

23RD ANNUAL



23RD LCI CONGRESS
OCTOBER 19-22

The Business Case for Lean: Operational Excellence Improved by Lean

LEARN BY DOING FROM THOSE WHO DO

October 19, 2021

Health precautions to keep everyone as safe as possible at Congress:

- Wear masks at all times in indoor events.
- Complete your daily health screening on your phone and bring it with you when you enter the center each day.
- Practice social distancing to the extent possible. Seating at plenary sessions is structured to help with this.
- If you feel ill at any time, please leave the conference and return to your room/consult a physician as necessary.
- Ultimately, our collective health and safety at Congress is up to all of us. Thanks for your support!





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Learning Objectives

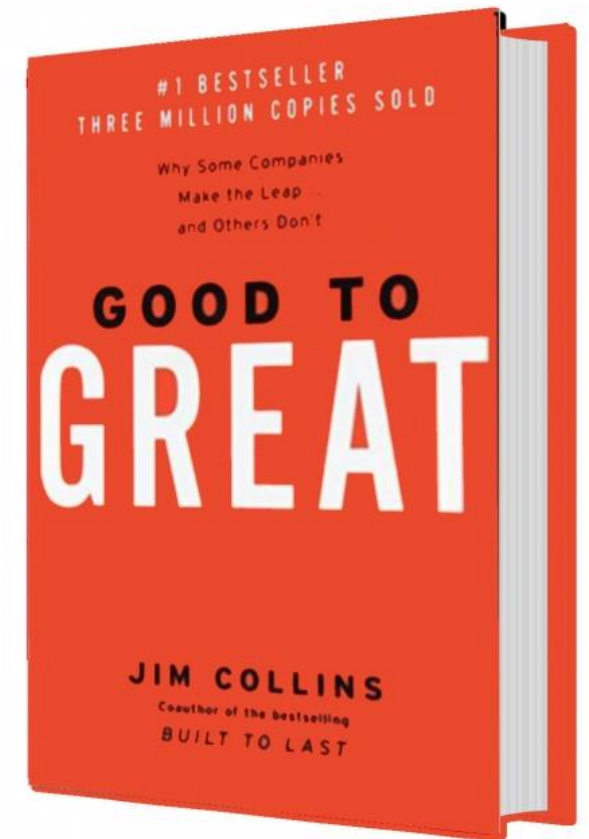
By the end of this session, participants will be able to:

1. Learn how best projects differentiate from typical
2. Understand impact of project choices
3. Become a change agent



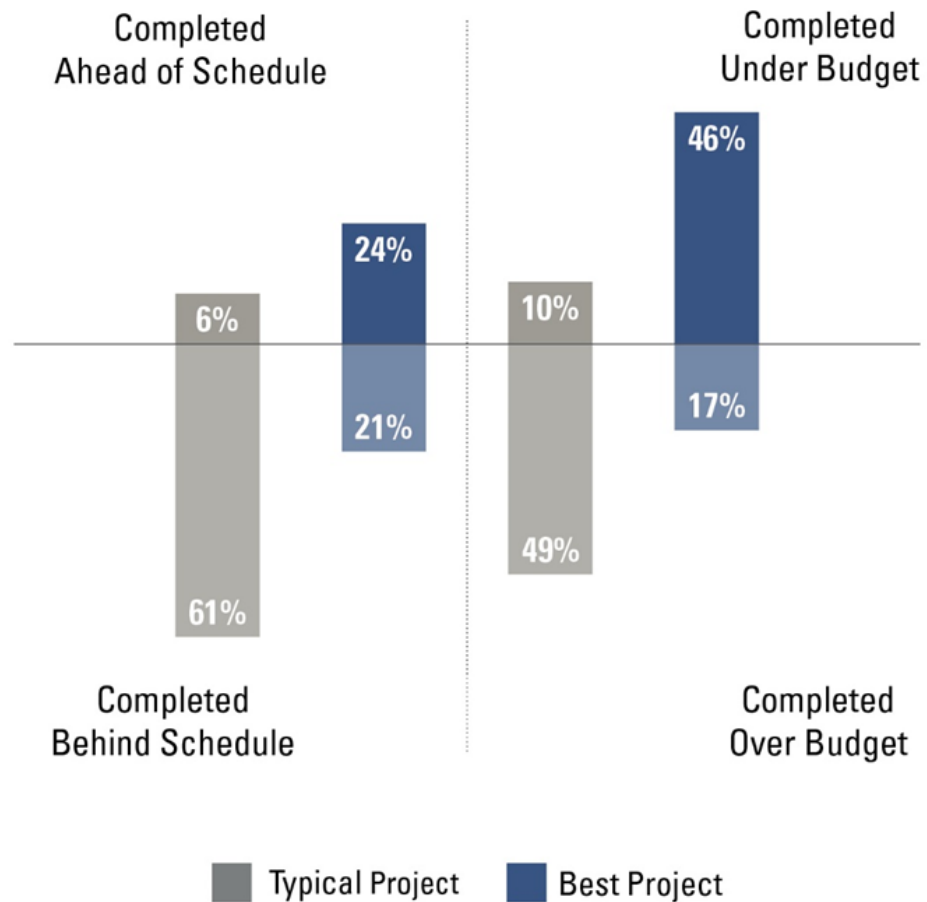
Research Methodology

1. Identify what creates value (satisfaction) for each stakeholder
2. Collect data from best and typical projects on:
 - Project Outcomes (e.g., design excellence, profitability)
 - Organizational Factors (e.g., team health, team dynamics)
 - Commercial Factors (e.g., delivery method, procurement)
 - Operational Factors (e.g., management methods)

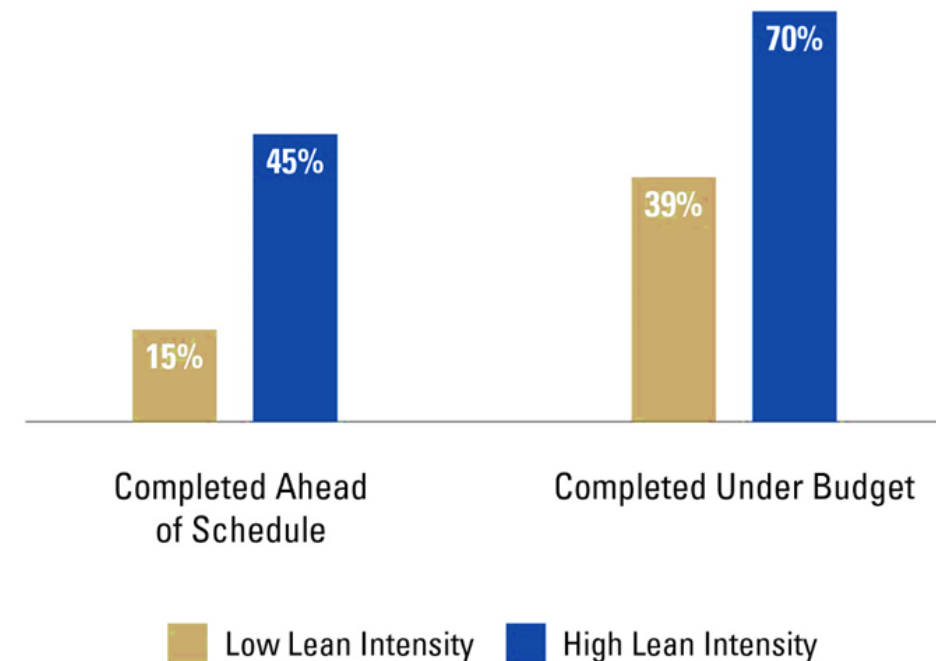


Owner's Business Case for Lean (2016)

**% of Projects Achieving Outcome
(From approval of Capital Project)**

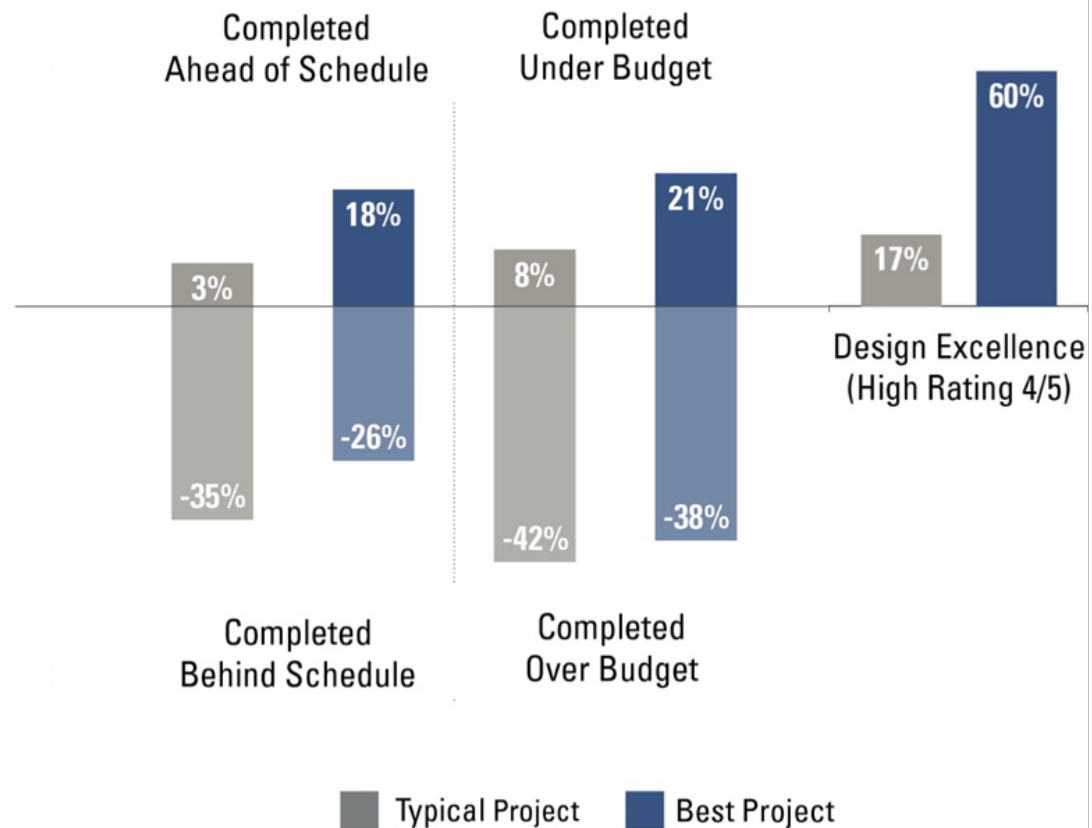


% of BEST Projects Achieving Outcome

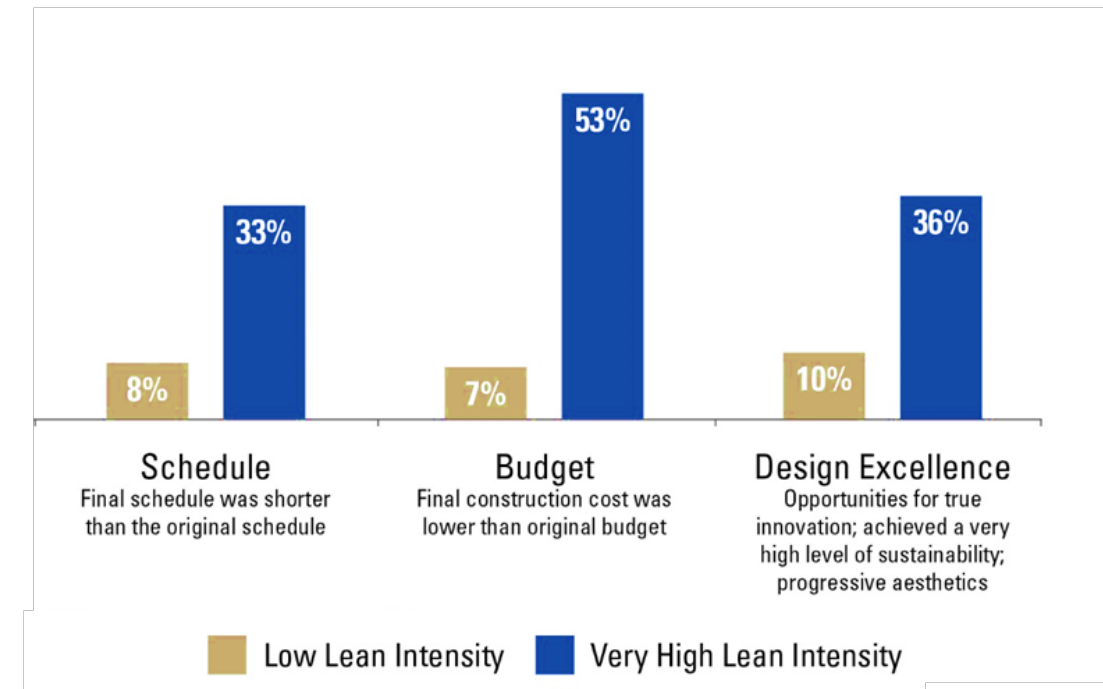


Great Design Enabled by Lean (2017)

**% of Projects Achieving Outcome
(From initial involvement of Architect)**



% of BEST Projects Achieving Outcome



Why?



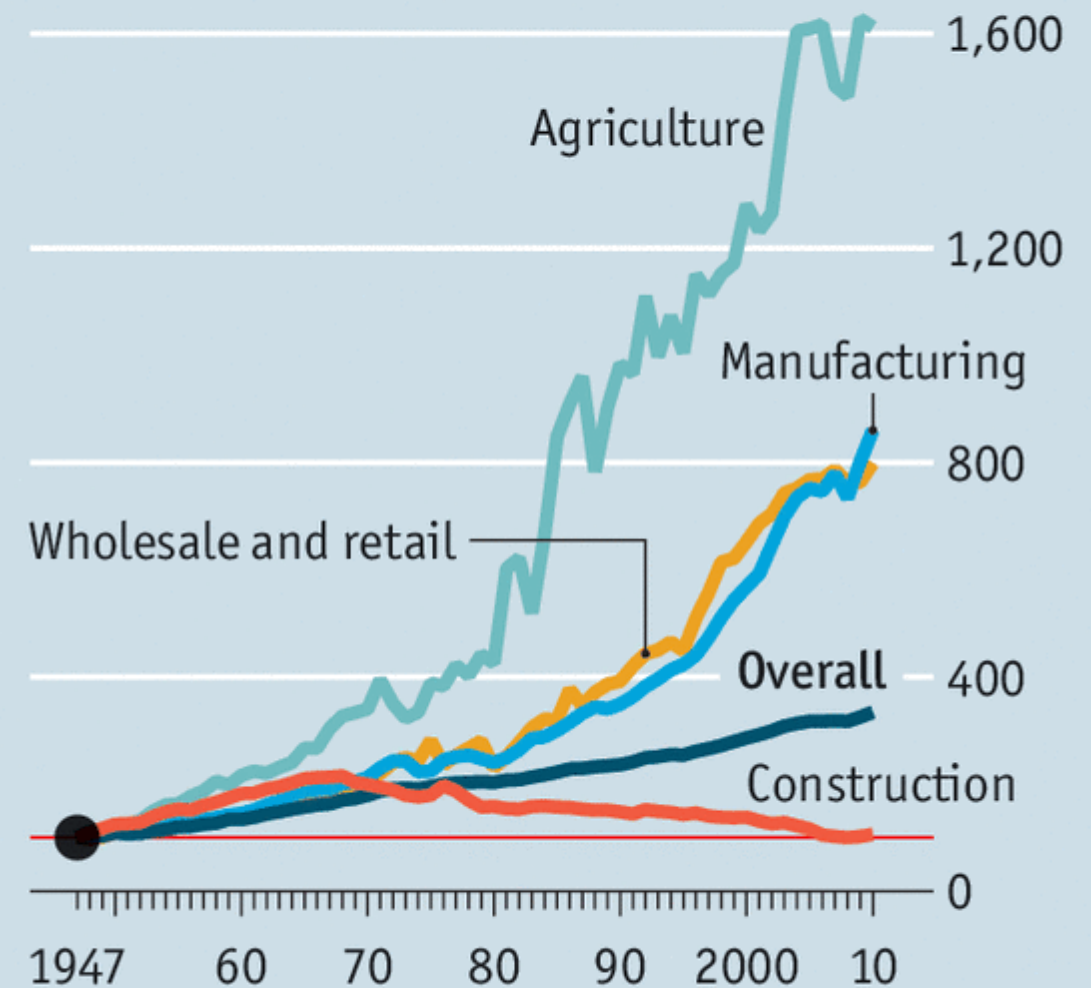
Lean Construction Institute
Transforming the Built Environment

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Unlearning by doing

United States, gross value-added*

Per hour worked, 1947=100



Source: McKinsey Global Institute

*At constant prices

Economist.com



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Research Methodology

- Identification of need at 2019 AGC National Convention
- AGC Beta Survey:
 - Schedule, Cost, Safety, Employee Engagement, Client Satisfaction
- Creation of Survey Instrument
 - AGC Partners with LCI and Dodge
 - Creation of Core Group
 - Creation of Stakeholder Group
 - Iterative Review, Final Survey Instrument



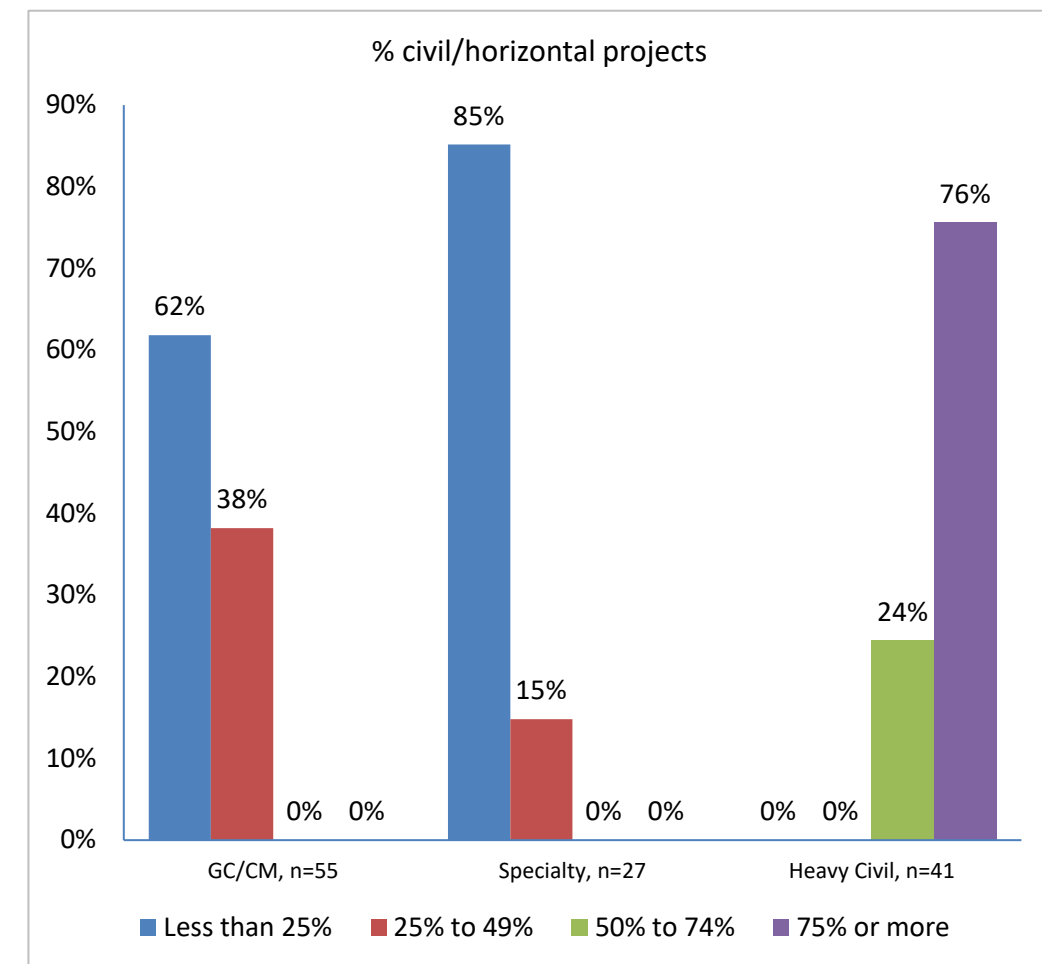
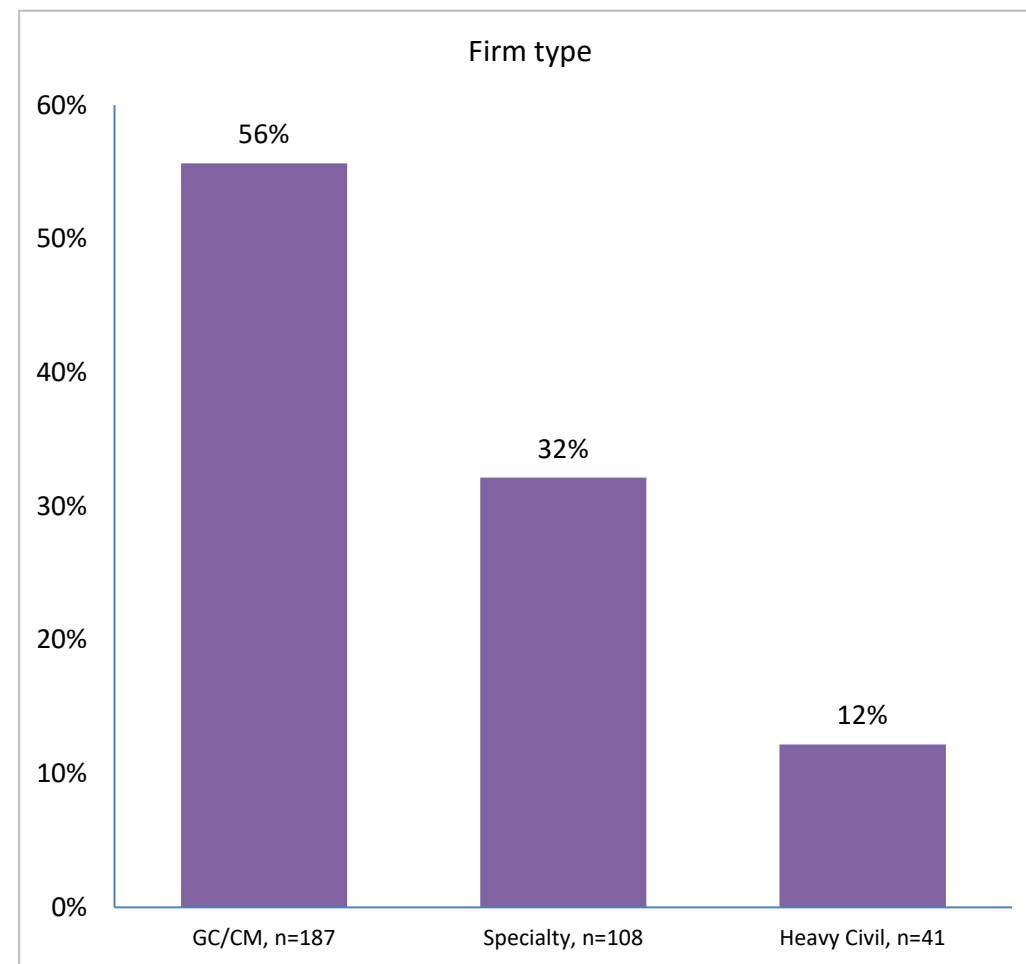
Findings



- **Selection of Best v. Typical projects**
 - Project Outcomes
 - Organizational Factors
 - Commercial Factors
 - Process/Operational Factors
-
- **Unless otherwise noted sample size is:**
 - **Total: 336 respondents**
 - **GC/CM: 187**
 - **Specialty: 108**
 - **Heavy civil: 41**

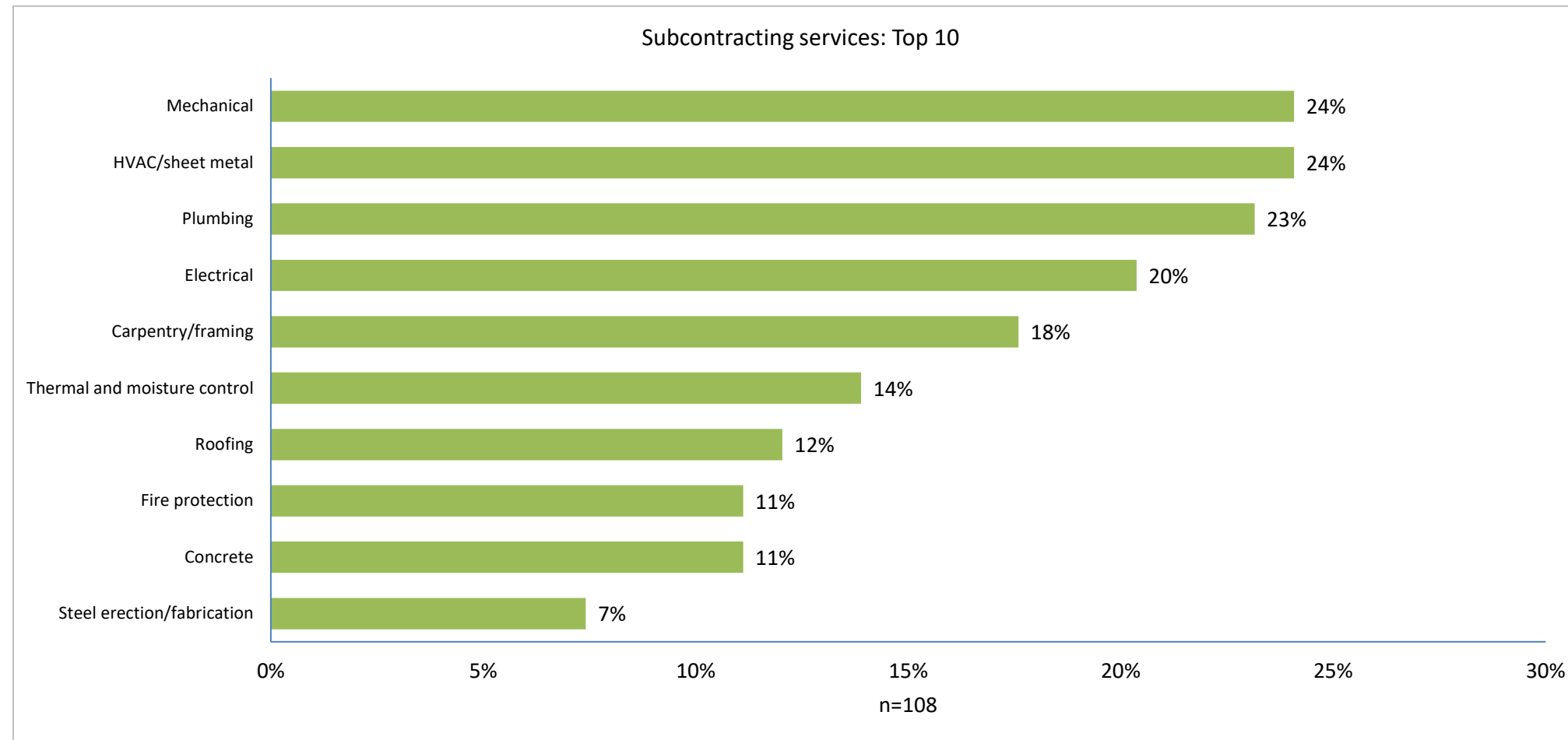
Demographics: Firm Type and Job Role

- A good representation of general, specialty, and heavy civil contractors were included
- To be considered a heavy civil contractor more than 50% of that firm's projects were civil/horizontal



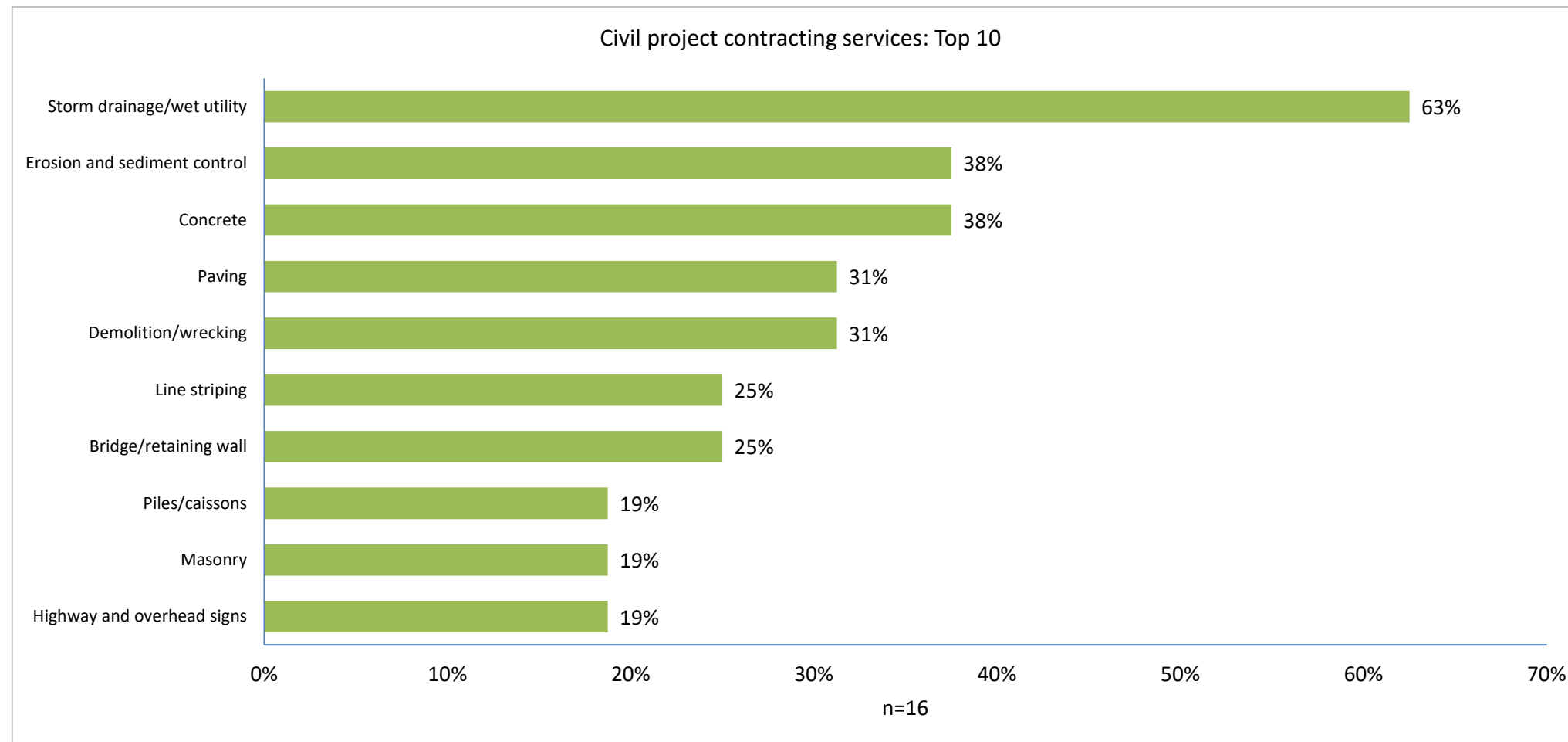
Demographics: Specialty Contractor

- A broad array of specialty contractor types were included
- Mechanical, HVAC, plumbing and electrical were most common



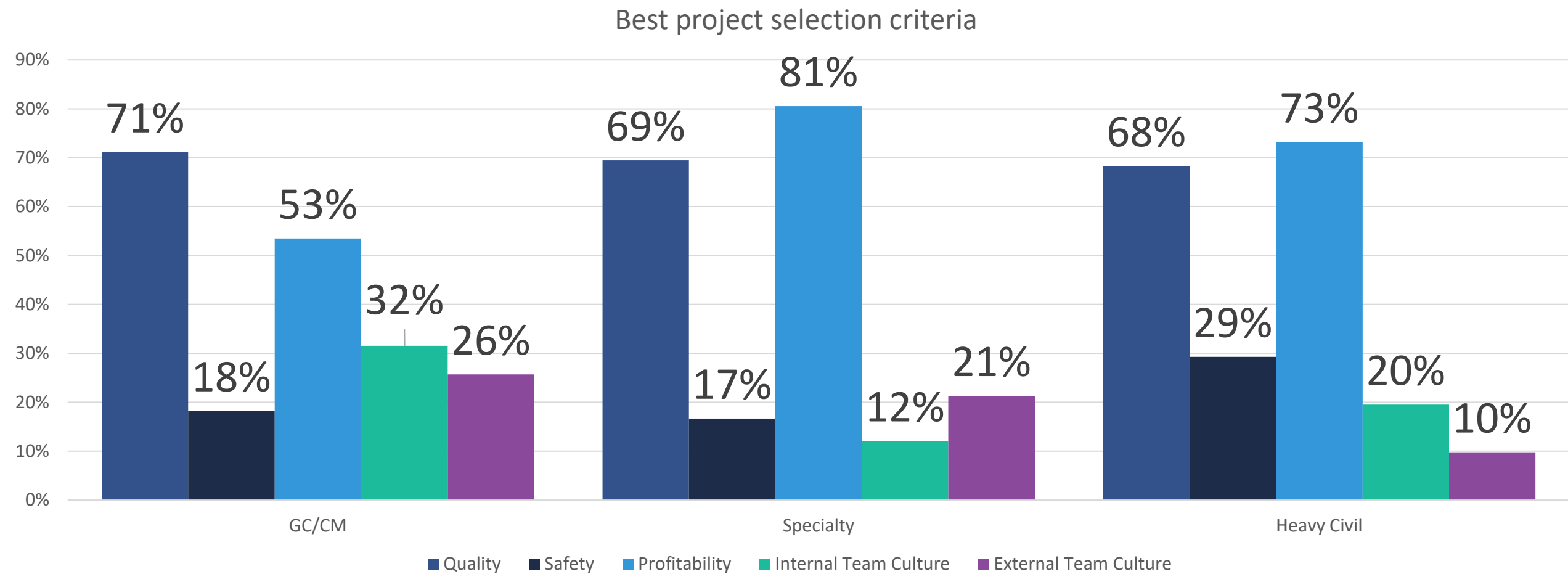
Demographics: Heavy Civil Specialty Services

- 16 specialty firms were considered heavy civil, based on their project types
- Many civil project services were included, primarily storm drainage, erosion/sediment control, and concrete



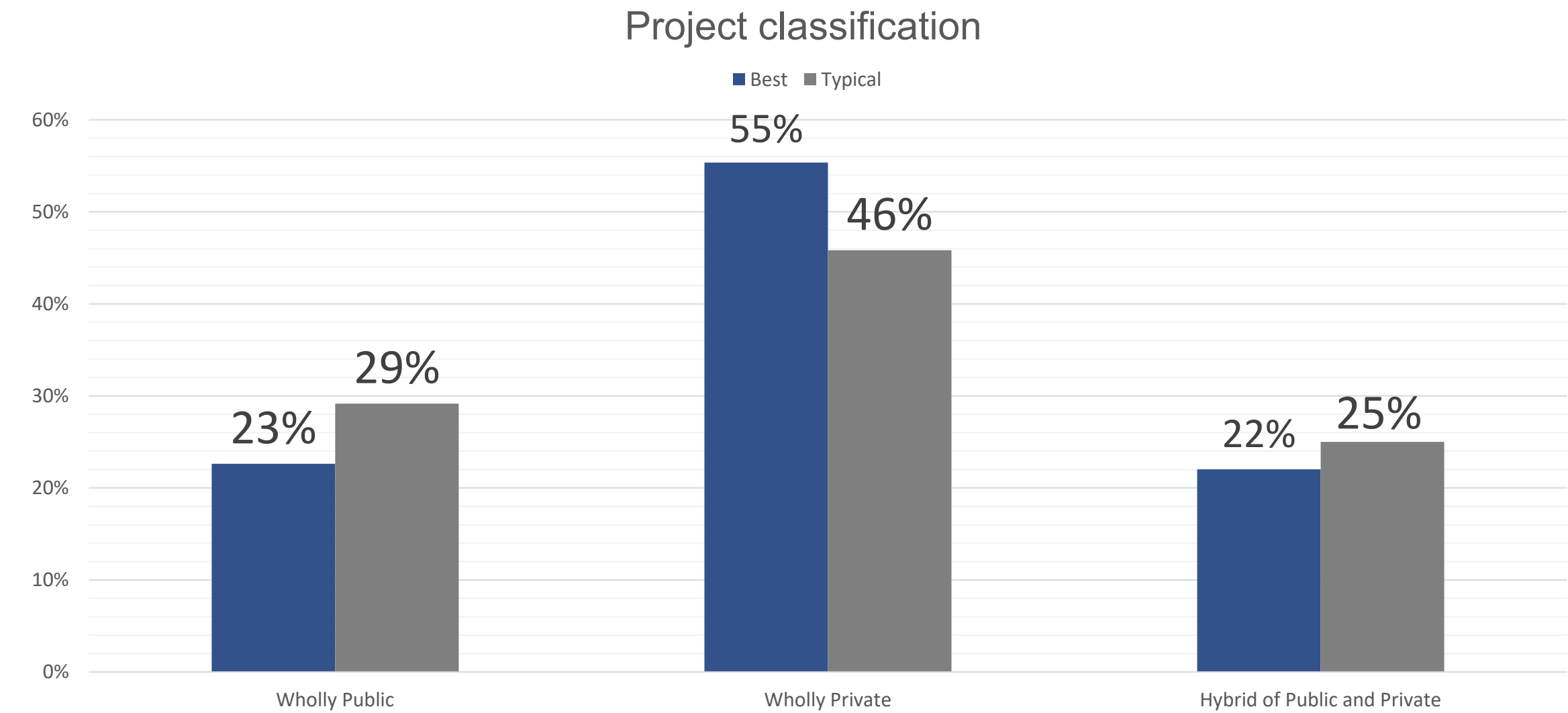
Best Project Selection

- Respondent firms typically relied on quality and profitability as determinants of “best” projects



Private Public

Best projects were most likely wholly private



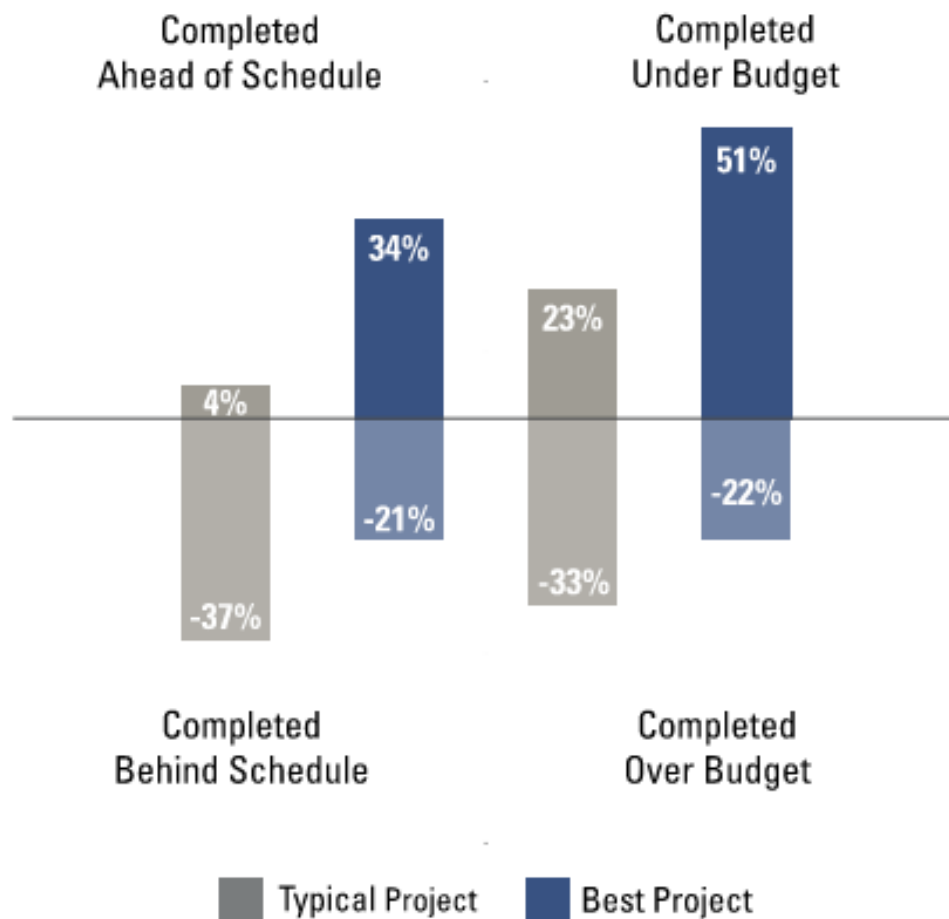
Findings



- Selection of Best v. Typical projects
- **Project Outcomes**
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Operational Excellence Improved by Lean (2021)

% of Projects Achieving Outcome
(Performance from initial involvement of contractor)

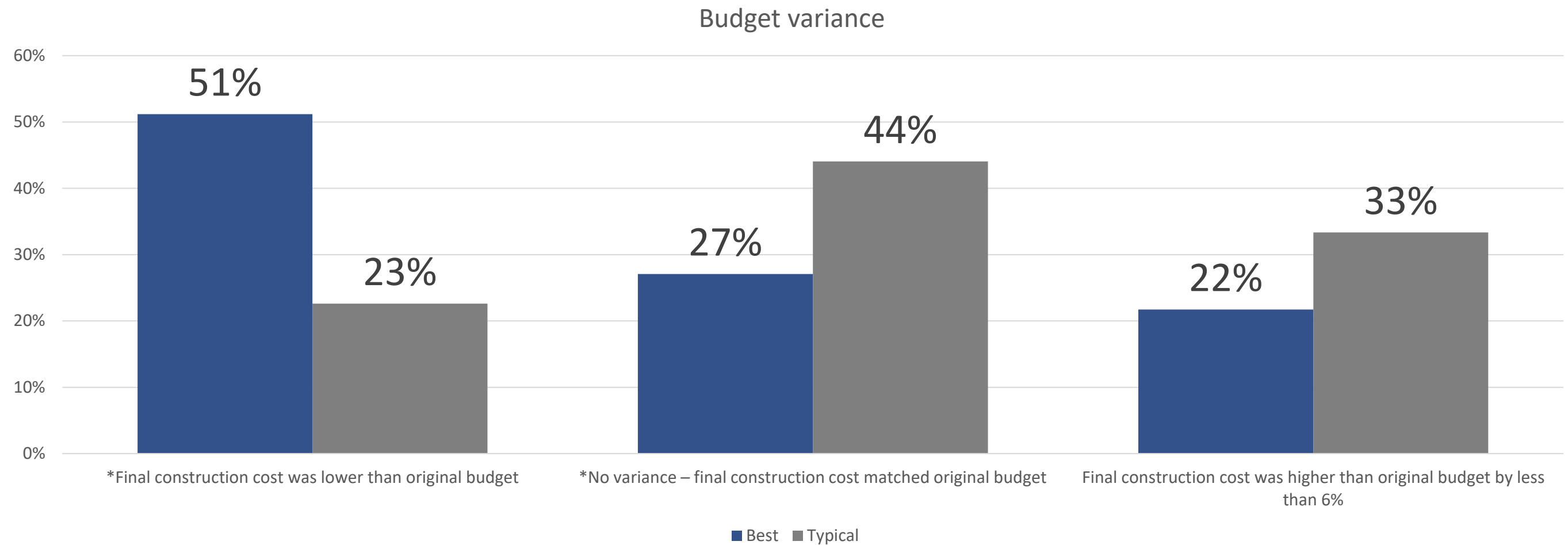


% of Projects Achieving Outcome



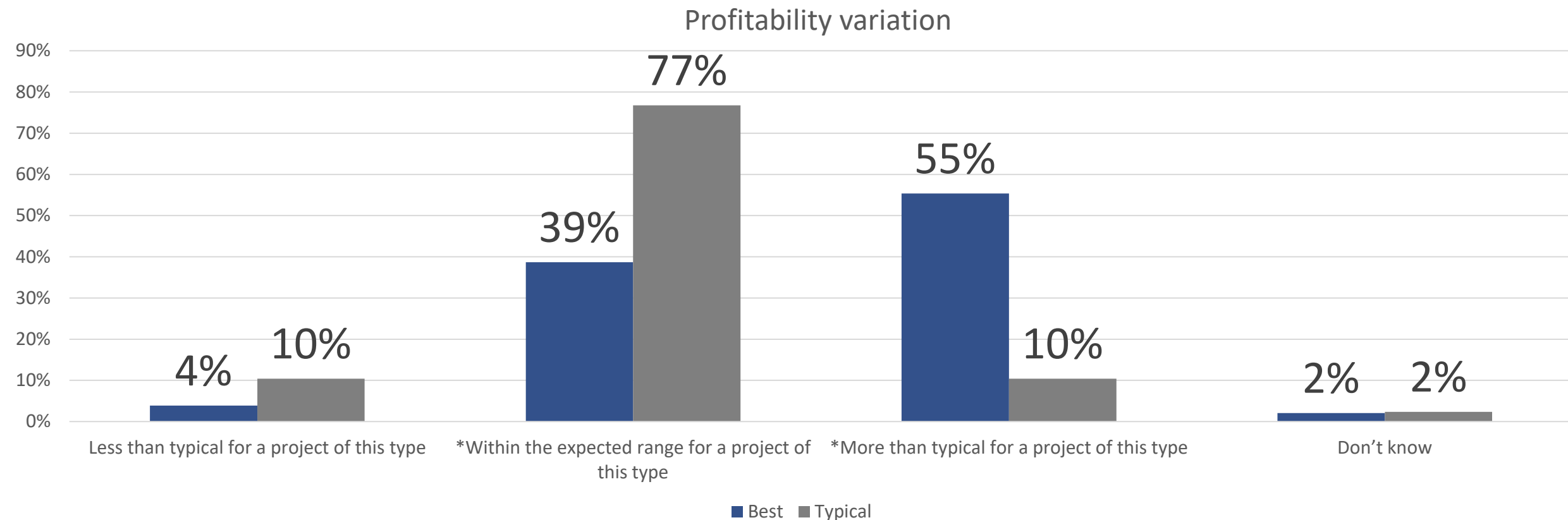
Project Outcomes: Budget Variance

- Best projects were more likely to have a final cost lower than the original budget
- Typical projects were more likely to have no variance from original budget



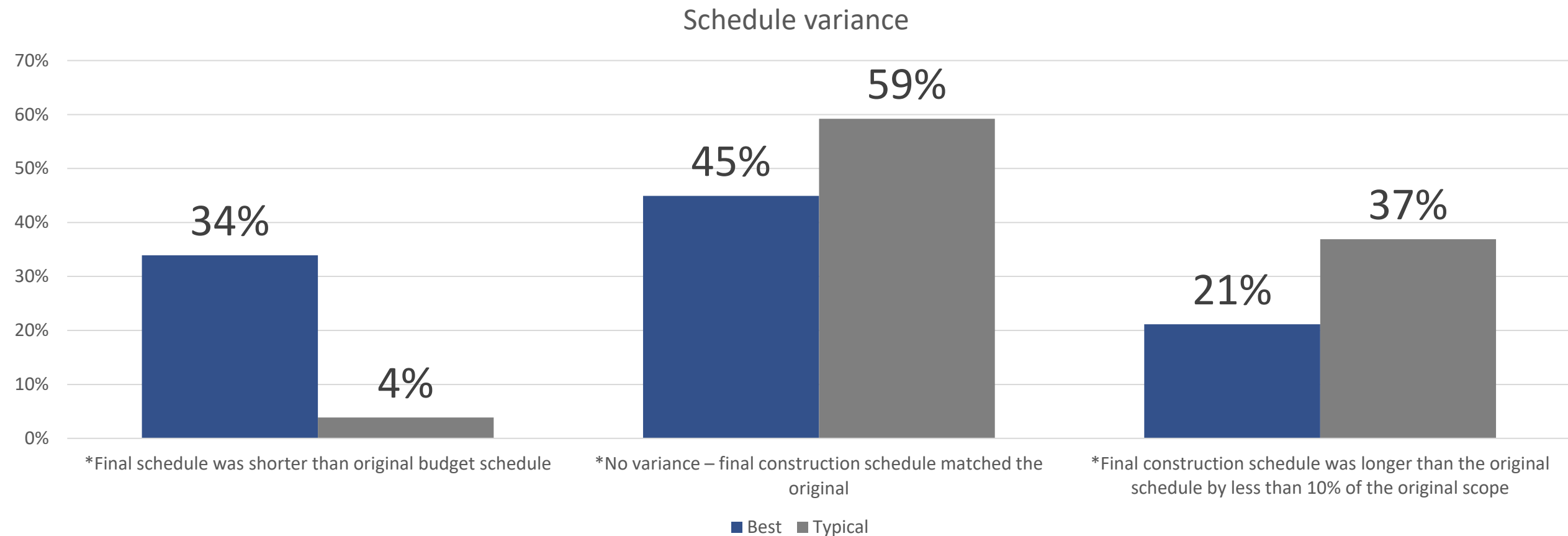
Project Outcomes: Profitability Variance

- There were significant differences between best and typical projects on profitability, one of the key items for choosing a best project
- Typical projects were more likely to be within the expected profit range
- Best projects were more likely to have a higher profit than typical projects, with trade contractors most frequently reporting the highest profit levels.



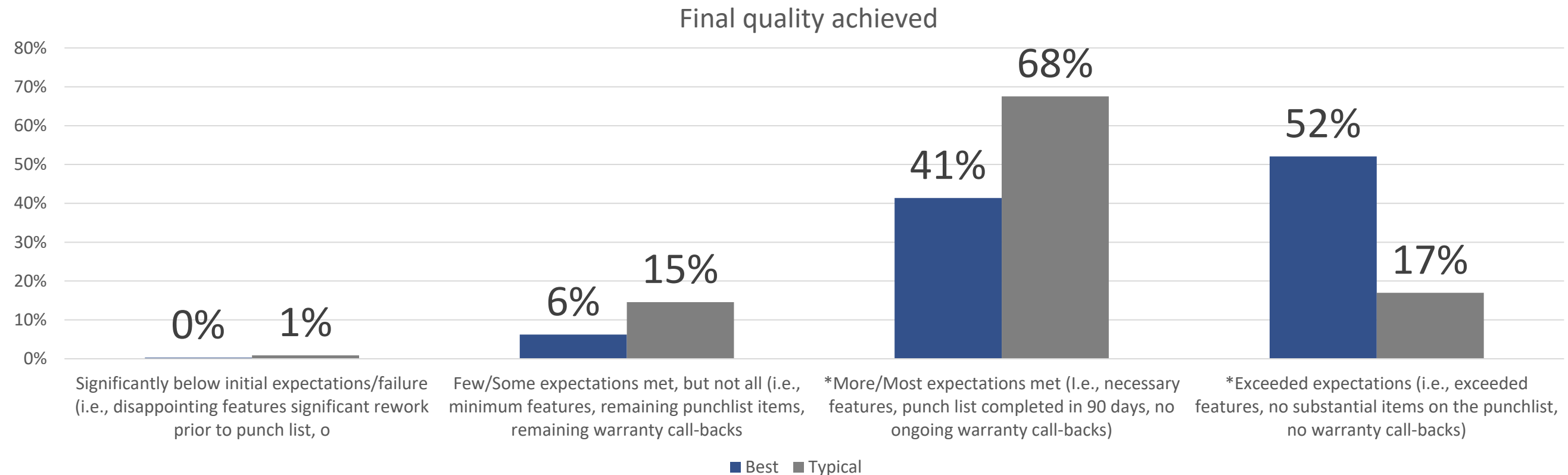
Project Outcomes: Schedule Variance

- Schedule variance differed across the board for best and typical projects
- Best projects were more likely to be under schedule, typical projects were more likely to be either on schedule or over schedule



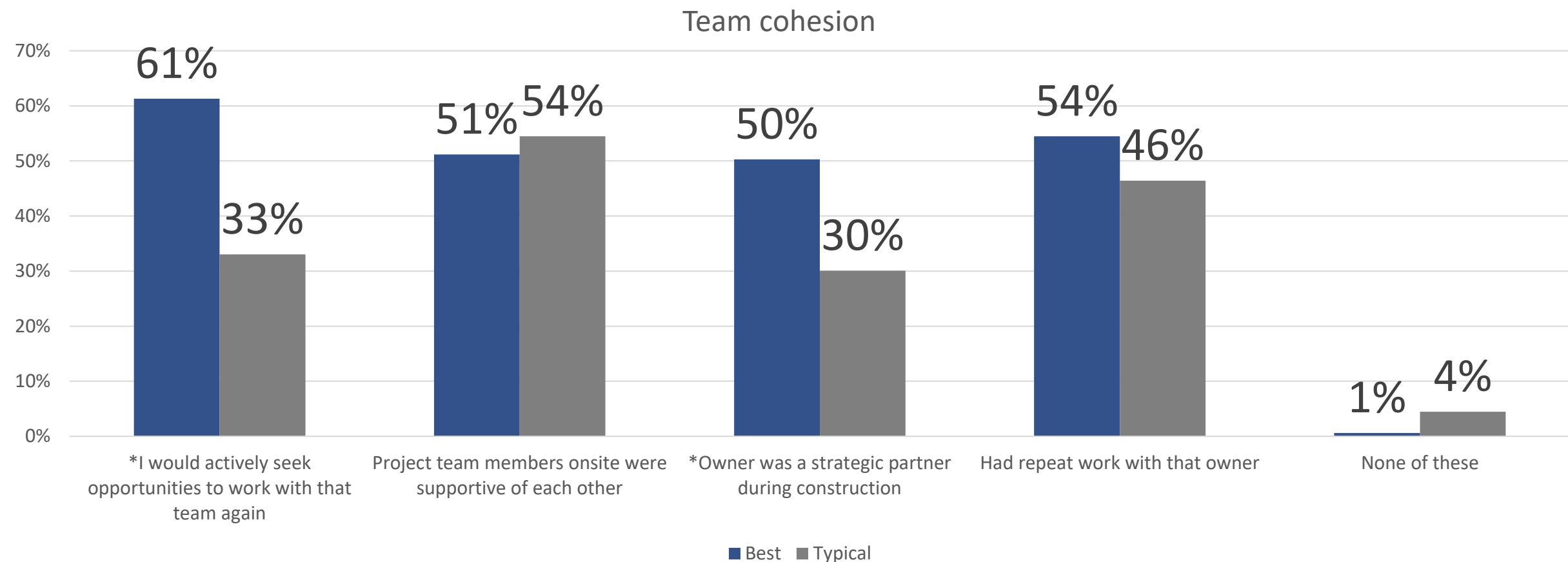
Project Outcomes: Final Quality

- Both types of projects also achieved good quality outcomes, the other main item for choosing a best project
- Typical projects were more likely to meet more or most necessary features
- Best projects were more likely to exceed project expectations with no substantial items on the punchlist



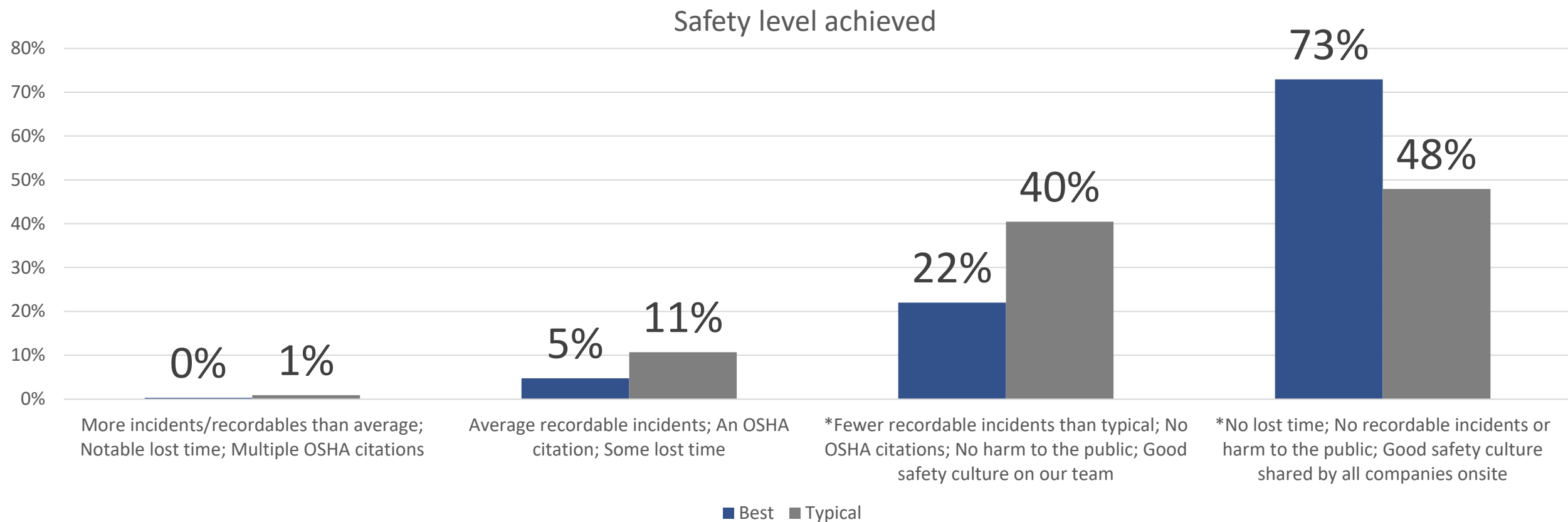
Project Outcomes: Team Cohesion

- On best projects respondents significantly more frequently noted wanting to actively seek opportunities to work with that team again and that the owner was a strategic partner
- Significantly more GC/CMs (59%) than trades (36%) report that the owner was a strategic partner during construction on best projects, and GC/CMs (40%) are significantly higher for typical projects in this category than both trades (14%) and civil contractors (27%).
- Significantly more trade contractors (9%) report that none of these apply to their typical projects than do GC/CMs (3%) or civil contractors (0%)



Project Outcomes: Safety Level

- Both typical and best projects achieved good safety outcomes
- Typical projects were more likely to have a higher rate of fewer recordable incidents than best projects
- Best projects were more likely to achieve the highest level of safety noted, with no recordable incidents or lost time



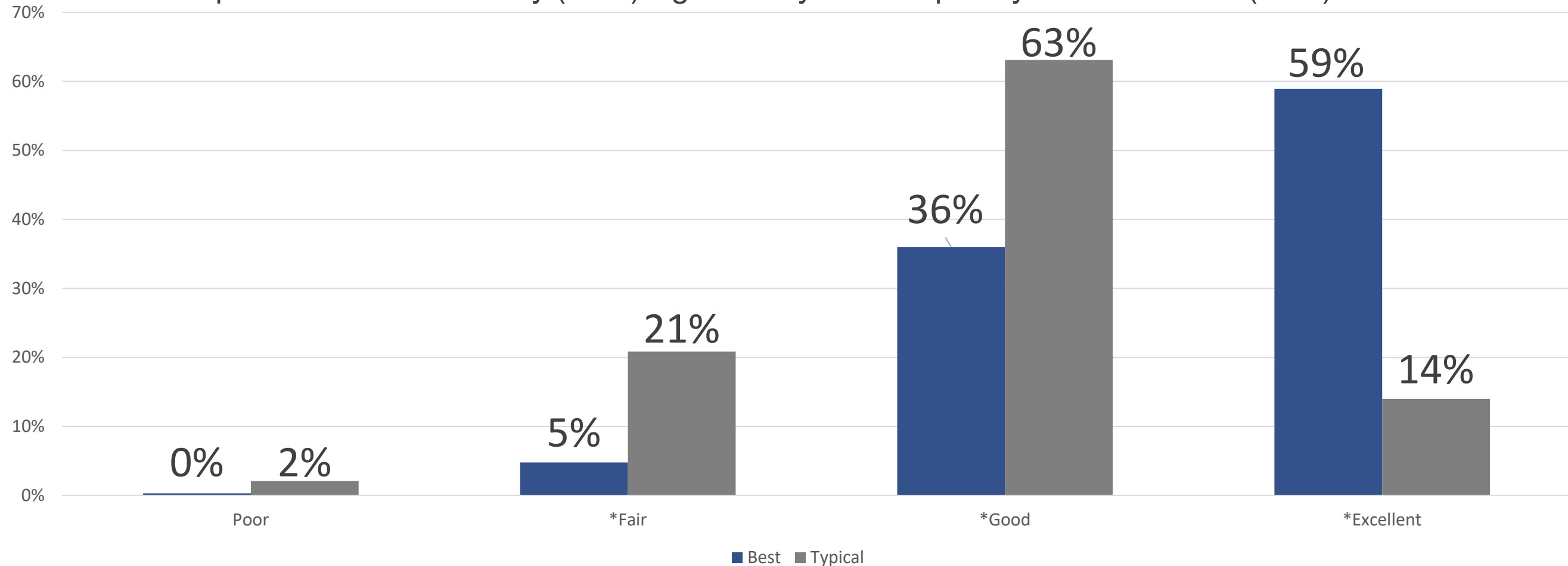
Findings



- Selection of Best v. Typical projects
- Project Outcomes
- **Organizational Factors**
- Commercial Factors
- Process/Operational Factors

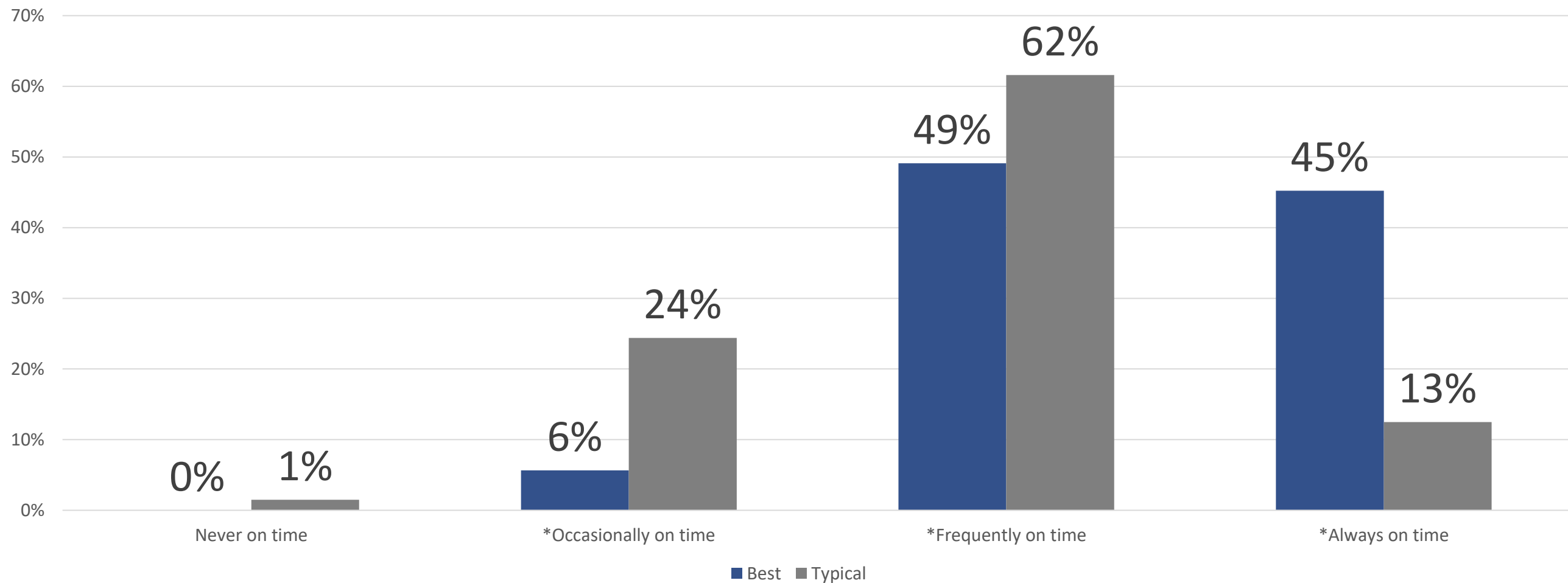
Organizational Factors: Team Chemistry

- Typical projects were more likely to report a fair or good team chemistry
- Best projects were more likely to report an excellent team chemistry
- GC/CMs report fair team chemistry (14%) significantly less frequently than do trades (28%) or civil contractors (32%)



Organizational Factors: Timeliness of Communication

- Typical projects were more likely to note that communication was occasionally or frequently on time
- Best projects were more likely to note always on time communication



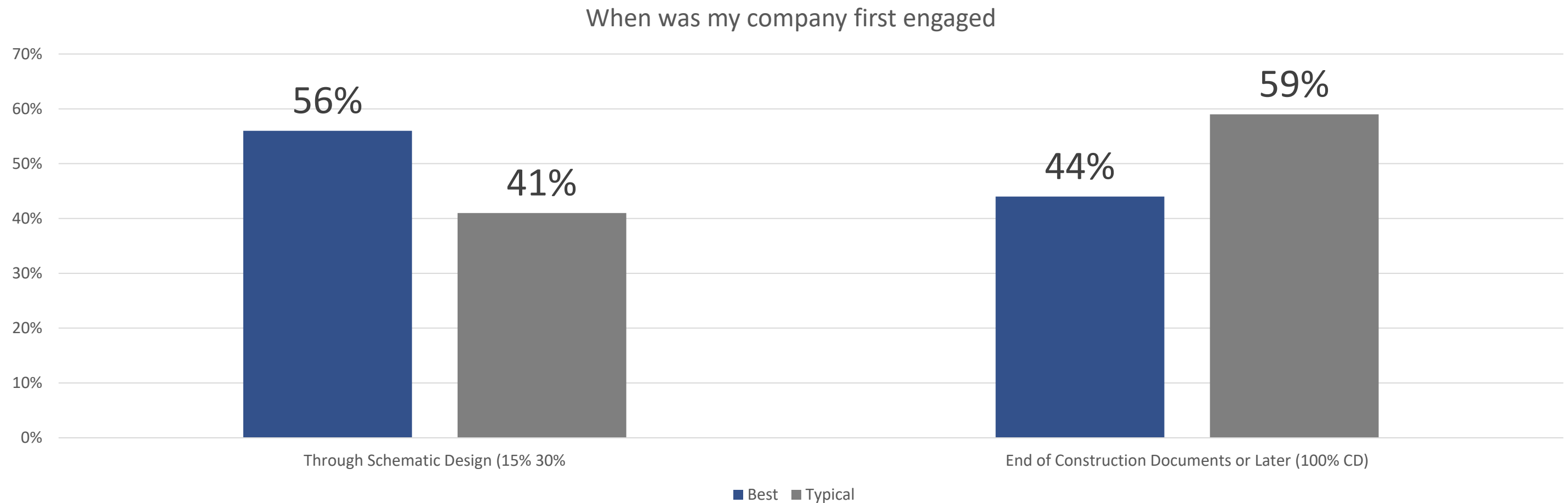
Findings



- Selection of Best v. Typical projects
- Project Outcomes
- Organizational Factors
- **Commercial Factors**
- Process/Operational Factors

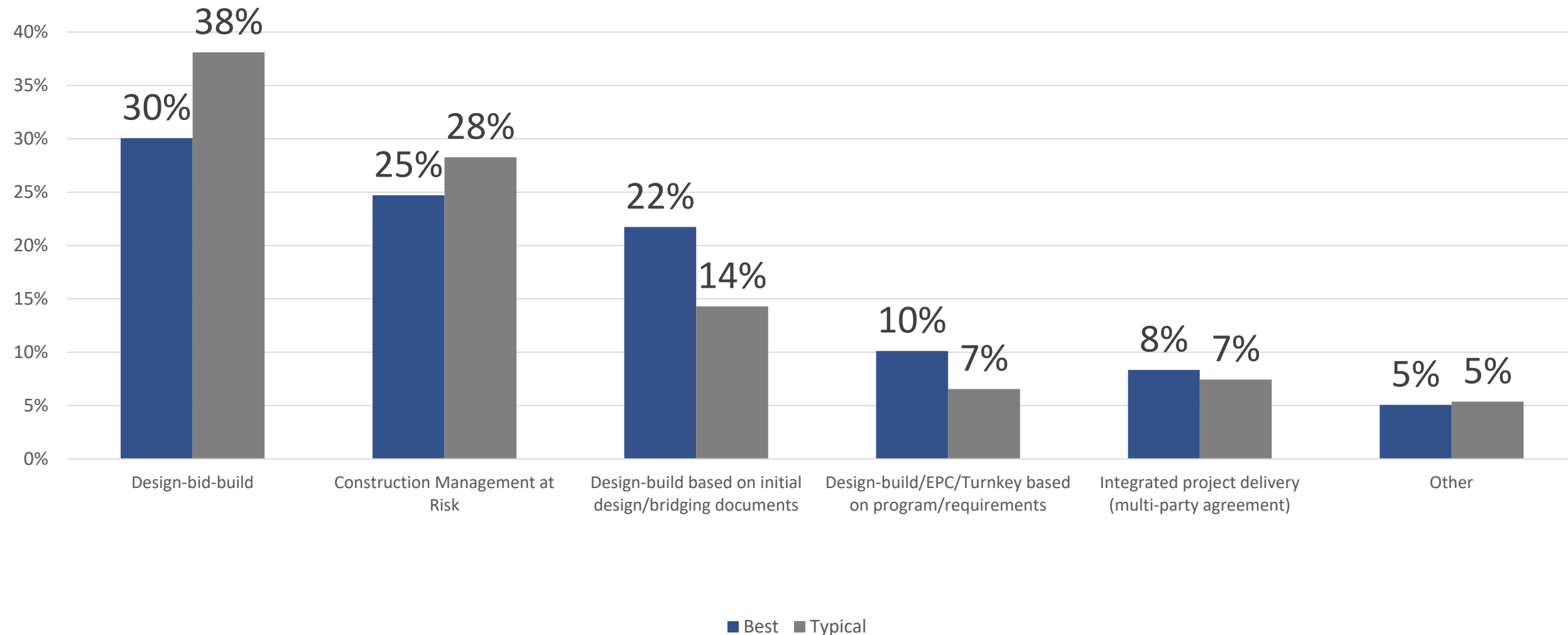
Commercial Factors: Initial Engagement of My Company

- Typical and best projects did not significantly differ as to stage of the project for when a respondent noted their company's first engagement



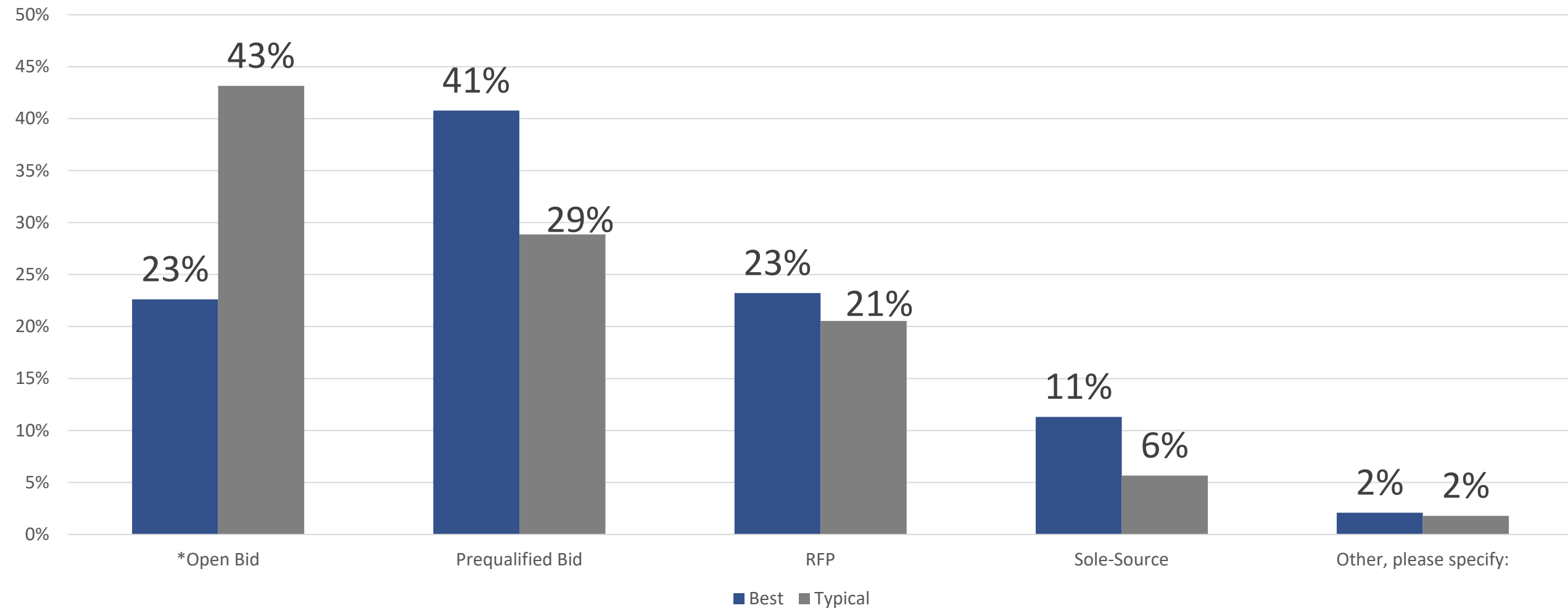
Commercial Factors: Project Delivery Method

- There were no significant differences in project delivery method between best and typical projects



Procurement Process

- Typical projects were more likely to use an open bid process



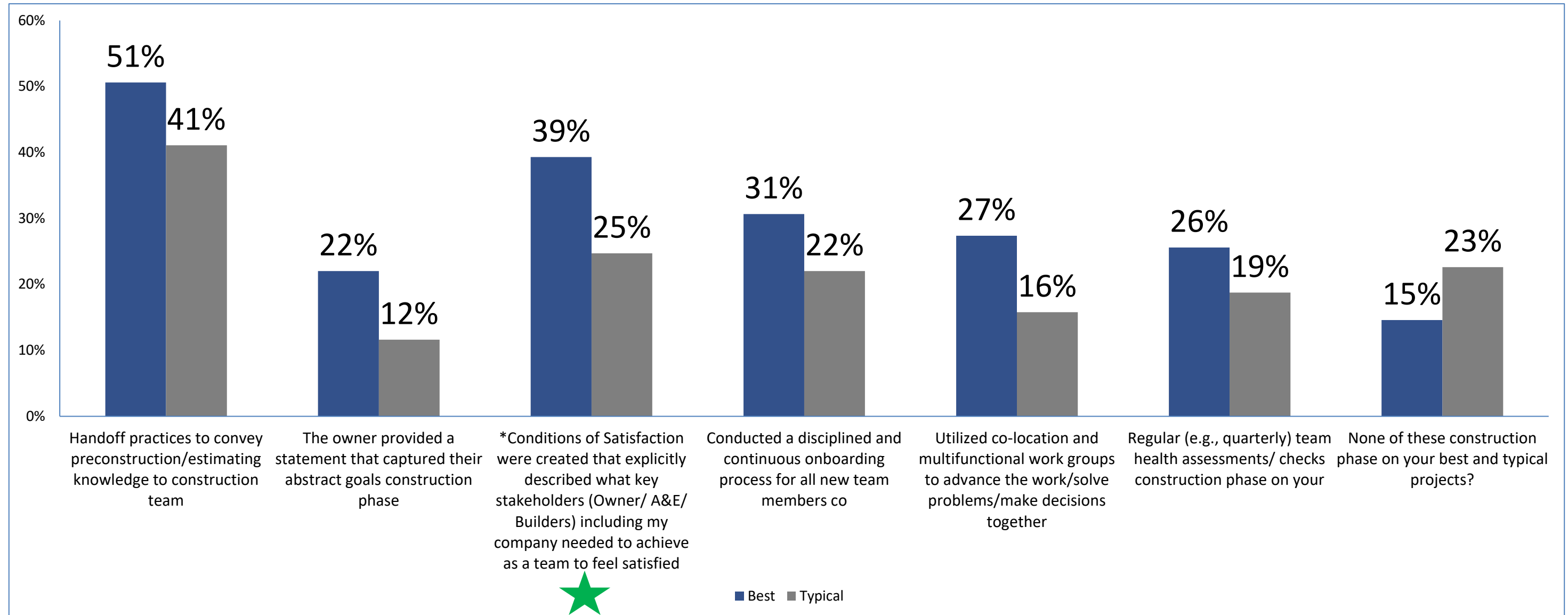
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- **Process/Operational Factors**

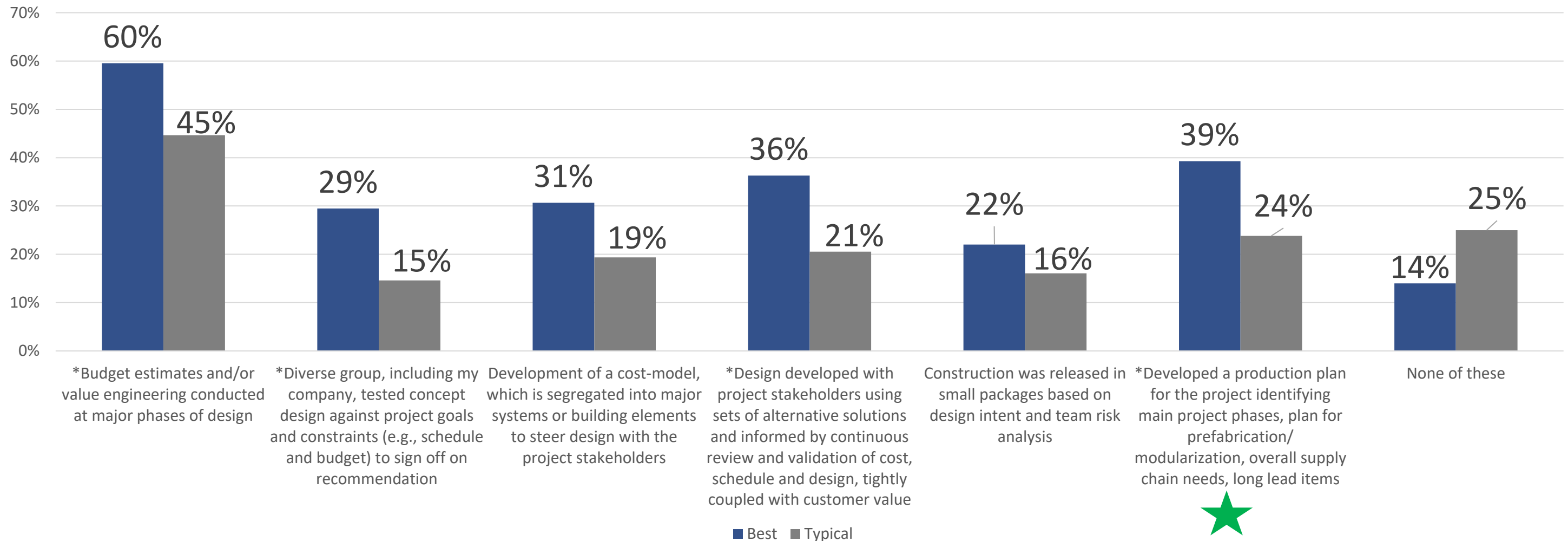
Process Factors: Intentional Project Formation

- Best projects were more likely to establish conditions of satisfaction key stakeholders needed to achieve as a team to feel satisfied



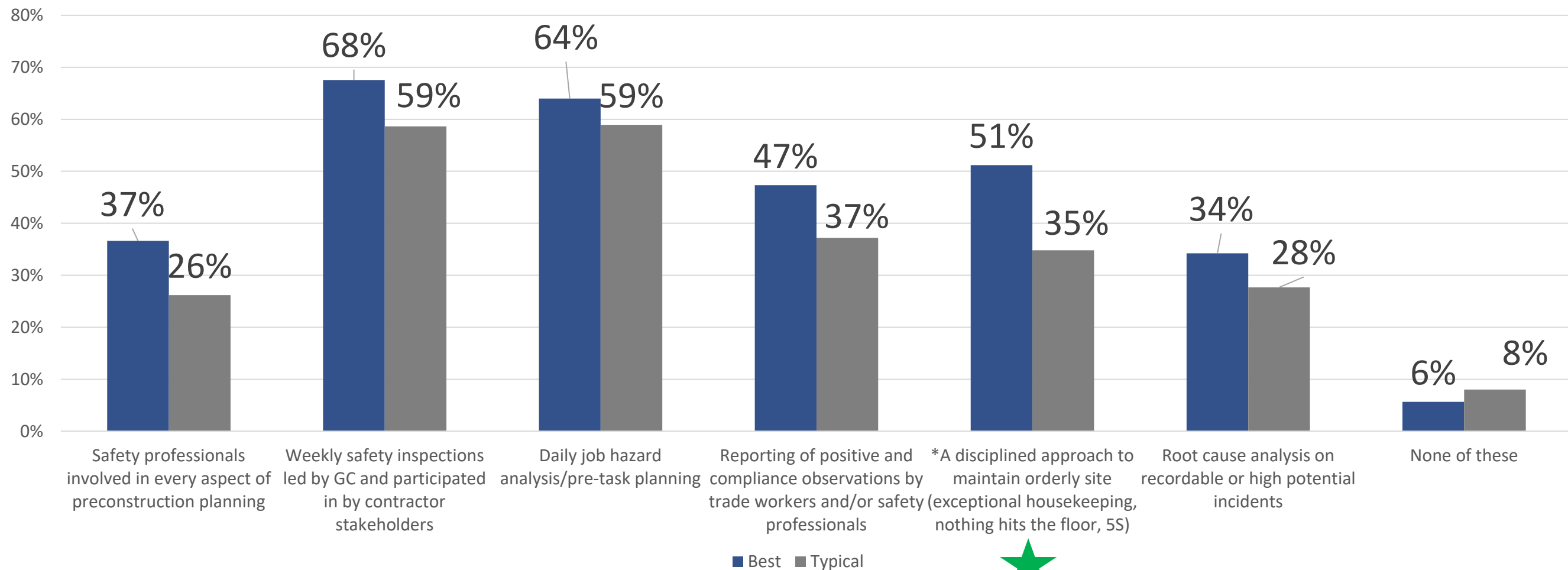
Process Factors: Design/Preconstruction Practices

- Best projects significantly conducted more design practices including; budget estimates at major phases of design, tested concept design against project goals, an iterative design process informed by continuous review and validated against outcomes, and developed a production plan identifying main project phases



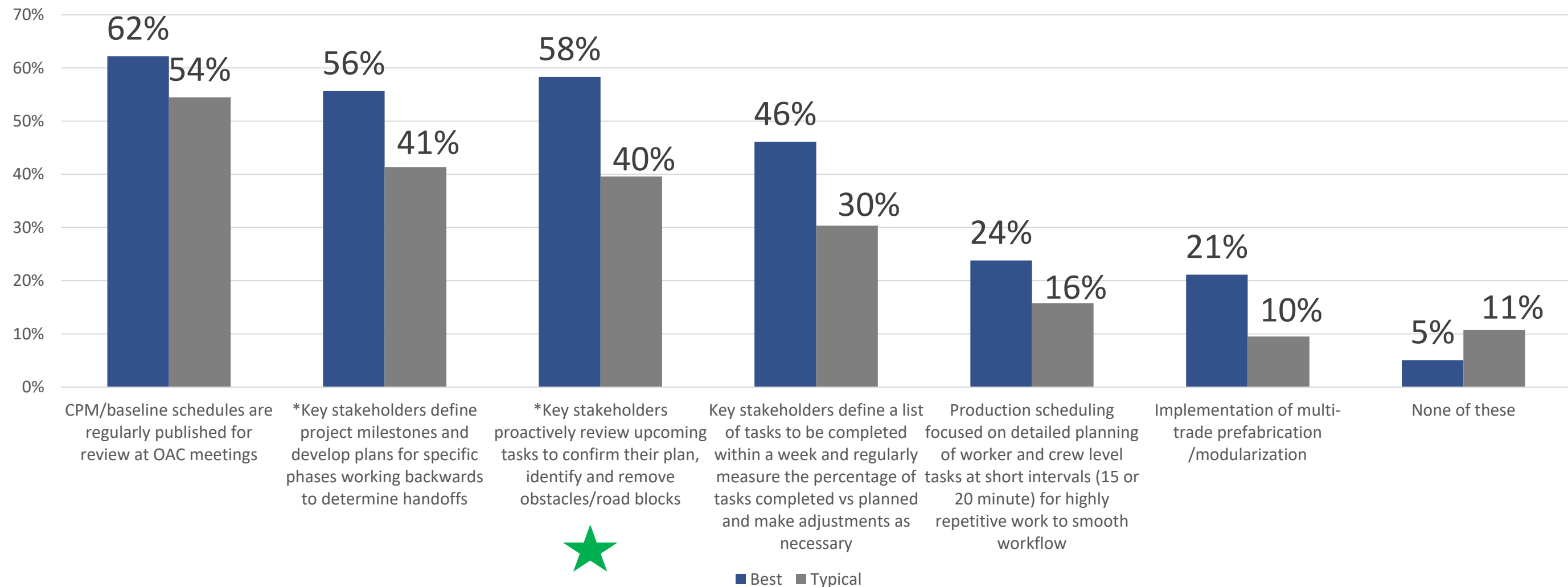
Process Factors: Safety Practices

- Best projects were more likely to use a disciplined approach to maintain orderly site than were typical projects



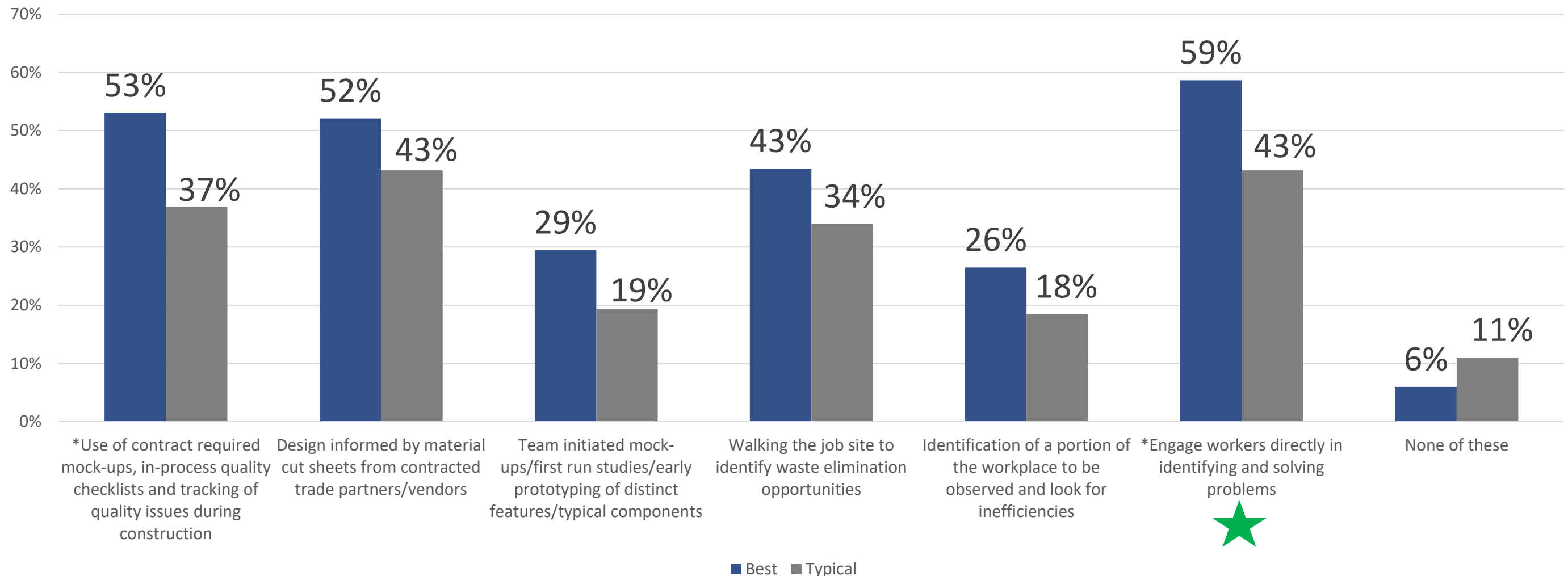
Process Factors: Planning and Scheduling Practices

- Best projects were more likely to have key stakeholders proactively review upcoming tasks to confirm plan, identify and remove obstacles/ road blocks (remove constraints)



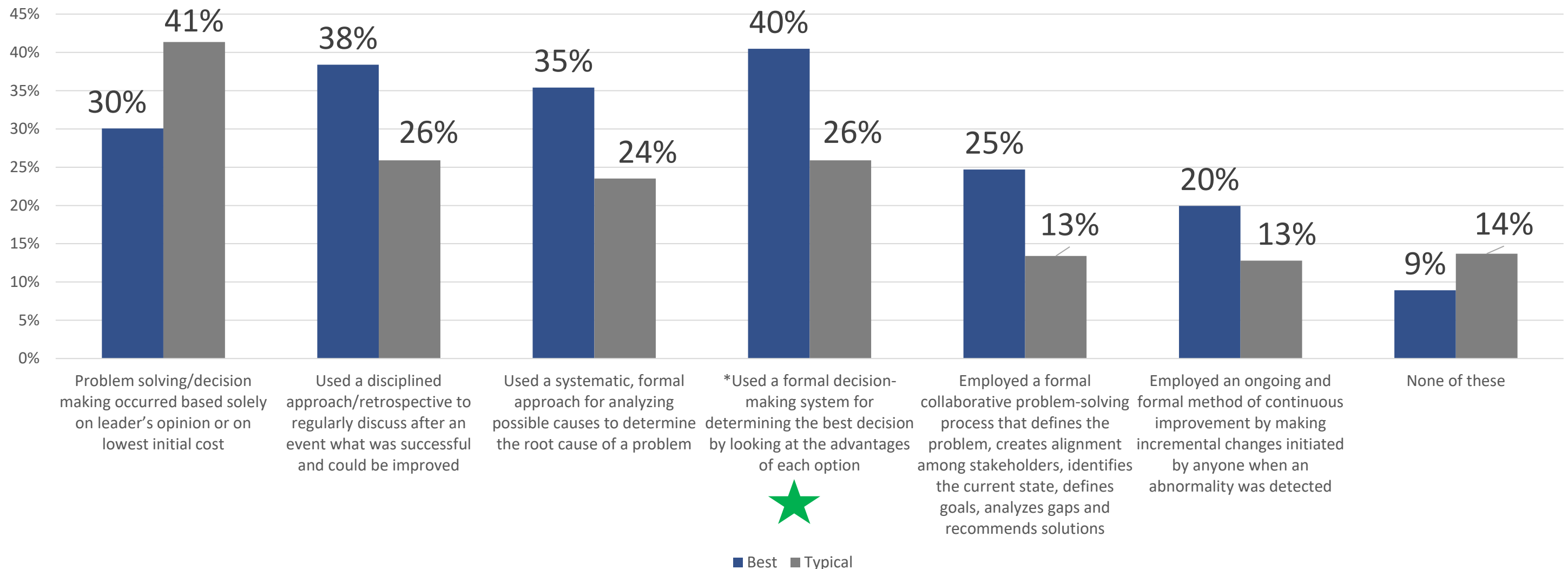
Process Factors: Quality Practices

- Use of contract required mock-ups, in-process quality checklists and tracking of quality issues during construction and engaging workers directly in identifying and solving problems were practices more frequently conducted on best projects



Process Factors: Issue Resolution & Decision-Making Practices

- Using a formal decision-making system for determining the best decision by looking at the advantages of each option was more frequently done on best projects than typical ones

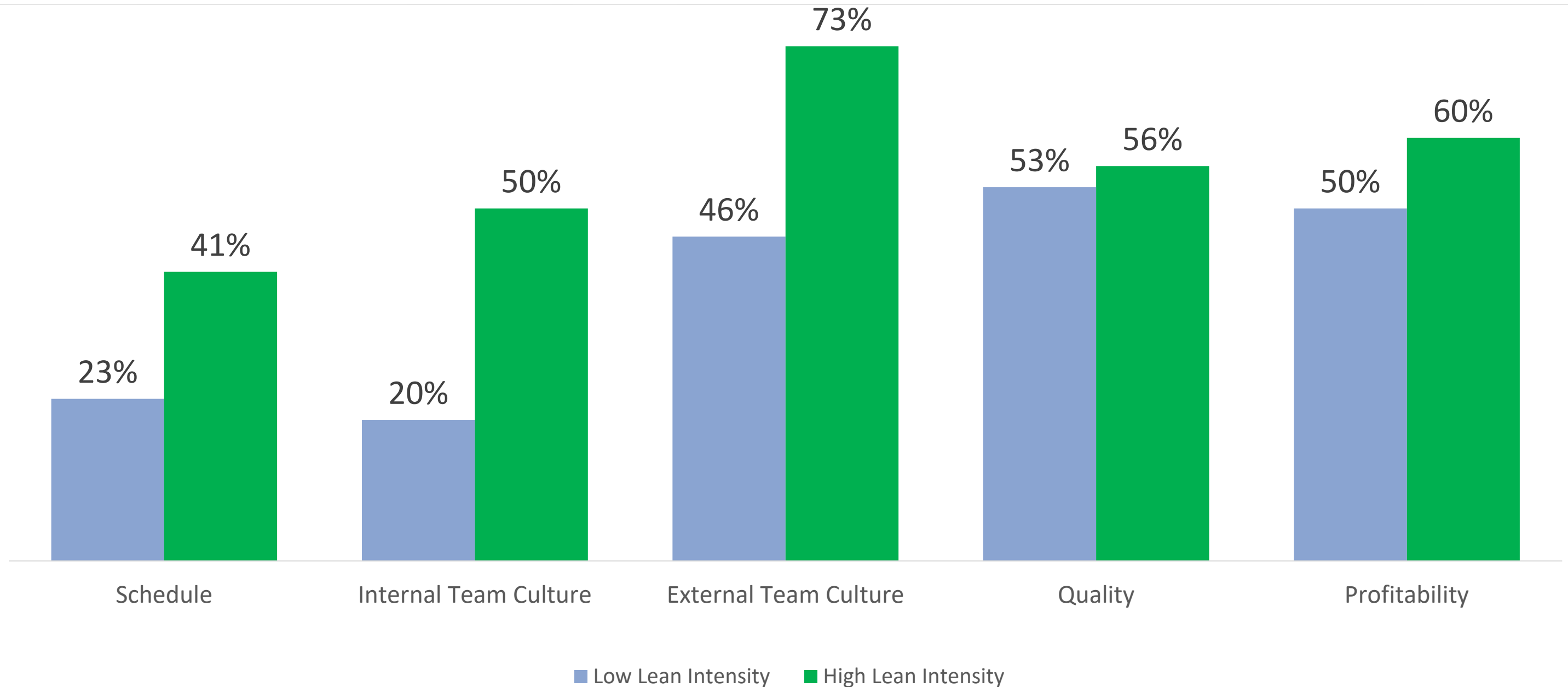


Lean Intensity

- Activities were weighted to reflect positive contribution to Lean
- Respondents were analyzed by their usage (Lean Intensity)
- Three roughly equal tiers were created (Low, Medium, High)
- Performance (cost, schedule, team chemistry, etc.) on best and typical projects was correlated to Lean Intensity
- Meaningful variances include the following...



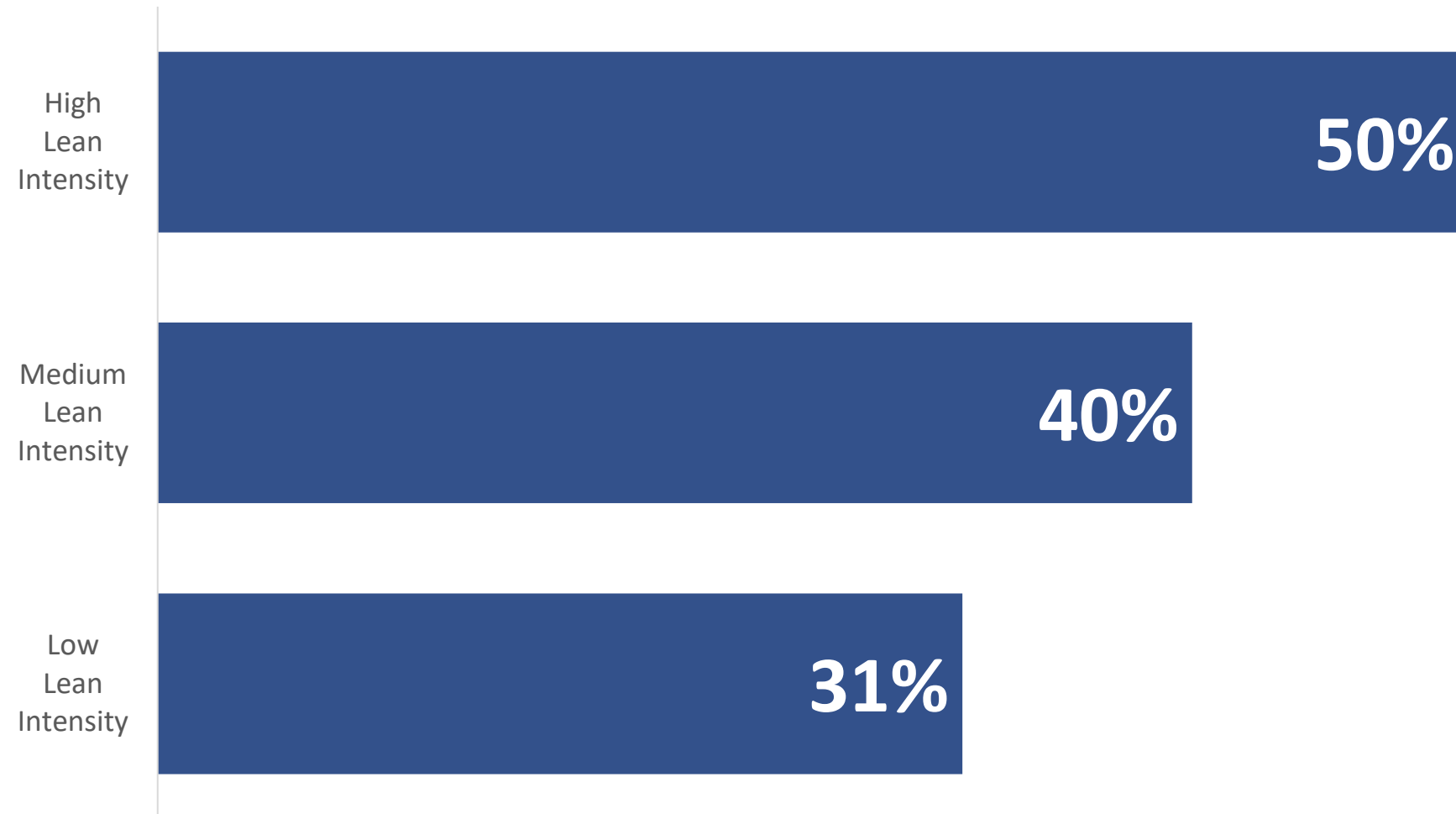
Impact of Lean Intensity on Best Project Outcomes



Lean Intensity and Performance: Safety

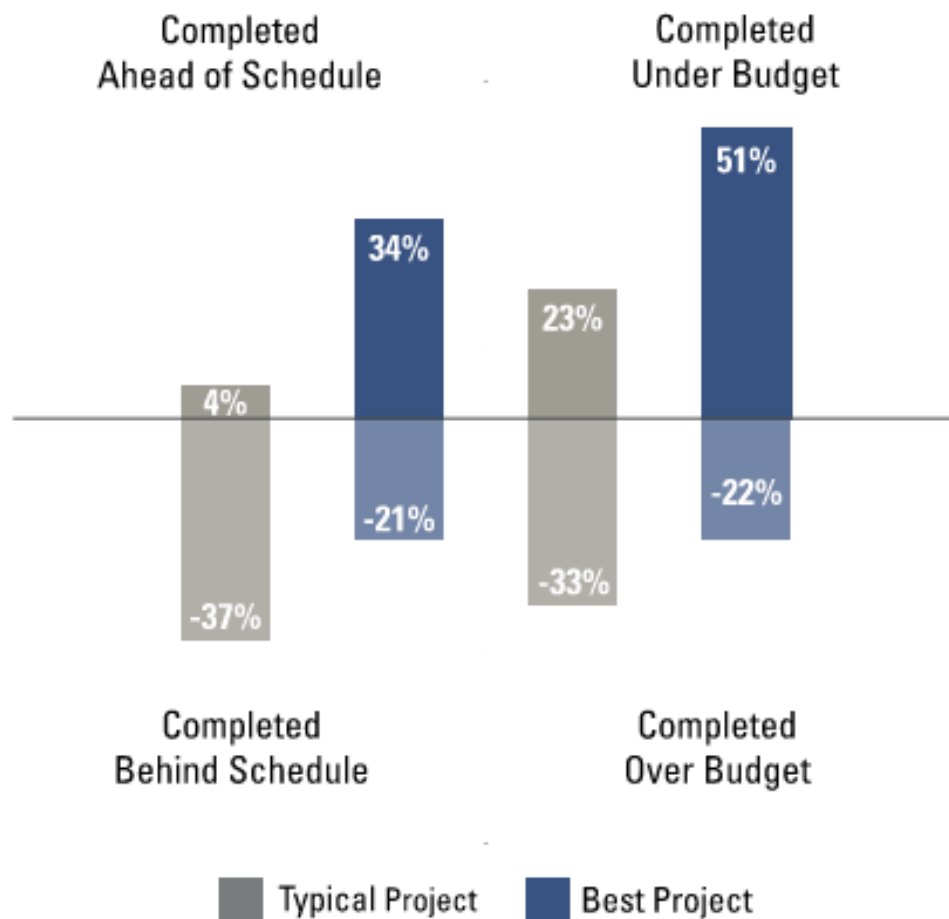
TYPICAL PROJECTS:

Fewer recordable incidents than typical; No OSHA citations; No harm to the public; Good safety culture on our team



Operational Excellence Improved by Lean (2021)

% of Projects Achieving Outcome
(Performance from initial involvement of contractor)



% of Projects Achieving Outcome



Where should you invest?

Engage workers directly in identifying and solving problems

Last Planner System – make ready planning/
constraint management

Disciplined approach to maintain orderly site (5S)

Preconstruction production planning

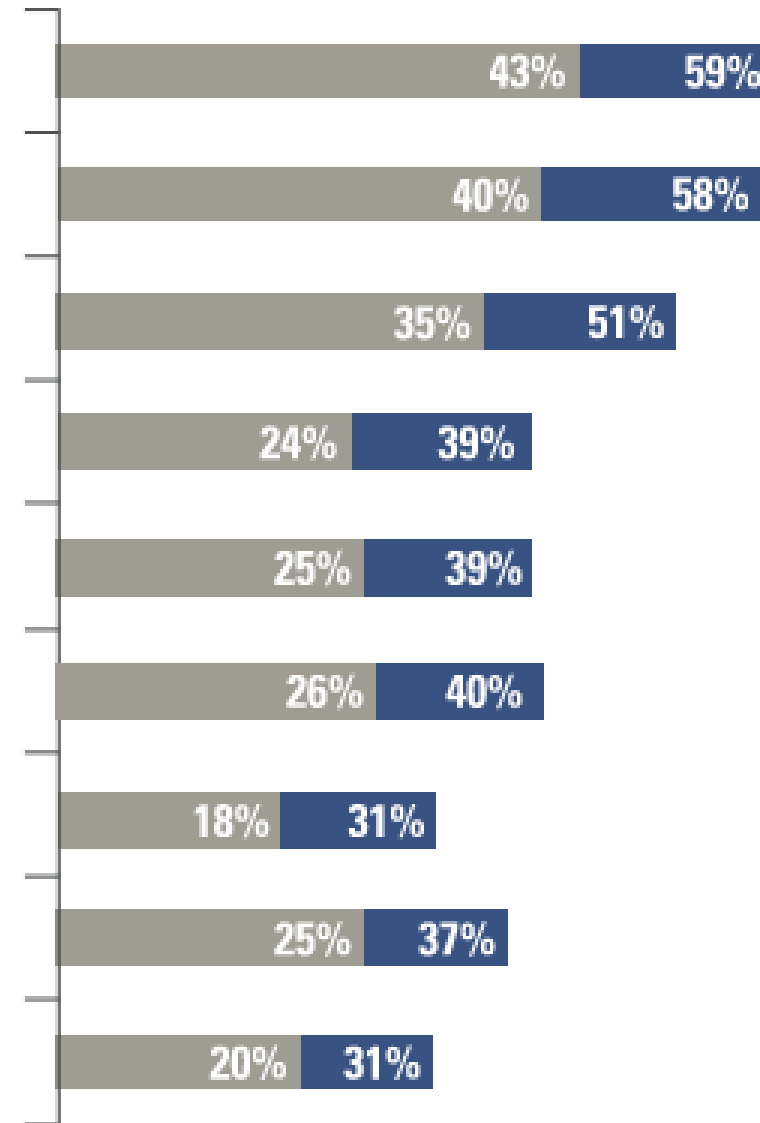
Conditions of Satisfaction

Choosing by advantages

BIM Implementation Planning

Project contingency jointly managed with customer,
opportunity for shared savings

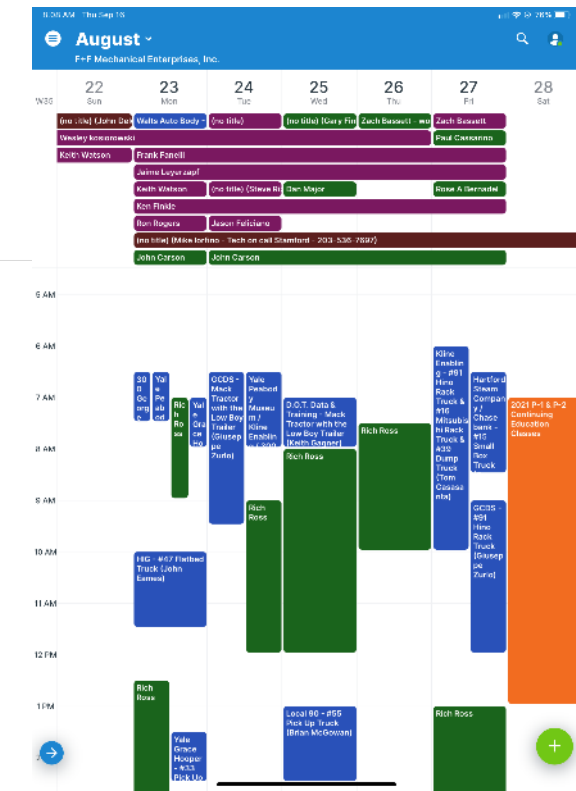
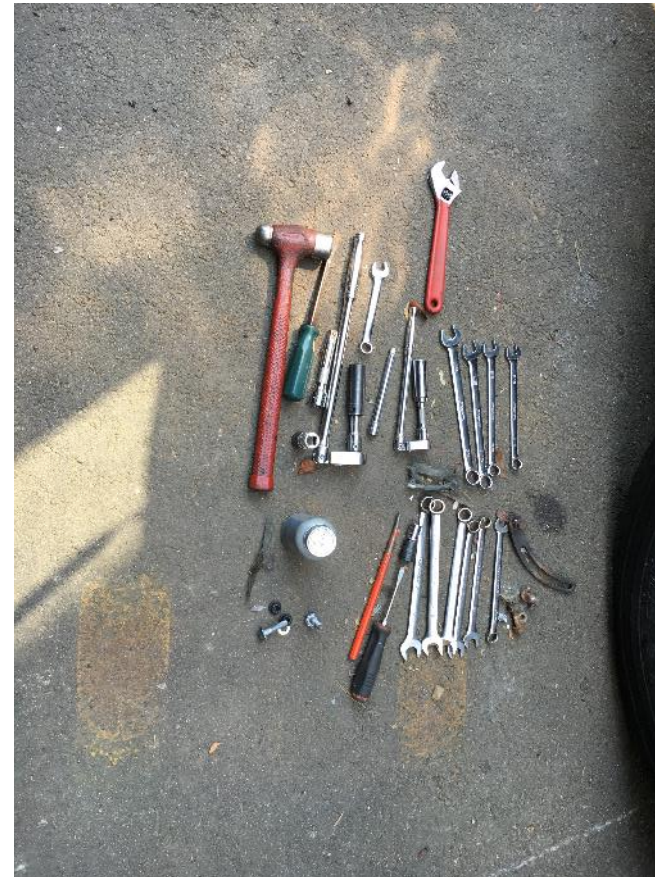
Post occupancy evaluations at regular intervals



Typical Project Best Project

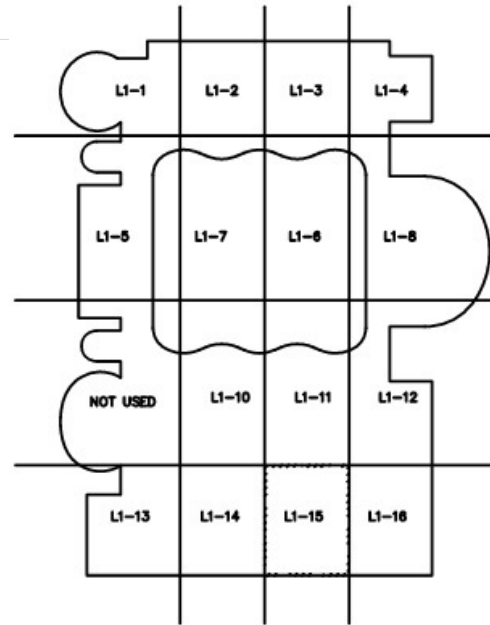
For example...

- Alignment of team goals
- Consider all options
- Keep it organized, clean and safe = productivity



A few more examples

- Keep it flowing
- Break it down
- Keep it transparent



Questions

Click Links to Navigate Resources Below



[AGC Lean Forum](#)



[LCI Homepage](#)



[Prior Research Results](#)





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In the spirit of continuous improvement, we would like to remind you to complete this session's survey! We look forward to receiving your feedback.

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Thank you for attending this presentation. Enjoy the rest of the 23rd Annual LCI Congress!