



The Seattle Problem

*Three Megaprojects, Three Kinds of Delay, and the
Lessons They Share*

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Table of Contents

Executive Summary	2
The Three Projects in Brief	3
Three Different Delay Patterns	4
What the Three Projects Share	6
What Could Have Been Done Differently	9
Conclusion: The Common Pattern	14
References.....	15

Executive Summary

Three of the most consequential public infrastructure projects in recent Seattle history all overran schedule, generated litigation or active claims, and produced the kind of high-profile delay narratives that shape how owners, contractors, and the public think about megaproject delivery. The SR 99 Bored Tunnel, the Elliott Bay Seawall Replacement, and the Sound Transit East Link extension each lost two to three years against their original schedules. Each became the subject of public hearings, legal proceedings, or both.

What is striking about these three projects is that they failed differently. SR 99 lost two years to a single dramatic event: the world’s largest TBM stalling 1,000 feet into a 9,000-foot drive. The Seawall lost a year to a thousand small cuts: harder ground than expected, a containment wall that moved, sequencing changes imposed on a specialty subcontractor mid-execution, and a contract that placed substantial risk on the City. East Link lost three years to cascading construction quality defects that emerged through inspection cycles, with each repair attempt revealing additional problems.

But the three failures share a common structural pattern. In each case, the schedule risk that ultimately materialized was knowable in advance. In each case, prevention strategies are documented in industry practice. And in each case, specific decisions made early in the project, in contract structure, in geotechnical investigation, in quality assurance staffing, in public communication, contributed materially to the eventual outcome.

This paper synthesizes the lessons from the three projects and offers concrete recommendations for owners, contractors, and schedulers working on similar Pacific Northwest public infrastructure. It is intended for practitioners, not for general audiences. It assumes familiarity with CPM scheduling, design-build contracting, and the basic concepts of delay analysis under AACE RP 29R-03.

The Three Projects in Brief

SR 99 Bored Tunnel and the Bertha TBM (2011-2019)

The State Route 99 Tunnel, a 1.7-mile, four-lane double-deck highway tunnel beneath downtown Seattle, was constructed by Seattle Tunnel Partners (Dragados USA and Tutor Perini) under a design-build contract with WSDOT valued at approximately \$1.44 billion. The “Bertha” tunnel boring machine, the world’s largest TBM at 57.5 feet in diameter, encountered an 8-inch steel groundwater monitoring well casing in December 2013 and stalled three days later, requiring an extensive rescue and repair operation that took approximately two years. The tunnel opened to traffic on February 4, 2019, approximately 867 days late. STP claimed up to \$642 million for repair and delay costs; WSDOT counter-claimed \$57.2 million in liquidated damages. A December 2019 jury verdict found in favor of WSDOT on all claims; the Court of Appeals upheld the verdict in 2022; the Washington Supreme Court ultimately affirmed a final award to WSDOT of approximately \$77 million including interest. The Differing Site Conditions clause and the adequacy of the geotechnical baseline reports were central to the legal dispute.

Elliott Bay Seawall Replacement (2013-2017)

The Elliott Bay Seawall Replacement, a 7,166-linear-foot replacement of the original 1916-1934 timber-pile seawall along Seattle’s downtown waterfront, was constructed by the Mortenson-Manson Joint Venture under a contract structure that placed substantial cost risk on the City of Seattle. The project’s original 2013 estimate of \$330.8 million for Phase 1 grew to approximately \$410 million, an increase of roughly 21 percent. A mid-project decision to switch from dewatering to ground freezing for excavation support, driven by concern about settlement risk to the adjacent Alaskan Way Viaduct, contributed substantial cost. Specialty subcontractor Hayward Baker filed a \$7.3 million breach-of-

contract lawsuit against MMJV in 2016 over haphazard sequencing imposed after the project's containment wall moved westward in early 2015. The seawall was completed in 2017, more than a year late against the original schedule.

Sound Transit East Link / 2 Line (2016-2026)

The Sound Transit East Link extension, a 14-mile light rail line including the world's first light rail service across a floating bridge (the I-90 Homer M. Hadley Memorial Bridge), was constructed in part by the Kiewit-Hoffman East Link Constructors joint venture. Original ST2 voter approval in 2008 promised service to Bellevue by 2020 and Overlake by 2021. Original ST3 voter approval in 2016 reset the target to mid-2023. The project ultimately opened the full line on March 28, 2026, approximately three years later than the ST3 baseline. The delay was driven by cascading quality defects in concrete plinths supporting the rails on the I-90 approach spans, with approximately 5,400 to 6,000 plinths requiring complete demolition and reconstruction, plus 19,500 nylon fastener inserts replaced on the floating bridge segment. The contractor's claims of approximately \$184 million for additional work and extended duration are still in process. The COVID-19 pandemic, a four-month concrete strike in late 2021 and early 2022, and degraded inspection capacity all contributed to the cascading quality issues.

Three Different Delay Patterns

These three projects illustrate three distinct categories of megaproject schedule risk. Understanding the categories helps practitioners recognize each pattern early when it begins to emerge.

The Single Catastrophic Event (SR 99)

SR 99 is the textbook case of catastrophic event-driven delay. A single physical occurrence on December 6, 2013, stopped tunneling and required a two-year recovery operation. Before the event, the project was substantially on schedule. After the event, the project was approximately two years late. Recovery required an emergency 83-foot-deep shaft, a TBM extraction, replacement of major components, and restart.

The signature of this delay pattern is that the project schedule has a clear pre-event baseline and a clearly identifiable inflection point. Forensic schedule analysis on this kind of

delay is relatively tractable: the questions are about causation of the event (which the SR 99 jury answered in favor of WSDOT), allocation of recovery cost between owner and contractor, and quantification of downstream cascade effects. Windows analysis, MIP 3.5 reconstruction (where the contemporaneous schedule has to be re-baselined post-event), and explicit treatment of recovery work as nested project scope are all directly applicable.

The Cumulative Many Small Cuts (Elliott Bay Seawall)

The Seawall illustrates a different delay pattern: no single event drove the result, but a series of mid-project surprises and decisions accumulated to a 21 percent cost increase and a year-plus schedule slip. Harder ground than the original estimate anticipated. A containment wall that moved during construction. A decision to switch from dewatering to ground freezing. Sequencing changes imposed on the jet grouting subcontractor. Each individually was manageable. Together they exceeded the project's \$30 million contingency and forced a public budget reconciliation.

The signature of this delay pattern is that no single failure can be pointed to as the cause. Forensic schedule analysis is correspondingly more complex: windows analysis becomes essential because the answer to "when did the project become late" is genuinely "during multiple windows for multiple reasons." The Half-Step bifurcation (separating progress from revisions in each contemporaneous update) is particularly valuable on this kind of project, because the question of whether each update represented actual performance or schedule manipulation is contested. Concurrency analysis is critical because owner-caused, contractor-caused, and ground-condition-caused delays often overlap.

The Cascading Quality Discovery (East Link)

East Link illustrates a third pattern: a quality issue identified in one window grows through inspection cycles as repair attempts fail and broader defects come to light. The original 2019 plinth issue was the gap between the top of the plinth and the rail it was supposed to support. The first repair (mortar) failed in 2020. Further inspection in 2021 revealed concrete placement issues, geometric issues, and void issues. By 2022, missing or improperly installed rebar was discovered in many plinths. By March 2022, the floating bridge segment itself had revealed cracking and spalling on precast blocks, and stripped nylon inserts on fasteners. The eventual decision was full demolition and reconstruction of approximately 5,400 to 6,000 plinths, plus replacement of 19,500 fastener inserts.

The signature of this delay pattern is that the schedule impact grows over time as the inspection scope widens. Forensic schedule analysis requires careful tracking of when each issue was identified, when each repair was attempted, when each repair was found insufficient, and when broader defects came to light. Concurrency analysis is again critical: contractor-caused defects (poor concrete workmanship, inadequate quality control) may overlap with owner-shared causes (the COVID-19 pandemic disrupting on-site inspection, the November 2021 concrete strike).

What the Three Projects Share

Despite their different delay patterns, the three projects share a structural pattern that is worth examining explicitly.

The Risk That Materialized Was Knowable in Advance

In each case, the schedule risk that ultimately materialized was a known category of risk on this type of project at the time the contract was signed.

On SR 99, TBM stoppage on a project of unprecedented scale was a known risk. Hitachi Zosen knew it. STP knew it. WSDOT knew it. The 8-inch steel pipe specifically may have been a surprise (the legal dispute centered on whether it was adequately disclosed), but TBM stoppages of various kinds occur on a meaningful fraction of major TBM projects globally. The contract structure was specifically designed to allocate that risk to the contractor, and the resulting outcome was consistent with that allocation.

On the Seawall, ground risk in century-old reclaimed harbor fill was a known category of risk. The Denny Hill regrades, decommissioned harbor structures, and incremental fill of the Seattle waterfront over a hundred years made the subsurface inherently less predictable than well-characterized native soils. The proximity of the Alaskan Way Viaduct, itself seismically vulnerable, was a known constraint that limited construction methods. The project's ground risk profile was discussed in the geotechnical reports and the early environmental documentation. The eventual decision to switch from dewatering to ground freezing was foreseeable as a possibility from the start.

On East Link, quality control on rapid repetitive concrete placements is a known requirement on every major rail project. The plinths are not novel engineering. The novel engineering on East Link, the track bridge transition system, the lightweight plinth design

with drip caps, the Dex-G adhesive, all worked as designed. The conventional cast-in-place plinths on the approach spans, the work that did not require novel engineering to execute, is what failed. Quality control on this work was a known requirement, and degraded inspection capacity during the pandemic was a known risk to that quality control. In each project, the actual delay was driven by a foreseeable risk that the project's risk management framework did not adequately address. This is not the same as saying the projects could have been built without delay. It is saying that the specific delay outcomes were not random surprises; they were predictable consequences of decisions and conditions that were visible at the time.

Contract Structure Determined Outcome

All three projects illustrate how contract structure decisions made years before construction begins determine who pays for delays when they materialize. WSDOT's design-build contract on SR 99 explicitly placed tunneling risk on the contractor. This is a defensible structure for tunneling work where contractor expertise is the primary value proposition. The contract's Differing Site Conditions clause provided a mechanism for the contractor to seek relief if subsurface conditions were materially different from those disclosed. Whether that relief was warranted became the central legal question. When the trial concluded that WSDOT had adequately disclosed the conditions, the contract structure delivered the outcome it was designed to deliver: the contractor bore the cost of a tunneling-related delay.

Mortenson-Manson's contract for the Seawall reportedly placed substantial cost risk on the City of Seattle. Mayor Murray characterized the contract this way after the cost overruns emerged. Without seeing the full contract, the precise allocation cannot be verified, but the publicly reported pattern is that the City retained material ground risk, and when ground risk materialized, the City bore most of the cost. This is also a defensible contract structure for marine civil work in poorly characterized fill, where transferring ground risk to the contractor would have required a substantial premium. But it had predictable cost consequences when conditions turned out to be worse than expected.

The East Link contract structure between Sound Transit and Kiewit-Hoffman has not been publicly examined in the same depth as SR 99. But the contractor's \$184 million claim for extra work and extended duration suggests that the contract treated some categories of risk as owner-allocated, and that the contractor expects to recover at least some of that allocation. The eventual claim resolution will depend on what the contract said about

quality remediation responsibility, force majeure during the pandemic and concrete strike, and constructive change for inspection regime modifications.

Public Communication Discipline Mattered

The three projects had three different approaches to public communication, with measurably different outcomes for institutional credibility.

WSDOT on SR 99 maintained a relatively disciplined and consistent position throughout the dispute: tunneling risk had been allocated to the contractor, the contractor was responsible for repair costs and delay damages, the State would not pay. Governor Inslee and successive WSDOT Secretaries publicly reinforced this position through years of dispute. When the jury returned its verdict in WSDOT's favor in December 2019, the institutional credibility WSDOT had maintained over six years of public scrutiny was a meaningful asset. The Seawall's public communication, by contrast, included a specific incident in July 2015 where the project manager publicly stated "the project's not delayed overall" approximately one month before a \$71 million budget increase was announced. The credibility cost of that gap, between the public statement and the actual emerging picture, was real. Mayor Murray's eventual response, including calling for an independent audit and publicly attributing the contract structure to his predecessor, was an attempt to reset institutional credibility, but it came at political cost.

Sound Transit on East Link adopted a "no surprises" communication policy with regular quarterly Board updates and public release of construction issue details. The criticism in real time was substantial. But the institutional credibility was largely preserved through a multi-year public airing of construction problems. The April 2024 partial opening of the Eastside-only starter line, while the cross-lake repairs continued, demonstrated that the agency could deliver tangible service even in the middle of a delay crisis. Ridership on that abridged service exceeded projections, providing real evidence that the underlying demand was real.

The pattern across the three projects suggests that public communication discipline has measurable institutional value. Honest early acknowledgment of problems is generally less damaging than late acknowledgment forced by financial reality. Owners on troubled public projects who maintain consistent communication tend to preserve more institutional capital than owners who allow gaps between public statements and project reality.

Forensic Defensibility Mattered

In each project, the quality of the contemporaneous schedule record and the project documentation made a measurable difference in how disputes were ultimately resolved. On SR 99, the spoliation finding against STP for losing or destroying pipe fragments and a key engineering journal during the 2013–14 winter was a substantial setback for the contractor’s case. Judge Murphy issued adverse jury instructions specifically because of the spoliation. In a case where the central legal question was causation of the TBM stoppage, the loss of physical evidence and contemporaneous documentation directly weakened STP’s ability to prove its position. The lesson is direct: evidence preservation discipline from the moment a project event suggests potential dispute is essential, not optional.

On the Seawall, the public record of project status reports, the reconciliation of contemporaneous estimates with the actual cost trajectory, and the documentation of the dewatering-to-ground-freezing decision all became evidence in the eventual project reviews. The clarity of that record influenced how the additional appropriation discussion proceeded with the City Council and the public.

On East Link, Sound Transit’s quarterly Board updates and the explicit documentation of each successive plinth issue, each repair attempt, each broadening of inspection scope, has produced a contemporaneous record that will support whatever forensic schedule analysis is eventually required to resolve Kiewit–Hoffman’s claims. The agency’s documentation discipline during the crisis is an asset for the eventual claim resolution.

Adjacent Operating Infrastructure Constrained Construction

Two of the three projects, SR 99 and the Seawall, were constrained by the proximity of the Alaskan Way Viaduct, a vulnerable structure that limited the construction methods available for adjacent work. The third, East Link, was constrained by the I-90 floating bridge itself, where construction had to accommodate a structure that is constantly moving with water levels and that could not be drilled into without compromising structural integrity. This is a recurring feature of urban infrastructure work, particularly in a city like Seattle where waterfront, seismic, and freight corridor constraints overlap. The construction methods available on each project were limited by what was acceptable to adjacent infrastructure. The schedule consequences of those limitations were real and significant.

What Could Have Been Done Differently

The most useful question for practitioners is not whether these projects could have been delivered without delay (they probably could not, given their inherent complexity), but whether specific decisions could have reduced the magnitude of delay or the severity of the eventual disputes. The following recommendations are drawn from the patterns observed across all three projects.

1. Treat Geotechnical Baseline Reports as a Primary Risk Allocation Instrument

On SR 99, the legal dispute turned in significant part on whether the 8-inch steel pipe was adequately disclosed in the contract's geotechnical baseline reports. On the Seawall, the volume and character of historic harbor fill turned out to be more variable than the geotechnical investigation had characterized. On East Link, while not a primary driver of the delays, ground conditions on the Federal Way segment of the broader program were also identified as a contributing factor on related projects.

For owners, the geotechnical baseline report is the primary risk allocation document for any underground or marine civil project. Every existing subsurface obstruction, every prior investigation artifact, every old foundation, utility, monitoring well, and abandoned pile should be specifically identified and characterized. The cost of expanding the geotechnical investigation by an additional 10 to 20 percent is small relative to the cost of a single major dispute over a missed condition.

For contractors, the GBR is the primary basis for risk pricing. Any gaps or ambiguities in the GBR should be documented in writing before bid. Verbal assurances during pre-bid meetings are not contract documents. If the GBR does not say it, the contractor should not bid on the assumption that it is true.

2. Size Contingency to the Actual Risk Profile of the Work

The Seawall's \$30 million contingency, approximately 9 percent of the original Phase 1 budget, was inadequate for a project with this much ground risk in century-old harbor fill. SR 99's contract structure shifted contingency exposure to the contractor, which is a different way of sizing it but equally subject to underestimation. East Link's contingency was sized for normal construction risk, not for cascading quality issues that grow through inspection cycles.

For owners, contingency on complex marine civil, tunneling, or repetitive structural work in poorly characterized conditions should be sized to absorb realistic ranges of the dominant

risk drivers. A useful exercise is to identify the three to five highest-impact risks the project could encounter, estimate the cost of each if it materialized, and ensure that contingency could absorb at least the largest one without external appropriation. Contingency that is exhausted by the first significant adverse event is contingency that was inadequately sized.

3. Design the Contract to Match the Risk Profile, Then Hold the Line

WSDOT's discipline in maintaining its risk allocation position on SR 99, through six years of public dispute and a two-month trial, was decisive. Contract structures only work if owners are prepared to defend them. Owners who allocate risk to contractors and then renegotiate when problems emerge tend to undermine future contract negotiations across their portfolio. Owners who allocate risk to themselves and then express surprise when costs increase undermine public credibility.

The choice of risk allocation should be made deliberately, with explicit consideration of the owner's ability to absorb the allocated risk in cost and political terms. Once made, the allocation should be defended consistently. WSDOT did this. The City of Seattle, on the Seawall, retained more risk than the original budget could absorb, and the resulting public reconciliation was costly in political capital.

4. Invest in Quality Assurance Staffing as a Schedule Discipline

The East Link plinth issues are, at root, a quality control failure. The pandemic context is real, but the fundamental issue is that thousands of repetitive structural elements were placed without adequate real-time inspection to catch the problems at the time of placement. By the time the problems were identified, the concrete had cured, and remediation became orders of magnitude more expensive than prevention.

For owners on projects with extensive repetitive structural work, particularly cast-in-place concrete, the investment in dedicated owner-side quality assurance staff is a schedule investment, not just a cost. An additional inspector at \$200,000 per year is a fraction of the cost of demolishing and reconstructing thousands of plinths. The inspection function should be sized to the actual placement rate and should be protected during periods of disruption (such as a pandemic) rather than being among the first activities suspended. For contractors, the quality control program is a schedule risk management program. The contractor's quality manager and inspection staff are the early warning system for problems that will otherwise emerge years later as defects, claims, or both. Investment in

quality control during construction is meaningfully cheaper than investment in remediation during commissioning.

5. Establish an Evidence Preservation Protocol from Day One

The spoliation finding against STP on SR 99 was a serious setback for the contractor's case. Once a project event suggests the possibility of dispute, formal evidence preservation procedures should be implemented immediately: physical samples retained, photographs taken, daily reports preserved, communications archived, internal memoranda protected. This applies to both owners and contractors. The party that maintains better contemporaneous documentation tends to fare better in eventual dispute resolution, regardless of which side is technically right on the merits. Evidence preservation is not adversarial; it is professional discipline. Both parties should expect the other to maintain strong documentation, and both should hold themselves to the same standard.

6. Build the Contemporaneous Schedule for Forensic Defensibility

On all three projects, the eventual forensic schedule analysis required to support claims, defenses, or cost reconciliation depended heavily on the quality of the contemporaneous schedule record. Schedule updates that are accurate, well-maintained, and clearly distinguish progress from revisions are the foundation for any defensible delay analysis. This is the practical case for the AACE methodology. A project schedule maintained with discipline through monthly updates, with the Half-Step bifurcation applied to separate progress from revisions where appropriate, with clear identification of critical path during each window, and with explicit treatment of changes through formal revisions rather than silent edits, produces a record that supports Windows Analysis (MIP 3.3 or 3.4) and concurrency analysis when those become necessary.

A project schedule maintained casually, with progress and revisions mixed in each update, with critical path identification ambiguous, and with changes made silently, produces a record that does not support defensible analysis. Forensic analysts can only work with what the project produced. Owners and contractors who invest in contemporaneous schedule discipline during construction are building the foundation for whatever dispute resolution may follow.

7. Plan Means and Methods Decisions, Including Reasonable Alternatives

The Seawall's mid-project switch from dewatering to ground freezing was driven by a real concern about Viaduct settlement risk. The decision was probably right in isolation. But it was made well after the contract was signed and the original schedule was set, which meant the cost and schedule consequences had to be absorbed by a project already in execution.

For owners, means and methods decisions on complex projects should include explicit consideration of alternatives at the contract negotiation stage, with cost and schedule impact pre-quantified. If ground freezing is a possible necessity given the project's risk profile, the cost differential between dewatering and ground freezing should be in the contract documents, and the trigger conditions for switching should be defined. Mid-project decisions are inherently more disruptive and more expensive than pre-construction decisions.

8. Plan Phased Opening Strategy as a Risk Mitigation Tool

Sound Transit's April 2024 phased opening of the Eastside-only starter line was an effective response to a delay crisis. Ten stations of light rail service were delivered while cross-lake repairs continued. Riders used the service in higher-than-projected numbers. The agency's institutional credibility was protected.

For owners on major transit, public infrastructure, or phased commercial projects, the question of whether portions of the project can deliver value before the full project is complete should be considered during the original project planning. Phased opening is rarely the original plan, but having it in the playbook for use if the schedule slips is a valuable form of risk mitigation. Owners who can demonstrate tangible delivery during a delay crisis tend to maintain more public support than owners who must wait until the full project is complete.

9. Design Public Communication for the Long Run

The contrast between WSDOT's consistent communication on SR 99, the Seawall's gap between public statements and actual project status, and Sound Transit's "no surprises" policy on East Link is instructive. Public communication on troubled megaprojects is its own discipline. Owners who establish honest, consistent communication early tend to preserve institutional credibility through difficult periods. Owners who allow gaps between public statements and project reality tend to compound their problems with credibility crises.

The practical recommendation: establish a communication cadence (monthly, quarterly) and a level of detail (financial status, schedule status, known issues, anticipated risks) at the start of the project, and maintain it through both good and bad periods. Resist the temptation to soften the message when news turns negative. The public and the funding base, in our experience, respond better to honest difficulty than to optimistic statements that turn out to be wrong.

10. Recognize That Some Risks Cannot Be Eliminated

Finally, a realistic recommendation: not every megaproject delay is preventable. TBMs of unprecedented scale carry irreducible risk. Marine civil work in poorly characterized fill carries irreducible risk. Cast-in-place concrete on thousands of repetitive structural elements during a pandemic carries irreducible risk. The discipline is not to eliminate risk but to manage it, contain it, document it, and respond to it when it materializes.

The three Seattle projects discussed here all delivered their underlying public purpose. The SR 99 tunnel carries up to 80,000 vehicles per day and the Alaskan Way Viaduct came down. The Elliott Bay Seawall protects the waterfront and meets current seismic standards. The Sound Transit 2 Line connects Seattle to the Eastside, including the world's first light rail service across a floating bridge. The delays and disputes are real and worth understanding. The successes are also real and worth recognizing.

For practitioners, the goal is not to deliver megaprojects without difficulty, but to deliver them with the kind of rigor that limits the magnitude of difficulty when it arrives, and that produces a record defensible enough to support the dispute resolution that may follow.

Conclusion: The Common Pattern

The SR 99 Bored Tunnel, the Elliott Bay Seawall Replacement, and the Sound Transit East Link extension are three different projects with three different delay patterns. But they share a structural pattern that is worth naming explicitly. In each case, the schedule risk that ultimately materialized was a known category of risk on this type of project at the time the contract was signed. In each case, contract structure decisions made years before construction begins determined who paid for the delay when it materialized. In each case, public communication discipline made a measurable difference in institutional credibility. In

each case, the quality of the contemporaneous schedule record influenced the eventual dispute resolution.

For owners, contractors, and schedulers working on Pacific Northwest public infrastructure, these three projects collectively suggest a small number of disciplined practices that consistently distinguish projects that deliver on schedule from projects that do not. Robust geotechnical investigation. Realistic contingency. Deliberate contract risk allocation, defended consistently. Investment in quality assurance staffing as a schedule discipline. Evidence preservation from day one. Contemporaneous schedule discipline. Pre-planned means-and-methods alternatives. Phased opening as a risk mitigation tool. Honest, consistent public communication. And recognition that some risk cannot be eliminated, only managed.

These practices are not novel. They are not proprietary. They are documented in industry literature, reflected in AACE recommended practices, and embedded in the standard contract forms used across the public infrastructure sector. What distinguishes projects that apply them from projects that do not is rarely a question of knowledge. It is a question of discipline, institutional capacity, and the willingness of owners and contractors to make hard decisions early, when those decisions are cheap, rather than late, when they are expensive.

The three projects examined here are now part of the historical record of Pacific Northwest public infrastructure delivery. The next generation of major projects in the region, the next light rail extensions, the next waterfront infrastructure, the next major underground work, will be built on the foundation of these projects' lessons. Whether the next projects deliver more reliably, more cost-effectively, and with fewer public disputes will depend on whether the lessons are absorbed in practice, not just acknowledged in retrospect.

References

Primary Project Documentation

- Washington State Department of Transportation, *SR 99 Tunnel Project* documentation; Thurston County Superior Court records, *WSDOT v. Seattle Tunnel Partners*; Washington State Court of Appeals 2022 ruling; Washington Supreme Court ruling on appeal.

- Seattle Department of Transportation and the Office of the Waterfront, *Elliott Bay Seawall Project* documentation; Parsons Corporation project records; Mortenson–Manson Joint Venture project documentation; Hayward Baker v. Mortenson–Manson lawsuit filings.
- Sound Transit, *East Link Extension* program documentation, Board of Directors materials, and quarterly construction updates; Kiewit–Hoffman East Link Constructors public project documentation.

Industry Standards and Frameworks

- AACE International, *Recommended Practice No. 29R–03, Forensic Schedule Analysis*, current edition.
- AACE International, *Recommended Practice No. 52R–06, Time Impact Analysis As Applied in Construction*.
- AACE International, *Professional Practice Guide No. 20, Forensic Schedule Analysis*, 2nd Edition.
- Society of Construction Law, *Delay and Disruption Protocol*, 2nd Edition (2017).

Contemporaneous Reporting

- *The Seattle Times* coverage of the SR 99 Tunnel project, the Elliott Bay Seawall project, and the Sound Transit East Link extension across multiple years.
- *MyNorthwest.com*, *KOMO News*, *KIRO 7 News*, *King 5 News*, *PubliCola*, *The Urbanist*, *Seattle Transit Blog*, *Lynnwood Times*, and *KUOW* contemporaneous coverage of project milestones, disputes, and outcomes.
- *TunnelTalk* and *Tunneling Online* technical and trade press coverage of the SR 99 Tunnel and Bertha TBM.
- *ACS Lawyers* analysis of the SR 99 Differing Site Conditions claim and Dispute Review Board process.

Supporting Industry Context

- DBIA, *Design–Build Done Right Universally Applicable Best Practices*, current edition.
- Federal Transit Administration, *Capital Investment Grants Program* guidance.
- Washington State Department of Transportation historical documentation on the I–90 Homer M. Hadley Memorial Bridge and the Alaskan Way Viaduct corridor.

Note: Practitioners citing this synthesis in formal work should consult the underlying CPM Pros case studies (Perth Children’s Hospital, Elizabeth Quay, Elliott Bay Seawall, SR 99 Tunnel and Bertha, Sound Transit East Link) and the primary sources directly. Schedule durations, claim amounts, and dispute outcomes continue to evolve as ongoing claims are resolved.