



Delivering a Lean Design-Build Project

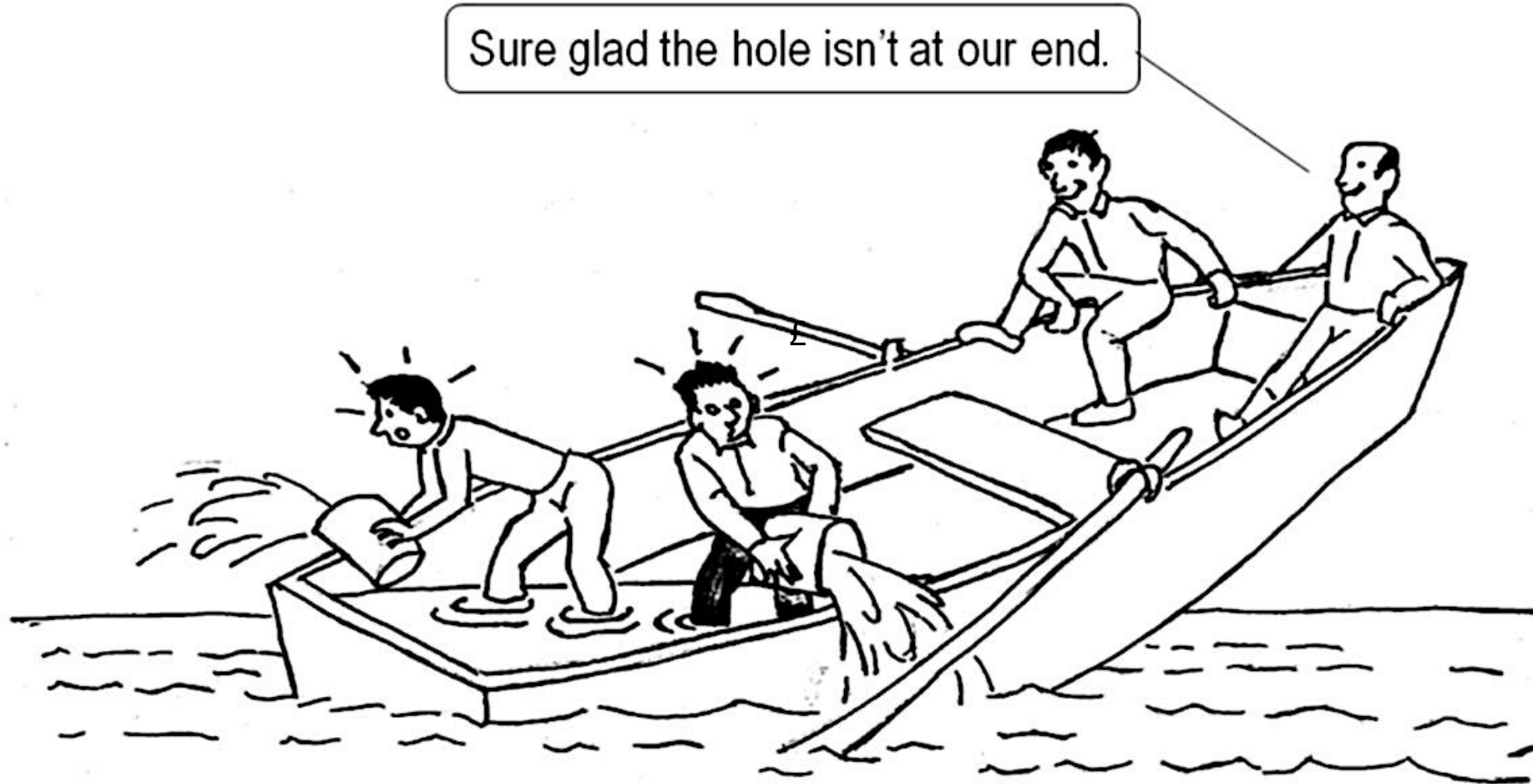
David Umstot, PE, CEM
Past President, DBIA WPR

18 July 2019

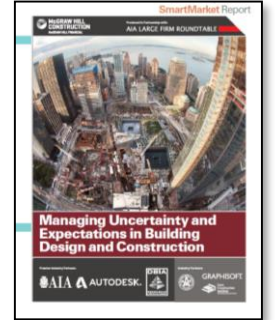
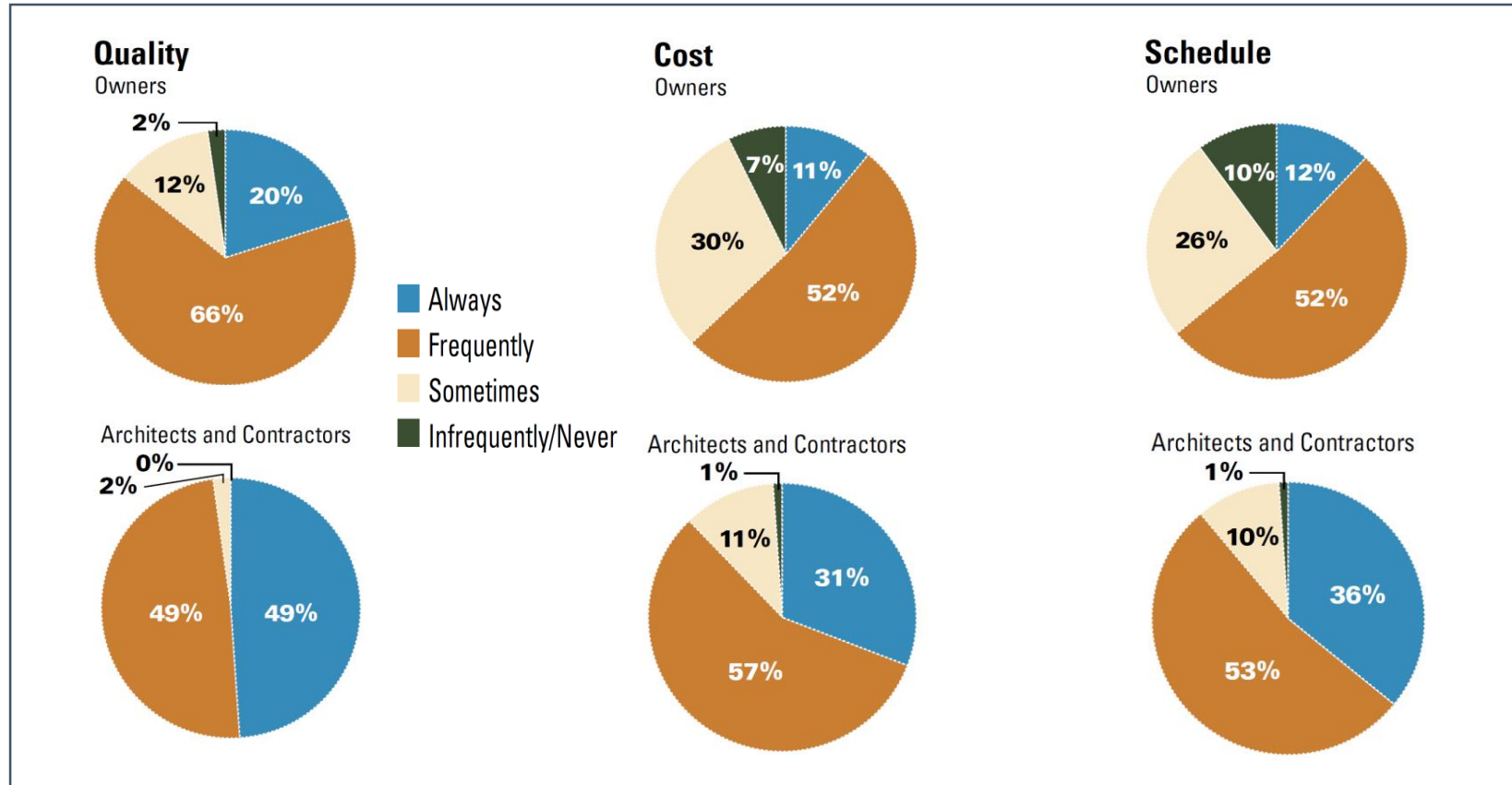


**Dedicated to my friend and Design-Build advocate,
Jacob Williams**

Sink or Swim Together?



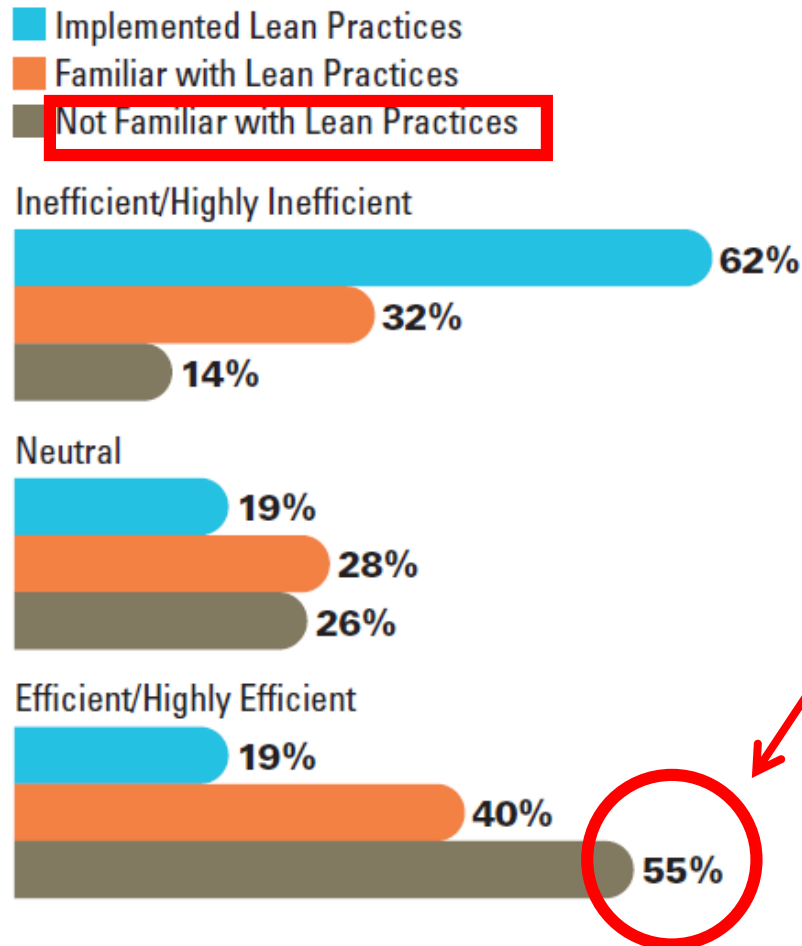
Owner Values and Satisfaction



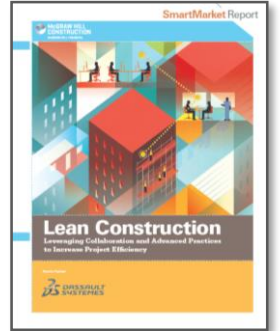
(2014)

2.5 to 3X Disconnect!

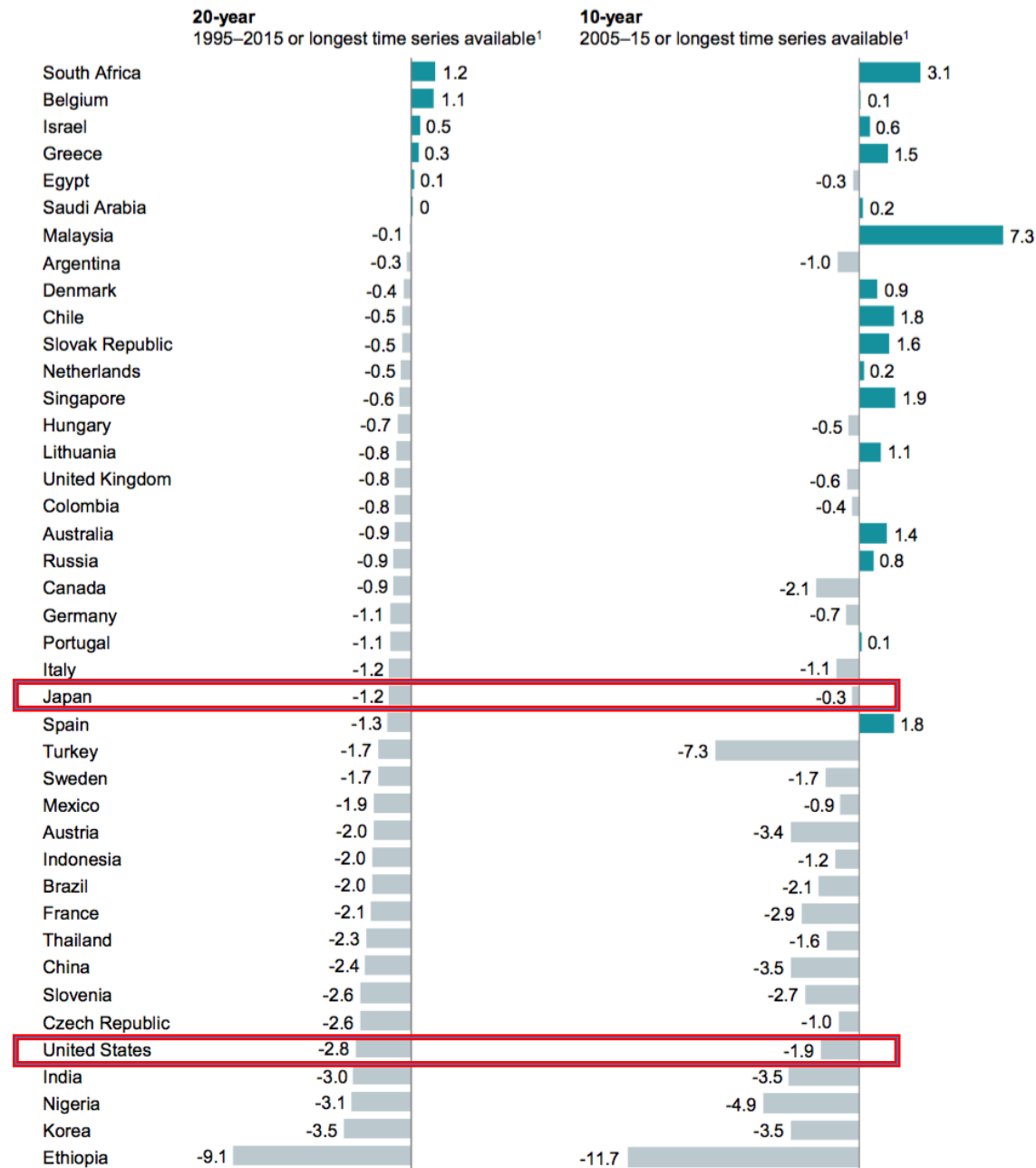
Industry Efficiency



Most who never heard of Lean think the industry is **Efficient**



(2013)



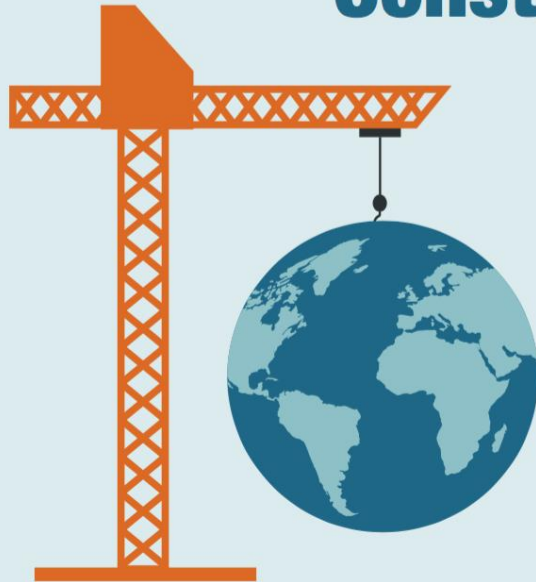
Productivity Differential between Construction Market Sector and Overall Economy by Country

Source: McKinsey (2017)

The **productivity opportunity** in construction



Construction matters for the world economy ... but has a long record of poor productivity



Construction-related spending
accounts for

13% of the world's GDP

...but the sector's annual productivity
growth has only increased

1% over the past 20 years

\$1.6 trillion of additional value added could be
created through higher productivity,
meeting half the world's infrastructure need

Source: McKinsey (2017)

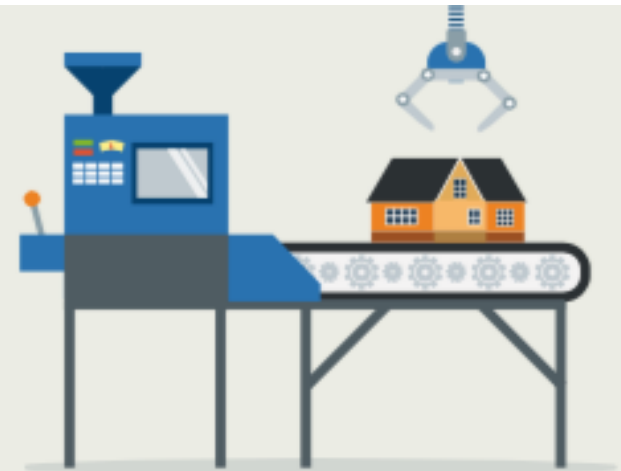


**Action in seven areas
can boost sector
productivity by
50–60%**

- Reshape regulation
- Rewire contracts
- Rethink design
- Improve procurement and supply chain
- Improve onsite execution
- Infuse technology and innovation
- Reskill workers

5–10x productivity boost

possible for some parts of the industry by moving
to a manufacturing-style production system





“Ours is the only trillion dollar industry in the history of the world in which the misguided owners demand processes that increase cost and reduce quality.” - *Barbara White Bryson*

The Business Case for Lean

3

X
As likely to
finish on or
ahead of
schedule!!!

2

X
As likely to
finish on or
below original
budget

Lean Tenets



Eight Types of Waste



Overproduction



Waiting



Transportation



Over Processing



Inventory



Motion



Defects



Underutilizing the creativity
of project team members

Typical Types of Design Waste

- Rework
- Lack of Coordination Between Disciplines
- Inefficient work flow
- Over design of systems (diversity and factors of safety)
- Poor design that generates waste during construction
- Designing over allowable budget
- RFIs



Typical Types of Construction Waste

- Waiting on another trade
- Waiting on information
- Waiting on supplies
- Rework
- Requests for Information
- Change orders
- Inadequate Resources
- Inefficient work flow
- Workarounds
- Multiple handling of material
- Excess material
- Safety losses
- Improper sequencing of work

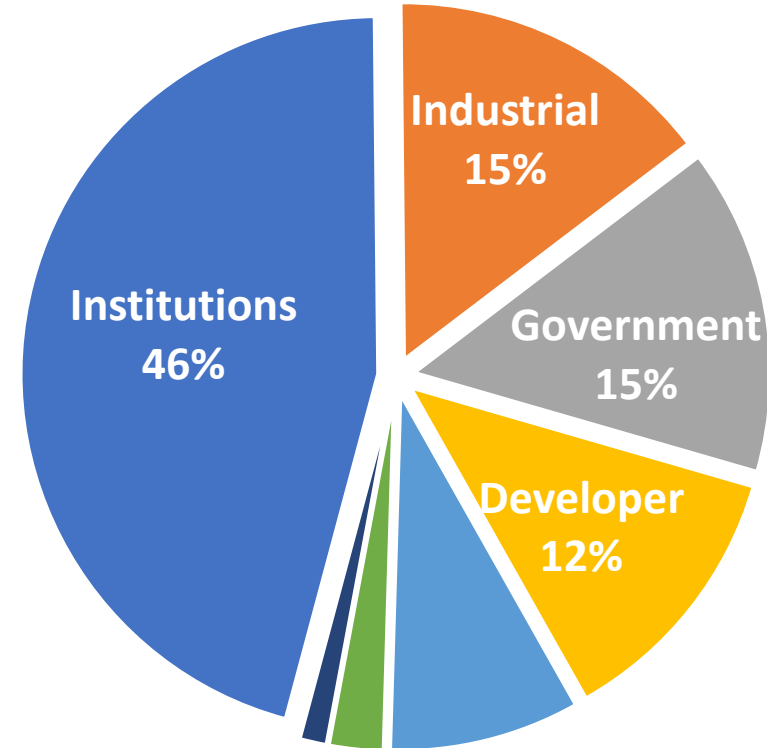


Owner Satisfaction & Project Performance Research Overview

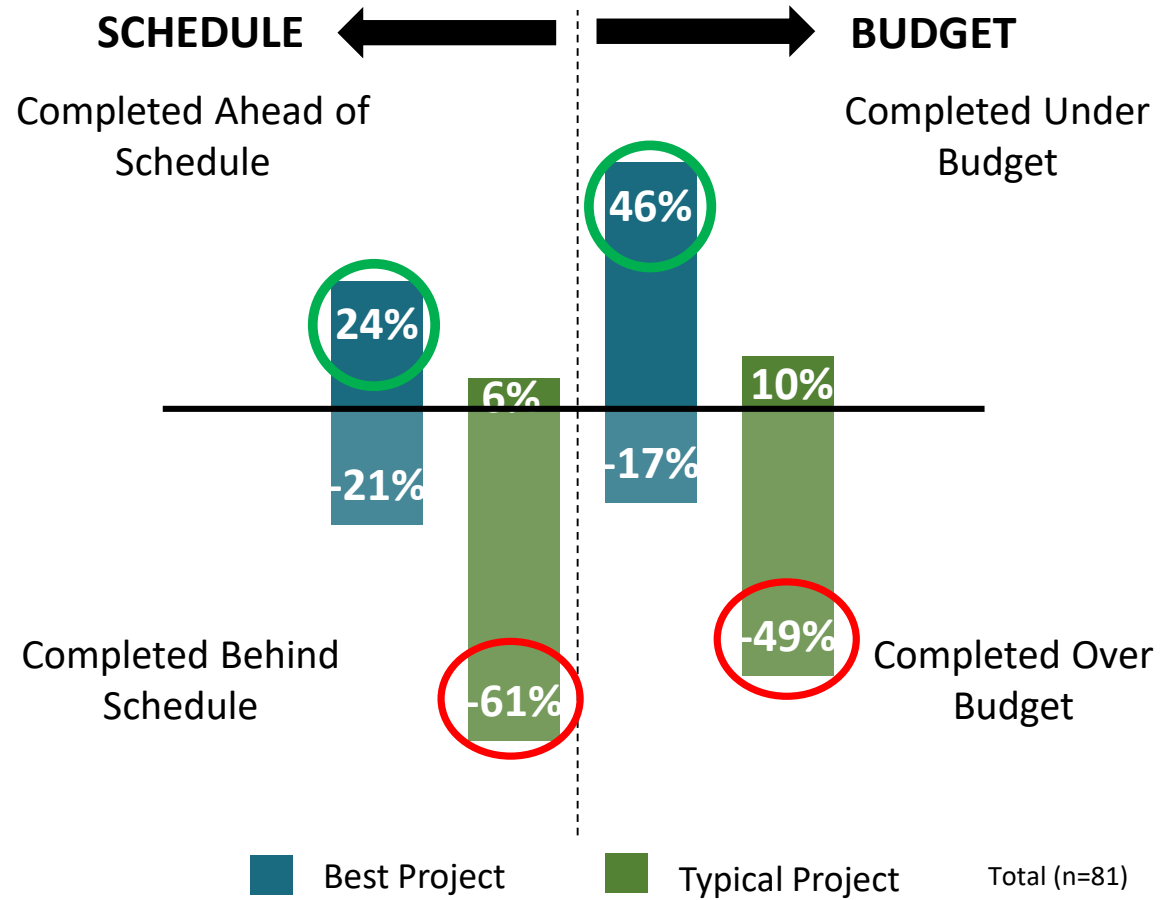
Objectives:

1. Benchmark owner satisfaction & project performance
2. What is the impact of Lean?

Survey: 81 Owners/ 162 projects

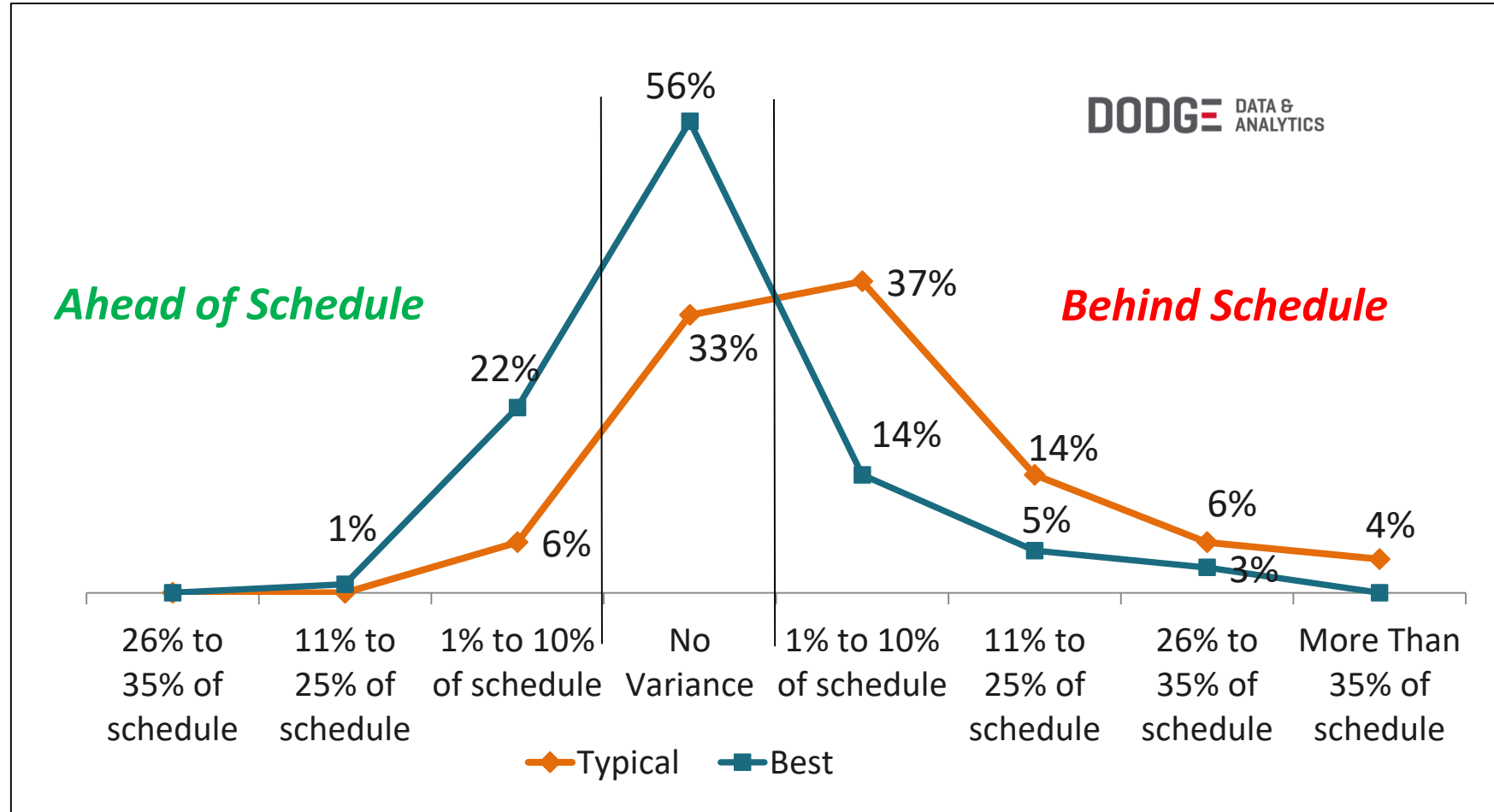


Performance from Approval of Capital Project (% of Best/ Typical Projects)



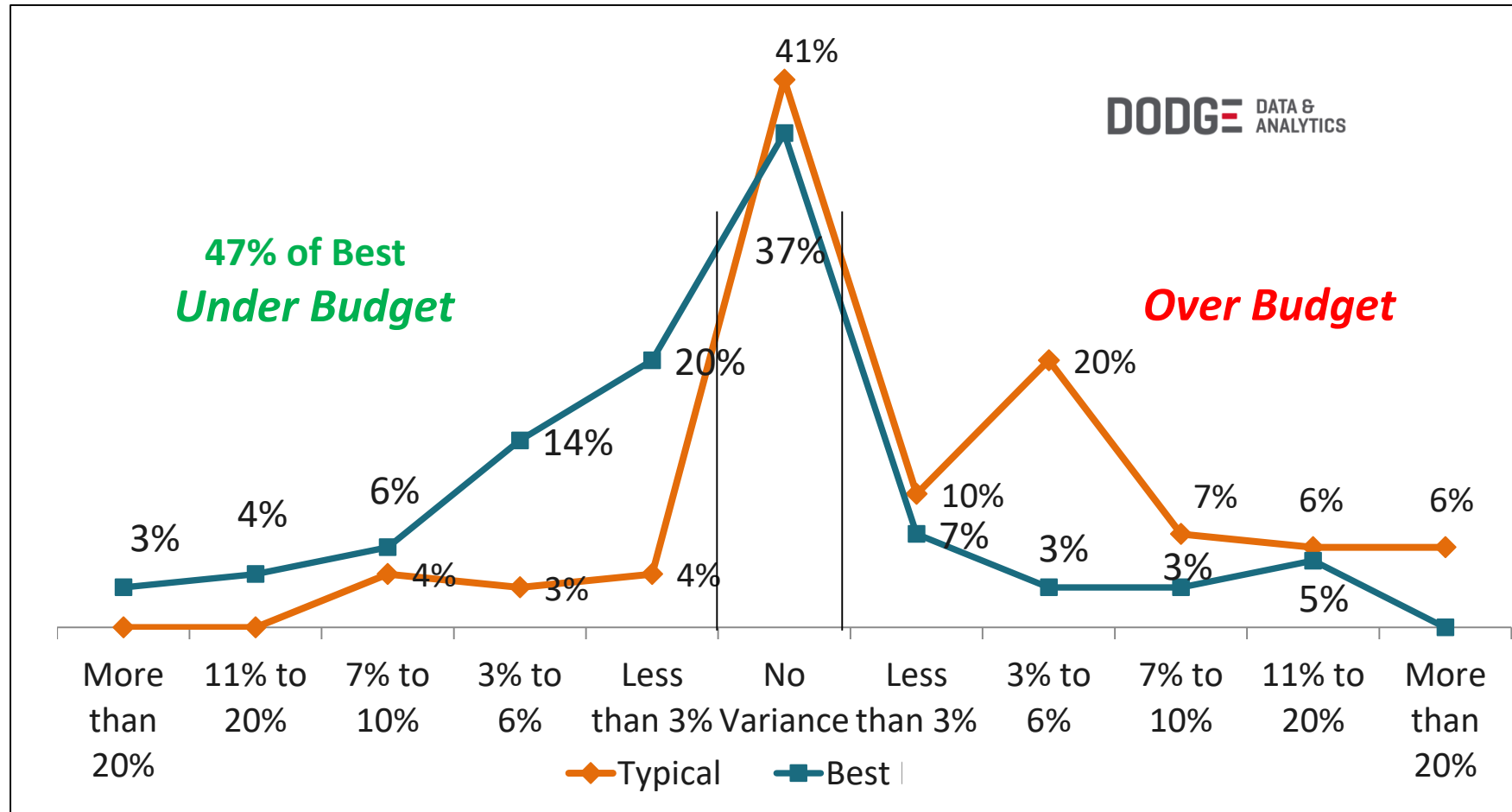
Schedule Performance

Variance of Final Schedule vs. Allocated Capital Schedule

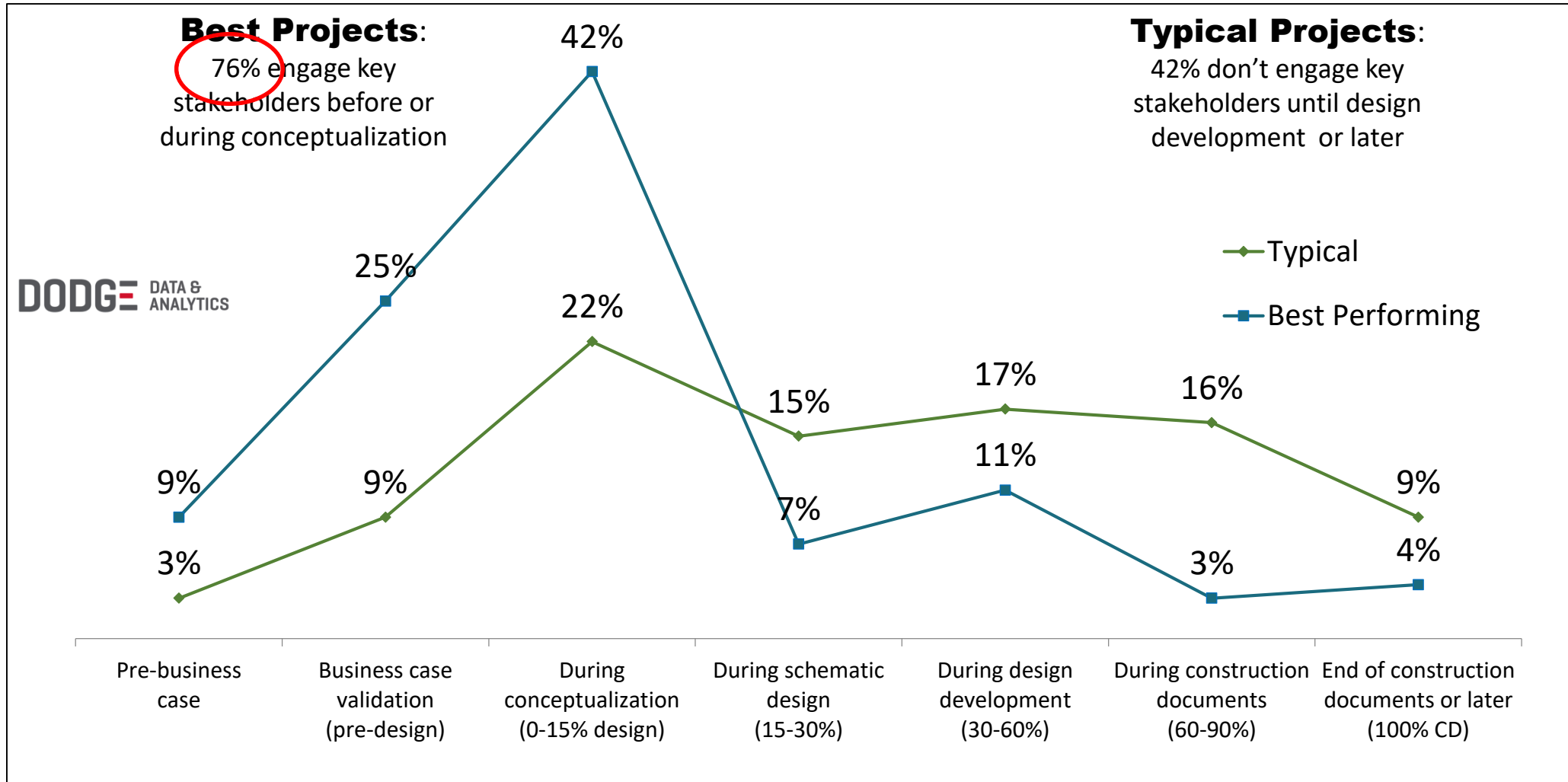


Budget Performance

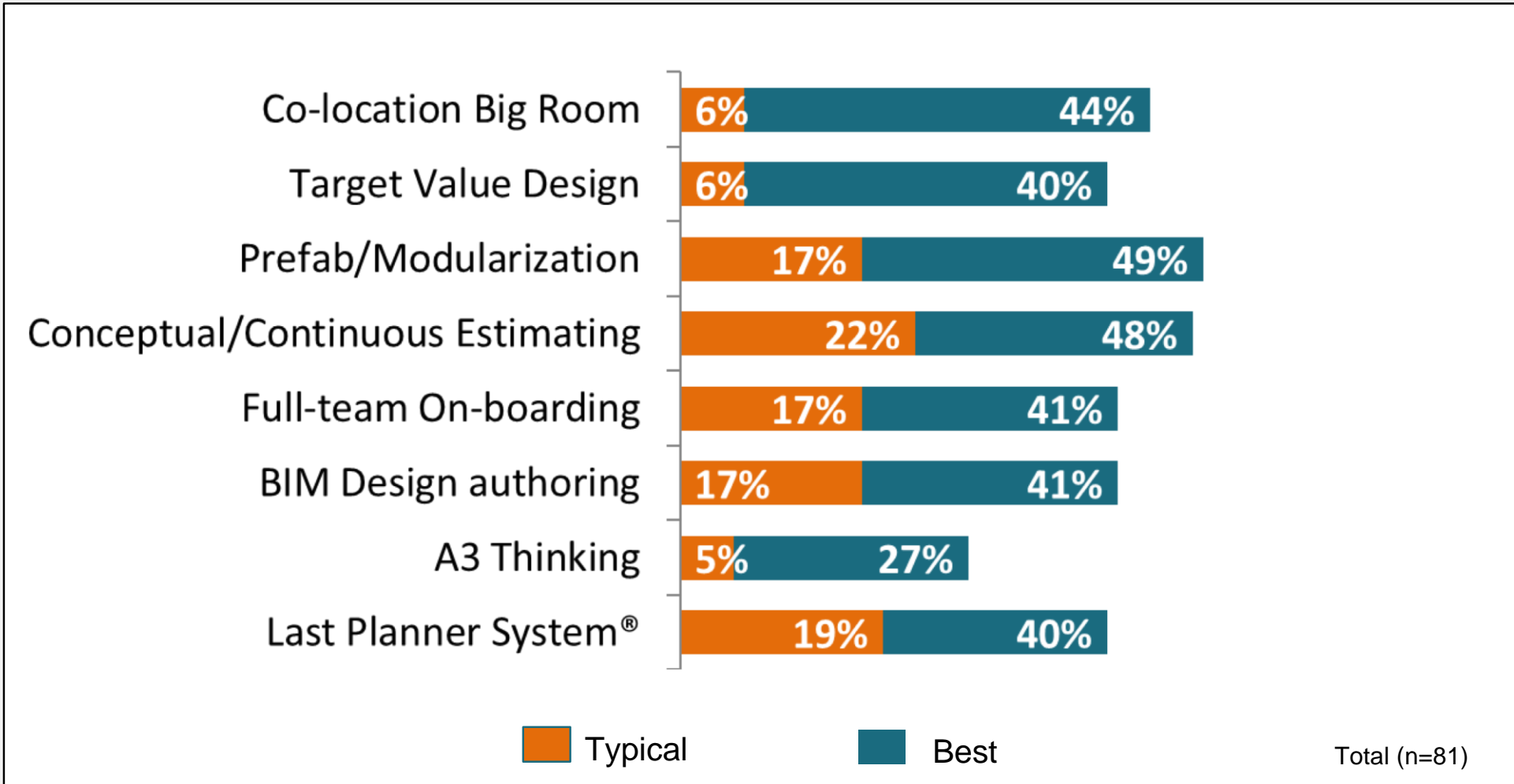
Variance of Final Cost vs. Allocated Capital Budget



Timing of Key Stakeholder Engagement



LEAN TOOLS USE IN BEST VS. TYPICAL PROJECTS



Big Room – What?

- Mindset
- Intense focus on advancing work
- Refers to the behaviors & actions of team
- Its about the collaborative behavior of a team and the work they are producing



Effective Big Room

- Foster behavior leading to high performing team
- Adds significant value
- Drives down overall project costs
- Rapid advancement of work in short time frame
- Less rework and less waste
- Collaborative brain power together



Target Value Design (TVD)

“A collaborative, team-managed design process that is used throughout all stages of design and construction to ensure that projects are delivered within the allowable budget, that projects meet the operational needs and values of the users and that projects promote innovation to increase value and eliminate waste”.

TARGET VALUE DESIGN VS. TRADITIONAL ESTIMATING APPROACH

Target Value Design

- Cost as an input to design
- Share information early and often
- Rapid model based estimating
- Carry multiple solutions sets forward as long as possible
- Provide cost feedback to concepts rather than drawings
- Graphical display posted for all to see

Traditional

- Cost as an output of design
- Wait till I'm finished; don't bother me* mentality
- Time consuming manual quantity take-off
- Early commitment to design solutions
- Design, then calculate cost of design
- Tabular cost estimates and reports for owners

Would you buy a car this way?



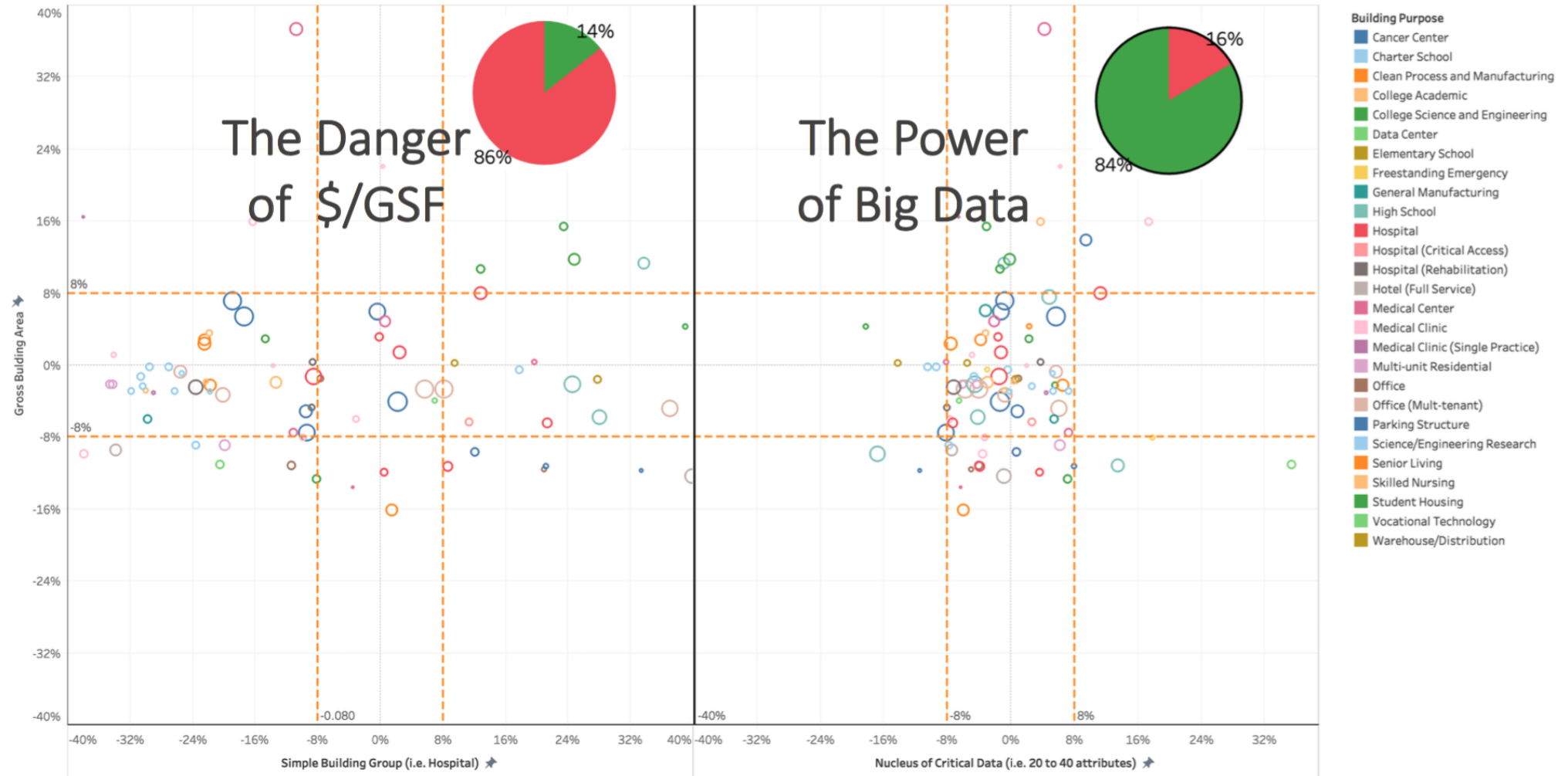
Big Data and Predictive Analytics

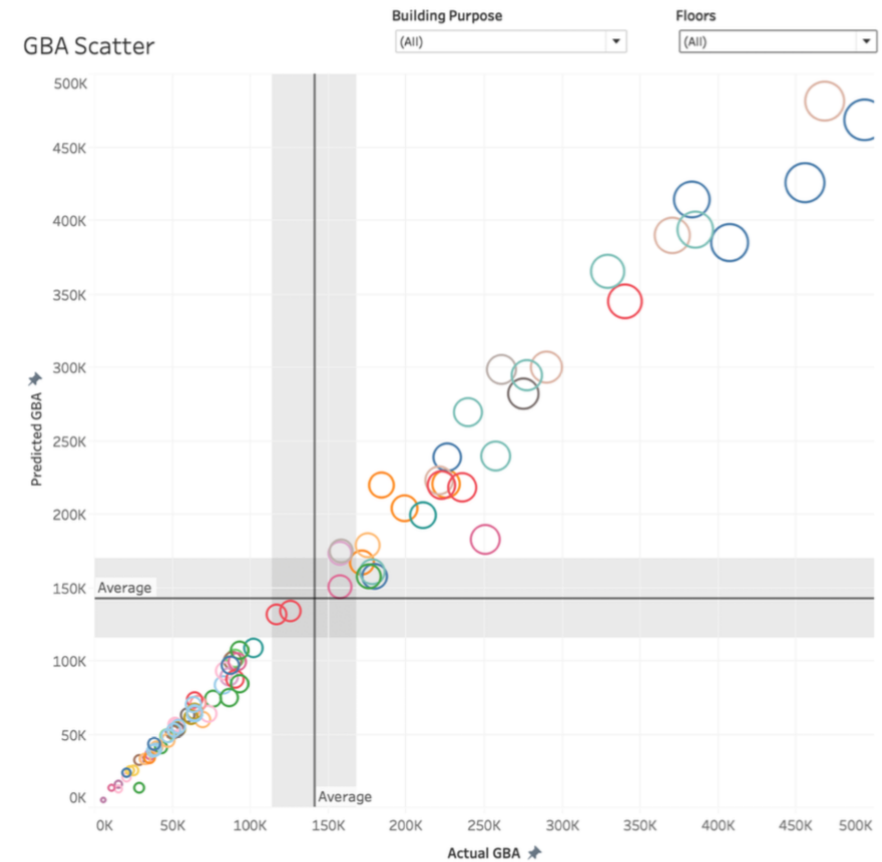
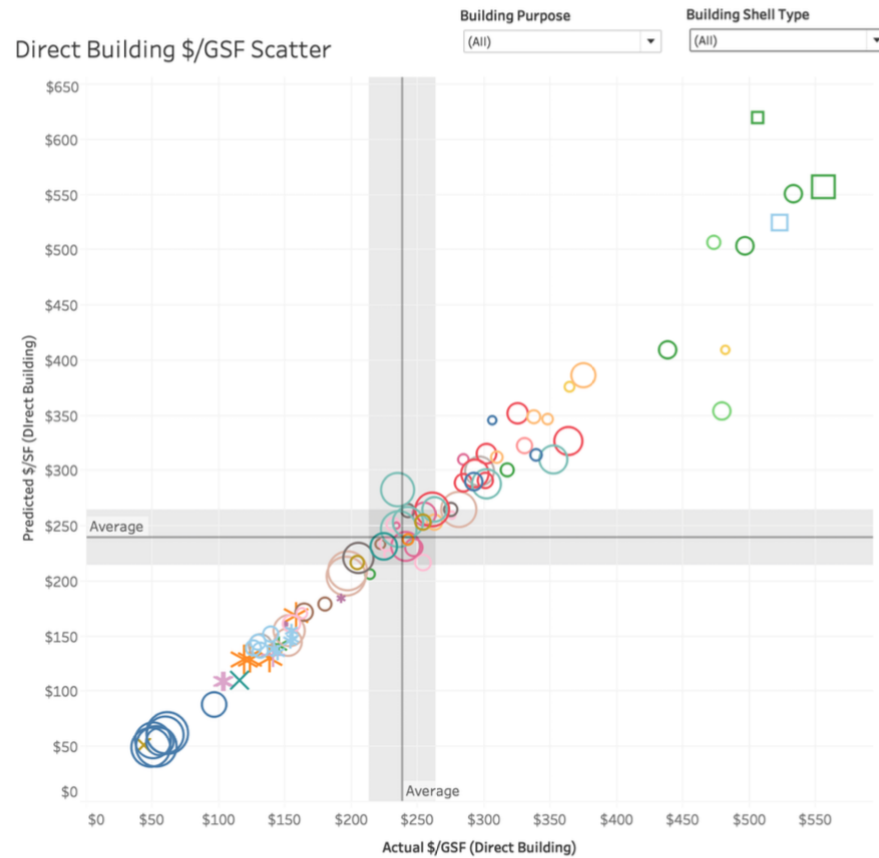


Building Purpose

(All)

Variation - Direct Building Costs (Normalized to St. Louis 2019)

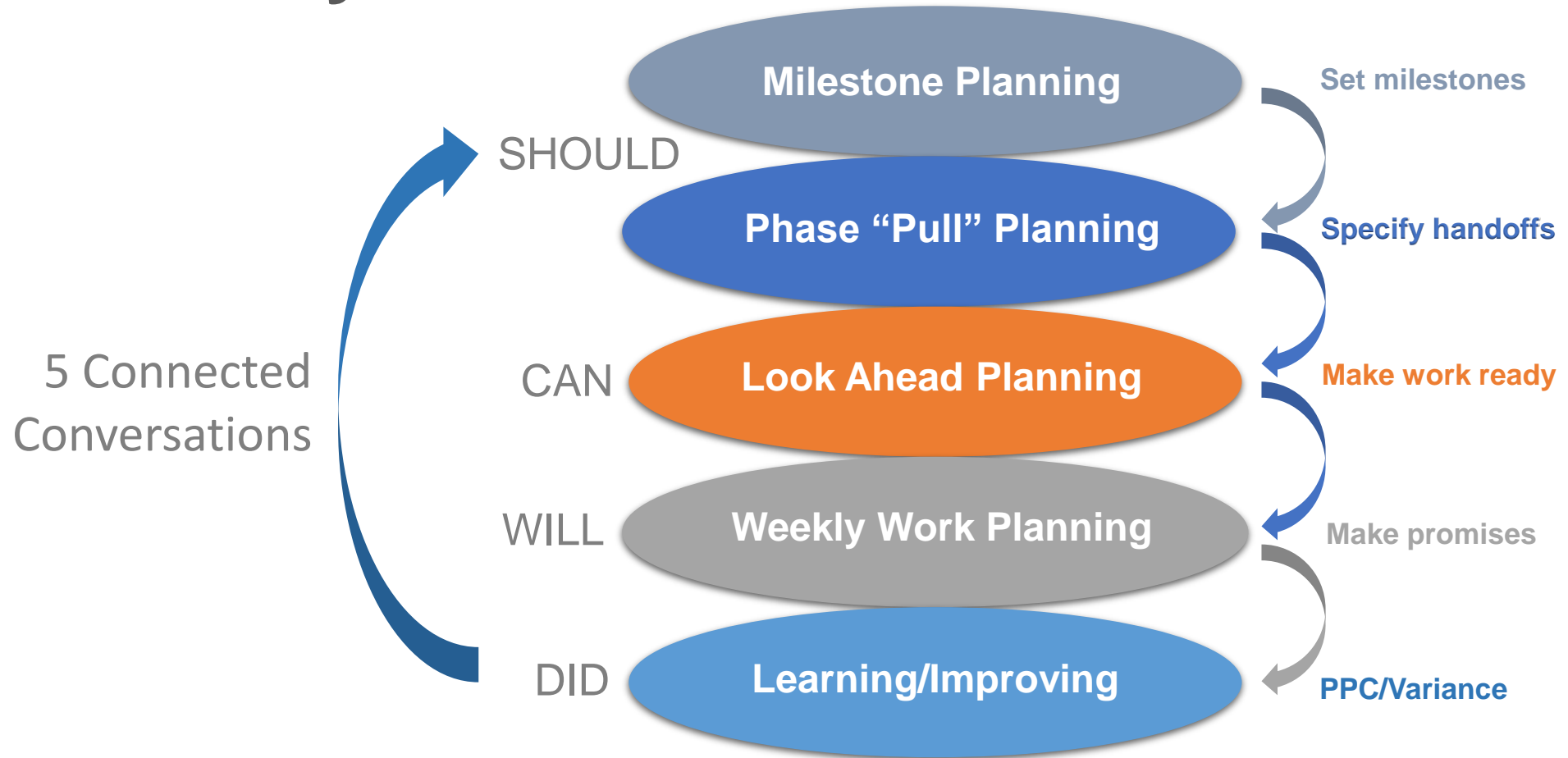




Building Purpose

- | | | | | | | |
|---------------------|---------------------|----------------------|----------------------|----------------------|---------------------|--------------------|
| ■ Cancer Center | ■ College Science.. | ■ General Manuf.. | ■ Hospital (Reha.. | ■ Medical Clinic (.. | ■ Parking Structu.. | ■ Student Housing |
| ■ Charter School | ■ Data Center | ■ High School | ■ Hotel (Full Serv.. | ■ Multi-unit Resi.. | ■ Science/Engine.. | ■ Vocational Tec.. |
| ■ Clean Process a.. | ■ Elementary Sch.. | ■ Hospital | ■ Medical Center | ■ Office | ■ Senior Living | ■ Warehouse/Dis.. |
| ■ College Acade.. | ■ Freestanding E.. | ■ Hospital (Critic.. | ■ Medical Clinic | ■ Office (Mult-te.. | ■ Skilled Nursing | |

Last Planner[®] System



University of Washington Population Health





Integrated Design-Build Contract Between Owner and Design-Builder Cost Plus Fee with a Final Target Cost

2.5 Incentive Compensation. The Incentive Compensation and the Incentive Compensation Percentages of the Risk/Reward Team Members will be set forth in the Incentive Distribution Spreadsheet. The Incentive Compensation can be adjusted by Modification. Incentive Compensation may be provisionally earned during the Project but will not be earned or paid before Final Completion.

1.10.6 Lean Principles. The Design-Builder will utilize Lean™ principles and techniques (the “Lean Principles”) as developed or defined by the Lean Construction Institute™ and as generally identified below.

1.10.6.1 Open Communication. Communication is open, clear, and direct. It is important that the Owner and all Design-Build Team Members be apprised of information that affects their performance or which they can impact. Communication will be directly between the immediate participants through the most expeditious manner, with information or decisions documented, and made available to the Owner and Design-Build Team Members. The goal of communication in Lean™ is to ensure that the Owner and all Design-Build Team Members have a high level of common understanding.

1.10.6.2 Collaboration. The Design-Build Team Members will freely share concepts and ideas with each other to improve the overall Project outcome. Within the limits of licensing or professional registration, the Design-Build Team Members will review each other's portions of the Work and recommend improvements and will openly consider suggestions from the Owner and all Design-Build Team Members. Nothing in this Section changes a Design-Build Team Member's responsibility for its portion of the Work or requires another Design-Build Team Member to assume responsibility for, or to engage in portions of the Work that require licensure beyond that necessary to perform its respective Work.

1.10.6.3 Reliable Promising. Effective Project planning requires that each Design-Build Team Member clearly communicate its needs and provide reliable promises to other Design-Build Team Members with regard to its own performance. If a Design-Build

Team Member discovers that it will not achieve a promise, it must immediately inform the PMT identifying when it can perform, and any impediments to its performance.

1.10.6.4 **Commitment-Based (Pull) Scheduling.** The Milestones will be collaboratively developed by the Owner and Design-Build Team Members based on the Owner's schedule requirements and realistic durations agreed by those who are primarily responsible for delivering the information, services, or materials for various components of the Project. In making detailed work plans for accomplishing the various Milestones, Design-Build Team Members will use a planning system based on requests and commitments by Design-Build Team Members to each other for information, materials, or resources that the requester needs to accomplish its task by a certain time in order to optimize the flow of Work through the Project by increasing schedule reliability and reducing bottlenecks and activities that do not facilitate achievement of the Milestones.

1.10.6.5 **Elimination of Waste.** Design or construction effort that does not add value is waste and will be reduced or eliminated. Design effort that is not necessary for construction or for regulatory purposes will be avoided. Similarly, construction resources and materials that are not incorporated into the completed Project will be reduced or eliminated. The Design-Build Team Members will maximize the use of just-in-time delivery of materials and information to reduce waste associated with maintaining inventories.

1.10.6.6 **Quality and Reduction in Rework.** Quality is created through careful execution of Work, not by inspection and rejection. The Design-Builder will develop a Quality Assurance/Quality Control work plan (QA/QC Work Plan) for the Project, which will be submitted to the Owner for approval. The Design-Build Team Members will consider innovative ways to design Work that reduces the risk of installation errors. Each Design-Build Team Member must strive to accurately complete its Work and identify any Work that does not meet the Project requirements so that necessary corrections can be identified and executed before, or at the time, the Work is being performed. The Design-Build Team Members will strive to eliminate rework. The Design-Builder will collaborate with the Design-Build Team Members to develop clear and effective procedures for a Design-Build Team Member to handoff its Work to a follow-on Design-Build Team Member so that any quality deviations are caught early.

1.10.6.7 **Best Performer.** Work is performed, to the greatest extent possible, by the organization or individual best capable of performing that Work.

1.10.6.8 **Value of Ideas, Not Status of Author.** Open communication and collaboration leads to the development of new ideas and concepts. Good ideas can come from any Design-Build Team Member, and it is the value of the ideas, not the role or status of the author, that determines whether an idea or concept will be used.

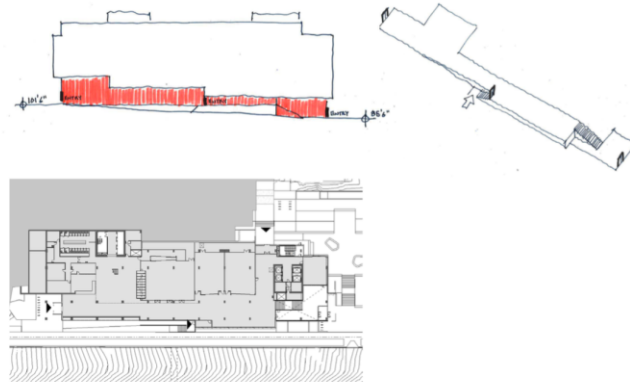
1.10.6.9 **Optimize the Whole Project, Not Its Components.** Under the leadership of the PMT, each Design-Build Team Member will focus efforts on creating value for the Project as a whole within the Project Charter. Efforts to optimize any individual Design-Build Team Member's portion of the Work must benefit the entire Project to be justifiable.

1.10.6.10 **Continuous Improvement.** Lessons learned are generated continuously and used to guide and improve processes while the Project is underway rather than only at its conclusion.

Set-Based Approach to Design

DECISION: MID-BLOCK ENTRY

OPTION 1: PORCH

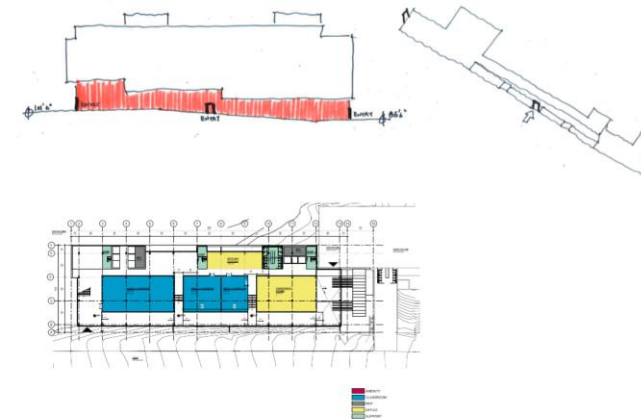


OPTION 1: PORCH

This option creates an elevated mid-block entry with accessible access via a "Porch" that extends from the North entry to the mid-block entry. The pedestrian experience along 15th Ave is challenged by a blank wall that supports the porch and entry.

DECISION: MID-BLOCK ENTRY

OPTION 2: RAMP/GALLERY



OPTION 2: RAMP/GALLERY

This option creates the opportunity to have a mid-block entry at grade elevation +1.95' with an accessible route through the building to Astin Lane. The gallery program would be located along the ramp facing 15th Ave. The pedestrian experience along 15th Ave is activated by transparency and program for the length of the facade.

10/12/2017

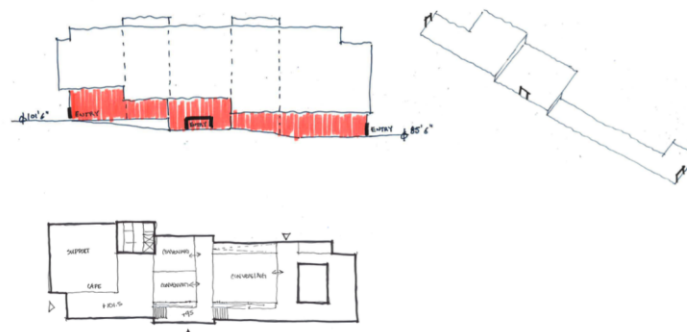
LEASE CRUTCHER LEWIS | MILLER HULL | UNIVERSITY OF WASHINGTON: Population Health Facility

10/12/2017

LEASE CRUTCHER LEWIS | MILLER HULL | UNIVERSITY OF WASHINGTON: Population Health Facility

DECISION: MID-BLOCK ENTRY

OPTION 3: PORTAL

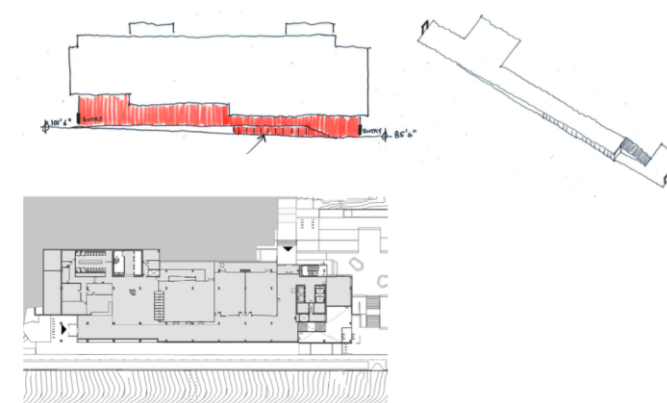


OPTION 3: PORTAL

This option creates the opportunity to have a gracious mid-block entry at grade elevation +1.95' with an accessible route through the building to Astin Lane. The gallery program would be located along the ramp facing 15th Ave. The pedestrian experience along 15th Ave is activated by transparency and program for the majority of the facade. The program and accessible path through the building from North to South is influenced by the mid-block entry and path to Astin.

DECISION: MID-BLOCK ENTRY

OPTION 4: NO ENTRY



OPTION 4: NO ENTRY

This option does not provide a mid-block entry. All entries into the building are accessible and all paths through the building are accessible. The pedestrian experience along 15th Ave is activated by transparency and program visibility.

10/12/2017

© 2019 Umstot Project & Facilities Solutions, LLC

LEASE CRUTCHER LEWIS | MILLER HULL | UNIVERSITY OF WASHINGTON: Population Health Facility

“Expanding Services While Minimizing Disruption
and Maximizing Retention of Existing Infrastructure”

design ::
TERMINAL 5.5-

LAX TERMINAL CORES PROJECT TO PREPARE FOR THE PLANNED AUTOMATED PEOPLE MOVER

Proposers shall submit a two-page narrative, not including any supporting tables, diagrams or illustrations outlining the Proposers' methods in integrating innovative design concepts and existing conditions of the work site and how that integration will be planned, executed and documented. Proposers should focus on how quality will be instituted as an overarching influence on all stages and aspects of the Project.

6. Risk Management Plan

Provide a Risk Management Plan that identifies the Proposers' strategy in identifying, assessing, and managing risk throughout the Project. Identify those resources that should be included in the Risk Management process and describe the roles they would play.

The Risk Management process should be applied to all stages of the Project and be included in Project Plans and operational documents. In this way, it becomes an integral part of every aspect of managing the Project, in every phase and in every process group.

Provide a preliminary risk register and Risk Breakdown Structure that identifies and assesses preliminary Project risks, both threats and opportunities, and includes an assessment of each along with a preliminary response strategy. The response strategy shall be of sufficient detail to adequately communicate its meaning.

7. Lean Construction

Proposers are required to submit a plan to incorporate BIM and Lean Construction methodologies in its execution of the Project. The plan should include recommended uses of Lean Construction techniques as they apply to each stage of the Project – Design, Preconstruction and Construction. Additionally, provide a narrative that illustrates the clear benefits to the Project and LAWA. Include Lean Construction tools that may be applicable to the Project and its goals. Examples include Reliable Promises, Last Planner® System, Standard Work/ Processes, Value Stream/Process Mapping, etc.

All trade contractors and significant vendors are expected to fully participate in the appropriate selected Lean Construction tools as facilitated by the Contractor. Include in the Plan how the Proposer will prequalify or train those partners to ensure their participation.

In addition, the Plan will require the designation of an internal or outside consultant facilitator. The facilitator shall be trained and competent in establishing work practices for the Lean Construction tools being implemented. Additionally, the facilitator will be required to have the facilitation skills which permit them to remain a neutral party in planning sessions.

8. Safety Plan

Proposers should consider the use of Early Work Packages in the determination of its strategy for accomplishing the Work. Identify enabling projects, including approximate scope, sequencing and phasing.

The overall design submittal requirements for the RFP will include the following:

- a. Target Value Design Plan
- b. Drawings – Type and scale described
- c. Listing of anticipated specifications
- d. Design narrative
- e. Proposed finish materials boards

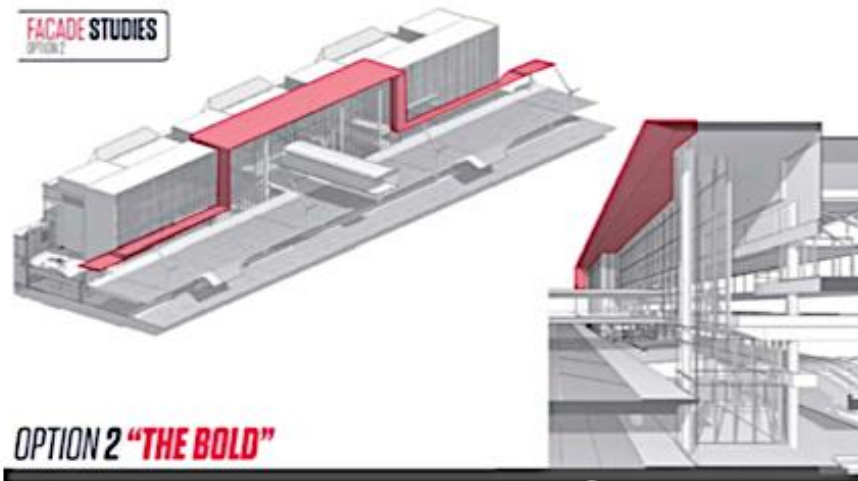
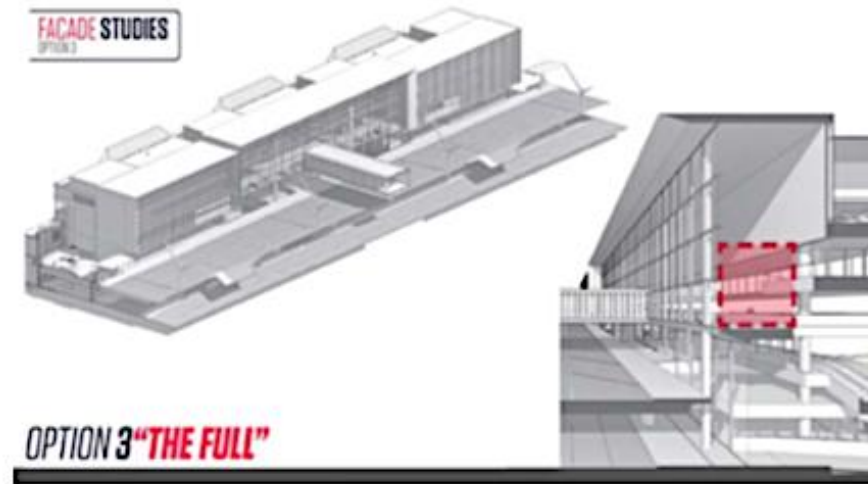
3. Target Value Design Plan

Target Value Design is a collaborative design process involving the Design/Builder, their suppliers, estimators, schedulers and LAWA co-located in one Project Management Office to collaboratively produce a design that provides the best value for LAWA where budget is a design criterion. Proposers shall submit a narrative that discusses the Proposers' successes and failures in performing Target Value Design and a Project plan that details the Proposers' approach to and plan for Target Value Design.

The plan shall include:

- Expected engagement efforts and interface with stakeholders
- Leadership approach during the design process that takes into account unexpected information.
- Approach to estimate development, level of detail and establishment of the target value(s)
- Project planning methods and studies that will be used to develop the Basis of Design.
- Identification of the methodology for developing details in small batches in collaboration with Stakeholders.
- Description of the proposed methodology for prioritization of design details based on Stakeholder prioritization.
- The organization of resources in groups or disciplines or other means and the advantage that organization brings to the design effort.
- A plan that best exploits the advantages of co-location and the expected outcomes.
- Description of design cycles and the methodology that will be used to incorporate lessons learned from previous design cycles.

Set-Based Approach to Design





Alignment Partnering™

PROJECT CHARTER

LAX TERMINAL CORES

We value:

Working safely

Producing quality

Collaborating & communicating effectively

Having fun

Delivering the highest value within budget

Achieving schedule milestones

Minimizing impacts on airport operations

Meeting stakeholder expectations

Innovating

Managing risk effectively

Making a fair & reasonable profit

We will:

Foster an environment of trust with one another

Establish & maintain a culture of collaboration

Communicate transparently & fairly

Promote a culture of safety

Keep a positive attitude

Succeed as a team

Be open-minded

Learn from one another

Respect each other

Ask for help

Offer assistance



Handwritten signatures of project team members, including names like Van Ching Thye, Keith, Paul, and others.

Data Gap Analysis



TERMINAL CORES & APM INTERFACE

PMO

"GOLD STANDARD AIRPORTS DELIVERED"

A COLLABORATION BETWEEN
LAWA
AUSTIN COMMERCIAL
AC MARTIN PARTNERS



**The Big Room
Collaboration Space**

LOS ANGELES INTERNATIONAL AIRPORT

TERMINAL CORES

This begins a **Larger Context**;
The **Next Step** in a More **Efficient**,
More **Sustainable** Future for LAX

PROCESS

Collaboration is inclusive and essential throughout the process—working together to develop solutions that are creative, viable, and value-based. Our approach begins with a clear understanding of the goals and vision for LAX, as well as understanding the key factors involved with the competitive landscape and airport conditions of the airport.

globalization
urbanization
operations
guest experience
wayfinding
security
technology

PRINCIPLES

1. VISION
Support the success of the LAX airport by providing a world-class airport experience.
2. ACCESS
Provide seamless connections between the terminal and the airport, including easy access to the terminal, parking, and transit.
3. UNIFICATION
Provide a unified experience for all airport users, including passengers, staff, and visitors.

PERFORMANCE

DESIGN + CONSTRUCTION
OUR TEAM'S SINGULAR OBJECTIVE IS TO PROVIDE WORLD-CLASS SERVICE TO LAX BY COMMUNICATING, PROBLEM-SOLVING, ADAPTING, AND EXECUTING OUR WORK WITH PROFESSIONALISM AND INTEGRITY. THE TEAM IS OUTCOME-ORIENTED AND WILL HARNESS THE INSIGHTS AND TALENTS OF ALL PARTICIPANTS TO OPTIMIZE WHOLE-SYSTEMS THINKING INTO PROJECT RESULTS.

delivering + measuring success

4. GUEST EXPERIENCE
Provide the best experience with new amenities.
5. MOVEMENT
Create a clear, intuitive path through the terminal.
6. VISUAL WAYFINDING
Provide intuitive visual cues and signage throughout the terminal.
7. FLOW
Create zones of vertical circulation to accommodate different types of passengers and activities.
8. VISUAL CONNECTION
Provide seamless connections between the terminal and the airport, including easy access to the terminal, parking, and transit.
9. PLANE TO TRAIN
Provide a unified experience for all airport users, including passengers, staff, and visitors.



INVITING + DYNAMIC + REFINED + FUNCTIONAL = 2021

PASSION

We believe in the power of design to enrich the human experience—it inspires, influences, and transforms our environment; it conveys meaning beyond the functional.

MOBILITY
THE CORE OF 21ST CENTURY LAX: SUSTAINABLE CITIES

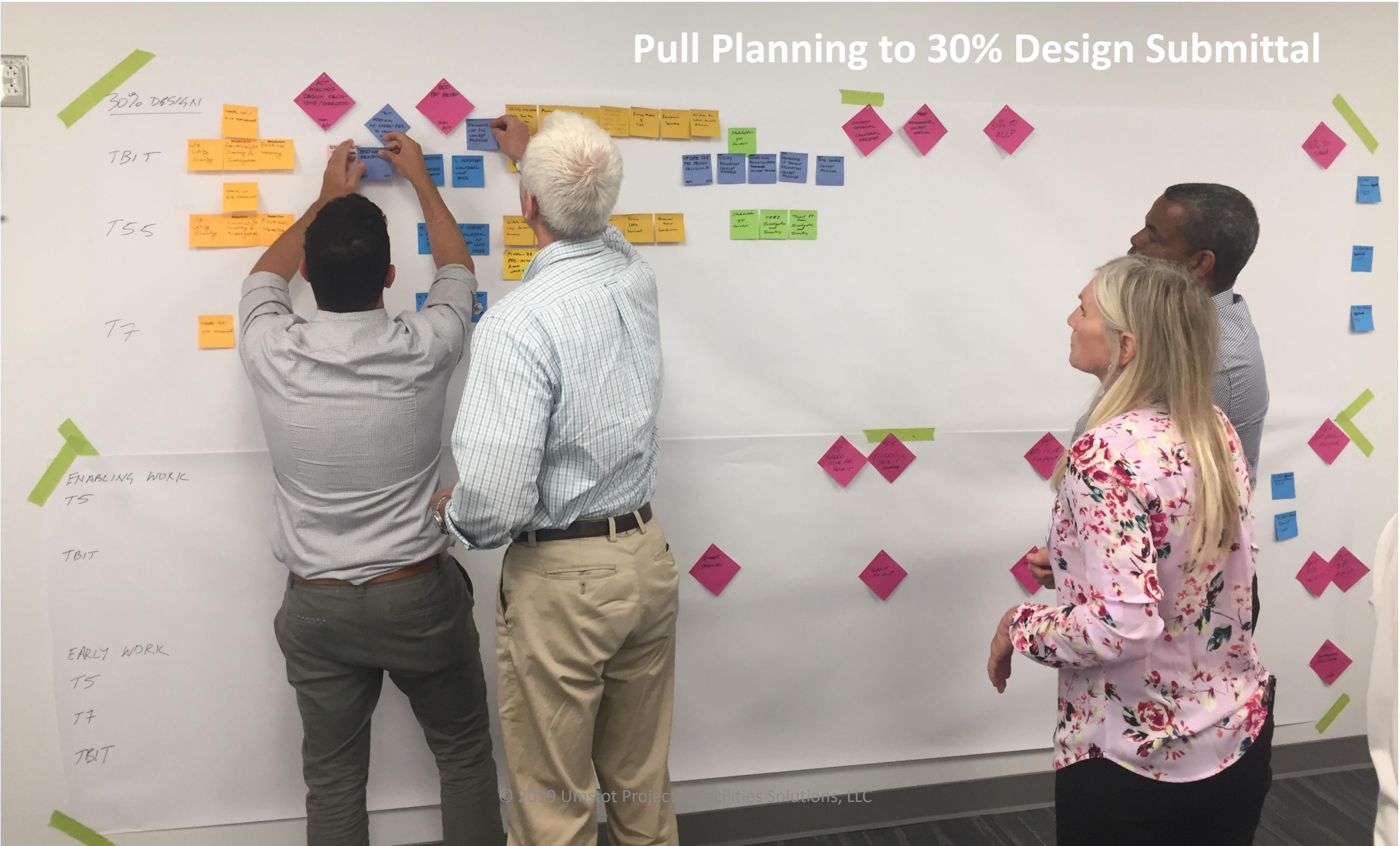
CONNECTIVITY
OF PEOPLE & SERVICES, KNOWLEDGE & INNOVATION, CITIES & REGIONS

RELATIONSHIP
WITH ITS CITY, LOCAL, AND GLOBAL COMMUNITY

21ST CENTURY
21ST CENTURY AIRPORTS ARE THE MOST VISIBLE PUBLIC INFRASTRUCTURE ELEMENTS, SERVING AS THE GATEWAY TO THE CITIES+REGIONS THEY SERVE.



Pull Planning to 30% Design Submittal



Forward Pass by Design Manager



Pull Planning and Scrum in Design



Scrum Board Wall

T5.5 SCRUM

Constraints			
Date Added	Description	Date Resd	Res Party
12/4	RFI - Loads From Bridge (Cable)	12/11/7	LA W&A

BACK LOG

Start: 11/26/2017

Enabling Energy Model
T5.501834

Start: 11/21/18

T5.5 30% Docs
T5.501834

Start: 11/21/18

T7 30% Docs
T7.0100

Start: 12/21/18

T5.5 30% Sub.
T5.501834

Start: 12/21/18

T7 30% Sub.
T7.0105

T5.5/T7 SPRINT

DOING

DONE

BACKLOG

Meet w/ Delta
re.
Utilities (2)

PSOMAS
REVIEW &
COMMENT ON POTHOLE
PLAN (2)

BMCD
Special Systems
(E) Equipment
Survey (5)

PSOMAS
meet
w/
CADDs (2)

BMCD
Mech
(E) Equipment
Survey (5)

GENERATE
INITIAL
ROOM
NUMBERS (2)

Safety
Work
Plan
Penhall (2)

BMCD
Elect
(E) Equipment
Survey (5)

GENERATE
ENLARGED
PLAN (2)

Pre Con
Meeting
Penhall (2)

GENERATE SUB
PLANS (DRAFT) (3)

BORN DETECTORS
ISSUE
WALK (2)

PREFER TO
(E) CHILLER
WALK (2)

PAT Rev.
meetings
for reviews (2)
Send
Comments
to ACLP (3)

Room
Door
Eqpt
Naming (2)

DOING

COMPLETE
DRAFT POTHOLE
PLAN AND
ISSUE TO
AC MARTIN
&
PSOMAS (2)

BMCD
Cx Plan
Draft Complete
(15)

FINALIZE
POTHOLE
PLAN (3)

Finalized
Labor
Rates
Penhall (2)

ADJUSTMENT
Report
Final (2)

GEOTECH
FIELD
INVEST. (1)

EXECUTE
Demo
Contract
SITE INVESTIGATION
Plan (2)

QC REVIEW
Validation
of
BOB (13)

Stair
1+2
Draws for
later loads (2)

DEFINE WALL
TYPES
(INTERIOR) (13)

UTILITY POC (2)

-SME-
LAWA PID
CDG LARD (5)

JAMA (34)
10% Check

DEFINE BLDG
QUADRANTS (8)

-SME-
CBP
APPROVAL:
LETTER W/ PORT
DIRECTOR (13)

JAMA (3)
COORDINATION
BTWN
GL A & B

REVISE
LEVEL
NAMES (3)

-SME-
ICE LOC
APPROVAL
LARD - CDG (5)

DIRECTION
FROM
ACLP FOR
FACADE
REDESIGN (8)

DEFINE
WALL TYPES
(EXTERIOR) (13)

-SME-
LAWA PID
CUTSHEET
PREP. (3)

GENERATE
ALTERNATES
DELIVERABLES
LIST (5)

EXITING DISTANCE
MODIFICATIONS
(DRAFT) (13)

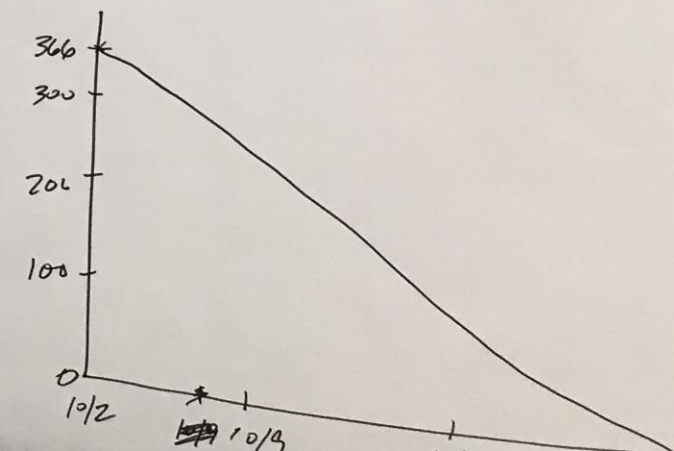
-SME-
UPDATE
ANCILLARY
TABLE: TENANT (2)

Fiber Optic
relocation
design (1)

LOCK
GRIDLINES
FACADE &
UPPER ROADWAY
(NEED) (13)

DONE

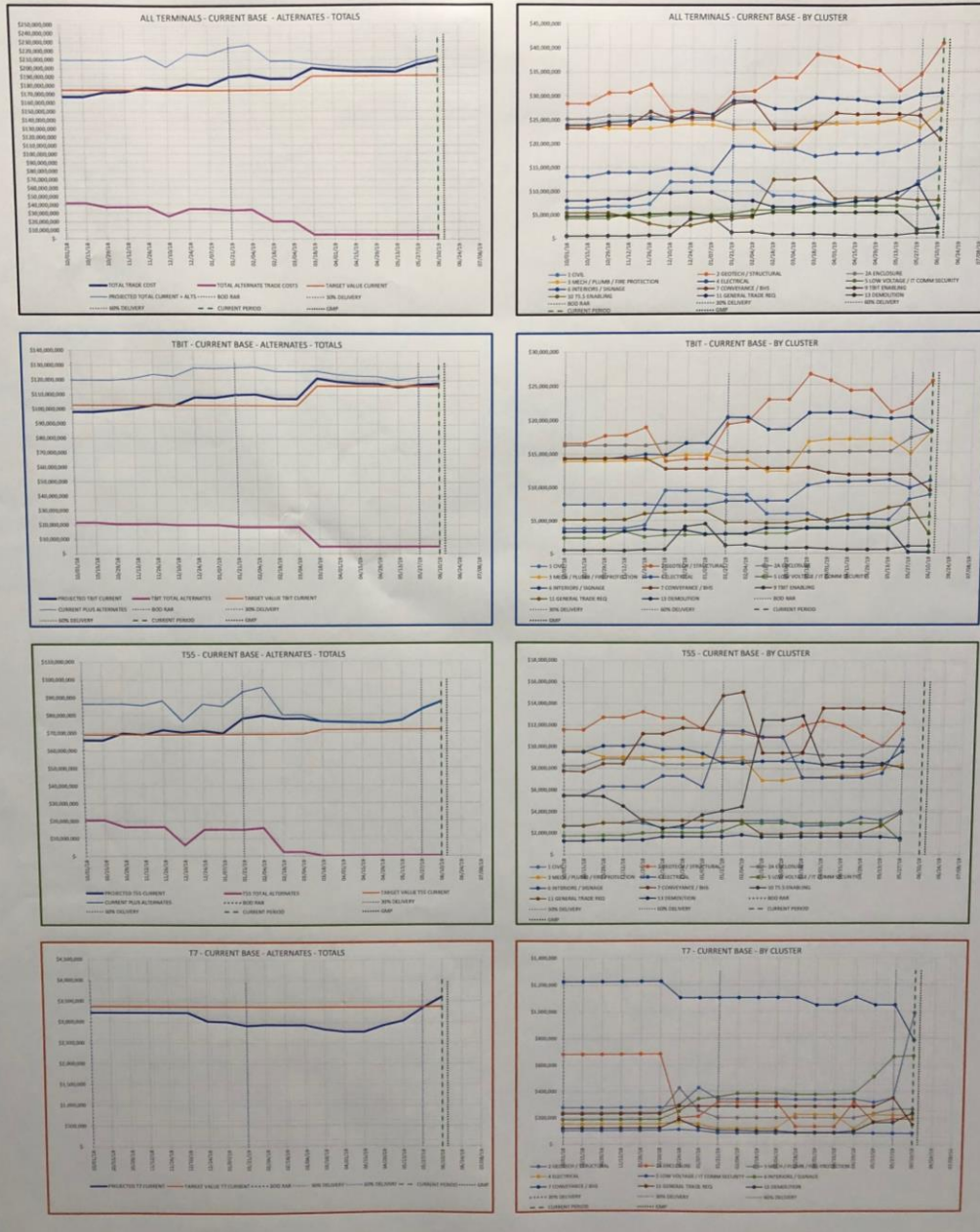
Scrum Board



Big Room Daily Scrum Stand Up







Target Value Design Cost Tracking by Cluster Group and Overall Elements of Project

UC San Diego – Future College



Organizing Ideas Overview

To realize the three fundamental development concepts of this plan as explained in the executive summary; Gateway Experience, Vibrant Mixed-Use Community, and Active Campus Connections; planning and development needs to occur on many levels. The basis of this plan are the following organizing ideas, which will help guide the implementation of the fundamental concepts:



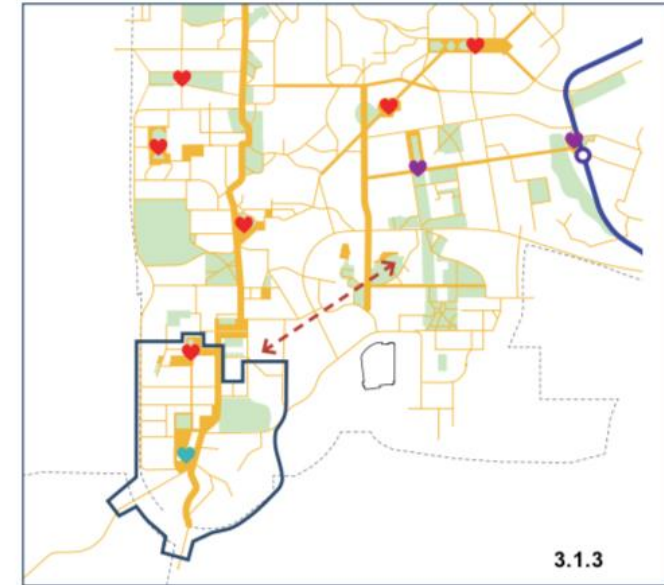
Gateway Experience

- 1 A Memorable Arrival Sequence
- 2 Facade Activation



Vibrant Mixed-Use Community

- 3 A Unified Pedestrian Zone
- 4 A Neighborhood Heart
- 5 Hierarchy of Open Spaces
- 6 Diverse Zones of Public Life



Active Campus Connections

- 7 Ridge Walk Extension
- 8 A Public Realm Framework

UC San Diego

B.iv) WORKING TOGETHER OR PROMOTING INTEGRATION

Describe the Team's past performance working together and/or describe the steps the Team has taken to promote **integration** and a **collaborative working environment**. The University reserves the right to award more points to those teams who have worked together in a collaborative delivery model. If the Team has not worked together, describe the efforts the Team has undertaken to create a collaborative teaming environment.

UC San Diego

C.i) DESIGN BUILDERS PAST PERFORMANCE MANAGING THE DESIGN PROCESS COLLABORATING WITH OWNER (DESIGN EXCELLENCE)

Describe the Design-Builder's past performance in managing the design process collaborating with owner's representatives and stakeholders to achieve Design Excellence.

UC San Diego

D.ii) ESTIMATING & COST MONITORING PROCESS (MEANINGFUL REPORTING)

Discuss how the estimating and cost monitoring reporting process provided substantive and meaningful information to the owner, including but not limited to use of Target Value Design to allow an owner and design team to make informed decisions about the cost implications of design decisions throughout the design process.

Skill-Building for High-Performing Team Leadership





Last Planner® in Design

SECTION 01 32 10

COLLABORATIVE CONSTRUCTION PLANNING PROCESS

This Division One section 01 32 10, Collaborative Construction Planning Process, shall replace section 01 32 00, Construction Progress Specification, for this Project.

GENERAL

1.1 RELATED DOCUMENTS

- A. Construction Drawings, Technical Specifications, Addenda, and general provisions of the Contract, including Contract General Conditions and Supplementary General Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Section Includes:
1. Definitions
 2. Basic Requirements of Contractor's Scheduling System
 3. Collaborative Schedule Overview/Background
 4. LPS Facilitation
 5. Collaborative Schedule Process
 - a. Required Participants
 - b. LPS Implementation Material and Tools
 - c. Preconstruction Meeting
 - d. Master Milestone Schedule
 - e. Phase Pull Scheduling
 - f. 6 Week Make Ready Planning
 - g. Weekly Work Plan
 - h. Workable Backlog
 - i. Daily Work Planning Huddles
 6. Deliverables
 7. Responsibility for Completion

1.3 DEFINITIONS

- A. Constraint – In the context of the Last Planner® System, an input, directive, resource or other requirement that will prevent a task or an assignment from starting, advancing or completing as planned.
- B. Constraint Log – A list of constraints, each one with an identification of the individual or champion who promises to remove it by an agreed upon date.
- C. Last Planner® System (LPS) – A system for project production planning and control aimed at creating a work flow for reliable execution.
- D. Last Planner – The person who conducts the final planning of a task or activity and makes the work resource assignments for those in production.
- E. Milestone Plan – A master plan schedule developed collaboratively by a project team that identifies major milestones in the project as well as each team members' milestones and their timing.
- F. Pareto chart - Named after Vilfredo Pareto, this chart contains both bars and a line graph, where individual values are represented in descending order by bars, and the cumulative total is represented by the line.
- G. Percent Planned Complete (PPC) – Metric used in the Last Planner® System to gauge plan reliability. Defined as the ratio of the number of actual activities completed in a given time period over the number of actual activities planned (typically weekly).

CSU System – Adoption of Last Planner® System

VI. SELECTION CRITERIA

1. Professional experience of the firm in relation to the work to be performed – list each person with their role and office location for all staff identified as a part of this proposal (identify staff of sub-consultants similarly but separately).
2. Professional experience of the principals to be assigned to the project – list the Principals to be assigned to and involved with the project.
3. Professional experience and training of key personnel – list staff education, certification and training.
4. Demonstrated competence and specialized experience of firm.
5. Nature and quality of completed work.
6. Reliability of firm and continuity of proposed firm's staff and sub-consultants with firm.
7. Firm's workload and demonstrated ability to meet schedules.
8. Location of firm office(s) for project coordination and services.
9. Demonstrated ability of coordinating and working with various governmental subdivisions, jurisdictions and municipalities. Expertise in the coordination and documentation with those various groups to develop an overall building program (at both a Macro and Micro level) to be included within design build performance criteria as well as creating a change management plan for execution either by the firm or for another entity.
10. Demonstrated LEED and ZNE experience and capabilities.
11. Demonstrated expertise and experience in cost estimating, scheduling and phasing, value engineering and cost benefit analysis.
12. Expertise in state policies and goals concerning, Zero Net Energy design and Carbon Neutral operations.
13. Demonstrated effectiveness of Quality Assurance and Control program and procedures being utilized by firm.
14. Demonstrated experience and expertise in design/build, design and construction of improvements to existing office buildings including development of design build performance criteria for an existing building; conducting design and constructability reviews.
15. Demonstrated abilities of working knowledge of the latest industry techniques such as: Operating in a "Big Room" environment, Design-Build and Progressive Design-Build, Lean principles, Formal Partnering, Last Planner, Target Value design, use of A3's and Choosing by Advantages principals. DGS may utilize elements of these operational tools or none at all. However, DGS is seeking firms who can implement these tools and assimilate into a progressive partnering attitude focused on collaboration to optimize efficiency and value to the state and avoid litigation.

**RENOVATE RESOURCES BUILDING – CRITERIA ARCHITECT/ENGINEER
DEPARTMENT OF GENERAL SERVICES
SACRAMENTO, SACRAMENTO COUNTY
RESD PMDB 2018-21
Delivery: Design-Build**

Demonstrated abilities of the latest industry techniques such as Operating in a "**Big Room**" environment, Design-Build and Progressive Design-Build, **Lean Principles**, Formal Partnering, **Last Planner**, **Target Value Design**, use of **A3s** and **Choosing by Advantages** principles.

Resources

Cross-mapping between Design-Build Done Right™ and Lean Practices

<https://www.leanconstruction.org/learning/education/lean-in-design-build/>

Local Lean Construction Institute Community of Practice Look Up

<https://www.leanconstruction.org/local-communities/>

Lean Construction Institute Publications

<https://www.leanconstruction.org/learning/publications/>



[Lean Project Delivery | Building Championship Project Teams](#)



Lean Project Delivery

BUILDING CHAMPIONSHIP
PROJECT TEAMS

David Umstot and Dan Fauchier



Questions?

David Umstot, PE, CEM

david.umstot@umstotsolutions.com

www.umstotsolutions.com

619-201-8483 (O)