

OWNERS' GUIDE TO ALTERNATE PROJECT DELIVERY SYSTEMS

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by

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Why Consider Alternate Project Delivery Systems?

- Potential schedule reduction
- Potential cost reduction
- Potential risk reduction
- Potential claims reduction

Owners' Guide to Alternate Project Delivery Systems

- A comparative overview of APDS
- Selecting the most appropriate system
- Risk Tradeoffs
- Lessons Learned

Owners' Guide to Alternate Project Delivery Systems

- APDS is no panacea
- No single solution
- No one size fits all
- All APDS can be successful

Mixed Terminology for APDS

- “Traditional” Design-bid-build (DBB)
- Single prime (SP)
- Multiple prime (MP)
- Construction Manager (CM)
- Construction Manager at Risk (CM@R)
- Engineer-procure-construct (EPC)
- Turnkey (TK)
- Design-build (DB)

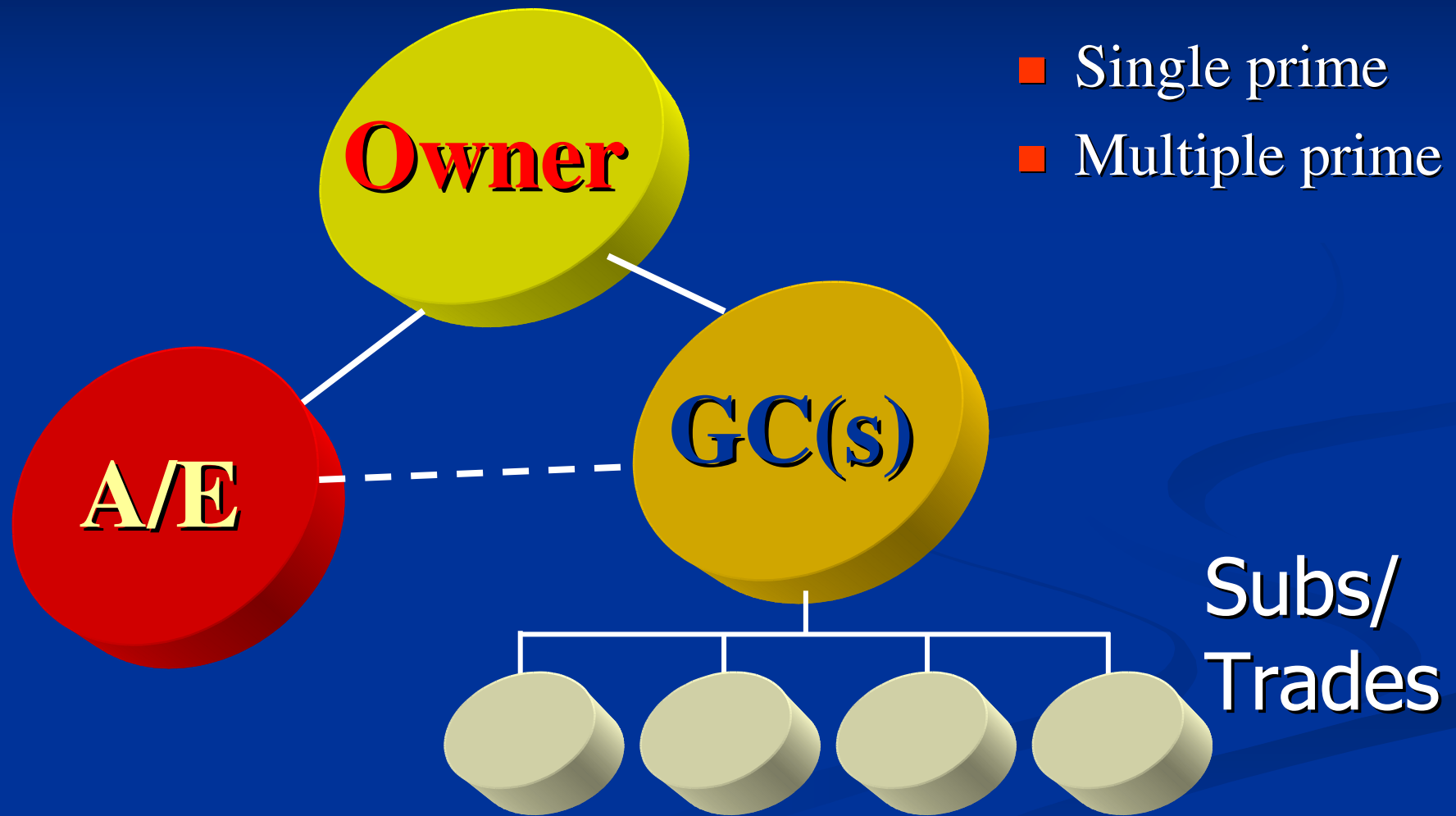
Other Terms and Approaches

- DBOM/T - operability and maintainability issues, lifecycle costs and alternatives for funding
- Warranty contracting - includes an extended warranty for product performance
- Bridging - conceptual designer engaged before the DB entity
- Novation - conceptual designer assigned to the DB entity

3 Project Delivery Methods

- Design, Bid, Build (with General Contractor or Multiple Primes)
- CM@Risk
- Design/Build

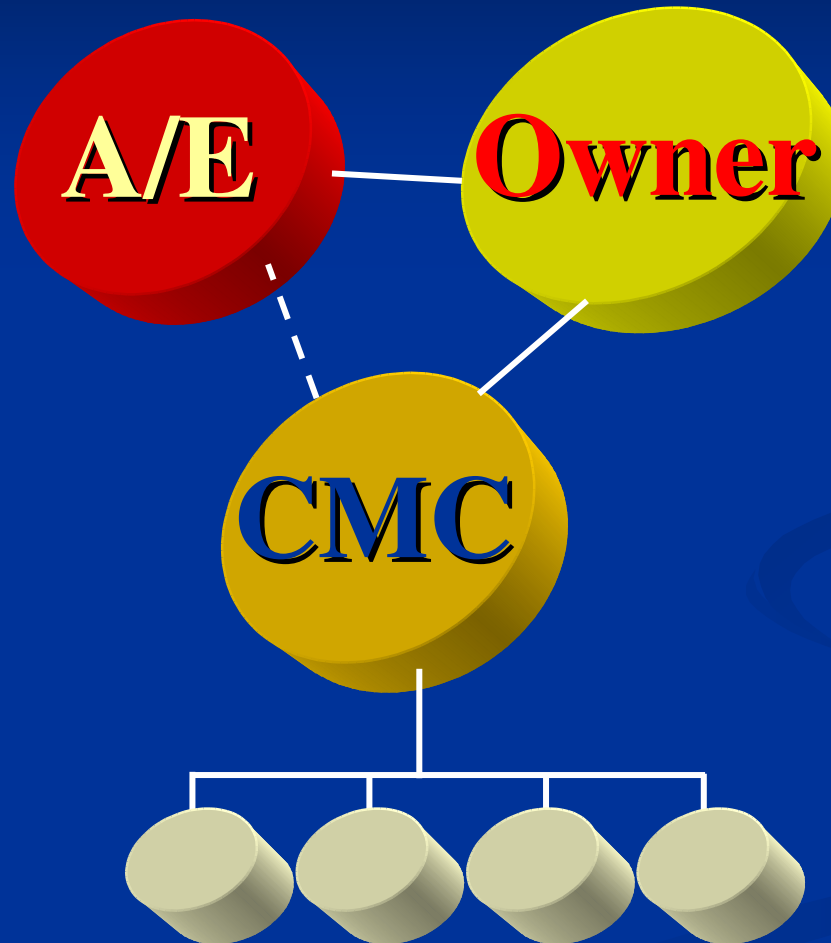
Design – Bid - Build



Design-Bid-Build (DBB)

- Separate contracts with a designer and a contractor.
- Typically selected only on cost, i.e. low bid
- The design and construction are sequential
- Responsibility for project delivery is shared between the designer and the contractor.
- Owner can control quality.
- Owner is responsible to the contractor for design errors.

Construction Manager @ Risk



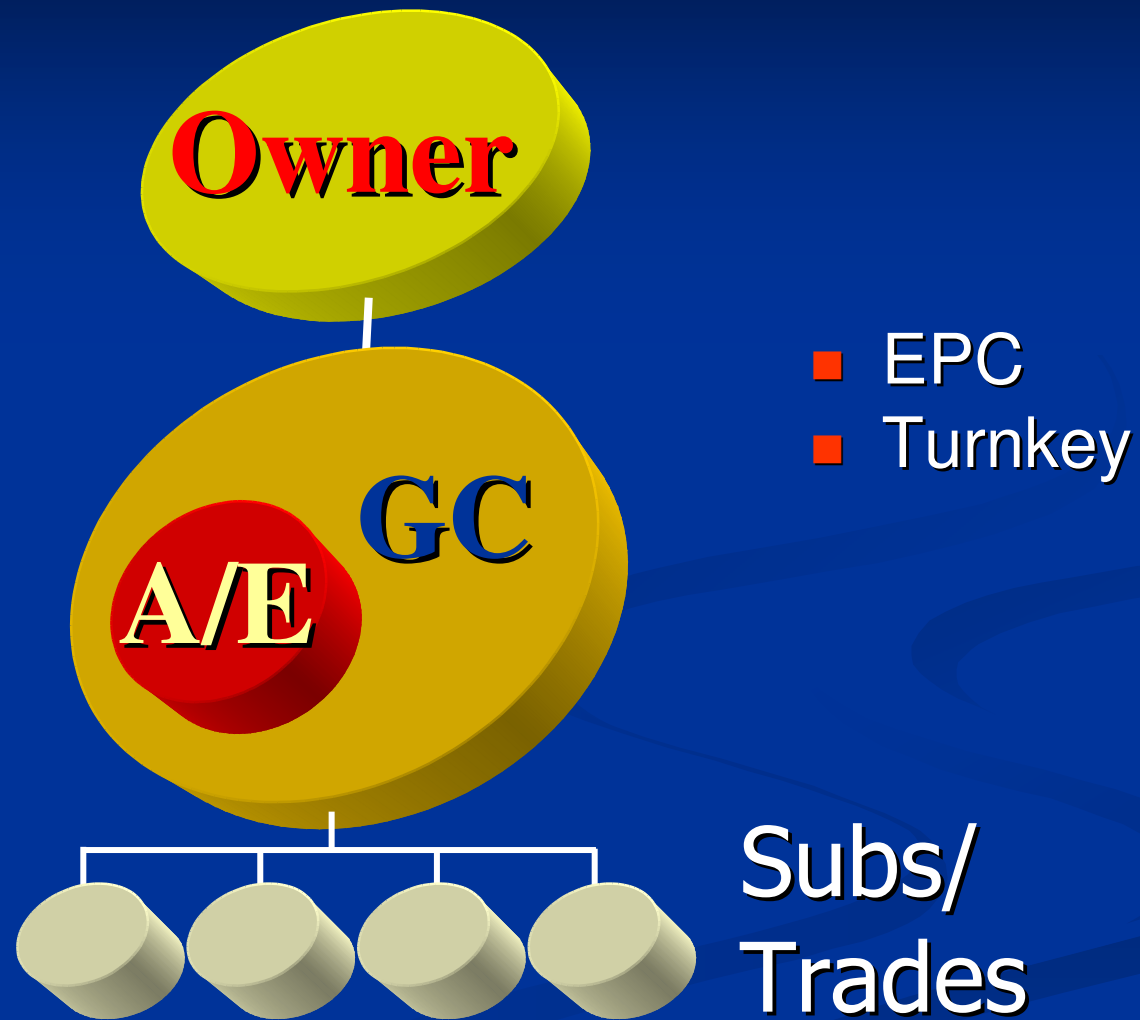
- Not an Agent Construction Manager

Subs/
Trades

Construction Manager at Risk (CM@R)

- Separate contracts with a designer and a contractor.
- Typically not selected only on cost
- Design and construction often overlap
- Engaged during design phase
- Transfer of responsibility/risk from the owner to CM@R
- Owner control over quality is somewhat less.

Design/Build



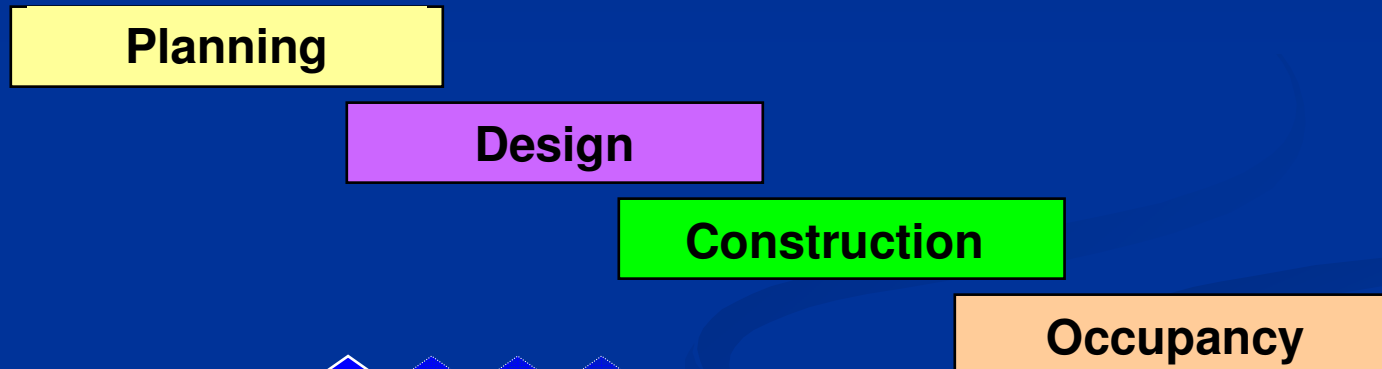
Design-Build (DB)

- The owner holds a single contract with the DB.
- Typically not selected only on cost.
- Design and construction often overlap.
- Design and construction quality are primarily controlled by the DB entity.
- Transfer of responsibility/risk from the owner for both design and construction to the DB.
- Minimal owner control of quality.

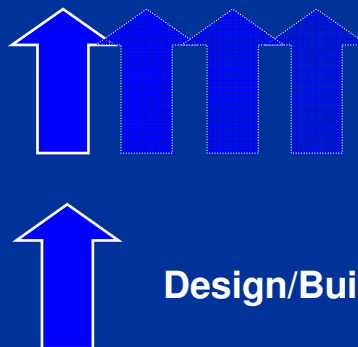
APDS Project Timelines



Overlapping Process



APDS brings construction expertise into the design phase



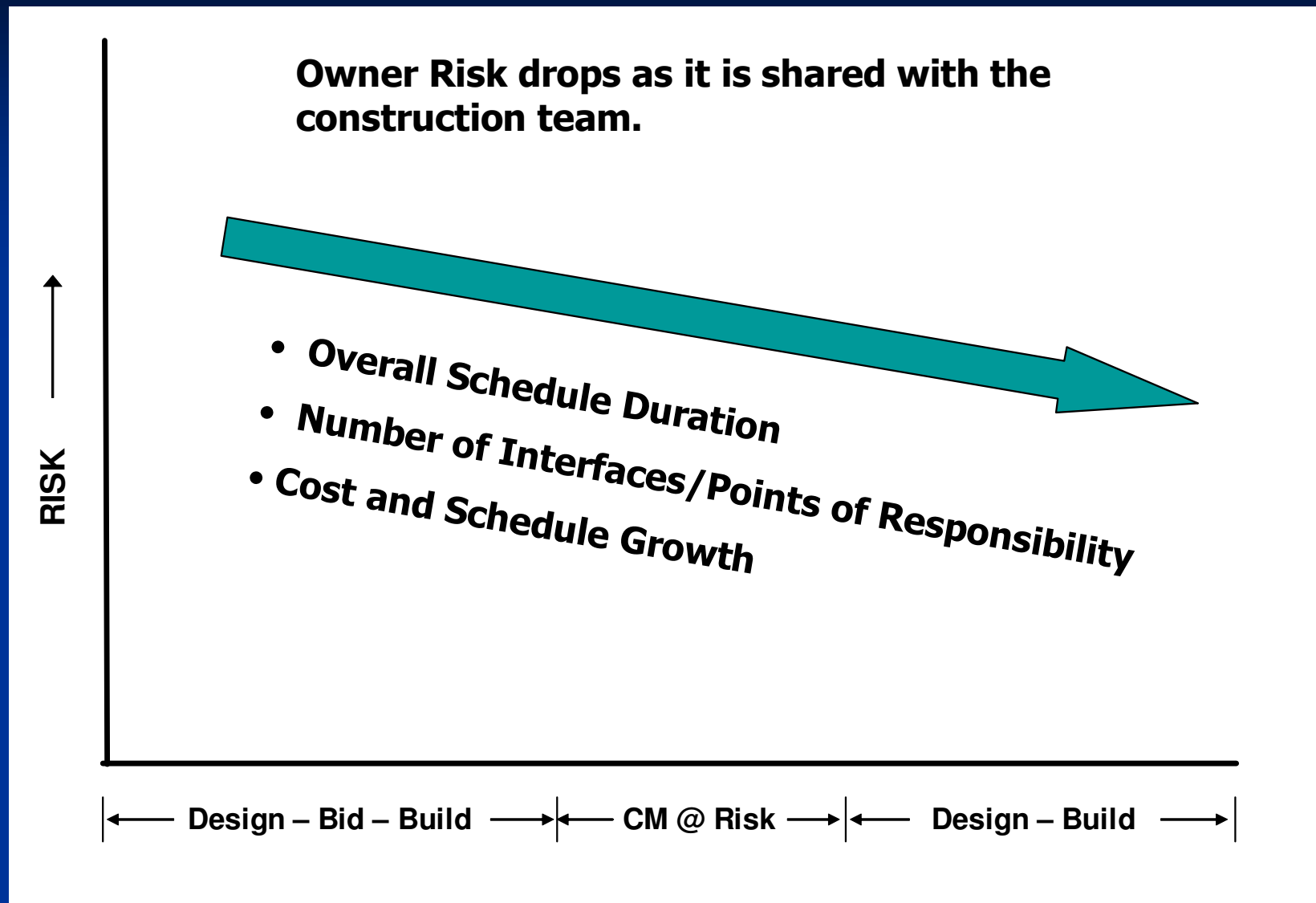
CM At-Risk

Design/Build Team

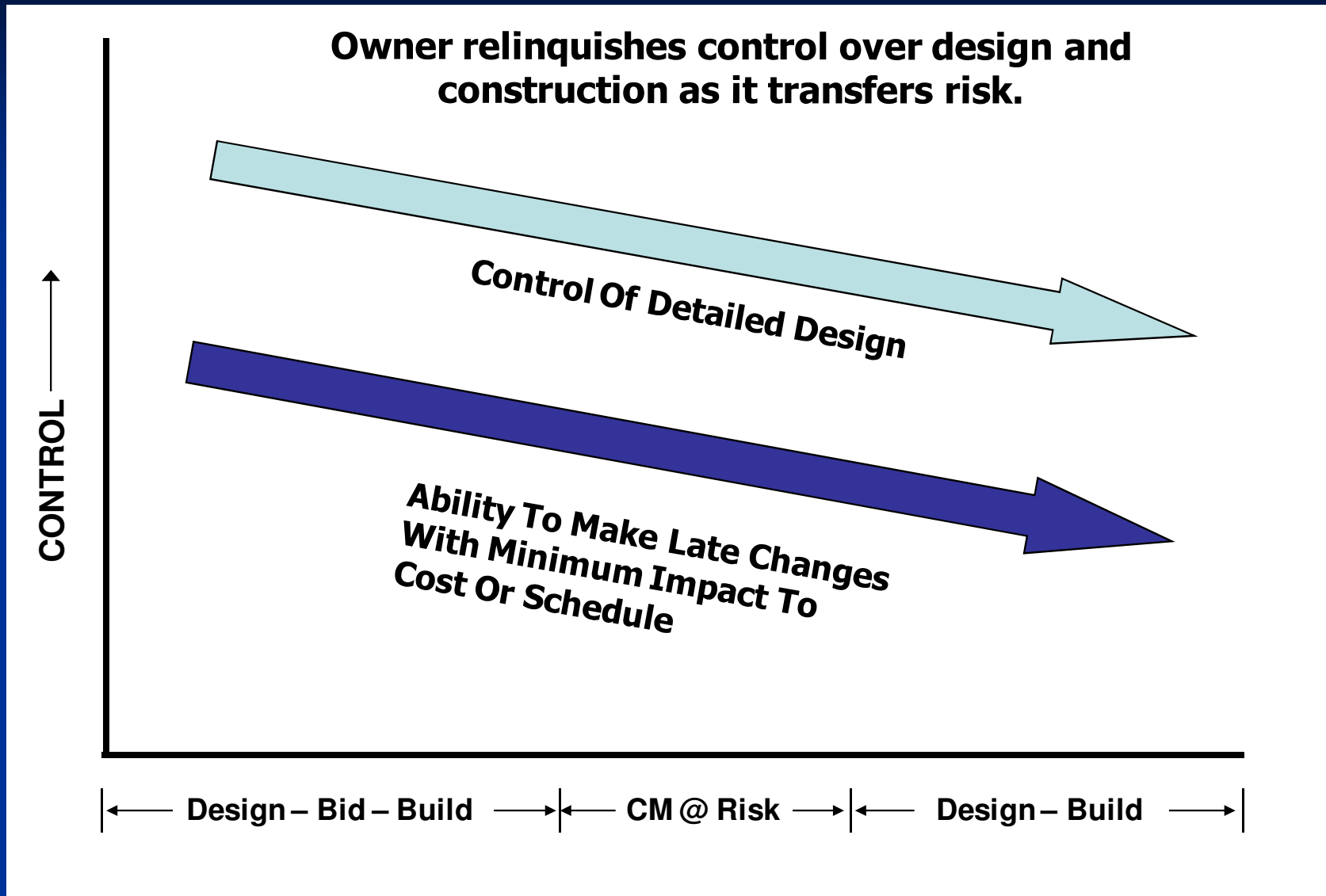
General Summary of Distinctions

	D-B-B	CM@R	DB
Design & Construction Contract	Separate	Separate	Combined into one
Contractor Selection Basis	Cost	Quals & Cost	Quals & Cost
% Design at Bid Pricing	100%	< 100%	<< 100%
Design Construct Sequence	Sequential	Overlapped	Overlapped
Coord Risk to Owner	Highest	Lower	Lowest

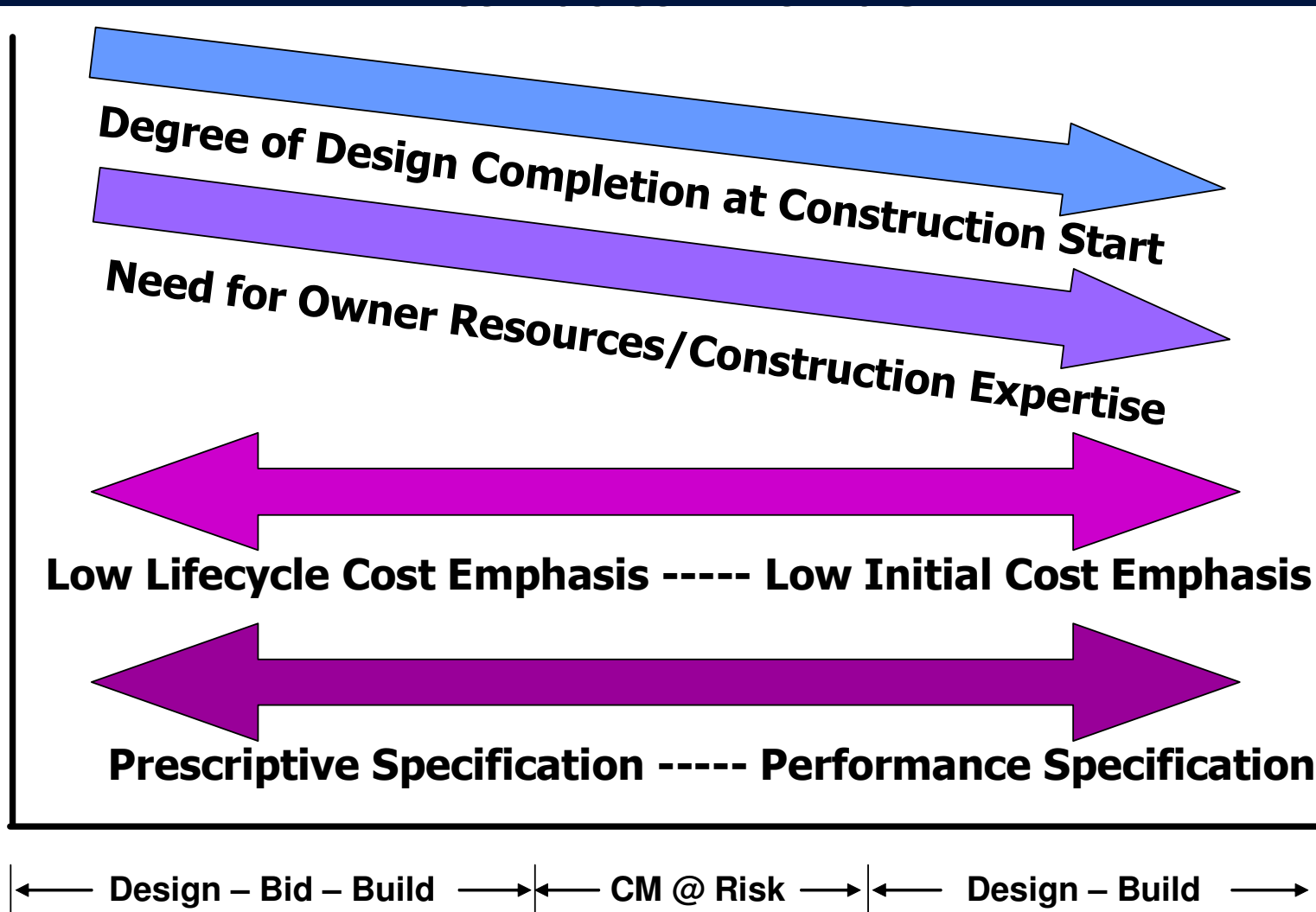
“General” APDS Risk Trends



“General” APDS Risk Trends



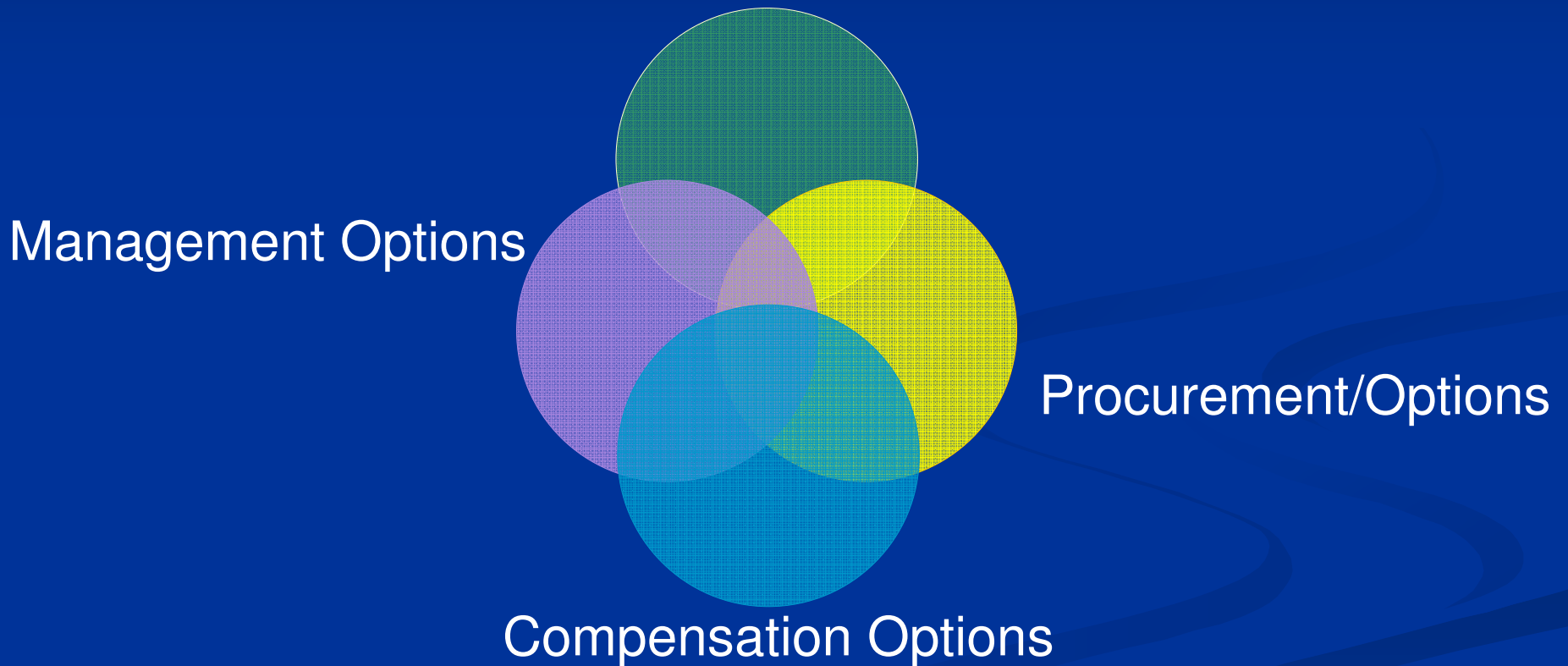
“General” APDS Attribute Trends



Defining Terms

Defining Terms

Project Delivery Systems

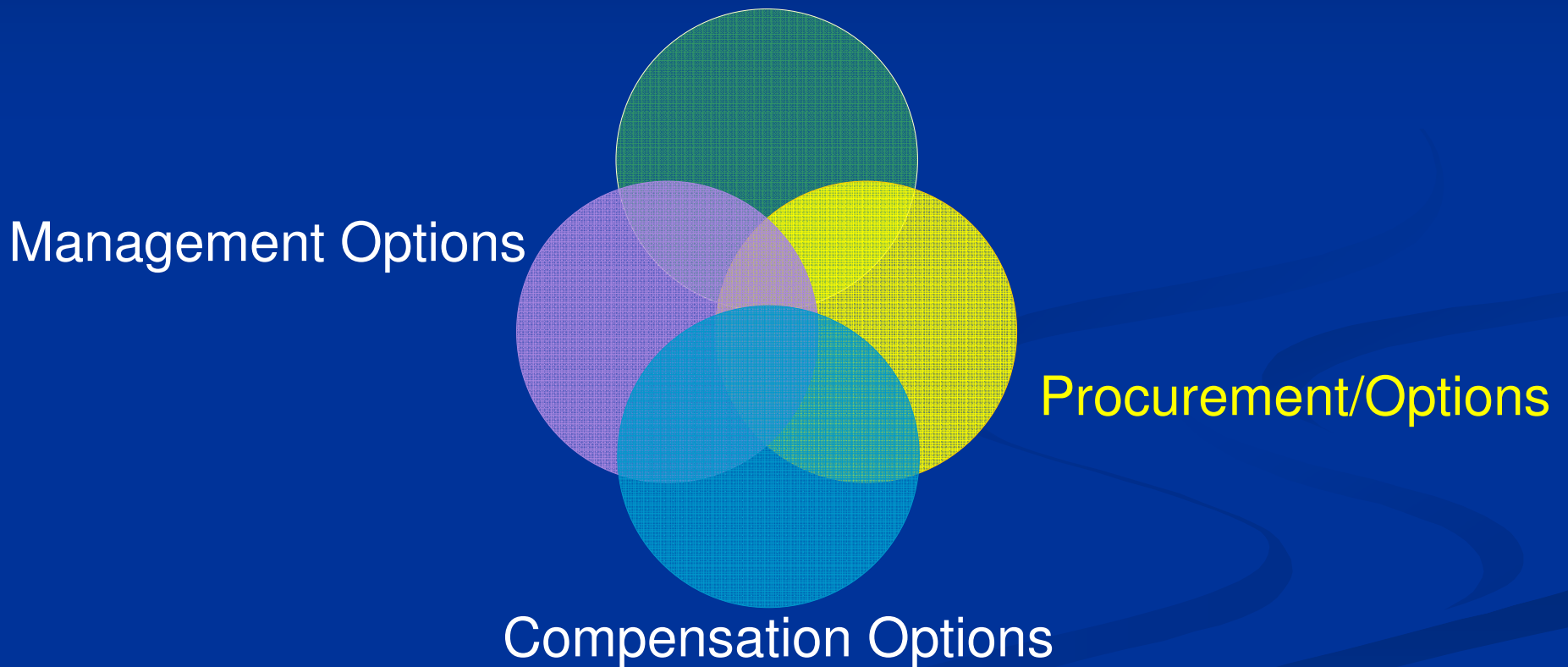


Project Delivery Methods

- Design, Bid, Build (with General Contractor or Multiple Primes)
- CM@Risk
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Defining Terms

Project Delivery Systems

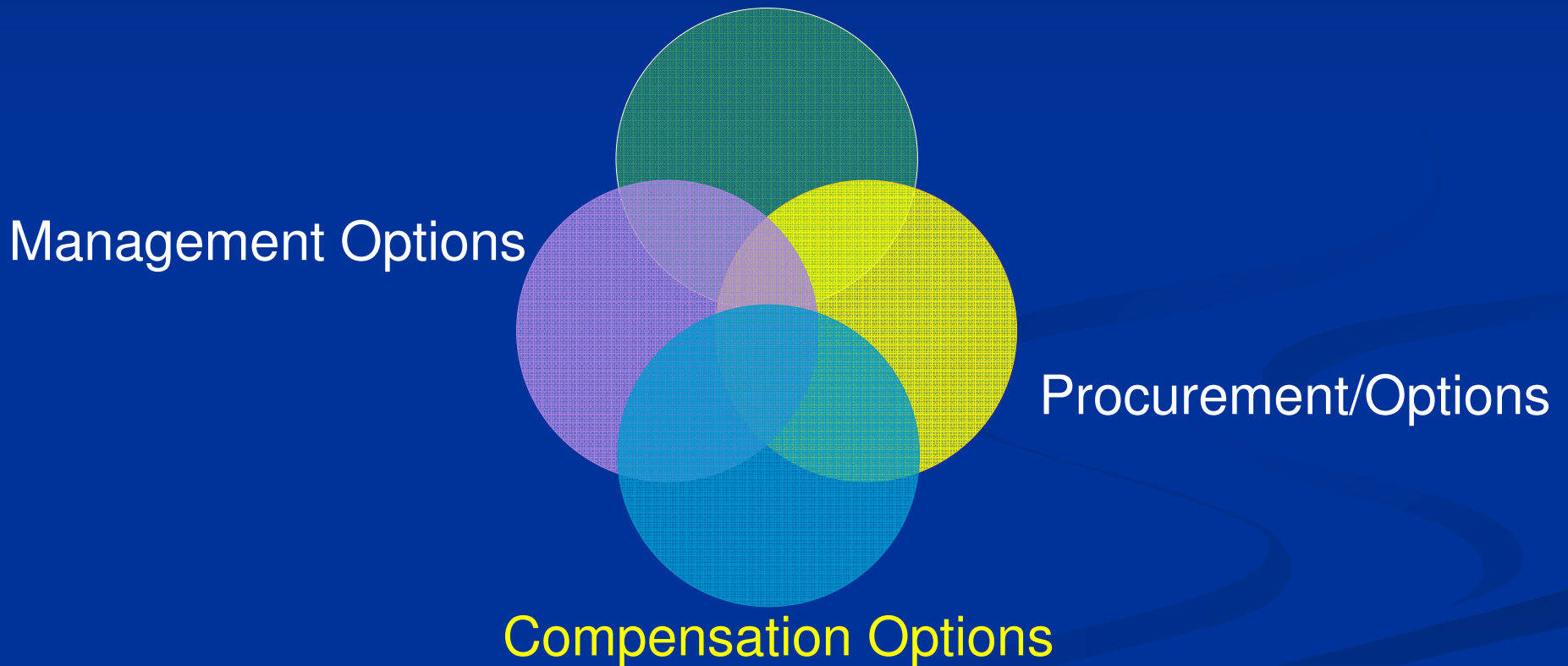


Procurement Methods

- Low bid – cost only
- Qualification based selection (QBS) – no cost
- Best value - cost included
- 2-Step processes – cost included
 - Competitive proposal selection (CPS)
 - Prequalification followed by low bid
- Other hybrids
- What about subcontractor selection?

Defining Terms

Project Delivery Systems

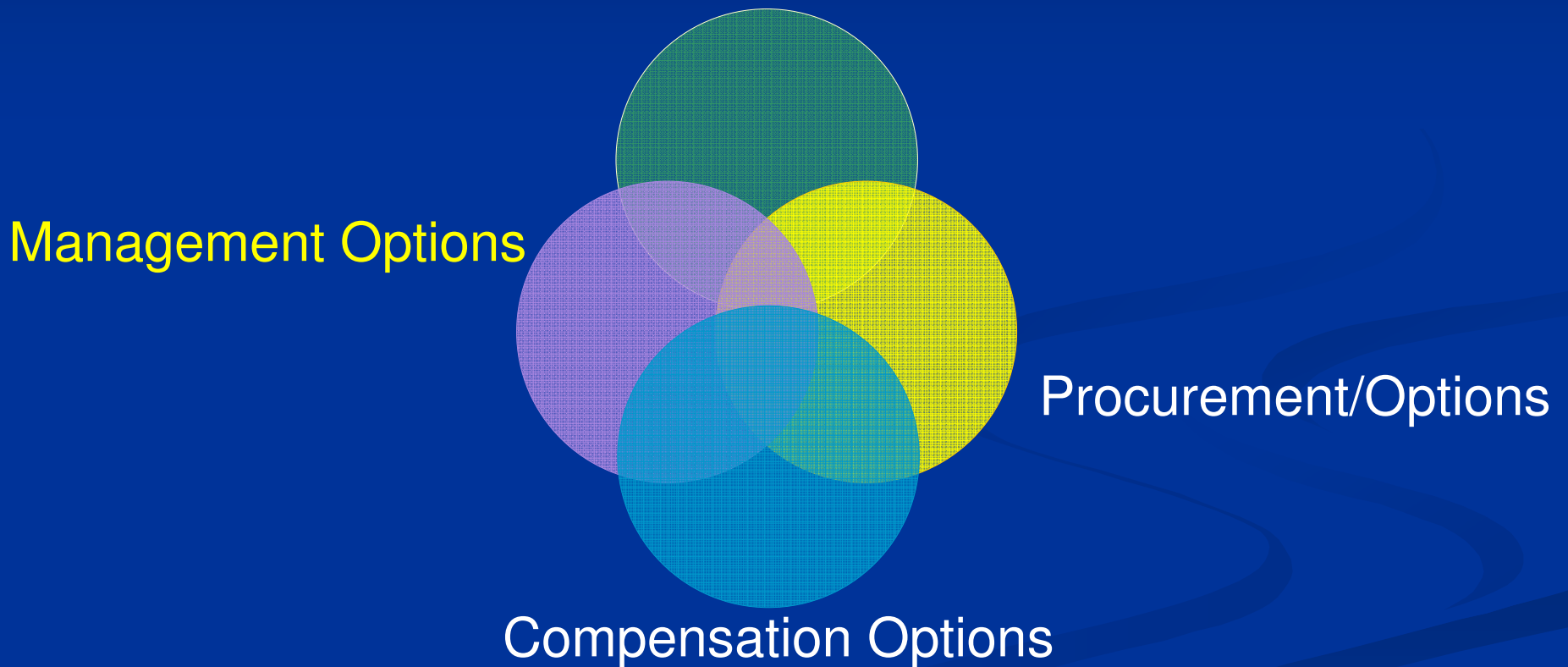


Compensation Methods

- Design and Preconstruction services
 - Reimbursable hourly rates
 - Lump sum
- Construction services
 - T&M
 - Cost plus fixed fee, percentage fee, incentive fee
 - Lump Sum
 - GMP
 - Other

Defining Terms

Project Delivery Systems



Typical Management Types

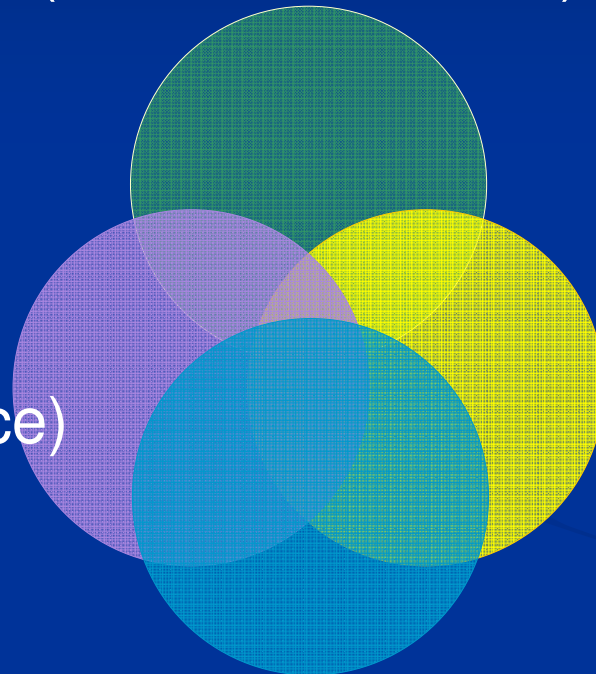
- **In-House Resources**
 - **Owner's Staff**

- **Supplement Resources/Out-Source**
 - **Staff Augmentation (Program Managers, Construction Managers, etc.)**
 - **CM Agency**
 - **Program Management**

Defining Terms

Project Delivery Systems
(DBB, CM@R, DB)

Management Options
(in-house or out-source)



Procurement Options
(cost and/or qualas)

Compensation Options
(cost plus, lump sum, GMP, etc)

APDS Misconceptions

- CM@R does not mean GPM
- DB does not mean GPM
- GMP does not mean the cost is capped
- Statutory requirement for low bid does not preclude APDS

APDS Selection Steps

- There is no perfect project delivery system.
- Prioritize project goals and objectives.
- Match trends and attributes of each APDS to project goals and objectives.
- Balance advantages and weaknesses.
- Create hybrids to select best from each.
- Risks & Tradeoffs –to gain advantage must give up something or pay a price

What Risks can we Transfer?

- Design E&O risk – Yes with DB
- Schedule risk – Somewhat with CM@R
 - More so with DB
- Cost risk – Yes for LS on DBB
 - Somewhat for LS pricing on CM@R and DB
 - Even less so for GMP pricing
(both depend on timing of pricing)

Risk Transfer is Not Free

Risk = \$\$

(based on uncertainty and ability to control)

Risk transfer to contractor



Increased price to owner

Summary Comments

- APDS is not a panacea
- Communicate goals and issues to your various team members
- Assess potential risks and understand tradeoffs
- Pursue hybrids to combine best features and maximize benefits

APDS Selection Tools

- Construction Industry Institute's (CII) Research Summary 165-1, Owners Tool for Project Delivery and Contract Strategy Selection dated June 2001
- CII Implementation Resource 165-2, Users Guide dated September 2001.
- Design/Build Selector Tool found at the University of Colorado civil engineering web site.
- Associated General Contractor's books
- DBIA

Owner Survey Responses and Lessons Learned

Owner Survey Responses

APDS Benefits

- Contractor input to design, estimating and scheduling
- Fewer changes, cost overruns and delays
- Promotes cooperative relationships
- Fast track design and construction
- No design E&O issues in DB

Owner Survey Responses CM@Risk & DB - Challenges

- Harder to segregate soft from hard costs.
- Design team blames contractor input for problems.
- Difficult to set scope and expectations for design phase contractor input
- Hard to understand/manage GMP, LS fees

Owner Survey Responses

CM@Risk & DB - Lessons Learned

- Strengthen cooperation between contractor and design team.
- Wanted a Guaranteed Maximum Price but contractor said “that’s not in our cost”
- Contractors better at manipulating CM@R & DB to their advantage w/o sharing benefits.
- Everything is still a change per the contractor.

Owner Survey Responses Comments on APDS

- Many Owners use all methods
- CM@R & DB equated with GMP
- Many expect GMP to reduce cost risk and return cost underruns to owner
- Still get changes, cost and schedule growth

Verdict on APDS

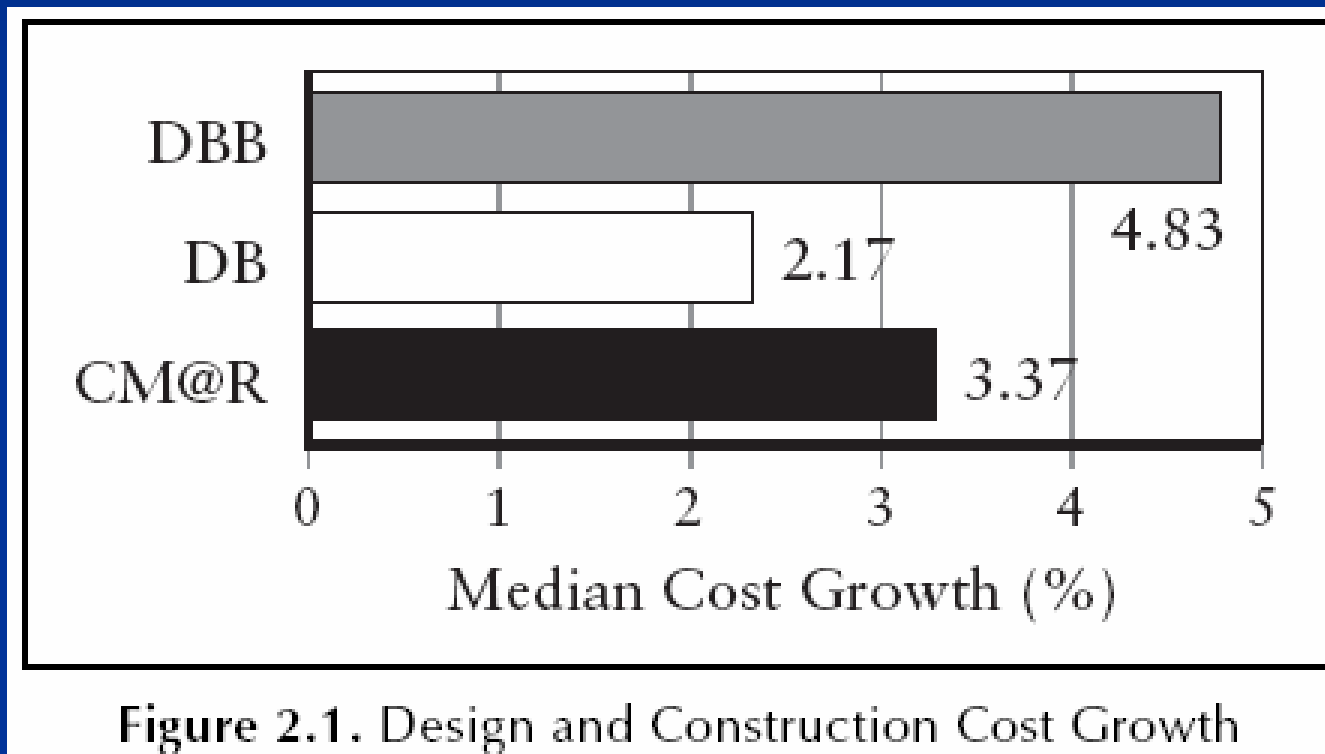
- Many Owners are realizing benefits from APDS
 - Speed of project delivery
 - Cost savings
 - Innovative approaches
- Significant risk remains, but with a different spin as changes, cost and schedule growth come in a different form
- Know your risks & tradeoffs

Questions ?

Industry Reports and Studies

- Construction Industry Institute
 - DB outperforms DBB and CM in cost and schedule growth and construction speed
- National Institute of Standards and Technology
 - Perhaps a slight edge to DB but subject to special interests
- State of Illinois Study
 - SP less costly than MP
 - Inconclusive re: DB vs DBB vs CM
- See White Paper

Construction Industry Institute



Construction Industry Institute

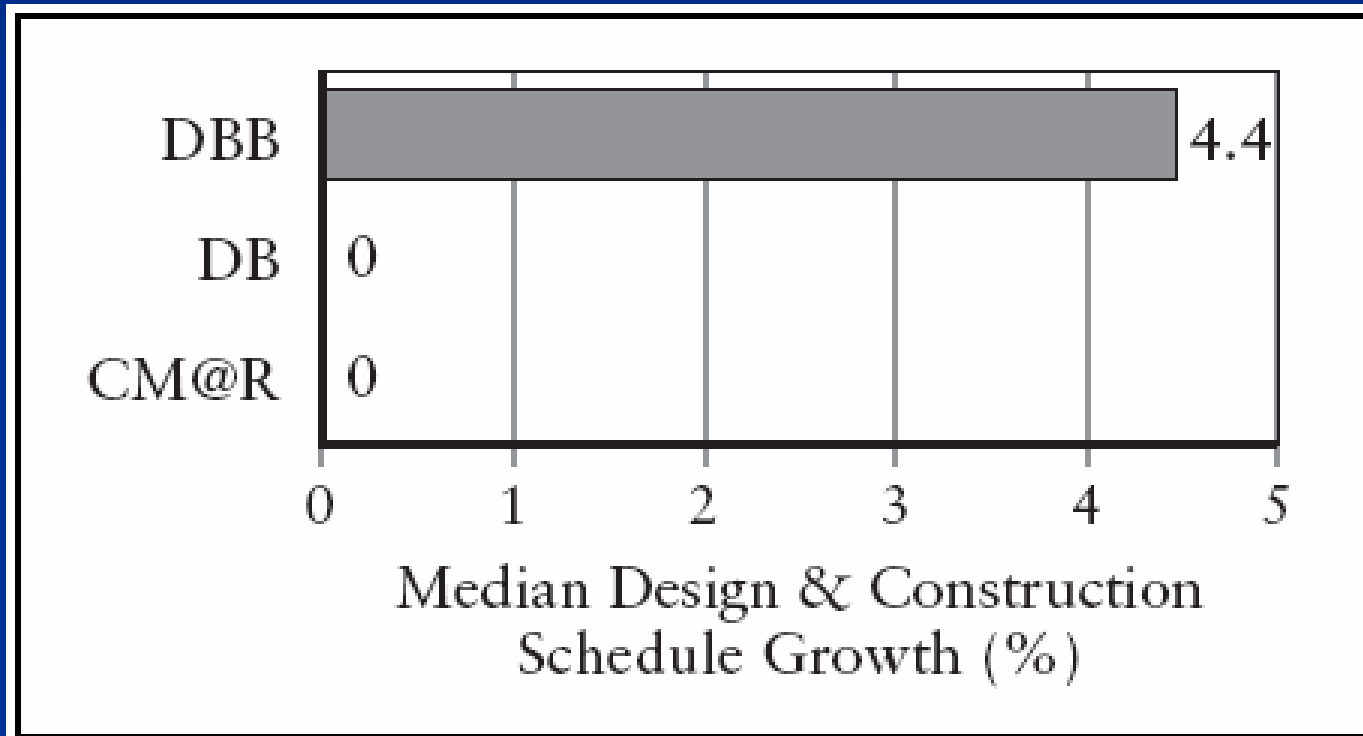


Figure 2.4. Design and Construction Schedule Growth

Construction Industry Institute

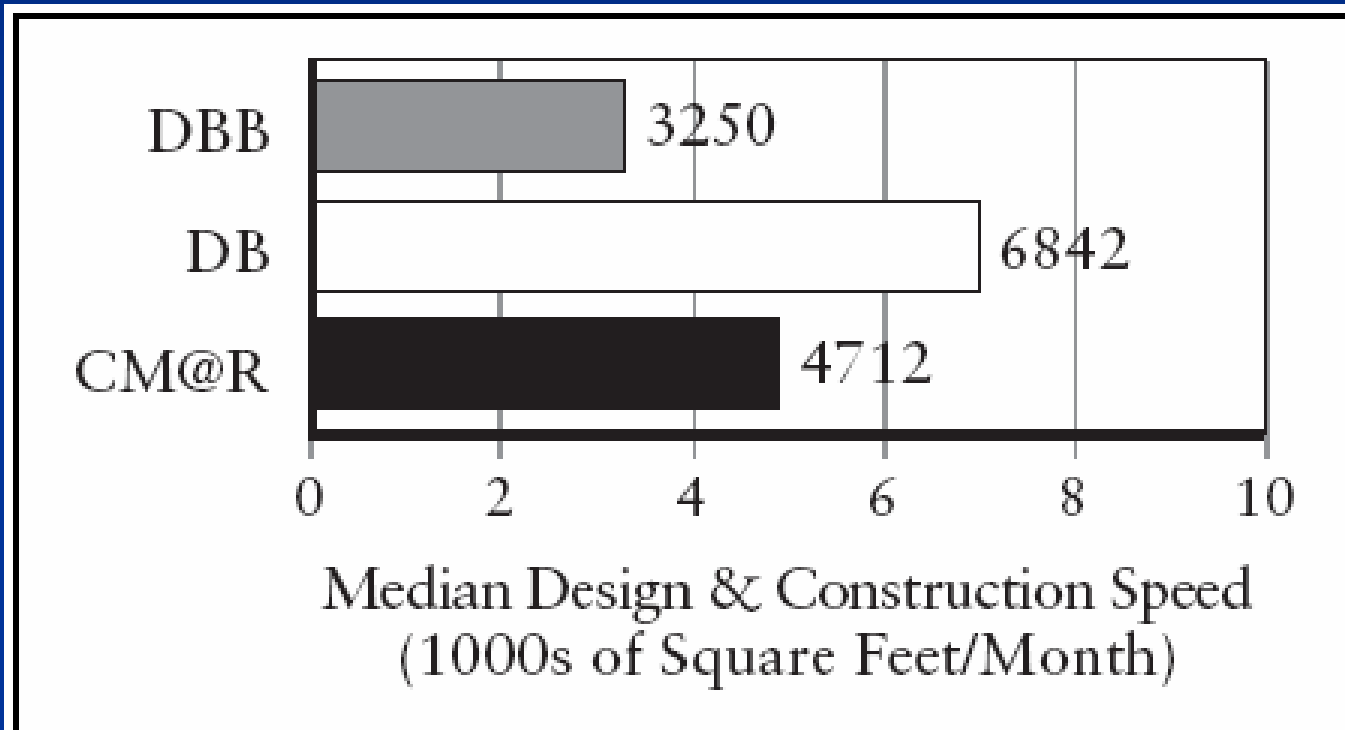


Figure 2.8. Design and Construction Speed

National Institute of Standards and Technology

Table ES.1 Summary of Overall Performance and Practice Use Outcomes

	Cost		Schedule		Safety	
	Owner	Contractor	Owner	Contractor	Owner	Contractor
Overall	DB ¹	--	DB	DBB	--	--

	Changes		Rework		Practice Use	
	Owner	Contractor	Owner	Contractor	Owner	Contractor
Overall	DB	DB	DB	DB ¹	DB	DB ¹

¹ Observed difference, not statistically significant

-- No difference in performance

Bold indicates significant difference, $p \leq 0.05$

State of Illinois

OVERALL CONCLUSIONS

- ▶ **NYC** – Single is less expensive.
- ▶ **North Carolina** – Single and multiple both cost the same.
- ▶ **IMSCA** – Multiple is less expensive.
- ▶ **Electrical Contractors** – Multiple is less expensive.
- ▶ **Peoria** – Single is less expensive.
- ▶ **CII** – Design/build is less expensive
- ▶ **Washington** – General contractor as contract manager is less expensive.

Procurement – Contracting Method Study

- ASCE Journal of Const. Mgmt. 3/06
- Study Compared
 - Sole Source (Negotiated Price)
 - Quals-based (Negotiated Price)
 - Best Value (Bid or negotiated)
 - Low Bid
- Based on CII data for 76 DB projects

Price	Low bid	Quals based	Sole source	Best value
	Lowest	4% higher	14% higher	50% higher
Cost Growth	Quals based	Best value	Sole source	Low bid
	Lowest	1.6% more	5.5% more	9% more
Delivery Speed	Low bid	Quals based	Best value	Sole source
	Fastest	28% slower	42% slower	67% slower
Schedule Growth	Best value	Sole source	Low bid	Quals based
	Lowest	1% more	5.6% more	6% more

- No measurable difference in quality among the 4 types
- Ref: ASCE JCE&M, 3/06

Comments/Insights

- Low bid can be successful in speedy delivery
- Quals based can be cost competitive and exhibits low cost growth
- Negotiated pricing or 2-step bid pricing can both be cost and schedule effective if:
 - Negotiation is detailed
 - Owner has GOOD cost and schedule estimates
- A key benefit is the resulting meeting of the minds on Scope Details, Quality, & Sustainability