Maximizing Success in Integrated Projects

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PROJECT DELIVERY SYSTEMS:

CM AT RISK, DESIGN-BUILD,
DESIGN-BID-BUILD

1998

REVISITING
PROJECT
DELIVERY
PERFORMANCE:
1998–2018

New benchmarks for unit cost, delivery speed, cost and schedule reliability.

2018

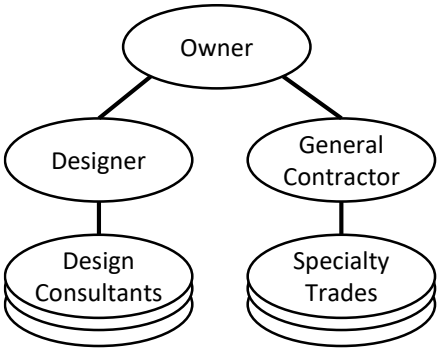
Learning Objectives

- Describe how today's project delivery systems perform with respect to cost and schedule
- Identify the variables that most influence cost and schedule performance
- Recognize the practices found on highly successful and poorly performing projects

Research Motivation

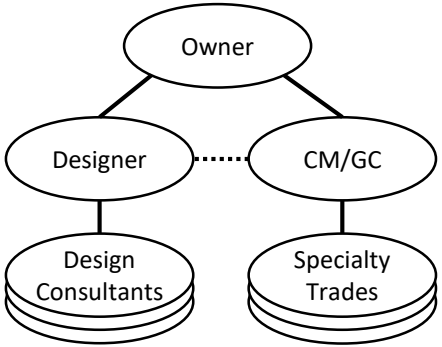
To improve owner decision-making by providing current benchmarks for ***project delivery system*** performance

Design-Bid-Build



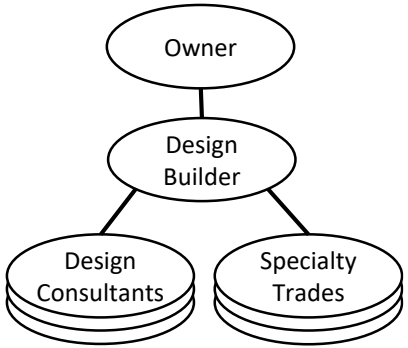
vs.

Construction Manager at Risk



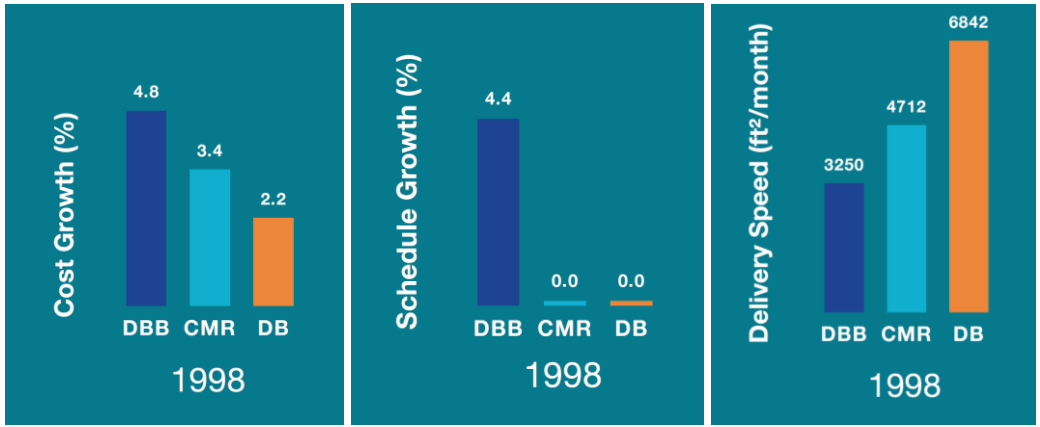
vs.

Design-Build

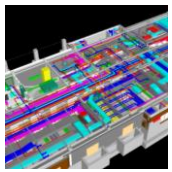


1998 CII Benchmark

In 1998, the ***CII*** released a report comparing the performance of DBB, CMR and DB project delivery systems based on data from 351 projects:



20 Years of Change


Technological change that enables more complex engineering, design and management



A focus on **sustainability** to improve building efficiency and reduce waste in the process



Organizational change that promotes collaboration across disciplines

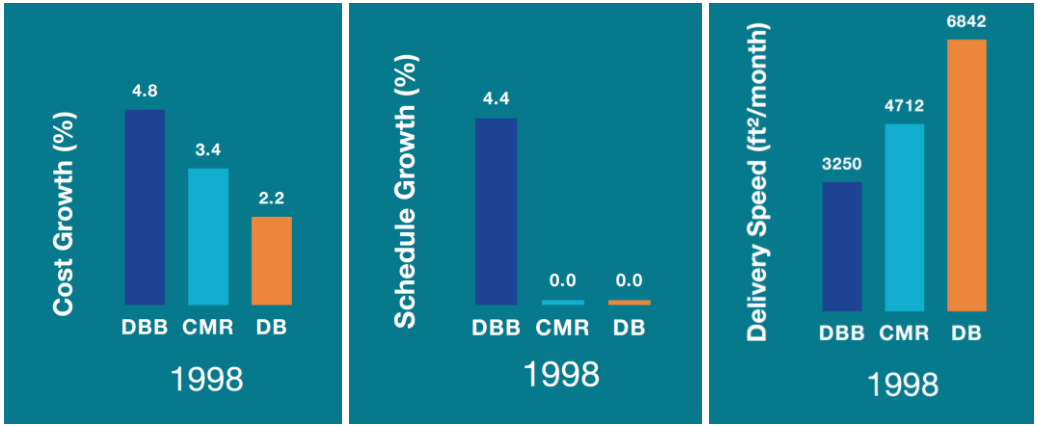
2018 CII/Pankow Benchmark

Now, the **CII** and **Charles Pankow Foundation** sponsored a study to repeat the same comparison with a set of contemporary projects and answer the question:

Does the Design-Build delivery system still outperform the alternatives?

Summary of Findings

After 20 years…



Summary of Findings

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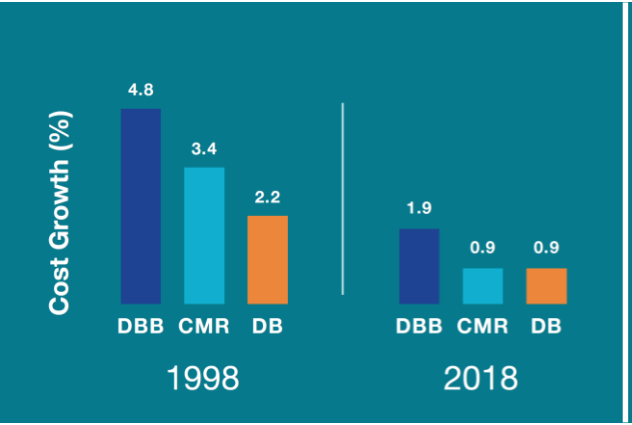
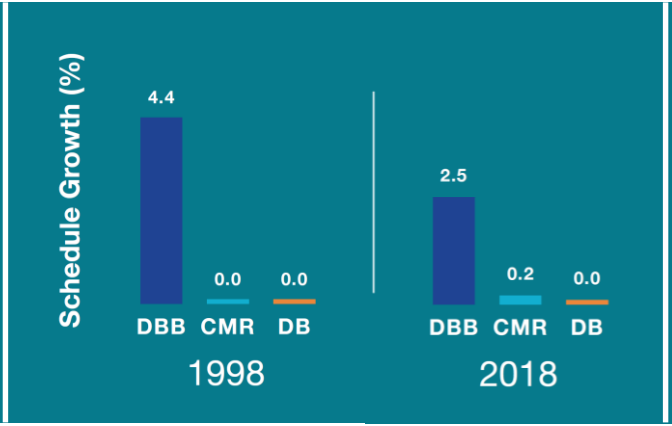
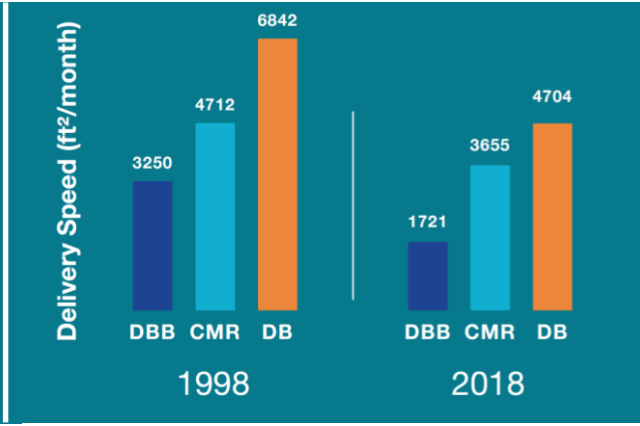




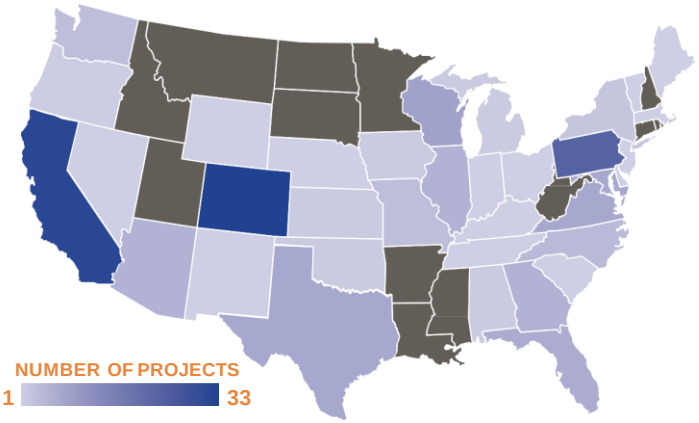


Upon Deeper Analysis

After 20 years…

- The **delivery speed** of Design-Build projects has increased, relative to DBB and CMR projects
- Design-Build projects are still more reliable than DBB and CMR projects, in terms of **cost and schedule growth**
- On a per **square-foot cost** basis, Design-Build projects are equivalent to or slightly less than DBB and CMR projects

Project Data Set



212
Projects completed
(2008 - 2013)

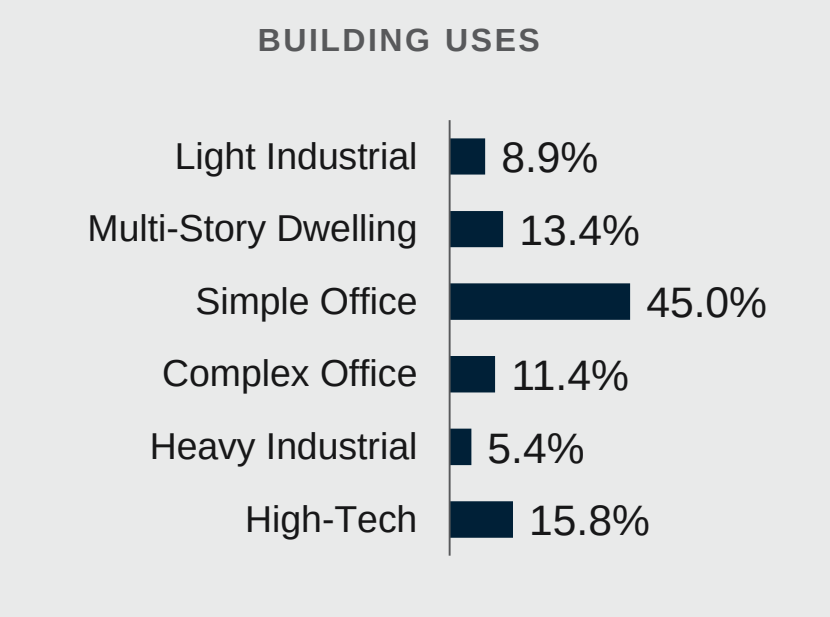
53 Design-Bid-Build

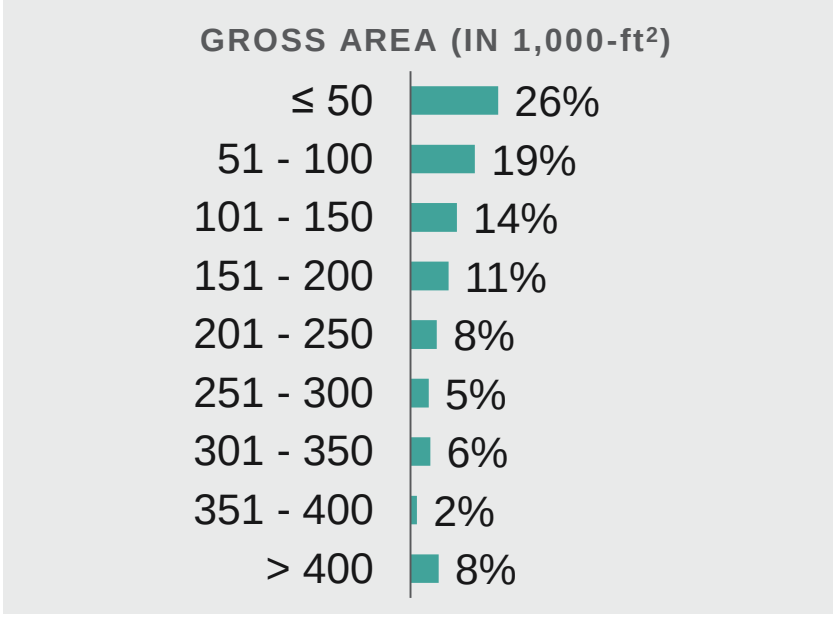
79 CM at Risk

80 Design-Build

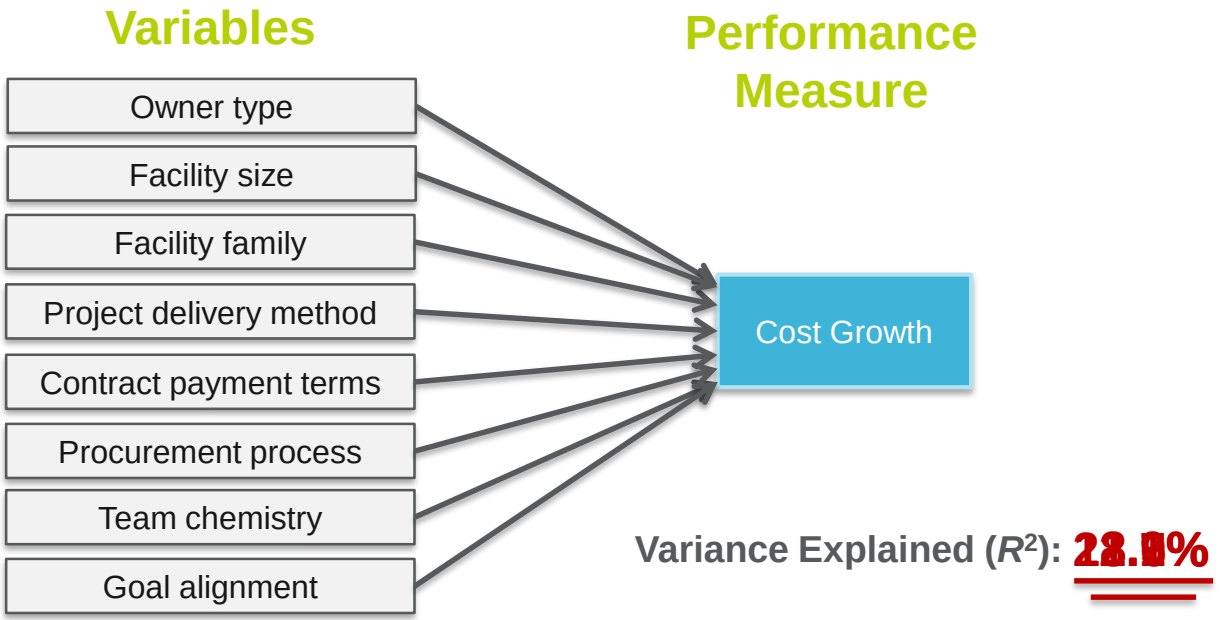
62% Publicly Funded / **38%** Privately Funded

Project Data Set





Analysis Methods



Results: Average Cost Performance

Performance Measure	DB vs. CMR	CMR vs. DBB	DB vs. DBB	R^2
Unit Cost	1.9% less	1.6% more	0.3% less	99
Cost Growth	2.4% less	1.4% less	3.8% less	22

Results: Average Cost Performance

Lower **unit costs**
were best explained by:

- Higher team chemistry among the Owner, designer and builder
- Open book contracting terms
- Lower initial contracted unit cost

Lower **cost growth**
was best explained by:

- Use of a DB delivery system
- Higher team chemistry among the Owner, designer and builder
- Smaller gross area
- Open book contracting terms
- Earlier involvement of the builder

Results: Average Schedule Performance

Performance Measure	DB vs. CMR	CMR vs. DBB	DB vs. DBB	R^2
Schedule Growth	3.9% less	2.2% more	1.7% less	21
Construction Speed	13% faster	20% faster	36% faster	88
Delivery Speed	61% faster	25% faster	102% faster	89

Results: Average Schedule Performance

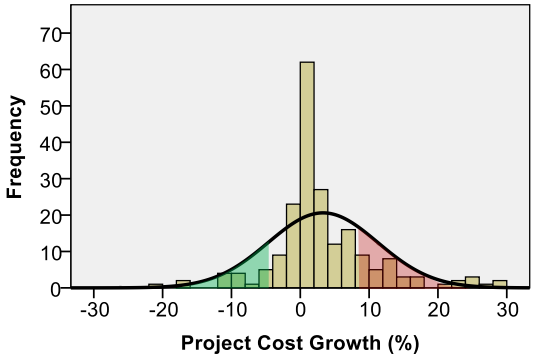
Lower **schedule growth** was best explained by:

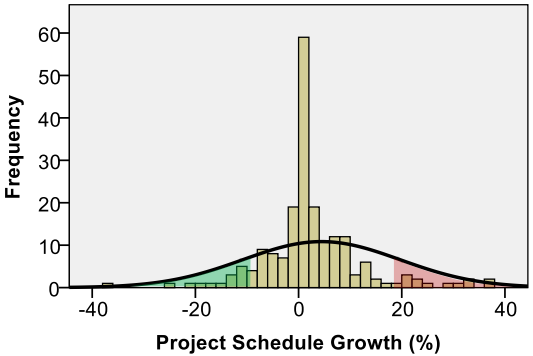
- Participation of the designer and builder in project goal-setting
- Early involvement of the builder
- Lower project complexity
- Private funding source
- Simpler foundation systems

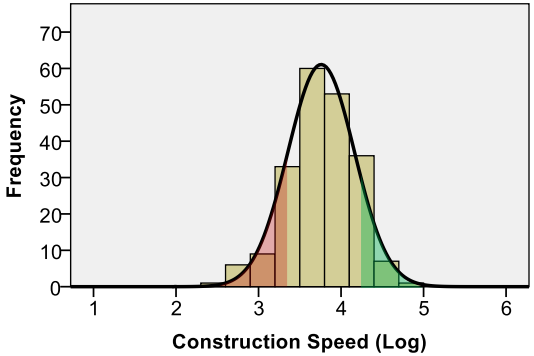
Faster **construction speed** and **delivery speed** were best explained by:

- Use of a DB or CMR delivery system
- Larger gross area
- Higher initial contracted unit cost

Validation: Best and Worst Performers







24 Projects appeared in at least three of the best performing quartiles (***green*** shaded areas)

38% agreed to a follow-on interview

16 Projects appeared in at least three of the worst performing quartiles (***red*** shaded areas)

44% agreed to a follow-on interview

Results: Lessons Learned

The **best performing** projects differentiated themselves by:

Emphasizing a relational project culture: Owners issued early expectations to the team to not tolerate arguments, unprofessionalism or unfairness

Repeated relationships: Designer and/or builder often worked with the Owner on prior projects

Results: Lessons Learned

The **worst performing** projects were characterized by:

Lack of experience: First-time project managers or the Owner's first time working with the project delivery method

Poor communication: Breakdowns in communication leading to unrealistic expectations and delayed decision-making

Turnover in the team: Understaffing creating high work loads, stress and errors

Bringing Everything Together

After 20 years, DB projects are still **delivered faster and with greater reliability in cost and schedule performance**

In addition, the likelihood of project delivery success can be improved through:

1. Assembling the project team early
2. Developing a relational project culture
3. Communicating expectations
4. Engaging in succession planning

Where is Project Delivery Headed?

CURRENT

Challenge
The lines between project delivery methods are ***continuing to blur***

NEAR TERM

Transition
Owners need to consider ***more than the project delivery method*** itself

Qualification-based selection

+

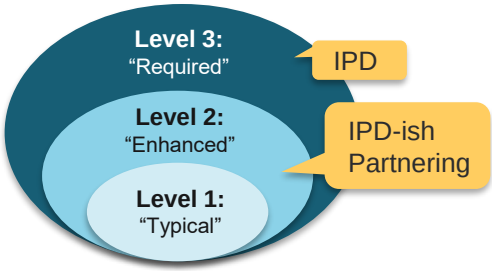
Earlier involvement of participants

+

Cost transparency during execution

FUTURE

Response
The focus will be on developing project ***teams*** and ensuring their ***integration***



Levels of Collaboration

Learning Objectives

- ✓ Describe how today's project delivery systems perform with respect to cost and schedule
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THANKS!

CHARLES PANKOW FOUNDATION

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