. +50% to +100%	Usually falls between open cut and microtunnelling in cost. Varies with casing diameter and ground conditions; moderate tolerance; casing typically required.
Pipe Ramming	Approx. +50% to +100%	Driven casing; effective for short crossings and coarse soils; limited line/grade control.
Road	**Up to +15%**	

*compared to greenfield conditions

4 Construction Cost Escalation

4.1 S&P Global Cost Series

As mentioned in **Section 3.2**, the City provided detailed construction cost estimates that were prepared by bidders for a sample of development projects in the last five years. This information was used to identify key cost items (e.g., PVC pipe) that are recurring across projects, and group them into major cost categories (e.g., earthworks). There were too few historical data points to identify and analyze cost trends at the cost item or cost category level. As a result, additional data was collected from a different source, namely S&P Global. Through a subscription to S&P Global Market Intelligence's Global Pricing and Purchasing service, HDR has access to an online database of more than 500,000 historical prices across a wide range of commodities and industries (building materials, capital equipment, energy, wages, etc.) as well as countries (including Canada and the United States). The data dates to 1990 and is provided on a quarterly or annual basis, to the extent available.

For each key cost item, HDR identified at least one (or several) matching cost series from the S&P Global database. When no Canadian cost series was available, HDR picked the closest matching US cost series. In general, given the connectedness of the US and Canadian economies, construction cost trends are very similar on both sides of the border. Therefore, US cost series can be used as proxies, after factoring in the exchange rate. HDR's selected cost series were then reviewed and revised as needed by S&P Global cost experts.

Table 4-1 shows the list of selected cost series from the S&P Global database.

Table 4-1. S&P Global Cost Series

Cost Series	Unit	Source
Canada, Producer Price Index, Asphalt (Except Natural) and Asphalt Products	2020M1=100	Statistics Canada (CANSIMS)
Canada, Canada, Average Hourly Wage, Heavy Equipment Operators (except Crane)	CAD/Hour	Statistics Canada (CANSIMS)
Canada, Producer Price Index, Construction Machinery	2020M1=100	Statistics Canada (CANSIMS)
Canada, Producer Price Index, Diesel and Biodiesel Fuels	2020M1=100	Statistics Canada (CANSIMS)
Canada, Producer Price Index, Ready-Mix Concrete	2020M1=100	Statistics Canada (CANSIMS)
Canada, Producer Price Index, Cement and Concrete Product	2020M1=100	Statistics Canada (CANSIMS)
United States, Producer Price Index, Fabricated Structural Metal Products	1982=100	U.S. Bureau of Labor Statistics (BLS)
United States, Producer Price Index, Iron/Steel Pipe and Tube Manufacturing From Purch Steel	1982M6=100	U.S. Bureau of Labor Statistics (BLS)
United States, Producer Price Index, Metal Tank, Heavy Gauge	2003M12=100	U.S. Bureau of Labor Statistics (BLS)
Canada, Producer Price Index, Metal Valves and Pipe Fittings (Except Industrial Valves) and Enameled Metal Sanitary Ware	2020M1=100	Statistics Canada (CANSIMS)
United States, Spot Price, Structural Steel, ex-Works Midwest	USD/Metric Ton	MEPS International Ltd
Canada, Producer Price Index, Unwrought Copper and Copper Alloys	2020M1=100	Statistics Canada (CANSIMS)
Canada, Producer Price Index, Basic and Semi-Finished Products of Aluminum and Aluminum Alloys	2020M1=100	Statistics Canada (CANSIMS)
United States, Producer Price Index, Plastics Product Manufacturing	1993M6=100	U.S. Bureau of Labor Statistics (BLS)
United States, Producer Price Index, All other Reinforced and Fiberglass Plastics Products	1993M6=100	U.S. Bureau of Labor Statistics (BLS)
United States, Producer Price Index, Laminated Plastics Plate Sheet and Shape	1993M6=100	U.S. Bureau of Labor Statistics (BLS)
United States, Producer Price Index, Plastics Pipe and Pipe Fitting	1993M6=100	U.S. Bureau of Labor Statistics (BLS)
Canada, Producer Price Index, Softwood Lumber (Except Tongue and Groove and Other Edge Worked Lumber)	2020M1=100	Statistics Canada (CANSIMS)
United States, United States, Export Transaction Price, Nylon 6, FOB	US Cents/Pound	Intratec Solutions LLC
United States, Producer Price Index, Mineral Wool for Structural Insulation	1981M12=100	U.S. Bureau of Labor Statistics (BLS)
United States, Producer Price Index, Metal Window and Door	1983M6=100	U.S. Bureau of Labor Statistics (BLS)
United States, Producer Price Index, Paints and Coatings	1983M6=100	U.S. Bureau of Labor Statistics (BLS)
United States, Producer Price Index, Industrial Process Controls	1983M6=100	U.S. Bureau of Labor Statistics (BLS)
Canada, Producer Price Index, Pump and Compressor	2020M1=100	Statistics Canada (CANSIMS)
United States, Producer Price Index, Conveyor and Conveying Equipment	1984M6=100	U.S. Bureau of Labor Statistics (BLS)

Cost Series	Unit	Source
United States, Producer Price Index, Machinery	2003M12=100	U.S. Bureau of Labor Statistics (BLS)
United States, Producer Price Index, Industrial Valves	1991M6=100	U.S. Bureau of Labor Statistics (BLS)
Canada, Producer Price Index, Iron or Steel Pipes and Tubes (Except Castings)	2020M1=100	Statistics Canada (CANSIMS)
United States, Producer Price Index, Industrial Commodities	1982=100	U.S. Bureau of Labor Statistics (BLS)
Canada, Hourly Wages, Construction, Ontario	CAD/Hour	S&P Global Market Intelligence
Canada, Hourly Wages, Skilled Construction, Ontario	CAD/Hour	S&P Global Market Intelligence
Canada, Hourly Wages, Unskilled Construction, Ontario	CAD/Hour	S&P Global Market Intelligence

Source: S&P Global Market Intelligence.

4.2 Central Forecast

HDR extracted the latest available projections (released September 2, 2025) from the S&P Global online database for cost variables of interest to the City over the 2025–2028 period. The projections were developed using recently published data from Statistics Canada and other sources, accounting for recent (and ongoing) policy developments that would impact prices in 2025 and beyond. In particular, S&P Global made several assumptions regarding the implementation of tariffs in the United States and Canada. Those assumptions are described in **Appendix A**. The annual cost escalation factors are presented in **Table 4-2** and represent the central (or most likely) forecast.

Table 4-2. Annual Cost Escalation Factors (2025–2028)

Cost Variable	2025	2026	2027	2028
Asphalt and Asphalt Products	2.2%	1.8%	3.2%	2.9%
Heavy Equipment Operators	0.0%	4.1%	3.5%	3.9%
Construction Machinery	0.0%	3.2%	-0.9%	0.0%
Diesel and Biodiesel Fuels	-1.1%	-14.4%	2.9%	0.6%
Ready-Mix Concrete	6.1%	2.1%	0.6%	1.6%
Cement and Concrete Products	5.5%	1.8%	1.1%	1.7%
Fabricated Structural Metal Products	7.5%	5.0%	-7.0%	-5.1%
Iron/Steel Pipe and Tube Manufacturing	3.5%	1.5%	-7.3%	-4.8%
Metal Tank, Heavy Gauge	7.7%	7.3%	-5.9%	-4.1%
Metal Valves and Pipe Fittings	2.1%	-2.0%	-2.4%	-0.8%
Structural Steel	6.4%	-3.6%	-13.1%	-6.8%
Unwrought Copper and Copper Alloys	4.8%	-1.8%	-1.2%	1.5%
Products of Aluminum and Aluminum Alloys	18.8%	3.3%	-4.4%	-1.9%
Plastics Product Manufacturing	3.3%	4.1%	-3.8%	-2.8%
All other Reinforced and Fiberglass Plastics Products	6.9%	5.1%	-3.0%	-1.9%
Laminated Plastics Plate Sheet and Shape	4.2%	5.1%	-3.4%	-2.3%
Plastic Pipe and Pipe Fitting	-1.7%	3.5%	-2.3%	-2.1%
Softwood Lumber	4.2%	-0.6%	1.6%	1.0%
Nylon 6	-2.3%	-1.7%	-2.3%	-2.0%
Mineral Wool for Structural Insulation	5.4%	3.1%	-4.1%	-1.5%
Metal Window and Door	8.0%	5.4%	-6.1%	-4.8%
Paints and Coatings	4.0%	4.9%	-2.5%	-1.6%
Industrial Process Controls	8.2%	4.1%	-5.5%	-4.9%
Pump and Compressor	3.9%	1.2%	-0.1%	0.0%
Conveyor and Conveying Equipment	4.3%	3.1%	2.1%	2.4%
Machinery	6.1%	6.1%	-4.3%	-3.0%
Industrial Valves	9.3%	5.8%	-4.4%	-2.2%
Iron or Steel Pipes and Tubes	-9.6%	-1.3%	0.9%	0.9%
Industrial Commodities	4.5%	4.4%	-3.4%	-3.0%
Construction, Ontario	3.9%	1.9%	2.9%	2.8%
Skilled Construction, Ontario	3.0%	3.1%	3.2%	3.2%
Unskilled Construction, Ontario	3.9%	2.8%	2.8%	2.8%

Source: S&P Global Market Intelligence.

In general, costs are expected to rise substantially in 2025, well above the pace observed in the previous two years. For the most part, tariffs (on both side of the Canada-US border) are responsible for the increase. Steel and aluminum products are particularly affected. A weaker Canadian dollar also implies that the cost of some manufactured goods imported from the US are more expensive.

While the direct impact of tariffs on costs is expected to be relatively small and short-lived, the effect of persistent trade policy unpredictability and economic uncertainty in general is expected to linger beyond 2025 and weigh on demand and prices. As a result, the cost of many construction items is projected to increase at a slower pace in 2026 and to go down in 2027 and 2028. This is especially true of steel and aluminum products.

4.2.1 Forecasted Unit Costs

Forecasted unit costs for each item are summarized below in **Table 4-3 , Table 4-4** and **Table 4-5**. Similar to the development of unit costs for 2025 dollars, unit costs were forecasted to each year between 2026 and 2028 based on the corresponding S&P 500 cost series category. The future indices reflect anticipated market trends and escalation factors applied.

Table 4-3. Summary of Greenfield Water Infrastructure Unit Costs ($2025 to $2028)

ID	Item	Unit	Unit Cost ($2025)	Cost Category (S&P Global)	2026	2027	2028	2025 to 2026	2026 to 2027	2027 to 2028
Water Distribution Main Pipe (Open Cut Installation)										
1	150mm PVC DR18 Watermain	m	$200	WOODS & PLASTICS	$ 207	$ 202	$ 198	4%	-2%	-2%
2	200mm PVC DR18 Watermain	m	$250	WOODS & PLASTICS	$ 259	$ 253	$ 248	4%	-2%	-2%
3	250mm PVC DR18 Watermain	m	$316	WOODS & PLASTICS	$ 327	$ 319	$ 313	4%	-2%	-2%
4	300mm PVC DR18 Watermain	m	$380	WOODS & PLASTICS	$ 393	$ 384	$ 376	4%	-2%	-2%
5	400mm PVC DR18 Watermain	m	$606	WOODS & PLASTICS	$ 627	$ 613	$ 600	4%	-2%	-2%
Control Valve Chamber (with Drain Valve)										
6	150mm GV	ea	$6,246	CONCRETE	$ 6,377	$ 6,417	$ 6,520	2%	1%	2%
7	200mm GV	ea	$10,741	CONCRETE	$ 10,967	$ 11,034	$ 11,213	2%	1%	2%
8	250mm GV	ea	$13,129	CONCRETE	$ 13,405	$ 13,488	$ 13,706	2%	1%	2%
9	300mm GV	ea	$15,000	CONCRETE	$ 15,315	$ 15,410	$ 15,659	2%	1%	2%
10	400mm GV	ea	$27,142	CONCRETE	$ 27,712	$ 27,883	$ 28,334	2%	1%	2%
Air Valve Chamber										
11	150mm AV	ea	$6,000	CONCRETE	$ 6,126	$ 6,164	$ 6,263	2%	1%	2%
12	200mm AV	ea	$10,000	CONCRETE	$ 10,210	$ 10,273	$ 10,439	2%	1%	2%
13	250mm AV	ea	$13,000	CONCRETE	$ 13,273	$ 13,355	$ 13,571	2%	1%	2%
14	300mm AV	ea	$15,000	CONCRETE	$ 15,315	$ 15,410	$ 15,659	2%	1%	2%
15	400mm AV	ea	$27,000	CONCRETE	$ 27,567	$ 27,737	$ 28,186	2%	1%	2%
Drain Valve										
16	50mm DV	ea	$5,000	CONCRETE	$ 5,105	$ 5,137	$ 5,220	2%	1%	2%
17	100mm DV	ea	$7,500	CONCRETE	$ 7,658	$ 7,705	$ 7,829	2%	1%	2%
Combined Control/Air Valve Chamber										
18	150mm GV-AV	ea	$8,120	CONCRETE	$ 8,291	$ 8,342	$ 8,477	2%	1%	2%
19	200mm GV-AV	ea	$13,963	CONCRETE	$ 14,257	$ 14,345	$ 14,576	2%	1%	2%
20	250mm GV-AV	ea	$17,068	CONCRETE	$ 17,427	$ 17,534	$ 17,818	2%	1%	2%
21	300mm GV-AV	ea	$19,500	CONCRETE	$ 19,910	$ 20,033	$ 20,356	2%	1%	2%
22	400mm GV-AV	ea	$35,786	CONCRETE	$ 36,538	$ 36,764	$ 37,358	2%	1%	2%

Note: Water unit costs are estimated to be up to 100% higher in intensification areas (see **Section 3.3.3)**.

Table 4-3. Summary of Greenfield Water Infrastructure Unit Costs ($2025 to $2028, continued)

ID	Item	Unit	Unit Cost ($2025)	Cost Category (S&P Global)	2026	2027	2028	2025 to 2026	2026 to 2027	2027 to 2028
Tee (and connection into existing watermain where required)										
23	150x150 Tee	ea	$1,000	METALS - VALVES & FITTINGS	$ 980	$ 957	$ 948	-2%	-2%	-1%
24	200x200 Tee	ea	$2,000	METALS - VALVES & FITTINGS	$ 1,960	$ 1,913	$ 1,897	-2%	-2%	-1%
25	250x250 Tee	ea	$4,500	METALS - VALVES & FITTINGS	$ 4,410	$ 4,304	$ 4,268	-2%	-2%	-1%
26	300x300 Tee	ea	$10,213	METALS - VALVES & FITTINGS	$ 10,009	$ 9,769	$ 9,687	-2%	-2%	-1%
27	400x400 Tee	ea	$16,281	METALS - VALVES & FITTINGS	$ 15,956	$ 15,573	$ 15,442	-2%	-2%	-1%
Water Service (including curb stop in box)										
28	25mm Type K standard residential service	ea	$1,802	NONFERROUS METALS & METAL PRODUCTS	$ 1,770	$ 1,748	$ 1,775	-2%	-1%	2%
29	100mm PVC water service	ea	$3,220	WOODS & PLASTICS	$ 3,334	$ 3,256	$ 3,188	4%	-2%	-2%
Fire Hydrant Assembly										
30	Fire Hydrant Assembly	ea	$8,000	METALS - VALVES & FITTINGS	$ 7,840	$ 7,652	$ 7,588	-2%	-2%	-1%
31	Anti-tampering device	ea	$277	METALS - VALVES & FITTINGS	$ 272	$ 265	$ 263	-2%	-2%	-1%
Watermain Commissioning										
32	Watermain swabbing, flushing, testing including pressure and bacteriological.	m	$21	LABOUR	$ 21	$ 22	$ 23	2%	3%	3%
Sanitary Collector Main Pipe (Open Cut)										
33	200mm PVC DR 35 Sanitary Main	m	$240	WOODS & PLASTICS	$ 248	$ 243	$ 238	4%	-2%	-2%
34	250mm PVC DR 35 Sanitary Main	m	$260	WOODS & PLASTICS	$ 269	$ 263	$ 257	4%	-2%	-2%
35	300mm PVC DR 35 Sanitary Main	m	$360	WOODS & PLASTICS	$ 373	$ 364	$ 356	4%	-2%	-2%
36	375mm PVC DR 35 Sanitary Main	m	$460	WOODS & PLASTICS	$ 476	$ 465	$ 455	4%	-2%	-2%
37	450mm PVC DR 35 Sanitary Main	m	$578	WOODS & PLASTICS	$ 598	$ 584	$ 572	4%	-2%	-2%
38	300mm Reinforced Concrete Sanitary Main	m	$400	CONCRETE	$ 408	$ 411	$ 418	2%	1%	2%
39	375mm Reinforced Concrete Sanitary Main	m	$450	CONCRETE	$ 459	$ 462	$ 470	2%	1%	2%
40	450mm Reinforced Concrete Sanitary Main	m	$510	CONCRETE	$ 521	$ 524	$ 532	2%	1%	2%

Note: Water unit costs are estimated to be up to 100% higher in intensification areas (see **Section 3.3.3)**.

Table 4-3. Summary of Greenfield Water Infrastructure Unit Costs ($2025 to $2028, continued)

ID	Item	Unit	Unit Cost ($2025)	Cost Category (S&P Global)	2026	2027	2028	2025 to 2026	2026 to 2027	2027 to 2028
Sanitary Maintenance Holes										
41	1200mm Precast Concrete Maintenance Hole	ea	$6,833	CONCRETE	$ 6,976	$ 7,019	$ 7,133	2%	1%	2%
42	1500mm Precast Concrete Maintenance Hole	ea	$12,302	CONCRETE	$ 12,560	$ 12,638	$ 12,842	2%	1%	2%
43	2400mm Precast Concrete Maintenance Hole	ea	$24,985	CONCRETE	$ 25,510	$ 25,667	$ 26,082	2%	1%	2%
44	3000mm Precast Concrete Maintenance Hole	ea	$34,354	CONCRETE	$ 35,076	$ 35,293	$ 35,863	2%	1%	2%
Sanitary Service Pipe										
45	100mm PVC Residential Service - Single	ea	$1,296	WOODS & PLASTICS	$ 1,342	$ 1,311	$ 1,284	4%	-2%	-2%
46	125mm PVC Residential Service - Double	ea	$1,450	WOODS & PLASTICS	$ 1,501	$ 1,466	$ 1,435	4%	-2%	-2%
47	Cleanout Fixture	ea	$639	WOODS & PLASTICS	$ 661	$ 646	$ 632	4%	-2%	-2%
Storm Collector Main Pipe (Open Cut)										
48	300mm PVC DR 35 Storm Main	m	$260	WOODS & PLASTICS	$ 269	$ 263	$ 257	4%	-2%	-2%
49	375mm PVC DR 35 Storm Main	m	$330	WOODS & PLASTICS	$ 342	$ 334	$ 327	4%	-2%	-2%
50	450mm PVC DR 35 Storm Main	m	$400	WOODS & PLASTICS	$ 414	$ 404	$ 396	4%	-2%	-2%
51	300mm Reinforced Concrete Storm Main	m	$320	CONCRETE	$ 327	$ 329	$ 334	2%	1%	2%
52	375mm Reinforced Concrete Storm Main	m	$360	CONCRETE	$ 368	$ 370	$ 376	2%	1%	2%
53	450mm Reinforced Concrete Storm Main	m	$415	CONCRETE	$ 424	$ 426	$ 433	2%	1%	2%
54	300mm Non-Reinforced Concrete Storm Main	m	$260	CONCRETE	$ 265	$ 267	$ 271	2%	1%	2%
55	375mm Non-Reinforced Concrete Storm Main	m	$330	CONCRETE	$ 337	$ 339	$ 344	2%	1%	2%
56	450mm Non-Reinforced Concrete Storm Main	m	$400	CONCRETE	$ 408	$ 411	$ 418	2%	1%	2%
Storm Maintenance Holes										
57	1200mm Precast Concrete Maintenance Hole	ea	$6,430	CONCRETE	$ 6,565	$ 6,606	$ 6,713	2%	1%	2%
58	1500mm Precast Concrete Maintenance Hole	ea	$10,031	CONCRETE	$ 10,241	$ 10,305	$ 10,471	2%	1%	2%
59	1800mm Precast Concrete Maintenance Hole	ea	$15,124	CONCRETE	$ 15,442	$ 15,537	$ 15,788	2%	1%	2%
60	2400mm Precast Concrete Maintenance Hole	ea	$25,000	CONCRETE	$ 25,525	$ 25,683	$ 26,098	2%	1%	2%
61	3000mm Precast Concrete Maintenance Hole	ea	$49,394	CONCRETE	$ 50,431	$ 50,743	$ 51,562	2%	1%	2%
62	3600mm Precast Concrete Maintenance Hole	ea	$174,936	CONCRETE	$ 178,611	$ 179,714	$ 182,617	2%	1%	2%

Note: Water unit costs are estimated to be up to 100% higher in intensification areas (see **Section 3.3.3)**.

Table 4-3. Summary of Greenfield Water Infrastructure Unit Costs ($2025 to $2028, continued)

ID	Item	Unit	Unit Cost ($2025)	Cost Category (S&P Global)	2026	2027	2028	2025 to 2026	2026 to 2027	2027 to 2028
Storm Catchbasins (complete with frame, grates, leads)										
63	Single Catchbasin	ea	$6,430	CONCRETE	$ 6,565	$ 6,606	$ 6,713	2%	1%	2%
64	Double Catchbasin	ea	$10,031	CONCRETE	$ 10,241	$ 10,305	$ 10,471	2%	1%	2%
65	Catchbasin control	ea	$300	CLOTH	$ 295	$ 288	$ 282	-2%	-2%	-2%
Storm Subdrain										
66	100mm subdrain	m	$20	WOODS & PLASTICS	$ 21	$ 20	$ 20	4%	-2%	-2%
67	150mm subdrain	m	$22	WOODS & PLASTICS	$ 23	$ 22	$ 22	4%	-2%	-2%
Storm Service Pipe										
68	125mm PVC Residential storm service (single)	ea	$1,407	WOODS & PLASTICS	$ 1,456	$ 1,422	$ 1,393	4%	-2%	-2%
69	150mm PVC Residential storm service (double)	ea	$1,426	WOODS & PLASTICS	$ 1,476	$ 1,442	$ 1,412	4%	-2%	-2%

Note: Water unit costs are estimated to be up to 100% higher in intensification areas (see **Section 3.3.3)**.

Table 4-4 Summary of Greenfield Road Infrastructure Unit Costs ($2025 to $2028)

ID	Item	Unit	Unit Cost ($2025)	Cost Category (S&P Global)	2026	2027	2028	2025 to 2026	2026 to 2027	2027 to 2028
Construction General										
70	Remove Catchbasin (single)	ea	$1,335	LABOUR	$ 1,360	$ 1,398	$ 1,437	2%	3%	3%
71	Remove Manholes (full depth)	ea	$3,289	LABOUR	$ 3,350	$ 3,446	$ 3,542	2%	3%	3%
72	No-post and crash barrier	m	$850	CONCRETE	$ 867.86	$ 855.25	$ 863.73	2%	1%	2%
73	Sediment control fence	m	$24.42	CLOTH	$ 24.02	$ 23.87	$ 23.93	-2%	-2%	-2%
74	Mud-mat / Stone pad	m2	$5.26	EARTH WORKS	$ 5.43	$ 5.21	$ 5.26	3%	-1%	0%
75	Seeding / Stabilization	m2	$3.57	EARTH WORKS	$ 3.68	$ 3.53	$ 3.57	3%	-1%	0%
76	Mud tracking	ea	$10,000	EARTH WORKS	$ 10,316	$ 9,905	$ 10,004	3%	-1%	0%
77	Clearing and Grubbing	m2	$6.66	EARTH WORKS	$ 6.87	$ 6.60	$ 6.67	3%	-1%	0%
78	Excavation and Grading	m3	$50.94	EARTH WORKS	$ 52.55	$ 50.46	$ 50.95	3%	-1%	0%
79	Remove Concrete Curb and Gutter	m	$30.98	LABOUR	$ 31.56	$ 31.87	$ 31.84	2%	3%	3%
80	Remove Existing Pavement	m2	$1.58	LABOUR	$ 1.61	$ 1.63	$ 1.63	2%	3%	3%
Roadway										
81	Two Way Stage Concrete Curb and Gutter	m	$140.07	CONCRETE	$ 143.01	$ 143.90	$ 146.22	2%	1%	2%
82	Concrete Median	m2	$321.21	CONCRETE	$ 327.96	$ 323.20	$ 326.40	2%	1%	2%
83	50mm - HL3 Top Asphalt	m2	$14.82	MASONRY	$ 15.09	$ 14.98	$ 15.07	2%	1%	2%
84	Tack Coat	m2	$0.96	ASPHALT	$ 0.98	$ 0.99	$ 0.99	2%	3%	3%
85	150mm-20mm CR limestone	m2	$13.26	MASONRY	$ 13.51	$ 13.41	$ 13.49	2%	1%	2%
86	75mm - HL8 Base Asphalt	m2	$19.47	ASPHALT	$ 19.81	$ 20.10	$ 20.05	2%	3%	3%
87	360-50mm CR limestone	m2	$26.99	MASONRY	$ 27.49	$ 27.29	$ 27.45	2%	1%	2%
88	Painted Markings	m	$6.00	FINISHES	$ 6.29	$ 5.85	$ 5.91	5%	-2%	-2%

Note: Road unit costs are estimated to be up to 15% higher in intensification areas (see **Section 3.3.3)**.

Table 4-4: Summary of Greenfield Road Infrastructure Unit Costs ($2025 to $2028, continued)

ID	Item	Unit	Unit Cost ($2025)	Cost Category (S&P Global)	2026	2027	2028	2025 to 2026	2026 to 2027	2027 to 2028
Boulevard and Driveway Works										
89	Asphalt Salt Pad	m2	$24.69	ASPHALT	$ 25.13	$ 25.49	$ 25.42	2%	3%	3%
90	Asphalt Driveway	m2	$24.69	ASPHALT	$ 25.13	$ 25.49	$ 25.42	2%	3%	3%
91	Boulevard Grading	m2	$61.12	EARTH WORKS	$ 63.05	$ 60.55	$ 61.15	3%	-1%	0%
Active Transportation Facilities										
92	Multi-use Paths / Trails (3 m wide, one side)	km	$157,500	ASPHALT	$ 160,261	$ 162,601	$ 162,144	2%	3%	3%
93	Cycle Tracks (1.8 m wide, both sides)	km	$189,000	ASPHALT	$ 192,314	$ 195,121	$ 194,573	2%	3%	3%
94	Sidewalks	m2	$166.67	CONCRETE	$ 170.17	$ 167.70	$ 169.36	2%	1%	2%
Fencing and Noise Attenuation Features										
95	Noise attenuation	m2	$50.94	WOODS & PLASTICS	$ 52.73	$ 49.75	$ 49.88	4%	-2%	-2%
96	Fencing	m	$189.44	EARTH WORKS	$ 195.42	$ 187.65	$ 189.51	3%	-1%	0%
Culverts										
97	300 mm Concrete Culvert	m	$526.00	CONCRETE	$ 537.24	$ 529.43	$ 534.69	2%	1%	2%
98	375 mm Concrete Culvert	m	$580.00	CONCRETE	$ 592.20	$ 583.60	$ 589.39	2%	1%	2%
99	450 mm Concrete Culvert	m	$655.00	CONCRETE	$ 669.08	$ 659.36	$ 665.90	2%	1%	2%
100	525 mm Concrete Culvert	m	$730.00	CONCRETE	$ 745.48	$ 734.65	$ 741.94	2%	1%	2%
101	600 mm Concrete Culvert	m	$842.00	CONCRETE	$ 859.71	$ 847.22	$ 855.63	2%	1%	2%
102	675 mm Concrete Culvert	m	$890.00	CONCRETE	$ 908.68	$ 895.48	$ 904.36	2%	1%	2%
103	750 mm Concrete Culvert	m	$955.00	CONCRETE	$ 974.90	$ 960.74	$ 970.27	2%	1%	2%
104	825 mm Concrete Culvert	m	$1,160.00	CONCRETE	$ 1,183.91	$ 1,166.71	$ 1,178.28	2%	1%	2%
105	900 mm Concrete Culvert	m	$1,304.00	CONCRETE	$ 1,331.43	$ 1,312.09	$ 1,325.11	2%	1%	2%
106	1050 mm Concrete Culvert	m	$1,563.00	CONCRETE	$ 1,595.40	$ 1,572.22	$ 1,587.82	2%	1%	2%
107	1200 mm Concrete Culvert	m	$1,821.00	CONCRETE	$ 1,859.56	$ 1,832.55	$ 1,850.73	2%	1%	2%
Other										
108	Wayfinding and Control Signs	ea	$382.45	METALS - STRUCTURAL STEEL	$ 368.65	$ 332.17	$ 356.42	-4%	-13%	-7%
109	Bollards	ea	$310.00	WOODS & PLASTICS	$ 320.92	$ 302.76	$ 303.57	4%	-2%	-2%
110	Signals	ea	$321,400	METALS - STRUCTURAL STEEL	$ 309,810	$ 279,152	$ 299,524	-4%	-13%	-7%
111	Roundabout	ea	$1,840,000	ASPHALT	$ 1,872,259	$ 1,899,593	$ 1,894,251	2%	3%	3%
112	Utility Relocation	km	$850,000	LABOUR	$ 876,843	$ 841,964	$ 850,302	3%	-1%	0%

Note: Road unit costs are estimated to be up to 15% higher in intensification areas (see **Section 3.3.3)**.

Table 4-5. Summary of Other Forecasted Unit Costs ($2025 to $2028)

ID	Categorization	Item	Unit	Material Category	Unit Price ($2025, lower range)	Unit Price ($2025, upper range)	Unit Price ($2026, lower range)	Unit Price ($2026, upper range)	Unit Price ($2027, lower range)	Unit Price ($2027, upper range)	Unit Price ($2028, lower range)	Unit Price ($2028, upper range)
A	Water	Water Pump Station (Small, Capacity 10 to 150 L/s)	L/s	CONCRETE	$27,000	$150,000	$28,000	$153,000	$28,000	$154,000	$30,000	$160,000
B	Water	Water Pump Station (Medium, Capacity 150 to 600 L/s)	L/s	CONCRETE	$13,000	$27,000	$13,000	$28,000	$13,000	$28,000	$14,000	$28,000
C	Water	Water Pump Station (Large or Complex Station, 600 to 1000 L/s)	L/s	CONCRETE	$13,000	$15,000+	$13,000	$15,000+	$13,000	$15,000+	$14,000	$16,000+
D	Water	Pressure Reduction Valve Station (Low complexity, ≤100mm diameter)	ea	METALS - VALVES & FITTINGS	$50,000	$100,000	$49,000	$98,000	$48,000	$96,000	$47,000	$95,000
E	Water	Pressure Reduction Valve Station (High complexity, ≥150mm diameter)	ea	CONCRETE	$100,000	$300,000	$102,000	$306,000	$103,000	$308,000	$104,000	$313,000
F	Sanitary	Control Valve Station	ea	LABOUR	$5,000	$10,000	$5,000	$10,000	$5,000	$10,000	$5,000	$11,000
G	Sanitary	Collector Forcemain Pipe	m	CONCRETE	$500	$900	$500	$900	$500	$900	$500	$1,000
H	Sanitary	Sanitary Pump Station (Small, Capacity 10 to 150 L/s)	L/s	CONCRETE	$27,000	$150,000	$28,000	$153,000	$28,000	$154,000	$30,000	$160,000
I	Sanitary	Sanitary Pump Station (Medium, Capacity 150 to 600 L/s)	L/s	CONCRETE	$13,000	$27,000	$13,000	$28,000	$13,000	$28,000	$14,000	$28,000
J	Sanitary	Sanitary Pump Station (Large or Complex Station, 600 to 1000 L/s)	L/s	CONCRETE	$13,000	$15,000+	$13,000	$15,000+	$13,000	$15,000+	$14,000	$16,000+
K	Storm	Stormwater Management Ponds (Low Complexity)	m^3	EARTH WORKS	$40	$80	$41	$83	$42	$84	$41	$82
L	Storm	Stormwater Management Ponds (Medium Complexity)	m^3	EARTH WORKS	$80	$150	$83	$155	$84	$158	$82	$153
M	Storm	Stormwater Management Ponds (High Complexity)	m^3	EARTH WORKS	$150	$250	$155	$258	$158	$264	$153	$256
N	Storm	Storm - Concrete Tank	m^3	CONCRETE	$100	$300	$102	$306	$105	$315	$104	$313
O	Road	Noise Walls	km	CONCRETE	$1,000,000	$2,000,000	$1,021,008	$2,042,016	$1,048,893	$2,097,787	$1,044,000	$2,088,000

All costs are for greenfield areas only. In intensification areas, water, sanitary, and storm costs are estimated to be up to 100% higher and road costs are estimated to be up to 15% higher (see **Section 3.3.3)**

4.3 Risk Analysis

Uncertainty is inherent in economic forecasting. To account for uncertainty in the S&P Global forecast HDR conducted a risk analysis using @RISK, an MS Excel add-in. Unlike a traditional, deterministic approach that yields only a few discrete outcomes with equal likelihood of occurrence (such as “what-if” analysis, optimistic vs pessimistic scenarios, and sensitivity analysis), the proposed risk analysis framework relies on a deterministic approach that is iteratively replicated to produce a range of probabilistic results.

The risk analysis was conducted in three steps:

1. Ranges (i.e., low and high estimates) were assigned to the projected annual growth rates of the cost variables over the forecast period (2025–2028). Ranges were derived from a historical analysis of statistical uncertainty, as measured by the standard deviation. The midpoint of each range is the forecast obtained from S&P Global (i.e., central forecast).
2. A Monte Carlo simulation was performed in @RISK that drew random values for all cost variables from 10,000 iterations. More specifically, for each iteration within the simulation, a forecast of each cost variable was drawn for each year of the forecast period.
3. Finally, the results of the Monte Carlo simulation were aggregated and summarized to derive risk-adjusted projections.

Table 4-6 below summarizes the risk analysis results for a sample of key cost variables. For each cost variable in any given year (2025 through 2028), the expected escalation factor is reported at different probability levels. For instance, in 2026, there is a 10 percent chance that the cost of concrete (as measured by the producer price index for cement and concrete products in Canada) will increase by 3.2 percent or more. Likewise, there is also a 90 percent chance that it will increase by at least 0.5 percent. At the median (50^{th} percentile), the expected growth rate is 1.8 percent.

As shown in **Table 4-6**, the range of projected values for a given year can vary considerably across cost items, thereby reflecting differences in the magnitude of historical price fluctuations. In particular, the prices of some items used in construction, such as structural steel or diesel fuel, are known to be very volatile.

The table gives some perspective on the range of possible values (cost escalation factors) in any given year and could be used, for instance, by the City to assess the reasonableness of assumptions made by contractors in their bids.

Table 4-6: Summary of Risk Analysis Results for a Sample of Cost Variables (2025–2028)

Variable	Year	Probability of Exceeding				
		90%	75%	50%	25%	10%
Canada, Producer Price Index, Asphalt (Except Natural) and Asphalt Products	2025	-2.3%	-0.2%	**2.2%**	4.6%	6.7%
	2026	-2.8%	-0.6%	**1.8%**	4.1%	6.3%
	2027	-1.3%	0.8%	**3.2%**	5.6%	7.8%
	2028	-1.6%	0.6%	**2.9%**	5.3%	7.5%
Canada, Producer Price Index, Cement and Concrete Products	2025	4.2%	4.8%	**5.5%**	6.2%	6.8%
	2026	0.5%	1.1%	**1.8%**	2.5%	3.2%
	2027	-0.2%	0.4%	**1.1%**	1.8%	2.4%
	2028	0.4%	1.0%	**1.7%**	2.4%	3.0%
United States, Producer Price Index, Plastics Pipe and Pipe Fitting	2025	-5.8%	-3.8%	**-1.7%**	0.5%	2.4%
	2026	-0.6%	1.4%	**3.5%**	5.7%	7.6%
	2027	-6.4%	-4.5%	**-2.3%**	-0.2%	1.8%
	2028	-6.2%	-4.2%	**-2.1%**	0.1%	2.0%

Note that a complete summary of the risk analysis results showing expected annual cost escalation factors by cost item, by year, and at different probability levels is provided separately in **Appendix B**.

Appendix A

Appendix A: Tariff Assumptions in S&P Global Forecast

Tariff action	Current (Q3) forecast assumptions	Previous (Q2) forecast assumptions	Commentary
Region tariffs			
IEEPA tariffs on Canada	35% under IEEPA	25% under IEEPA	Tariffs apply to non-USMCA-compliant goods. Goods on the Annex II list and Section 232 goods are excluded (0% on USMCA-compliant). A small list of non-USMCA Canadian energy and mineral products receives 10% tariffs. We assume the 35% rate will be lowered to 12% in June 2026.
IEEPA tariffs on Mexico	25% under IEEPA	25% under IEEPA	No change compared with the second-quarter forecast.
IEEPA tariffs on European Union, Japan	15% baseline tariff	10% under IEEPA	The additional tariff rate shall be calculated such that any current ad valorem tariffs, plus new IEEPA tariffs, sum to 15%. For products with pre-existing duty rates above 15%, the additional rate of duty is 0%. Annex II and Section 232 goods are excluded.
IEEPA tariffs on India	25% under IEEPA, additional 25% for importation of Russian oil	10% under IEEPA	India is subject to 25% IEEPA tariffs, which stack with a 25% tariff on imported goods due to India's importation of Russian oil. The cumulative tariff rate on Indian goods into the United States is therefore 50%. Annex II and Section 232 goods are excluded.
General IEEPA tariffs (excluding Canada, Mexico, Japan, European Union, India)	10% minimum for all economies, then specific rates ranging from 10% to 41% for all nonexempted goods from 95 economies.	10% under IEEPA	Annex II and goods covered by Section 232 tariffs are excluded from IEEPA tariffs.
IEEPA tariffs on mainland China	20% under IEEPA	20% under IEEPA	No change compared with the second-quarter forecast. Stacks with the general IEEPA tariff rate of 10%.
Industry tariffs			
Steel, aluminum, and a select group of fabricated metal products	50% under Section 232	25% under Section 232	The list of derivative products covered has been expanded compared with the second-quarter forecast. We assume gradual geographic exemptions resulting from bilateral negotiations. The average tariff rate declines to 38% in the first quarter of 2026 and 30% in the first quarter of 2027 and thereafter.

Tariff action	Current (Q3) forecast assumptions	Previous (Q2) forecast assumptions	Commentary
Autos and auto parts	25% under Section 232	25% under Section 232	For USMCA-compliant autos, tariffs are on non-US content. USMCA-compliant auto parts are excluded. For imports from Canada and Mexico, we assume the 25% on non-USMCA-compliant goods is reduced to 12% in 2026. The UK faces 10% with a quota. The EU, Japan, and South Korea face 15%.
Copper	50% under Section 232	25% under Section 232	We previously assumed these tariffs would impact raw and refined copper. Raw and refined copper will be excluded until 2027, when a 15% tariff is expected, rising to 30% in 2028.
Lumber	25% under Section 232	25% under Section 232	The forecast assumes tariffs of 25% on imports of lumber and wood products will come into effect in the fourth quarter of 2025.
Semiconductors	25% under Section 232	25% under Section 232	The forecast assumes tariffs of 25% on imports of semiconductors and related components will come into effect in the fourth quarter of 2025. The forecast assumes downstream electronics such as laptops and cell phones will be excluded.
Pharmaceuticals	10%-25% under Section 232	10%-25% under Section 232	President Donald Trump warned of the potential for 200% tariffs on pharmaceuticals, but without a timeline or other details.
Critical minerals	10% under Section 232	10% under Section 232	The forecast assumes tariffs of 10% on imports of critical minerals will come into effect in the fourth quarter of 2025.

Data compiled on September 15, 2025.

IEEPA: International Emergency Economic Powers Act; USMCA: US-Mexico-Canada Agreement.

Source: S&P Global Market Intelligence.

Key notes:

- As of June 23, the Section 232 tariff on steel, aluminum, and derivative products was increased from 25% to 50%. In addition, the list of steel and aluminum derivative products was significantly expanded.
- As of August 1, 50% tariffs were applied to semifinished copper products and intensive copper derivative products.
- As of September 15, no trade deal had been reached between the US and Canada, but negotiations were ongoing. Canada now faces a 35% tariff rate on non-USMCA-compliant goods. Actions by the Canadian government to apply retaliatory duties have been partly reversed. Tariffs on US steel and aluminum imports and certain US automobile imports remain in effect.
- An ongoing case on the legality of implementing tariffs under IEEPA is working through the US court system. The US Court of International Trade (CIT) found the use of IEEPA for tariffs illegal on May 28. The US Court of Appeals for the Federal Circuit upheld the earlier CIT ruling that the Trump administration's use of IEEPA duties exceeded powers granted by Congress. The removal of IEEPA tariffs is delayed until October 14.
- There are also ongoing Section 232 investigations on timber and lumber, semiconductors and semiconductor manufacturing equipment, pharmaceuticals and pharmaceutical ingredients, trucks, processed critical minerals and derivative products, commercial aircraft and jet engines, polysilicon and its derivatives, unmanned aircraft systems and their parts and components, and wind turbines.

Appendix B

Appendix B: Risk Adjusted Forecast

Variable	Year	Probability of Exceeding				
		90%	75%	50%	25%	10%
Asphalt and Asphalt Products	2025	-2.3%	-0.2%	2.2%	4.6%	6.7%
Asphalt and Asphalt Products	2026	-2.8%	-0.6%	1.8%	4.1%	6.3%
Asphalt and Asphalt Products	2027	-1.3%	0.8%	3.2%	5.6%	7.8%
Asphalt and Asphalt Products	2028	-1.6%	0.6%	2.9%	5.3%	7.5%
Heavy Equipment Operators	2025	-2.4%	-1.3%	0.0%	1.2%	2.3%
Heavy Equipment Operators	2026	1.7%	2.8%	4.1%	5.3%	6.4%
Heavy Equipment Operators	2027	1.2%	2.3%	3.5%	4.8%	5.9%
Heavy Equipment Operators	2028	1.6%	2.7%	3.9%	5.2%	6.3%
Construction Machinery	2025	-1.1%	-0.6%	0.0%	0.6%	1.1%
Construction Machinery	2026	2.1%	2.6%	3.2%	3.7%	4.2%
Construction Machinery	2027	-2.0%	-1.5%	-0.9%	-0.4%	0.1%
Construction Machinery	2028	-1.0%	-0.5%	0.0%	0.6%	1.1%
Diesel and Biodiesel Fuels	2025	-10.7%	-6.2%	-1.1%	4.0%	8.5%
Diesel and Biodiesel Fuels	2026	-24.0%	-19.5%	-14.4%	-9.3%	-4.8%
Diesel and Biodiesel Fuels	2027	-6.7%	-2.2%	2.9%	8.0%	12.5%
Diesel and Biodiesel Fuels	2028	-9.0%	-4.5%	0.6%	5.7%	10.2%
Ready-Mix Concrete	2025	4.9%	5.5%	6.1%	6.8%	7.4%
Ready-Mix Concrete	2026	0.9%	1.4%	2.1%	2.8%	3.3%
Ready-Mix Concrete	2027	-0.6%	0.0%	0.6%	1.3%	1.9%
Ready-Mix Concrete	2028	0.4%	1.0%	1.6%	2.3%	2.9%
Cement and Concrete Products	2025	4.2%	4.8%	5.5%	6.2%	6.8%
Cement and Concrete Products	2026	0.5%	1.1%	1.8%	2.5%	3.2%
Cement and Concrete Products	2027	-0.2%	0.4%	1.1%	1.8%	2.4%
Cement and Concrete Products	2028	0.4%	1.0%	1.7%	2.4%	3.0%

Variable	Year	Probability of Exceeding				
		90%	75%	50%	25%	10%
Fabricated Structural Metal Products	2025	4.8%	6.0%	7.5%	8.9%	10.2%
Fabricated Structural Metal Products	2026	2.3%	3.6%	5.0%	6.5%	7.7%
Fabricated Structural Metal Products	2027	-9.8%	-8.5%	-7.0%	-5.6%	-4.3%
Fabricated Structural Metal Products	2028	-7.9%	-6.6%	-5.1%	-3.7%	-2.4%
Iron/Steel Pipe and Tube Manufacturing	2025	-1.3%	1.0%	3.5%	6.1%	8.4%
Iron/Steel Pipe and Tube Manufacturing	2026	-3.4%	-1.1%	1.5%	4.1%	6.3%
Iron/Steel Pipe and Tube Manufacturing	2027	-12.2%	-9.9%	-7.3%	-4.8%	-2.5%
Iron/Steel Pipe and Tube Manufacturing	2028	-9.6%	-7.4%	-4.8%	-2.2%	0.1%
Metal Tank, Heavy Gauge	2025	5.0%	6.3%	7.7%	9.1%	10.4%
Metal Tank, Heavy Gauge	2026	4.6%	5.8%	7.3%	8.7%	9.9%
Metal Tank, Heavy Gauge	2027	-8.6%	-7.3%	-5.9%	-4.5%	-3.2%
Metal Tank, Heavy Gauge	2028	-6.8%	-5.5%	-4.1%	-2.7%	-1.4%
Metal Valves and Pipe Fittings	2025	1.2%	1.6%	2.1%	2.6%	3.1%
Metal Valves and Pipe Fittings	2026	-3.0%	-2.5%	-2.0%	-1.5%	-1.0%
Metal Valves and Pipe Fittings	2027	-3.4%	-2.9%	-2.4%	-1.9%	-1.4%
Metal Valves and Pipe Fittings	2028	-1.8%	-1.4%	-0.8%	-0.3%	0.1%
Structural Steel	2025	0.7%	3.4%	6.4%	9.4%	12.1%
Structural Steel	2026	-9.3%	-6.6%	-3.6%	-0.6%	2.1%
Structural Steel	2027	-18.8%	-16.2%	-13.1%	-10.1%	-7.4%
Structural Steel	2028	-12.5%	-9.8%	-6.8%	-3.8%	-1.1%
Unwrought Copper and Copper Alloys	2025	0.0%	2.2%	4.8%	7.4%	9.6%
Unwrought Copper and Copper Alloys	2026	-6.7%	-4.4%	-1.8%	0.8%	3.0%
Unwrought Copper and Copper Alloys	2027	-6.1%	-3.8%	-1.2%	1.4%	3.6%
Unwrought Copper and Copper Alloys	2028	-3.3%	-1.0%	1.5%	4.1%	6.4%
Products of Aluminum and Aluminum Alloys	2025	14.8%	16.7%	18.8%	20.9%	22.7%
Products of Aluminum and Aluminum Alloys	2026	-0.6%	1.2%	3.3%	5.4%	7.2%
Products of Aluminum and Aluminum Alloys	2027	-8.4%	-6.5%	-4.4%	-2.3%	-0.5%
Products of Aluminum and Aluminum Alloys	2028	-5.8%	-4.0%	-1.9%	0.2%	2.1%

Variable	Year	Probability of Exceeding				
		90%	75%	50%	25%	10%
Plastics Product Manufacturing	2025	1.3%	2.2%	3.3%	4.3%	5.3%
Plastics Product Manufacturing	2026	2.1%	3.1%	4.1%	5.2%	6.1%
Plastics Product Manufacturing	2027	-5.8%	-4.9%	-3.8%	-2.8%	-1.8%
Plastics Product Manufacturing	2028	-4.8%	-3.8%	-2.8%	-1.7%	-0.8%
All other Reinforced and Fiberglass Plastics Products	2025	4.2%	5.5%	6.9%	8.3%	9.6%
All other Reinforced and Fiberglass Plastics Products	2026	2.5%	3.7%	5.1%	6.5%	7.8%
All other Reinforced and Fiberglass Plastics Products	2027	-5.7%	-4.4%	-3.0%	-1.6%	-0.3%
All other Reinforced and Fiberglass Plastics Products	2028	-4.6%	-3.4%	-1.9%	-0.5%	0.7%
Laminated Plastics Plate Sheet and Shape	2025	1.9%	3.0%	4.2%	5.3%	6.4%
Laminated Plastics Plate Sheet and Shape	2026	2.8%	3.9%	5.1%	6.3%	7.3%
Laminated Plastics Plate Sheet and Shape	2027	-5.6%	-4.6%	-3.4%	-2.2%	-1.1%
Laminated Plastics Plate Sheet and Shape	2028	-4.6%	-3.5%	-2.3%	-1.1%	-0.1%
Plastic Pipe and Pipe Fitting	2025	-5.8%	-3.8%	-1.7%	0.5%	2.4%
Plastic Pipe and Pipe Fitting	2026	-0.6%	1.4%	3.5%	5.7%	7.6%
Plastic Pipe and Pipe Fitting	2027	-6.4%	-4.5%	-2.3%	-0.2%	1.8%
Plastic Pipe and Pipe Fitting	2028	-6.2%	-4.2%	-2.1%	0.1%	2.0%
Softwood Lumber	2025	-3.8%	0.0%	4.2%	8.4%	12.2%
Softwood Lumber	2026	-8.5%	-4.8%	-0.6%	3.6%	7.4%
Softwood Lumber	2027	-6.4%	-2.6%	1.6%	5.8%	9.6%
Softwood Lumber	2028	-6.9%	-3.2%	1.0%	5.3%	9.0%
Nylon 6	2025	-7.2%	-4.9%	-2.3%	0.2%	2.5%
Nylon 6	2026	-6.5%	-4.2%	-1.7%	0.9%	3.2%
Nylon 6	2027	-7.1%	-4.9%	-2.3%	0.3%	2.6%
Nylon 6	2028	-6.9%	-4.6%	-2.0%	0.5%	2.8%
Mineral Wool for Structural Insulation	2025	3.0%	4.1%	5.4%	6.6%	7.8%
Mineral Wool for Structural Insulation	2026	0.7%	1.9%	3.1%	4.4%	5.6%
Mineral Wool for Structural Insulation	2027	-6.5%	-5.4%	-4.1%	-2.8%	-1.7%
Mineral Wool for Structural Insulation	2028	-4.0%	-2.8%	-1.5%	-0.3%	0.9%

Variable	Year	Probability of Exceeding				
		90%	75%	50%	25%	10%
Metal Window and Door	2025	4.9%	6.4%	8.0%	9.7%	11.1%
Metal Window and Door	2026	2.3%	3.8%	5.4%	7.1%	8.5%
Metal Window and Door	2027	-9.2%	-7.7%	-6.1%	-4.4%	-3.0%
Metal Window and Door	2028	-7.9%	-6.4%	-4.8%	-3.1%	-1.7%
Paints and Coatings	2025	1.5%	2.6%	4.0%	5.3%	6.5%
Paints and Coatings	2026	2.4%	3.6%	4.9%	6.2%	7.4%
Paints and Coatings	2027	-5.0%	-3.8%	-2.5%	-1.1%	0.0%
Paints and Coatings	2028	-4.1%	-2.9%	-1.6%	-0.2%	0.9%
Industrial Process Controls	2025	6.1%	7.1%	8.2%	9.3%	10.3%
Industrial Process Controls	2026	2.0%	3.0%	4.1%	5.2%	6.2%
Industrial Process Controls	2027	-7.6%	-6.6%	-5.5%	-4.4%	-3.4%
Industrial Process Controls	2028	-7.0%	-6.0%	-4.9%	-3.8%	-2.8%
Pump and Compressor	2025	3.2%	3.5%	3.9%	4.3%	4.7%
Pump and Compressor	2026	0.5%	0.8%	1.2%	1.6%	1.9%
Pump and Compressor	2027	-0.9%	-0.5%	-0.1%	0.2%	0.6%
Pump and Compressor	2028	-0.7%	-0.4%	0.0%	0.4%	0.7%
Conveyor and Conveying Equipment	2025	2.9%	3.6%	4.3%	5.0%	5.7%
Conveyor and Conveying Equipment	2026	1.7%	2.4%	3.1%	3.8%	4.5%
Conveyor and Conveying Equipment	2027	0.8%	1.4%	2.1%	2.9%	3.5%
Conveyor and Conveying Equipment	2028	1.0%	1.7%	2.4%	3.1%	3.8%
Machinery	2025	4.0%	5.0%	6.1%	7.2%	8.2%
Machinery	2026	4.1%	5.0%	6.1%	7.2%	8.2%
Machinery	2027	-6.3%	-5.4%	-4.3%	-3.2%	-2.2%
Machinery	2028	-5.1%	-4.1%	-3.0%	-1.9%	-1.0%
Industrial Valves	2025	7.3%	8.3%	9.3%	10.4%	11.4%
Industrial Valves	2026	3.7%	4.7%	5.8%	6.9%	7.8%
Industrial Valves	2027	-6.5%	-5.5%	-4.4%	-3.3%	-2.4%
Industrial Valves	2028	-4.3%	-3.3%	-2.2%	-1.1%	-0.2%

Variable	Year	Probability of Exceeding				
		90%	75%	50%	25%	10%
Iron or Steel Pipes and Tubes	2025	-15.1%	-12.5%	-9.6%	-6.7%	-4.2%
Iron or Steel Pipes and Tubes	2026	-6.8%	-4.2%	-1.3%	1.6%	4.1%
Iron or Steel Pipes and Tubes	2027	-4.6%	-2.0%	0.9%	3.8%	6.3%
Iron or Steel Pipes and Tubes	2028	-4.5%	-2.0%	0.9%	3.8%	6.4%
Industrial Commodities	2025	2.6%	3.5%	4.5%	5.6%	6.5%
Industrial Commodities	2026	2.4%	3.4%	4.4%	5.5%	6.4%
Industrial Commodities	2027	-5.3%	-4.4%	-3.4%	-2.3%	-1.4%
Industrial Commodities	2028	-4.9%	-4.0%	-3.0%	-1.9%	-1.0%
Construction, Ontario	2025	3.3%	3.6%	3.9%	4.2%	4.4%
Construction, Ontario	2026	1.3%	1.6%	1.9%	2.2%	2.4%
Construction, Ontario	2027	2.3%	2.6%	2.9%	3.2%	3.4%
Construction, Ontario	2028	2.2%	2.5%	2.8%	3.1%	3.4%
Skilled Construction, Ontario	2025	2.4%	2.7%	3.0%	3.3%	3.6%
Skilled Construction, Ontario	2026	2.5%	2.8%	3.1%	3.5%	3.8%
Skilled Construction, Ontario	2027	2.6%	2.9%	3.2%	3.5%	3.8%
Skilled Construction, Ontario	2028	2.6%	2.9%	3.2%	3.6%	3.8%
Unskilled Construction, Ontario	2025	3.3%	3.6%	3.9%	4.2%	4.5%
Unskilled Construction, Ontario	2026	2.2%	2.5%	2.8%	3.1%	3.4%
Unskilled Construction, Ontario	2027	2.3%	2.5%	2.8%	3.2%	3.4%
Unskilled Construction, Ontario	2028	2.3%	2.5%	2.8%	3.2%	3.4%
Local Currency to US Dollars	2025	0.8%	1.6%	2.6%	3.5%	4.3%
Local Currency to US Dollars	2026	0.9%	1.7%	2.7%	3.6%	4.5%
Local Currency to US Dollars	2027	-7.3%	-6.5%	-5.5%	-4.6%	-3.7%
Local Currency to US Dollars	2028	-6.3%	-5.4%	-4.5%	-3.5%	-2.7%