IMPLEMENTING TECHNOLOGY TO AVOID & MITIGATE RISK

Presented by:
Brian Goodreau, PSP, ENV-SP

October 26, 2016
Ohio Transportation Engineering Conference
Agenda

- Background/Abstract
  - Industry Studies Related to On-Time and On-Budget Performance
  - Benchmark Budget & Schedule
  - Risks, Management Reserves, and Contingencies
  - How Do Change Orders Fit Into Expectations?
  - How to Keep the Owner Happy
  - Conclusion
Health & Safety Moment
Brian Goodreau, PSP, ENV-SP

7 Years at Arcadis
- NYC Operations Leader – Contract Solutions
- Senior Claims Analyst
- Mega Projects

8 Years as a Subcontractor
- Concrete, Masonry, Sitework
- Estimating, Scheduling, Project Management

CMAA New England Chapter
- Founding Co-Chair Rising CM (Young Members)

Education / Accreditation
- Degree in Construction Management
- Planning & Scheduling Professional (AACEI)
- Institute for Sustainable Infrastructure (ENV-SP)
Brian Goodreau, PSP, ENV-SP

7 years helping owners Avoid, Mitigate, and Resolve disputes

WMATA Silver Springs Transit Center
ODOT I-75 and Hopple St. Bridge Reconstruction
NYC Law Bronx County Hall of Justice
NYC Law Honeywell Street and Queens Blvd. Bridges
NYC Housing Hurricane Sandy Recovery Program at Ocean Bay
NYC DEP Croton Water Treatment Plant
NCDPW Eisenhower Park Athletic Field Improvements
MBTA Beverly Station Parking Garage
MBTA Fitchburg Commuter Rail Line Improvements
MBTA Newmarket Commuter Rail Station
MBTA Talbot Ave Commuter Rail Station
MBTA Littleton Station
MBTA Wedgemere Station Improvements
MassDOT Rte. 99 (Alford Street) Over the Mystic River
MassDOT Route 128/I-95 Add-A-Lane and Seven Bridges
MassDOT Bates Bridge Rte. 97 & 113 over the Merrimack River
Illinois Tollway Jane Adams Memorial Tollway
Ericsson Global ICT Center Program - Montreal
ConnDOT CTfastrakBus Rapid Transit Program
ConnDOT Waterbury Bus Maintenance Facility
CKC Investor Knoll Crest - Luxury Apartments, Phase II
Background / Abstract

Most Owners Ask for:
- On Time
- On Budget

Most Contractors Promise:
- On Time
- On Budget

- Many projects fail either condition
- New tools and technologies can facilitate on time, on budget completion
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Background/Abstract

Industry Studies Related to On-Time and On-Budget Performance

Benchmark Budget & Schedule

Risks, Management Reserves, and Contingencies

How Do Change Orders Fit Into Expectations?

How to Keep the Owner Happy

Conclusion
Underperforming projects during the last financial year

<table>
<thead>
<tr>
<th>Sector</th>
<th>Yes</th>
<th>No</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy and natural resources</td>
<td>29%</td>
<td>71%</td>
<td>NO</td>
</tr>
<tr>
<td>Technology</td>
<td>57%</td>
<td>43%</td>
<td>NO</td>
</tr>
<tr>
<td>Public sector</td>
<td>10%</td>
<td>90%</td>
<td>YES</td>
</tr>
<tr>
<td>Other sector</td>
<td>61%</td>
<td>39%</td>
<td>YES</td>
</tr>
</tbody>
</table>

\( n = 109 \)

Source: KPMG International, 2015

Looking back over the past 3 years, fewer than one-third of all respondents’ projects managed to come within 10 percent of the planned budget, with the energy and natural resources, and especially the public sector, performing considerably worse than other industries.
“fewer than one-third… come within 10 percent of the planned budget…”

Looking back over the past 3 years, fewer than one-third of all respondents’ projects managed to come within 10 percent of the planned budget, with the energy and natural resources, and especially the public sector, performing considerably worse than other industries.
Underperforming projects during the last financial year

- Energy and natural resources: 29% Yes, 71% No
- Technology: 57% Yes, 43% No
- Public sector: 10% Yes, 90% No
- Other sector: 61% Yes, 39% No

Overall: 47% No, 53% Yes

Source: KPMG International, 2015

And, in the same time period, just a quarter of construction projects came within 10 percent of their original deadlines; only one in ten public sector organizations managed to hit this target.
“...just a quarter of construction projects came within 10 percent of the original deadline...”

And, in the same time period, just a quarter of construction projects came within 10 percent of their original deadlines; only one in ten public sector organizations managed to hit this target.
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Conclusion
Establish Realistic Expectations

Project planning is necessary to establish systems and procedures to ensure adequate project controls are in place.

Establish Good Project Controls:
Require benchmarks in the form of:
- Baseline schedule
- Cost budget
- Scope
- Quality

Teamwork
Good planning requires the team working out all the steps necessary to succeed.
Benchmark Budget & Schedule

Benchmark Sources

- Conceptual budget & schedule
- Similar projects
- Industry standards
- Historical performance

Caution:
Without good planning, surprises occur throughout the project encouraging crisis management

The End:
A realistic benchmark is the first step towards a successful project
Benchmark Schedule

💡 Invokes comparable actual or planned projects, identifying:

- Best practices
- Opportunities for improvement/optimization
- Basis for measuring performance
- Conceptualization between projects within (institutional knowledge) and without the organization, as well as intra-geographical and intra-industry

“During the planning phase, schedule benchmarking is a valuable tool for ensuring realistic and achievable forecast that represents the work required to achieve project completion.”

-projectacumen.com

Scheduling and planning are not the same thing!
## Benchmark Schedule

<table>
<thead>
<tr>
<th>Basic Software Packages</th>
<th>Advanced Software Packages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primavera SureTrak Project Manager</td>
<td>Primavera P3</td>
</tr>
<tr>
<td>Microsoft Project</td>
<td>Primavera P6</td>
</tr>
</tbody>
</table>

### Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low initial cost</td>
<td>High initial cost</td>
</tr>
<tr>
<td>Limited project capacity</td>
<td>Handles small to extremely large projects</td>
</tr>
<tr>
<td>Single user</td>
<td>Enterprise management</td>
</tr>
<tr>
<td>Limited analytics</td>
<td>Cost / resource / risk analysis</td>
</tr>
</tbody>
</table>
Benchmark Budget

The Conceptual Budget is the primary cost work product that identifies:

- Owner’s and project objectives
- Funding limitations
- Assesses all conditions that affecting the budget such as:
  - Environmental conditions
  - Market conditions
  - Site limitations
- Scales of contingency and management reserves
Benchmark Budget

• Choose the right system
• User training
• Enforce the rules

Software alone will not facilitate a good budget!
Characteristics of Generation-Y

Positive Characteristics

- Focused on consumer, collaboration and goal oriented
- Highly educated
- Multitask Fast
- Optimistic
- Positive attitude
- Technical; savvy

Limitations

- Distaste for menial work (they are brain smart)
- Inexperienced, lack discipline & patience
- Need structure & supervision
- Lack of skills for dealing with difficult people
- Respond poorly to those who act in an authoritarian manner and/or who expect to be respected due to higher rank alone

Leverage Gen-Y technical capabilities with the team’s experience
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Benchmark Budget & Schedule

➢ Risks, Management Reserves, and Contingencies
How Do Change Orders Fit Into Expectations?
How to Keep the Owner Happy
Conclusion
Risk Management

Typical Risks:
- Design errors/changes
- Schedule
- Quality
- Safety
- Existing conditions
- Environmental concerns
- Project delivery method
- Security
- Permitting
- Funding
- Contractual
- End user satisfaction
Risks, Management Reserves, and Contingencies

Discussion starts with an agreement on the meanings

- Assess Owner’s risk tolerance level
- Use risk-based approach to selecting reserves & contingencies
Risks, Management Reserves, and Contingencies

- **Deterministic Schedule**: 11/2/2015
- **17% probability that project completed on 11/2/2015**
- **P80 Schedule**: 4/4/2016
- **Schedule Contingency**: 154 Days
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Conclusion
Avoid

Mitigate

Resolve

NTP

PC

Ability to Change

Cost of Changes

Effort Required

Time

Concept

Design

Construct

Closeout

© Arcadis 2015
Project Management Information Systems

Key Features:

- Project bookshelf
- Process workflows
- Monitor ball-in-court
- Financial and schedule data
Demonstrative Evidence

- Mutual understanding leads to resolution
- Technology helps present your side of the story
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Conclusion
How to Keep the Owner Happy

No Surprises!

• Constant communications
• Good monitoring of performance against benchmarks
• Transparency in schedule and impacts
• Early identification of problems to allow Owner to participate in mitigation decisions
• All stakeholders happy

Technology can facilitate communication and transparency
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▶ Conclusion
Conclusion

• Many projects fail to complete on-time and on-budget
• New tools and technologies can facilitate on time, on budget completion
• Benchmark schedules and budgets are the start of a successful project
• Risk-based contingency management effectively identifies and manages project reserves
• Technology can support change management and dispute resolution
Questions/Discussion

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