LEAN IN DESIGN FORUM

MAY 31-JUNE 1 • CHICAGO, IL

Target Value Delivery

MAY 31-JUNE1 2017

David and Summer Umstot, Umstot Project and Facilities Solutions, LLC

May 31, 2017

Agenda for the Day

- Introductions - 15 minutes
- Target Value Design (Delivery) – An Overview – 90 minutes
- Short break – 10 minutes
- Sample Project Overview – 15 minutes
- Value Proposition Group Exercise – 30 minutes
- Value Satisfaction Brainstorming – 30 minutes
- Group Conceptual Design – 60 minutes
- Lunch – 60 minutes
- Vote for Best Conceptual Design – 10 minutes
- Develop Budgets for System Clusters – 20 minutes
- Cluster Groups by Major Systems – Round 1 (3 concepts with costs) – 45 minutes
- Group Report Out on Costs – Project Target Cost Assessment -30 minutes
- Break – 15 minutes
- Cluster Groups by Major Systems – Round 2 – 30 minutes
- Group Report Out on Costs – Project Target Cost Assessment – 30 minutes
- Takeaways – 10 minutes
- Plus/Delta – 5 minutes

Lean Construction Institute

Provider Number H561

Target Value Delivery Workshop

053117TVDHW

David and Summer Umstot
Umstot Project Facilities & Solutions, LLC

May 31, 2017

7.5 LU|HSW Credit(s) earned on completion of this course will be reported to AIA CES for AIA members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

This course is registered with AIA CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

Course Description

Target Value Design (Delivery) is a disciplined management practice that is used throughout project definition, design, detailing, construction, commissioning and activation to assure that the facility meets the operational needs and values of the users, is delivered within the allowable budget, and promotes innovation though out the process to increase value and eliminate waste. Participants in this course learn about real-life experiences to open their mind to new ideas about innovation, constraints, and prototyping. They will learn how to drive innovations into a project within constraints and understand the importance of continual cost estimating in giving power to the end users to add value. At the end of the course, participants will understand the parameters and have methods for structuring TVD within their projects. In this interactive hands-on workshop, participants will use a mock project at Beloit College with a $32M target cost to learn the specific steps in successfully implementing target value design (delivery).

Learning Objectives

1. Participants in this workshop will learn how to collaborate with design, trade and construction partners to enhance the value proposition on a project within a fixed budgetary constraint.

2. Participants in this workshop will learn how to interactively coordinate real time pricing with design to meet project requirements within project constraints.

3. Participants will recognize and understand the importance of early specialty trade involvement. They will understand the importance of continual cost estimating of projects to enable designers to more effectively make informed decisions communicate value adds to the end users.

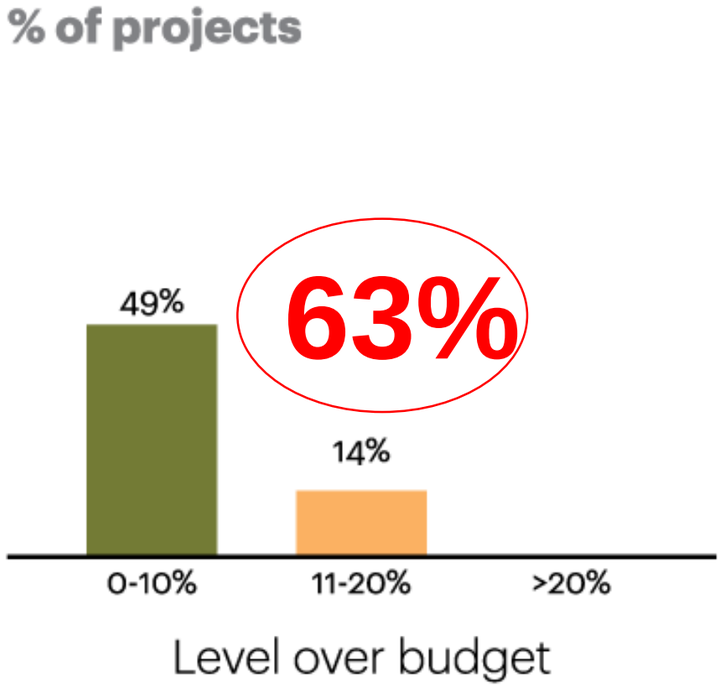
4. Participants will understand the parameters and methods for structuring TVD within their projects.

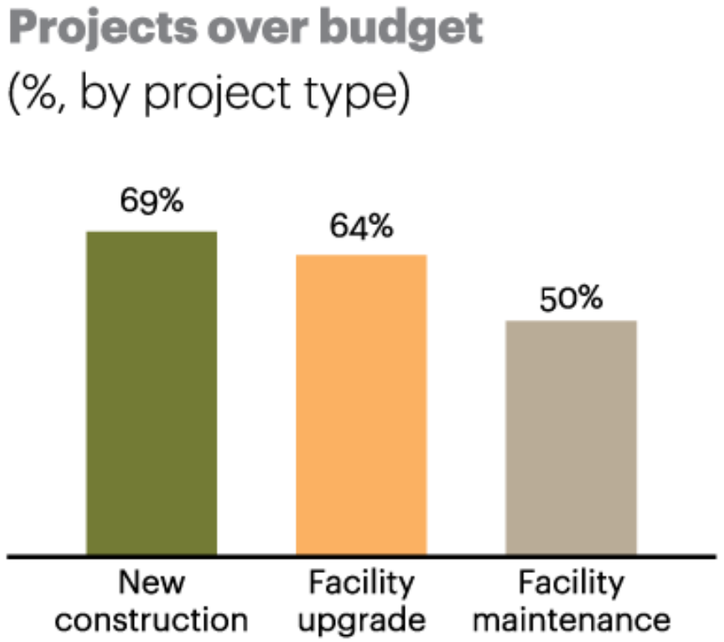
Why Target Value Design?

Traditional Project Design and Delivery Approaches are Failing at Alarming Rates!

“Danger: Cost overruns and delays possible. Scope not yet fully settled. Price to be determined later.” – Richard Korman, ENR Viewpoint January 25, 2016

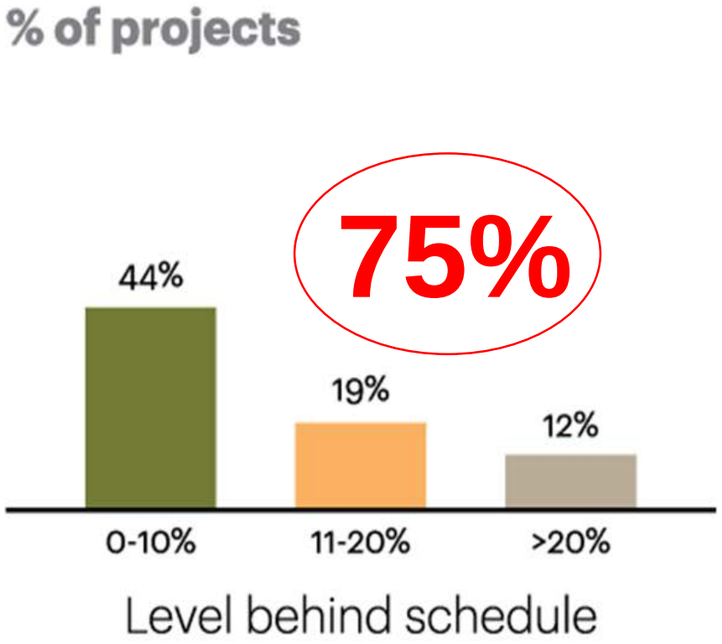
Capital Projects' Budget Performance

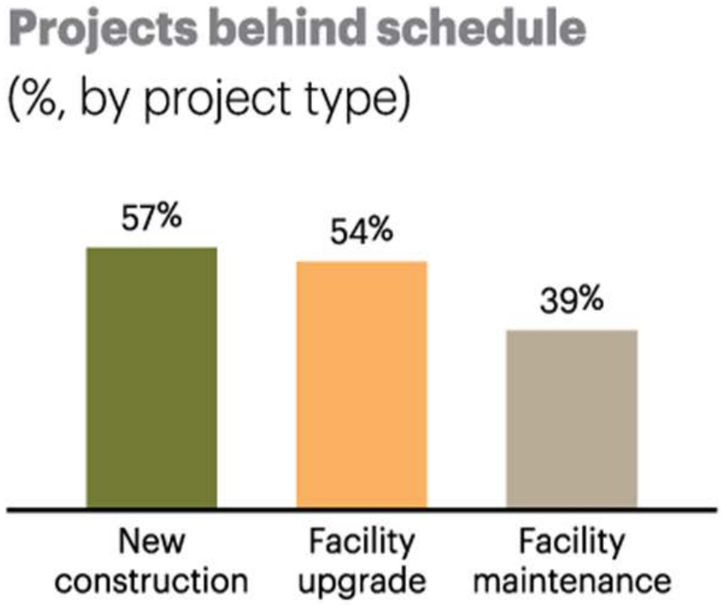




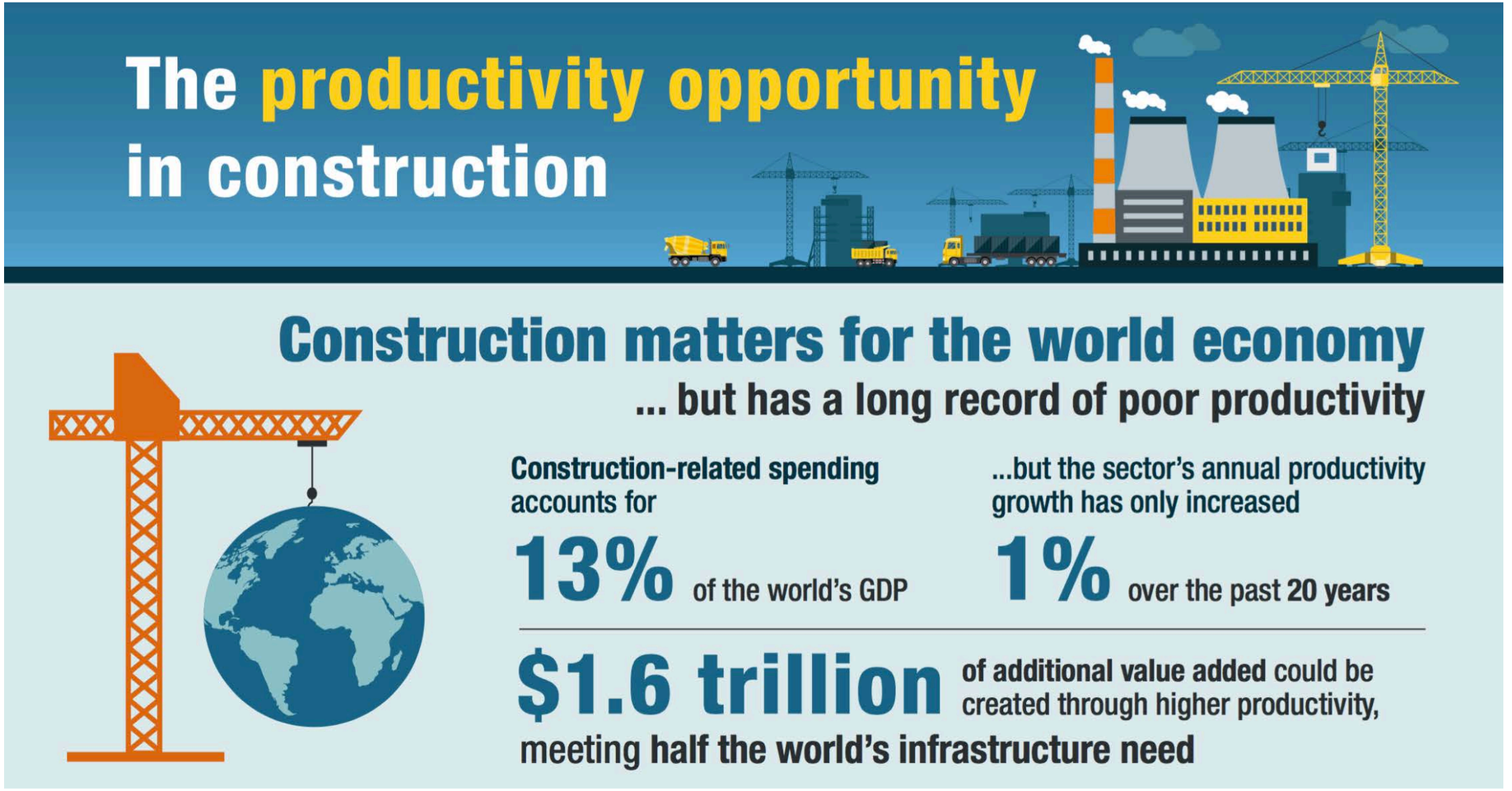
Source: A.T. Kearney Excellence in Capital Projects II study, 2012

Capital Projects' Schedule Performance





Source: A.T. Kearney Excellence in Capital Projects II study, 2012



Source: McKinsey (2017)

The Problem w/ Traditional Delivery

- Risk is high.
- 70% of projects are delivered late.
- 73% of projects are over budget.
- Rework and waste is high.
- Teamwork is unreliable.
- Customers are not satisfied.
- Profit margins are shrinking.

"Lean processes bring about improvements not only in cost and delivery but also in quality and safety."

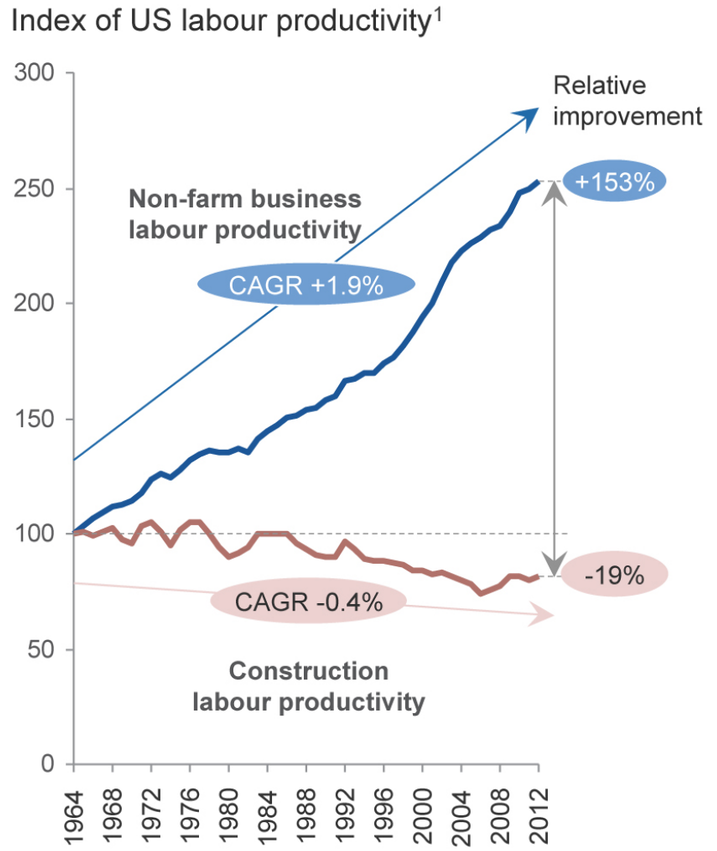
— World Economic Forum's *Shaping the Future of Construction: A Breakthrough in Mindset and Technology (pg. 31).*

Source: LCI Transforming Design and Construction 2016

Why Lean?

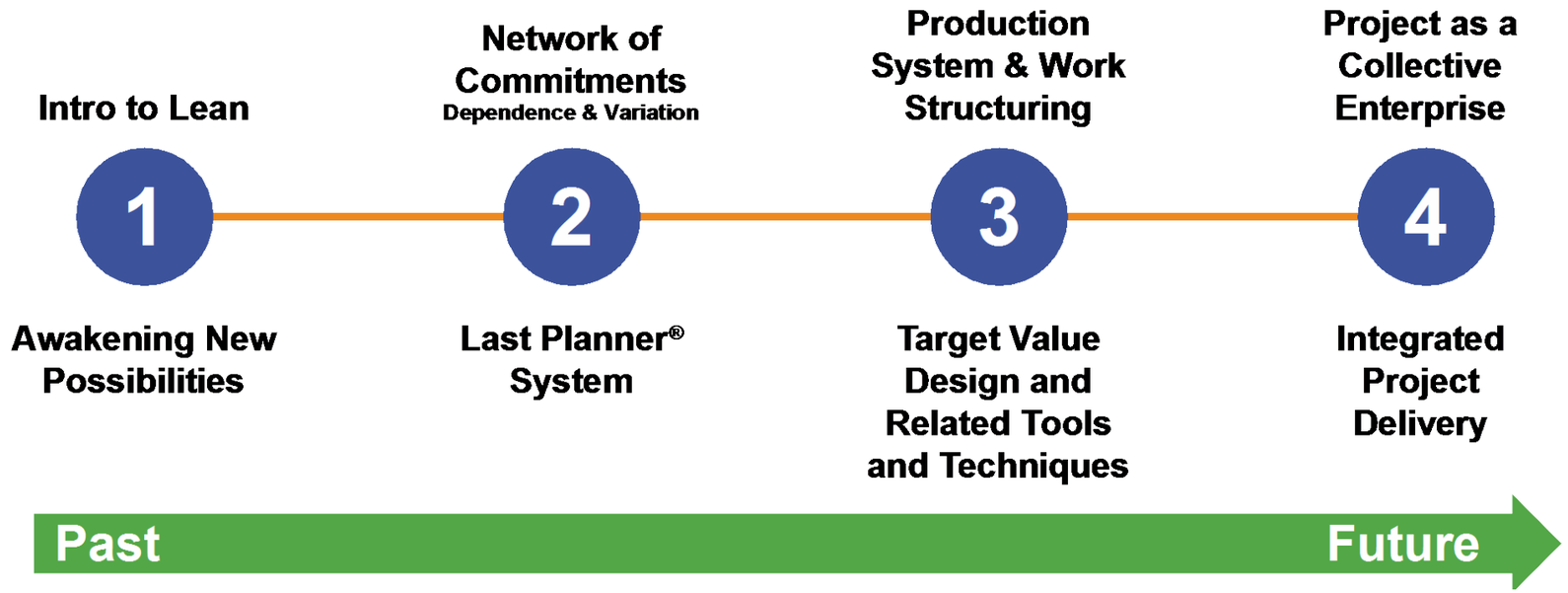
- Construction productivity is declining.
- Construction costs are skyrocketing.
- Injuries are too high.
- Traditional planning systems are unable to produce predictable workflows.
- Workflow reliability directly affects speed and cost of projects.

Figure 3: US Industry Productivity and Performance, 1964-2012[28]



What is Lean?

"Producing what is needed, when it is needed, with the minimum amount of time, materials, equipment, labor and space."



Lean *is* about:

Focusing on value
Eliminating waste
Continuous improvement

Lean *is not* about:

Cost cutting
Slashing prices
Workforce reductions

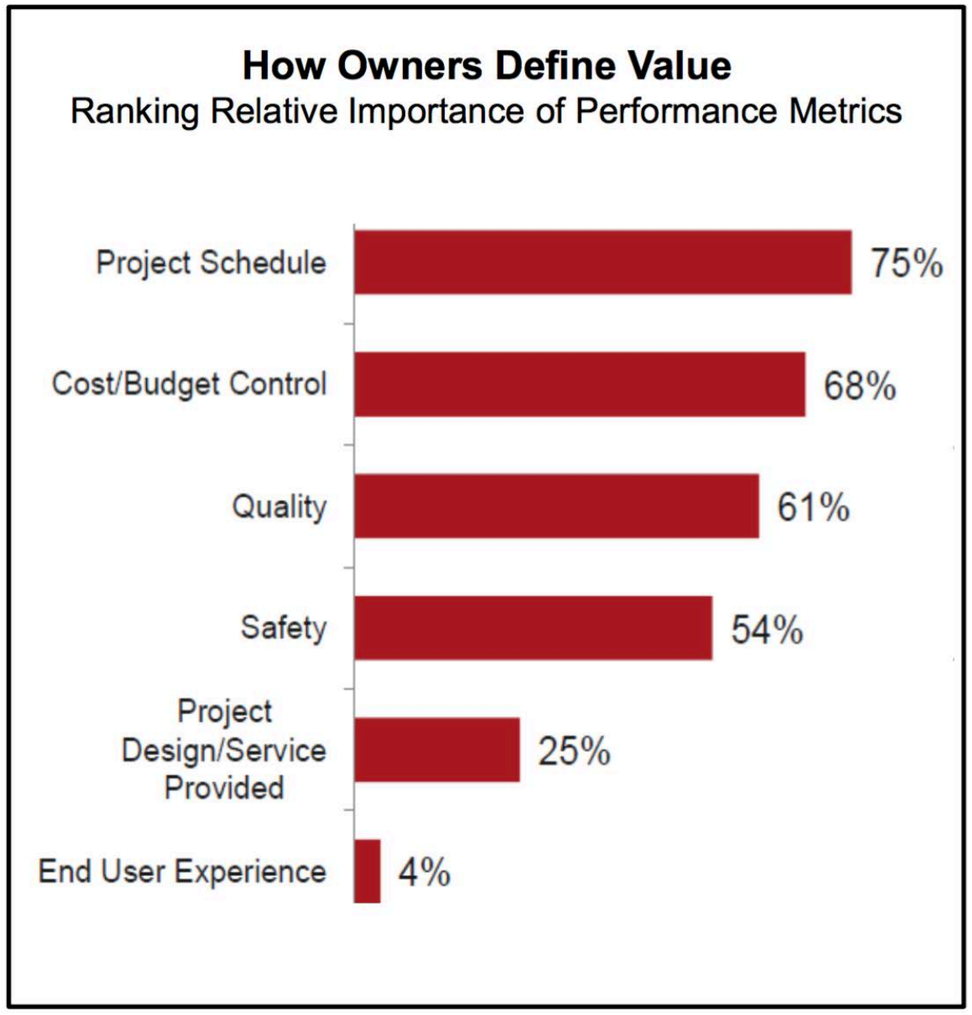
Target Value Delivery (TVD)

“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”.

Value

What the customer wants from the process. The customer defines value.

The value definition is composed of statements that describe expected outcomes, or “value” that the project will deliver.

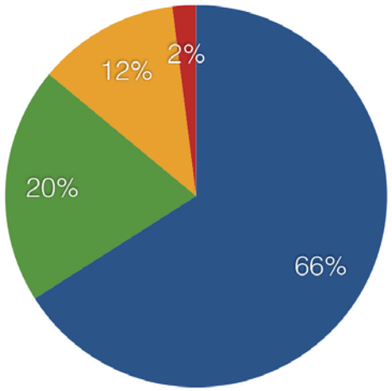


Source: McGraw-Hill (2014)

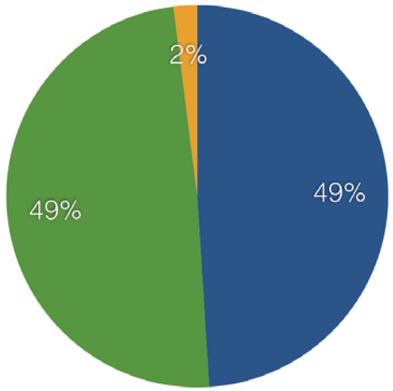
Frequency with Which Projects Meet Expectations

QUALITY

Owners

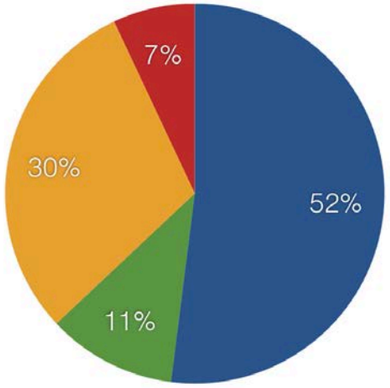


Architects and Contractors



COST

Owners



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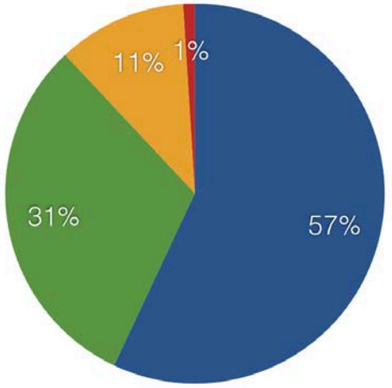
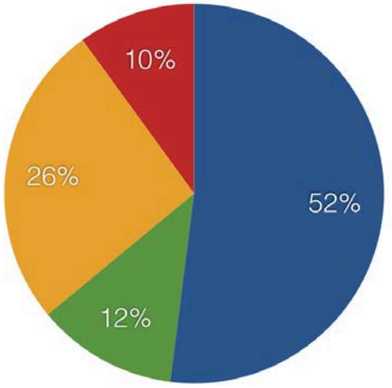


SCHEDULE

Owners



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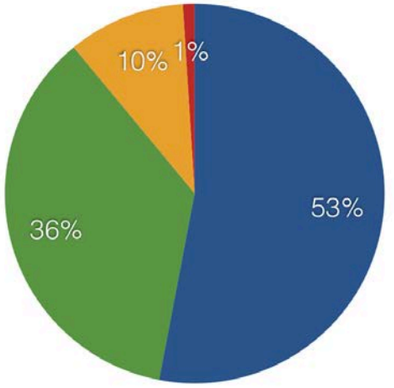


Always Meets Expectations

Frequently Meets Expectations

Sometimes Meets Expectations

Infrequently/Never Meets Expectations

Source: McGraw-Hill (2014)

“Value is in the eye of the beholder.”

val·ue (valyo͞o)

noun: **value**; plural noun: **values**

the regard that something is held to deserve; the importance, worth, or usefulness of something.

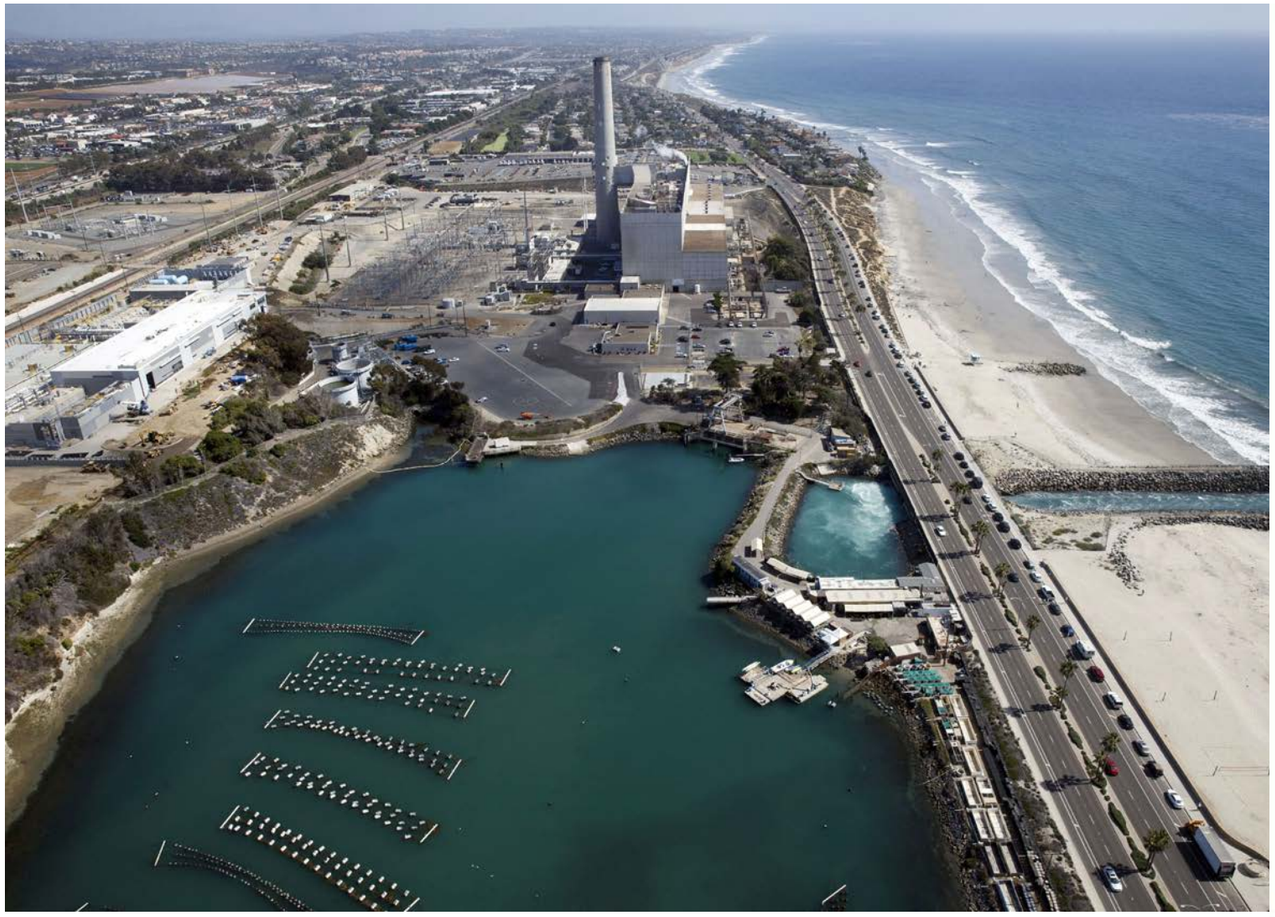
verb: **value**; 3rd person present: *consider (someone or something) to be important or beneficial; have a high opinion of.*

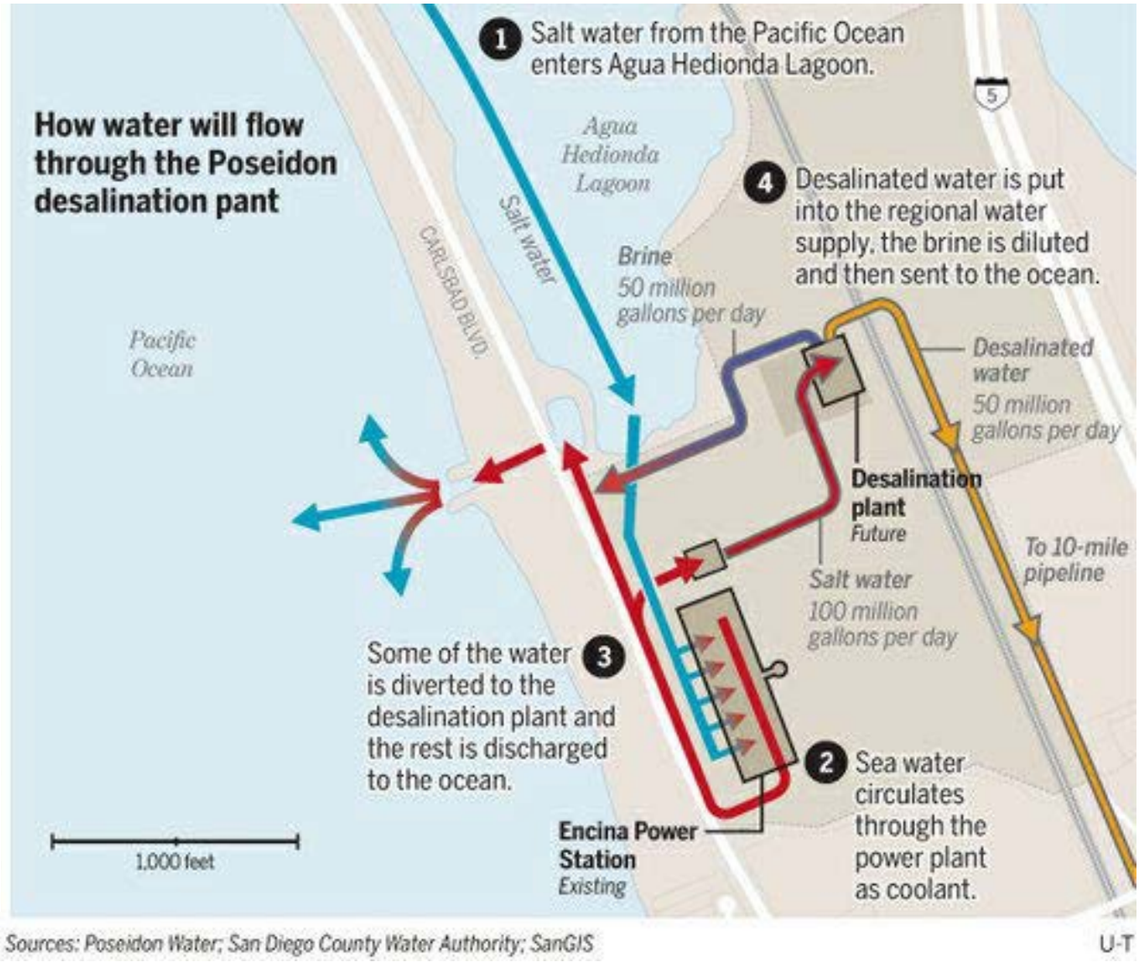
How does one define value?

1. Iconic Design?
2. Functionality?
3. Sustainable?
4. Beautiful?
5. Appropriate cost?
6. Total cost of ownership?
7. Energy efficient?
8. Net zero?
9. No Disruption?
10. Improved Productivity?

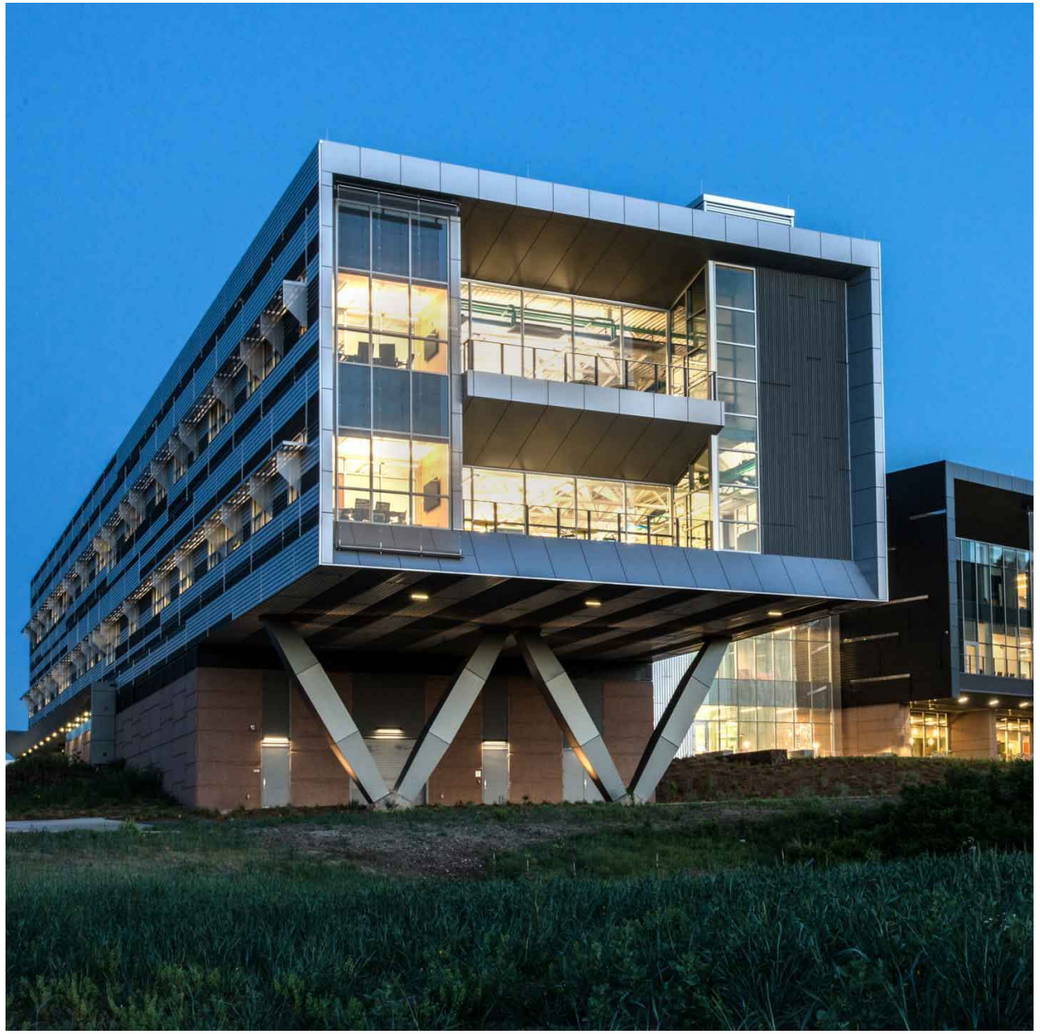
Spaceship 2.0

Poseidon Desalination Plant – San Diego



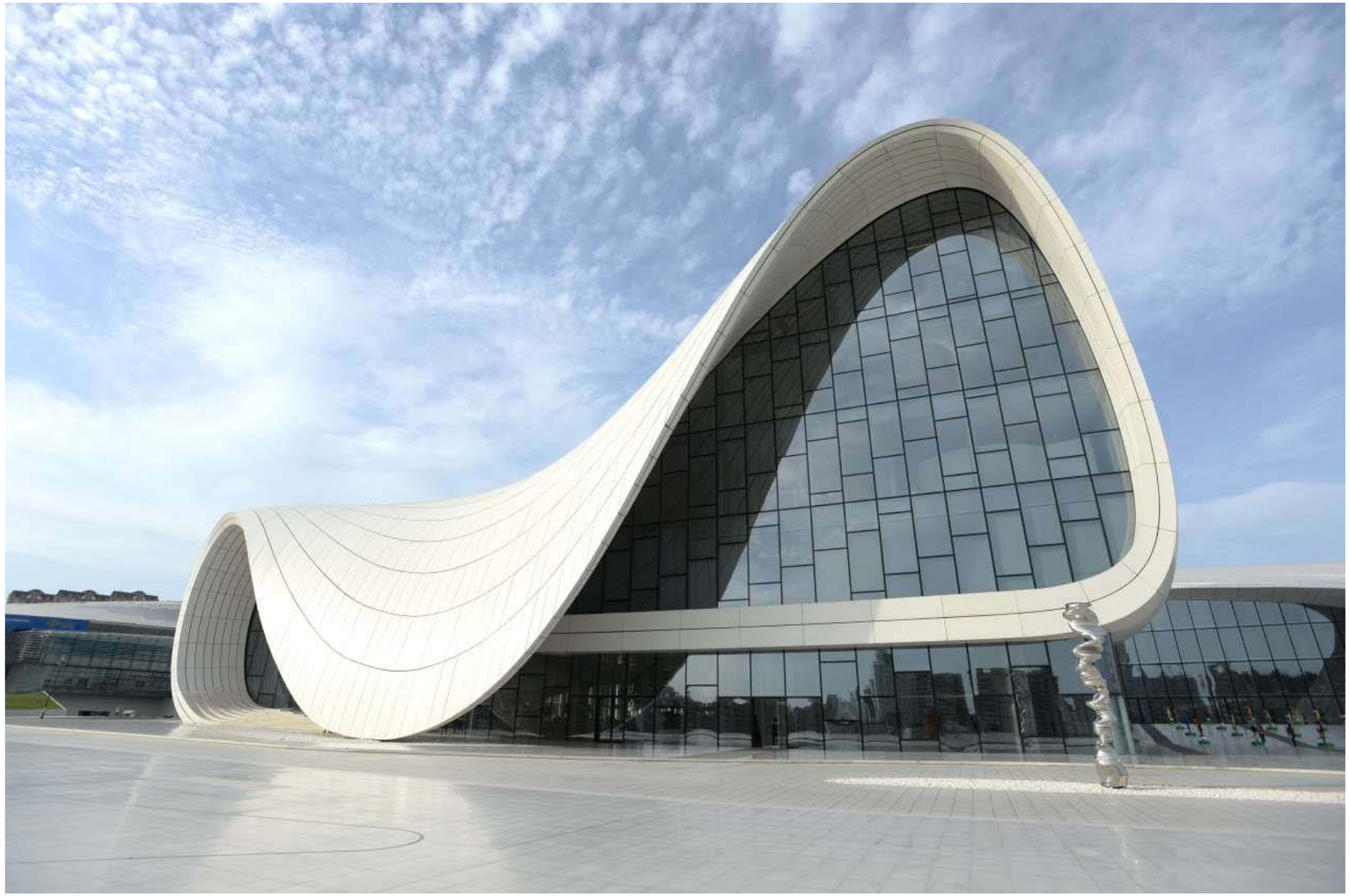


National Renewable Energy Lab, Golden, Colorado

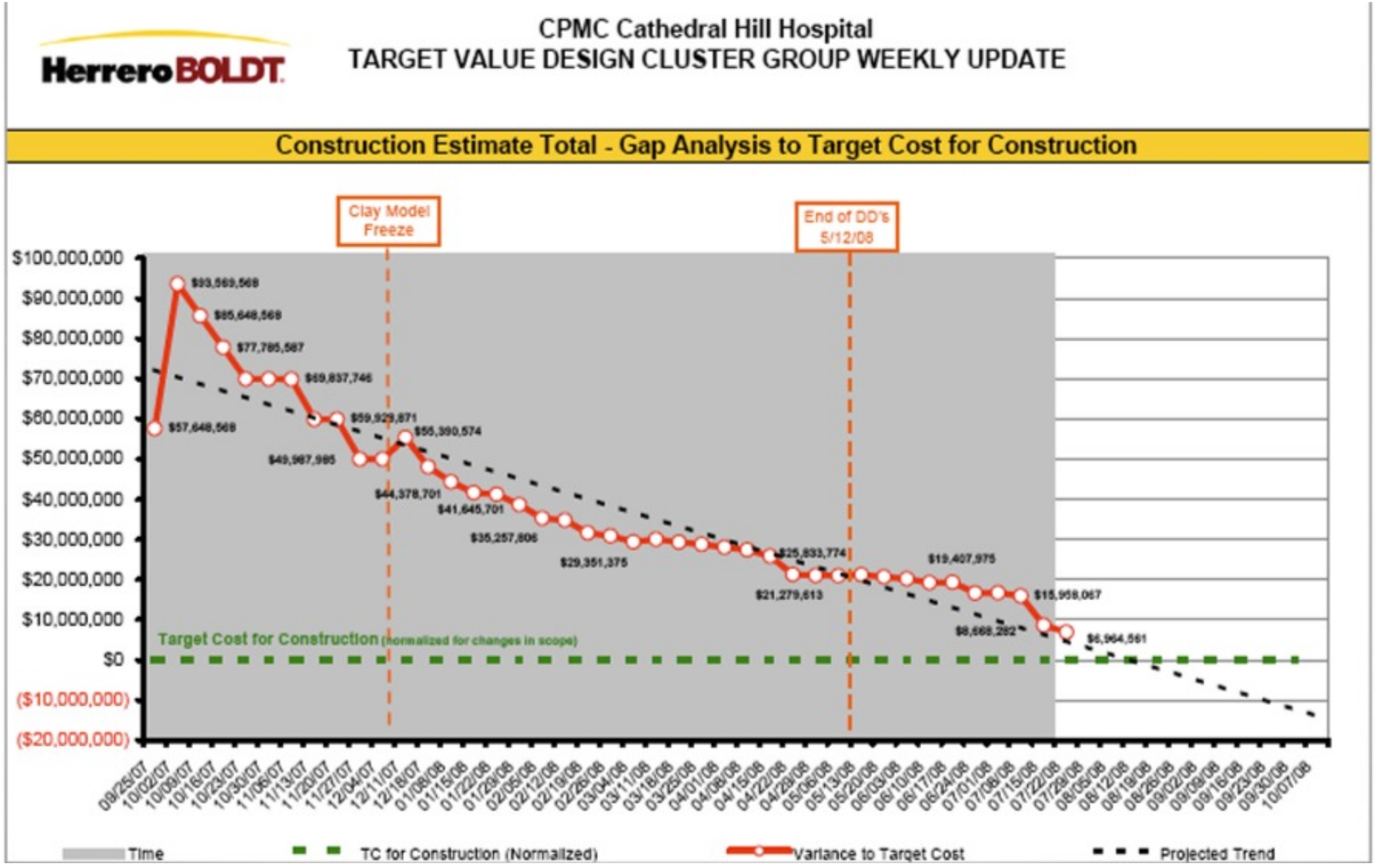


182,500-square-foot LEED Platinum Energy Systems Integration Facility

Heydar Aliyev Center, Azerbaijan



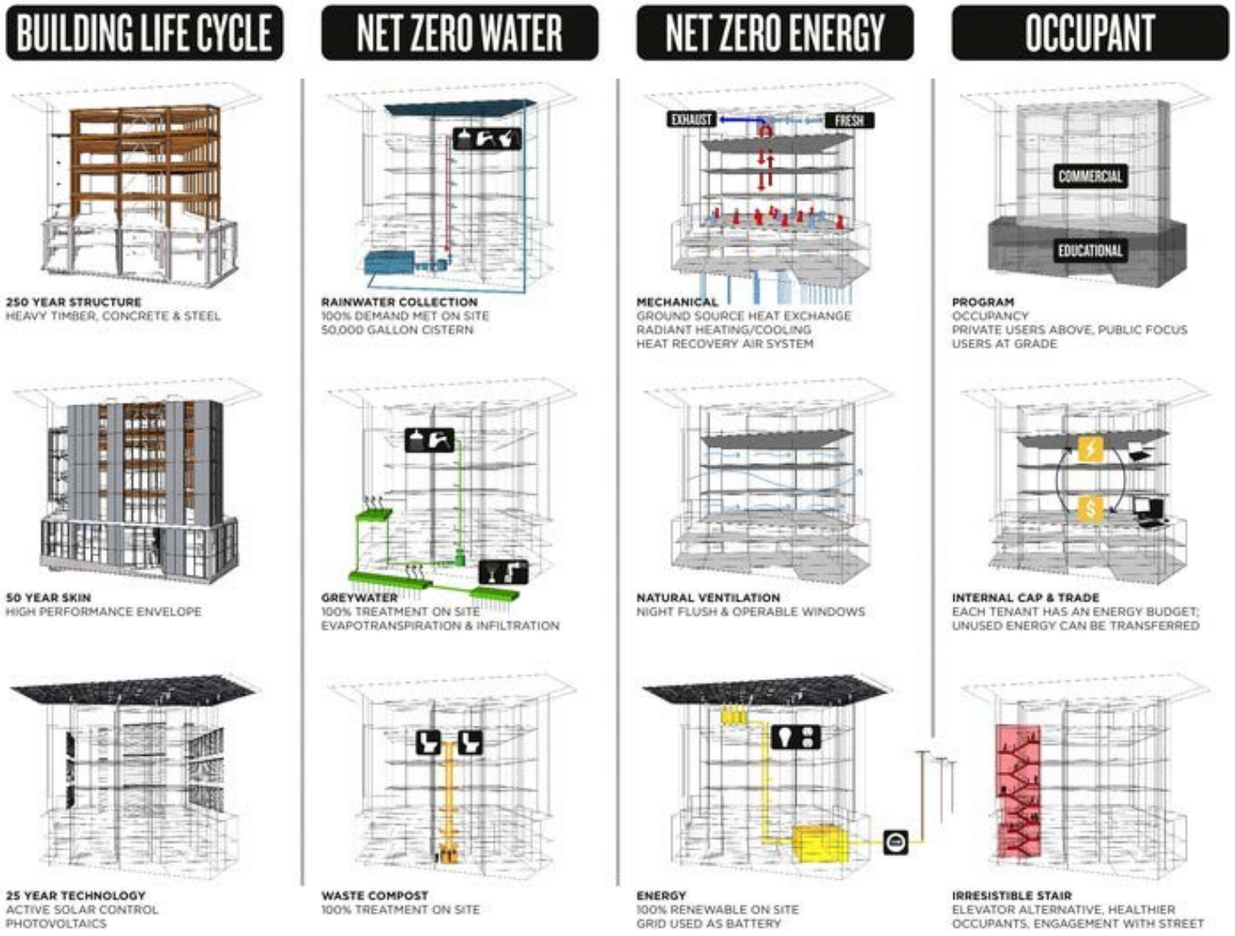
The Right Cost for the Business Case



Total Cost of Ownership

Halley VI Antarctic Research Station

Bullitt Center, Seattle



Business Continuity/Energy Efficiency/Renewable Energy

Occupant Productivity

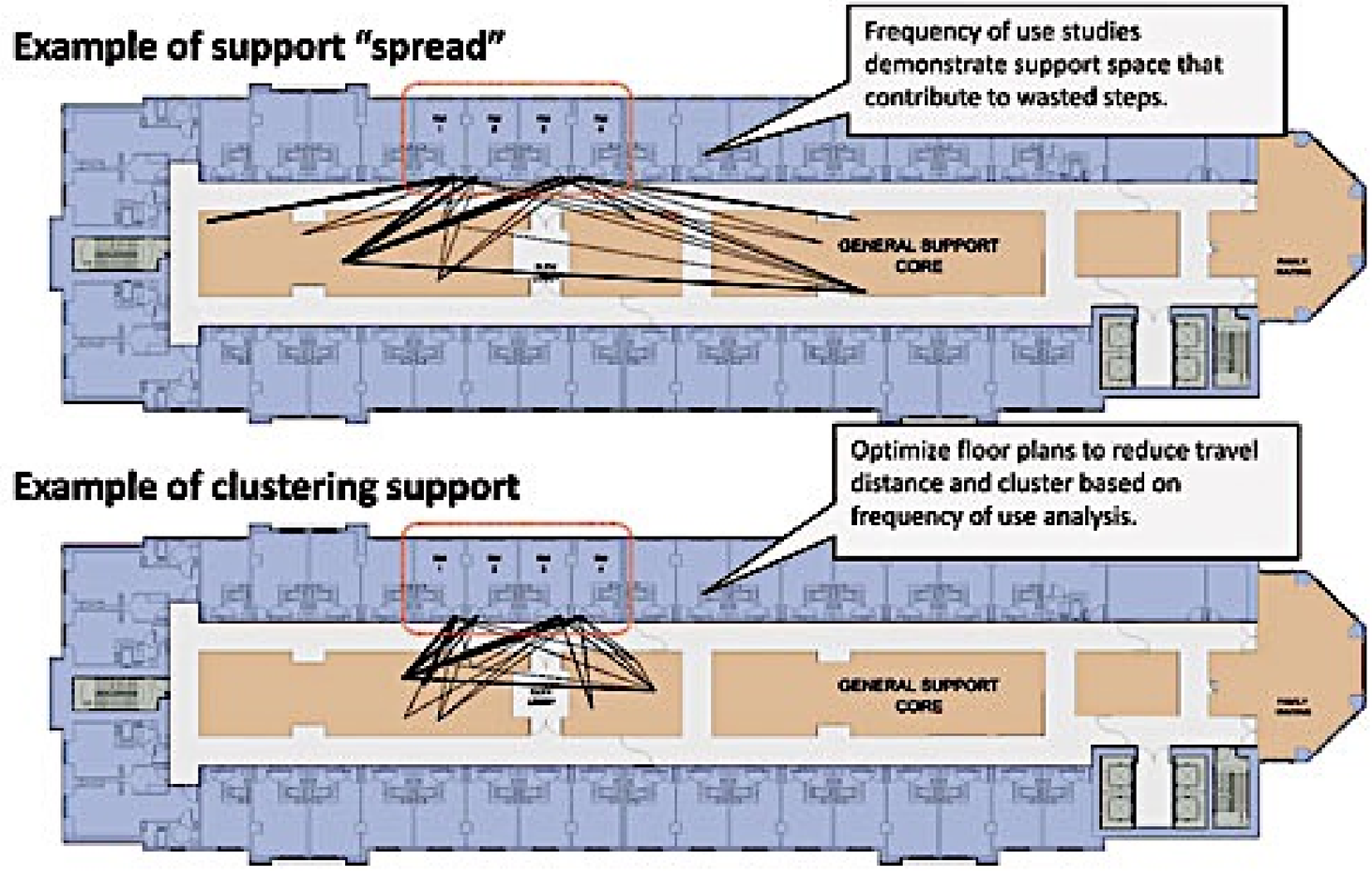
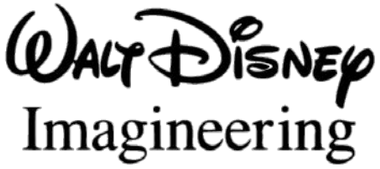
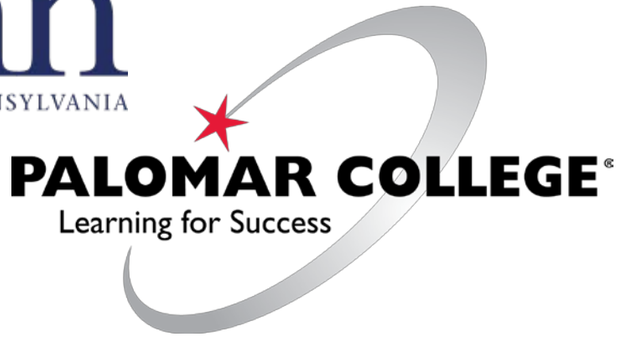


DIAGRAM COURTESY OF HEALTH STRATEGIES & SOLUTIONS, INC.

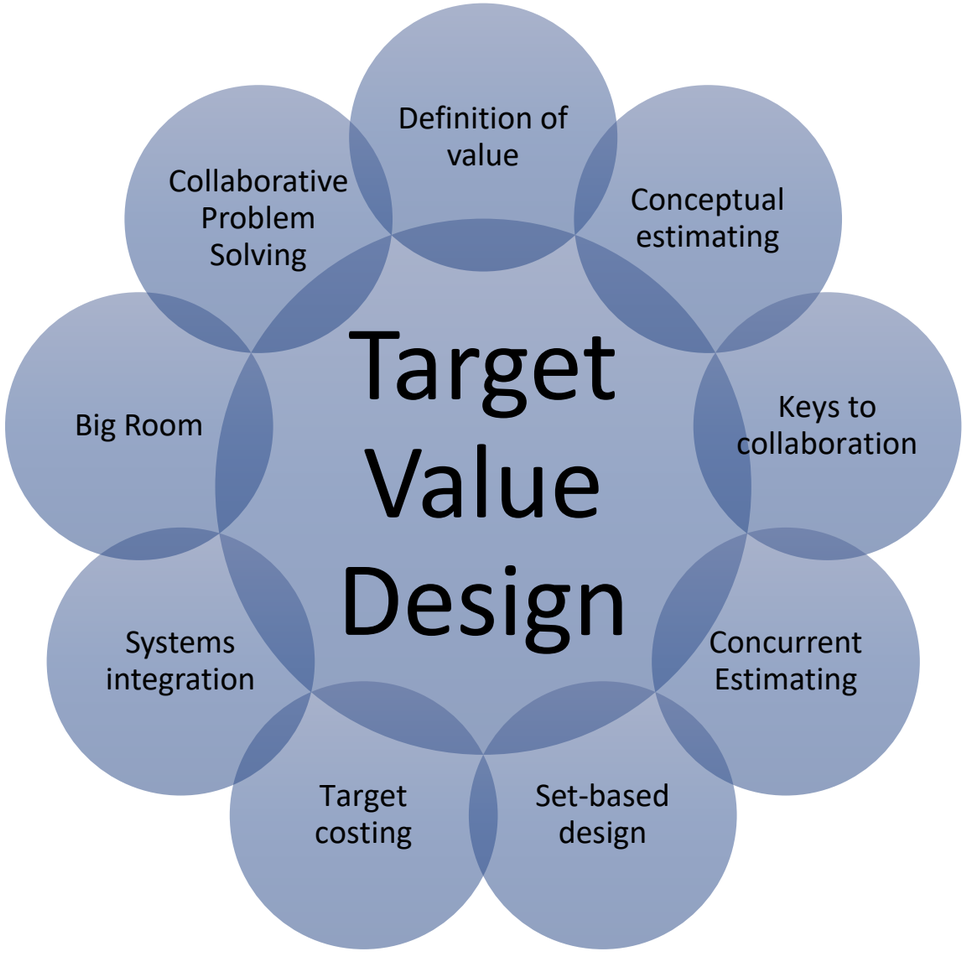
Understanding value through the eyes of the customer yields excellence!

Who's Using Target Value Design?





Elements of Target Value Design



TVD Flow

- Developing the value proposition
- From values to program
- From program to interactive design
- From interactive design to selecting design options
- From design options to TVD clusters
- From clusters to systems and pricing
- To fully developed package

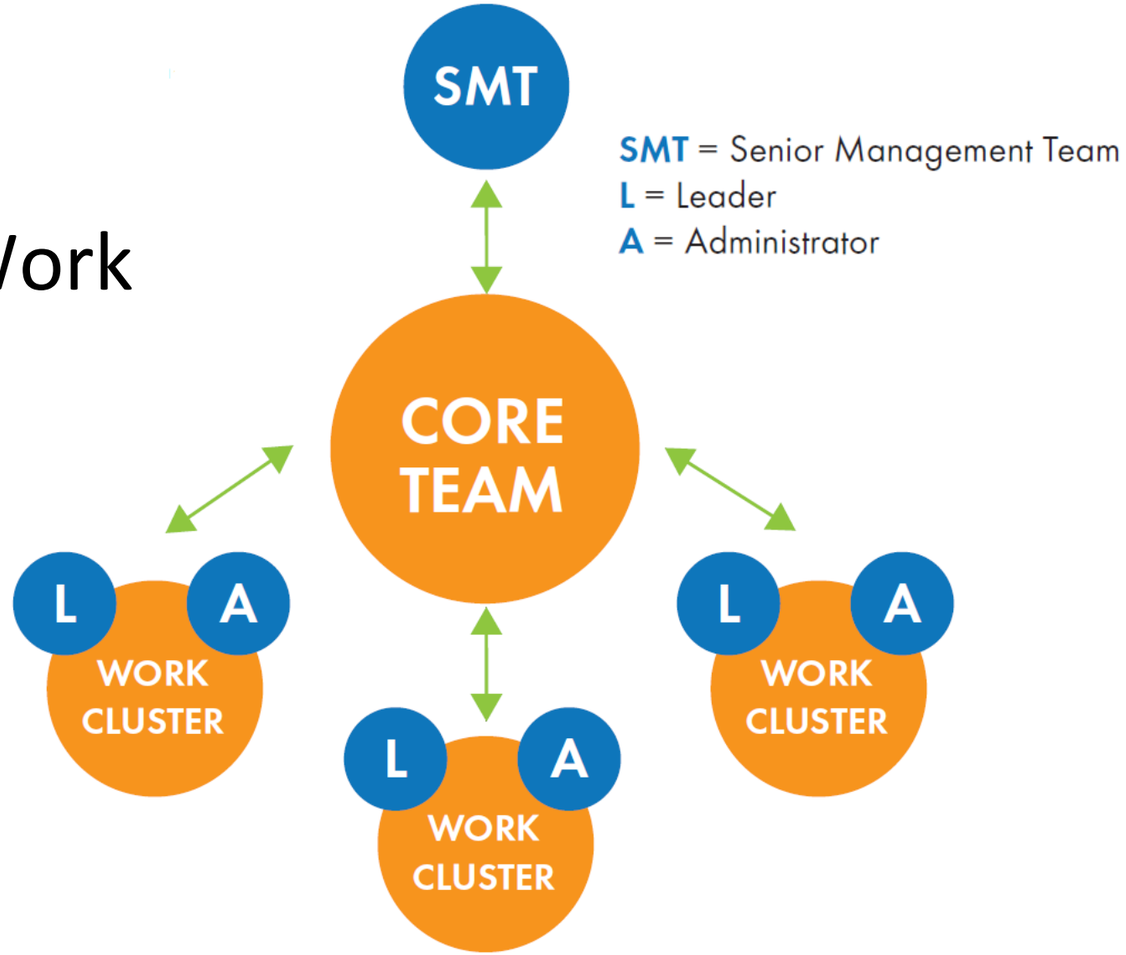
Project Team and Sub-Teams

Core Team

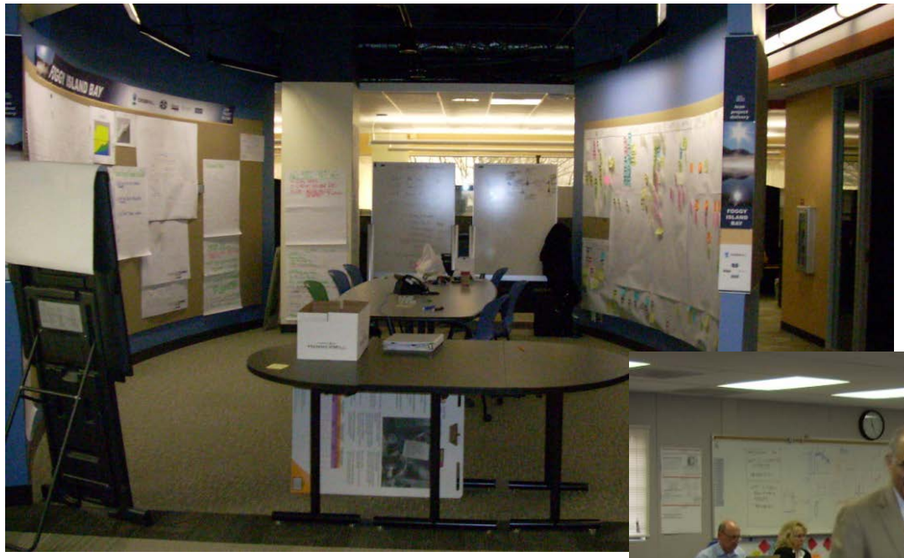
Senior or Executive Management Work

Clusters

- Cross-discipline
- Stakeholder Representation



Big Room



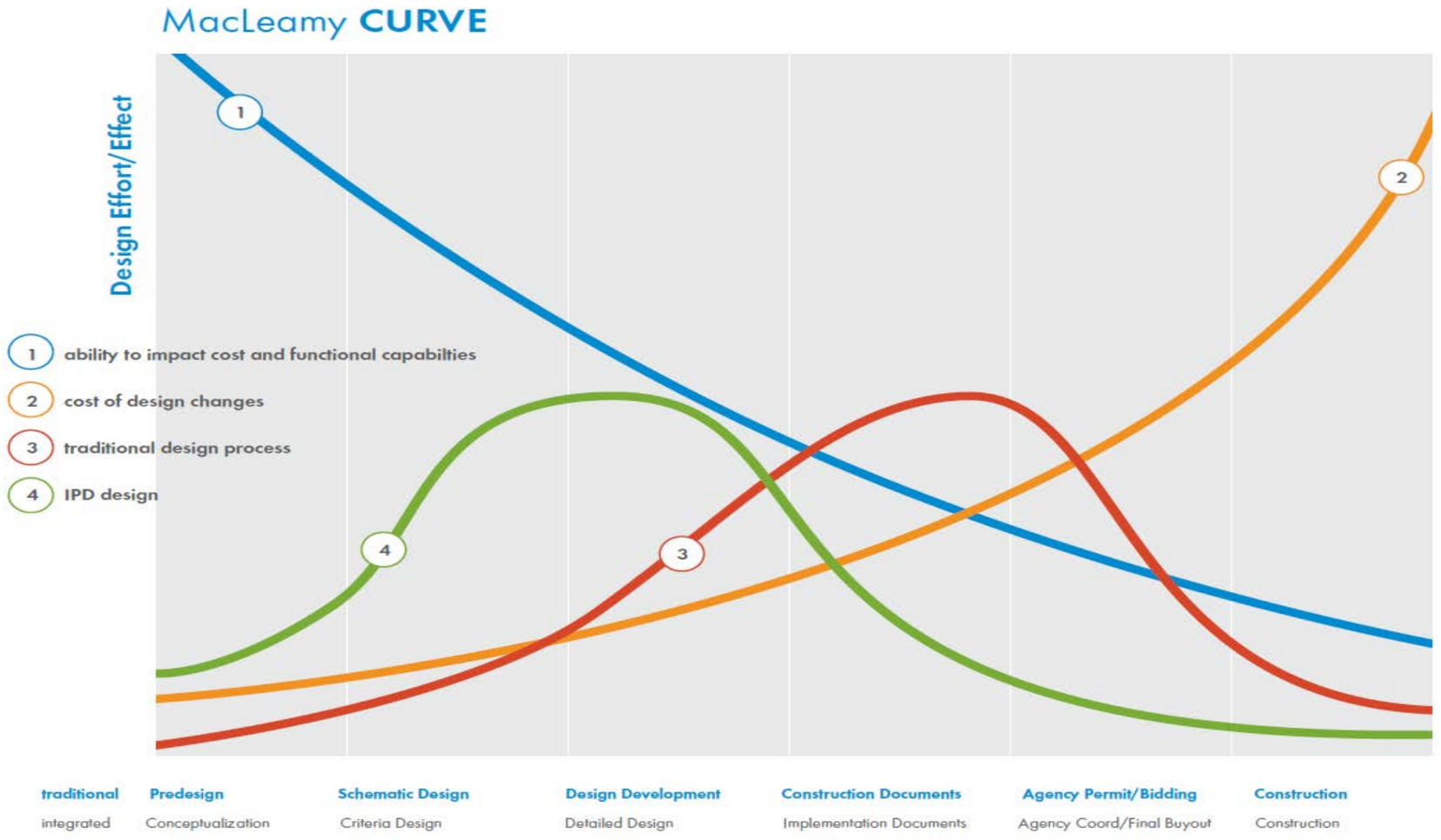
Big Room – What?

- 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

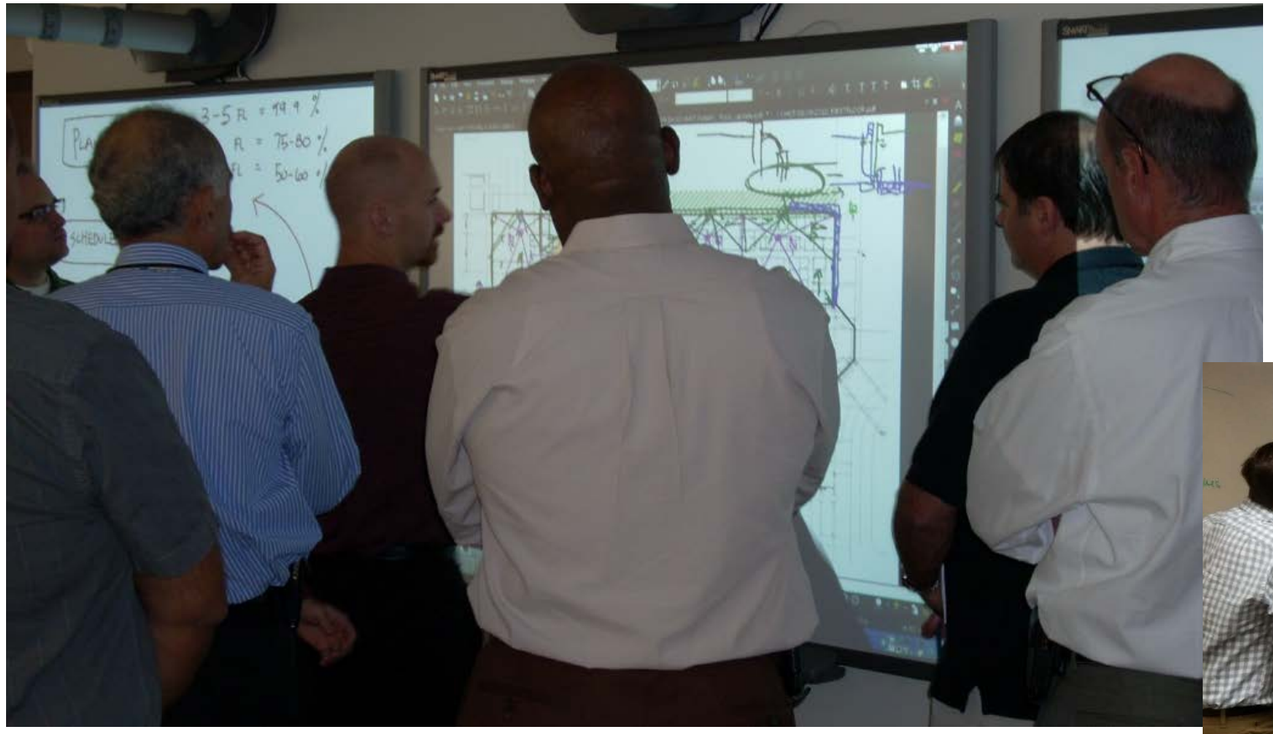
Effective Big Room

- 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

The MacLeamy Curve

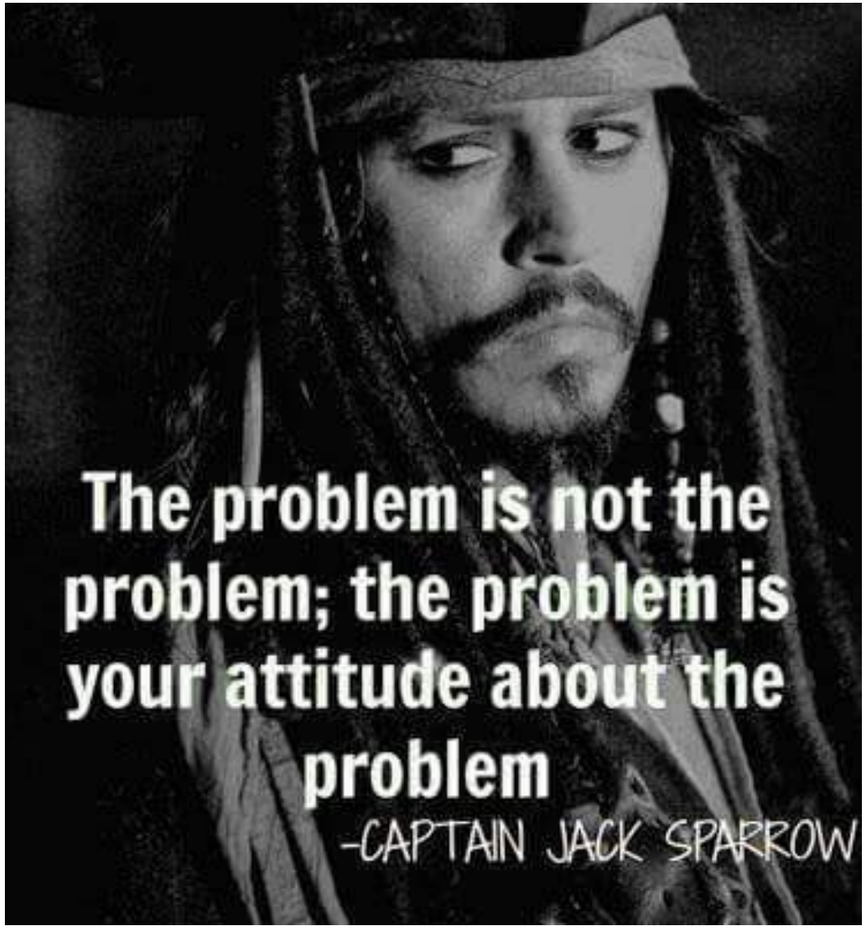


Collaborative Design Conversation

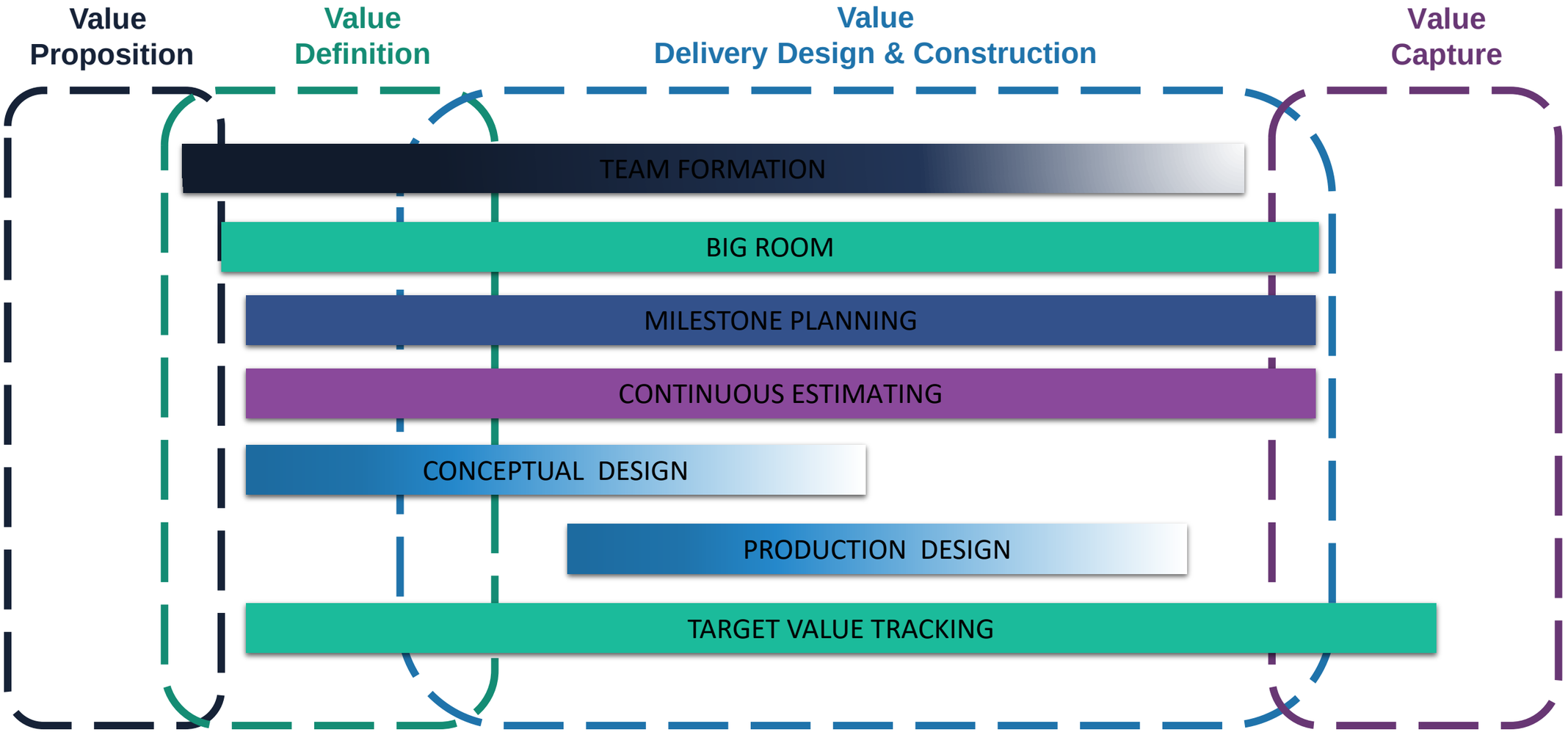


Problem Solving

Collaborative Problem Solving



Target Value Delivery Phases & Components



DESIGN, THEN ESTIMATE VS. TVD

Traditional	Integrated
Cost as an output of design	Cost as an input to design
Wait till I'm finished; don't bother me mentality	Share information early and often
Time consuming manual quality take-off	Rapid model based estimating
Early commitment to design solutions	Carry multiple solutions sets forward as long as possible
Design, then calculate cost of design	Provide cost feedback to concepts rather than drawings
Tabular cost estimates and reports for owners	Graphical display posted for all to see

Conditions of Satisfaction (CoS)

- Language Act of Making a Promise
- CoS are measurable statements that tell the project delivery team what tests a project must pass to be accepted as a success.
- No – compromise goals – This *YET* That
- Informs decision-making for team
- Post in Team Space – Keep Active

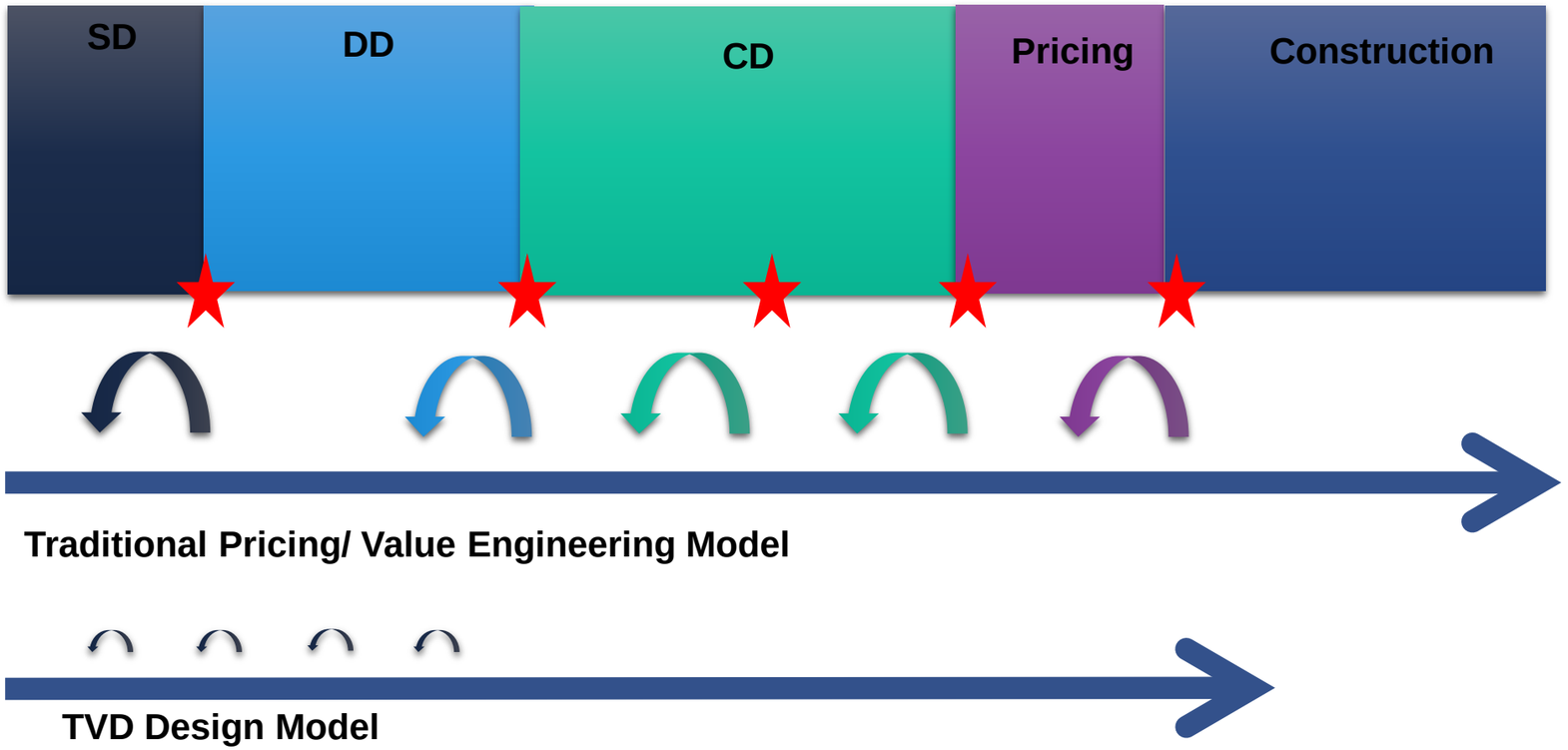
When to Set the Target Cost?

- Early in the project process.
- Don’t wait until you start construction!!!

How to Set the Target Cost?

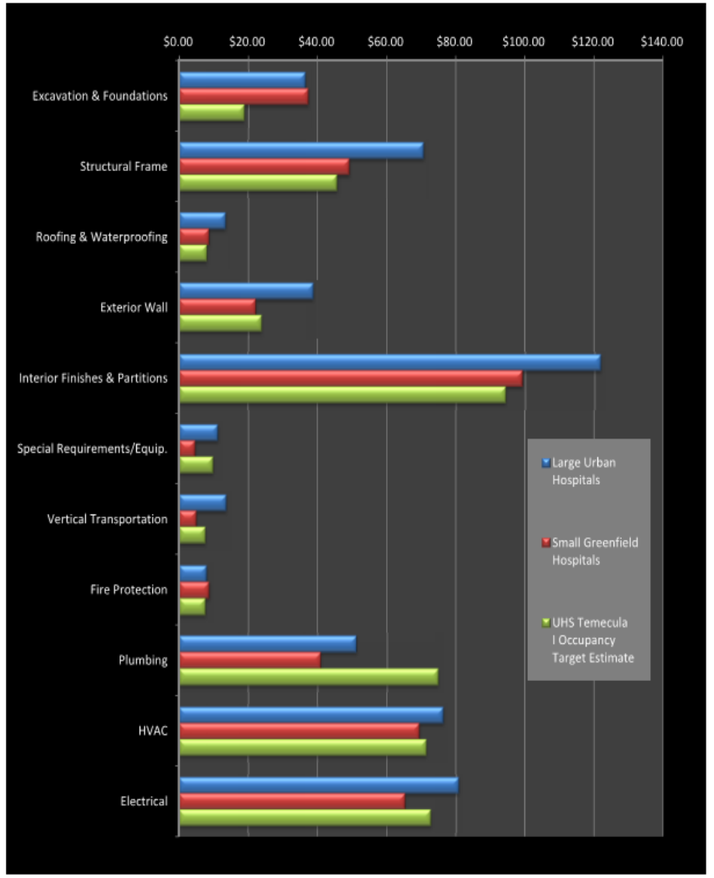
- Clearly understand the value proposition and prioritization.
- Don’t pick numbers out of the air without a firm business case understanding.
- Estimates based on past performance are embedded with waste. Set a target that strives to eliminate some of the embedded waste. 20% is not uncommon.
- Have the core team members buy in to setting the target cost.
- Eliminate individual buffers (waste) in historic estimating models.
- Have the right players on the core team that are empowered to make financial commitments on behalf of their organization.

Design Phase Pricing Model



TVD Guidelines

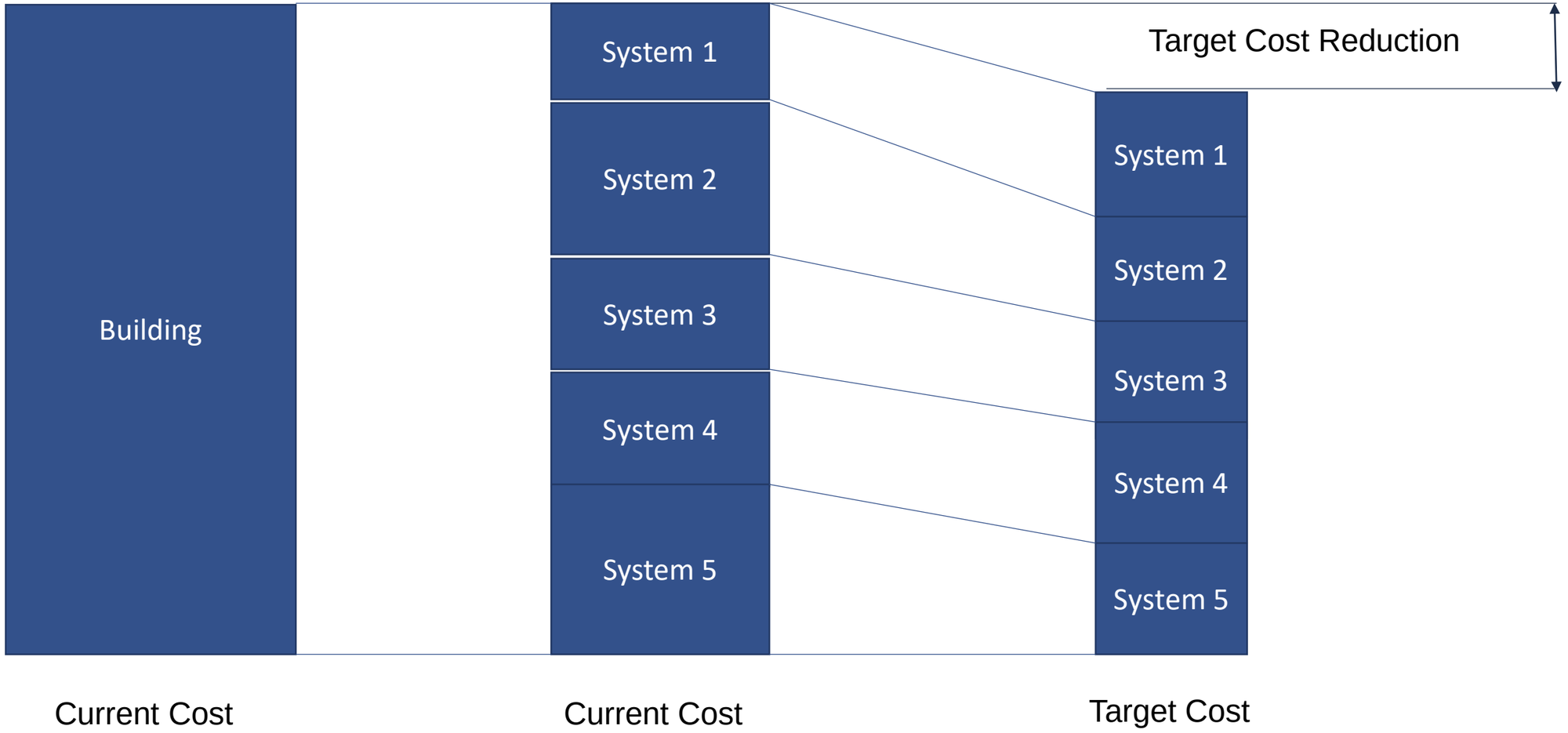
- Develop detailed Cost Model
  - Clear schedule of values
- Measure against benchmarks
- Design to the estimate vs. estimating a design



TVD Guidelines

- Collaboratively develop Path to Target & Risk Mitigation Plans
- Have collaborative design conversation
- Make decisions after considering sets
- Collaboratively make decisions in context of whole

How Multiple Systems Interact to Target Cost



Path to Target

Trade	Estimate	Target	Probable	Savings
Concrete	$3,504,798	$3,200,000	$3,200,000	-$304,798
Steel	$4,355,000	$4,350,000	$4,355,000	$0
Millwork	1,933,550	$1,668,000	$1,596,362	-$337,188
Window	$856,589	$913,500	$1,077,545	$220,956
Stucco	$1,194,187	$930	$1,027,725	-$166,462
Doors	$1982,988	$1,785,000	$1,900,000	-$82,988
Kitchen Equip	$1,200,000	$1,200,000	$1,100,000	-$100,000
P-tube	$314,700	$283,000	$283,000	-$31,700
	$15,746,812	$14,579,500	$14,789,632	-$957,180

Risk Mitigation

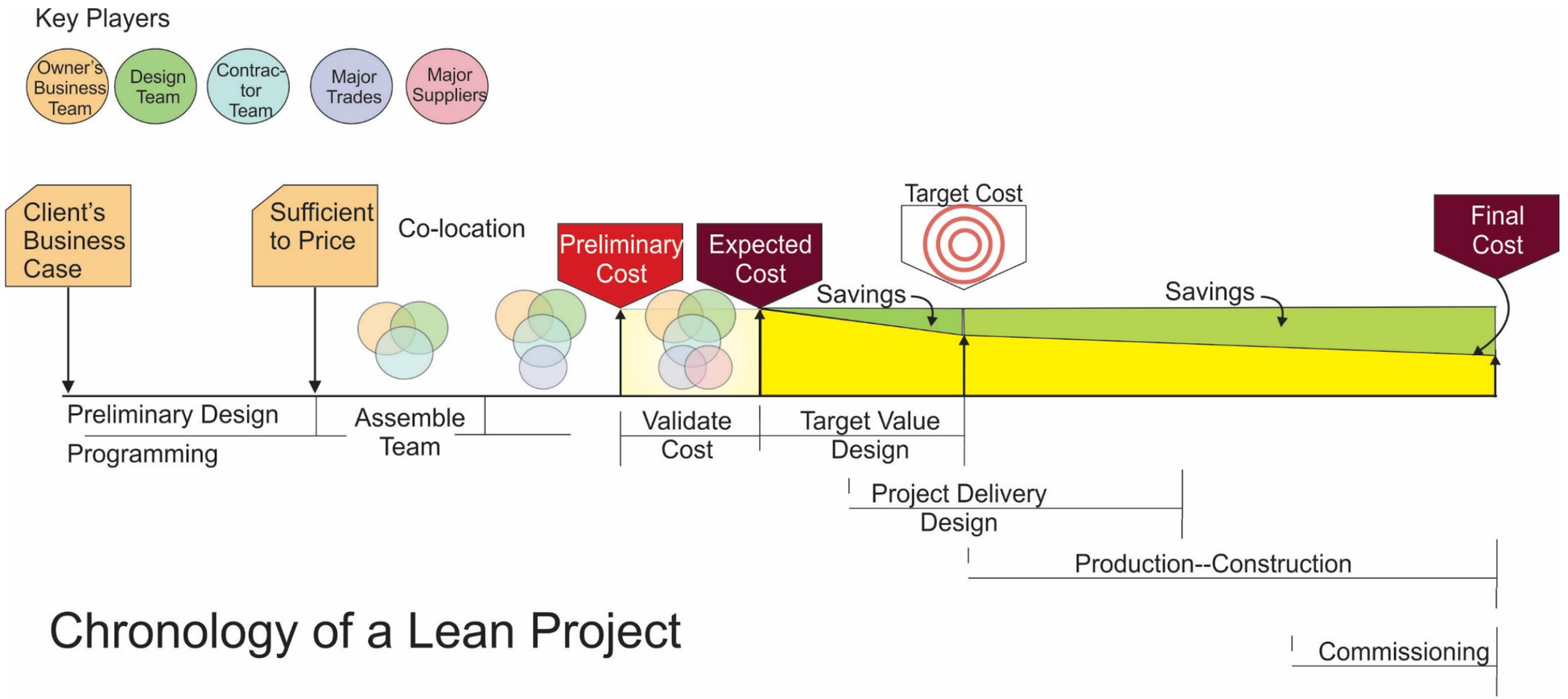
Risk	Estimate $	Level
City Development Plan & Architectural Review process delays	$30,000	Med
Community response to project during planning commission	$10,000	Low
Shared parking requirements with TMC	$250,000	Low
Program & scope changes	$100,000	High
Material cost escalation (5%)	$100,000	High
Procurement of remaining traders & partners	$80,000	Low
Total	**$570,000**	

Target Value Tracking Activities

- Target Cost Tracking Transparency
- Risk Identification
  - Mitigation strategy
  - Cost
  - Rank
- Path Back Identification

Photo Credit: InsideOut Consulting, Inc.

Target Value Design



Chronology of a Lean Project

Dick Bayer, updated March 2, 2011

UCSF Block 23A Target Cost Model

RUDOLPH & SLETTEN, INC.

TARGET COST MODEL COMPARISON #1
UCSF BLOCK 25A - FACULTY OFFICE BUILDING

ARCHITECT: WRNS STUDIO
LOCATION : SAN FRANCISCO, CA

DATE: 30-Apr-12
BLDG. AREA: 266,000

DESCRIPTION	CURRENT COST COST	CURRENT COST COST/SF	TARGET COST COST	TARGET COST COST/SF	TARGET REDUCTION
FOUNDATIONS	$3,099,495	$11.65	$3,000,000	$11.28	$99,495
SUBSTRUCTURE	$2,530,910	$9.51	$2,500,000	$9.40	$30,910
SUPERSTRUCTURE	$10,896,350	$40.96	$9,800,000	$36.84	$1,096,350
EXTERIOR ENVELOPE	$8,065,300	$30.32	$8,000,000	$30.08	$65,300
ROOFING	$737,500	$2.77	$737,000	$2.77	$500
INTERIOR CONSTRUCTION	$10,061,826	$37.83	$10,000,000	$37.59	$61,826
OFFICE FURNITURE SYSTEMS	$6,000,000	$22.56	$4,500,000	$16.92	$1,500,000
ELEVATORS	$1,625,000	$6.11	$1,600,000	$6.02	$25,000
SPECIAL BUILDING EQUIPMENT	$210,000	$0.79	$200,000	$0.75	$10,000
FIRE SPRINKLER SYSTEMS	$1,376,000	$5.17	$1,200,000	$4.51	$176,000
PLUMBING SYSTEMS	$1,820,000	$6.84	$1,800,000	$6.77	$20,000
HVAC, CONTROLS & BALANCING	$13,000,000	$48.87	$11,500,000	$43.23	$1,500,000
ELECTRICAL SYSTEMS	$12,307,900	$46.27	$9,000,000	$33.83	$3,307,900
LOW VOLTAGE SYSTEMS	$5,873,750	$22.08	$4,000,000	$15.04	$1,873,750
3RD PARTY COMMISSIONING	$0	$0.00	$0	$0.00	$0
SITEWORK CONSTRUCTION	$1,872,130	$7.04	$1,800,000	$6.77	$72,130
JOBSITE MANAGEMENT	$2,000,000	$7.52	$2,000,000	$7.52	$0
JOBSITE REQUIREMENTS	$4,655,000	$17.50	$4,630,000	$17.41	$25,000
BIG ROOM COSTS	$311,000	$1.17	$300,000	$1.13	$11,000
PERMIT FEES	$285,000	$1.07	$285,000	$1.07	$0
SUBTOTAL	**$86,727,161**	**$326.04**	$76,852,000	$288.92	
DESIGN FEES & CA COSTS	$7,581,000	$28.50	$6,000,000	$22.56	$1,581,000
SUBTOTAL	**$94,308,161**	**$354.54**	$82,852,000	$311.47	
DESIGN CONTINGENCY AT 5%	$4,715,408	$17.73	$4,142,600	$15.57	$572,808
CONSTRUCTION CNTGNCY. AT 3%	$2,970,707	$11.17	$2,609,838	$9.81	$360,869
SUBTOTAL	**$101,994,276**	**$383.44**	$89,604,438	$336.86	
R&S FEE, BOND, INSUR., PRECON	$4,781,765	$17.98	$4,273,782	$16.07	$507,983
TOTAL COST	**$106,776,041**	**$401.41**	**$93,878,220**	$352.93	**$12,897,821**

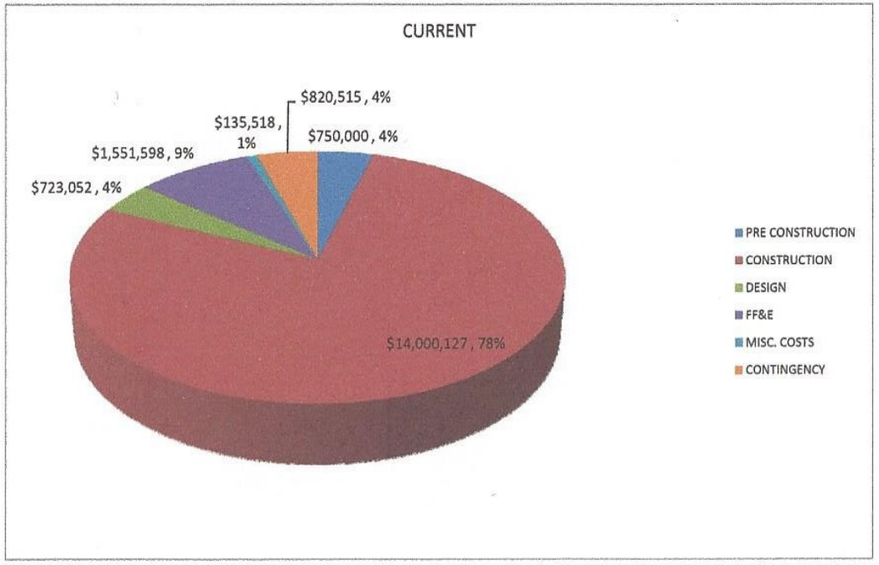
MAXIMUM ACCEPTANCE COST	$93,880,000

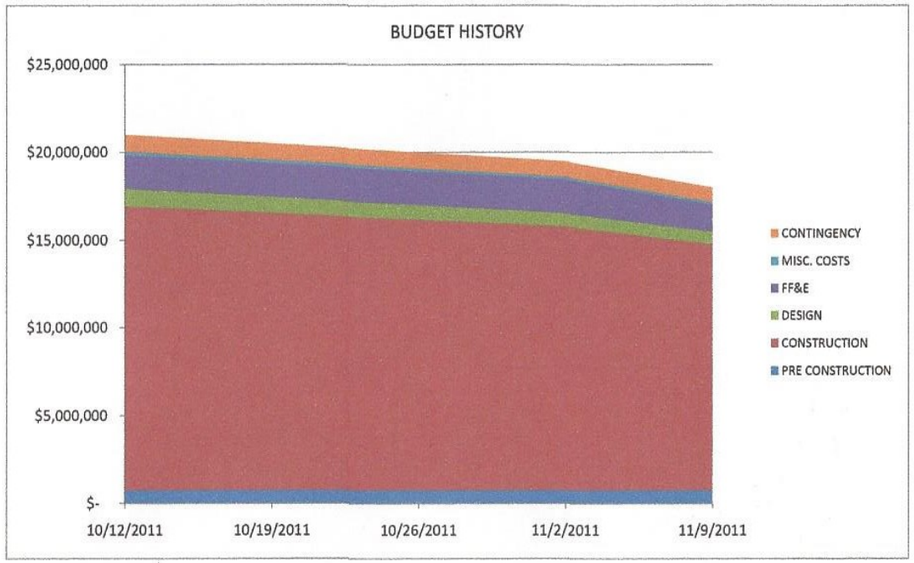
Courtesy:
Rudolph & Sletten and WRNS Studio

A3 Dashboard Reporting

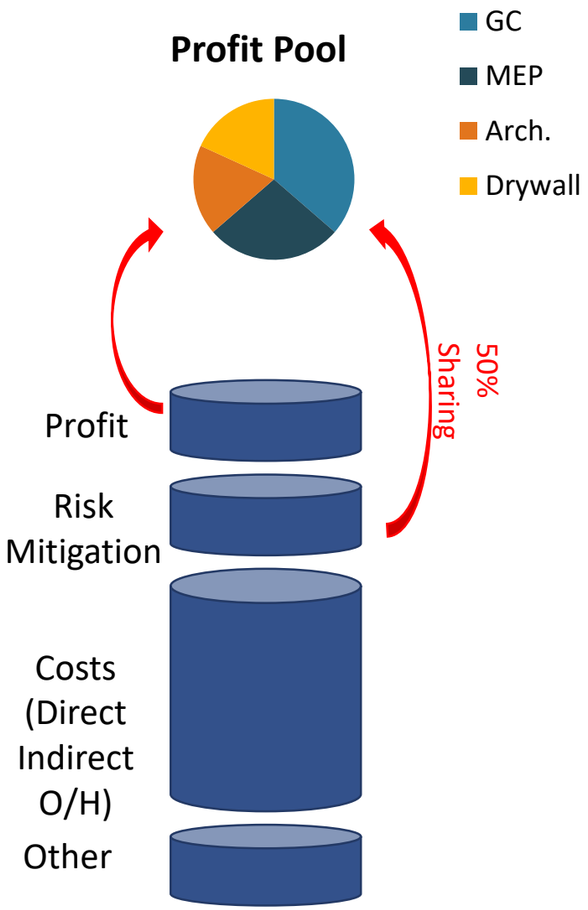
THE OAKS HOSPITAL - BUDGET TRACKING SHEET

CLUSTER GROUPS	PRE-LIM TARGET BUDGET 10/12/2011	PRE-LIM TARGET BUDGET 11/2/2011	PRE-LIM TARGET BUDGET 11/9/2011	PROGRESS BUDGET 11/16/2011	PROGRESS BUDGET 11/23/2011	PROGRESS BUDGET 11/30/2011	PROGRESS BUDGET 12/7/2011	PROGRESS BUDGET 12/14/2011	PROGRESS BUDGET 12/21/2011	PROGRESS BUDGET 12/28/2011	PROGRESS BUDGET 1/4/2011	CLUSTER GROUPS
PRE CONSTRUCTION	$ 750,000	$ 750,000	$ 750,000									PRE CONSTRUCTION
CONSTRUCTION	$ 16,182,206	$ 15,020,577	$ 14,000,127									CONSTRUCTION
DESIGN	$ 987,823	$ 762,137	$ 723,052									DESIGN
FF&E	$ 1,930,200	$ 1,930,200	$ 1,551,598									FF&E
MISC. COSTS	$ 190,518	$ 135,518	$ 135,518									MISC. COSTS
CONTINGENCY	$ 964,537	$ 892,422	$ 820,515									CONTINGENCY
TOTAL	$ 21,005,285	$ 19,490,854	$ 17,980,810	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	TOTAL

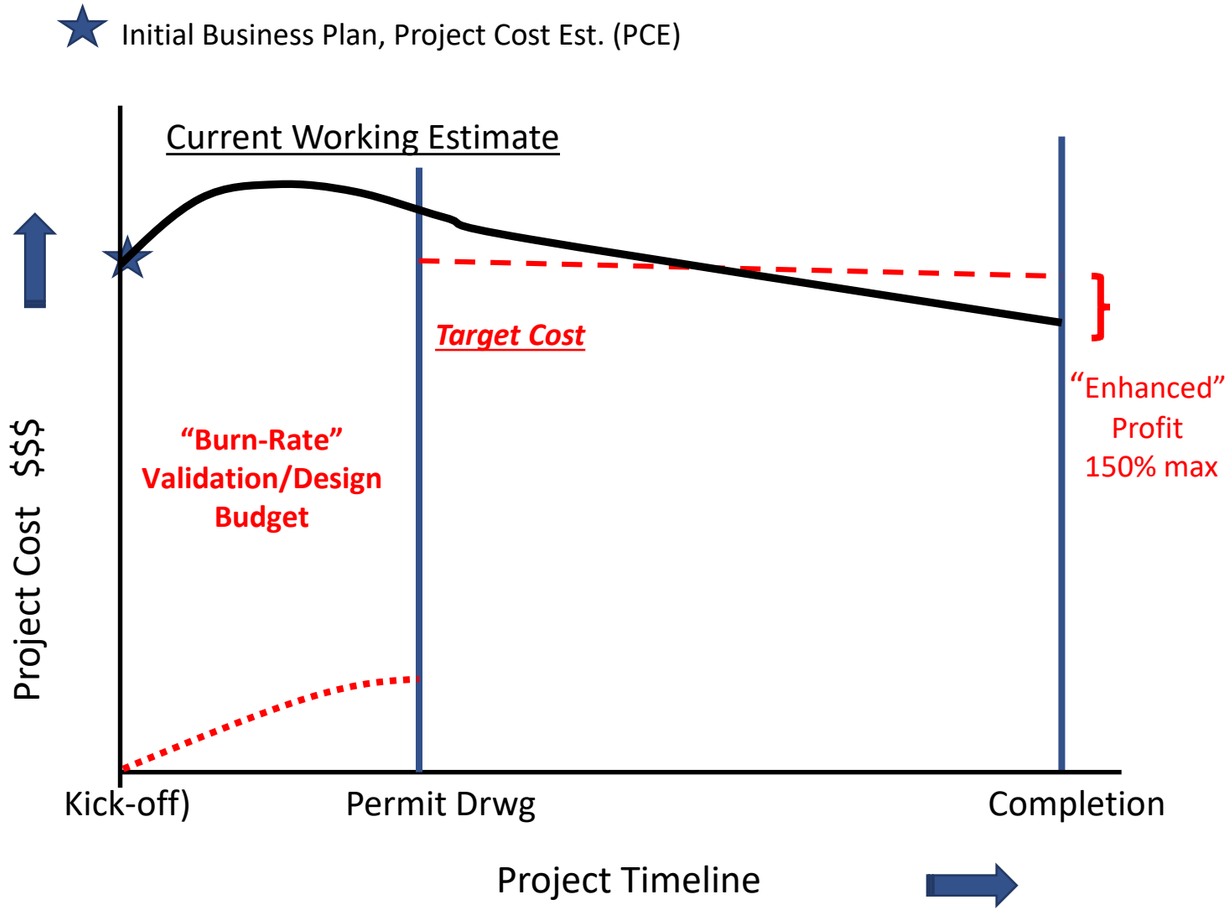




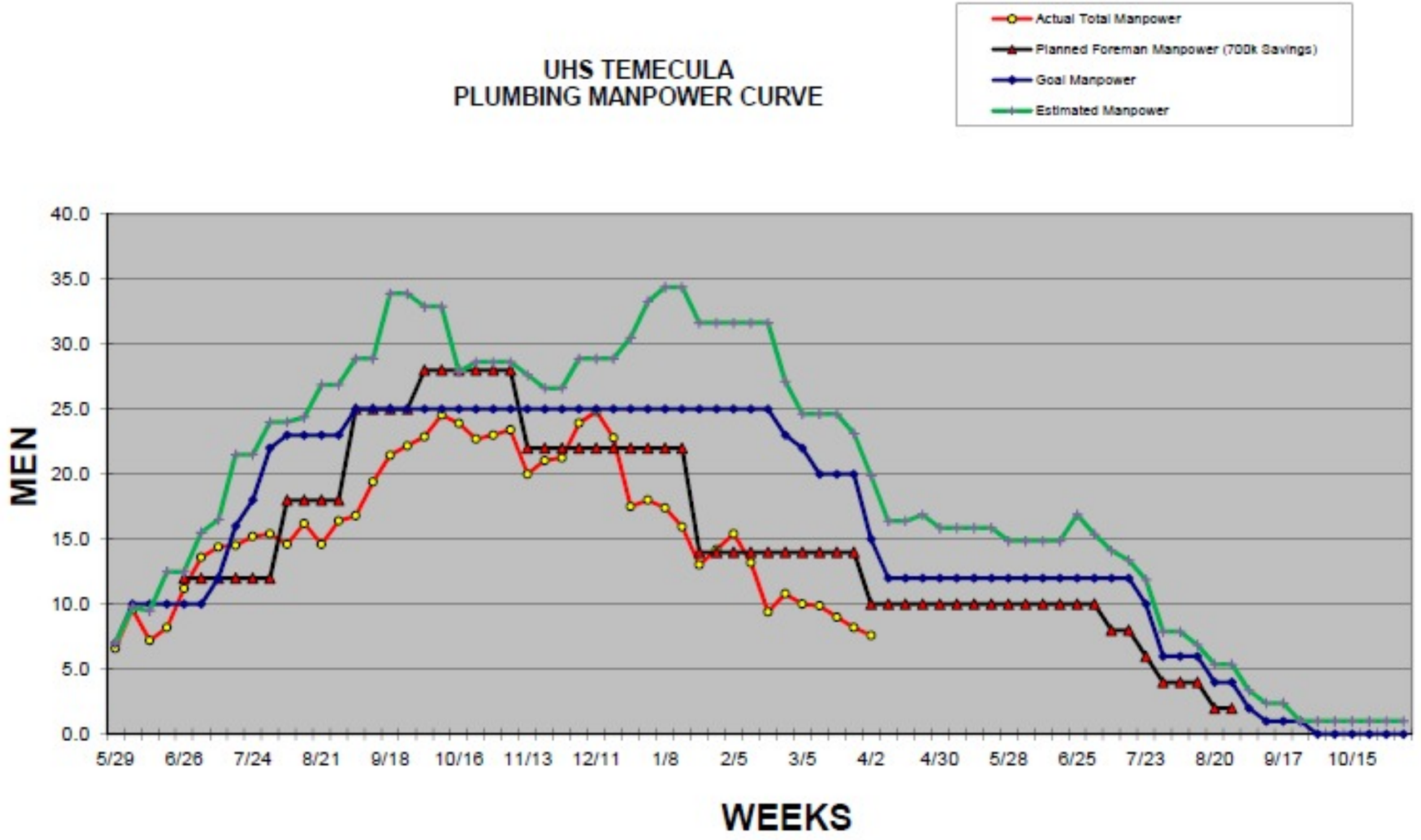
"*THE* Deal" Universal Health Services



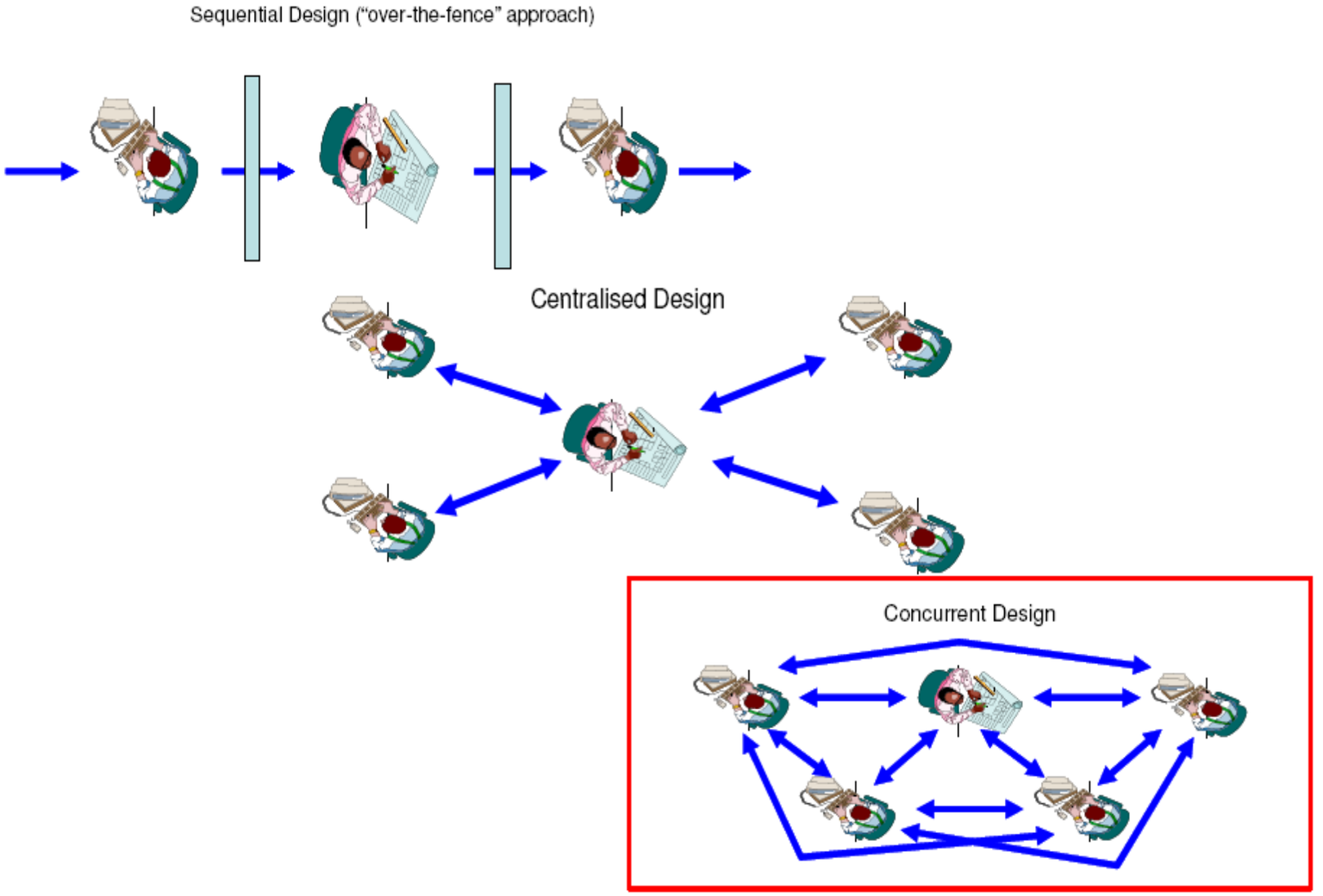
4 "Buckets" of $$$



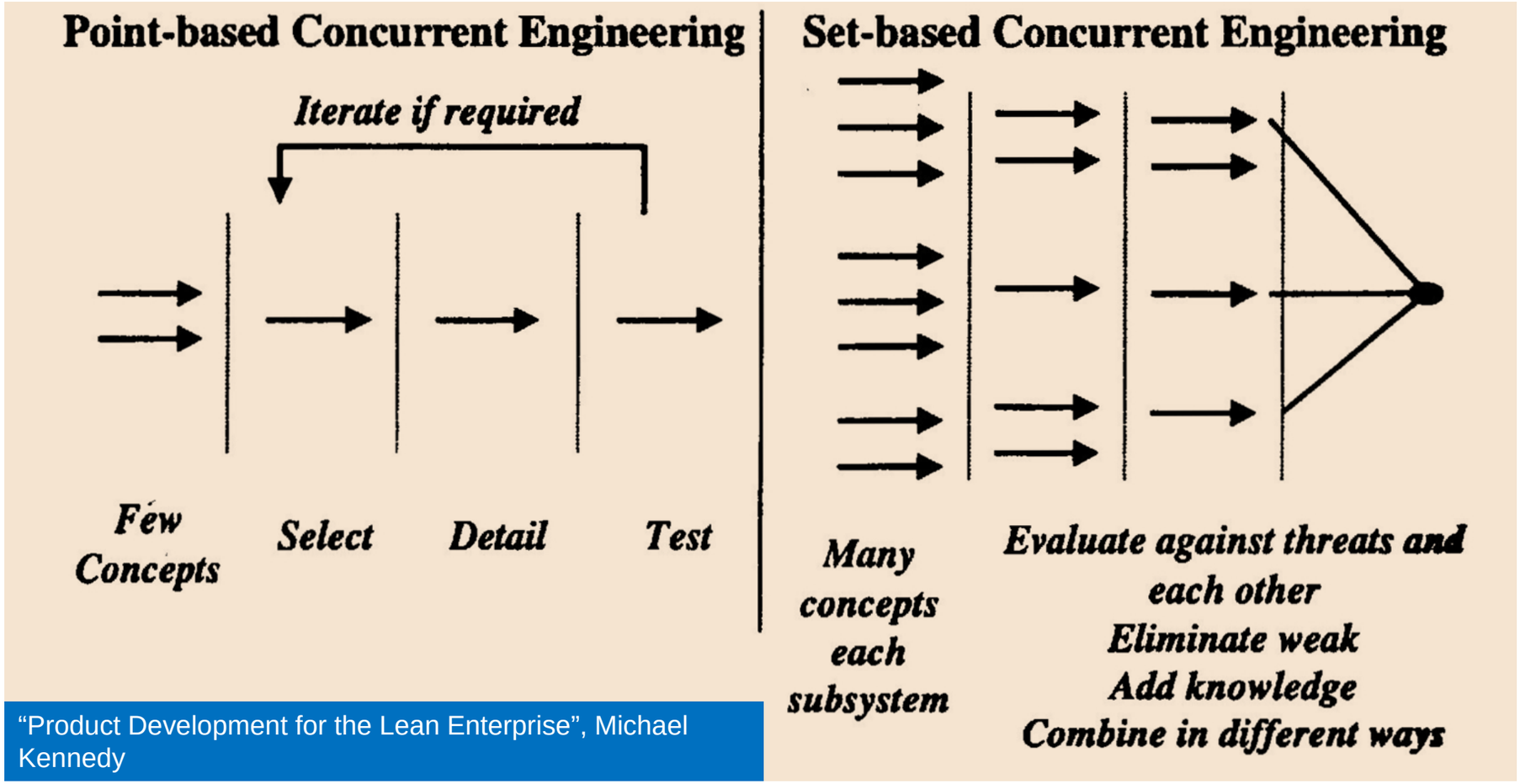
UHS Temecula Hospital Labor Curves



The Evolution of the Design Process

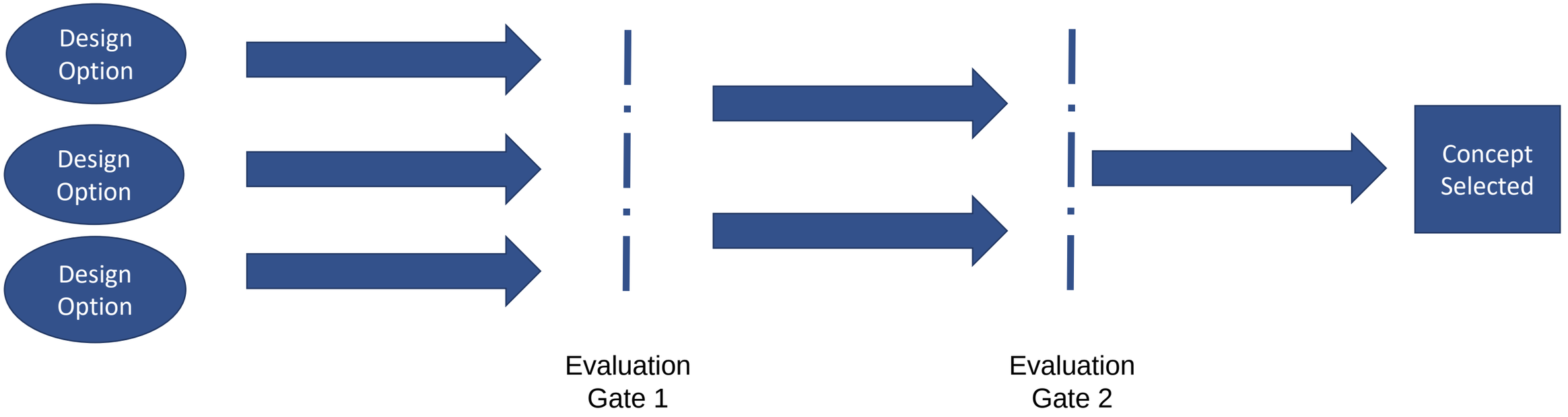


Set-Based Design

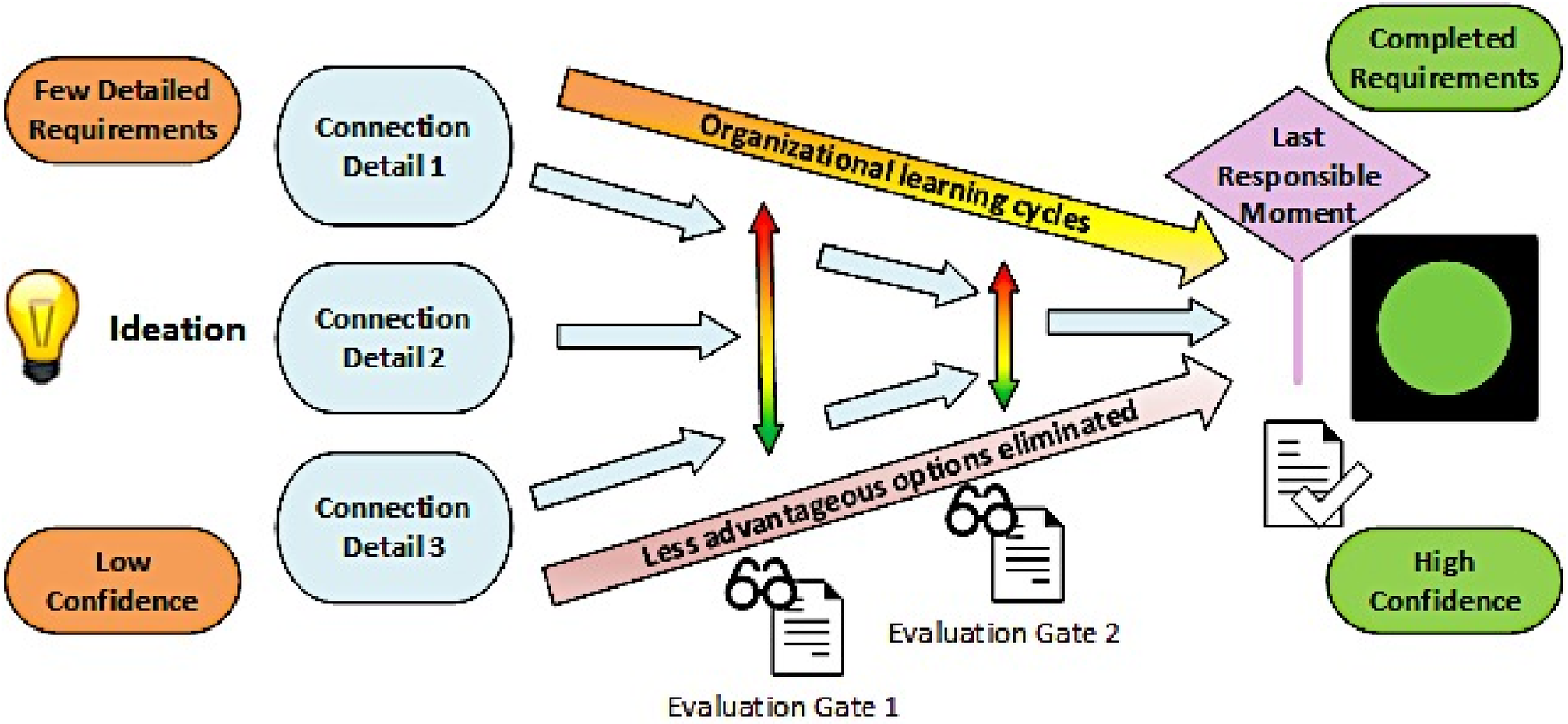


"Product Development for the Lean Enterprise", Michael Kennedy

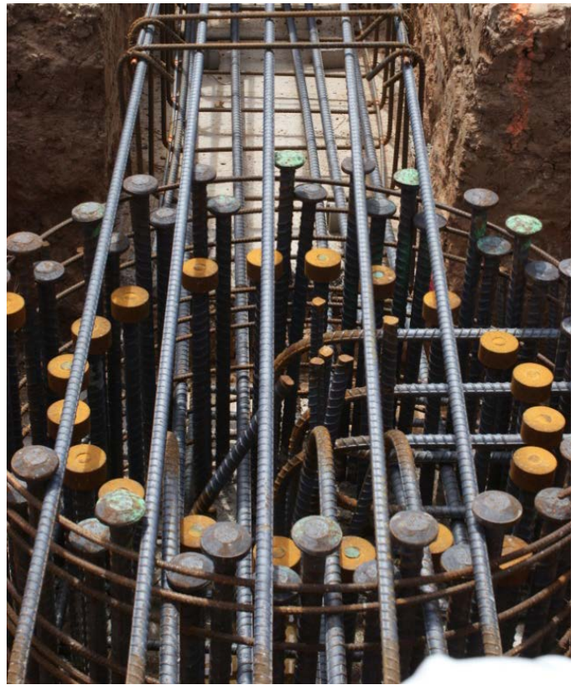
Set-Based Design



Set-Based Design – Structural Connection Example

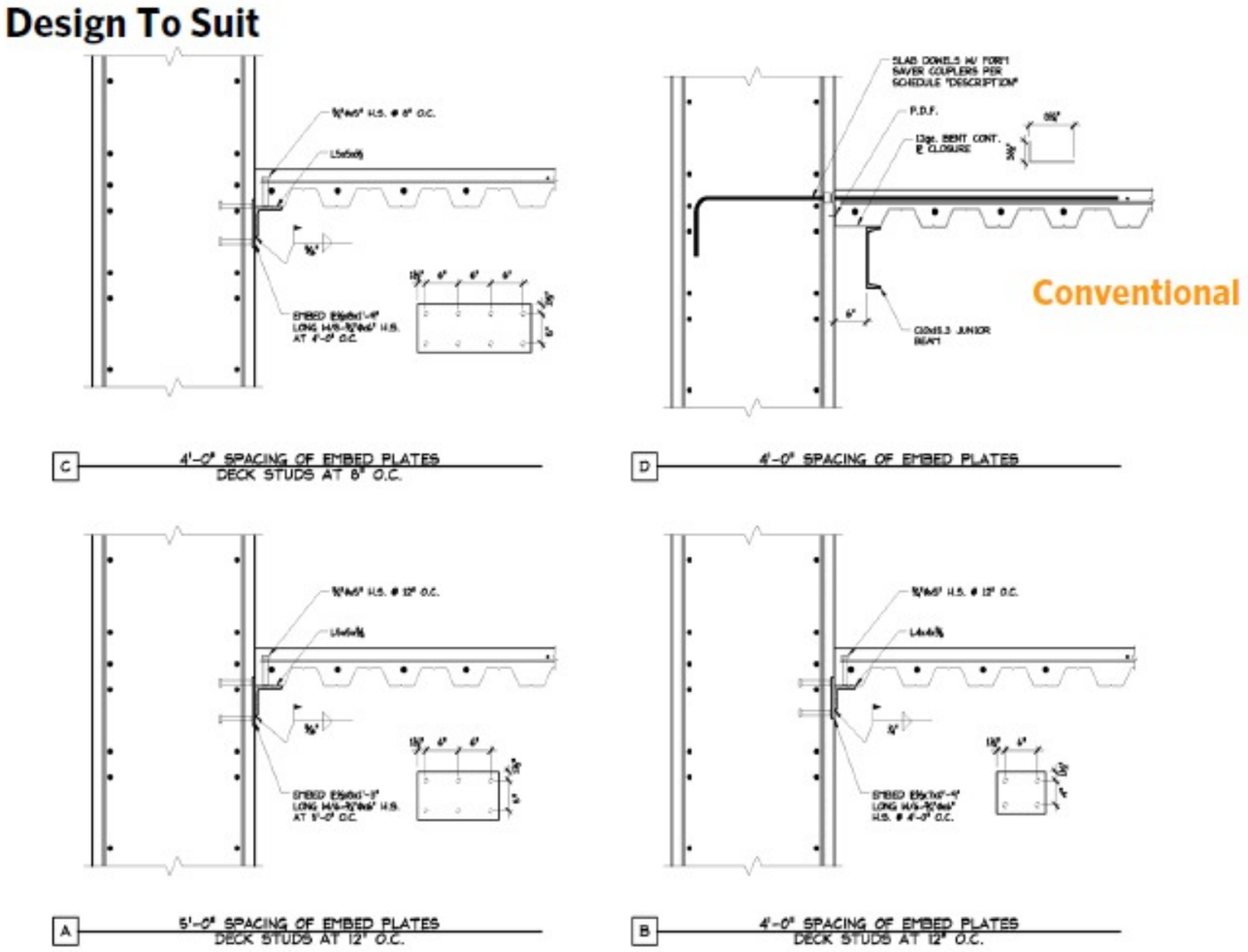


Rebar Alternatives



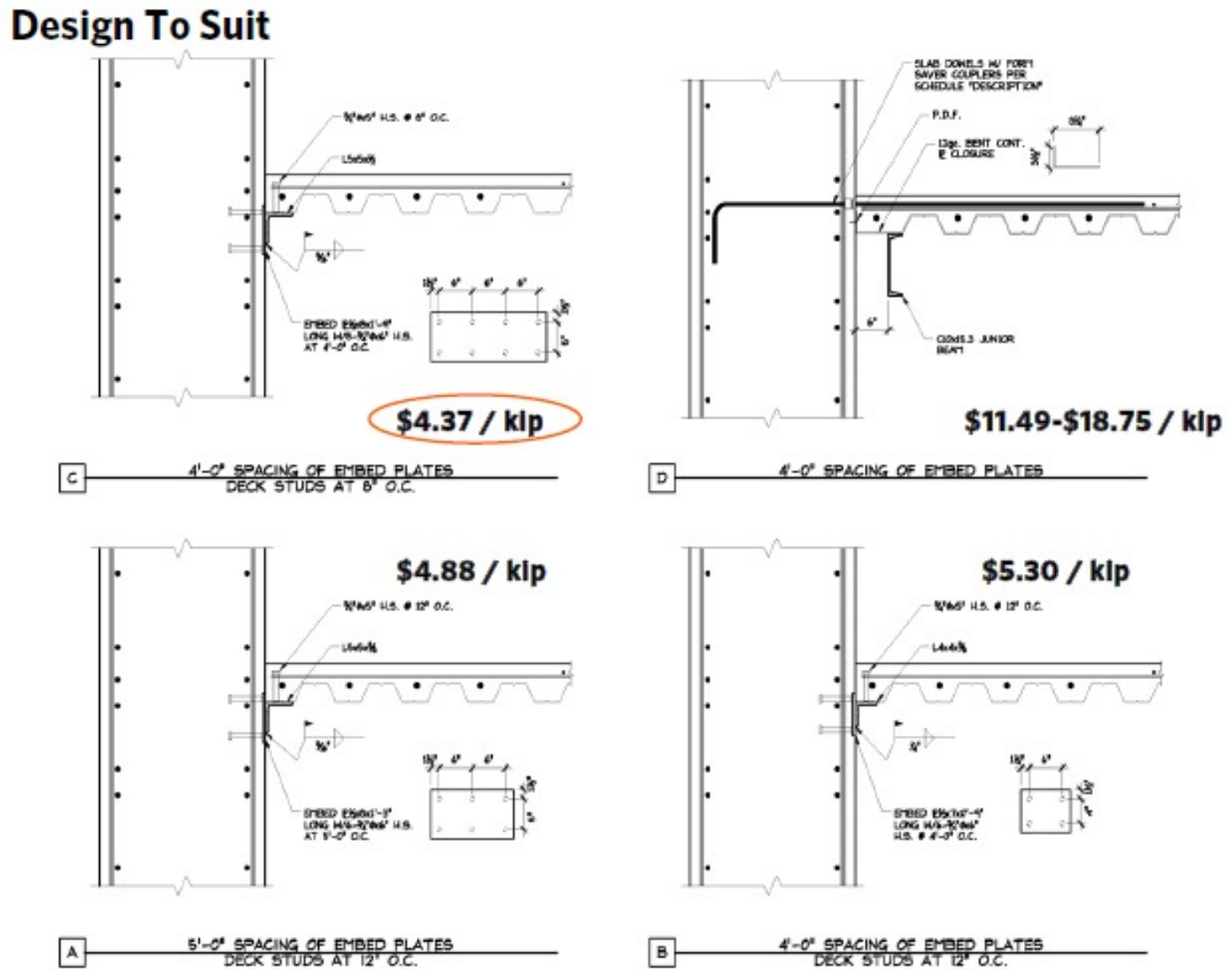
Set-Based Design – Connection Example

Courtesy: Tipping Mar



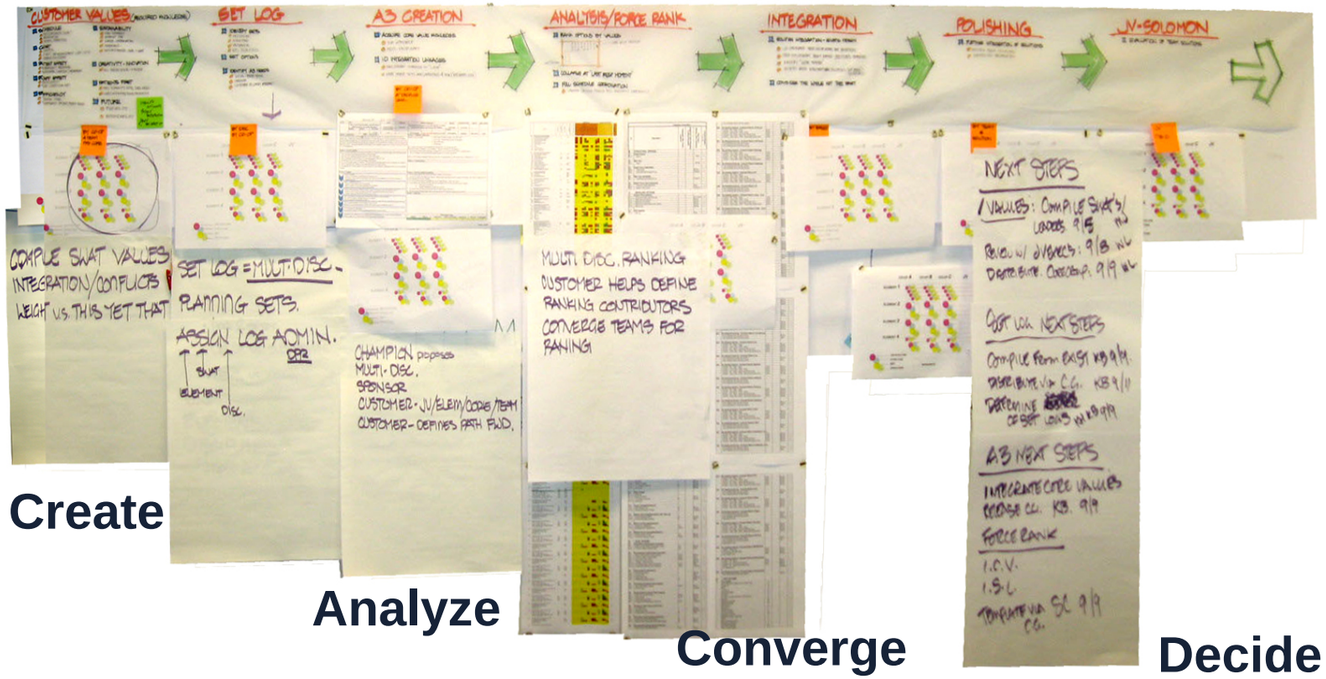
Set-Based Design – Connection Example

Courtesy: Tipping Mar



Set-Based Solutions

From CPR Program



San Diego Community College District Experience with TVD

Wouldn't It Be Nice If You Could...

Lean Construction Institute
Transforming the Built Environment

AIA P2SL

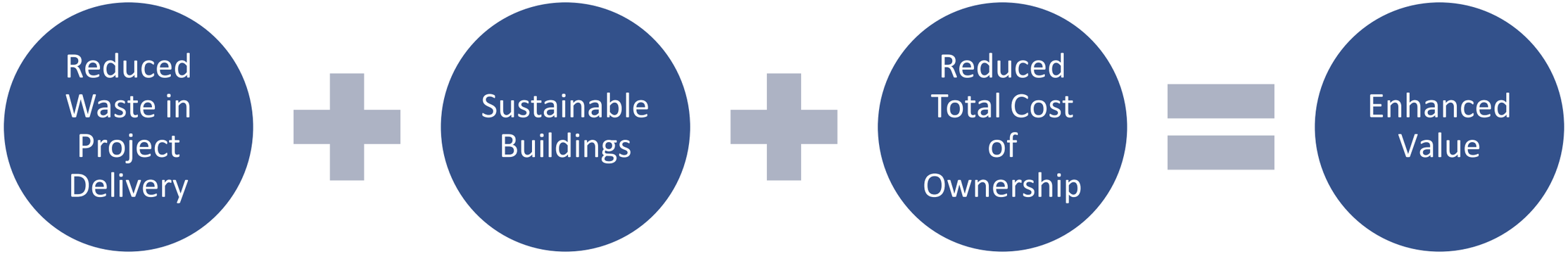
Average Savings of $900,000 on each of 15 projects

Reduce Average Schedule Delay by 56 days

Enhance Sustainability Objectives by 44%

Reduce Facilities Maintenance Costs by 53%

Public Owner Benefits



Target Value Design

- 11 Projects
- Avg. Value:
  US$21.8M
- 83% Met Target Cost; Avg. 7% Below Target Cost

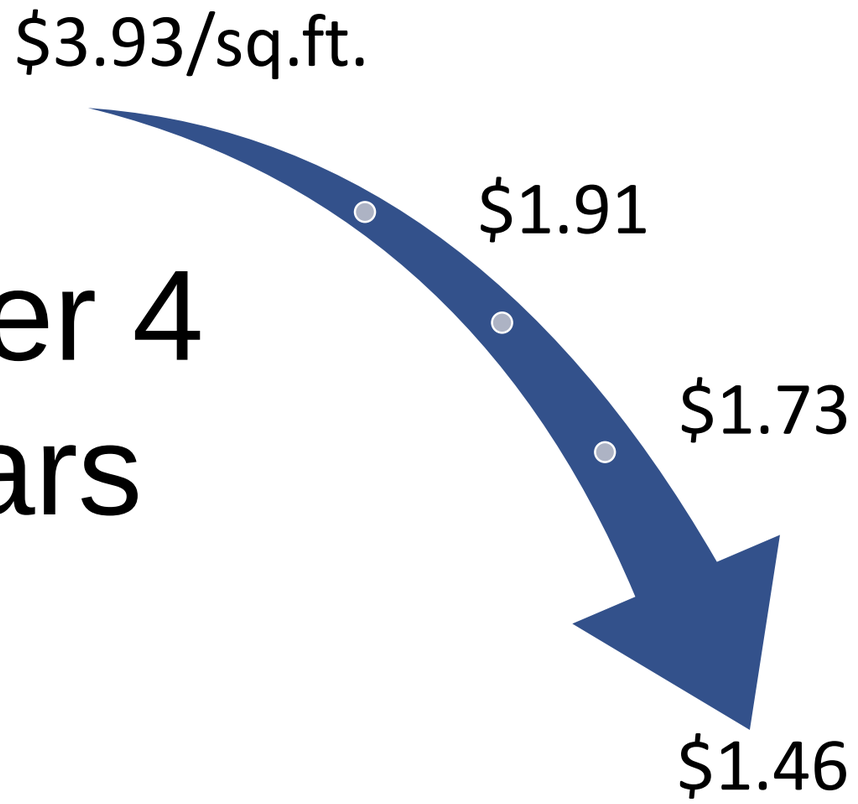
Sustainability as a Core Value
LEED Gold Projects

Lean Construction Institute
Transforming the Built Environment

AIA P2SL

20%	Direct Contract with Architect
26%	Post-Lean
44%	Target Value Design

Value as Reduced Maintenance Costs



Over 4 Years

Personal Lessons Learned

- Clearly define value at the beginning of the project
- Understand the business case constraints
- Specialty trade contractor involvement early is essential!
- Concurrent contemporaneous estimating is crucial!
- Report target cost status first, then design progress
- Document design decision-making process through A3 Reports
- Consider life cycle costs in design analysis
- Use Last Planner® during design

This concludes The American Institute of Architects
Continuing Education Systems Course

Lean Construction Institute info@leanconstruction.org

Questions?

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www.umstotsolutions.com

619-201-8483 (O)

LEAN IN DESIGN FORUM

MAY 31-JUNE 1 • CHICAGO, IL

In the spirit of continuous improvement, we would like to remind you to complete this session's survey in the Design Forum app! We look forward to receiving your feedback.

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