



ENGINEERING & CONSTRUCTION CONTRACTING ASSOCIATION



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Lean Everything A Transformational Journey



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Lean Consulting – CH2M HILL

A New Approach to Construction

“...the devastating impacts of the long recession have made it clear that, even as the economy slowly recovers, business as usual can no longer be an acceptable approach in the construction industry. **Lean Construction** offers an alternative that allows companies to thrive in any economic conditions.”

McGraw Hill Construction

SmartMarket Report 2013

Lean Construction – Leveraging Collaboration and Advanced Practices to Increase Project Efficiency

Survey Results From The Use Of Lean Practices In Construction

- Higher Quality Construction (84%)
- Greater Customer Satisfaction (80%)
- Greater Productivity (77%)
- Improved Safety (77%)

Agenda

- Lean – the What, the Where & the Why
- Lean in the Engineering & Construction Industry
- An Enterprise-Wide View
- One Company's "Journey"
- How do we improve?

Lean – What is it?

- “Lean is a customer-centric methodology used to continuously improve any process through the elimination of waste in everything you do; it is based on the ideas of “Continuous Incremental Improvement” and “Respect for People.” *Lean For Dummies Cheat Sheet*

Definition of Value Added

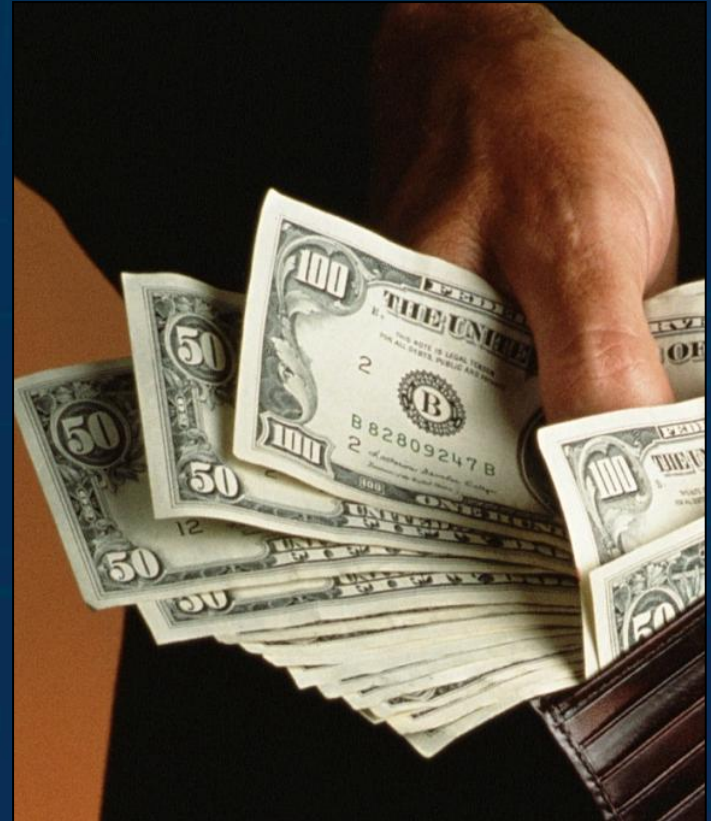
- Value Added – those activities that are **required** to provide the products and services to our customers **for which we get paid**
- Non-Value Added – Those activities that do not add value to the paying customer, **only add cost**
 - But Necessary – **reduce** to the extent possible
 - Unnecessary - **eliminate** to the extent possible

Lean – Where did it come from?

- Created out of necessity by a company with limited resources (**Toyota Production System**)
 - People
 - Space
 - Working Capital

Toyota's 7 (+1) Wastes

1. Over Production
2. Excess Inventory
3. Defects
4. Extra Processing
5. Waiting
6. Transportation
7. Excess Motion
8. Underutilized Employees

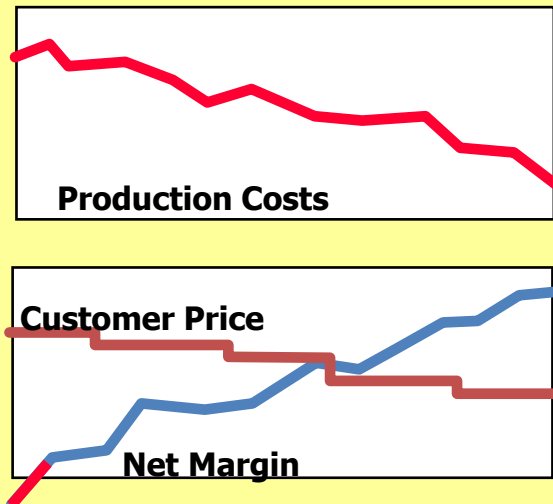


Lean – Why is it important?

The Challenge Facing All Businesses...

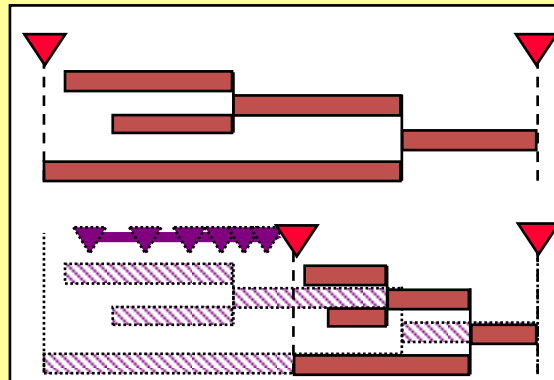
Do three things well, all at the same time!

Reduce
Cost



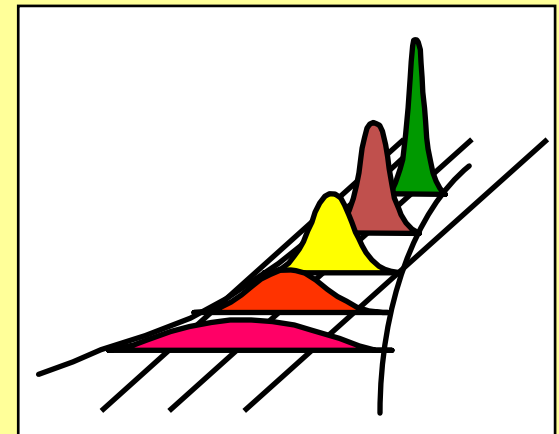
"Cheaper"

Reduce
Lead Time



"Faster"

Improve
Quality



"Better"

Lean – Why is it important?

- Lean = Easier-Better-Faster-Cheaper

Easier - simplify everything

Better -

Improved employee Quality of Life

Higher Quality of services

Safer work environment

Faster – reduced cycle times for all tasks

Cheaper – lowered costs

Benefits To The Enterprise

1. Unleashed restrained capacity
2. Increased cost competitiveness
3. Increased speed to market of new products & services
4. Ability to change strategic direction quickly
5. Improved customer satisfaction and relationships

Benefits To The Enterprise

6. Improved supplier relationships
7. Improved employee quality of life
8. Increased shareholder equity
9. Improved credit ratings

Lean in Engineering & Construction

6 Lean Practices Known To Contractors

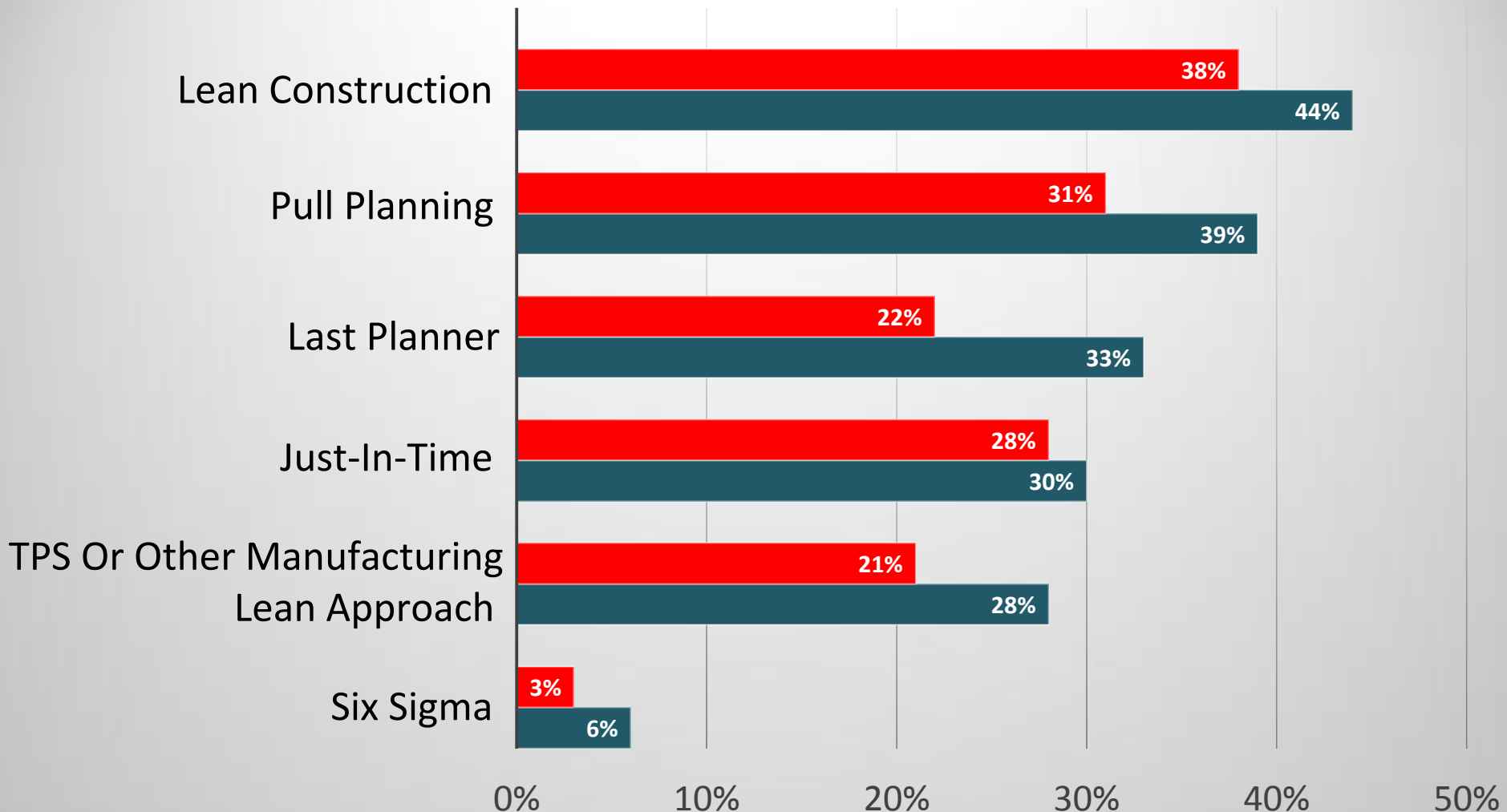
1. **Lean Construction:** Elimination of waste from design and construction processes.
2. **Pull Planning:** A targeted, specific tool involving the definition and sequencing of events on a project, working backward from a target completion date.
3. **Last Planner:** A comprehensive trademark approach developed by the Lean Construction Institute that includes several layers of planning and full commitments to schedules from the entire project team.

Lean in Engineering & Construction

6 Lean Practices Known To Contractors

4. **Just-In-Time:** Delivering just the amount of materials needed when it is needed.
5. **Toyota Production System:** A system for providing the best quality, lowest cost and shortest lead time by eliminating waste in processes and procedures.
6. **Six Sigma:** A set of strategies, techniques and tools to reduce variability and improve quality.

Engineering & Construction Firms Implementation of Lean Practices



Benefits Achieved By Firms That Have Implemented At Least One Lean Practice



The Last Planner® System (LPS)

Responsibility-based Project Delivery (RbPD)

- Produce predictable workflow
- Produce rapid learning
- Focused on making work ready and using commitment based planning
- Requires new thinking and new behavior from top managers and participants

The Last Planner® System Should-Can-Will-Did Planning

As Needed



Should

Master Planning

- Milestones
- Master Schedule
- Establishes promise of project

Phase Planning

- Pull planning to complete a milestone
- Collaboratively built plan
- Focus on handoffs

Make-Ready Planning

- Look-ahead Plan
- Make work ready
 - Identify constraints
 - Commitments to remove constraints
 - Constraint Log

Weekly Work Planning

- Weekly work plan
- Reliable promising

Learning

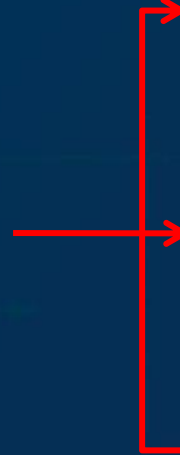
- Daily coordination
- PPC
- Rapid learning

Weekly

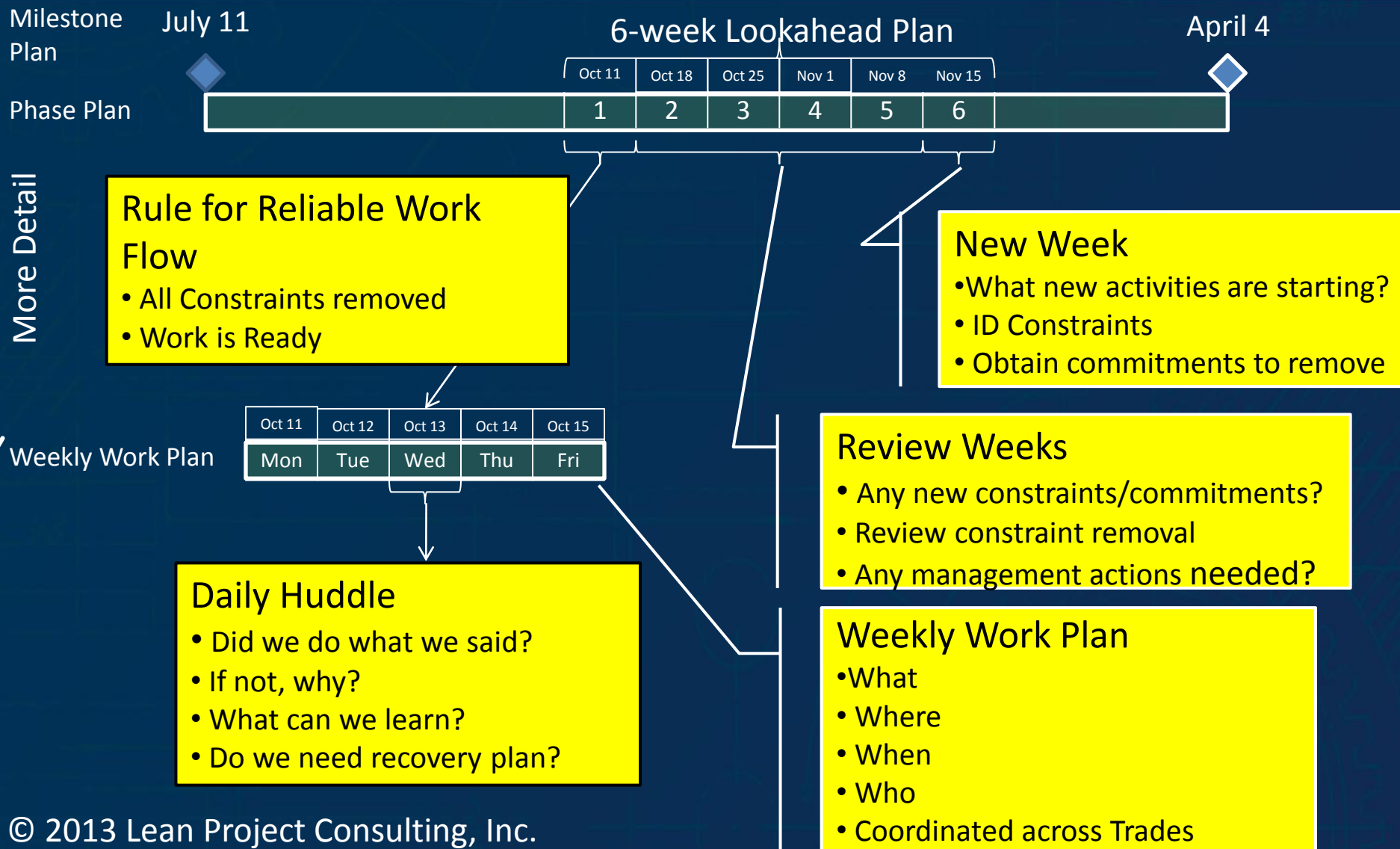
Can

Will

Did



The Last Planner® System



The Last Planner® System (LPS) Responsibility-based Project Delivery (RbPD)



An Enterprise-Wide View

“... used to continuously improve any process...”

Although Lean has its roots in Operations, it can **and should** be applied **across the entire Enterprise of any business in any industry**

- Lean Design
- Lean Manufacturing
- Lean Services
- Lean Construction
- Lean Supply Chain
- Lean Office and Business Processes

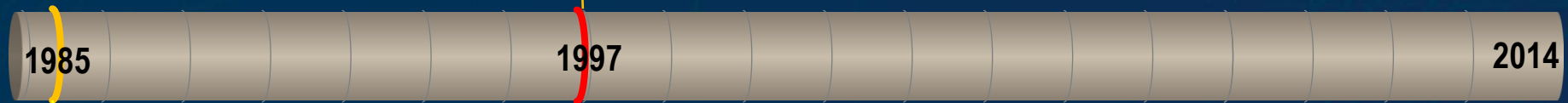
An Enterprise-Wide View

Becoming LEAN should not be a goal or objective on your business plan.

It is the method by which you achieve your goals and objectives.

One Company's Lean Journey A Case Study

Lean Construction
Institute Founded



1985

1997

2014

Lean Manufacturing
Consulting
Practice Established

Lean Construction Projects

Lean Integrated Project Delivery Concepts

- Contractor input into Scope and Design
- Continuous contractor involvement in Design
- Focus on workflow – LPS & RbPD
- Focus on collaborative project culture
- Full collaborative Design Sessions
- Target cost set up front

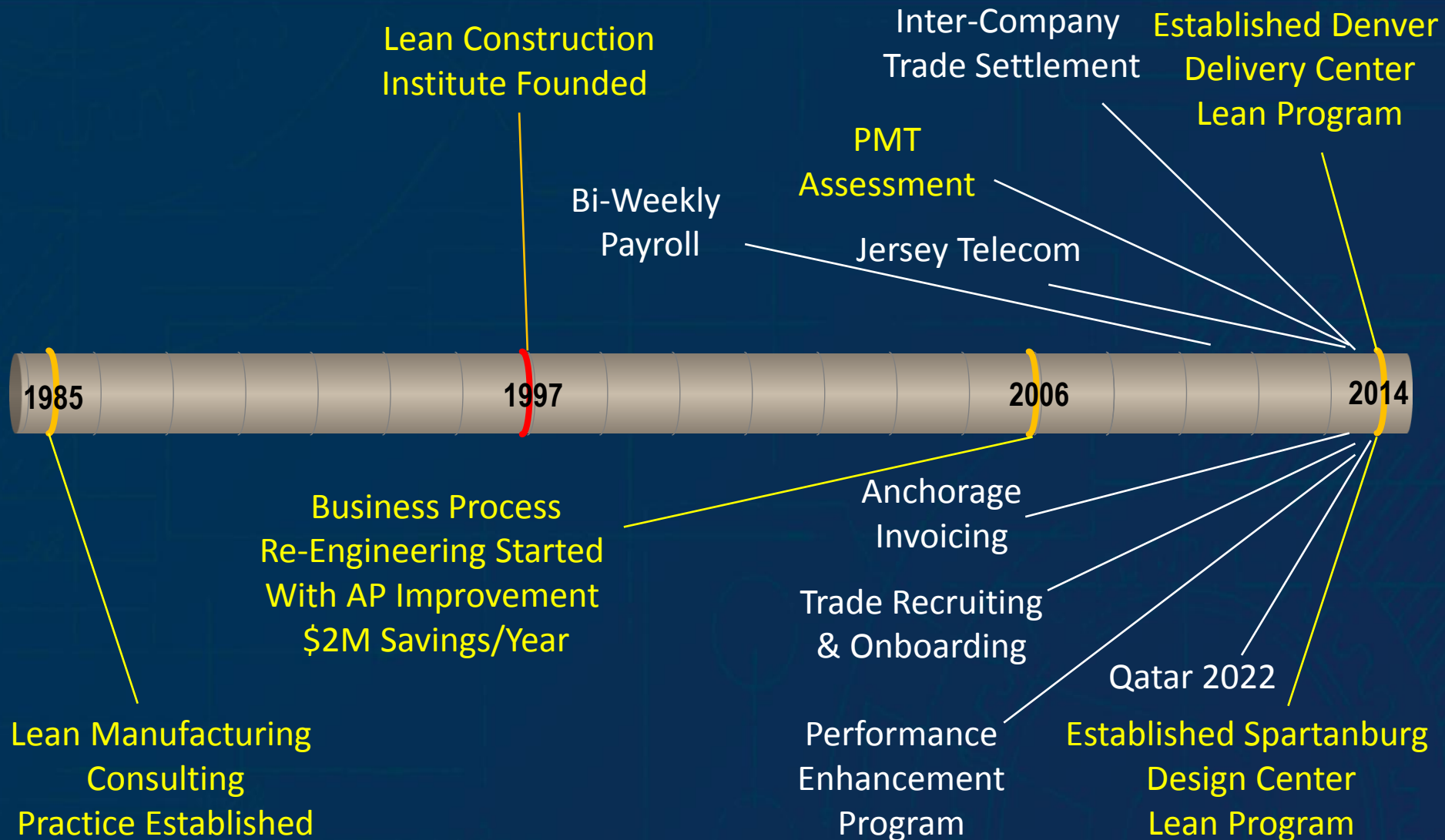
Lean Construction Projects

- 10 Construction Projects
- \$7M to \$150M (EPC & EPCM)
- Projects utilized most of IPD concepts
- Cost – 8 projects excellent scope control, met or underran budget
- Schedule – 8 projects excellent adherence to schedule, met or beat milestones
- Safety – 7 projects listed zero injuries, excellent record or “World-Class”

Lean Construction Projects (continued)

- 8 projects resulted in very high to extremely high customer satisfaction & team satisfaction
- 7 customer PMs' replied "Best project of my career"

One Company's Lean Journey A Case Study



So....how do we improve?

- Capacity(100%) = $\frac{\text{VA Activities Revenue Generating}}{\text{NVA Activities Cost Generating}}$
- **Goal** - Increase the overall % of our capacity that is directly focused on providing the **VALUE** to our clients for which we get paid
- **How** - By making it **EASIER** for all employees to provide this **VALUE**

Elements of a Sustainable Lean Transformation Program

- Must be led from the top of the Organization
- Must be endorsed and supported by all levels of management
- Requires full support and participation of all functional areas
- All employees are involved
- Improvements must come from and be implemented by employees to be sustainable

Lean Program Action Plan

- Start with awareness and education
 - Include all employees
 - Reading material and formal training
- Create a culture of continuous improvement
 - Management must show that it is important
(think Safety Programs)
 - Make Lean a subject at every communications meeting
 - Have “Lean Moments”
 - Dedicated Lean Message Board(s)
 - Lean posters and other signage
 - Be rigorous

Lean Program Action Plan (continued)

- Plan for success and sustainment
 - Organization
 - Lean Council provides program leadership
 - Lean Leaders work with employees to identify and implement improvements
 - Develop and execute an implementation plan
 - Identify Value Streams
 - Start close to the customer and work your way back
 - Develop and post relevant metrics that drive the right behaviors
- Publicly recognize individual and team wins

Lean Program Action Plan (continued)

- Repeat forever.....

Lean is a journey that does not end.....

In Summary....

Where can Lean be applied in your business?



To everything you do, for every customer you serve

Customer Development
Project Services
Accounts Payable
Construction Management
Quality Management
Training
Program Management
Project Accounting
Environmental Management
Master Planning
Document Control
Corporate Branding
Business Development
Marketing
Procurement
Information Technology
Payroll
Strategic Account Management
Operations Management
Accounts Receivable
Bids Process Management
Studies
Financial Management
Consulting
Quality Systems
Human Resource Management
Facility Maintenance
Project Controls
Construction
Sourcing
Strategic Controls

Lean Quotes

“There is nothing so useless as doing efficiently that which should not be done at all”

Peter Drucker

“Any intelligent fool can invent further complications, but it takes a genius to retain, or recapture, simplicity.”

E.F. Schumacher



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