

# 2018

## Project Delivery Symposium: Delivering the future OWNERS PANEL



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# Moderator:

## **Craig Unger DBIA**

Principal and CEO of  
Unger Security Solutions

# Panelists:

## **Anna Franz**

Administrative Office of  
the 3 US Courts

## **Stephen Ayers**

Architect of the Capital

## **Christian Stohler**

Dean of the Columbia  
School of Dentistry

## **Laura Stagner**

Assistant Commissioner  
of the GSA

Office of Project Delivery



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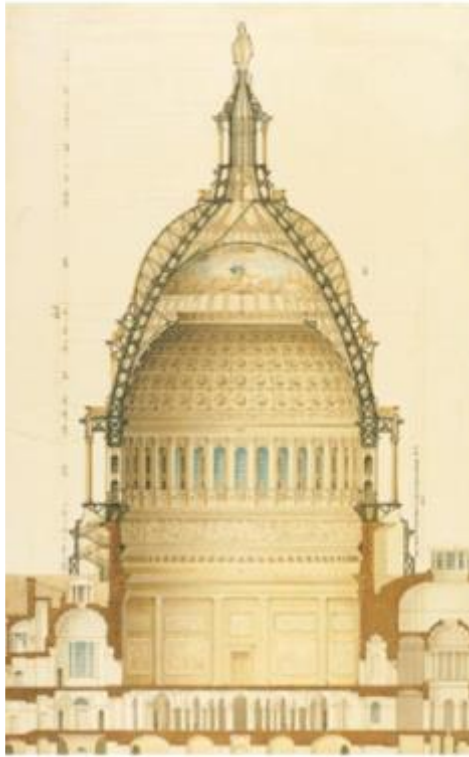
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## Architect of the Capitol

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Serve, Preserve & Inspire



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## Construction Contract

CHRISTMAN COMPANY

HITT CONTRACTING

TURNER CONSTRUCTION

CONSIGLI CONSTRUCTION

KIEWIT BUILDING GROUP

## Construction Management/Project Management Contract

PROCON CONSULTING LLC

JACOBS PROJECT  
MANAGEMENT CO.

PARSONS  
INFRASTRUCTURE &  
TECHNOLOGY GROUP,  
INC.

## A-E Contractors

SHALOM BARANES  
ASSOCIATES

AECOM

HGA MID-ATLANTIC INC.

JAMES POSEY ASSOCIATES,  
INC.

QUINN EVANS ARCHITECTS

URS GROUP, INC.

## E-A Contractors

RMF ENGINEERING, INC.

AFFILIATED ENGINEERS INC.

WILEY WILSON | BURNS &  
MCDONNELL



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OWNERS PANEL – Christian Stohler

# The Vision

*Big data generate actionable intelligence in support of teaching and learning of individual students, and the personalized care of patients*

*Space as an Enabler for a **First of Its Kind***  
**The Owner's Perspective**

Columbia University Medical Center  
Columbia University



**AIA** | *Data-Assisted, Technology-Enabled Intelligent Education / CSS*



Virtual  
Mixed  
Augmented  
Real



Planning – Design – Construction

The Wikipedia “View”\*

### **Virtual Reality** (VR)

A computer-generated reality that simulates a **physical presence in the real or an imagined world**, *allowing the user to function in that world.*

### **Mixed Reality** (MR)

The **merging of real and virtual worlds** to produce new environments *where physical and digital objects co-exist and interact in real time.*

### **Augmented Reality** (AR)

A live view of a **real-world environment** whose elements are **augmented by computer-generated sensory input**, such as sound, video, graphics, location data, *etc.*

*\*February 29, 2018*

**AIA** | *Data-Assisted, Technology-Enabled Intelligent Education*

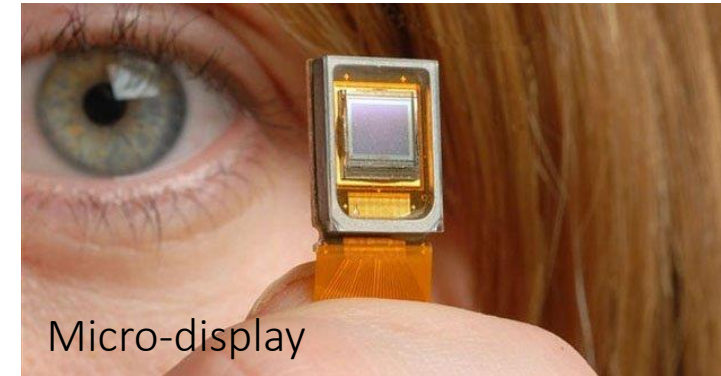


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YEAR	INNOVATION
2016-17	4K 2D Video 3840*1920 pixels
2018-19	8K 2D Video 7680*3840 pixels
2020-22	12K 2D Video 11520*5760 pixels
2023-27	24K 3D Video 23040*11520 pixels
2019-20	First micro-displays
2020+	GPU-Accelerated (vs CPU) Computing Goes Mainstream



Micro-display

Augmented Reality



Contact Lenses  
Machine Vision

AR+



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Alvar Aalto | *In His Helsinki Villa*



Convergence of the Minds | *At Alvar Aalto's Villa*

Dentists

IT and Informatics Professionals

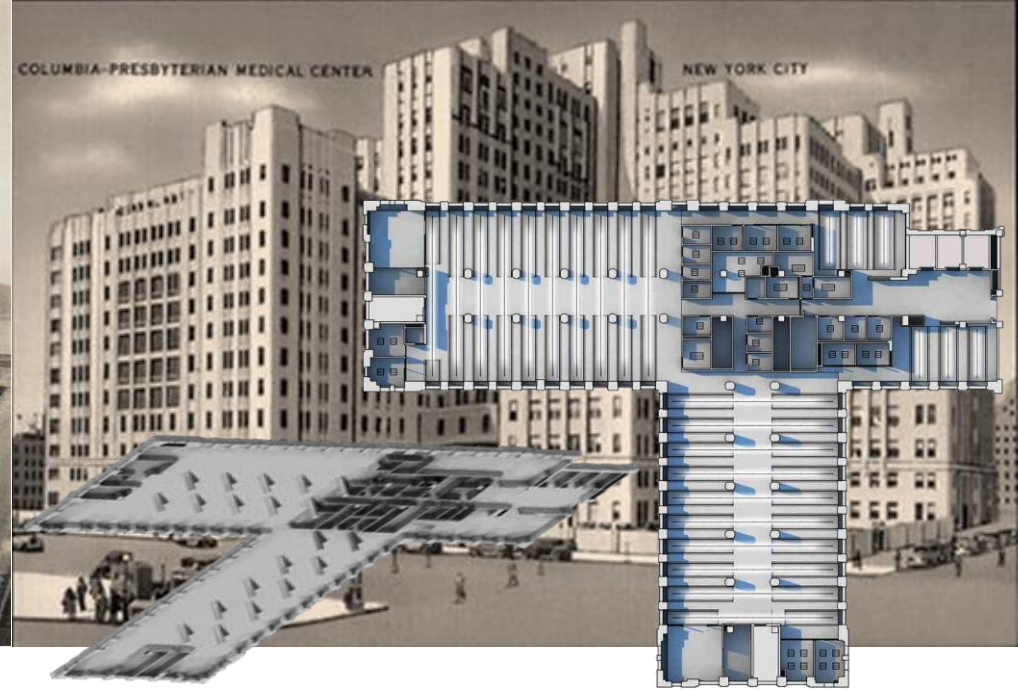
Mechanical and Computer Engineers

Professors, Scientists and Content Experts

Finance and University Representatives

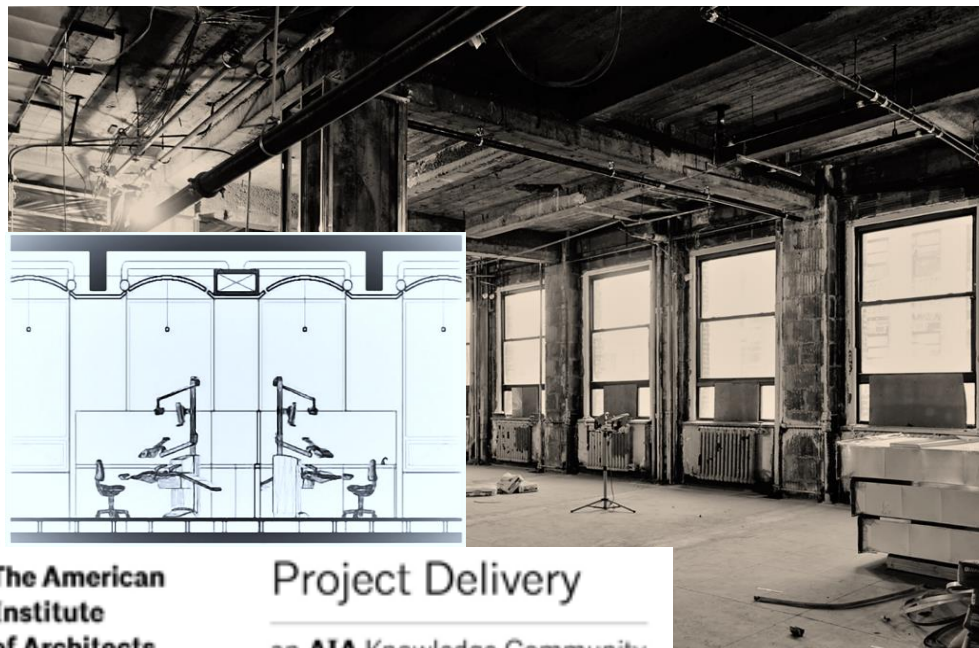
Architects and Designers





15,000 sqft | 48 Operatories

Choice of Site | *In the Heart of  
Columbia University's  
Medical School*  
But ... there is **no space there.**



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# Teaching-Learning Environment



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High Fidelity  
Simulation Analytics

Big Data  
*Cloud Computing*



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# RFID Tagged *Instrument and Supplies Dispensing Cabinets*



*Check-out sign-in panel*



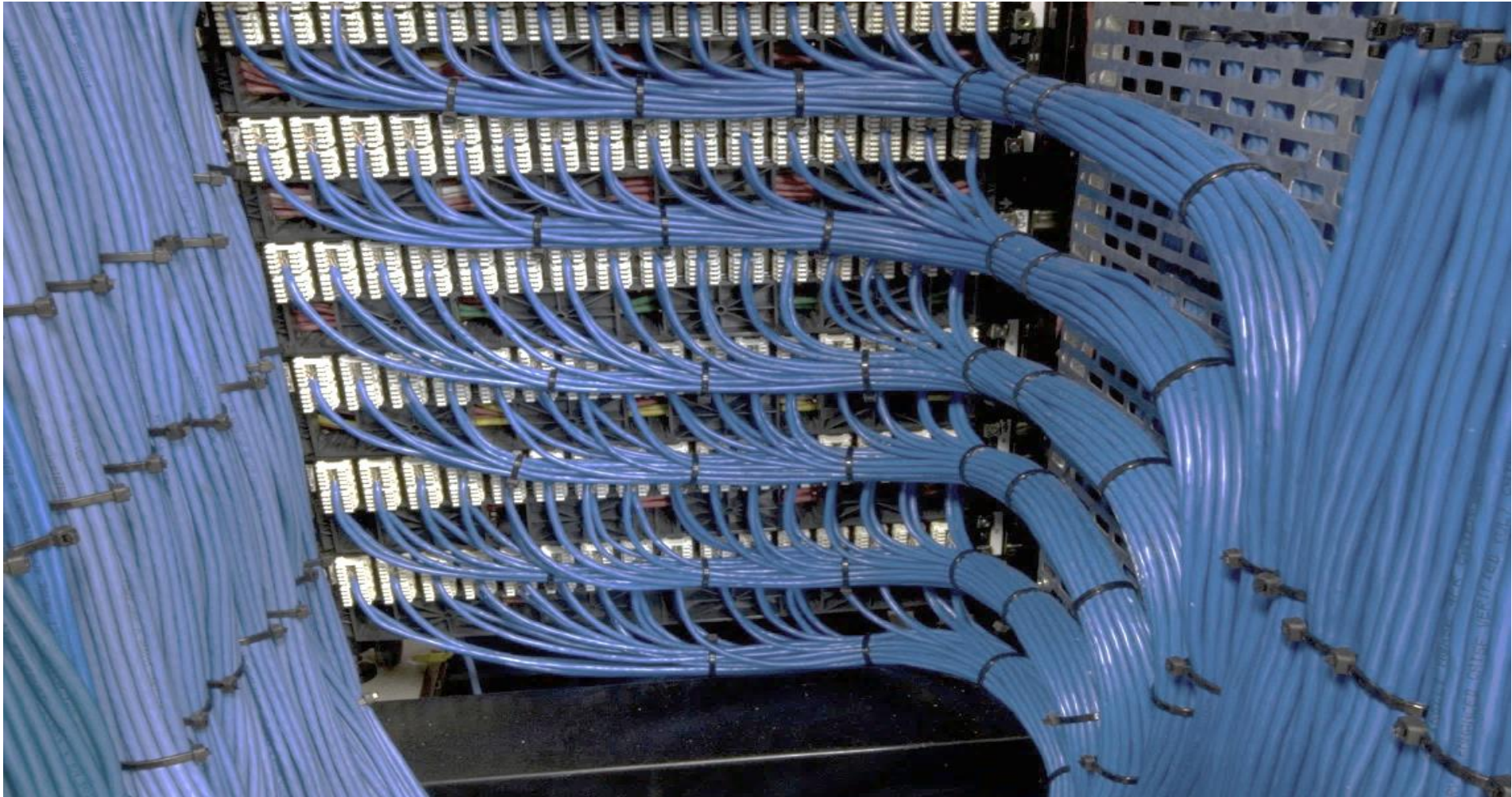
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# Passive Big Data Acquisition

## Connectivity of 24 Dental Teaching Stations

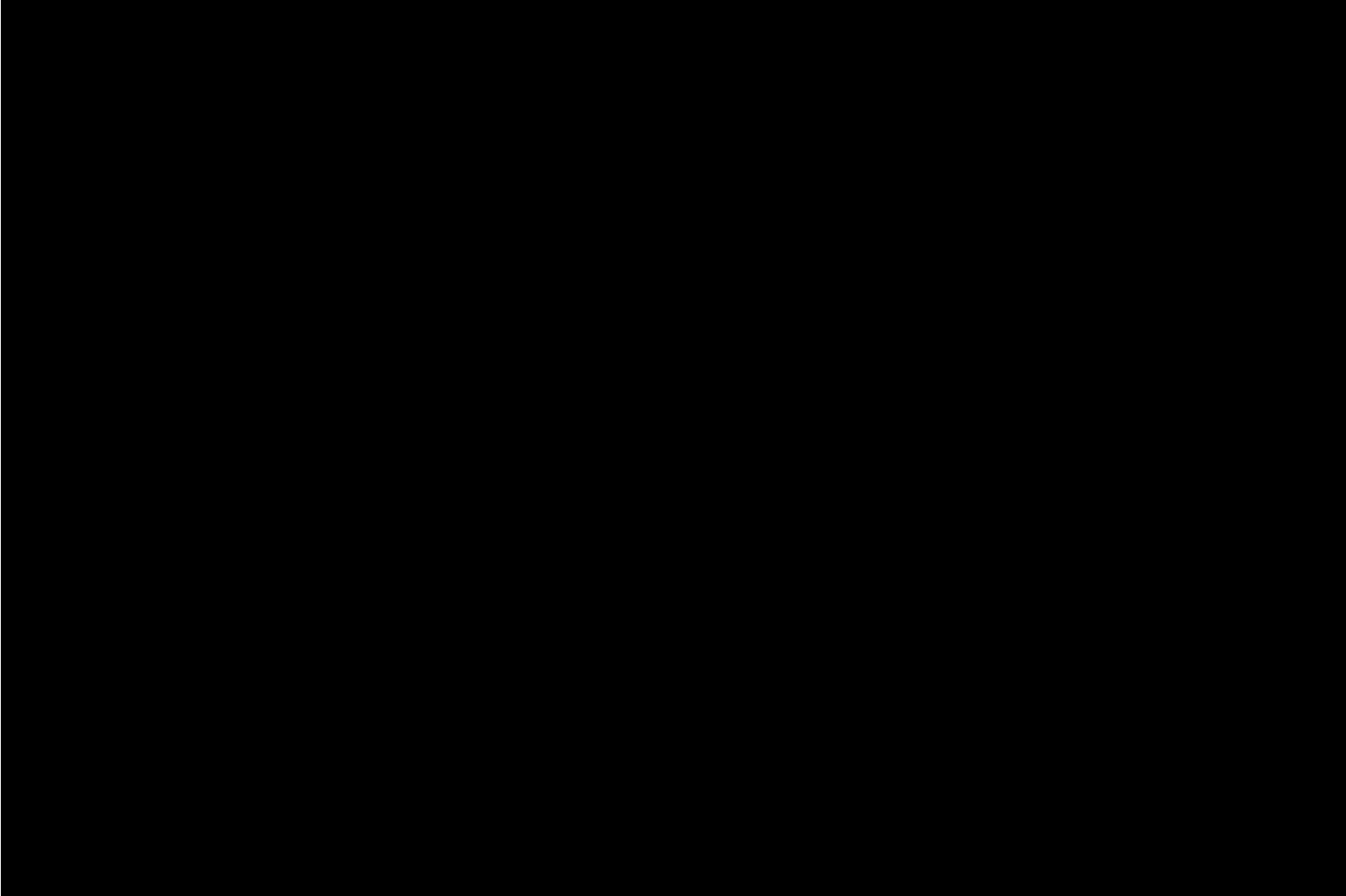


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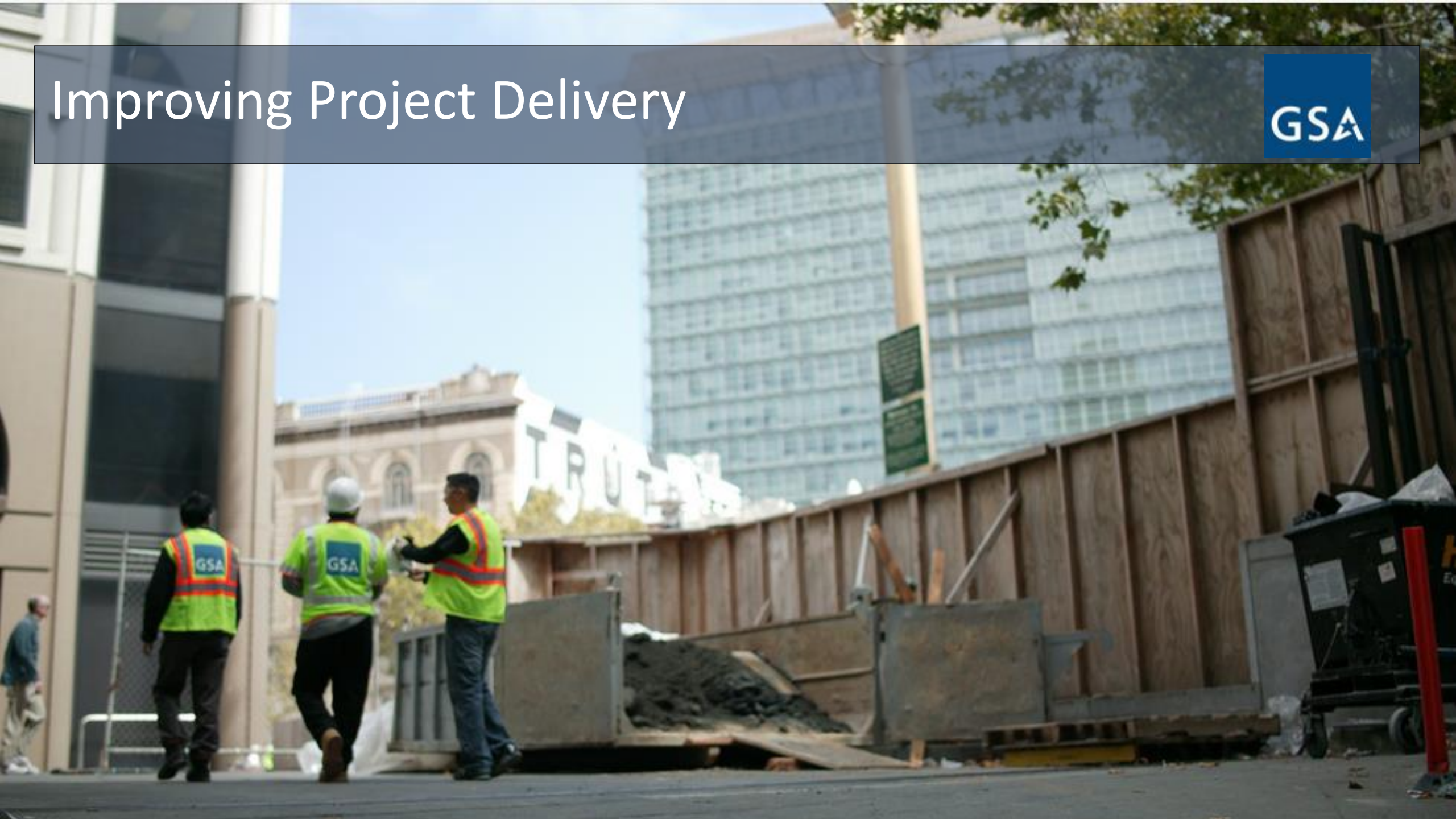
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# Improving Project Delivery

GSA

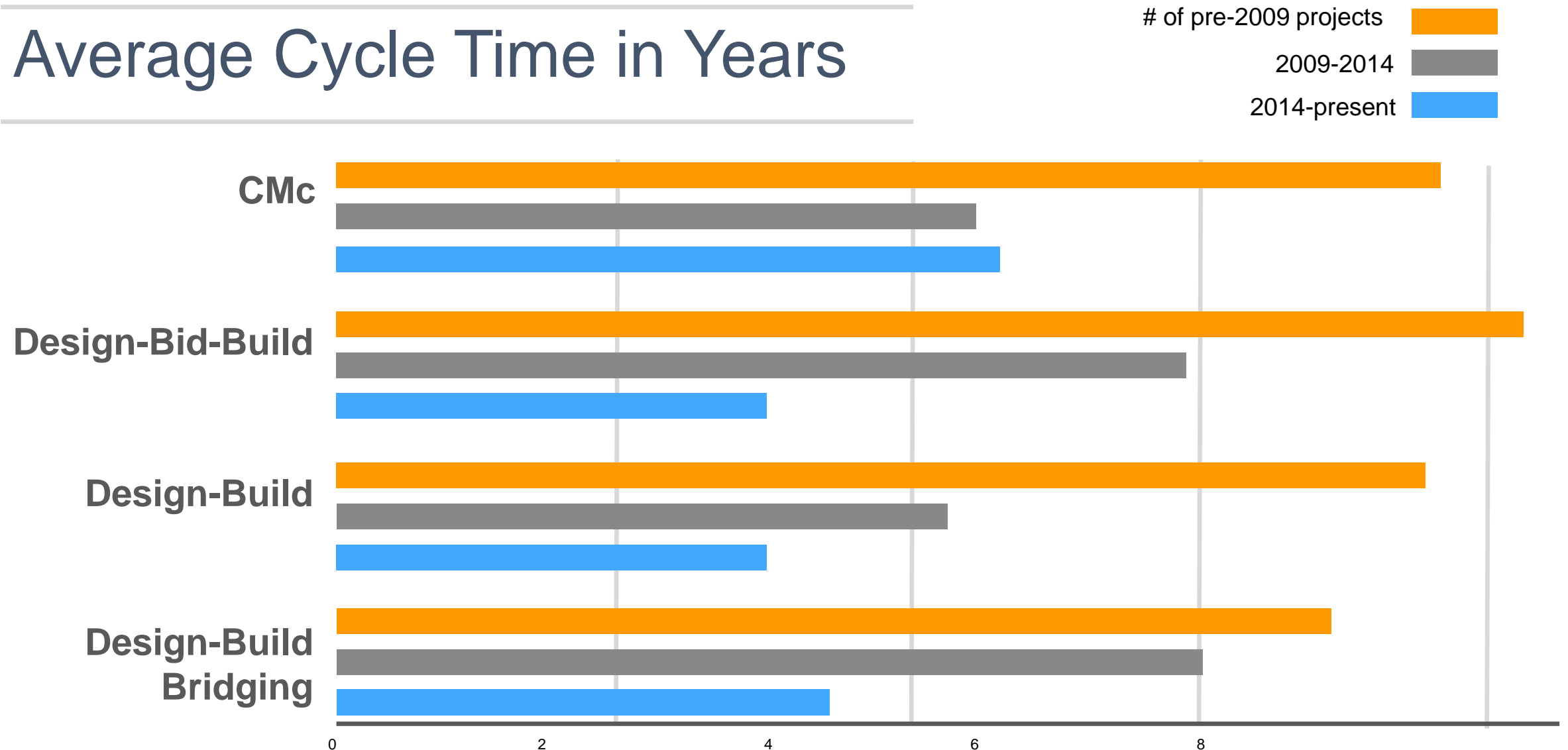




# Improving outcomes in project delivery

- 1.Data & Information
- 2.Collaboration & Relationships
- 3.Choosing a delivery method to mitigate risk

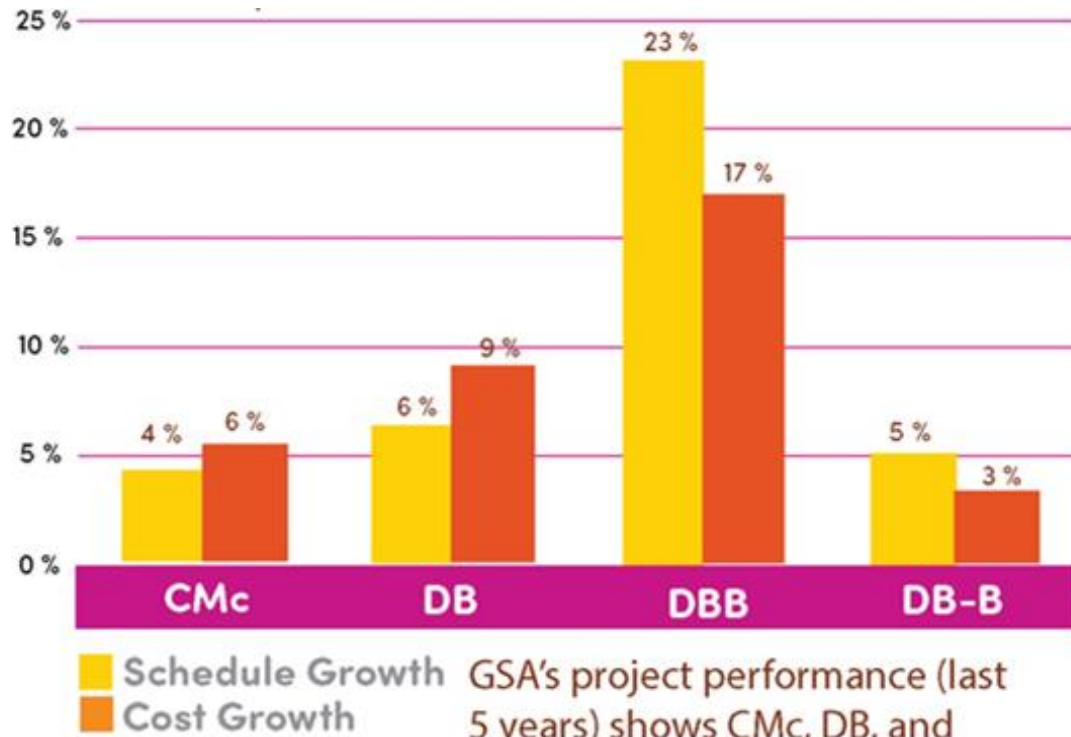
# Average Cycle Time in Years



This analysis includes all substantially completed projects and active projects with a defined estimated substantial completion date. Limited scope projects (Fire and Life Safety, Consolidation, etc.) are not a part of this analysis.

## Schedule & Cost Growth

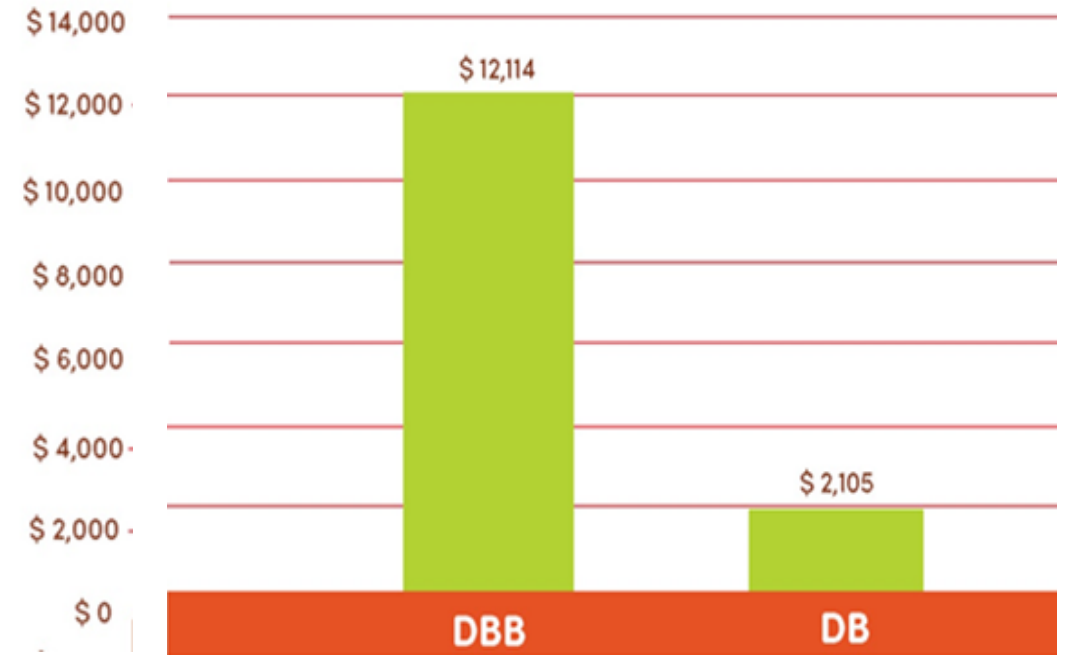
**Project Set:** 103 capital projects worth \$6.9B



GSA's project performance (last 5 years) shows CMc, DB, and DB-B delivery methods outperforming DBB

## Litigation

**Project Set:** \$29.1B obligations, \$183.7M lost to litigation 2004-2014



**Dollars Lost per Million Obligated** GSA's litigation experience (last 10 years) shows benefits to using DB and DB-B



# INTEGRATION AT ITS FINEST:

Success in High-Performance Building Design

and Project Delivery in the Federal Sector

Research Report  
April 14, 2015

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Renée Cheng, AIA, Professor, School of Architecture, University of Minnesota

Sponsored by Office of Federal High-Performance Green Buildings,  
U.S. General Services Administration

# Clear Implications: Trust/Respect & Aligned Goals

Context						Key Ingredients																Outcomes														
						Commercial				Leadership										Logistical & Process Tactics		Team Outcomes						Building Outcomes								
Project Size	Complexity and Risk	Logistical Complexity	Level of scope development at ARRA award	Frequency of scope refinement after ARRA award	Experience Level (Years in Career)	Experience Level (Familiarity)	Percentage of shared savings (1=n, 2=y)	Amount of savings and funding process	Percentage of GSA funding decisions	Percentage of ARRA visionary goals	Team Leadership Capability	Team Leadership Impact on goal achievement	Percentage of ARRA Regional Leadership Involvement	Accountability	Effective and healthy relationships	Continual improvement for complexity	Core team planning and decisions	Early problem solvers and stakeholders	Timely Information Meeting	Extend and manage Degree of Co-location	Trust and Respect	Aligned Goals	Effective Communication	Decisions Quality	Collaboration	Team Capability	BIM Impact	Design includes Innovative Technology	Contribution to advancing the project	Impact of scope refinement	Cumulative ARRA Outlay Performance	Monthly ARRA Outlay Deadline Performance	Overall Project Success			
1.00	3.88	2.2	1.38	2.88	4.00	2.37	2.00	3.02	3.87	4.18	4.30	3.84	3.16	1.95	4.11	1.00	4.14	3.00	2.86	2.63	4.19	3.50	2.00	2.88	3.71	2.86	4.08	4.25	4.00	3.86	4.00	2.00	3.38	3.00	3.60	4.34
5.00	4.19	3.00	1.15	3.63	4.00	2.37	2.00	3.02	3.87	4.18	4.30	3.84	3.16	1.95	4.11	1.00	4.14	3.00	2.86	2.63	4.19	3.50	2.00	2.88	3.71	2.86	4.08	4.25	4.00	3.86	4.00	2.00	3.38	3.00	3.60	4.34
2.00	3.90	2.60	3.60	3.50	2.00	1.94	1.00	-	3.69	3.68	4.34	3.85	2.50	1.94	4.29	4.00	4.29	2.86	2.86	2.49	4.13	3.2	3.00	2.71	3.70	3.00	4.05	3.92	4.43	2.42	-	2.00	3.17	2.00	3.10	4.71
1.00	3.76	2.60	2.50	2.89	4.00	2.55	1.86	3.42	3.33	3.58	4.24	3.70	2.89	1.89	4.17	1.00	4.13	2.89	2.89	2.66	4.24	2.57	2.00	2.78	3.67	2.67	4.11	4.17	4.28	2.40	2.00	2.00	3.89	1.00	2.80	4.27
5.00	3.87	3.00	1.57	2.67	4.00	2.34	1.17	4.40	3.50	3.47	4.01	3.79	3.26	1.89	3.86	3.50	4.22	2.67	3.00	2.70	3.61	2.10	4.00	2.78	3.56	2.67	3.99	3.98	4.00	1.87	4.00	2.00	3.44	2.00	2.70	4.34
1.00	3.54	1.00	1.40	3.21	3.00	2.31	1.00	-	3.32	3.58	3.81	3.71	3.11	1.87	3.86	2.90	3.90	2.65	2.78	2.61	3.74	3.25	3.00	2.64	3.30	2.71	3.46	3.64	3.96	2.88	1.00	1.75	2.95	3.00	3.10	3.96



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# Mixed Implications: Open Book, BIM, Co-lo

Context							Key Ingredients															Outcomes														
							Commercial			Leadership										Logistical & Process Tactics		Team Outcomes					Building Outcomes									
Project Size	Complexity and Risk	Logistical Complexity	Level of scope development at ARRA award	Frequency of scope refinement after ARRA award	Experience Level (Years in Career)	Experience Level (Familiarity)	Presence of shared savings (1=n, 2=y)	Impact of savings and funding process	Impact of GSA funding decisions	Impact of ARRA visionary leadership	GSA PM Leadership Capabilities	GSA Leadership Impact on project	GSA Regional Leadership	Accountability	Effective and healthy relationships	Continuity	Core team supported planning for complexity	Early process planning	Processes supported joint planning and decisions	Timely Involvement of partners & stakeholders	Meeting Quality	Extend and Breath of BIM usage	Degree of Co-location	Trust and Respect	Aligned Goals	Effective Communication	Decisions Quality	Collaboration	Team Capability	BIM Impact	Design includes Innovative	Adopting sustainable technology	Cost Management	Quality Performance	Delivery Dead line Performance	Overall Project Success
1.00	3.88	2.2	1.38	2.88	4.00	1.67	2.00	3.45	3.82	3.91	4.30	3.83	3.48	2	4.11	1.00	4.14	3.00	2.86	2.63	4.19	3.50	2.00	2.88	3.71	2.86	4.08	4.25	4.00	3.86	4.00	2.00	3.38	3.00	3.60	4.34
5.00	4.19	3.00	1.15	3.63	4.00	2.37	2.00	3.02	3.87	4.18	4.30	3.84	3.16	1.95	3.93	2.80	4.06	2.88	2.82	2.72	3.96	3.96	5.00	2.8	3.49	2.69	3.84	4.58	4.31	3.88	5.00	1.94	3.94	5.00	4.20	4.24
2.00	3.90	2.60	3.60	3.50	2.00	1.94	1.00	-	3.69	3.68	4.34	3.85	2.50	1.94	4.29	4.00	4.29	2.86	2.86	2.49	4.13	3.2	3.00	2.71	3.70	3.00	4.05	3.92	4.43	2.42	-	2.00	3.17	2.00	3.10	4.71
1.00	3.76	2.60	2.50	2.89	4.00	2.55	1.86	3.42	3.33	3.58	4.24	3.70	2.89	1.89	4.17	1.00	4.13	2.89	2.89	2.66	4.24	2.57	2.00	2.78	3.67	2.67	4.11	4.17	4.28	2.40	2.00	2.00	3.89	1.00	2.80	4.27
5.00	3.87	3.00	1.57	2.67	4.00	2.34	1.17	4.40	3.50	3.47	4.01	3.79	3.26	1.89	3.86	3.50	4.22	2.67	3.00	2.70	3.61	2.10	4.00	2.78	3.56	2.67	3.99	3.98	4.00	1.87	4.00	2.00	3.44	2.00	2.70	4.34
1.00	3.54	1.00	1.40	3.21	3.00	2.31	1.00	-	3.32	3.58	3.81	3.71	3.11	1.87	3.86	2.90	3.90	2.65	2.78	2.61	3.74	3.25	3.00	2.64	3.30	2.71	3.46	3.64	3.96	2.88	1.00	1.75	2.95	3.00	3.10	3.96

Shared Savings

Co-location

BIM Impact







**Advantages**

GSA retains control over design  
Most used & best understood method by GSA  
Procurement laws well understood

**Disadvantages/Issues**

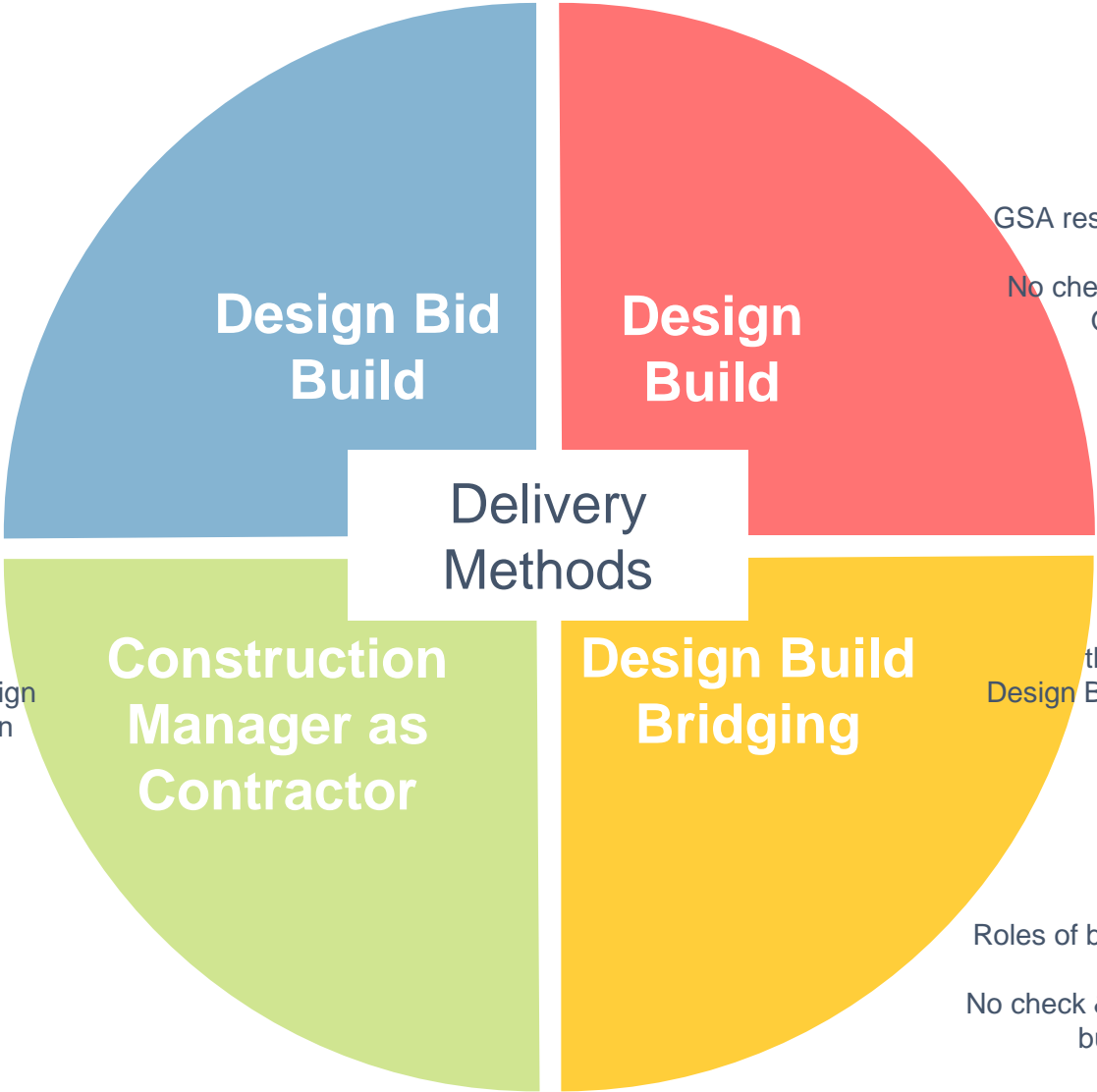
Linear sequence - longest duration  
Design liability - GSA warrants design  
Contractor has no input into project  
Final cost changes - GSA is responsible  
Most litigious

**Advantages**

GSA obtains construction input during design  
Cost “guarantee” prior to design completion  
Construction can start before design is complete, saving time & money  
Can improve quality of subcontractors

**Disadvantages/Issues**

GSA Responsible for changes after GMP  
Design Liability - GSA warrants design  
GSA may not have full control on contract changes as desired



**Advantages**

Single point of contract & accountability  
Design Builder warrants design  
Construction input during design  
Enable fast track construction  
Early knowledge of firm project costs  
Best value selection of entire team

**Disadvantages/Issues**

Need well defined scope - POR  
GSA responsible for changes, overlaps & gaps in scope  
No check & balance between designer & builder  
Quality can be difficult to control & predict  
Timely decisions critical

**Advantages**

More precise set of requirements  
than in pure DB, more control over quality  
Design Builder warrants design, but less effective than DB  
Enables fast track construction  
Early knowledge of firm project costs  
Best value selection of DB team

**Disadvantages/Issues**

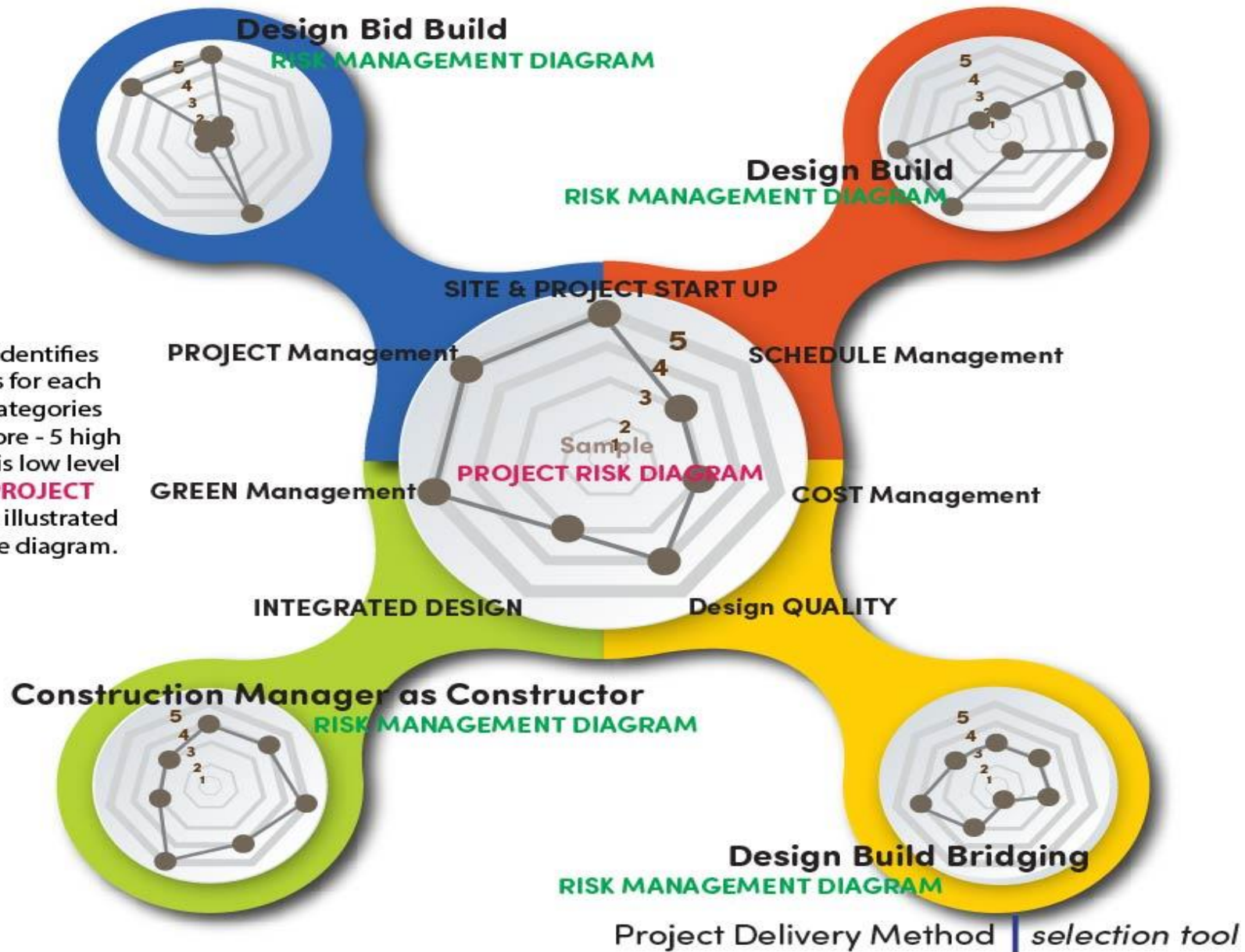
Roles of bridging designer & execution design firm must be established  
No check & balance between executing designer & builder, no privity of contract with designer

# pdm *tool* Step 4

The **RISK MANAGEMENT DIAGRAMS** measure the ability of the delivery method to manage the risk of the project. A score of 5 represents a high level of management influence. A score of 1 represents a low level of risk mitigation.

The Project Team identifies the goals and risks for each of the seven risk categories and assigned a score - 5 high level of risk and 1 is low level of risk. A sample **PROJECT RISK DIAGRAM** is illustrated in the center of the diagram.

The Project Team then compares the **PROJECT RISK DIAGRAMS** to the idealized diagrams for each of the 4 PDM types. The team considers the selection of the PDM that best resembles the **RISK MANAGEMENT DIAGRAM** and reach a consensus on which method will best mitigate the risks to the project



slide 19



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# Project Delivery

Executive, Legislative and Judicial Branch Perspectives



## Common Challenges

- Comprehensive Vision
- Design Risk
- Contract Flexibility
- Project Direction

## Risk Management

- Shared Leadership
- Integrated Approach
- Innovation Contingency
- Performance Measurement

Franz, A. 2013. **Whole System Design and Evolutionary 21<sup>st</sup> Century American Buildings + Infrastructure**, *The International Journal of Architectonic, Spatial and Environmental Design*, Volume 7, Issue 1, pp. 11 – 48.

# Executive Branch



Robert F. Kennedy Department of Justice Building



## Modernization Project

- Artistic Design Conference
- Construction Manager as Constructor (CMc) Project Delivery
- Department of Justice / General Services Administration Partnership



# Executive Branch



Donald W. Reynolds Center for American Art and Portraiture – Robert and Arlene Kogod Courtyard



## Renewal Project

- International Design Competition
- Multi-Year Contract



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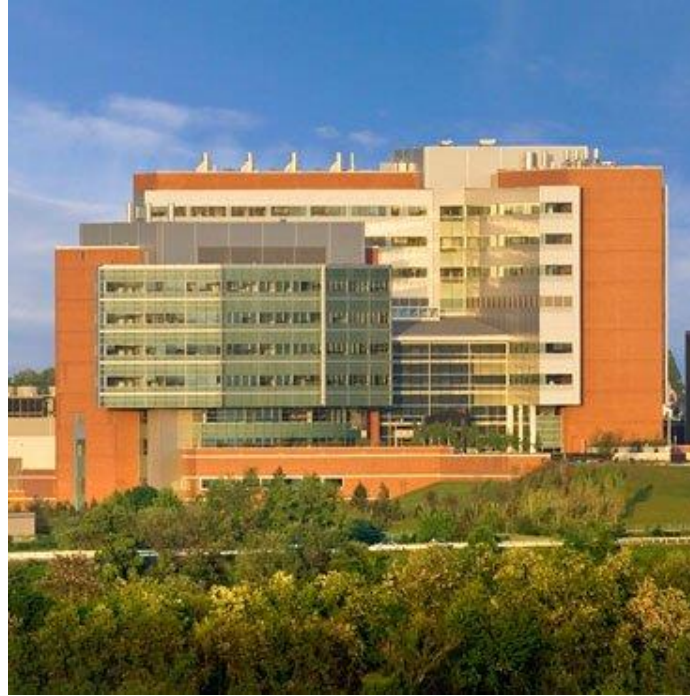
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# Executive Branch



Clinical Research Center, Bethesda



Biomedical Research Center, Bayview

## CRC

- Developer Manager Contract
- Integrated Master Schedule
- Performance Metrics

## Bayview

- Public Private Partnership

# Legislative Branch



Cannon House Office Building



## Renewal Project

- Design Peer Review
- Integrated Team Completion Bonus
- Quantitative Risk Assessment



# Judicial Branch



New United States Courthouse- Los Angeles

A/E IDIQ (\*re-compete this year) :

- AECOM
- Beyer Blinder Belle
- CRA Architecture
- Gensler
- Jacobs
- Page Southerland Page

A/V Design/Install:

- Alvine
- EII
- Newcomb & Boyd
- Polysonics
- PSE
- Spectrum

Long-Range Planning:

- Fentress
- Baker
- Jacobs

Performance Metrics:

- Booz Allen Hamilton

\* adding Project Direction Services



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# Judicial Branch



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# Questions?



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