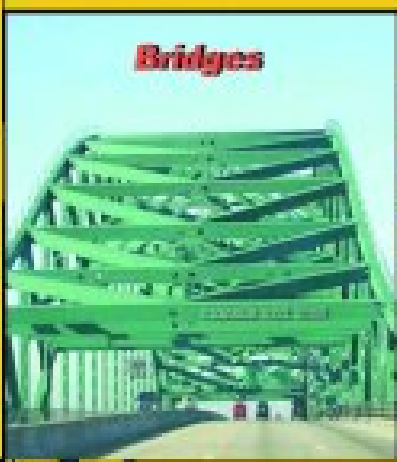


# Atlantic Coastal Construction Journal

## Recognizing and Avoiding Risks on Capital Public Construction

March Edition - 2023

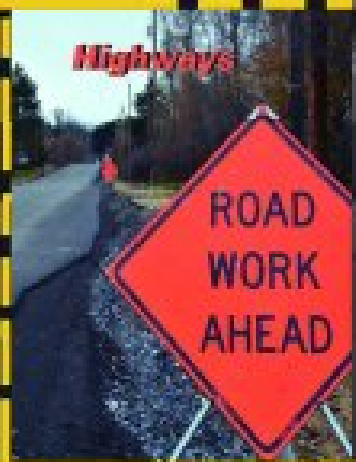
**Bridges**



**Airports**



**Highways**



BY LAURENCE  
2023

# *Atlantic Coastal Construction* **JOURNAL**

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## **COVER FOCUS**

**Recognizing and Avoiding Risks  
to Municipalities, Taxpayers,  
and Stakeholders on Capital  
Public Construction Projects:**

*Highway Reconstruction, MaineDOT  
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*March - 2023 Edition*

# **Recognizing and Avoiding Risks to Municipalities, Taxpayers, and Stakeholders on Capital Public Construction Projects:**

Highway Reconstruction, MaineDOT Pavement Projects, Bridge Repairs, and Department of Public Works Infrastructure Projects

*By: Arthur House, EJD, Senior Resident Engineer, JTC Consulting*

## Introduction

Risk is a quantifiable component of uncertainty, for which we can estimate an ‘incidence probability’ and the magnitude or extent of any proximate loss, injury, or damage caused by any particular incident or occurrence. Risk is acknowledged as a deviation from the desired or intended level or outcome of the bargained-for product or service incorporated in a construction agreement or contract. The result of an incident or occurrence can be positive or, it can be negative. Similar to a passenger airline on landing at an airport; the pilot may plan to touch down on the numbers and arrive safely at the gate on time. An unanticipated, or unforeseen event may interfere with that presumption. The pilot may be able to stop earlier than expects and turn toward the gate sooner or, that same pilot might overshoot or overrun the runway, thus not arriving at the gate – on time, if ever.

A risk analysis is deemed a vital assessment of potential adverse events or occurrences beginning at the planning stage of a construction project, and continuing throughout the project up to and including completion and closeout. Risk is commonly thought of as the probability of an event or action that causes the possibility of a loss or injury to the project. While the connotation of loss or damages generally supports the observance of negative or adverse outcomes; the opposite is equally possible, where innovative management oversight or, alternative means or methods, may produce opportunities for any variety of cost savings, project schedule acceleration, or enhanced quality control and delivery.

## Independent Risk Analysis and Oversight Services

The primary value of retaining an independent oversight and risk management consulting firm is to draw upon the experiences of seasoned professionals in the construction industry in the pursuit of risk management, and the mitigation or avoidance of financial exposure to the municipality, owner, and taxpayers. Engaging ‘John Turner Consulting’ as an oversight professional and risk avoidance entity, early on, is best justified by the words spoken in an insurance company advertisement – “We know a thing or two because we’ve seen a thing or two.” In our present litigious world, the construction environment is rampant with controversy and disputes.

Bringing in professional talent to help mitigate risks, proves that the municipality or project owner is exercising due diligence and ensuring its duty of care to the public is not compromised. “...risk management in the construction industry requires a complementary, interdisciplinary, flexible approach allowing to capture the changing character of risk factors (qualitative, quantitative) as well as it requires a precise description and explanation of the mechanisms involved in the organization of construction production.”[1]

### Public Infrastructure Expenditure is Fraught with Cost Overruns

Sharing an observation about infrastructure projects in Wisconsin; as reported in an article, “...some infrastructure projects have been far more egregious than others. We’ve historically seen cost overruns of [between] 25 to 50 percent, for transportation projects, and projected benefits that often failed to fully materialize.”[2] The New York Times, often a booster of government spending has publicly warned of “Years of Delays, Billions in Overruns: The Dismal History of Big Infrastructure.” The state inspector general of Wisconsin, Stephen Street, estimates that as much as 10% of large, infrastructure project, budgeted expenditures can fall prey to waste and even be fraudulently used.

Street says, “There’s built-in fraud with such a gargantuan amount of money,” and “Any time you have that amount of money, it’s almost impossible to oversee every dime... it just can’t be done.” He concluded that “There’s not enough personnel, not enough man hours in a day. And, “at the end of the day, it all comes out of taxpayers’ pockets.”[3]

The recent \$1.2 trillion infrastructure package directed \$500 billion to highways, and \$39 billion to urban transit, among other items. This paper focuses on Maine’s infrastructure work and the recently presented Maine Department of Transportation (MaineDOT) ‘Work Plan’ for the three calendar-year periods of 2022, 2023, and 2024, which included capital projects and programs, maintenance and operations activities, and administrative functions. The plan contains 2,316 individual work items with a total budget of \$3.17 billion. The Work Plan consisted principally of work to be delivered or coordinated through MaineDOT, but included funding and work by other transportation partners, including airports and transit agencies. Arising from the Work Plan budget of \$3.17 billion, roughly \$1.8 billion is allocated to “Highway and Bridge Capital” projects, and an additional \$535 million is dedicated to “Highway and Bridge Operation.”

## Project Risks Associated with Infrastructure Work – Construction Risks

'John Turner Consulting' (JTC), referred to as an "Agent" for the owners, municipalities, and taxpayers. As an Agent, JTC routinely will become more significantly engaged in the project just after the bid and award phase, and more specifically, once the project is let out to the successful bidder of the work. JTC is characteristically involved in the 'Construction phase' and continue throughout the 'Post-construction phase' and turn-over of the project.

The Agent's professional obligation is to the owner in all aspects of managing and executing the project. While there are risks inherent to the general contractor, and other prime contractor entities; the duty and care guaranteed by the Agent, are owed to the owner. A project life-cycle is traditionally divided into five phases, which include: 1.) Pre-design, 2.) Design, 3.) Bid and Award, 4.) Construction, and 5.) Post Construction. As referenced above, the first two phases are typically handled by the owner and their professional design and engineering teams. As an Agent, there is a distinction between providing professional objectivity and counsel to its owner/client, and that of being a zealous advocate for the owner/client.

A duty of care owed to the owner/client must be to provide unbiased, open, fair, and objective oversight, daily record keeping, and continuous attention to all manners of performance by all contracted entities on the project – in the event that a risk of cost escalation, or schedule creep becomes apparent enough to affect the project in a meaningful way. The Agent shall never be swayed by a bias toward any participant, seeking to establish their rights over another party – whereas, the focus should never be on who is right, rather than doing what is right for the project.

## Checklist of Applicable Tasks – Bid Award, Turnkey to Close Out

The list of applicable tasks shall start with risk identification that could conceivably cause loss or damage but, a more precise examination must also identify opportunities for project enhancements in terms of cost containment, and opportunities that may provide for an efficient and equitable escalation process. Below we provide a road map of tasks that fall under risk avoidance categories. We will provide examples where appropriate of opportunities as well. The source of the explicit task considerations is derived of a substantial study, and publication, underwritten by Northeastern University, Department of Civil and Environmental Engineering.[4]

## **Bid and Award Phase**

### **- Project delivery**

The methodology implemented on any project or program is of paramount interest to the Agent as each contract or agreement has its own particular terms and conditions, and it is necessary to understand the methodologies, intuitively, in order to manage, monitor, and evaluate deliverables incumbent upon all parties. A robust list, not inclusive of all potential methodologies, is provided:

- Turnkey, design-build
- Design-bid-build
- Single prime
- Multi-prime
- Guaranteed Max/ Gen Contractor (GM/GC)
- CM @ Risk

### **- Contract Payment Terms**

- Lump Sum – Fixed price – Here the contractor has tremendous exposure to cost increases, if the project schedule should be unduly extended. Alternatively, the owner may experience an unfair benefit if the project schedule is extended significantly, and the owner does not pay any upcharge for price escalations.
- Unit price – Here the contractor will be at a disadvantage if there exists no language that allows a price modification or increase.
- Cost plus – Here the owner may opt to purchase all materials directly so as to eliminate a cost mark-up (e.g., a 15% mark-up on \$1 million agreement if purchases are made direct by the owner, will save \$150,000 for the owner.)
  
- Contract size – Here it may prove to be a disadvantage to the owner, if a contract is so large that the budget precludes participation in the process by other firms. If only two firms are capable of performing the contract, at the larger budget, then both companies have a motive to hold their prices artificially high because there is no alternative available to the owner – and the public is damaged.

Below is a continuation of the individual tasks that are essential to the foundational makeup of a Risk Assessment Study for any significant public project. In the interest of brevity, we can be contacted for additional dissemination and explanation of the content for each task.

# The Top 20 Construction Risks

## DOCUMENT, LEGAL, AND CONTRACT RISKS

- 1. Change Orders**  
*Formal documents outlining changes that must be made on a construction project.*
- 2. Stop Work Orders**  
*Legally binding documents that force some or all parts of a project to cease production.*
- 3. Incomplete Drawings**  
*When architectural or engineering documents are not completed, leading to change orders.*
- 4. Poorly Defined Project Scope**  
*Project boundaries should be clearly defined in scope statements and other documents.*
- 5. Poorly Written Contracts**  
*Gaps in contract language can expose various stakeholders to legal/liability risk.*
- 6. Contract Disputes**  
*These tend to arise whenever work is not done in accordance with specifications or at cost.*

**35%** of construction projects are subject to at least one major change.

**\$1B** is the value of equipment stolen from construction sites in the US every year.

## FINANCIAL RISKS

- 7. Increase in Material Costs**  
*Unexpected cost spikes can be destructive to projects when materials = half of project costs.*
- 8. Liquidated Damages**  
*A financial penalty on contractors when projects continue past the scheduled date of completion.*
- 9. Regulatory Fines**  
*When workers fail to meet regulatory mandates, it can lead to hefty fines for contractors.*
- 10. Damage or Theft to Equipment and Tools**  
*Insurance deductibles and project delays are the true costs of damaged or stolen equipment.*
- 11. Project Delays**  
*On most projects, being set a single day behind schedule can equate thousands in costs.*
- 12. Inaccurate Project Estimation**  
*Failure to budget work accurately can leave insufficient funds for materials, wages, and more.*

## ENVIRONMENTAL RISKS

- 13. Natural Disasters**  
*Wildfires, earthquakes, hurricanes, flooding, storms, tornadoes... no site is immune to these risks.*
- 14. Poor Weather Conditions**  
*Any changes in normal weather conditions can lead to increased risk of incident on a project.*



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6

**\$15,000+** is the potential fine for one untrained worker.

## SAFETY RISKS

- 15. Safety Hazards On-Site**  
*Exposed electrical, heavy equipment, extreme heights, airborne materials, etc.*
- 16. Untrained Workers**  
*Workers conducting work without training are a threat to everyone else on a project site.*
- 17. Insecure Construction Sites**  
*With anything less than a secure perimeter, outsiders can easily gain access to project sites.*

## PRODUCTIVITY RISKS

- 18. Labor Shortages**  
*An inability to source skilled labor or align that labor with project timelines can be damaging.*
- 19. Trade Stacking**  
*When too many trades are working in the same area, it can limit capacity and production.*
- 20. Material Availability**  
*An inability to source necessary materials can lead to delays or expensive substitutions.*

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## Contractor

- Experience and performance on similar projects
- Character, capacity, capital, continuity (criteria used by surety)
- Safety record
- Need for bonds, bond limits, surety's reputation
- Familiarity with the area
- Cost, schedule, and document control practices
- History regarding claims and change orders
- History of delivering on-time and on-budget
- Subcontractor qualifications and capacity
- Subcontractor roles and responsibilities
- QA/QC program (contractor and subcontractors)

## Market conditions

- Number of bidders
- Availability of supplies and subs
- Unemployment rate in construction trades
- Workload of regional contractors
- General economic climate that can affect bidding behavior
- Material and energy prices
- Inflation rate, interest rate

## Regulatory conditions

- Environmental and ADA requirements
- DBE requirements and (local) workforce participation
- Taxes and duties
- Limitations on the use of overseas materials and equipment

## Owner/CM involvement

- Clear definition of CM (Agency) scope and authority
- Underestimation of the level of effort (soft costs)
- Supplying of material
- Testing, inspection, safety
- Start-up and providing clear access to the site
- MOUs - coordination w/local agencies, companies, & community groups
- Communication channels/MIS



## Guarantees

- Contractors' bonds or letters of credit
- Designer's liability insurance
- Consequential damages
- Liquidated damages
- Performance/quality
- Cost/schedule

## **Construction Phase**

### Work schedule

- Abutting contractors
- Limited work hours
- Restrictions on some construction activities such as blasting, trucking
- Maintenance of traffic, restrictions on traffic flow and access to site
- Disruption to public and businesses
- Coordination with utilities and other agencies
- Coordination with suppliers (long-lead orders)
- Subcontractors' delay, contractor's failure to effectively manage subs
- Weather effects on schedule
- Cash flow and contractor payments

### Means and methods

- New, untried techniques
- Noise, dust, fumes, excessive vibrations
- Utility relocation
- Errors in the design of temporary facilities
- Construction errors
- Accidents
- Material shortages and large price increases
- Delays in mobilization (equipment and manpower)
- Failure of major equipment
- Hardware/software problems (control systems, integration, etc)

### Acts of God/force majeure, including but not limited to:

- Inclement weather
- Earthquake
- Flood
- Fire
- Terrorism

## Labor

- Strikes
- Accidents
- Large wage fluctuations
- Sabotage, theft
- Substance abuse
- Unions
- Material wastes
- Insurance
- Productivity

## **Post – Construction Phase**

- Individual systems and full integrated testing
- Owner training
- Full commissioning
- Occupancy permit (building projects)
- Warranty issues
- Provide equipment books & operating catalogues
- Complete close-out of all financing, funding,
- Confirm/finalization of permitting agreements and conditions

## **Common Causes of Construction Delays and Cost Overruns**

### Inadequate planning

Before mobilizing to a construction site, owners must work with and coordinate with their contractor to consider the comprehensive schedule and work plan. The project planning process must account for delays that can be caused by many events or occurrences including but not limited to severe weather events or supply chain issues. For these potential holdups, owners might face a decision that could lead to an extended budget or the project timeline to avoid unexpected, last-minute changes.

### Labor shortages

Labor shortages have reached unprecedented levels. The construction industry experiences higher losses, with a worker shortage of 430,000 in the U.S. and 40% of construction workers expected to retire in the next decade. Owners can avoid delays by planning for labor shortages. Owners must communicate with subcontractors and team members in an effort to assess the level of workers you have available for the project. Here, a lack of adequate labor may force owners to issue change orders for extended time and an accompanying increase in project costs.

### Supply chain issues

The construction sector currently experiences more delays in obtaining materials than most other industries. Almost 60% of construction businesses report supplier delays. Material costs have also risen, especially among lumber and steel products.

### Equipment availability and operational effectiveness

On major road construction, or substantial rehabilitation, and reconstruction of state roads and highways, the availability of heavy paving equipment, rollers and such can become a major concern, especially if there is a great deal of work throughout the state, going on at the same time. This concern is extended to trucking equipment and the necessary support equipment required to load, unload, and handle massive quantities of materials.

### Severe weather and unforeseen storms or disasters

Rain, wind, snow, and other severe weather events often stop construction for hours or days. Since building takes place outside, workers can experience extreme weather, especially during long projects that span every season. While you can't predict the weather, use forecasts and past weather data to inform your building decisions.

### Project scope creep

If any factors change without authorization or control measures, your project experiences scope creep and deadlines must extend to accommodate changes. Reducing or eliminating scope changes will keep your project running smoothly. Owners can reduce scope creep by setting clear boundaries as they begin a project. Ensure that any changes meet approval before execution.

### Lack of communication

For a project to stay on track, every team member must know the schedule and any changes that occur. Owners, Agents, and contractors must track changes and document them so the team and stakeholders can adjust accordingly. Keeping everyone in the loop maintains constant activity during building, rather than waiting for different subcontractors or crews to arrive.

### Streamline the construction process

During the entire construction phase, proactively envision, evaluate, and account for occurrences or events like labor shortages or severe weather to create a realistic schedule. Communicate with your team during building and maintain equipment well to avoid delays. Recognizing the primary causes of construction delays will help you prevent future ones and improve project management skills. With the utilization and implementation of JTC for the entire project, owners will achieve a more predictable end result.



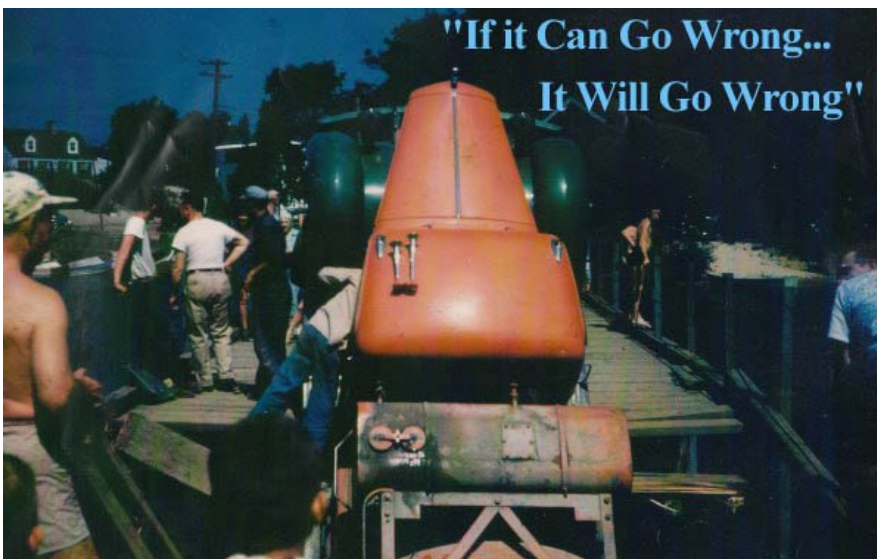
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**Author** Arthur House, EJD, Senior Resident Engineer, JTC Consulting

*The author has 40-years of construction management, forestry exports, and renewable energy-biomass industry experience. He holds BS, MBA, ABD, EJD degrees. Mr. House attended Business and Entrepreneurship program at Nova Southeastern University, working on a Doctorate in Business Development. Later he attended Purdue/Concord Law School, graduating with honors, earning an Executive Juris Doctorate (EJD). He teaches Contract and Construction Law, Corporate Business Development, and Strategic Management, Construction Finance, as an Adjunct Professor, in both undergraduate and graduate programs at universities including; Florida International University, Florida Atlantic University, Lynn University, Franklin Pierce, Notre Dame, Southern New Hampshire University, and Rochester University. Art lives with his wife of 48-years, on their farm in Maine.*





### **Advisors and Alternative Dispute Resolution Consultants to Industry: Supporting Clients from Concept to Turn-Key**

Construction claim consultants: We provide a crucial role when it comes to standard of care in construction. Specialized experts know the in and out of construction and civil engineering, and can help with project management, alternative dispute resolution, through preventive measures, and provide unbiased advice and counsel. Because these consultants know the industry intuitively, they may often help prevent legal troubles before they start.

Legal Support - Mediation: Construction claim consultants are a key resource in legal matters regarding civil engineering. Having years of experience working in construction, consultants know precisely what issues to look for that could potentially become a future legal matter. Construction claim consultants are strongly familiar with standard of care procedures as well as best practices. If you find yourself on the wrong end of a construction issue, consultants can find each and every detail you can use to build your defense case. On the other hand, they can also be used to pinpoint errors a construction company has made, and use these to form a prosecution case. Because these consultants are highly educated on the subject, they're the best choice to analyze potential missteps in a project.

**Website: <https://www.arthurhouse.com/>**

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**Phone: 207-338-6307**

Disclaimer: The author is not a practicing attorney and as such is not engaged in any unauthorized practice of law – but recommends the reader seek legal counsel on matters of concern in any dispute. Advisory content is not intended to give, and should not be relied upon for, legal advice in any particular circumstance or fact situation. No action should be taken in reliance upon the information contained in this site, without obtaining the advice of an attorney.

Construction claim consultants are often brought in by insurance companies to evaluate and analyze construction site accidents and mishaps, which can uncover potential cases to assess causal relationships between activities and the harm or damages that may actually arise in negligence. In many cases, what a claim consultant determines has a strong impact on legal cases. This is the most common role associated with these consultants.

### **Claim or Dispute Services**

- Construction claim investigation and analysis
- Change order claim and dispute analysis
- Contract dispute review and analysis
- Cost estimating and general conditions analysis
- Cost to complete analysis

### **Expert Witness Services**

- Gathering relevant documentation to support/deny claim
- Conduct due diligence investigations and analysis
- Assist in preparation and responses to written discovery
- Assist with deposition and interrogatory preparation
- Trial testimony involving claims and contract disputes

### **Construction Contract Experience**

- Project Due Diligence & Feasibility Studies
- Contract Drafting - Review and Analysis
- Lump-Sum; Cost-Plus; Time & Materials; Unit Price
- AIA - AGC - GMP Contracts
- Design-Build
- Negotiated Contracts
- Competitive Bid and Government Contracts
- Subcontractor Agreements - Contracts
- Bonding Agreements - Performance/Payments

### **Industry Sector Experience**

- Apartments / Multi Family / Traditional and Modular
- Planned Unit Development (PUD)
- Shopping Center - Retail Centers - Mini Plaza
- Government - Post Office - Army Reserve Center
- Sports - Giant Stadium - Meadowlands
- Office Hi-Rise - Landmark Square, Conoco, GTE
- Fuel - Convenience Stores - (Site Select to Turn-Key)
- Condo - High Rise - Concrete Restoration
- Grocery Cooperative and Distribution Firm







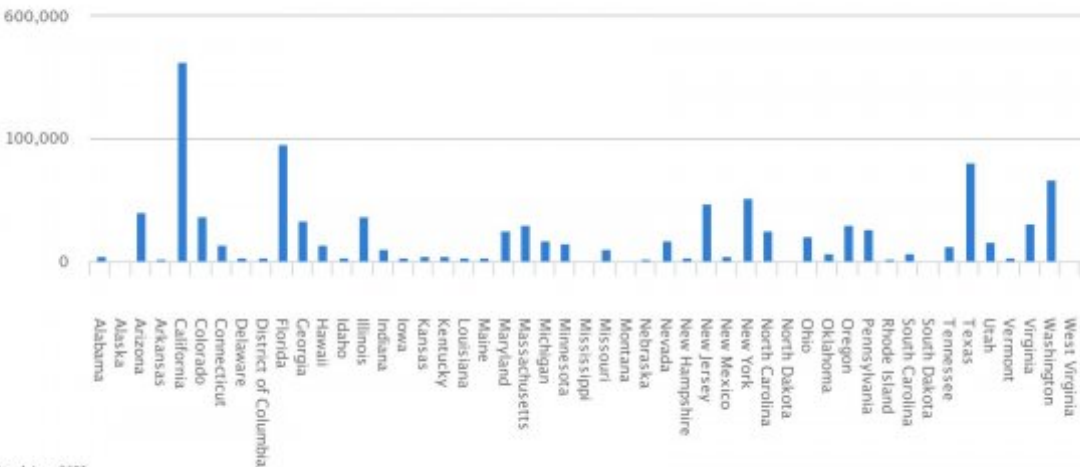
# Issues to Consider Regarding Electric Vehicles on Maine’s Highways

By: T. S. Laurent

At this time, electric vehicles do not appear to have risen to a crises level concern in Maine. Faintly more than 1 million electric vehicles (EVs) have been sold in the US since 2012 when the first models hit the roads. While that figure is remarkable, it is a mere fraction of the over 250 million vehicles currently registered and legally drivable on U.S. highways. But sales of electric cars are growing rapidly as how far they can travel before recharging and prices fall. Dealers sold a record 360,000 electric vehicles last year, up 80 percent from 2017. As of February, 2023, there are 1,920 registered electric vehicles in Maine, which is equivalent to .17% of the total vehicles registered in Maine.[1]

In Maine, where an estimated 65,000 new cars are sold every year, electric cars remain a novelty, totaling less than 0.5% of total light duty vehicles. But mirroring the national trend, electric cars are making up an ever-bigger slice of Maine’s car market, rising from 1.2% of new cars sold in 2020 to more than 2.4% in 2021.[2] The state’s climate action plan, released in December 2020, estimates that Maine needs 219,000 light-duty EVs on the road by 2030 to meet its emission targets; policies for how to achieve that will be included in Maine’s upcoming clean transportation roadmap due out this December.[3] McKinsey analysts note that while reduced inventories could continue through 2022, EVs could make up more than half of passenger-car sales by 2030.

Electric Vehicle Registrations by State



Updated June 2022  
 as of February 25

“Charging thousands of vehicles at peak times could potentially cause a lot of strain on the grid,” warns Jack Shapiro, climate and clean energy director at the Natural Resources Council of Maine. “However, if we create the right EV charging rates — incentivizing charging at night for example and/or incorporating smart charging technology — it could provide big benefits to both consumers and the grids.”

Electric cars have come under criticism from some scientists for emitting a lot of fine dust, produced by the tires and brakes. “Now it has also become clear that the road surface wears out much faster from electrical vehicles, compared to internal-combustion engine cars.”[4] Due to the massive battery, electric cars weigh more than ordinary passenger cars. Because of this bigger weight, not only do the tires wear out faster. According to experts from the Delft University of Technology, the top layer of the asphalt is also likely to wear out more quickly because electric cars have a higher acceleration capacity.

“Research shows that electric vehicles do cause extra wear due to their weight,” said Bruno Van Zeebroeck, researcher at Leuven's Transport & Mobility research center. “Furthermore, it appears that electric cars produce hardly any less fine dust than modern petrol cars. Exhaust emissions for electric cars are zero, but due to their weight, there is more wear on brakes, tires, and the road surface. The difference with diesel cars is even smaller because modern diesel cars emit less fine dust.”

The head of the National Transportation Safety Board, Jennifer Homendy, expressed concern Wednesday about the safety risks that heavy electric vehicles pose if they collide with lighter vehicles.[5] As a reference point, an electric GMC Hummer weighs approximately 9,000 pounds, with a battery pack weighing about 2,900 pounds or roughly 1/3 the total weight of the vehicle, and comparable to the total weight of a 2022 Honda Civic LX at 2,877 pounds, or just under the weight of the heaviest of four models of the Honda Civic family, the 2022 Honda Civic Touring vehicle at 3,077 pounds.[6]

In this example we also consider the average retail price of these two vehicles. The Honda Civic LX, 2022 model is a sedan with a Manufacturer's Suggested Retail Price (MSRP) of \$22,350.[7] Get ready for a season of electric trucks: The 2022 GMC Hummer EV Pickup starts at \$110,595 for the Edition 1 model. As time progresses, versions priced between \$80,000 and \$100,000 will arrive.[8]

“I’m concerned about the increased risk of severe injury and death for all road users from heavier curb weights and increasing size, power, and performance of vehicles on our roads, including electric vehicles,” Homendy said. Homendy added, “We have to be careful that we aren’t also creating unintended consequences: More death on our roads,” she said. “Safety, especially when it comes to new transportation policies and new technologies, cannot be overlooked.”

Homendy noted that Ford’s F-150 Lightning EV pickup is 2,000 to 3,000 pounds heavier than the same model’s combustion version. The Mustang Mach E electric SUV and the Volvo XC40 EV, she said, are roughly 33% heavier than their gasoline counterparts. The discussion about rapid acceleration and excessive damage to road surfaces, and the high risk of fatalities associated with EV crashes with smaller and lighter cars; the talk is not mere hyperbole; a Westbrook, structural engineer owner stated that driving an EV is, “...incredibly smooth and quiet and relaxing, but it’s also violently fast if you want it to be,” he says. “It’s kind of like driving a UFO.”[9]



Roads are crowded with heavy vehicles, thanks to flourishing sales of larger cars, trucks and SUVs. These traditional vehicles also can lead to acute disparities in collisions with smaller vehicles. But electric vehicles are typically much heavier than even the largest trucks and SUVs that are powered by gasoline or diesel. Michael Brooks, executive director of the nonprofit Center for Auto Safety, said he, too, is concerned about the weight of EVs because buyers seem to be demanding a range of 300 or more miles per charge, requiring heavy batteries. “These bigger, heavier batteries are going to cause more damage,” he said. “It’s a simple matter of mass and speed.”

Homendy noted that Ford's F-150 Lightning EV pickup is 2,000 to 3,000 pounds heavier than the same model's combustion version. The Mustang Mach E electric SUV and the Volvo XC40 EV, she said, are roughly 33% heavier than their gasoline counterparts. "That has a significant impact on safety for all road users," Homendy added. In 2011, the National Bureau of Economic Research published a paper warning that being hit by a vehicle with an added 1,000 pounds increases the probability of being killed in a crash by 47%.

In closing, there are other issues not yet even contemplated by many: 1.) If you are a buyer of an electric vehicle SUV - and you are aware of the dangers that can be caused by driving a beast EV, and you try to purchase insurance: you may be surprised at the cost of the premiums, and 2.) You may be held contributorily liable for damages - because you chose to take the risk.

Next, when you consider that a typical car carrier can only haul a maximum of 30-US tons on a load, and they are able to deliver from the factory, to a dealer, 6 to 7 cars at a time: 1.) the shared cost of delivery is absorbed by 6 or 7 cars, 2.) With EVs weighing 9,000 pounds, the carrier can only carry three EVs, 3.) The cost of delivery is shared by three EVs - thus the cost at the dealer is higher than normal, and 4.) You will cause heavy truck traffic to be doubled in order to deliver six EVs.

## *TSL*

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# Infrastructure - Construction Consultants

*By: Terrance Manning*

The transportation and infrastructure industries are rapidly expanding. This expansion includes the construction of new roads, highways, airports, light rails, subways, trains, and the infrastructure needed to support these projects. John Turner Consulting ("JTC") has extensive experience providing services on all types of transportation and infrastructure projects throughout New England and New York. JTC assists clients to overcome challenges by providing customized construction engineering services such as proactive cost estimating, scheduling, and claims support. Understanding that no project is the same, JTC tailors its services based upon the specific needs of each client. JTC delivers support and consultative guidance throughout each stage of the project lifecycle to ensure each project is delivered on time and within budget.

## **Risk Monitoring**

Construction risk monitoring is a key part of any construction risk management plan. Construction risks can be costly and time consuming for your organization and your clients. As a result, construction risks should be monitored, tracked and controlled throughout a project's life cycle. JTC construction risk monitoring consultants have extensive knowledge in identifying and overseeing construction risk in order to mitigate claims and disputes. Should an identified risk event or occurrence arise, JTC can assist by implementing a mitigation response plan to control the impact in a timely manner. Whether you are an owner, program manager, contractor, construction manager or subcontractor, JTC's consultants have the knowledge and know how to help you avoid disputes and mitigate claims.

## **Construction Probability Assessments**

An integral step in the process of construction risk management is evaluating an "Incident Probability" analysis to assess various events or occurrence that can have a positive or negative impact on project progress. A probability assessment is one step that will improve the project's risk profile and enable informed decision-making with regard to project strategy. The results of the probability assessment will aid the project team in formulating an effective risk management plan that can map out the most suitable path to completion for the project.

Additionally, this information can be used by the estimation and scheduling team to allocate cost and time contingencies to risky events. JTC's risk monitoring consultants have the experience and expertise needed to perform a probability assessment that can be used to improve the project team's risk identification & risk management capabilities.

The basic steps of this process include:

- Contract analysis
- Identification of risks
- Determination of favorable and unfavorable outcomes
- Calculation of probability of failure for various events
- Formulation of risk mitigation plan
- Development of a risk register
- Periodic reviews of project risk register

## **Construction Risk Identification**

Construction projects are fraught with more inherent risks than traditional corporate projects. As such, identification of these risks is the first step in mitigating their potential impact to the costs and schedule of a project. JTC's cost estimating and scheduling expertise provides us with the unique perspective to identify the risks associated with your project at every phase from concept to close out. When you are assuming the high risks associated with a construction project, JTC can help manage and mitigate those risks from the outset and, by extension, reduce the stresses and increase the likelihood of successfully constructing your project.

JTC's services that may assist in mitigating the potential risks of your project include:

- Pre-construction planning and coordination
- Construction cost management
- Risk workshop development
- Dispute avoidance and claims mitigation
- Risk register development
- Qualitative risk assessments & scoring
- Quantitative risk analysis
- Decision risk analysis
- Sensitivity analysis
- Risk response planning

Whether you are an owner, program manager, contractor, architect or construction manager, JTC's consultants are equipped to supplement your team's expertise with additional insight to ensure your project's success and to identify construction risks. In a continual effort to provide the most effective risk mitigation services, JTC utilizes the most cutting edge software and indexes, as outlined on the next page, which include, but are not limited to:

- Project 4D™
- Primavera™
- Claim Digger™
- Microsoft Proje
- Finest Hour™
- Timberline™
- RS Means™
- Microsoft Excel



## Schedule Forecasting

Construction schedule forecasting is an important component of the risk management process that enables the project team to plan capital and resource allocations with greater efficiency. Key performance indicators (KPIs) of a schedule need to be monitored continuously to understand the changing nature of a schedule and perform accurate forecasts. As projects can be in a state of fluctuation, being prepared for future schedule change will benefit the project team’s ability to make provisions for smooth material deliveries, sub-contractor management, stakeholder engagement, and mitigating the impacts of ripple effects. JTC’s consultants have extensive expertise in various scheduling techniques that can be coupled with predictive risk assessment tools to provide the client with an as accurate as possible schedule forecast.

The accuracy of a schedule forecast is dependent on the quality of the information available. JTC adopts a systematic approach to schedule forecasting that involves the following steps:

- Contract analysis
- Analyzing project scope of work
- Developing project Work Breakdown Structure
- Developing project Organizational Breakdown Structure
- Developing project Cost Breakdown Structure
- Developing project schedule
- Integrating project schedule with cost and resource data
- Identifying KPIs that will enable accurate schedule forecasts
- Performing a schedule forecast that considers both optimistic, and pessimistic scenarios
- Formulation of risk mitigation plan
- Periodic reviews of project risk register



## Cost Escalation Analysis

Over the course of long-term projects, inflation of material prices often results in disputes between owners and contractors. Material and labor escalation clauses can be used as contractual tools to account for pricing adjustments due to changes in prices of materials, while forensic material escalation analysis can be performed to retroactively quantify material cost adjustments in a manner equitable to both owners and contractors.

Through the use of various pricing indexes and historical data, JTC Consulting Group can construct historical pricing profiles for construction materials. Our material escalation analysis is often a helpful tool in conjunction with the following services:

- Contract administration
- Construction cost estimating
- Mediation and arbitration support
- Litigation support

Construction material escalation analysis is an objective tool for dispute avoidance and claims mitigation if used proactively and is an objective tool for dispute resolution if used forensically. It can also be combined with a revised cost forecasting for an ongoing project to avoid further disputes.

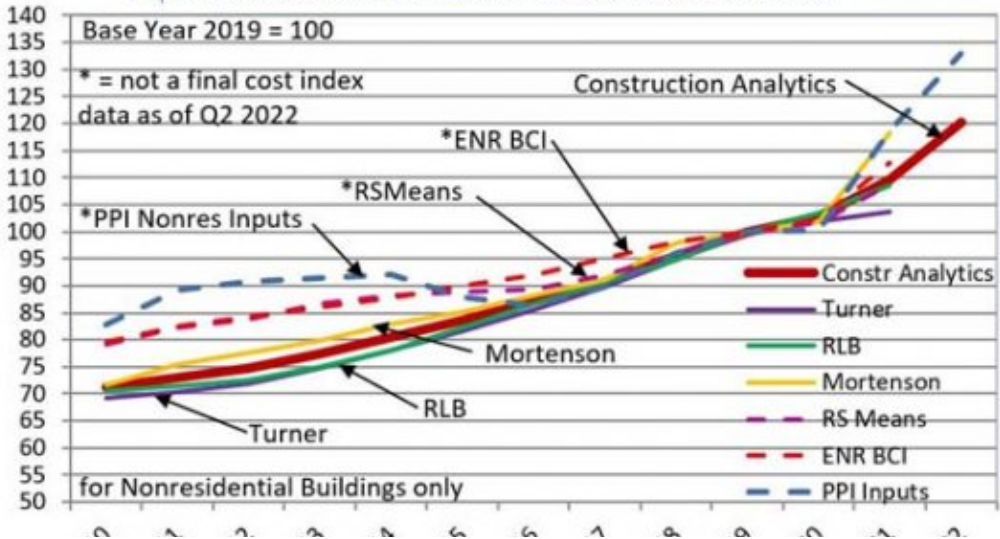
Whether you are a contractor or subcontractor trying to prove material escalation or an owner attempting to defend against over inflation of material costs, JTC's consultants are equipped to provide material escalation analysis to supplement your efforts. Material escalation analysis can play a pivotal role proactively in the drafting of contract documents as well as forensically in the expert reports and witness testimony provided for litigation support.

## Cost Forecasting

Managing the costs of a project requires careful planning to avoid shortfalls that can adversely affect payment schedules and damage stakeholder reputations. Cost forecasting is a useful exercise in determining required expenditures at the various payment stages of a project. Efficient management of project income is crucial in making timely payments to the various stakeholders involved in the project. An important aspect of cost forecasting is to understand the payment system for the project based on the contractual provisions, and accordingly retrieve information from the project schedule that will help map out the funds required during the course of the project. JTC's experienced construction cost consultants can assist clients in developing cost forecasts that are integrated with the project schedule.

*TM*

<https://edzarenski.com/2022/02/11/construction-inflation-2022/>



# JOHN TURNER CONSULTING

**Our company's mission is to provide outstanding service, to contribute to our clients' success, and to exceed expectations. We are committed to quality, efficient service, and meeting customer requirements for all aspects of our engineering services and solutions.**

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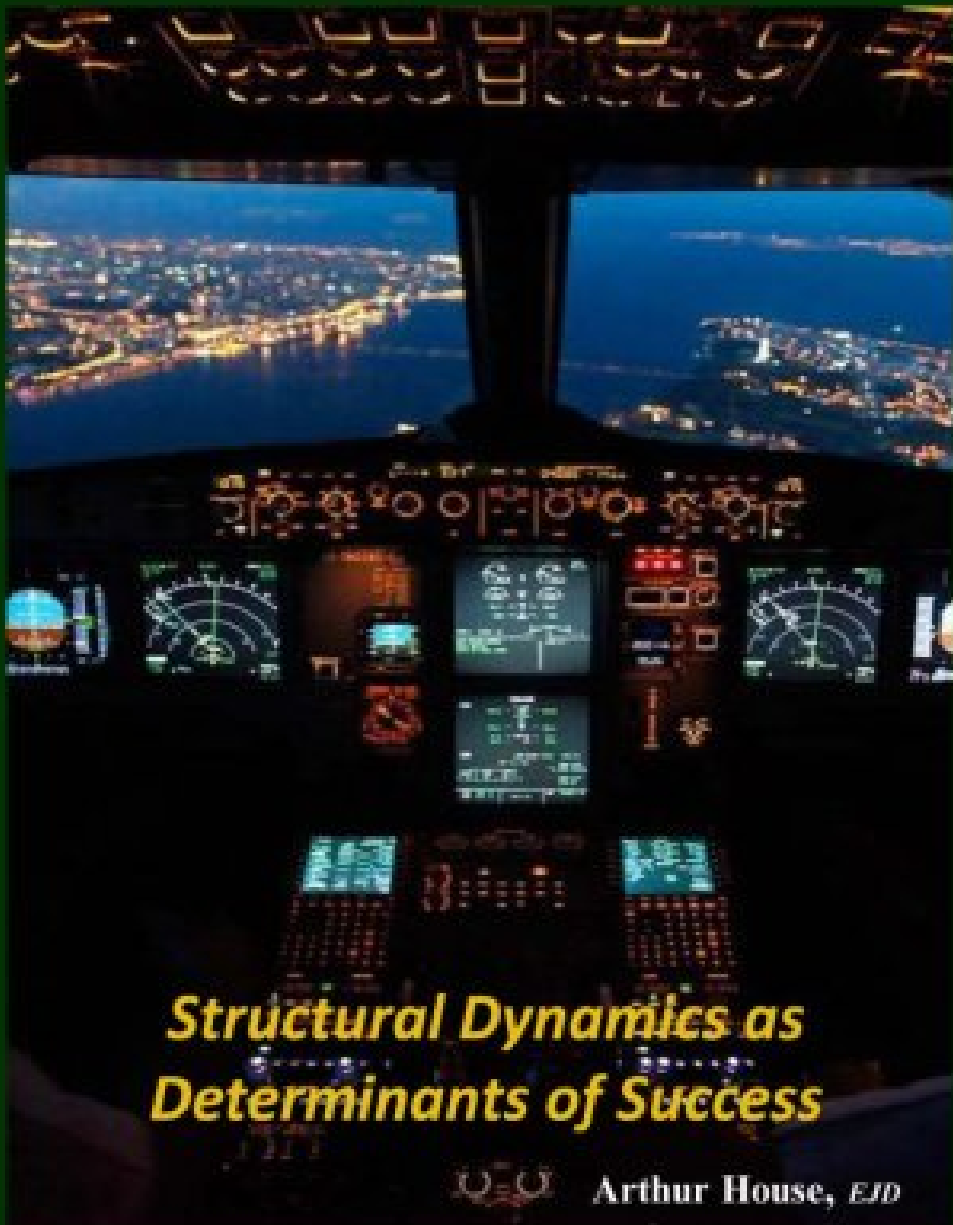


# CONSTRUCTION MANAGEMENT

*--- Effectively Managing the Company - Not the Project ---*

***Concept, Implementation, to Turn-Key***

*Planning, Taxi into Position, Commitment, Take-Off, Climb-Out,  
Control, Monitor, Arrive , Land, Taxi to Gate, Wind down, and Deplane*



***Structural Dynamics as  
Determinants of Success***



Arthur House, EJD