Cultural, technological and supply chain barriers have stood in the way of construction industry productivity for the last 30 years, but those barriers are being broken down by changes in the economic and environmental landscape. Emerging project delivery methods will leverage technology and cloud computing to create a “Facebook for the Built Environment,” which will drive greater efficiency as we enter an era of tighter budgets, reduced capital construction, and consolidation and adaptation of existing buildings.

ABOUT THE SPEAKERS

LISA COOLEY, LEED AP was literally born into the construction business, and cut her teeth at a family-owned general contractor where she managed design-build and IDIQ contracts for clients, including the U.S. Air Force and General Services Administration. For the last seven years she has been an industry leader in job order contracting and other progressive delivery methods for ongoing facility upgrades. She serves on the Association General Contractors of America Project Delivery Committee, and has served as a board member of her local AGC Chapter and local IFMA chapter.

RICHARD F. SLIWOSKI, P.E. is currently the Director of the Commonwealth of Virginia’s Department of General Services (DGS). Originally appointed as Director in January 2006 by Governor Kaine, he was reappointed by Governor McDonnell in April 2010. Mr. Sliwoski manages the agency’s more than 600 employees, four divisions, and eight business units. The agency is responsible for the renovation and construction of state owned facilities, the operation of a statewide electronic procurement system, analytical laboratory testing, the buying, selling and leasing of real estate properties, the management of a statewide fleet, and the selling of surplus property. Mr. Sliwoski oversees the agency with an annual operating budget of approximately $238 million.

A professional engineer and registered in Virginia, Mr. Sliwoski’s career in public service spans almost four decades. He has extensive leadership experience in managing major projects and helped spearhead the construction, renovation, and underground expansion of the historic Virginia State Capitol. Prior to his appointment, Mr. Sliwoski served for more than five years as the Director of the Division of Engineering and Buildings overseeing two bureaus, the Bureau of Capital Outlay Management and the Bureau of Facilities Management.
PROJECT DELIVERY METHODS OF THE FUTURE

Lisa Cooley, LEED AP
Lisa Cooley Associates, LLC

Rich Sliwoski, PE
Commonwealth of Virginia
Department of General Services

In the long history of humankind, those who learned to collaborate and improvise most effectively have prevailed.

– Charles Darwin

Presenters:

Lisa Cooley, LEED AP
Owner/Principal
Lisa Cooley Associates, LLC

Rich Sliwoski, PE
Director
Virginia Department of General Services

• Born-and-bred construction industry veteran
• Expert in Job Order Contracting and small projects solutions
• Passionate about evolving delivery methods

• Background in military construction (USACE)
• Oversees 852 employees, $250M annual budget, 3 million square feet of facilities
• Subject Matter Expert on Public Private Partnerships
Looking to the Past:

72% of projects over budget
70% of projects over schedule
5% of project costs spent in bidding

Rex Miller, Commercial Real Estate Revolution

Cultural Barriers
Fracturing of the Industry and Its Results

72% of projects over budget
70% of projects over schedule
5% of project costs spent in bidding

Adapted, HOK Architects
## Technology Barriers - Speed vs. Flexibility

- Owner
- AE
- Contractor
- Subs

## Technology Barriers

- Excel Spreadsheets
- Cloud Computing
- Relational Database

## Catalysts of Change
Environmental:
1. Recognition of building’s role in climate change
2. Challenge of meeting rising Energy Needs and paying for it
3. Government mandates

Economic:
1. Fallout from of a building boom followed by recession
2. Reduced capital expenditures at a time when monumental change to the built environment is needed
3. World economy becoming “flat”

Resulting in a fundamental cultural shift?
Driven by Millennial sensibilities and values
The built environment is transforming to meet efficiency needs
There is a need for responsive project delivery methods to facilitate these changes
Big Data:

- BIM and sophisticated energy modeling for new construction
- Ability to collect building performance metrics for existing buildings

Challenge:
1. How to process it for decisionmaking and
2. How to leverage team expertise to effect productive change

Need for delivery methods to quickly respond to urgency created by transparent data.

Disruptive Technology:

- BIM
- Cloud Computing

A disruptive technology changes/overturns traditional business methods and practices.
BIM – The “Simple Definition”

BIM is the life-cycle management of the built environment supported by digital technology. (adapted from NIBS)
Convergence

Flat World Economy

Constrained Capital Dollars

Refocus on O&M

Carbon Footprint

Government Mandates

New Project Delivery Methods to Meet New Demands

Altered Economic Landscape

Altered Environmental Landscape

Disruptive Technology

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Key Characteristics of Emergent Project Delivery Methods

Qualifications Based or Best Value Selection

Some form of pricing transparency

Early and ongoing information-sharing among project stakeholders

Appropriate distribution of risk

Some form of financial incentive to drive performance

CM At-Risk

• Easiest to use and most common of alternative delivery methods.
  • Most like Design-Bid Build?
  • Qualifications-based selection
  • Open-book, fee-based pricing
  • Facilitates early team integration while owner retains direct relationship with architect
  • Contractor assumed cost risk at milestones

From www.agc.org

Project Delivery Method of the Future

Tuesday, June 11 at 10:00am
CM At-Risk: Virginia’s Experience

• Used successfully for over 10 years on large (>$10M), complex capital construction projects with accelerated schedules
• Key Benefits:
  o Early CM involvement (i.e., no later than at schematic design) facilitates “constructability” and value engineer reviews concurrent with design development…which leads to smoother, more cost-efficient execution
  o Improved cost transparency with subcontractors

Design-Build

• Single Source Responsibility
• Shifts risk of design errors from Owner to Contractor
• Maximizing construction dollars—Design-to-Budget
• Faster Delivery
• Can be commoditized as low bid, but can be innovative with performance-based measures

Design-Build Case Study

Awarded September 11, 2001
Schedule, budget and scope completely changed from original bid
Completed 14 months ahead of schedule and $100 million under budget
Performance-based, flexible contract allowed for innovation
Incentives:
  Award fee allowed profit margins up to 10% if project goals were met
  Cost incentive allowed design/builder to share percentage of cost savings—30-50%
  Subjective evaluations every 90 days—feedback loop
**Integrated Project Delivery**

- Alliance Contracts create shared Risk and Reward—shared contingency and shared incentive pool. Liability Waivers mean no ability to sue.
- Entire team on board before design starts—requires Qualifications Based Selection and Full Pricing Transparency
- Deep involvement of key subcontractors and suppliers in design process
- Goal is to reduce duplication of design efforts—shop drawings serve design development
- Utilization of BIM and other forward-thinking technologies to enable collaboration among team members

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**Traditional Project Delivery vs. Integrated Project Delivery**

<table>
<thead>
<tr>
<th>Traditional Project Delivery</th>
<th>Integrated Project Delivery</th>
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<tbody>
<tr>
<td>Project Participants: Team of project constituents, open, collaborative</td>
<td>Project participants: Team of project constituents, open, collaborative</td>
</tr>
<tr>
<td>Process: Concurrent, project life cycle oriented, shared information, collaborative</td>
<td>Risk: Commonly shared and transparent</td>
</tr>
<tr>
<td>Initials managed</td>
<td>Compensation: Performance and value based</td>
</tr>
<tr>
<td>Technology: Object oriented, central knowledge repository; detailed drawings, analytical models, knowledge-based systems, BIM, VR, 3D modeling, RTLS software, shared model</td>
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**Project Delivery Method of the Future**

Tuesday, June 11 at 10:00am
Job Order Contracting

- “IPD Lite” for Existing Buildings
- Consolidates procurement to shorten Project Timelines and reduce procurement costs
- Transparency of pricing and procurement compliance through Unit Price Book
- Long Term Facility Relationship increases productivity and enables reiterative process improvements
- Quality and performance incentivized through IDIQ form of contract with minimal guarantee and clear maximum volume

Shorter Project Timelines

- Faster and timely delivery of projects.
- Consolidation of procurement creates lower overhead cost and procurement cost.
- Contractor and owner efficiencies in prosecution of the work. Development of a partner relationship based on work performance.
- Virtual elimination of legal disputes, claims and change orders.
- Standard pricing and specification utilizing a published unit price book (UPB), resulting in efficient and effective estimating, design, and fixed price construction.

Advantages of JOC for Owners
How OWNERS Use JOC & Technology

- Track & Manage each project from inception to completion.
- Manage a single project, your entire contract, or multiple contracts.
- All project milestones, thru warranty period.
- Display status of each project.
- Maintain a complete cost history.
- Record all estimates associated with a project.
- Review value of all projects awarded on a specific contract, or a specific contractor.
- Reports show pre-negotiation strategies and post-negotiation summaries.

Job Order Contracting In Virginia

- Strong federal roots—JOCs at Pentagon, Ft. Lee, Andrews AFB
- Long used by local government divisions
  - Fairfax County, Arlington County Schools, etc.
  - Under existing procurement code
  - Riders commonly used
- Virginia Department of General Services took a leadership role in defining JOC use and limits in legislation prior to implementation at the State level—HB 2079
  - Implementation plans

Public Private Partnerships

- Finds fullest expression as Design-Build-Own-Operate
- Takes advantage of the same team innovations as Design-Build and IPD—contract includes design and construction.
- Added benefit of private financing for upfront cost. Funding through toll concessions or availability payments.
  - Some may be during the course of design/construction
  - After completion, typically receive a regular (e.g. annual) payment – similar to a lease payment
- Added component of ongoing operation/maintenance.
  - Allows owners to incentivize ongoing building performance
  - Size of ongoing payments is contingent on the performance of the asset
- Drives performance and lifecycle decisions. Ultimate accountability for building systems.
- Originally focused on transportation. Now expanding into "social infrastructure" projects.
Public Private Partnerships
Virginia’s Experience with PPEA

• Introduced in 2002 as the Public-Private Education Facilities and Infrastructure Act (PPEA)
• A dynamic, evolving process since its introduction
• Best used to provide flexible means to deliver projects which include:
  o Complex real estate transactions
  o Multiple levels (i.e., state and local) of government interest/interaction
  o Politically sensitive initiatives
• Typically publicly-funded and essentially design-build

PPP Case Study
Southeastern Virginia Training Center

• Scope included:
  o 15 campus housing units
  o 13 community-based houses
• Cost: ~$34 M
• Success at resolving complex issues involving:
  o Acquisition of property for community-based housing
  o Resolution of sensitive wetland-related issues

Energy Performance Contracts

• Usually includes financing—paid off with energy savings
• Payment based on anticipated energy savings, or contingent on actual savings
• Well-established in public sector, challenges in private sector
• Variation: Energy Services Agreement. New business models to address challenges: Managed Utility Service Agreements, Property Assessed Clean Energy (PACE), On-bill financing
• Drivers: benchmarking laws creating transparency in building energy costs for tenants and buyers. C-Suite lens into facility costs
Supporting Software Technology

- Integration of Proven Construction Delivery Methods / Project Management
- Standardized Cost Data Architectures / Taxonomies (i.e. RSMeans™ - 400,000 line items)
- Comprehensive Document Management
- Electronic Visualization / QTO
A Common Language

MasterFormat2010, Uniformat II – Reference Cost Databases (aka RSMeans)

COBIE, OMNICLASS

IFC

Metrics: FCI, SCI, Cost/GSF, Cost/NSF, Utilization Rates, ...

“Facebook” for the Built Environment 1

Project Collaboration
Crystal Ball: What does the future hold?


Increased energy efficiency
Educational outcomes
Healthcare outcomes
Increased worker productivity

Performance Specs
Compensation Structure
Sophisticated Data Analysis

Contact and Other Info
Lisa Cooley
505-239-3446
lisa@lisacooleyassociates.com

Richard Sliwoski
804-786-3311
richard.sliwoski@dgs.virginia.gov

Presentation will be posted at www.lisacooleyassociates.com
Sources/Bibliography at: http://www.scoop.it/t/betterbuilding