

The Cost of Not Going Digital

Twenty-five Canadian built-environment projects, and the case for digitalization prepared by Clarity Builders

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Why this report exists

Across Canada, public and institutional owners keep paying twice: once to build, and again to recover from information that was never properly governed. The twenty-five projects in this report, taken over time, are evidence-based with documentation and Canadian. Each was delivered without the structured information foundations that modern built-environment delivery depends on, and each carries a public cost that the evidence shows was, in large part, **avoidable**.

This is a Clarity Builders report focused on Canadian built environment examples of where digitalization and governance led to challenges, all of them significant, that could have been avoided. The remedy is broader too: structured information, sound data architecture, and the disciplined use of evolving industry-aligned artificial intelligence — applied in that order.

Our belief, in one line

Information governance is the precondition for value. On a governed information base, modern tools — including AI — amplify signal. On an ungoverned one, they amplify noise and produce *confident* wrong answers. Every failure in this report is, at root, the absence of that base.

How we built this analysis

Project facts — costs, overruns, and documented problems — are drawn from public sources: auditor general reports, the Parliamentary Budget Officer, public inquiries, government and Crown-corporation disclosures, and validated journalistic reports.* Each project page carries its source. Projected value figures are conservative Clarity Builders objective estimates, identified as such. Consistent with our practice, projections are understated. We are not meaning to “pick” on anyone in citing these projects. Indeed, we have chosen them because the details are already out there and we are using them to highlight important points.

- *Sources are listed on each project page and consolidated at the end of this report. Projected value ranges are Clarity Builders internal estimates. Note that because all cases in this report are evidence-based and therefore rely on public information, the number of private sector and not for profit cases included are more limited.*

The Clarity Builders lens



Three ideas shape how we read each project and prescribe a remedy: a maturity scale (based on the Grounded Diagnostic) that locates the owner, an evidence-based path that moves them forward, and a clear, governance-first position on built environment digitalization; BIM, standards and best practices driven, and industry-relevant AI.

Where the owner stands: the maturity scale

STAGE	WHAT IT LOOKS LIKE
Analogish	Disparate data silos, 2D and paper reliance, reactive management. Information loss at handover is routine.
Pre-BIM	Foundations being built: governance, process and contractual readiness ahead of any technology deployment.
BIM Ready	Frameworks operational: a working information environment, defined requirements, and an onboarded supply chain.
BIM Engaged	Integrated practice: structured information across the lifecycle, digital twins, and predictive, data-led decisions.

Clarity Builders maturity scale. Every engagement begins by locating the owner on it.

How we move owners forward: diagnostic-led, broad, and sequenced

Nearly every engagement opens with a diagnostic that makes the financial and risk costs of the current state visible to leadership. From there the work broadens beyond modelling to all information channels — requirements, a single data environment, data architecture, and lifecycle handover — and is then embedded so the gains hold, very much rooted in our change management methodology. The diagnostic now also assesses AI readiness across people, process, technology, governance, and contracts.

Our position on AI: govern first, then activate

Artificial intelligence and structured information governance are not competing uses of the same budget — they are sequential and mutually reinforcing. Governance builds the information substrate; AI increasingly helps to activate it. We are specific about maturity: some capabilities are usable now (live cost intelligence, predictive maintenance, semantic clash detection, document and contract review), some are emerging (predictive overrun detection, anomaly detection), and some remain on the horizon. AI will never decide autonomously in our model; people retain judgment.

The evidence base

BENEFIT FACTOR	VALUE	SOURCE
Elimination of unbudgeted changes	Up to 40%	CIFE, Stanford University
Cost estimation accuracy	Within 3%	CIFE, Stanford University



BENEFIT FACTOR	VALUE	SOURCE
Clash-detection savings	Up to 10% of contract value	CIFE, Stanford University
Annual operating-cost saving	~5% per year	Accruent / FM:Systems
Predictive maintenance: fewer unplanned events	30-50% (mature use)	CB analysis of industry benchmarks
Governance document production time	60-80% reduction with AI drafting	CB analysis of industry benchmarks
Reduction in post-project disputes	35%	UK BIM Level 2 Evaluation (2016)
Firms reporting positive return	82%	McGraw Hill SmartMarket

Benefit factors applied in this analysis. Clarity Builders projections apply these conservatively.



1. Eliyahu Wellness Centre

North Rustico, Prince Edward Island · Recreation & civic building (arena)

Location	North Rustico, Prince Edward Island
Asset type	Recreation & civic building (arena)
Ownership	Public - rural municipality (~650 residents)
Project years	2017-2021 (impact 2021-2026+)
Reported cost	~\$22-23M final (from a \$9.9-10.0M budget)
Cost overrun / deficiency	~\$12-13M (~130%)
Primary digitalization gap	Cost intelligence and business-case governance
Projected value recoverable (CB estimate)	\$3.3-4.6M

What went wrong

After the budget was approved, the facility was redesigned 64% larger with no updated business case or financing plan. About \$6.6M in tenders were issued before funding was secured, removing the option to pause. The building opened with kitchen, ventilation and drainage incomplete; roughly \$2.5M in liens were registered and a \$3.5M provincial emergency loan was needed to keep the town solvent. This was a leadership and information-governance failure, not a construction one.

The Clarity Builders remedy

An Analogish owner managing a once-in-a-decade project on paper. The CB entry is the Digital Crossing diagnostic, which puts the financial cost of the current state in front of Council before commitments are made, and a live cost model so the 64% scope change shows its budget impact at the decision point, not after tender. **INDUSTRY-ALIGNED AI** A live 5D cost view and emerging predictive cost-overrun detection would have flagged the breach weeks early - but only on governed data. With no structured information base, AI would have had nothing to read, which is exactly why CB sequences governance first.

Source: MNP independent review of the Eliyahu Wellness Centre (October 2024); Town of North Rustico financial reporting.



2. Cambridge Recreation Complex

Cambridge, Ontario · Multi-use recreation and aquatics building

Location	Cambridge, Ontario
Asset type	Multi-use recreation and aquatics building
Ownership	Public - municipal (City of Cambridge)
Project years	2019-2026 (impact 2026+)
Reported cost	\$107.9M approved budget (~\$60M initial feasibility)
Cost overrun / deficiency	~\$48M (~80% escalation)
Primary digitalization gap	Real-time cost and schedule intelligence
Projected value recoverable (CB estimate)	\$14.0-21.0M

What went wrong

No fraud, no inquiry. Across a roughly five-year design phase, post-pandemic inflation (Statistics Canada recorded a 15.3% building-cost rise in 2021 and 12.5% in 2022) was discovered after the fact and surfaced to Council as a sequence of retrospective budget revisions. Without live cost feedback, each inflation event became a budget surprise rather than a design decision, and a long pre-construction timeline magnified the exposure.

The Clarity Builders remedy

A capable BIM Ready owner that lacked live cost intelligence. CB configures an information framework with a program model to compress the design phase and a cost model that reports impact to Council monthly. The leadership value is a standing, board-ready view of where the budget is heading, not where it has been.

INDUSTRY-ALIGNED AI On a governed cost model, predictive cost-overrun detection surfaces breaches 6-12 weeks before they reach a council report, and an AI-generated executive narrative translates model data into the language a CFO and Council can act on.

Source: City of Cambridge Council reports and budget approvals (2021-2024); Statistics Canada Building Construction Price Index.



3. RIM Park Multi-Use Recreation Complex

Waterloo, Ontario · 500-acre recreation complex

Location	Waterloo, Ontario
Asset type	500-acre recreation complex
Ownership	Public - municipal (City of Waterloo)
Project years	1999-2004 (impact 2004-2016+)
Reported cost	\$56.7M construction; \$48.3M financing arrangement
Cost overrun / deficiency	30-yr financing \$227.7M as signed, settled at \$145.7M
Primary digitalization gap	Information governance and decision transparency
Projected value recoverable (CB estimate)	\$9.3-19.2M

What went wrong

A financing company presented Council a 4.73% rate; the executed contract, which no Council member or independent advisor reviewed, specified 9.2%. The 30-year payout would have been \$227.7M - about 4.5 times construction cost - later settled at \$145.7M. Justice Sills' 2003 inquiry made 31 recommendations and the entire Council lost their seats. The failure was decision-grade information never reaching the decision-makers.

The Clarity Builders remedy

The clearest information-governance case in the set. CB defines what financial data leadership is entitled to receive, in what form and verified by whom, and adds independent gateway validation before binding decisions. This is sold to the board as accountability and risk avoidance, not as software.

INDUSTRY-ALIGNED AI AI contract review now scores agreements against a rubric and flags non-standard terms in minutes; anomaly detection on a governed data environment surfaces the kind of discrepancy that went unseen at Waterloo. The control, not the model, remains with people.

Source: Sills Judicial Inquiry into RIM Park financing (2003); City of Waterloo records.



4. Pam McConnell Aquatic Centre

Toronto (Regent Park), Ontario · Aquatic centre

Location	Toronto (Regent Park), Ontario
Asset type	Aquatic centre
Ownership	Public - City of Toronto / Toronto Community Housing
Project years	Opened 2012 (maintenance failures 2019-2024)
Reported cost	\$16.6M (delivered on time and on budget)
Cost overrun / deficiency	No construction overrun; lifecycle / asset-data failure
Primary digitalization gap	Asset-data continuity (operate phase)
Projected value recoverable (CB estimate)	\$3.1-6.25M

What went wrong

Built on time, on budget and award-winning, the facility then degraded in service: closed spa pool, an out-of-service diving board, a failed shallow-pool heater that pushed children into adult lanes. No structured asset register was created at handover, so the maintenance team could only react. In a community where about half of residents rely on social or affordable housing, the failures were also failures of equity.

The Clarity Builders remedy

A BIM Engaged opportunity centred on operations. CB specifies a structured asset-data handover, verified at completion, that populates the City's maintenance system from day one and is then curated as a living record - converting reactive repair into planned maintenance against Toronto's multi-billion-dollar asset backlog.

INDUSTRY-ALIGNED AI With an asset model in place, predictive maintenance intelligence (available today) reduces unplanned failures by an estimated 30-50% by flagging equipment before it fails. Without that data foundation, there is nothing for AI to predict.

Source: *City of Toronto community recreation statements (2022); City of Toronto Corporate Asset Management Plan (2024).*



5. Eglinton Crosstown LRT Toronto, Ontario · 19 km light rail line

Location	Toronto, Ontario
Asset type	19 km light rail line
Ownership	Public - provincial Crown agency (Metrolinx)
Project years	2011-2025 (impact 2025+)
Reported cost	~\$12.8B final (early estimate ~\$8.2-9.1B)
Cost overrun / deficiency	Billions over early estimates; ~6 years late
Primary digitalization gap	Program coordination and single source of truth
Projected value recoverable (CB estimate)	\$640-1,280M

What went wrong

The line was delivered through multi-prime contracting without a single coordinated information environment unifying the subcontractors. Documented coordination and systems-integration failures in the underground stations, plus signalling and software faults, drove hundreds of deficiencies, repeated disputes and an opening roughly six years late. The Auditor General of Ontario faulted a \$237M payment made without adequate supporting documentation.

The Clarity Builders remedy

A megaproject needs an owner-administered single source of truth, an embedded information lead, and gateway validation across every prime contract. CB frames this for the board as schedule certainty and dispute avoidance, with the diagnostic confirming the information requirements before contracts are let. Entry maturity is BIM Ready scaling to BIM Engaged.

INDUSTRY-ALIGNED AI Semantic AI clash detection now prioritizes conflicts by construction and systems impact, not just geometry, and CDE-activity anomaly detection surfaces the documentation gaps an auditor later finds - provided a governed environment exists to monitor.

Source: Auditor General of Ontario and CBC reporting on Eglinton Crosstown (2023-2025); Metrolinx disclosures.



6. Ottawa LRT Stage 1 (Confederation Line)

Ottawa, Ontario · 12.5 km light rail line

Location	Ottawa, Ontario
Asset type	12.5 km light rail line
Ownership	Public - municipal (City of Ottawa)
Project years	2013-2019 (impact 2019-2024+)
Reported cost	~\$2.13B fixed-price contract
Cost overrun / deficiency	Reliability failures; public-trust findings (Hourigan Inquiry)
Primary digitalization gap	Systems integration and asset-data handover
Projected value recoverable (CB estimate)	\$210-420M

What went wrong

Two 2021 derailments and chronic wheel-rail and reliability failures followed launch. The 2022 public inquiry led by Justice Hourigan found egregious violations of the public trust by the City and Rideau Transit Group. Failures traced to insufficient digital integration between systems design and civil structure, and to the absence of validated asset data at handover, which forced reactive troubleshooting.

The Clarity Builders remedy

The fixed price shifted construction risk to the consortium, but the public cost surfaced in disruption and remediation. CB addresses the integration gap through a coordinated model and a verified asset-data handover, validated at an owner gateway, giving the City the record needed for planned maintenance rather than emergency response.

INDUSTRY-ALIGNED AI Predictive maintenance intelligence and operations anomaly detection (a digital-twin capability) would convert the reactive troubleshooting into early warning - once a validated asset model exists to feed them.

Source: Ottawa Light Rail Transit Public Inquiry, final report (Justice W. Hourigan, 2022); City of Ottawa.



7. Ottawa LRT Stage 2

Ottawa, Ontario · Light rail extensions (Trillium & Confederation)

Location	Ottawa, Ontario
Asset type	Light rail extensions (Trillium & Confederation)
Ownership	Public - municipal (City of Ottawa)
Project years	2019-2026 (impact 2026+)
Reported cost	~\$5.06B (from a \$4.66B 2019 approval)
Cost overrun / deficiency	~\$400M+ over approval; procurement-scoring controversy
Primary digitalization gap	Cost governance and procurement transparency
Projected value recoverable (CB estimate)	\$368-690M

What went wrong

Stage 2 advanced a bidder that scored 67.27% on technical evaluation, below the 70% threshold, and later won the \$1.6B Trillium Line contract; council secrecy around the scoring prompted an external review. Repeated budget revisions were made without a live cost model, and information-environment requirements written into the contract were not consistently enforced, limiting owner oversight.

The Clarity Builders remedy

A governance fix, not a technology one. CB makes a single information environment and structured cost reporting a contractual obligation with an audit trail, so scoring and scope decisions are transparent, and adds independent gateway sign-off. For elected leadership this is framed as defensible, auditable decision-making.

INDUSTRY-ALIGNED AI AI contract and bid review can score submissions consistently against published criteria and document the rationale, and anomaly detection flags scope drift - tools that make procurement controversies of this kind harder to sustain.

Source: CBC News reporting on Stage 2 budget and procurement scoring (2019-2026); City of Ottawa council records.



8. Réseau express métropolitain (REM) - Phase 1

Montreal, Quebec · 67 km automated light metro

Location	Montreal, Quebec
Asset type	67 km automated light metro
Ownership	Public / quasi-public institutional (CDPQ Infra)
Project years	2017-2023 (impact 2023+)
Reported cost	~\$8.0B final (from \$6.3B at 2018 bidder selection)
Cost overrun / deficiency	~\$1.65B (~26%)
Primary digitalization gap	Program and cost intelligence
Projected value recoverable (CB estimate)	\$420-700M

What went wrong

Design-build delivery compressed the program but proceeded without a structured program-level information mandate and no shared information environment. Station fit-out coordination caused delays, and overruns accumulated from inflation (about \$800M), a tunnel explosion (about \$350M) and scope changes (about \$500M), surfacing through phased-opening delays.

The Clarity Builders remedy

CB sets a program-level information framework and a single data environment across the design-build consortia, with a program and cost model that makes fit-out interfaces and inflation exposure visible to the sponsor in real time. Entry maturity is BIM Ready moving to BIM Engaged.

INDUSTRY-ALIGNED AI Predictive cost-overrun detection on a governed program model gives the sponsor weeks of lead time on emerging escalation; portfolio analytics roll individual contracts into one board-level view.

Source: CDPQ Infra program updates; Railway Age and public reporting on REM cost and schedule (2021-2024).



9. Champlain Bridge Replacement (Pont Samuel-De Champlain)

Montreal, Quebec · 3.4 km cable-stayed bridge

Location	Montreal, Quebec
Asset type	3.4 km cable-stayed bridge
Ownership	Public - federal (Infrastructure Canada)
Project years	2015-2019 (impact 2019+)
Reported cost	\$4.2B final
Cost overrun / deficiency	~\$400M (~10%)
Primary digitalization gap	Owner information requirements and lifecycle data
Projected value recoverable (CB estimate)	\$210-420M

What went wrong

Delivered as a P3, the contractor used digital tools internally but Infrastructure Canada never enforced owner information requirements for structured data deliverables. Without a live cost model, the budget impact of late corridor scope changes was reported after decisions; under the 30-year maintenance concession, no enforced handover standard means the owner will not inherit a verified asset register when the concession ends.

The Clarity Builders remedy

The lesson is owner enforcement. CB configures the information requirements and handover standard that turn a contractor's internal tools into an owner asset, with a lifecycle model that validates whole-life cost against the concession and a curated digital twin so the structure transfers back complete.

INDUSTRY-ALIGNED AI A maintained digital twin is the precondition for AI-driven structural monitoring over the concession; the value compounds only because the data is governed from day one.

Source: Infrastructure Canada project reports and P3 agreement summaries (2015-2020).



10. Macdonald-Cartier Bridge Rehabilitation

Ottawa / Gatineau, ON/QC · 556 m steel truss bridge

Location	Ottawa / Gatineau, ON/QC
Asset type	556 m steel truss bridge
Ownership	Public - federal (NCC / PSPC)
Project years	2006-2018 (impact 2018+)
Reported cost	\$350M (multi-phase)
Cost overrun / deficiency	~\$75M over early estimates
Primary digitalization gap	Lifecycle asset memory
Projected value recoverable (CB estimate)	\$26.3-52.5M

What went wrong

Each rehabilitation phase was tendered as a standalone project with no cumulative digital asset model linking phases. Every new phase re-surveyed work already completed because no structured condition database was kept, and the Parliamentary Budget Officer documented escalation partly attributable to the absence of a program-level information framework. No fraud, no contractor failure - simply no digital memory.

The Clarity Builders remedy

CB mandates a structured asset deliverable in every contract so each phase builds a progressively complete model, removing the re-survey cost at phase entry, held in one authoritative condition record and curated for predictive, data-driven planning.

INDUSTRY-ALIGNED AI Predictive maintenance intelligence turns a cumulative condition record into a maintenance forecast, shifting phase boundaries from budget cycles to data - impossible without the persistent asset model CB builds first.

Source: National Capital Commission annual reports (2006-2018); Parliamentary Budget Officer cost analysis; PSPC records.



11. Nipigon River Bridge

Nipigon, Ontario · 320 m cable-stayed bridge

Location	Nipigon, Ontario
Asset type	320 m cable-stayed bridge
Ownership	Public - provincial (Ontario MTO)
Project years	2013-2016 (failure January 2016)
Reported cost	\$106M construction
Cost overrun / deficiency	Failure cost estimated \$50M+
Primary digitalization gap	Design assurance and simulation
Projected value recoverable (CB estimate)	\$15-30M

What went wrong

Six weeks after opening, an anchor strand fractured in extreme cold, the deck shifted, and the only road link between eastern and western Canada closed for about 18 hours. The MTO review identified a thermal expansion-joint design error: the joint was not designed for contraction near minus 30 Celsius. No coordinated structural model with thermal simulation validated joint performance against the local climate envelope before fabrication.

The Clarity Builders remedy

A design-assurance gap. CB sets the model-based performance-checking and fabrication-coordination requirements - standard on comparable northern bridges - so the joint is validated digitally before any steel is cut. Delivered through a BIM Ready capability focused on design-stage risk.

INDUSTRY-ALIGNED AI Simulation here is established engineering; the emerging AI layer prioritizes performance-checking and flags design intent versus fabricated geometry. CB's caution holds: AI assists the check, the engineer owns the judgment.

Source: Ontario Ministry of Transportation Nipigon Bridge review (2016); Transportation Research Board failure analysis (2016).



12. Ile-aux-Tourtes Bridge - Emergency Repairs

Vaudreuil-Dorion, Quebec · Autoroute 40 steel truss bridge

Location	Vaudreuil-Dorion, Quebec
Asset type	Autoroute 40 steel truss bridge
Ownership	Public - provincial (MTQ)
Project years	Built 1962; emergency repairs 2019-2026
Reported cost	Emergency program estimated \$130M+
Cost overrun / deficiency	Ongoing; repeated emergency closures
Primary digitalization gap	Asset baseline and predictive condition
Projected value recoverable (CB estimate)	\$32.5-65M

What went wrong

A 1962 bridge carrying more than 120,000 vehicles a day has needed repeated emergency closures since 2019 due to rebar corrosion and spalling that developed predictably over decades. No digital asset record, condition baseline or predictive model existed, so deterioration was found through visible failure rather than data. For a structure of this importance, the absence of a baseline is a governance choice, not a technical limit.

The Clarity Builders remedy

CB creates a retroactive asset baseline - point-cloud survey and structured condition model - against which inspections trend, with a lifecycle layer integrating climate, materials and loading. The same model embeds sensor-fed monitoring for planned intervention across the aging portfolio.

INDUSTRY-ALIGNED AI With a baseline in place, predictive condition models forecast a corrosion trajectory years ahead; this is the strongest AI maintenance case in the set, and it is unavailable until the asset data exists.

Source: *Ministere des Transports du Quebec press releases and rehabilitation announcements (2019-2026); Radio-Canada coverage.*



13. Turcot Interchange Reconstruction

Montreal, Quebec · Multi-level urban interchange

Location	Montreal, Quebec
Asset type	Multi-level urban interchange
Ownership	Public - provincial (MTQ)
Project years	2011-2021 (impact 2021+)
Reported cost	~\$3.7B final (early planning estimates near \$1.5B)
Cost overrun / deficiency	~\$700M over the pre-construction baseline
Primary digitalization gap	Multi-party coordination and single source of truth
Projected value recoverable (CB estimate)	\$222-370M

What went wrong

Quebec's largest-ever roadwork rebuilt a complex interchange in a dense corridor shared with CN Rail and multiple utility owners. Documented coordination conflicts among MTQ, the railway and utilities, without a shared information environment or coordinated model, drove schedule and cost growth over a decade of planning and a roughly six-year build.

The Clarity Builders remedy

CB establishes a federated model and a shared data environment across MTQ, the railway and utility owners, moving interface conflicts from the field to the screen, with a program model to sequence a live, traffic-bearing reconstruction.

INDUSTRY-ALIGNED AI Semantic clash detection prioritizes the multi-party conflicts that matter most, and a governed environment lets AI flag interface changes across owners as they happen.

Source: *Ministere des Transports du Quebec project reporting; public reporting on Turcot completion (2011-2021).*



14. Highway 1 - Rogers Pass Improvement Project

Rogers Pass (Glacier National Park), British Columbia · Alpine Trans-Canada Highway

Location	Rogers Pass (Glacier National Park), British Columbia
Asset type	Alpine Trans-Canada Highway
Ownership	Public - provincial / federal (BC MoTI, Parks Canada)
Project years	2012-2022 (impact 2022+)
Reported cost	~\$600M (Clarity Builders internal estimate)
Cost overrun / deficiency	~\$120M (Clarity Builders internal estimate)
Primary digitalization gap	Multi-agency terrain coordination
Projected value recoverable (CB estimate)	\$36-72M

What went wrong

Reconstruction through avalanche-controlled alpine terrain required coordination among BC MoTI, Parks Canada and National Defence (which runs avalanche control in the pass). Geotechnical, structural and environmental design proceeded without a shared terrain model, leaving gaps across agencies and a constrained, weather-limited construction window.

The Clarity Builders remedy

CB builds a federated terrain model integrating geotechnical, structural and environmental data so the agencies share one baseline, with a program model to sequence work around avalanche-control and seasonal constraints. The diagnostic confirms the multi-agency information requirements first. Entry maturity is BIM Ready.

INDUSTRY-ALIGNED AI A shared terrain dataset is the foundation for AI-assisted geotechnical risk and schedule modelling across agencies; the data alignment has to come before the analytics.

Source: Clarity Builders internal estimate based on BC MoTI / Parks Canada program records (figures to be confirmed against final public accounts).



15. Highway 407 East Extension

Durham Region, Ontario · TOLLED highway extension (P3)

Location	Durham Region, Ontario
Asset type	Tolled highway extension (P3)
Ownership	Public - provincial P3 (Infrastructure Ontario)
Project years	2013-2016 (Ph1); 2016-2020 (Ph2)
Reported cost	~\$2.2-2.5B (two fixed-price P3 phases)
Cost overrun / deficiency	Lifecycle-data deficiency (overrun figure: CB internal estimate)
Primary digitalization gap	Whole-life data handover
Projected value recoverable (CB estimate)	\$125-250M

What went wrong

As fixed-price design-build-finance P3s, construction risk sat with the consortia rather than appearing as a public capital overrun. The digitalization failure is in lifecycle data: contractor digital use was inconsistent and no owner information requirements mandated structured whole-life data, so Infrastructure Ontario did not receive a complete asset and cost model at handover for long-term management.

The Clarity Builders remedy

CB writes the information and handover obligations into the P3 so the owner inherits a verified whole-life model, not just a finished road, with a lifecycle layer for the maintenance-and-rehabilitation phase the concession will eventually return. A BIM Ready owner closing the data gap fixed-price delivery tends to hide.

INDUSTRY-ALIGNED AI Whole-life asset data is what later enables AI-based pavement and structure deterioration modelling across the toll network; the handover standard is the enabler.

Source: Infrastructure Ontario Highway 407 East project records; overrun magnitude is a Clarity Builders internal estimate (no audited capital overrun published).



16. Trans-Canada Highway Twinning - Saskatchewan

Multiple corridors, Saskatchewan · Multi-year twinning program

Location	Multiple corridors, Saskatchewan
Asset type	Multi-year twinning program
Ownership	Public - provincial (Sask. Ministry of Highways)
Project years	2007-2022 (impact 2022+)
Reported cost	~\$1.8B program (Clarity Builders internal estimate)
Cost overrun / deficiency	~\$280M (Clarity Builders internal estimate)
Primary digitalization gap	Program-level cost and schedule data
Projected value recoverable (CB estimate)	\$90-180M

What went wrong

A multi-decade, phased twinning program proceeded without a program-level information framework linking individual contracts. Repeated mobilisation and uncoordinated utility relocations recurred across corridors, with no program cost model to surface cumulative cost or schedule interdependencies.

The Clarity Builders remedy

CB links contracts into one program-level data environment and cost model, removing duplicated mobilisation, with the diagnostic setting the program information standard before the next phases. Clarity Builders recommends confirming the headline figures or substituting a fully audited prairie comparator (for example the Regina Bypass P3) before external release.

INDUSTRY-ALIGNED AI Program analytics across linked contracts are where AI adds cumulative value; the prerequisite is a program data standard that does not exist today on this file.

Source: Clarity Builders internal estimate; recommend verification against Saskatchewan Ministry of Highways program accounts or substitution of an audited comparator.



17. Edmonton Gold Bar Wastewater Treatment Plant Expansion

Edmonton, Alberta · Wastewater treatment-plant expansion

Location	Edmonton, Alberta
Asset type	Wastewater treatment-plant expansion
Ownership	Public - municipal (City of Edmonton)
Project years	2014-2020 (impact 2020+)
Reported cost	\$550M final (~\$500M program estimate)
Cost overrun / deficiency	~\$95M (~17%)
Primary digitalization gap	Coordination and cost intelligence on a live site
Projected value recoverable (CB estimate)	\$41.3-82.5M

What went wrong

New capacity had to be integrated into an actively operating plant serving about 900,000 people. Without a coordinated model linking the existing as-built condition to new mechanical, electrical and process systems, clashes were found in the field, where rework in a live wastewater environment carries a steep premium. No cost model surfaced budget variance in real time.

The Clarity Builders remedy

CB builds the federated model and data environment that move clash detection ahead of mobilisation, with an execution plan governing multiple primes on a live site and a cost model giving the City continuous budget status. A BIM Ready owner applying coordination discipline in a constrained facility.

INDUSTRY-ALIGNED AI Semantic clash detection prioritizes the conflicts that would otherwise become field rework; the governed model is what makes that prioritization reliable.

Source: City of Edmonton / Gold Bar program reporting; Construction Industry Institute MEP clash-avoidance benchmarks (2020).



18. Toronto Midtown Trunk Sewer (Basement Flooding Protection Program)

Toronto, Ontario · Deep urban trunk sewer

Location	Toronto, Ontario
Asset type	Deep urban trunk sewer
Ownership	Public - municipal (City of Toronto)
Project years	2018-2026 (impact 2026+)
Reported cost	\$720M final
Cost overrun / deficiency	~\$110M (~15%)
Primary digitalization gap	Subsurface coordination and asset-data continuity
Projected value recoverable (CB estimate)	\$54-108M

What went wrong

Deep sewer construction in one of Canada's most densely serviced corridors meant negotiating telecom, transit, watermain, gas, hydro and existing sewers. Utility conflicts found during construction - each costly in a deep, tight corridor - were the main source of variance. With no subsurface utility model and no asset-data framework, the asset also transfers without structured operational data, perpetuating reactive maintenance.

The Clarity Builders remedy

CB builds a subsurface utility model integrating utility records and ground-penetrating radar to move conflict identification from field to office, with an asset-data handover feeding Toronto Water's management system and program-level governance across the contract packages.

INDUSTRY-ALIGNED AI On a governed asset model, predictive maintenance intelligence extends the value into operations; the subsurface model is also the substrate for AI-assisted utility conflict prediction.

Source: City of Toronto Capital Works reporting on the Basement Flooding Protection Program (2018-2026).



19. Winnipeg Water Treatment Program

Winnipeg, Manitoba · Multi-site water program

Location	Winnipeg, Manitoba
Asset type	Multi-site water program
Ownership	Public - multi-government (municipal / provincial / federal)
Project years	2016-2023 (impact 2023+)
Reported cost	\$1.9B program total
Cost overrun / deficiency	~\$310M (~16%)
Primary digitalization gap	Multi-funder governance and cost intelligence
Projected value recoverable (CB estimate)	\$114-228M

What went wrong

This multi-site program - North End upgrades plus Shoal Lake Aqueduct decommissioning - was funded across the City, the Province and the federal government. With three funders reporting in different formats and no program-level data environment, the cost model was assembled from disparate sources rather than derived from one authoritative environment, and multi-site interdependencies were not visible in real time.

The Clarity Builders remedy

CB gives all three funders one authoritative cost and schedule source with an audit trail that makes misrepresentation structurally difficult, plus models that expose the cost consequence of change and cross-site dependencies. Sustained through an embedded governance retainer over a multi-year program.

INDUSTRY-ALIGNED AI A single governed data environment is the precondition for AI portfolio reporting that gives each funder board-ready briefings from the same source of truth.

Source: City of Winnipeg / Province of Manitoba / federal program reporting (2016-2023); UK BIM Level 2 dispute-reduction benchmark.



20. Halifax Water - Aerotech Wastewater Treatment Facility

Dartmouth, Nova Scotia · Industrial wastewater treatment facility

Location	Dartmouth, Nova Scotia
Asset type	Industrial wastewater treatment facility
Ownership	Public - municipal utility (Halifax Water)
Project years	2015-2021 (impact 2021+)
Reported cost	\$185M final
Cost overrun / deficiency	~\$38M (~21%)
Primary digitalization gap	Coordination and lifecycle energy
Projected value recoverable (CB estimate)	\$13.9-27.8M

What went wrong

Industrial treatment for a high-technology park interleaves process, civil/structural and complex mechanical and electrical systems. Post-construction reviews documented coordination failures between the process train and civil/structural disciplines - major rework in a constrained, corrosive setting. Significant aeration energy demand was not validated against design through a lifecycle energy model, and operating energy ran above design in early years.

The Clarity Builders remedy

CB builds a federated model across process, mechanical, electrical, civil and structural disciplines to resolve clashes in design, plus a lifecycle energy model validating aeration demand before construction. A BIM Ready capability with a lifecycle and operating-cost focus.

INDUSTRY-ALIGNED AI A governed model supports AI energy optimisation on the dominant aeration load over the asset life; the energy model has to exist before the optimisation can.

Source: Halifax Water annual reports; Nova Scotia Utility and Review Board and HRM capital reporting; CII MEP benchmarks (2020).



21. St. Paul's Hospital Redevelopment

Vancouver, British Columbia · 548-bed acute hospital

Location	Vancouver, British Columbia
Asset type	548-bed acute hospital
Ownership	Not-for-profit health provider, publicly funded (Providence Health Care)
Project years	2019-2027 (impact 2027+)
Reported cost	\$2.1B (2024 estimate)
Cost overrun / deficiency	~\$450M (variations and scope additions)
Primary digitalization gap	Coordination and live cost intelligence
Projected value recoverable (CB estimate)	\$126-252M

What went wrong

The largest hospital redevelopment in BC history used design-build to compress the program but without comprehensive owner information requirements mandating federated coordination across packages. Conflicts among clinical planning, structural and mechanical/electrical disciplines were found late, generating a large volume of variation orders, and with no live cost model the impact of clinical-brief changes could not be assessed in real time.

The Clarity Builders remedy

CB establishes the information requirements and a single data environment from inception so clash detection resolves conflicts digitally and a cost model gives the owner real-time visibility on brief changes, with a structured handover verifying the asset register before occupancy. A BIM Ready owner moving toward BIM Engaged operations.

INDUSTRY-ALIGNED AI On a governed model, predictive cost-overrun detection flags clinical-scope cost impact early, and an executive narrative keeps the health authority board ahead of the variation log.

Source: BC Ministry of Health and Providence Health Care St. Paul's project updates (2019-2024).



22. Royal Victoria Hospital (Glen Site) - McGill University Health Centre

Montreal, Quebec · 1,646-bed academic health centre

Location	Montreal, Quebec
Asset type	1,646-bed academic health centre
Ownership	Public - provincial health (MUHC)
Project years	2010-2015 (impact 2015+)
Reported cost	\$2.35B at completion
Cost overrun / deficiency	~\$640M (coordination failures and rework)
Primary digitalization gap	Information governance and auditability
Projected value recoverable (CB estimate)	\$141-282M

What went wrong

The largest hospital P3 in Canadian history at award consolidated five hospitals onto one campus. The consortium used digital tools internally, but no owner information requirements mandated a federated, auditable data environment across packages. The Auditor General of Quebec (2013, 2017) found governance failures and cost data not consistently available to the board, while fragmented asset-data handover forced costly manual inventories at go-live.

The Clarity Builders remedy

CB requires a single data environment accessible to the owner's team throughout, making cost data transparent and auditable - directly addressing the governance findings - plus a verified handover integrated with the maintenance system to remove the re-inventory burden across five campuses.

INDUSTRY-ALIGNED AI AI contract review and CDE-activity anomaly detection are precisely the controls that make board-level cost opacity harder to sustain, and portfolio narrative tools give the board one auditable view.

Source: Auditor General of Quebec reports on the MUHC Glen Site (2013, 2017); MUHC oversight board reporting.



23. Humber River Hospital

Toronto, Ontario · 656-bed acute hospital

Location	Toronto, Ontario
Asset type	656-bed acute hospital
Ownership	Not-for-profit hospital corporation, publicly funded (Humber River Health)
Project years	2011-2015 (impact 2015+)
Reported cost	\$1.7B at completion
Cost overrun / deficiency	No capital overrun claimed; asset-data handover gap
Primary digitalization gap	Asset-data continuity / digital twin
Projected value recoverable (CB estimate)	\$42.5-85M

What went wrong

Marketed as North America's first fully digital hospital, the project used digital tools in construction, but an independent post-go-live assessment found the asset-data handover incomplete: the register was not fully verified, operations documentation was not consistently linked to model objects, and the maintenance system was not pre-populated. The facilities team had to manually inventory a 656-bed building designed and marketed as a digital asset.

The Clarity Builders remedy

The fix is contractual rigour at handover. CB defines structured asset deliverables with verification gates at completion that make the model the authoritative register and pre-populate the maintenance system, then curates the digital twin so the digital-hospital claim is verified, not asserted.

INDUSTRY-ALIGNED AI This is the clearest digital-twin case: a verified twin is the foundation for AI-driven operations, anomaly detection and space optimisation - none of which a marketing claim delivers without governed data.

Source: CBC News and independent post-occupancy assessments of Humber River Hospital (2015-2023).



24. Vancouver Convention Centre Expansion (West Building)

Vancouver, British Columbia · Waterfront convention centre

Location	Vancouver, British Columbia
Asset type	Waterfront convention centre
Ownership	Public - provincial (Province of BC / BC Pavilion Corp)
Project years	2004-2009 (impact 2009+)
Reported cost	\$883M final
Cost overrun / deficiency	~\$318M over the 2004 budget (from \$565M; ~\$495M in 2000)
Primary digitalization gap	Coordination and live cost control
Projected value recoverable (CB estimate)	\$66-132M

What went wrong

The green-roof waterfront expansion began construction before design was complete and before a fixed-price contract was locked, which did not happen until summer 2007. As global steel, concrete and glass prices surged in an Olympic-era labour market, the budget escalated from about \$495M (2000) to a final \$883M, with design changes priced weeks after decisions. The BC Auditor General flagged the incomplete-design start and the absent fixed price.

The Clarity Builders remedy

CB pairs a federated model with a live cost model so design changes are priced as they are made and a fixed price can be locked before mobilisation, with the diagnostic establishing the readiness and gateway controls a project of this complexity needed before breaking ground. Entry maturity is Pre-BIM moving to BIM Ready.

INDUSTRY-ALIGNED AI A governed cost model is what makes predictive overrun detection possible; the lesson is that AI cannot price a design that was never modelled before it was built.

Source: Auditor General of British Columbia, review of the Vancouver Convention Centre Expansion Project (2007).



25. University of Ottawa - Academic Hall Replacement

Ottawa, Ontario · University academic facility

Location	Ottawa, Ontario
Asset type	University academic facility
Ownership	Public - publicly-assisted university (University of Ottawa)
Project years	2014-2017 (impact 2017+)
Reported cost	~\$155M (Clarity Builders internal estimate)
Cost overrun / deficiency	~\$28M (Clarity Builders internal estimate)
Primary digitalization gap	Campus data integration
Projected value recoverable (CB estimate)	\$11.6-23.3M

What went wrong

An academic facility on a dense urban campus required coordination with the university's live utility-tunnel network. Conflicts were discovered during construction because as-built data for the campus tunnels was incomplete, and no lifecycle layer linked the new building to campus energy and service systems.

The Clarity Builders remedy

CB builds a federated model incorporating verified as-built tunnel data to move conflicts to the design phase, plus a lifecycle layer tying the building into campus energy management, with the diagnostic first establishing the campus information baseline. Clarity Builders recommends confirming the project name and figures, or substituting a fully sourced university capital project, before external release.

INDUSTRY-ALIGNED AI Campus-wide governed data is the foundation for AI energy and space optimisation across the estate; the integration baseline comes first.

Source: Clarity Builders internal estimate (project naming and figures to be confirmed; closest verified uOttawa capital project is the Learning Crossroads/CRX building, ~\$83M).



The full picture: twenty-five projects

The projects below span recreation and civic buildings, transit, bridges, highways, water and wastewater, healthcare, and institutional facilities, across every region of Canada. The pattern is consistent: decisions made without timely, trustworthy information, and assets handed over without the data needed to run them. Projected value figures are conservative Clarity Builders estimates.

#	PROJECT	ASSET TYPE	REPORTED COST	OVERRUN / ISSUE	VALUE (CB EST.)
1	Eliyahu Wellness Centre	Recreation & civic building	\$22-23M final (from a \$9.9-10.0M budget)	~\$12-13M (~130%)	\$3.3-4.6M
2	Cambridge Recreation Complex	Multi-use recreation and aquatics building	\$107.9M approved budget (\$60M initial feasibility)	~\$48M (~80% escalation)	\$14.0-21.0M
3	RIM Park Multi-Use Recreation Complex	500-acre recreation complex	\$56.7M construction; \$48.3M financing arrangement	30-yr financing \$227.7M as signed, settled at \$145.7M	\$9.3-19.2M
4	Pam McConnell Aquatic Centre	Aquatic centre	\$16.6M (delivered on time and on budget)	No construction overrun; lifecycle / asset-data failure	\$3.1-6.25M
5	Eglinton Crosstown LRT	19 km light rail line	\$12.8B final (early estimate \$8.2-9.1B)	Billions over early estimates; ~6 years late	\$640-1,280M
6	Ottawa LRT Stage 1 (Confederation Line)	12.5 km light rail line	\$2.13B fixed-price contract	Reliability failures; public-trust findings (Hourigan Inquiry)	\$210-420M
7	Ottawa LRT Stage 2	Light rail extensions	\$5.06B (from a \$4.66B 2019 approval)	~\$400M+ over approval; procurement-scoring controversy	\$368-690M
8	Reseau express metropolitain (REM) - Phase 1	67 km automated light metro	\$8.0B final (from \$6.3B at 2018 bidder selection)	~\$1.65B (~26%)	\$420-700M
9	Champlain Bridge Replacement (Pont Samuel-De Champlain)	3.4 km cable-stayed bridge	\$4.2B final	~\$400M (~10%)	\$210-420M
10	Macdonald-Cartier Bridge Rehabilitation	556 m steel truss bridge	\$350M (multi-phase)	~\$75M over early estimates	\$26.3-52.5M



#	PROJECT	ASSET TYPE	REPORTED COST	OVERRUN / ISSUE	VALUE (CB EST.)
11	Nipigon River Bridge	320 m cable-stayed bridge	\$106M construction	Failure cost estimated \$50M+	\$15-30M
12	Ile-aux-Tourtes Bridge - Emergency Repairs	Autoroute 40 steel truss bridge	Emergency program estimated \$130M+	Ongoing; repeated emergency closures	\$32.5-65M
13	Turcot Interchange Reconstruction	Multi-level urban interchange	\$3.7B final (early planning estimates near \$1.5B)	~\$700M over the pre-construction baseline	\$222-370M
14	Highway 1 - Rogers Pass Improvement Project	Alpine Trans-Canada Highway	\$600M (Clarity Builders internal estimate)	~\$120M (Clarity Builders internal estimate)	\$36-72M
15	Highway 407 East Extension	Tolled highway extension	\$2.2-2.5B (two fixed-price P3 phases)	Lifecycle-data deficiency (overrun figure: CB internal estimate)	\$125-250M
16	Trans-Canada Highway Twinning - Saskatchewan	Multi-year twinning program	\$1.8B program (Clarity Builders internal estimate)	~\$280M (Clarity Builders internal estimate)	\$90-180M
17	Edmonton Gold Bar Wastewater Treatment Plant Expansion	Wastewater treatment-plant expansion	\$550M final (\$500M program estimate)	~\$95M (~17%)	\$41.3-82.5M
18	Toronto Midtown Trunk Sewer (Basement Flooding Protection Program)	Deep urban trunk sewer	\$720M final	~\$110M (~15%)	\$54-108M
19	Winnipeg Water Treatment Program	Multi-site water program	\$1.9B program total	~\$310M (~16%)	\$114-228M
20	Halifax Water - Aerotech Wastewater Treatment Facility	Industrial wastewater treatment facility	\$185M final	~\$38M (~21%)	\$13.9-27.8M
21	St. Paul's Hospital Redevelopment	548-bed acute hospital	\$2.1B (2024 estimate)	~\$450M (variations and scope additions)	\$126-252M
22	Royal Victoria Hospital (Glen Site) - McGill University Health Centre	1,646-bed academic health centre	\$2.35B at completion	~\$640M (coordination failures and rework)	\$141-282M



#	PROJECT	ASSET TYPE	REPORTED COST	OVERRUN / ISSUE	VALUE (CB EST.)
23	Humber River Hospital	656-bed acute hospital	\$1.7B at completion	No capital overrun claimed; asset-data handover gap	\$42.5-85M
24	Vancouver Convention Centre Expansion (West Building)	Waterfront convention centre	\$883M final	~\$318M over the 2004 budget (from \$565M; ~\$495M in 2000)	\$66-132M
25	University of Ottawa - Academic Hall Replacement	University academic facility	\$155M (Clarity Builders internal estimate)	~\$28M (Clarity Builders internal estimate)	\$11.6-23.3M

Reported figures are sourced on each project page. Value ranges are conservative Clarity Builders internal estimates; entries flagged on their pages should be confirmed before external release.



How Clarity Builders helps

Every problem in this report — scope decisions made blind, governance opacity, coordination failures, and assets handed over without data — is one Clarity Builders helps Canadian owners solve. The path is diagnostic-led and meets each organization at its stage, then broadens from information governance to data architecture to the disciplined use of AI.

PHASE	WHAT IT DOES	WHAT IT PREVENTS
Diagnose	Digital Crossing diagnostic: a maturity and AI-readiness assessment across people, process, technology, governance and contracts, with the financial cost of the current state made visible to leadership.	Locates the owner on the maturity scale and builds the executive case.
Build	Information requirements, a single data environment, data architecture, supply-chain onboarding, and lifecycle handover standards — the substrate that modern delivery and AI both depend on.	Closes the governance and data gaps behind the failures in this report.
Embed and activate	An embedded information capability, program governance, digital-twin curation, and industry-aligned AI applied where the data is ready.	Holds the gains and turns governed data into predictive value.

Clarity Builders engagement path. Diagnostic-led, broad, and sequenced: govern the information first, then activate AI on it.

The next step

If the patterns in this report resemble your portfolio — a major project ahead, an aging estate, or a program without consistent digital standards — a Digital Crossing diagnostic provides the baseline, the roadmap, and the executive business case. From there, you proceed at a pace that fits your capacity and risk appetite.



Consolidated sources

Project facts are drawn from the public sources below; projected value ranges are Clarity Builders internal estimates.

- 1. Eliyahu Wellness Centre.** MNP independent review of the Eliyahu Wellness Centre (October 2024); Town of North Rustico financial reporting.
- 2. Cambridge Recreation Complex.** City of Cambridge Council reports and budget approvals (2021-2024); Statistics Canada Building Construction Price Index.
- 3. RIM Park Multi-Use Recreation Complex.** Sills Judicial Inquiry into RIM Park financing (2003); City of Waterloo records.
- 4. Pam McConnell Aquatic Centre.** City of Toronto community recreation statements (2022); City of Toronto Corporate Asset Management Plan (2024).
- 5. Eglinton Crosstown LRT.** Auditor General of Ontario and CBC reporting on Eglinton Crosstown (2023-2025); Metrolinx disclosures.
- 6. Ottawa LRT Stage 1 (Confederation Line).** Ottawa Light Rail Transit Public Inquiry, final report (Justice W. Hourigan, 2022); City of Ottawa.
- 7. Ottawa LRT Stage 2.** CBC News reporting on Stage 2 budget and procurement scoring (2019-2026); City of Ottawa council records.
- 8. Réseau express métropolitain (REM) - Phase 1.** CDPQ Infra program updates; Railway Age and public reporting on REM cost and schedule (2021-2024).
- 9. Champlain Bridge Replacement (Pont Samuel-De Champlain).** Infrastructure Canada project reports and P3 agreement summaries (2015-2020).
- 10. Macdonald-Cartier Bridge Rehabilitation.** National Capital Commission annual reports (2006-2018); Parliamentary Budget Officer cost analysis; PSPC records.
- 11. Nipigon River Bridge.** Ontario Ministry of Transportation Nipigon Bridge review (2016); Transportation Research Board failure analysis (2016).
- 12. Ile-aux-Tourtes Bridge - Emergency Repairs.** Ministère des Transports du Québec press releases and rehabilitation announcements (2019-2026); Radio-Canada coverage.
- 13. Turcot Interchange Reconstruction.** Ministère des Transports du Québec project reporting; public reporting on Turcot completion (2011-2021).
- 14. Highway 1 - Rogers Pass Improvement Project.** Clarity Builders internal estimate based on BC MoTI / Parks Canada program records (figures to be confirmed against final public accounts).
- 15. Highway 407 East Extension.** Infrastructure Ontario Highway 407 East project records; overrun magnitude is a Clarity Builders internal estimate (no audited capital overrun published).
- 16. Trans-Canada Highway Twinning - Saskatchewan.** Clarity Builders internal estimate; recommend verification against Saskatchewan Ministry of Highways program accounts or substitution of an audited comparator.
- 17. Edmonton Gold Bar Wastewater Treatment Plant Expansion.** City of Edmonton / Gold Bar program reporting; Construction Industry Institute MEP clash-avoidance benchmarks (2020).
- 18. Toronto Midtown Trunk Sewer (Basement Flooding Protection Program).** City of Toronto Capital Works reporting on the Basement Flooding Protection Program (2018-2026).



19. Winnipeg Water Treatment Program. City of Winnipeg / Province of Manitoba / federal program reporting (2016-2023); UK BIM Level 2 dispute-reduction benchmark.

20. Halifax Water - Aerotech Wastewater Treatment Facility. Halifax Water annual reports; Nova Scotia Utility and Review Board and HRM capital reporting; CII MEP benchmarks (2020).

21. St. Paul's Hospital Redevelopment. BC Ministry of Health and Providence Health Care St. Paul's project updates (2019-2024).

22. Royal Victoria Hospital (Glen Site) - McGill University Health Centre. Auditor General of Quebec reports on the MUHC Glen Site (2013, 2017); MUHC oversight board reporting.

23. Humber River Hospital. CBC News and independent post-occupancy assessments of Humber River Hospital (2015-2023).

24. Vancouver Convention Centre Expansion (West Building). Auditor General of British Columbia, review of the Vancouver Convention Centre Expansion Project (2007).

25. University of Ottawa - Academic Hall Replacement. Clarity Builders internal estimate (project naming and figures to be confirmed; closest verified uOttawa capital project is the Learning Crossroads/CRX building, ~\$83M).

Benefit evidence base: Center for Integrated Facilities Engineering (CIFE), Stanford University; McGraw Hill SmartMarket Report (2014); UK BIM Level 2 Program Evaluation (2016); Infrastructure Australia (2021); Accruent / FM:Systems; Construction Industry Institute (2020).