

Lean Construction Institute

Building Knowledge in Design and Construction

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Provider Name: Lean Construction Institute

Provider Number – H561

Course Name: Improving the Way We Work: Principles of Lean Design

Course Number – 20121010PM

Course Speakers: Laura Lesniewski, Will Loftis, Bernita Beikmann, Jennifer Taylor, Luciana Burdi, Bevan Mace, John Bechtel, Steve DiBartolo, David Riz, Amanda Goolsby

Course Date: October 10, 2012



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Course Description

This session trains participants about the fundamental principles of lean design, such as co-location, team education, and an enlightened perspective about the nature of design. We will touch on lean as it relates to high-performance buildings, and incorporate case studies from participants in projects that used lean methodologies to improve the design of their facilities and change the way they deliver a project in design and construction.

Learning Objectives

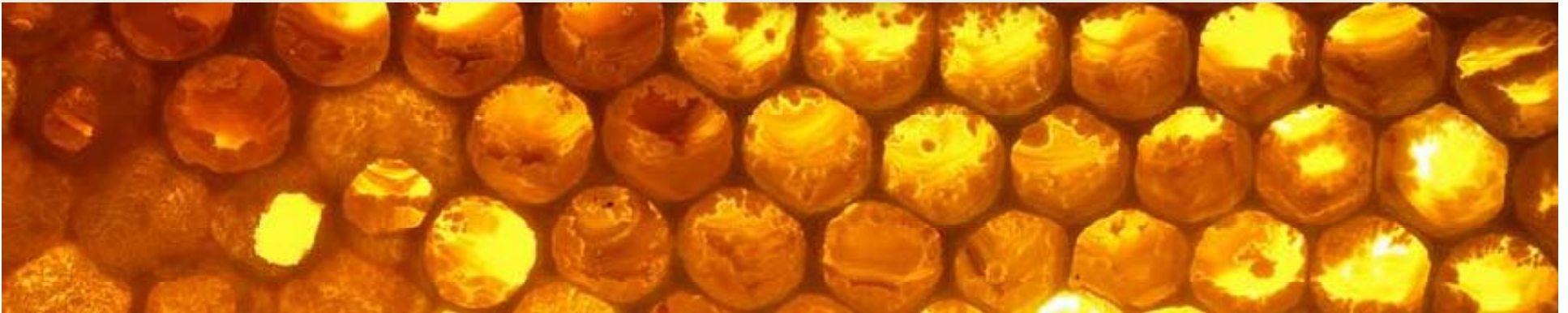
At the end of the this course, participants will be able to:

- 1) Uncover strategies and pitfalls associated with a Lean Transformation for a public agency including demonstrating results and coordinating implementation of Lean Construction practices to support process improvement.
- 2) Understand what specific procurement changes are needed for Owners to enable lean delivery of projects and establish a governance structure to enable decision making.
- 3) Gain an understanding of the need for each team member to reinvent themselves on a continual basis in response to the constant project dynamics and understand how this leads to greater sustainability.
- 4) Identify critical concepts around team collocation and integrated team dynamics in order to be more fully prepared to optimize the results.

14th Annual LCI Congress

LEAN IN DESIGN

Arlington, Virginia | 10 October 2012



Laura Lesniewski, AIA – BNIM

Markku Allison, AIA – American Institute of Architects

with participation from

David Mar, Tipping Mar

Dean Reed, DPR Construction

LEAN IN DESIGN:

2005 Position Paper

2005 Position Paper

LCI Design Forum

- **Undesirable Characteristics of Current Design**
 - Difficulty with Defining or Measuring Values
 - Poor Integration
 - Inability to Design to Set Budgets
 - Missed Opportunities for Adding or Capitalizing on Value
 - Typical Fee Structures Do Not Have Incentives for Adding Value
 - Other Problems...

2005 Position Paper

LCI Design Forum

▪ **Recommendations to Improve the Design Process**

- Assemble Teams Early in Pre-Design
- Get the Client to Develop and Commit to a Set of Design Values
- Determine the Decision-Making Structure of the Ownership Group
- Plan Using the Charrette Process
- Design Using the Charrette Process
- Design to Target Cost and Other Defined Characteristics
- Design with Awareness of the Construction Process
- Set Fees for Pre-Design to Schematic Design on an Hourly Basis
- Set Aside a Portion of Remaining Design Fees and Make Them Subject to Meeting Performance Targets
- Coordinate Design Work through Reliable Promising
- Design Using Shared 3D Object-Based Modeling

LEAN IN DESIGN:

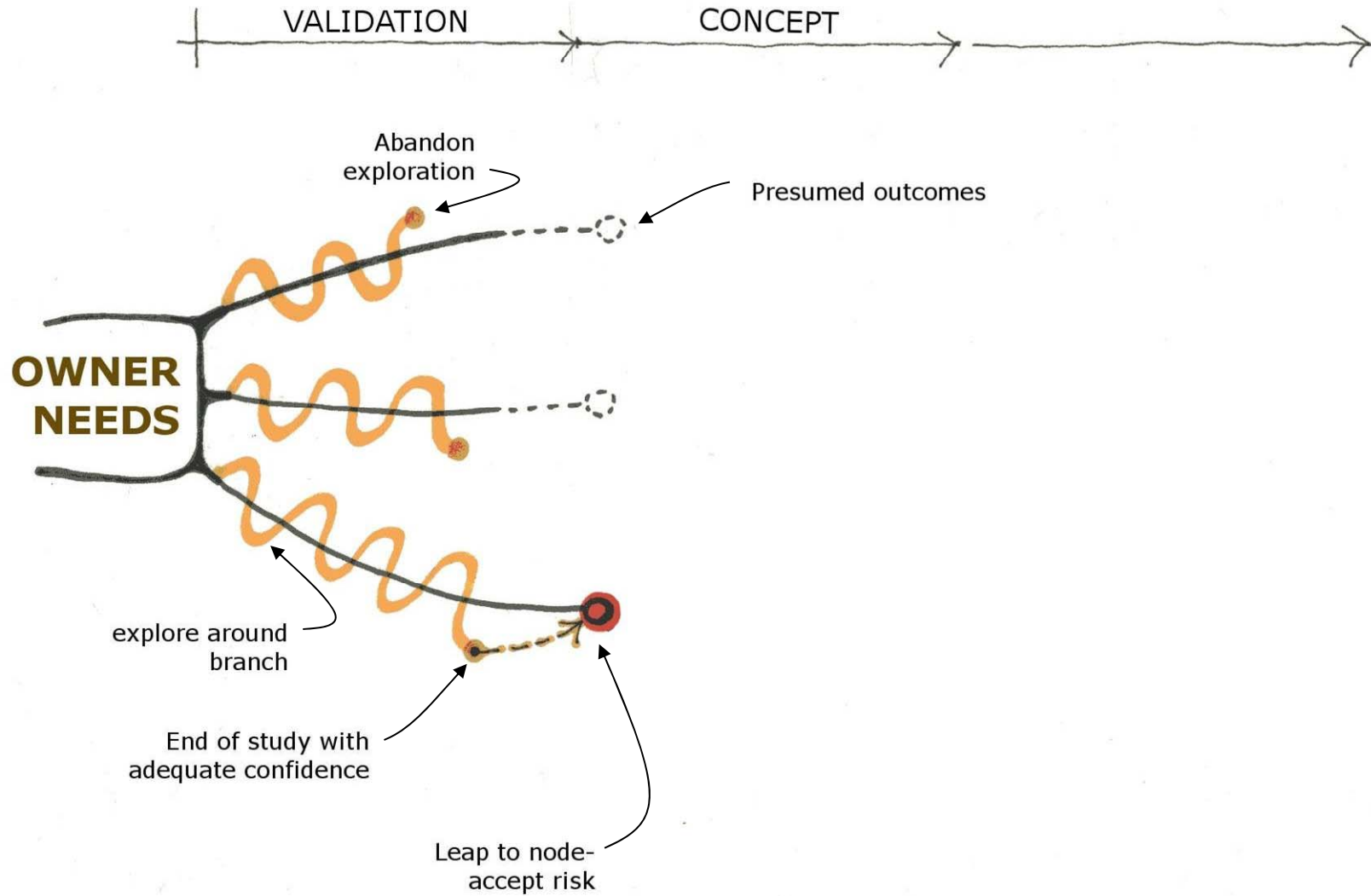
Some observations

*Lean is about
maximizing value and
eliminating waste*

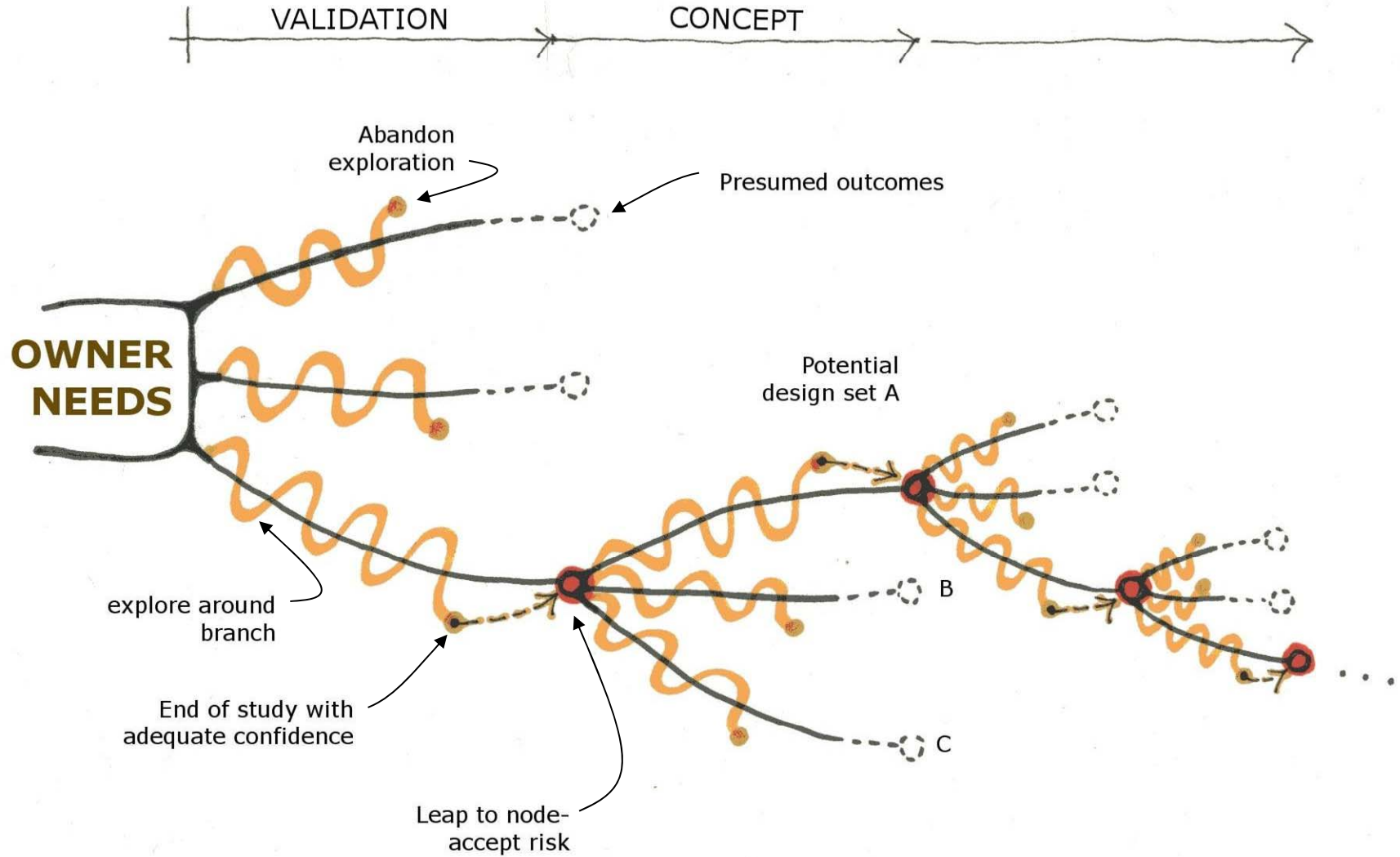
*Lean has been more
about eliminating
waste than increasing
value*

Lean in design
is fundamentally
different than
Lean in construction

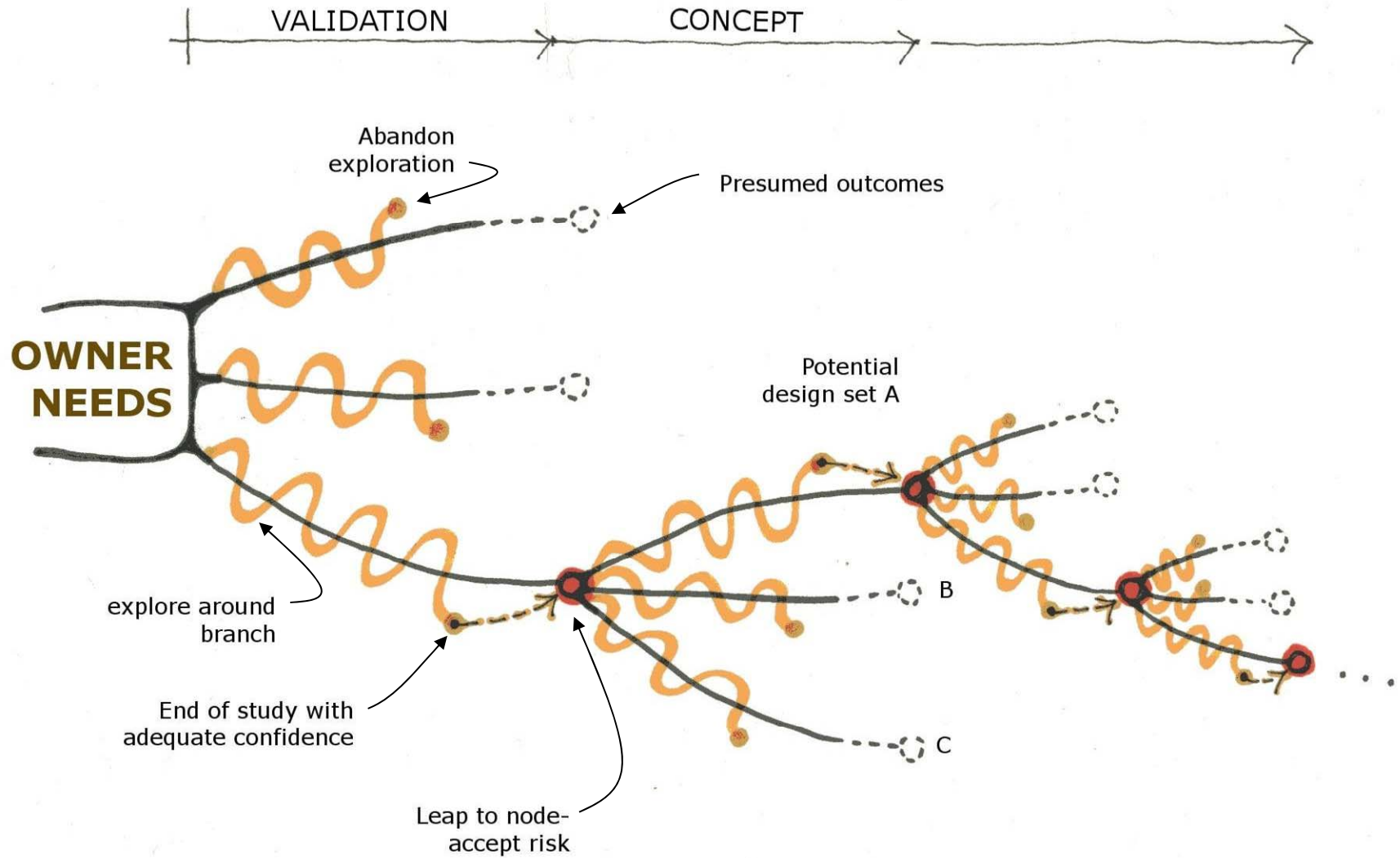
Design flow



Design flow



Design flow



Empathy Holistic Thinking Imagine, Visualize & Sketch
Articulate & Express Ideas Negotiate & Reach Consensus

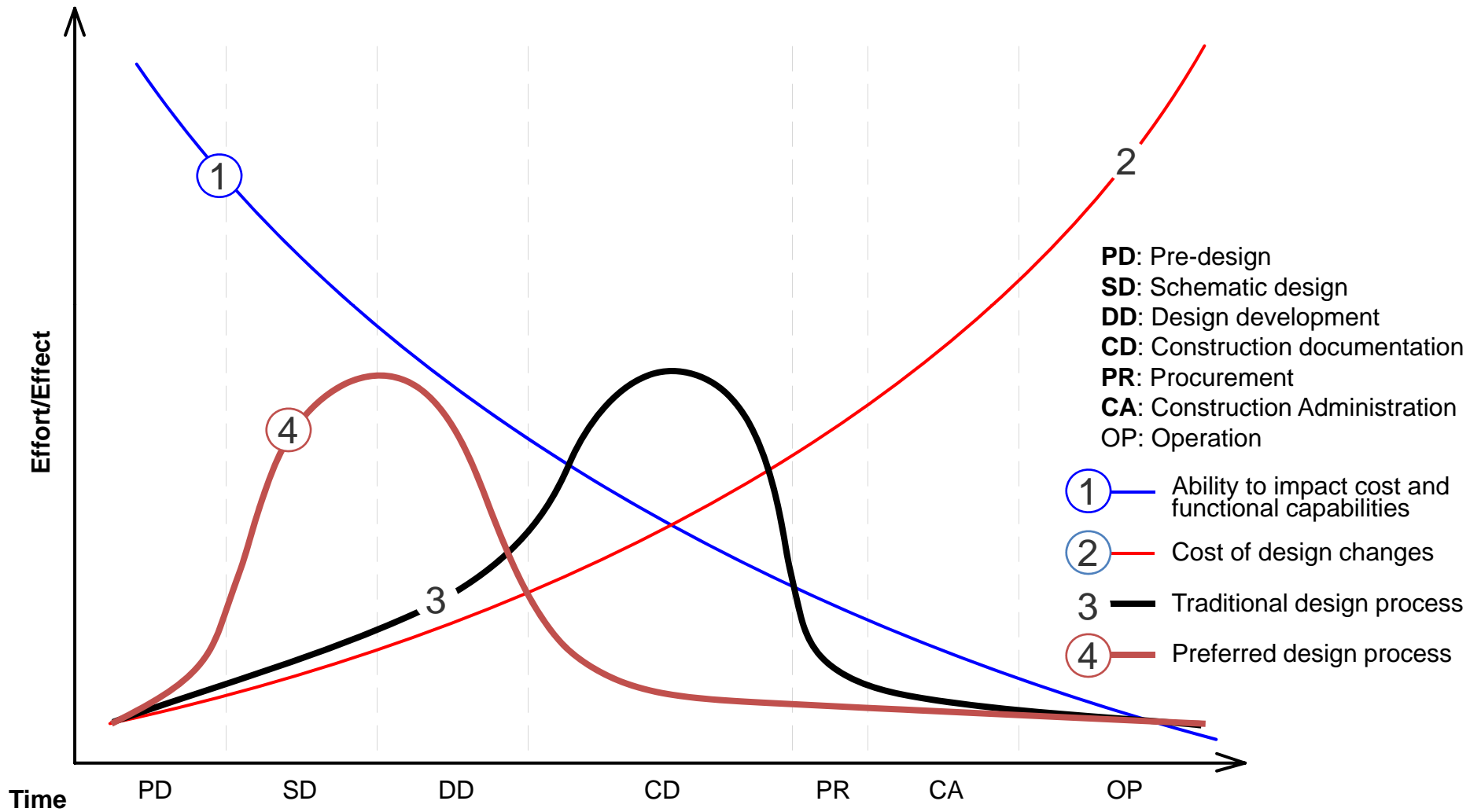
TIPPING | MAR

cost effectiveness / performance to budget
efficiency
productivity (construction)
environmental (sustainable) impact
embodied energy
energy use
maintenance costs
improved enterprise outcomes
worker satisfaction
productivity (users)
health
fit to use
flexibility
ROI
context / community
beauty

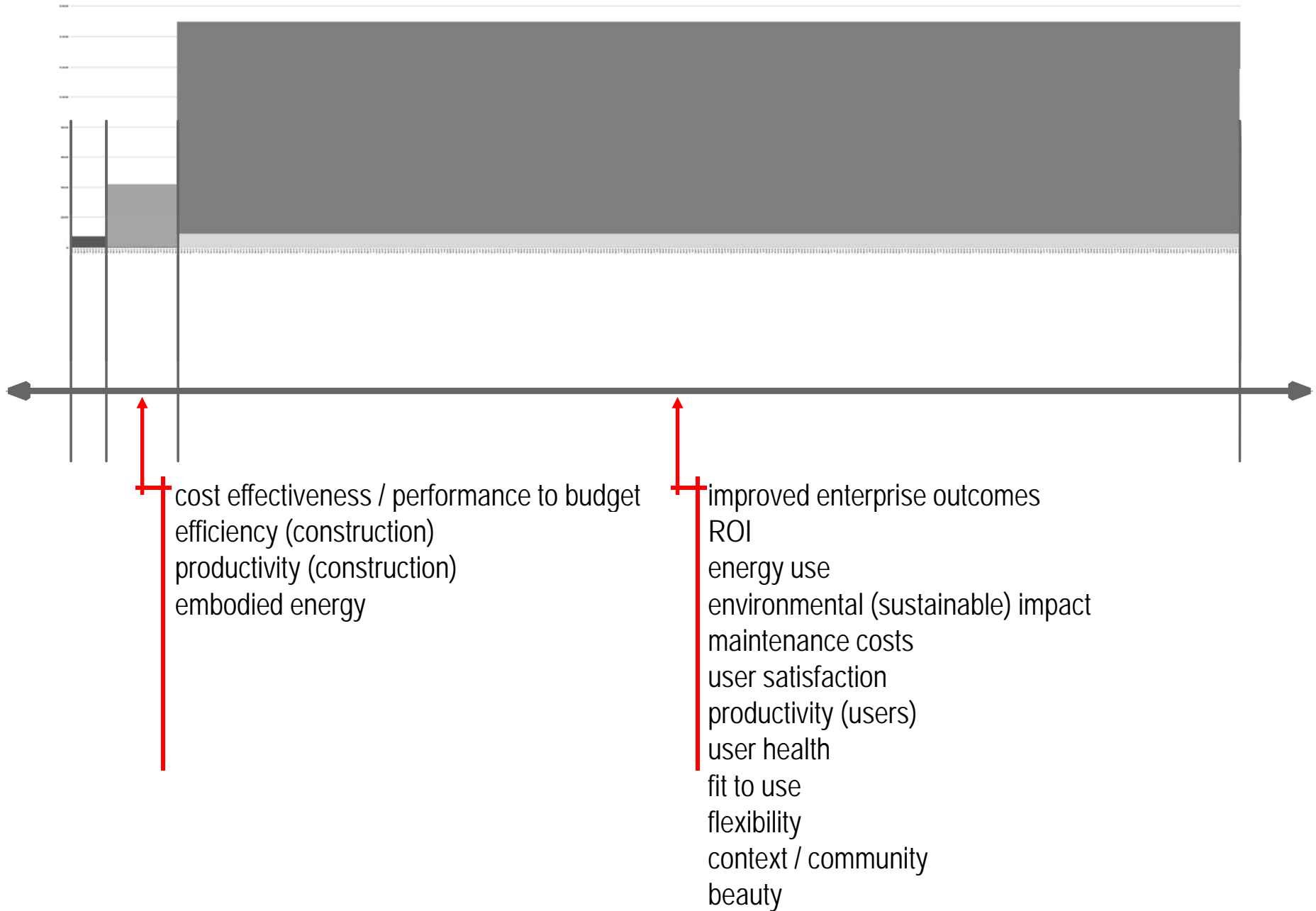
*We have not been able
to articulate that
“potential value” can
best be increased in the
design phase*

AEC Productivity

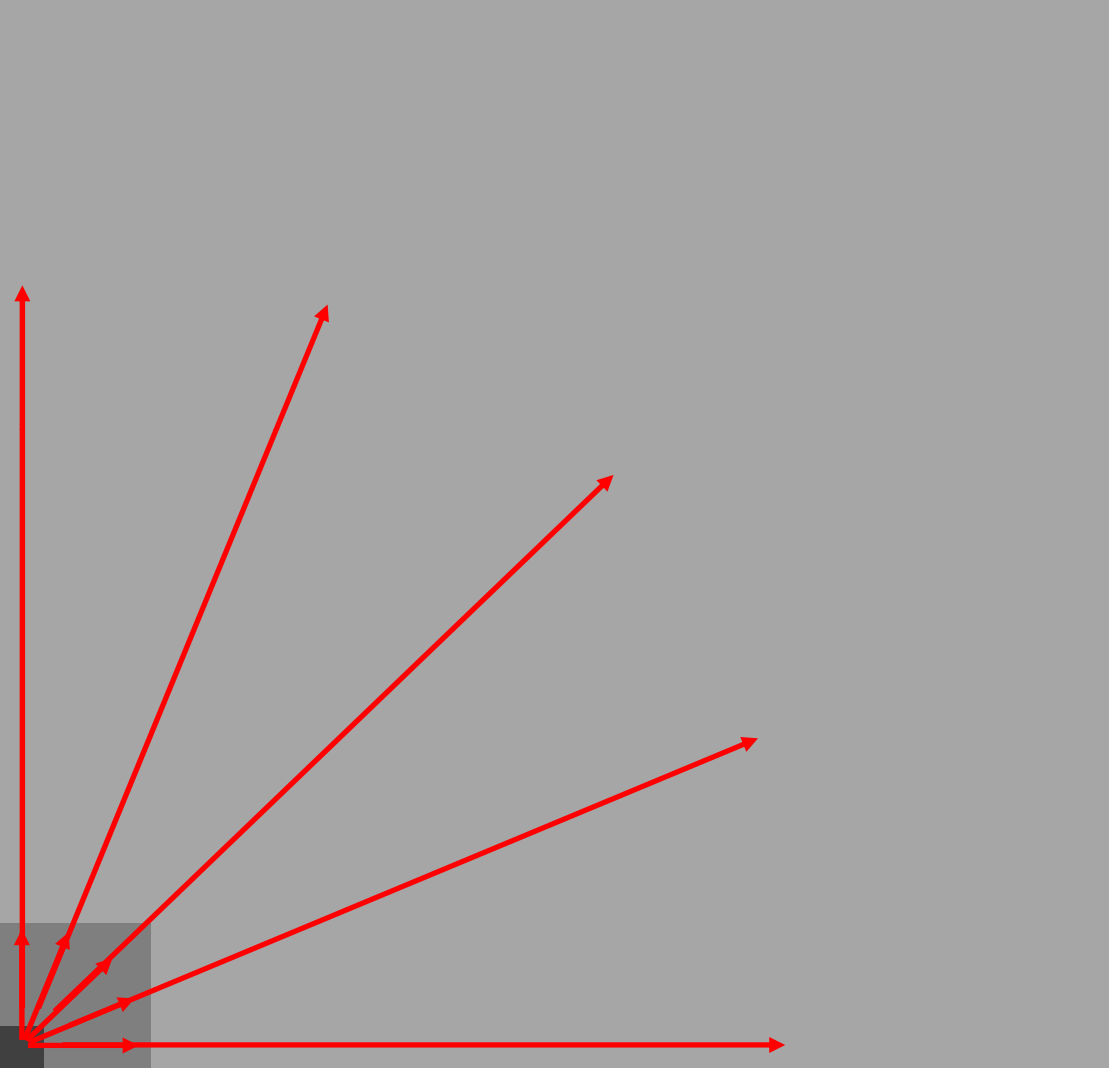
Construction User's Roundtable



Graphic originated by Patrick MacLeamy, AIA / HOK







*Lean is about
maximizing value and
eliminating waste*

*Lean (in design) is
about maximizing
value ~~and eliminating~~
~~waste~~*

*Lean in design means
nurturing design*

maximize value

long term view

effective communications

LEAN IN DESIGN:

Next steps

Cultural shifts

*There exists a general
inability to function as
a design collective*

Integrated design in lieu of
elaborate coordination

*There still exists a lot
of cultural baggage
between design and
construction, and
within design*

Creating new tools for lean in design

Cultural:

- *More effective design collective*
- *Keep design thinking/effort focused on long-term view (starting with project vision)*

Education / re-training

Reciprocal respect and cooperation
Collective understanding of design

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This concludes The American Institute of Architects
Continuing Education Systems Course

Lean Construction Institute



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