

Lean Construction Institute

Building Knowledge in Design and Construction

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LEAN CONSTRUCTION

Opportunities | Concepts | Practices

DEAN REED | DPR CONSTRUCTION, INC.

LEAN CONSTRUCTION INSTITUTE CASCADIA CHAPTER
INTRODUCTION TO LEAN DESIGN
SEATTLE, WA | SEPTEMBER 15, 2008

THREE CONNECTED OPPORTUNITIES

IMPECCABLE COORDINATION

PREDICTABLE WORKFLOW
FREEING HUMAN CAPACITY
TO FOCUS ON
INNOVATION & CONTINUOUS IMPROVEMENT

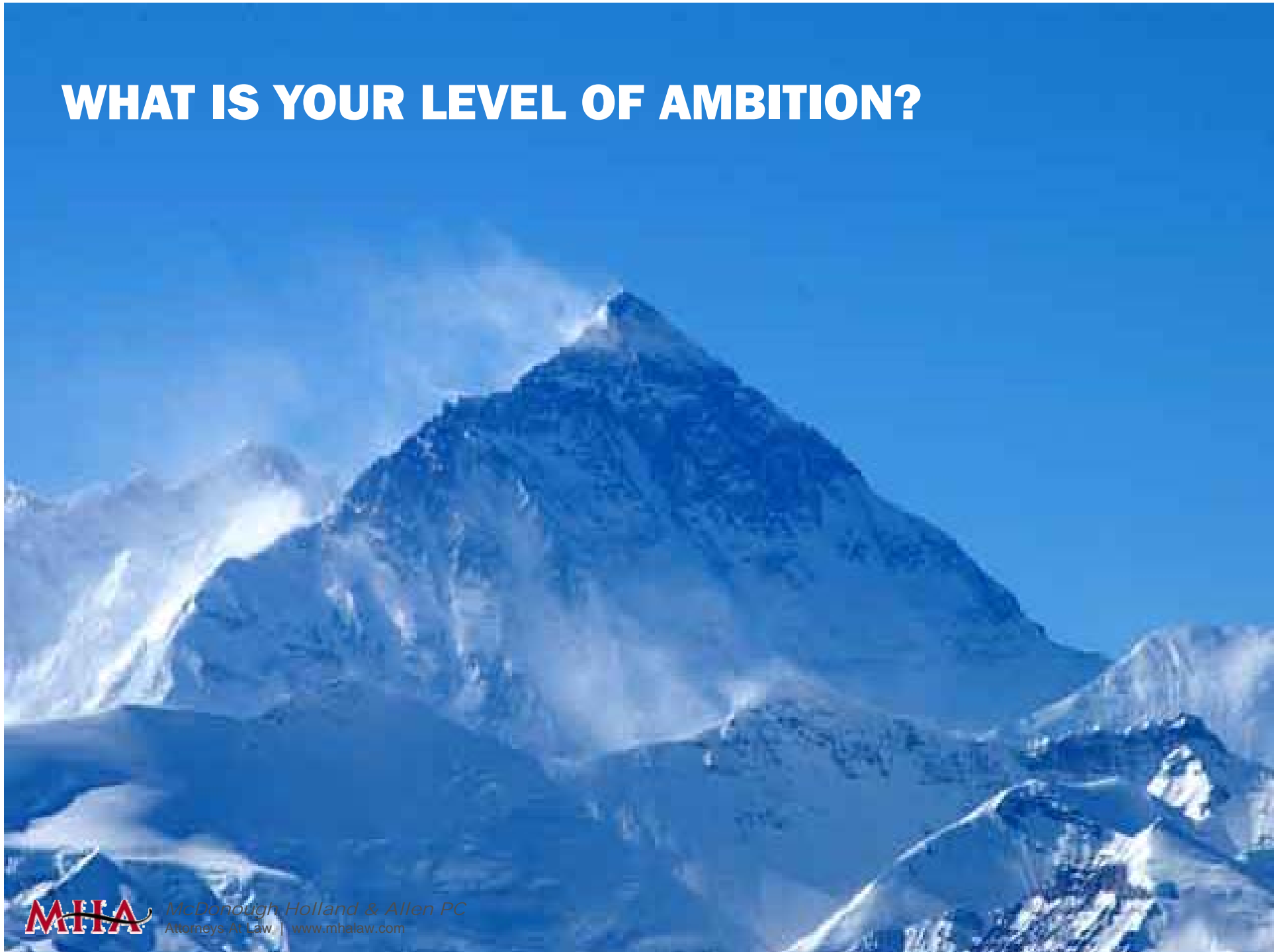
PROJECTS AS PRODUCTION SYSTEMS

CHANGING THE STRUCTURE OF WORK
ELEVATING COST & OTHER VALUES
TO DRIVE DESIGN

PROJECTS AS COLLECTIVE ENTERPRISE

ALIGN FINANCIAL INCENTIVES
MOVE MONEY ACROSS BOUNDARIES
FOR PROJECT OPTIMIZATION
RATHER THAN TRADE OR SILO FOCUS

WHAT IS YOUR LEVEL OF AMBITION?



McDonough, Holland & Allen PC
Attorneys At Law | www.mhalaw.com

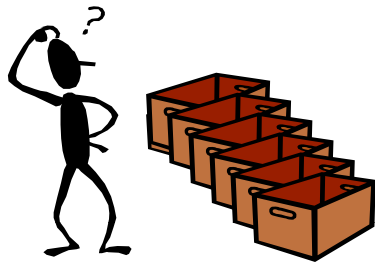
GOAL OF THE TOYOTA PRODUCTION SYSTEM

“To produce the right product at the right time in the right quantity for the customer and to produce exactly what you need and nothing more...”.

Taiichi Ohno
creator of the Toyota Production System

WASTE

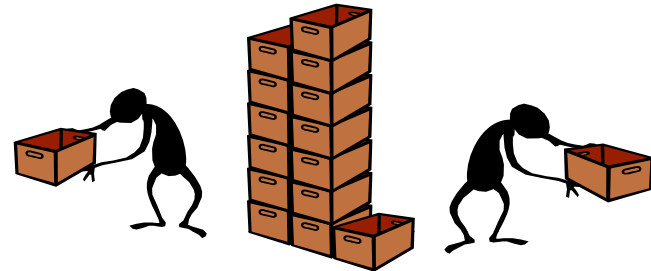
Anything that Consumes Resources but Does Not Provide Value for the Customer



1. Overproduction



2. Waiting



3. Inventory



4. Movement



5. Effort



6. Rework of Errors



7. Processing Errors

WASTES IN CONSTRUCTION

- **Overproduction:**
 - Putting as much work in place as possible, making it harder to do priority work
 - Ordering additional material because of poor quality or fit
- **Waiting:** for materials, direction, information or prerequisite work
- **Inventory:** information or material delivered before it is needed
- **Movement:** moving materials from one place to another before installing it
- **Effort:**
 - Returning to the shop to pick up plans, materials or tools not at the site
 - Hunting for information or tools
- **Rework:** re-doing work because of errors
- **Processing:**
 - Recreating work because it cannot be shared
 - Unnecessary reporting
 - Expediting material not ordered in time
 - Excessive coordination of multiple levels of suppliers

LEAN THINKING

Eliminate **waste** through application of 5 principles

1. Identify **Value**
2. Map the **Value Stream**
3. Make value-creating steps **flow**
4. At the **pull** of the customer
5. Strive for **perfection**

James Womack in Lean Thinking

PRESIDENT OF TOYOTA NORTH AMERICA'S ADVICE

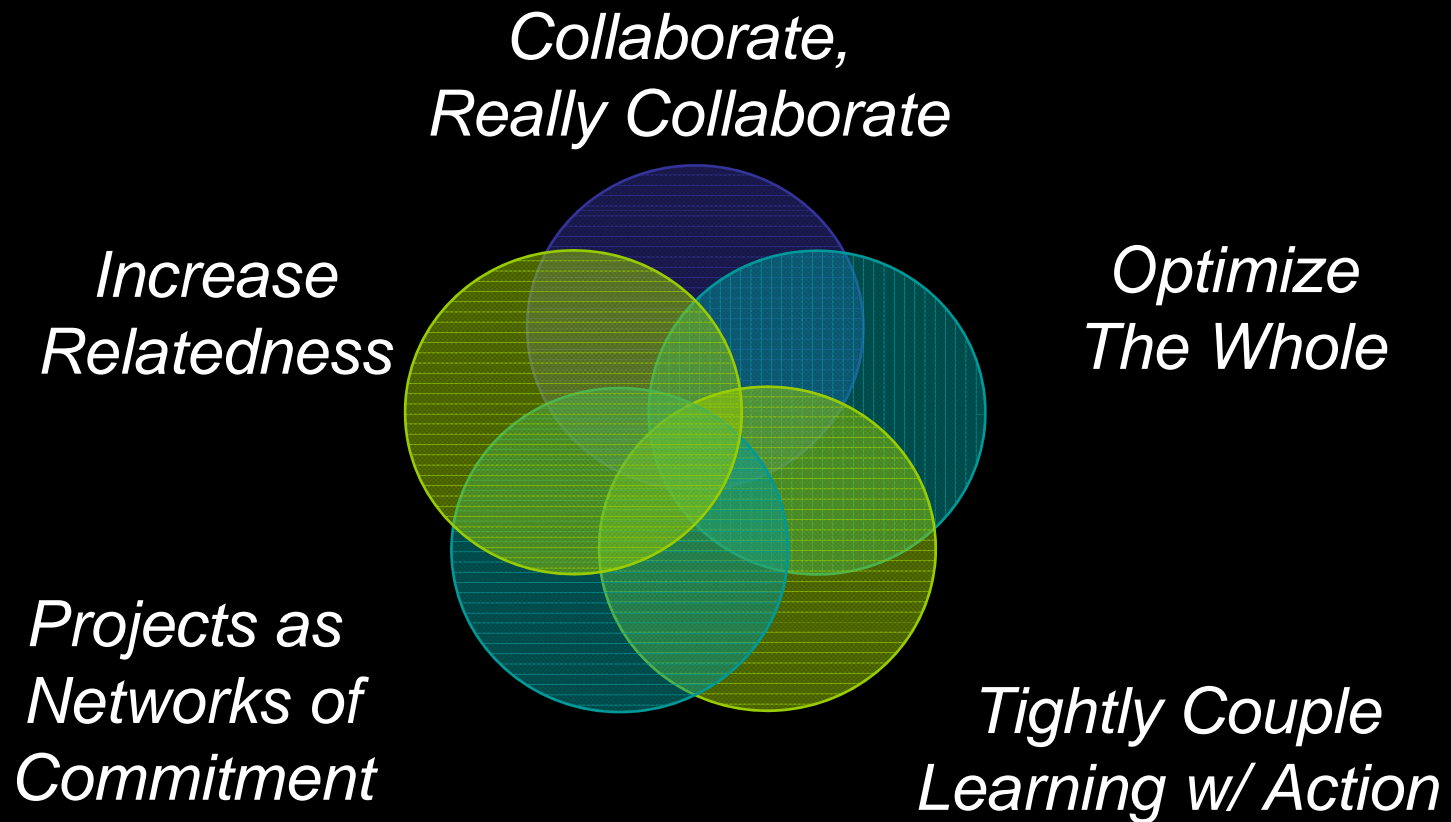
Keep everything simple

Make it visible

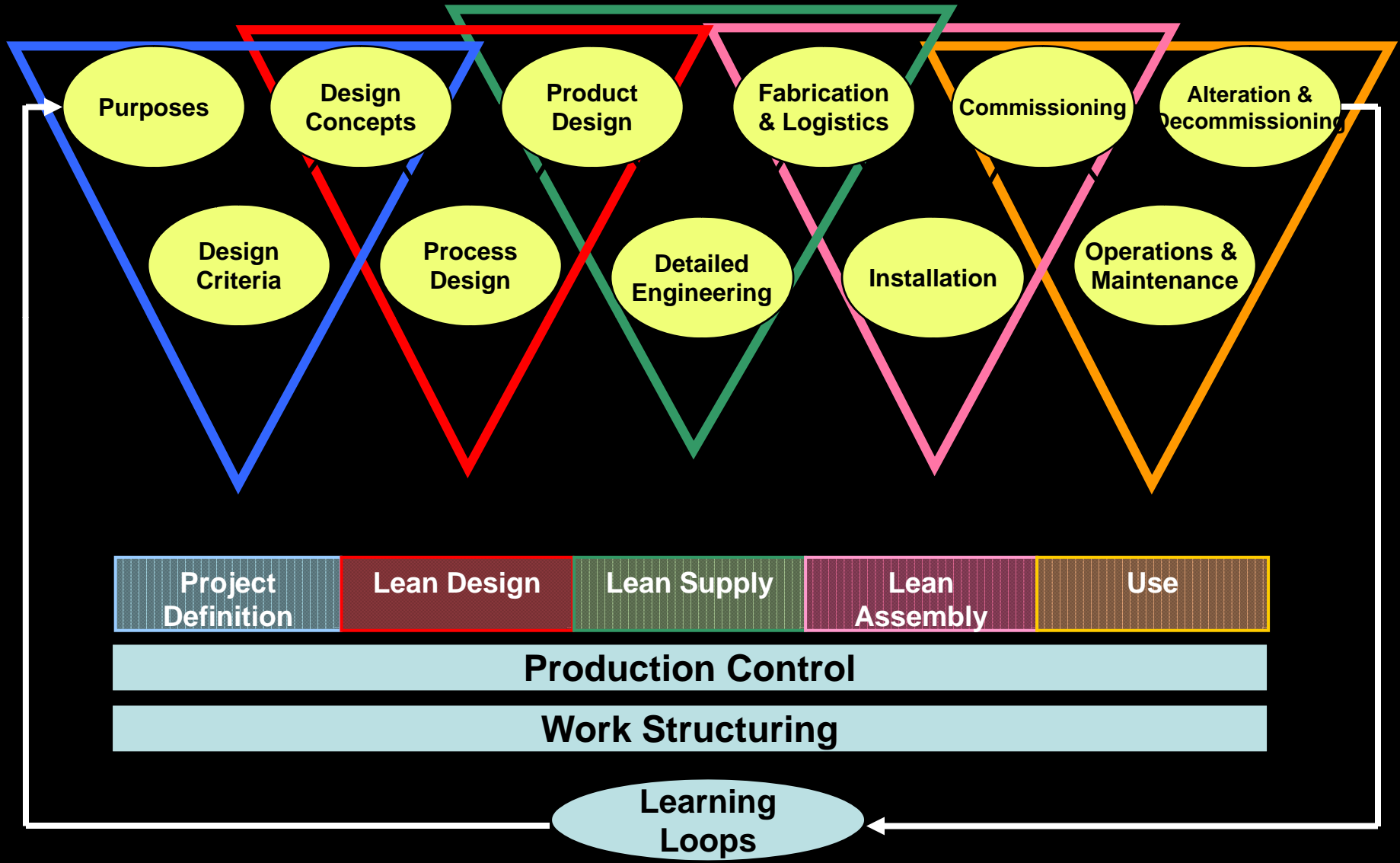
Trust your people to do the right thing

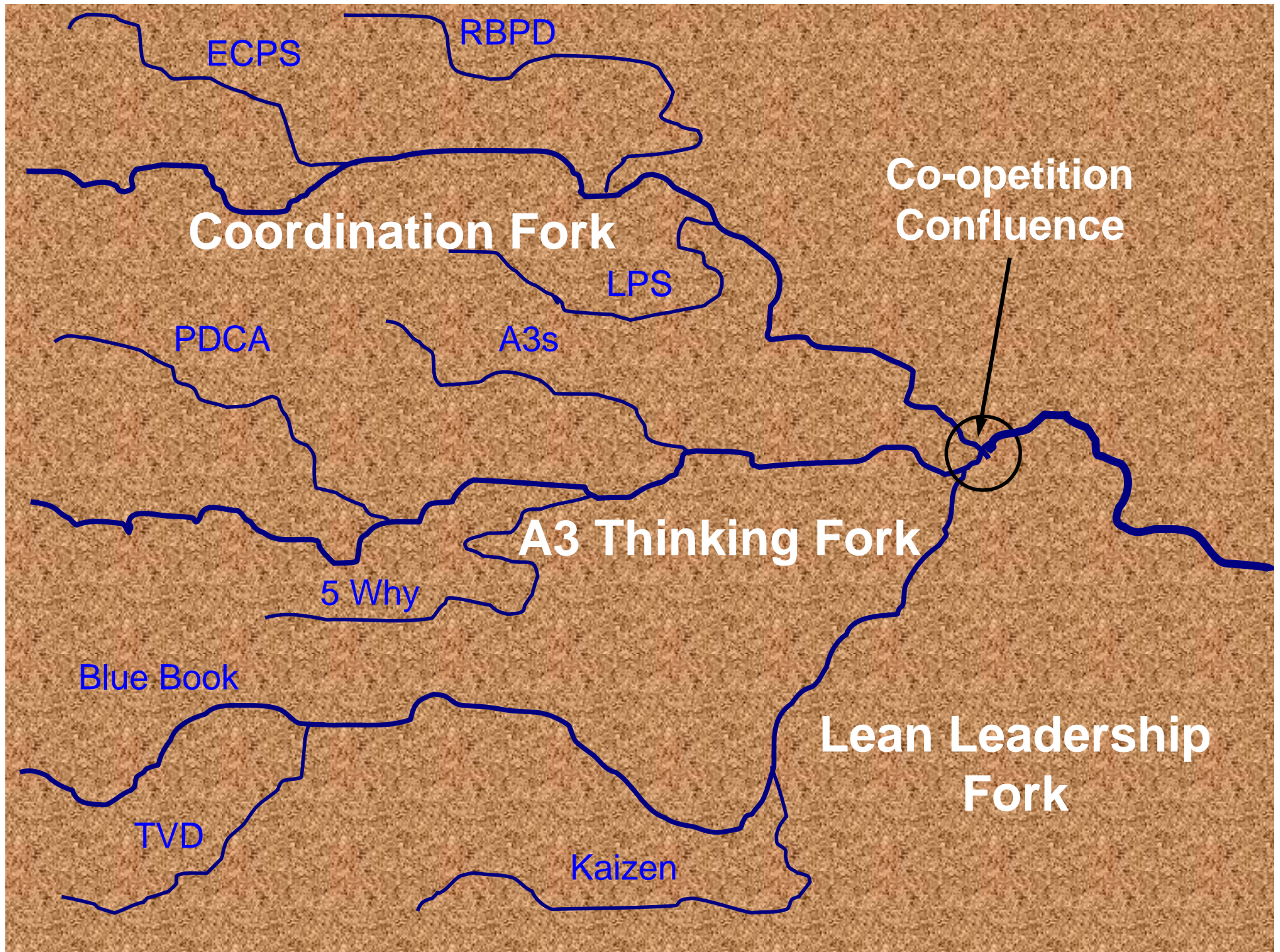
Cited by Michael Kennedy in "Ready Set Dominate"

SUTTER HEALTH'S FIVE BIG IDEAS FOR LEAN PROJECT DELIVERY

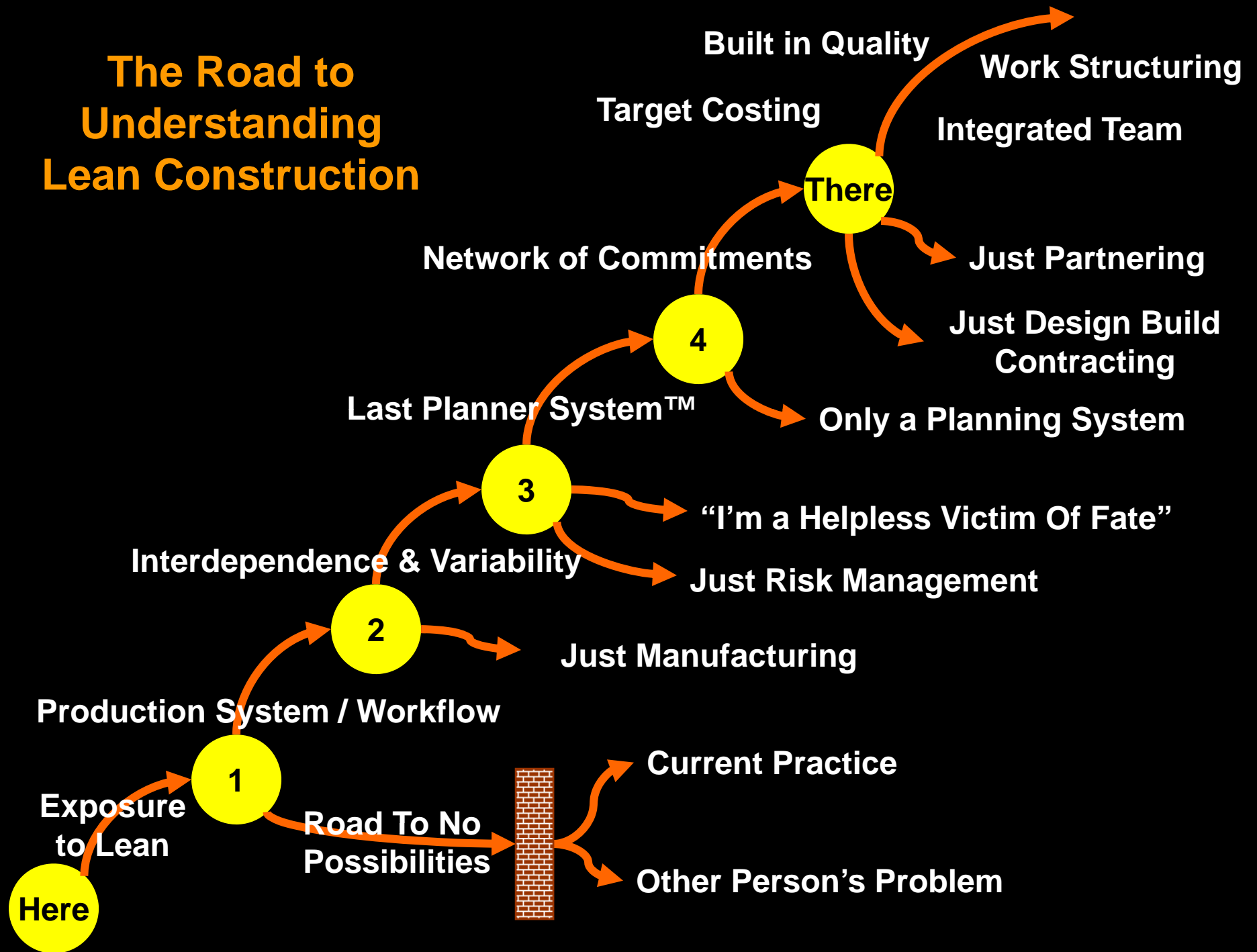


LEAN PROJECT DELIVERY

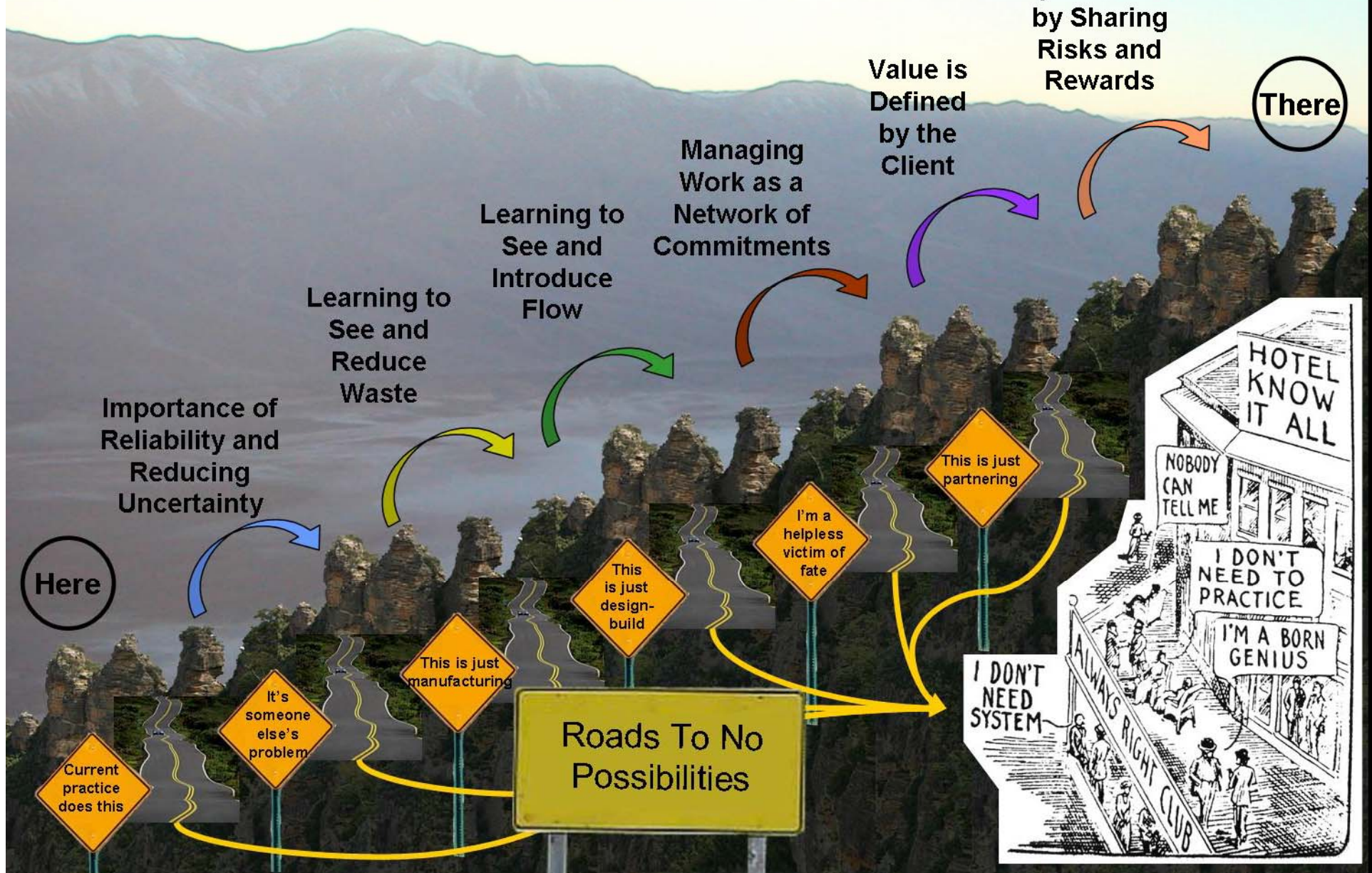




The Road to Understanding Lean Construction



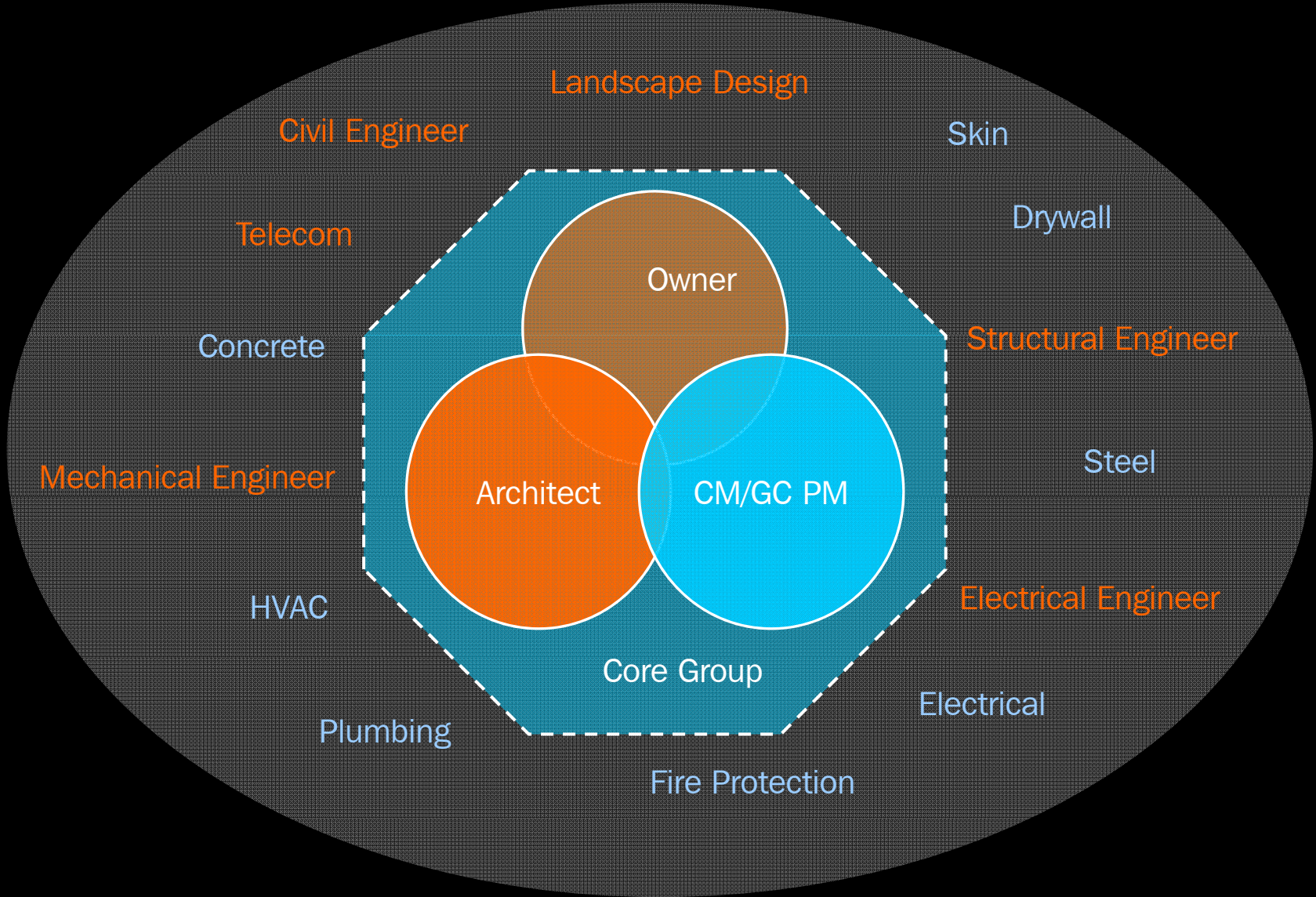
The Journey to Understanding Lean Project Delivery



LEAN CONSTRUCTION CONCEPTS & PRACTICES



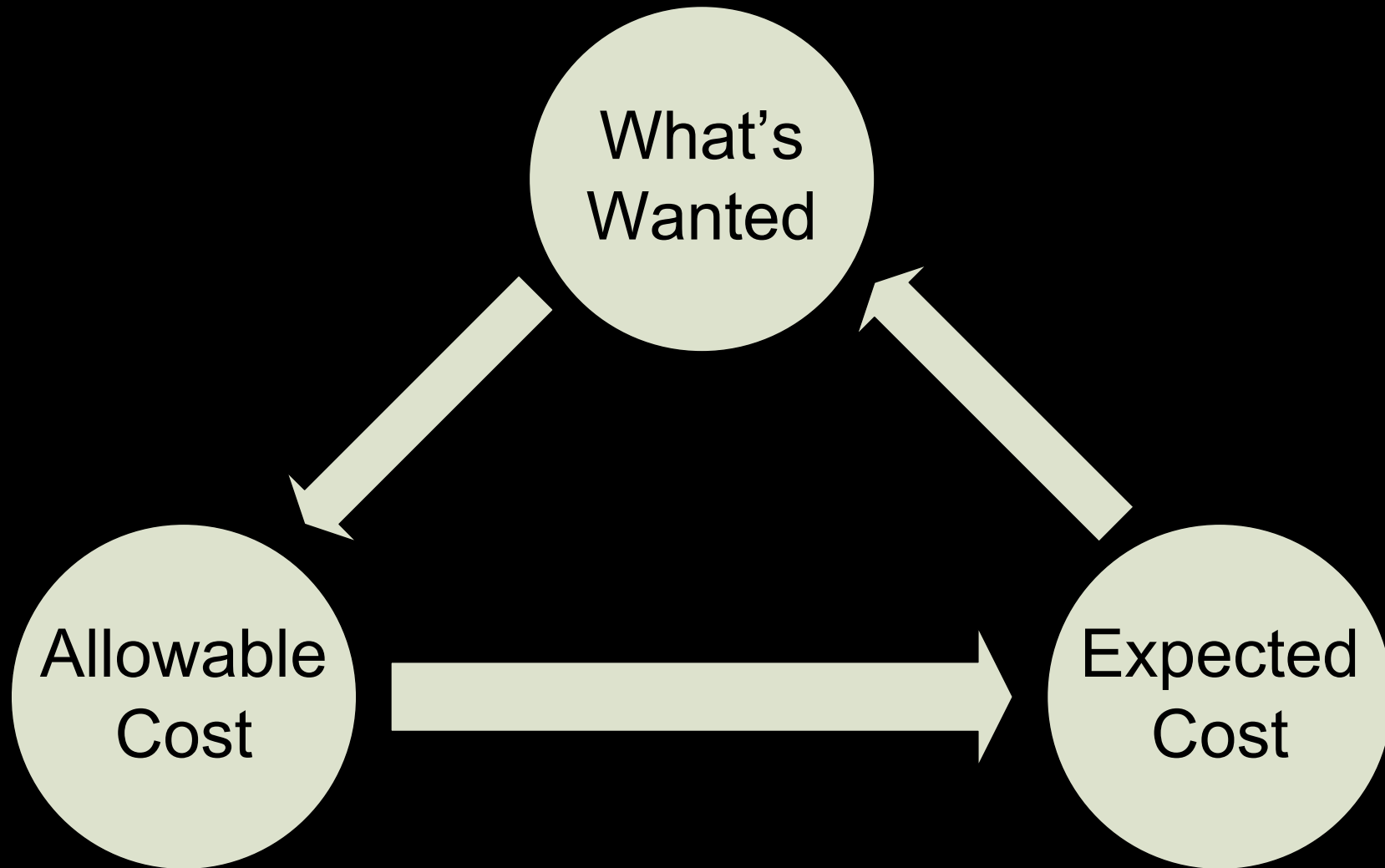
INTEGRATED PROJECT DELIVERY TEAM



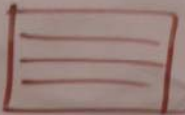

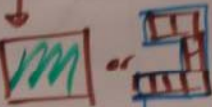
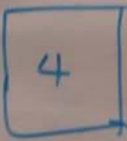
Real value is not the low bid on a higher cost design. It's achieving the lowest true cost on the right design.

**Eric Lamb
EVP, DPR Construction, Inc.**

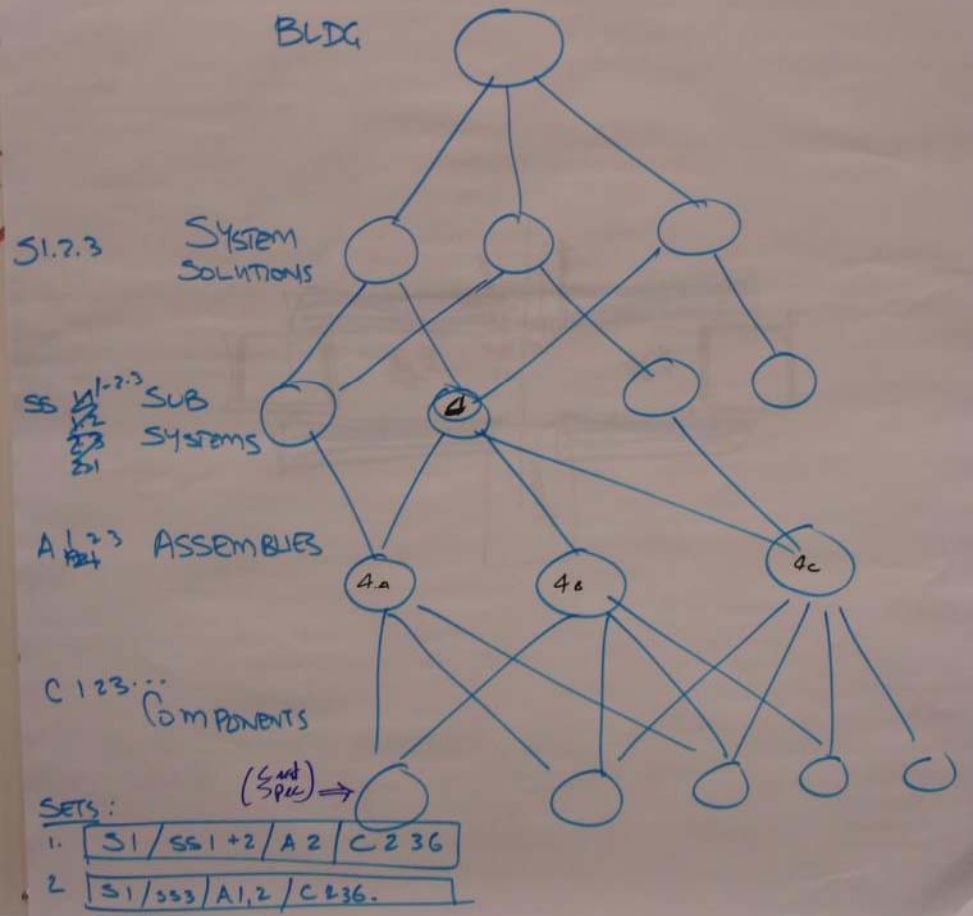
TARGET VALUE DESIGN FEEDBACK LOOP





	ARCHITECTURE	STR	M/P
CLUSTER BUILDING		GRID	FLOOR
SYSTEM		FRAMING PLAN	MAINS
SUB SYSTEM			BRANCH
ASSEMBLY		Connection Details?	Room Schematics
Component	Surfaces Finish FFE	Connections Elements	Fit/Type Types Counts

CARRYING MULTIPLE DESIGN SETS



SMCCV Value Stream Mapping

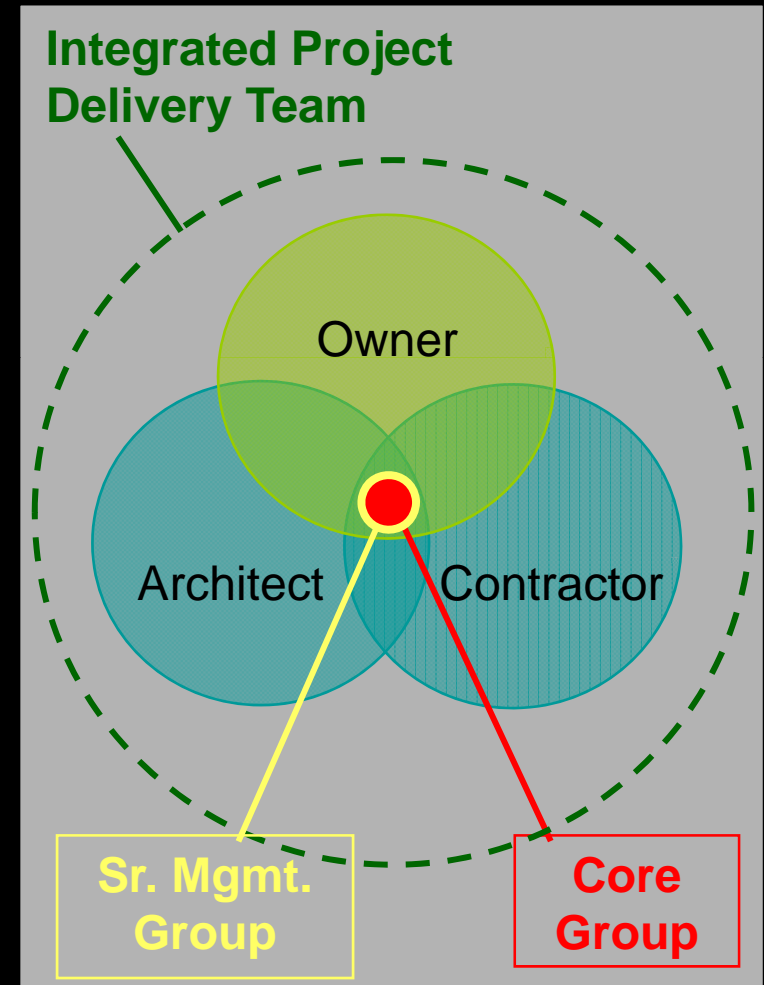


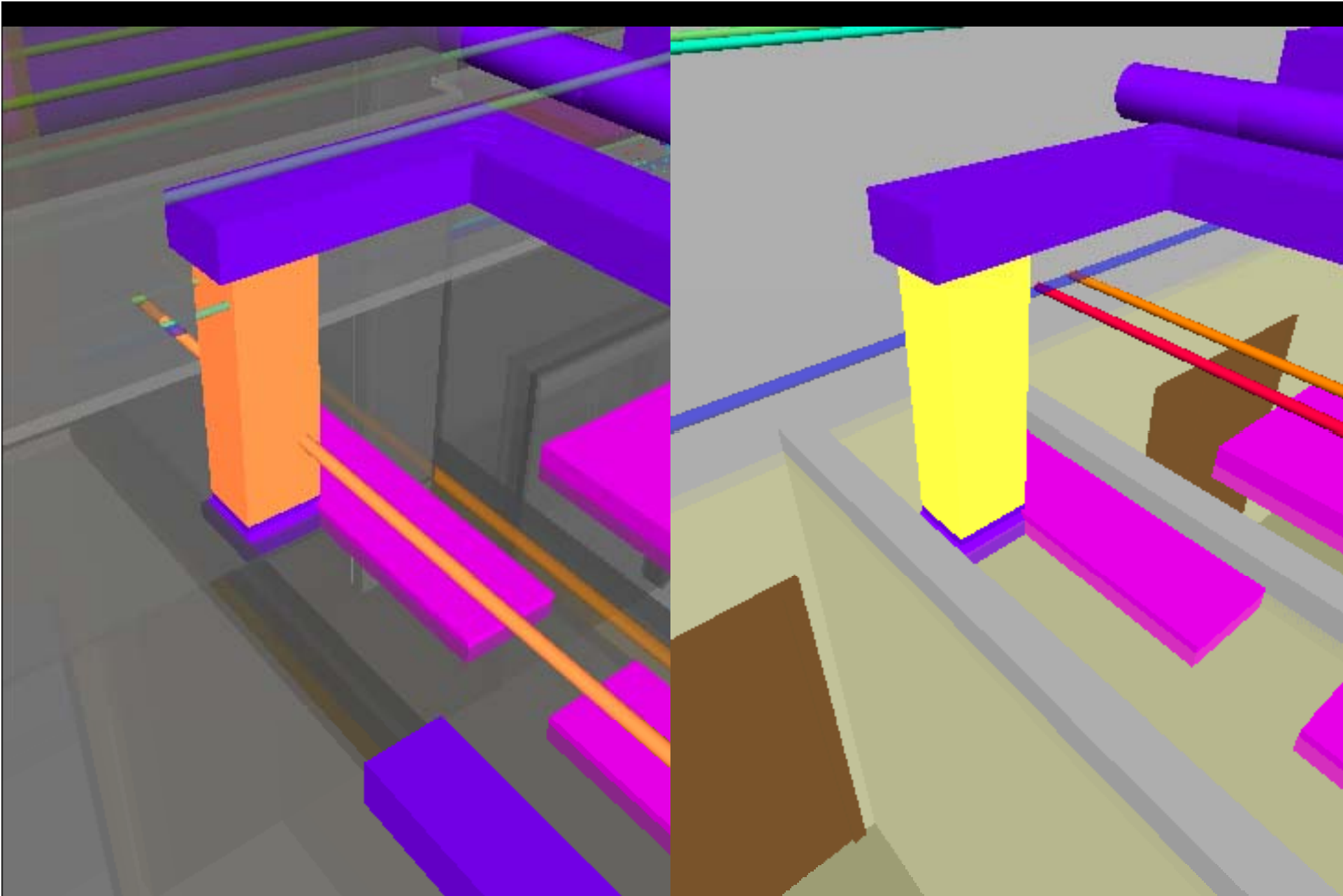


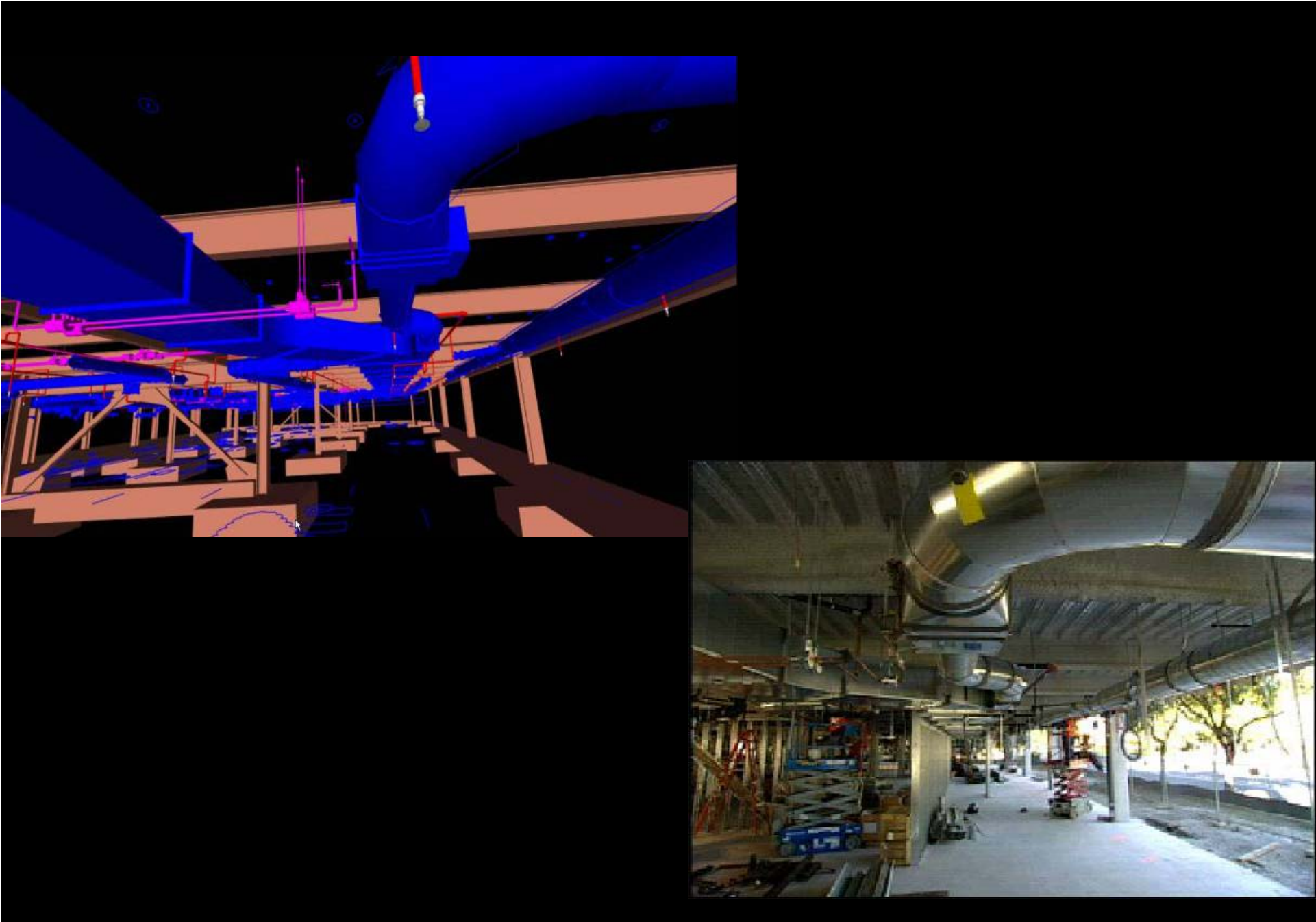


RELATIONAL CONTRACTS

- One Agreement signed by O-A-C
- “Joined” by jointly selected team members
- No separate “general conditions”
- Provides for formation of:
 - Core Group
 - Integrated Project Delivery Team
 - Senior Management Group
- Incentives for team performance











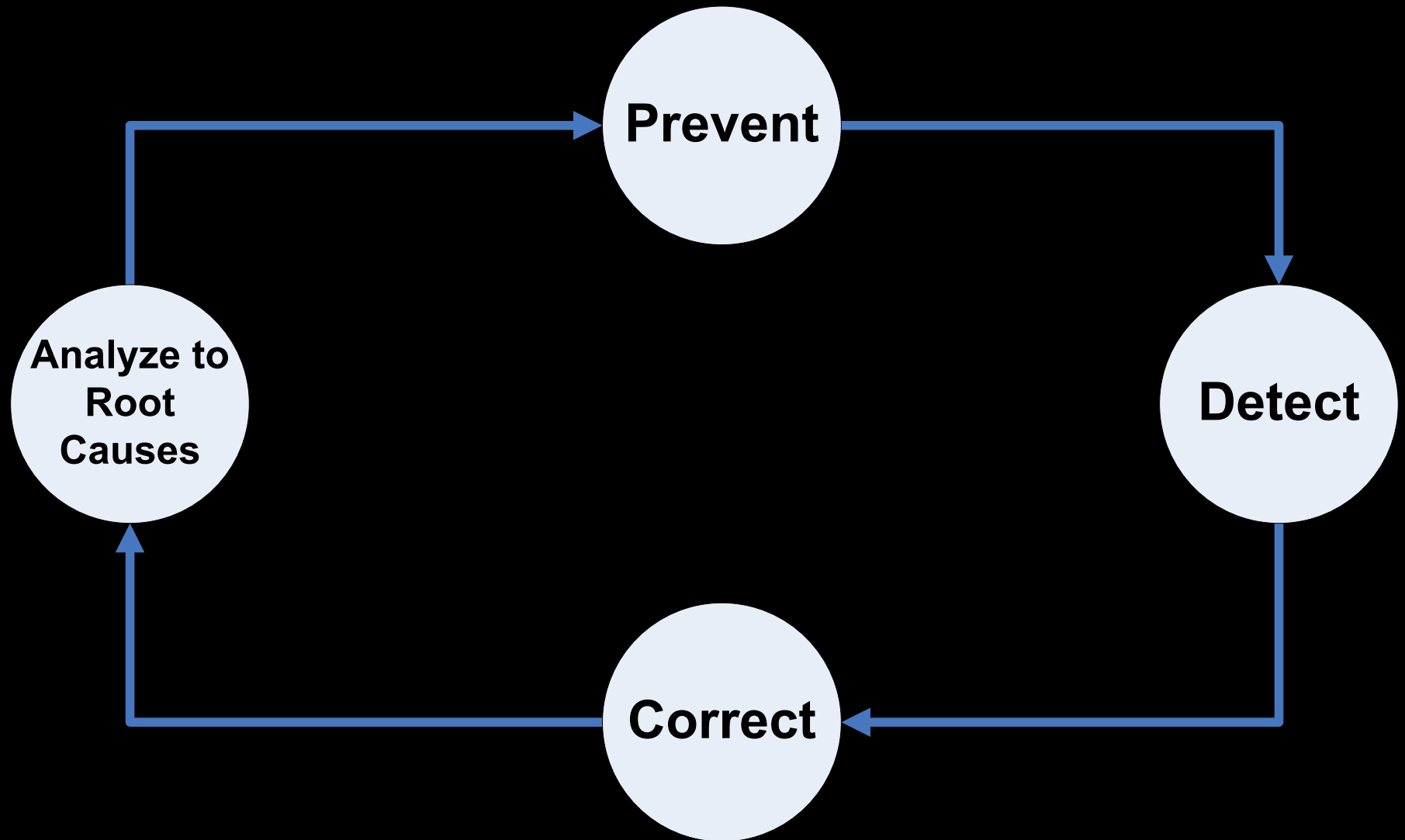


TOYOTA PROVERB

**Stop production so production
never has to stop**



BUILT-IN QUALITY CYCLE





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