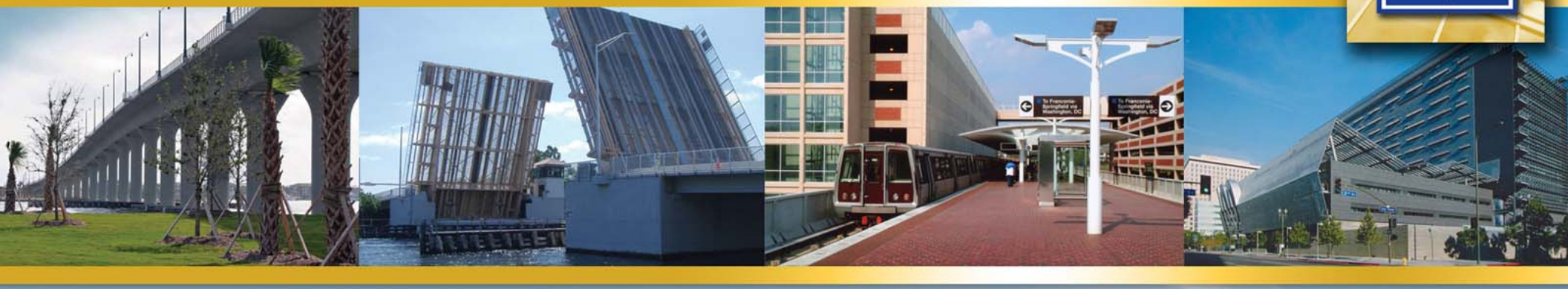
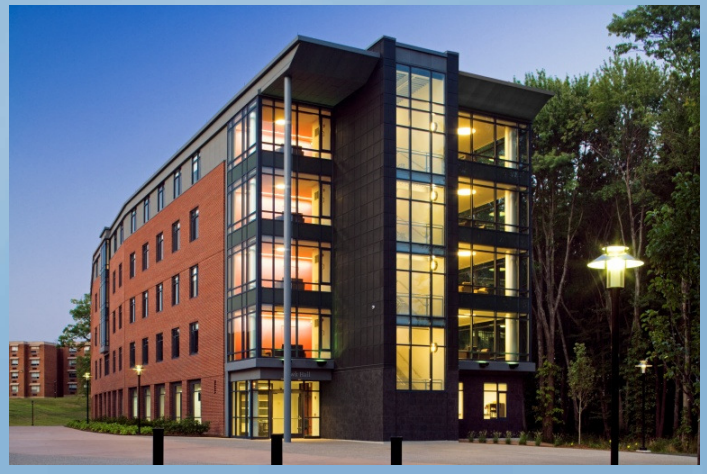


Design-Build Project Spotlight



University of Hartford
Hartford, CT

Industry Research

Delivery System Study
Construction Industry Institute (CII)/Penn State 1999

- Examined influence of 19 factors on:
  - Several types of delivery systems
  - Cost control
  - Schedule control
  - Construction speed
  - Delivery speed

Comparison of Project Delivery Methods (CII/Penn State Study)

Metric	DB vs. DBB	CM@R vs. DBB	DB vs. CM@R
Unit Cost	6.1% lower	1.6% lower	4.5% lower
Construction Speed	12% faster	5.8% faster	7% faster
Delivery Speed	33.5% faster	13.3% faster	23.5% faster
Cost Growth	5.2% less	7.8% more	12.6% less
Schedule Growth	11.4% less	9.2% less	2.2% less

Re: "Comparison of U.S. Project Delivery Systems," Mark Konchar & Victor Sanvido, *Journal of Construction Engineering and Management, Vol. 124, No. 6 (1998), pp. 435-444.*

Comparison (continued)

Research Study / Parameter	CII Penn State (US) DB vs. DBB	Reading DB Forum (UK) DB vs. DBB
Unit Cost	6% Less	13% Less
Construction Speed	12% Faster	12% Faster
Delivery Speed	33% Faster	30% Faster

Comparison for Quality

- D-B delivers **equal or higher quality**

- D-B out performed traditional D-B-B in every category on a 10 point scale
  - Startup
  - Call Backs
  - O&M
  - Exterior & Structure
  - Interior
  - Environmental
  - Equipment

Contributing Factors for Success

- Contractor's & specialty contractor's experience with project delivery system & facility type
- Excellent team communication
- Early engagement of construction team
- Ability to restrain/pre-qualify the Contractor pool

Contributing Factors for Success (continued)

- Prior experience of team as a unit
- Owner's ability to make prompt decisions
- Use of negotiated contract format
- No onerous contract clauses

Success Factors for D-B Delivery System

- Engaging construction team before more than 20% of design work done (by Owner)
- Experience of subs with facility type
- Experience of subs with D-B delivery system
- Contractor experience with facility type
- Excellent project team communication

CII Study Summary

- Best performing projects:
  - Excellent Owner decision making
  - Excellent scope definition
  - Excellent team communication
  - Qualified contractor pool
  - High ability to restrain Contractor pool

CII Study Summary (continued)

- Worst performing projects:
  - Engaged Contractor late in design
  - Limited or no prior team experience
  - Several onerous contract clauses
  - Poor ability to make decisions
  - Unable to pre-qualify Contractor pool