

Trade Partner Handbook of Lean Methods

Presented by:

Matt Kitzmiller
Rosendin Electric

Henry Nutt, III
Southland Industries

Robert M. Leicht, PhD.
Penn State



October 20, 2021

Health precautions to keep everyone as safe as possible at Congress:

- Wear masks at all times in indoor events.
- Complete your daily health screening on your phone and bring it with you when you enter the center each day.
- Practice social distancing to the extent possible. Seating at plenary sessions is being structured to help with this.
- If you feel ill at any time, please leave the conference and return to your room/consult a physician as necessary.
- Ultimately, our collective health and safety at Congress is up to all of us. Thanks for your support!



Presentation Team



Henry Nutt, III

Preconstruction Executive
Southland Industries



Robert Leicht, PhD

Associate Professor
Penn State University



Matt Kitzmiller

Lean Trainer
Rosendin Electric

October 20, 2021

Objectives



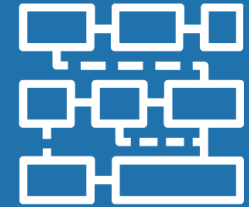
01.
Participants will understand the benefits of lean adoption specific to trade partners



02.
Participants will gain familiarity with common barriers that hamper adoption of lean methods

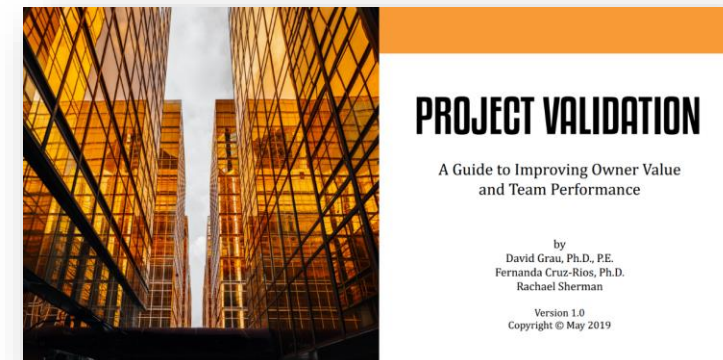
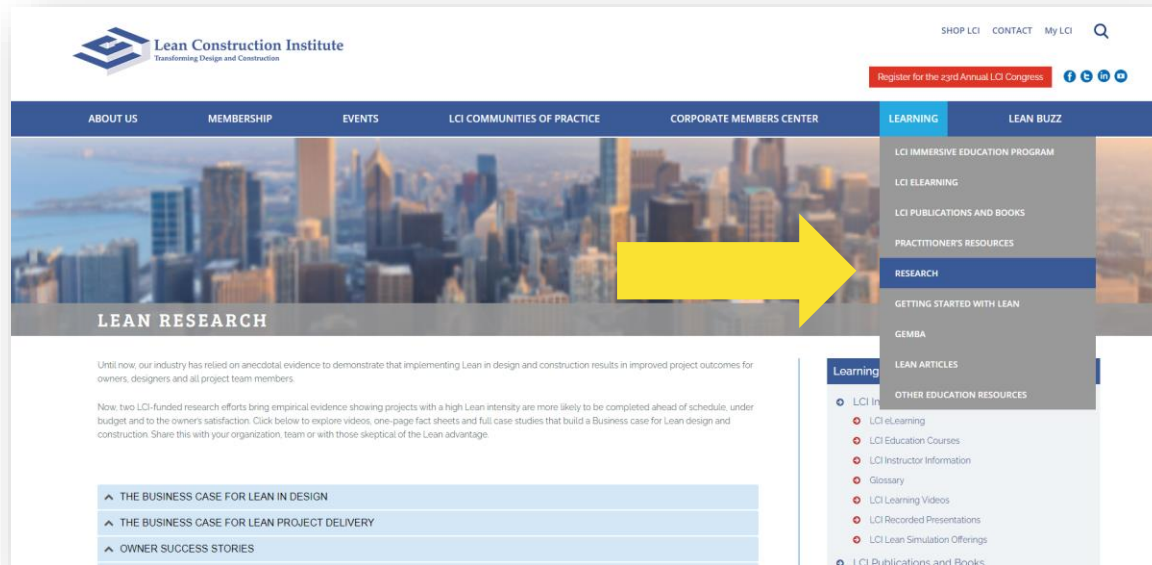


03.
Participants will learn about the process and resources in the Trade Partner Handbook of Lean Methods



04.
Participants will learn through a case study how to incorporate best practices for adoption of lean methods.

Trade Handbook is part of LCI's Research Portfolio



<https://leanconstruction.org/pages/learning/research/>

Project Summary

Goal:

Understand the mechanisms that support adoption of lean methods by trade contractors through detailed interviews and case studies, and develop valuable resources to support their expanded adoption.

Metrics:

- Increase in trade contractor participation in LCI
- Increase in Lean adoption by trades
- Presentations and outreach to trade organizations and through embedding content into LCI educational offerings

Project Steps

Perform interviews to recognize the barriers in adopting lean methods by trade contractors

Conduct case studies of successful adoption to profile the processes and business impacts

Identify high value and easily accessible lean methods that can be readily deployed by trade contractors

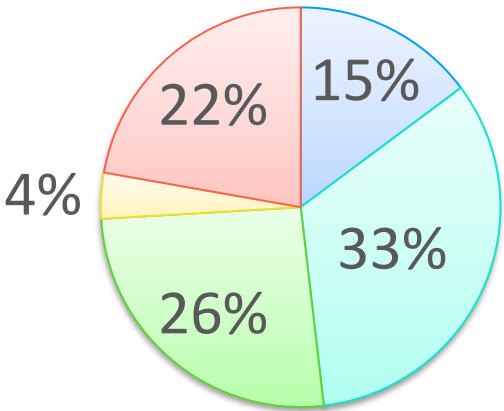
Develop and disseminate practical resource(s) that support adoption and grow trade interest

Background – Lean methods for Trade Partners



Diverse pool of interview participants

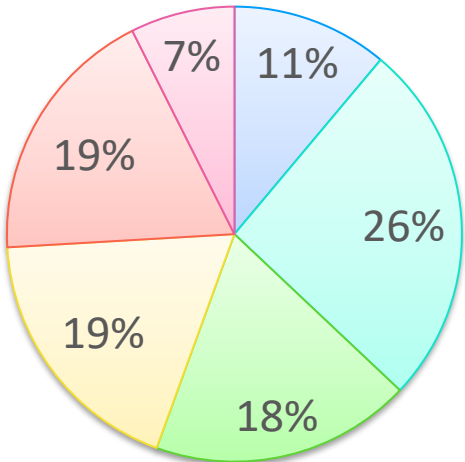
Years of Lean Engagement



■ less than 5 years
■ 5-10 years

Years of lean engagement	Number	Percentage
less than 5 years	4	15%
5-10 years	9	33%
11-15 years	7	26%
16-20 years	1	4%
more than 20 years	6	22%
Total	27	100%

Specialty



■ Lean Consultant
■ Trade- Mechanical

Specialty	Number	Percentage
Lean Consultant	3	11%
Trade- Mechanical	7	26%
Trade- Electrical	5	19%
Trade- Finishing	5	19%
CM/GC	5	19%
Industry Representative	2	7%
Total	27	100%

17 trade respondents

Geographic Distribution



(The dots are representative of that state
not the location of interviewees)

Total # of Interviewees = 27
Trade Partners = 64%

Methods Trade contractors most frequently use:

Most cited methods (by Trades):

- 1.Last Planner / Pull planning (100%)
- 2.Daily huddles (50%)
- 3.Prefab / Modular (33%)
- 4.Gemba (25%)

Functional categories	Methods	Frequency of Use	Percentage
Organization Methods	Daily Huddles	8	34%
	Gemba Walk	4	
	A3 Thinking (PDCA)	4	
	Choosing by Advantages	2	
	5 Whys	2	
	Onboarding	0	
	Work Clusters	0	
	Spaghetti Diagramming	0	
	PICK Chart	0	
	Quality Circles	0	
Operating System Methods	Last Planner System (and sub) + Pull Planning	17	66%
	Modularization/ Prefabrication	5	
	5S	4	
	Project Condition of Satisfaction	3	
	Virtual Management	2	
	Target Value Design	2	
	Standardization	2	
	BIM	1	
	Big Room Planning	1	
	JIT	1	
	Poke-Yoke	0	
	Set-based Design	0	
	Design Structure Matrix	0	
	Agile Planning	0	
	Value Stream Mapping	0	
	First Run Studies	0	
	3P	0	
	Takt Planning	0	

17 trade respondents

Benefits of Lean specific to Trade Contractors

Most cited benefits (by Trades):

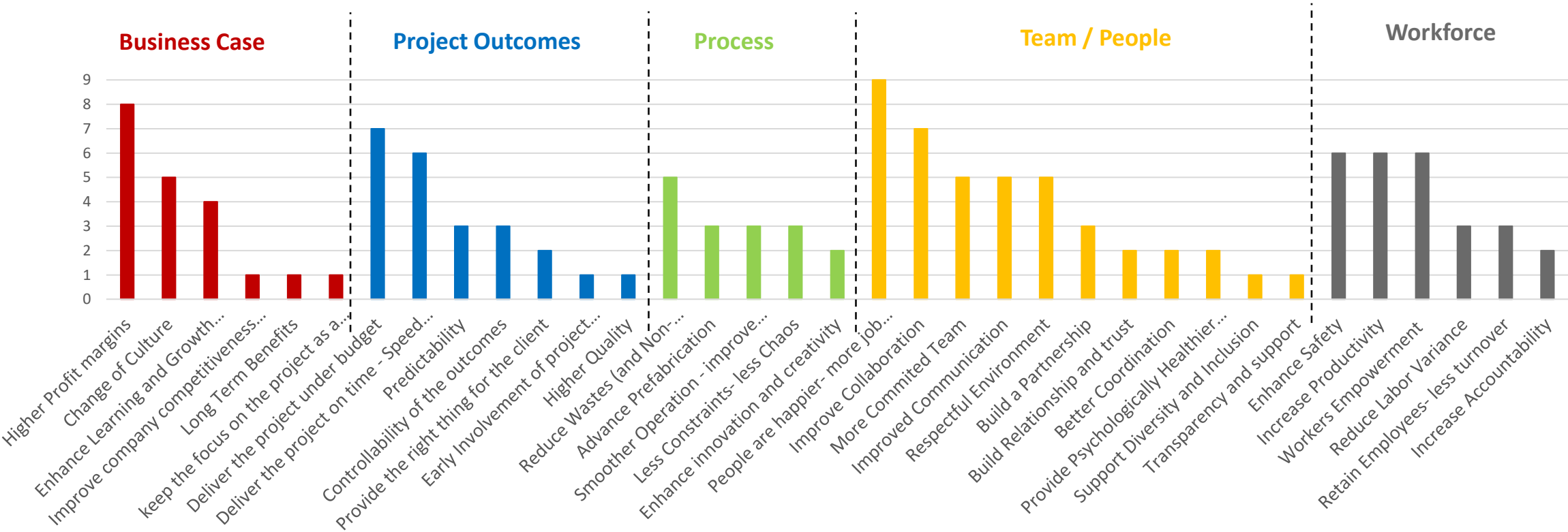
1. Happier people/employees

2. Improved collaboration

3. Enhance safety
4. Increased productivity

5. Worker empowerment

6. Deliver project on time



Barriers to trade adoption of lean

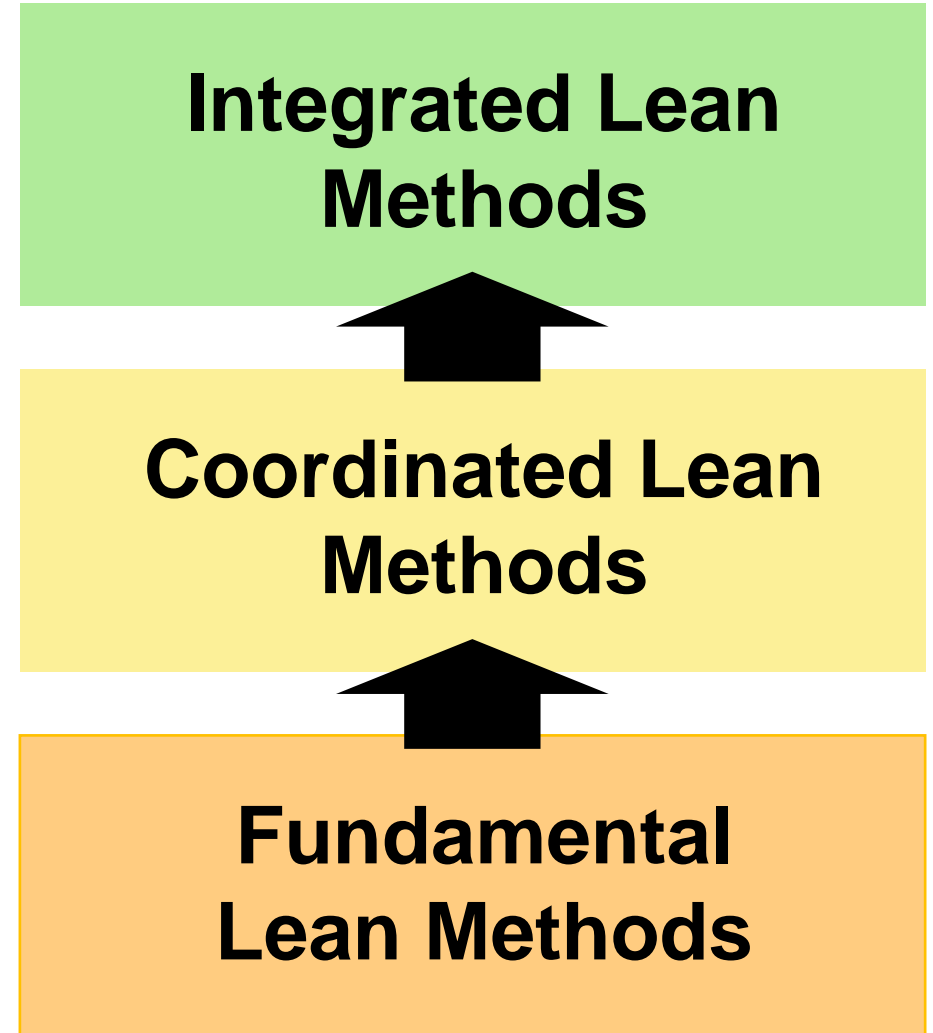
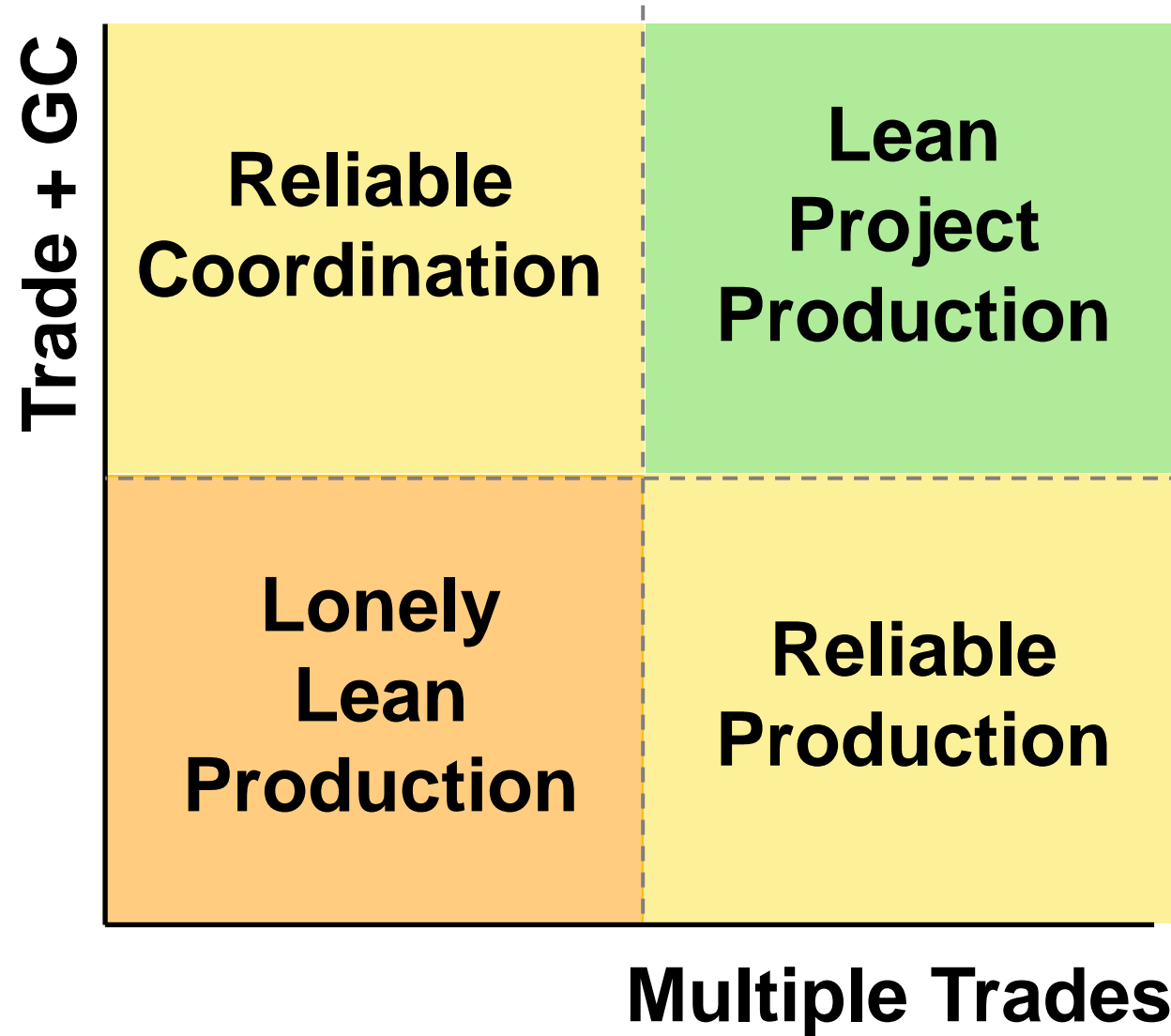
BARRIERS (TRADE PARTNERS PERSPECTIVE)



Lean Methods for Trade Partners



Organizing & Prioritizing Lean Methods



Chicken or the egg?

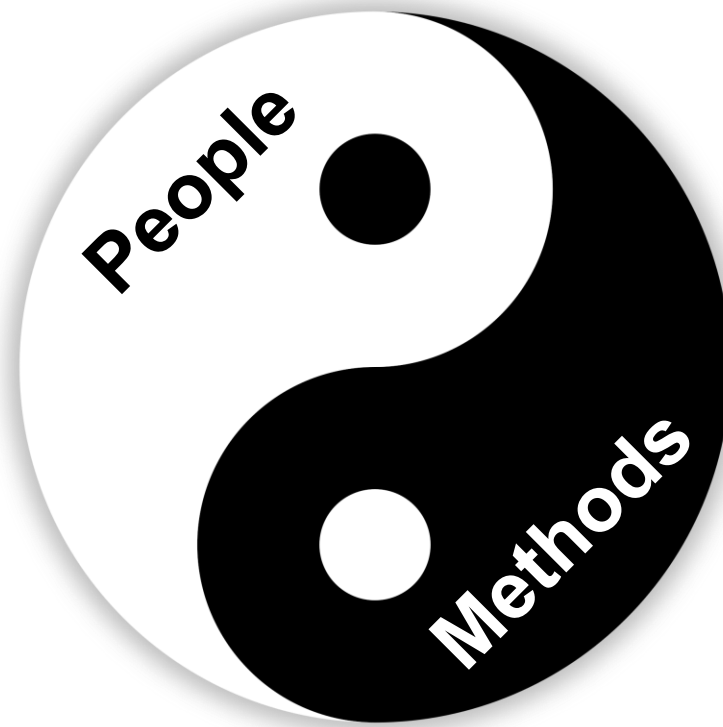


Lean Culture vs Lean Methods?



**It's both!
Chicken & Egg**

Both. Chicken and the egg too!



Operating System

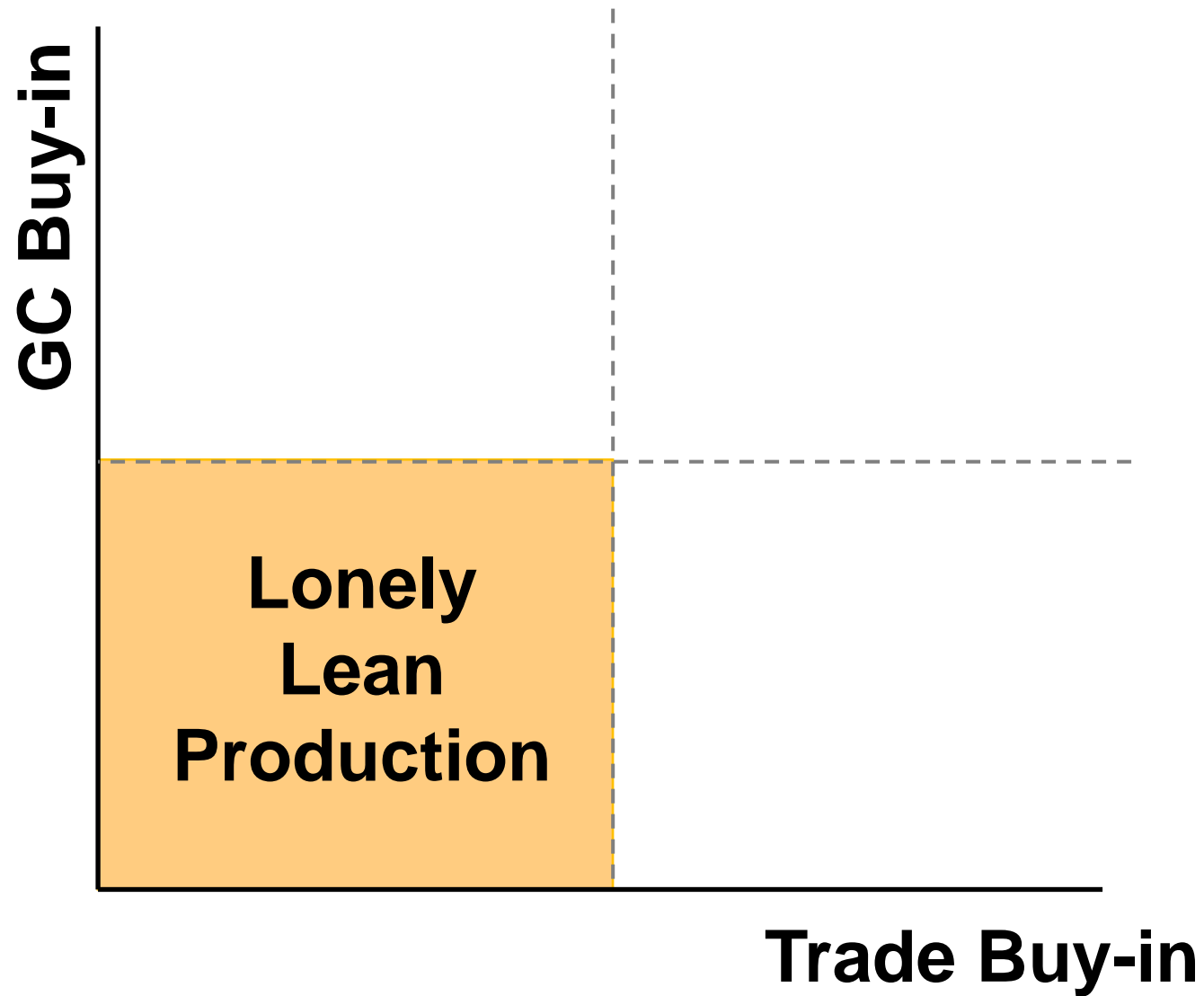


Lean Principle	Trade Context	Method
Right process for right results	'Field' is the downstream customer	8 Wastes – understand the process, identify & remove waste
Level Workflow	Crew-level planning	Weekly Work Plans – develop and coordinate detailed plans for crews & materials
Standardize Tasks	Create stability and repeatability for field	Standard Work & 5S - Standard job box, kits
Visual Control	Visual indicators for materials & tools	Visual Management - job box, Kanban for materials, carts w/ standard quantities
Respect / engage supply chain	Vendor integration	Just-in-Time - Shop / site delivery coordination

Organizational System



Lean Principle	Trade context	Method
Develop exceptional people	Empower field, mentorship	Daily Huddle – engage workers
Develop your people and partners	Grow leaders that understand the field work, lean & mentoring	Field Leaders - Field / craft as lean leaders
Respect / engage supply chain	Link internal processes to field	Training - Office should participate in lean training
Continuously solve root problems	Go and see	Gemba walks / field engagement
Long-term Philosophy	Find ways to separate 'investment' for improvement from project budgets	Training , access to better tools, materials organization,



Fundamental Lean Methods

Daily Huddle

Standard
Work

Weekly Work
Planning (LPS™)

Process Focus
(8 Wastes)

5 S

Visual
Mgmt

Training

Lean methods for trades should focus on where value / risk are the greatest – **operations!**

Lonely Lean Methods

Training

Field
champion

Daily
Huddles

- Brief, daily report on progress / plan
- Daily emphasis on safety & process
- Empowers workers & develop leaders

Weekly
Work
Plans

- Engage workers in future planning
- Visually plan / communicate work and material locations
- Recognize constraints in real time

5S

- Organization for tools and materials
- Reduce time spent 'searching'
- Increase "time on tools"

Gemba
Walks

- Structured / regular visits to workplace
- Focus foreman on supervising field
- Recognizing issues early/often

Visual
Mgmt

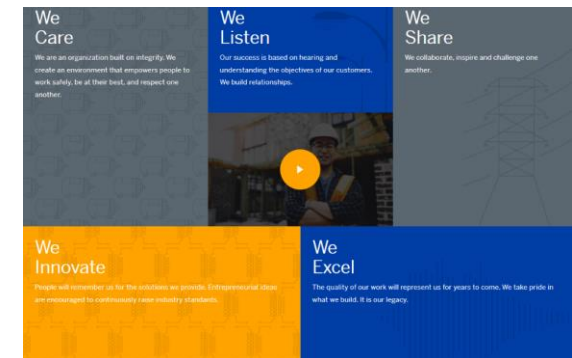
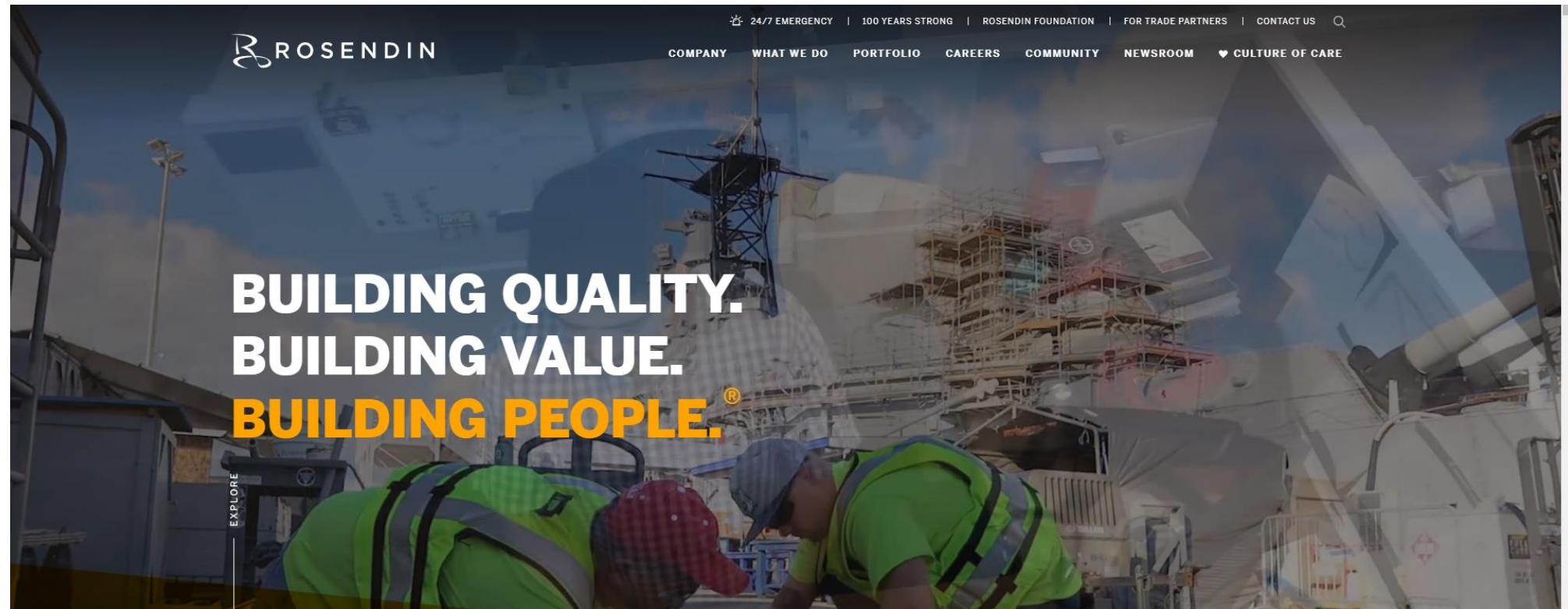
- Simple ways to recognize information
- Easy to recognize needed materials / consumables before they cause delays

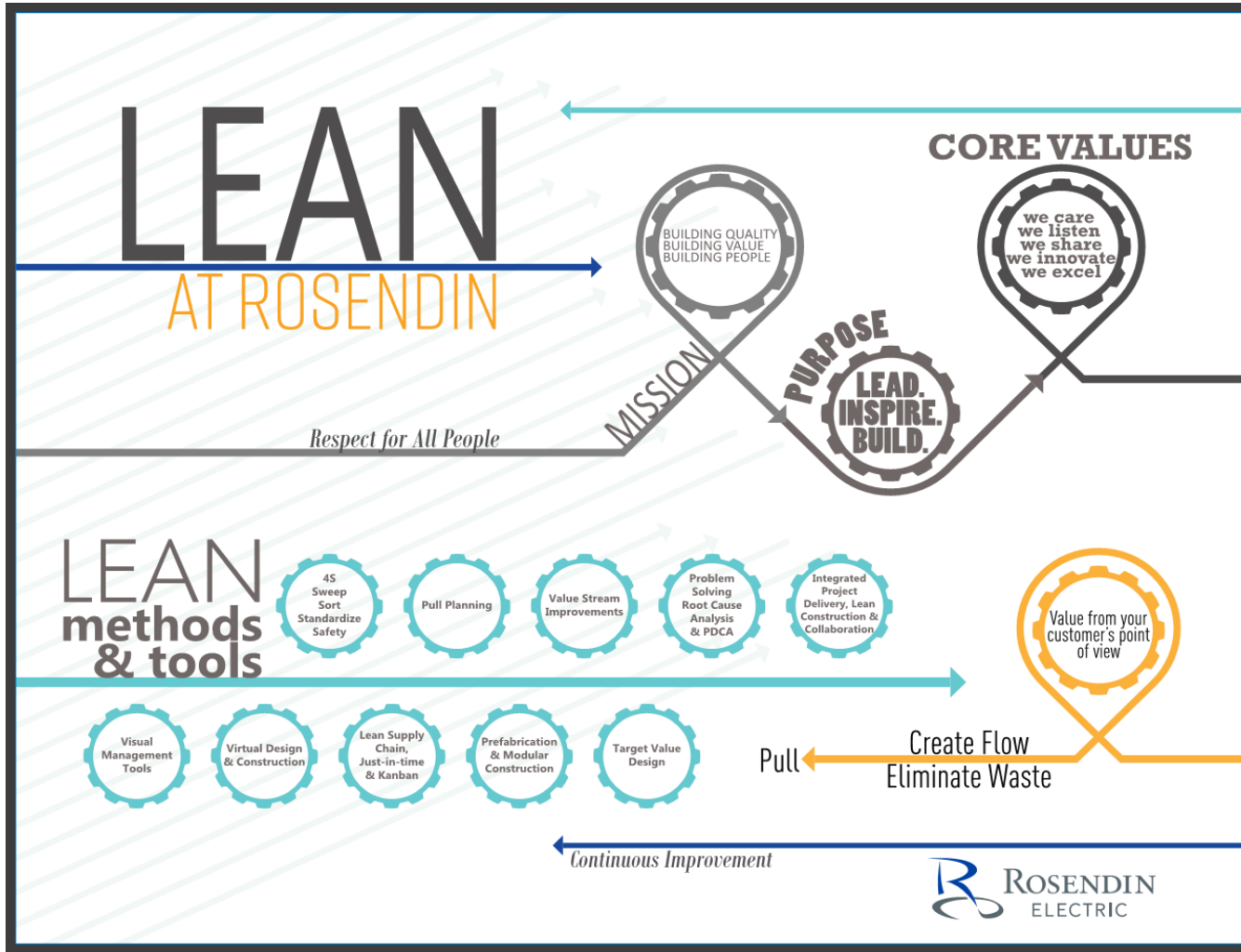
Process
(8 Wastes)

- Way to understand and then recognize process inefficiencies

Case Study: Rosendin Electric







Lean at Rosendin

- Alignment with Core Values
- Respect for people
- Continuous improvement



Weekly work planning – PLAN your work!

- Empower foremen and crew leads
- Plan labor and tasks in detail at the daily / weekly levels
- Identify:
 - Work / crew locations
 - Material needs & placement
 - Resource needs & constraints

Daily Huddle

Standard Work

Weekly Work Planning (LPS™)

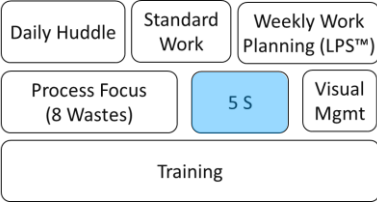
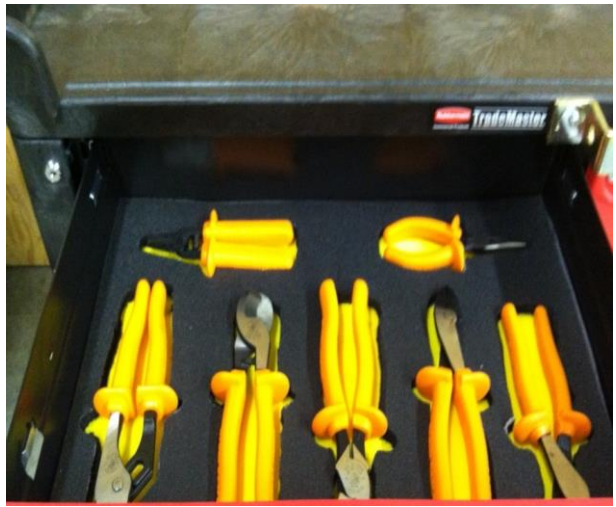
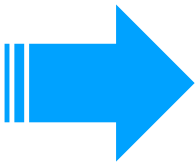
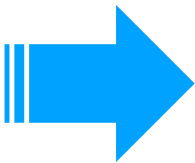
Process Focus (8 Wastes)

5 S

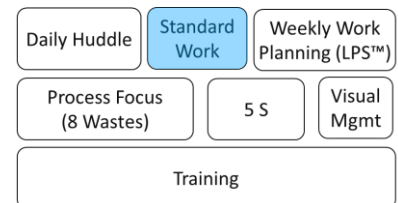
Visual Mgmt

Training

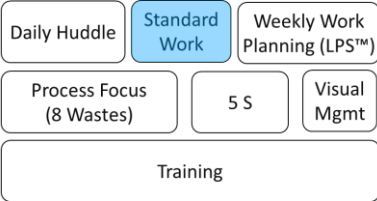
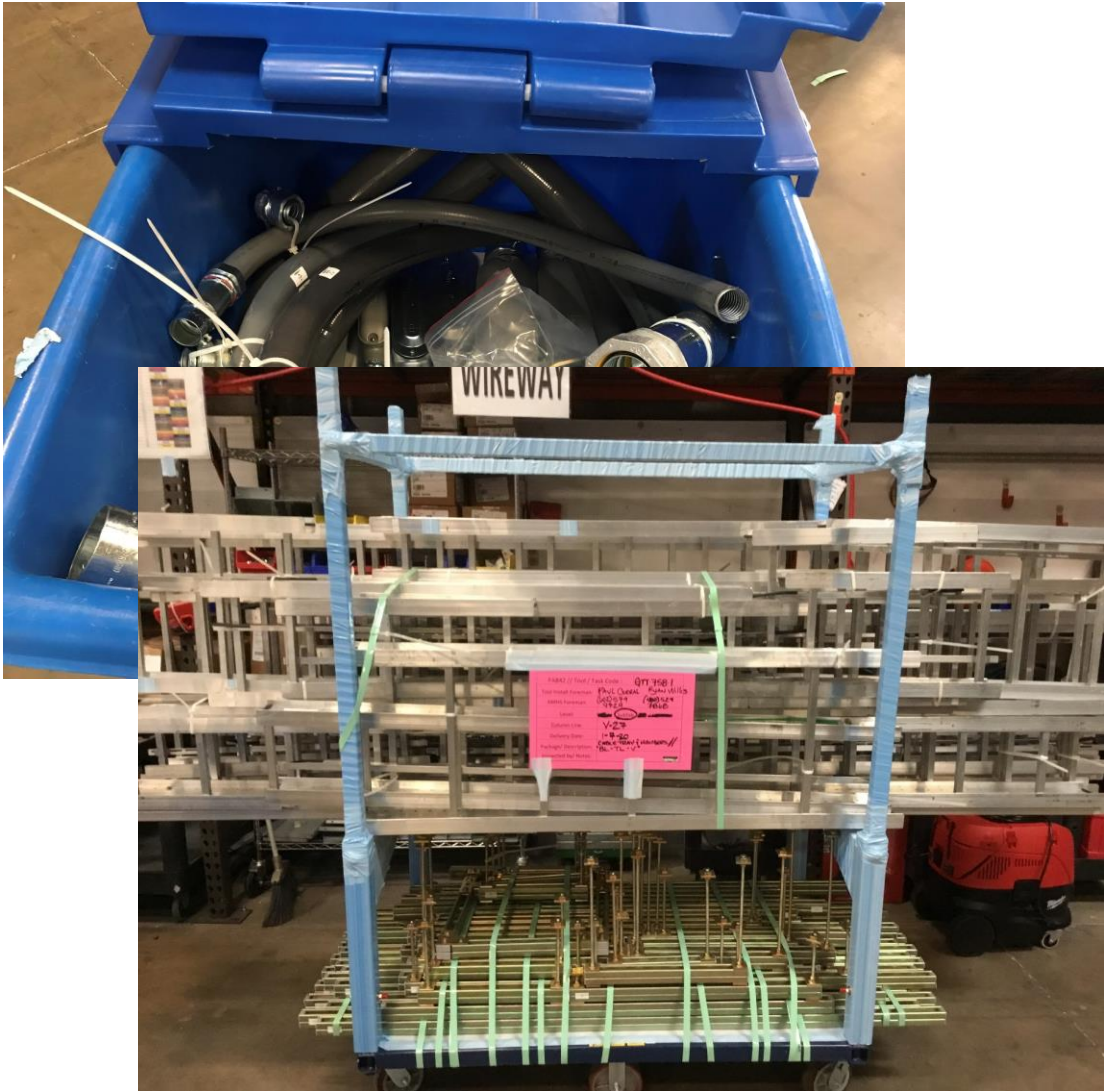
5S – Organize resources to enable craft to be efficient



Standard work – make tasks consistent to get reliable production



Kits – group components and materials for easy handling

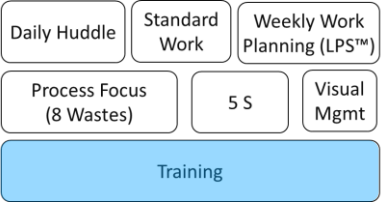
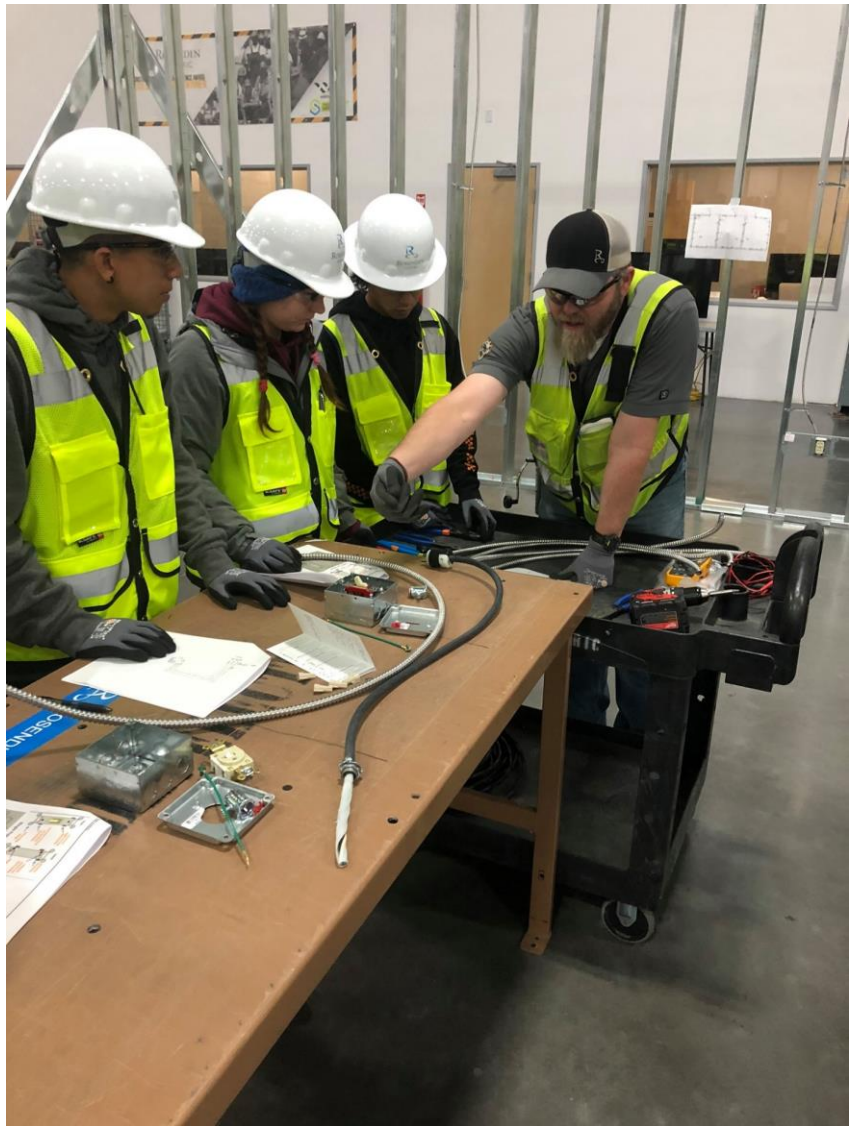


Standard work – make project planning / documentation standard

[illegible]

Daily Huddle	Standard Work	Weekly Work Planning (LPS™)
Process Focus (8 Wastes)	5 S	Visual Mgmt
Training		

Training to improve workforce and communication



Resources and Path Forward



Insights & Takeaways

- **Fundamentals:** Plan your work, organize your tools / materials
- **Discipline:** training and ongoing emphasis to embed lean thinking into routines and habits
- **Start small:** Focus on where crews lose time -> moving materials, collecting tools, finding equipment – a few minutes per day add up!
- **Empower Craft:** More improvements from empowering the workforce, than waiting for the boss to see a problem and fix it
- **Risk (cost) is in the field:** Everyone should be focused on helping craft focus on their tasks
- **Incentives vs penalties:** acknowledgement goes a long way!

Daily Huddle website

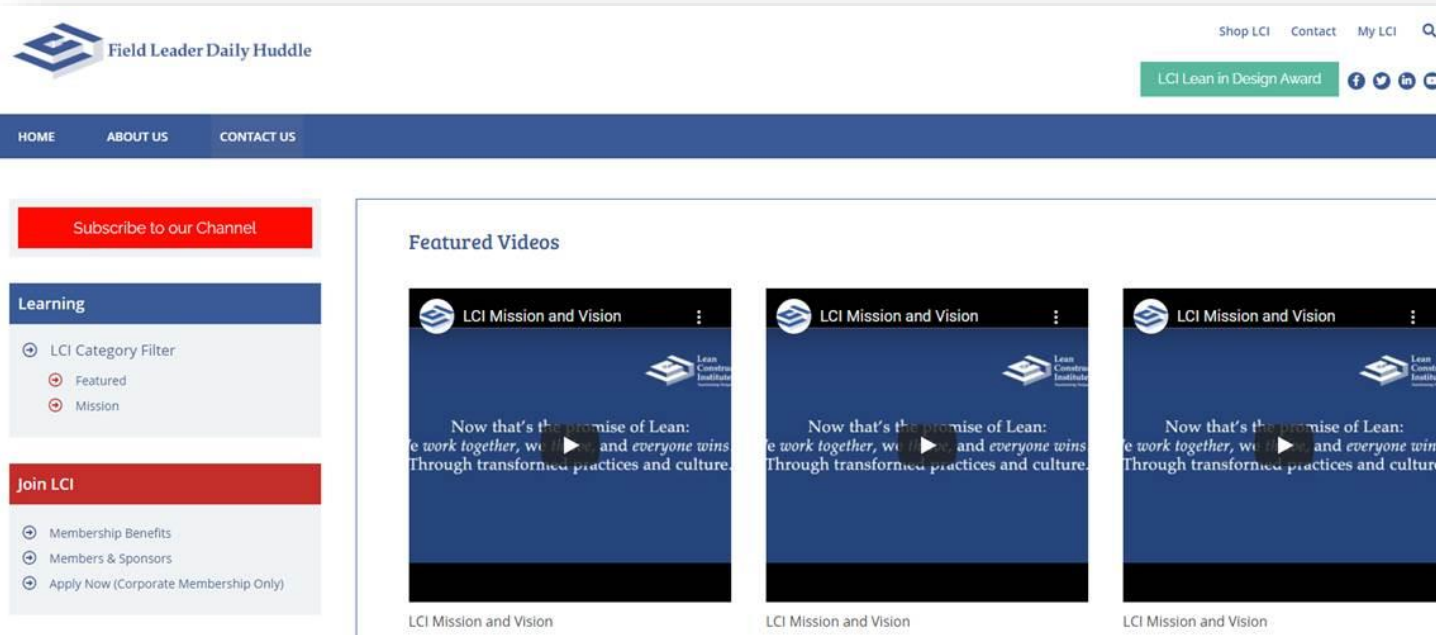


Prefab – Wasted Movement



Waste – Site Inventory

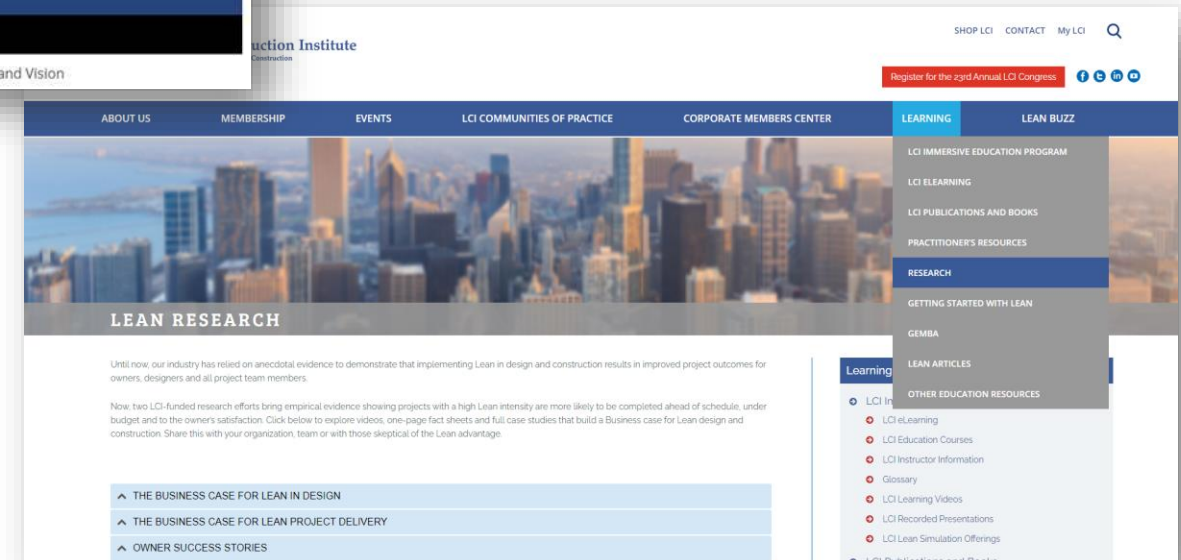




Field Leader Daily Huddle

<https://dailyhuddle.leanconstruction.org>

Trade Handbook of Lean Methods (coming soon!!)



<https://leanconstruction.org/pages/learning/research/>



Lean Construction Institute
Transforming Design and Construction

Greg Stedman

LCI TRADE

Nick Masci

Henry Nutt, III

TASK FORCE

Perry Thompson

Joe Donarumo

Stephanie Roldan

INDUSTRY

Sean Graystone

Thomas Soles, Jr.

ADVISORY

Brian Winningham

Cary Norberg

GROUP

Greg Stedman

Katie Page

Henry Nutt, III

H. Glenn Ballard