Lean Construction Institute
Immersive Education Program

Introduction to Last Planner System® in Design

Virtual Course

Christian Pikel

INSERT PRESENTATION DATE

Lean Construction Institute

Provider Number H561

Last Planner System in Design

LCIV.LPSD

Presenter name

date

2 LU 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.

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

Course Description

Similar to during construction, unpredictable workflows correlate with an increase to project costs and schedules during the design (preconstruction) phases. The Last Planner System® (LPS®) is an effective approach to improving the delivery of projects during these phases. In the Last Planner System® In Design course participants will gain insight as to how collaborative planning will improve their delivery process and outcomes as relevant to the specifics of design. This course is an important step in learning to stabilize your delivery process by keeping all team members' needs being reliably met.

Learning Objectives




01.

Participants will gain a foundational understanding of implementing LPS during design (preconstruction) phases of a project.

02.

Participants will be able to identify how LPS aids in project delivery and gain understanding of the adaptations and considerations for the design phase.

03.

Participant will gain an overview understanding of each of the five connected planning conversations of LPS and how they interrelate.

04.

Participants will discover the basic mechanics of LPS including the foundational base of reliable commitments.

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Rules of Engagement

- This is a safe zone
- Everyone has equal status
- Speak up and share your ideas
- Actively listen to others
- One conversation at a time
- Use E.L.M.O.
- Silence phones
- Be focused and engaged
- Stay on time
- Have fun!

Lean Journey To Mastery

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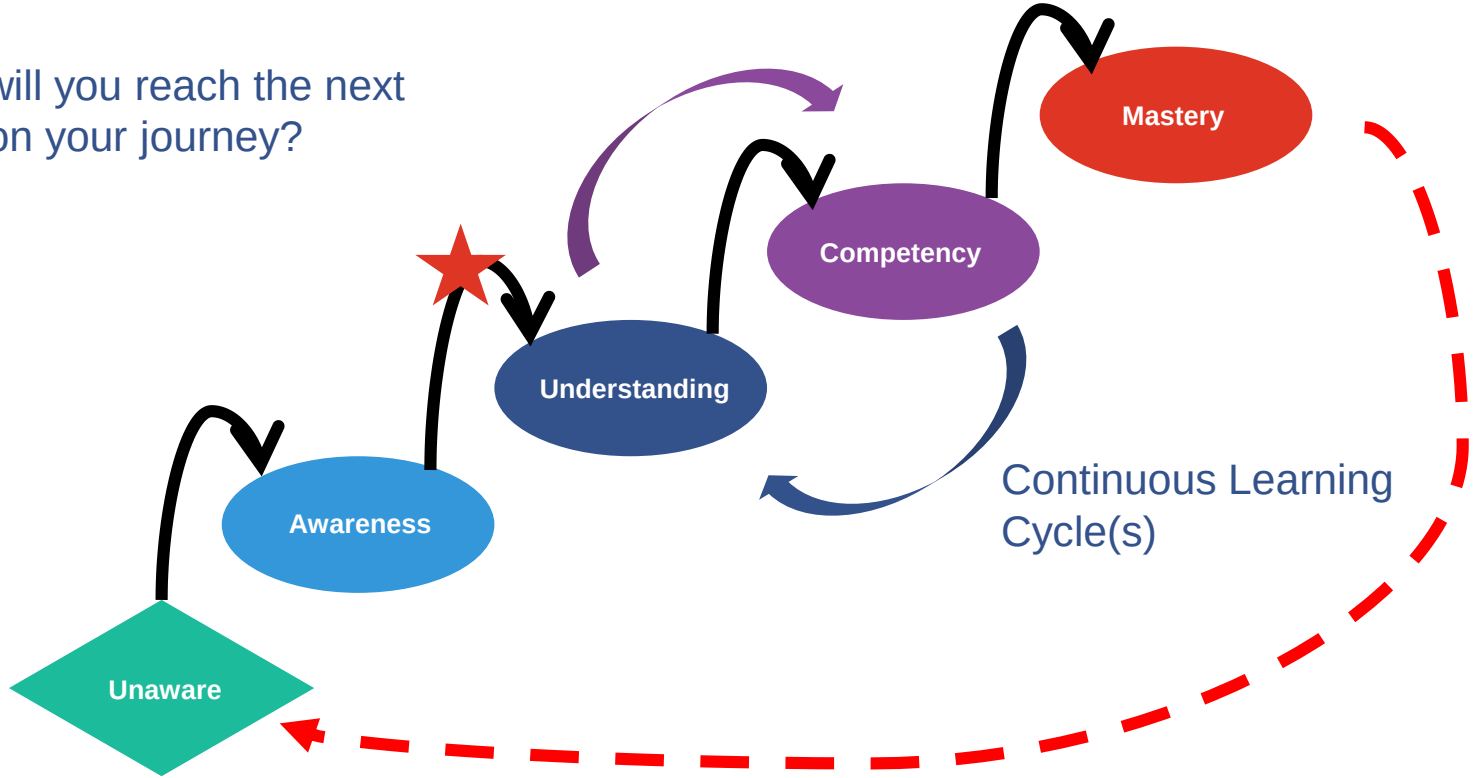
How will you reach the next level on your journey?



Last Planner System Trademark

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The Last Planner System® is a registered trademark of the Lean Construction Institute in the following formats:

- Last Planner System®
- LPS®
- Last Planner® in reference to the person not the system

Learning Overview

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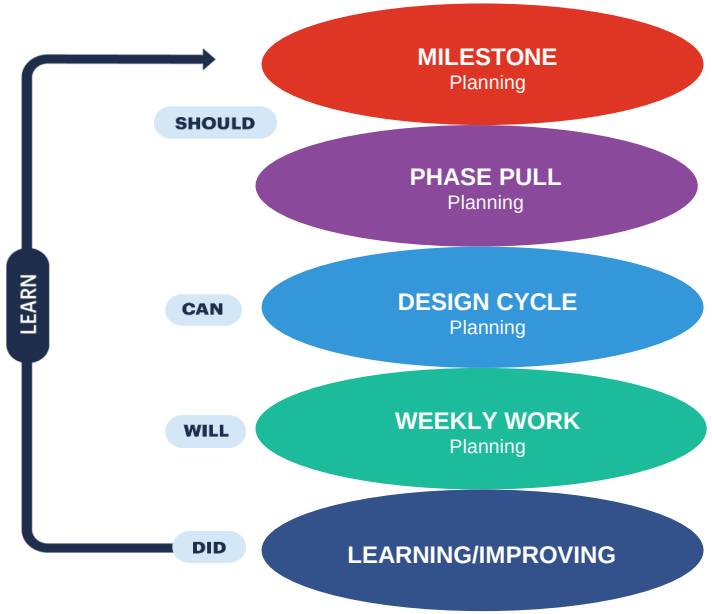
1. Why Last Planner System
2. LPS Overview
3. Milestone Planning
4. Phase Pull Planning
5. Design Cycle Planning
6. Weekly Work Planning
7. Learning/Improving

5 Connected Conversations



Group Discussion Question – Chat Box

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What are challenges with traditional project planning?

Chat Box
3 minutes

Why Use Last Planner System?

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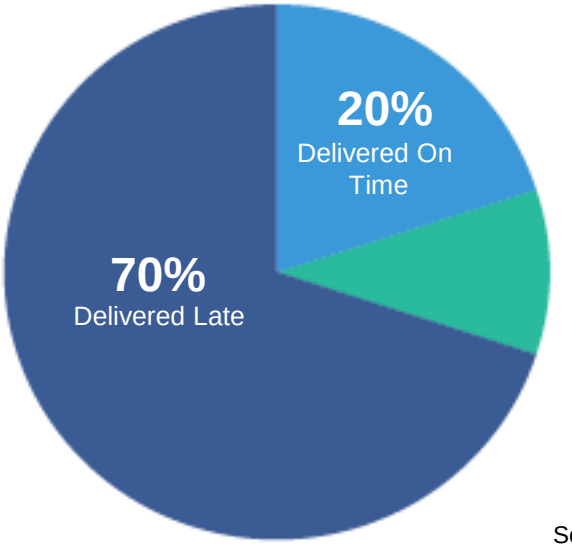
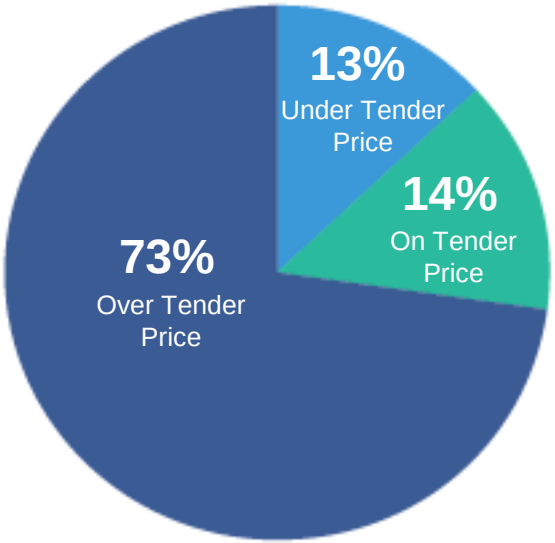
Time —
70% were delivered late



10%
Delivered Early

Cost —
73% were over budget



Source: Benchmarking the Government Client Stage Two Study December 1999

Why LPS In Design?

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Experienced Lean practitioners state that LPS aids in:

- Controlling how information gets shared.
- Identifying key decision points.
- Keeping the owner on track with making decisions.
- Aligning the team and the owner regarding information needed and when.
- Aligning the team with the plan for delivering the project.

Correlation of Lean

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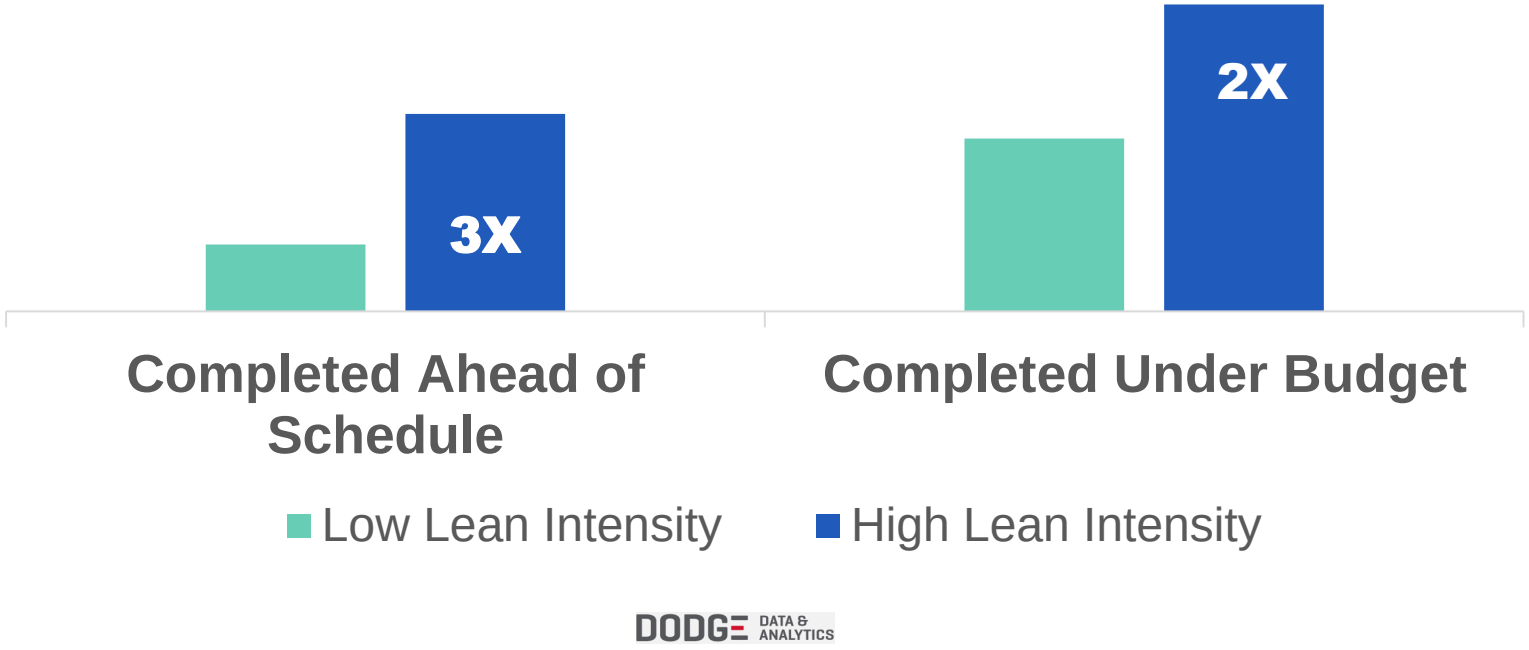
Correlation of Lean intensity to outcomes (% likelihood on best projects)



DODGE DATA & ANALYTICS

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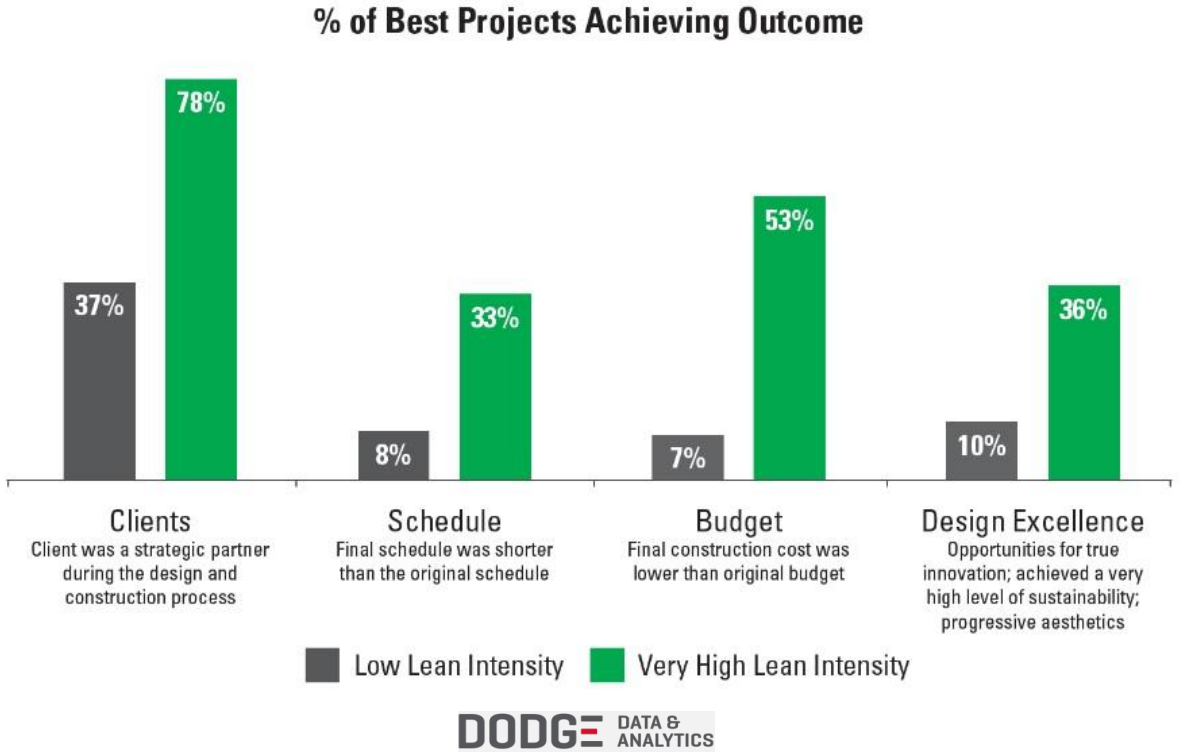
Why Implement LPS?



The Reliability Gap

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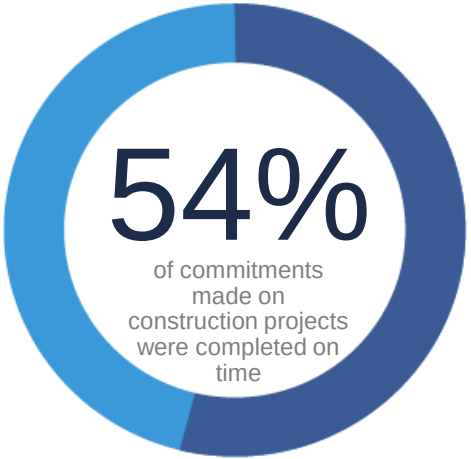
In the early 90's, Greg Howell and Glenn Ballard conducted a study of construction projects and determined that on average 54% of commitments made on projects were completed on time.

This led to the development of the Last Planner System.

This gap in reliability extends to the design phase of projects where there is also room to improve.



Last Planner System Defined

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The Last Planner System is a production planning system designed to produce predictable work flow and rapid learning in programming, design, construction and commissioning of projects.

Benefits

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1. Improves communication & reliability.
2. Fosters an enjoyable environment, trust, and collaboration.
3. Promotes early stakeholder engagement.
4. Improves visibility of the project plan (transparency).
5. Creates team alignment.
6. Rapid learning through metrics, revealing areas for improvement.
7. Improves planning in both design & construction phases.

Project As A Promise

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- All organizations or groups of greater than one can be viewed as operating as a *network of promises* or commitments, whether done well or poorly.
- The goal is to understand how to *improve the quality* of commitments and to *actively take responsibility* for managing them.
- The Last Planner System is a planning system based on developing a *network of promises*, then delivering on the commitments.

Elements Of A Promise

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Elements of a promise include:

- *The Customer:* The person making the request.
- *The Performer:* The person fulfilling the request.
- *Negotiated Conditions of Satisfaction (CoS):*
  - Are part of language act of making a promise.
  - Are developed by the people involved in the request and promise.
  - Are measureable statements that inform the performer of the promise which tests a task must pass to be accepted as a success.
  - Inform the decision-making process of the promisor.
  - Include a time frame.

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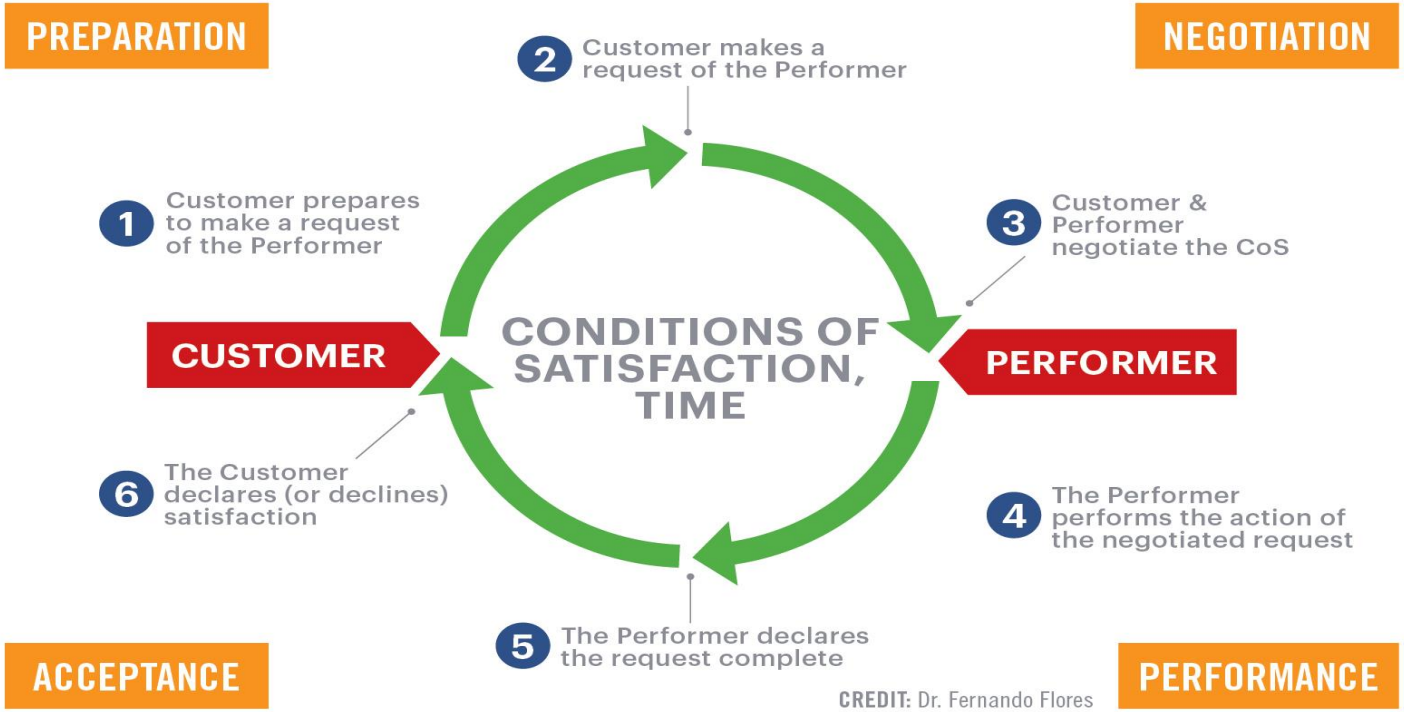
Basic Action Workflow Of A Promise



5 Connected Conversations Of LPS

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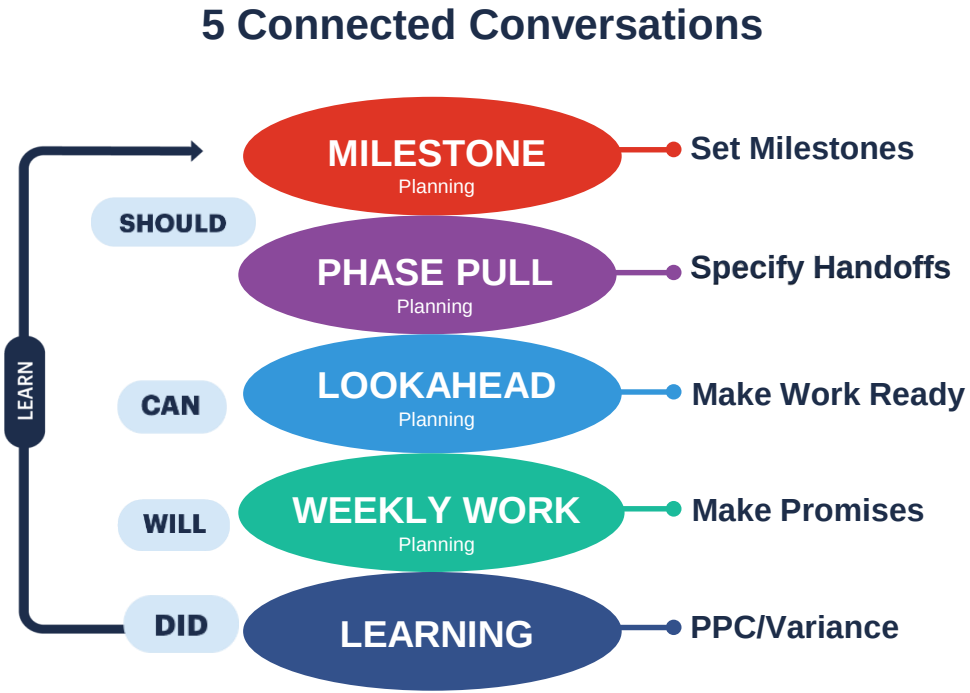
The LPS is a commitment-based system integrating 5 connected planning conversations:

1. Milestone Planning (Should)
2. Phase Pull Planning (Should)
3. Lookahead Planning (Can)
4. Weekly Work Planning (Will)
5. Learning (Did/Learn)



Last Planner System® in Design

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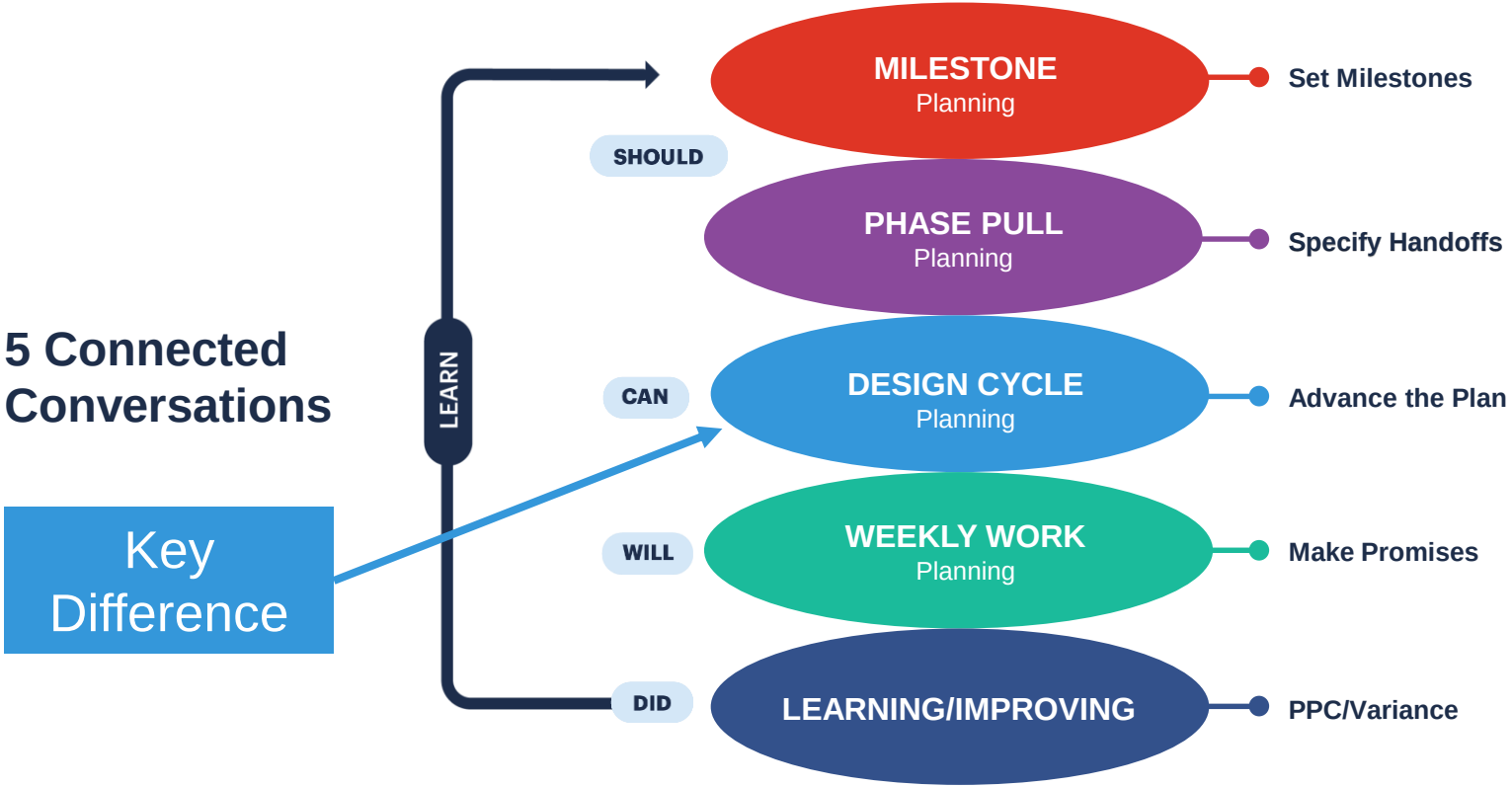

LPS In Design

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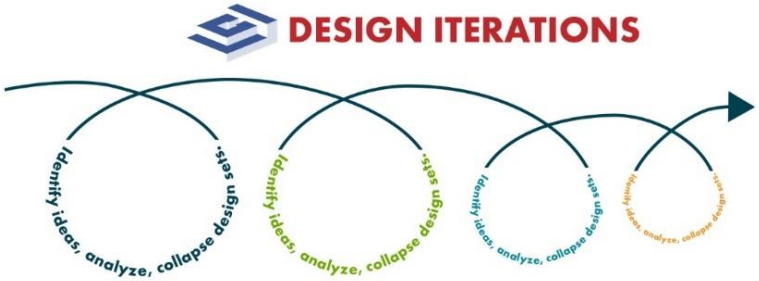
While design work doesn't have the hard logic of construction work, it is still accomplished in a network of commitments made among specialists.

That network can be designed and managed so that the work that should be done, can be done, and will be done.

Some adaptations have been made.



1. Discussion Question – Breakout Room

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What would be some specific advantages of improved work flow reliability on your projects?

Breakout Room Discussion
10 minutes

Design Considerations

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Design:

- Is emerging based on new information and the flow is “information”.
- Milestones are clearly defined by expected outcome which should describe what needs to be known.
- Milestones are often “decision points”.

Construction:

- Is linear in nature and the flow is “tangible materials”.
- Milestones are clearly defined by expected outcome which will be observable in the field.

Scrum & Agile Approaches

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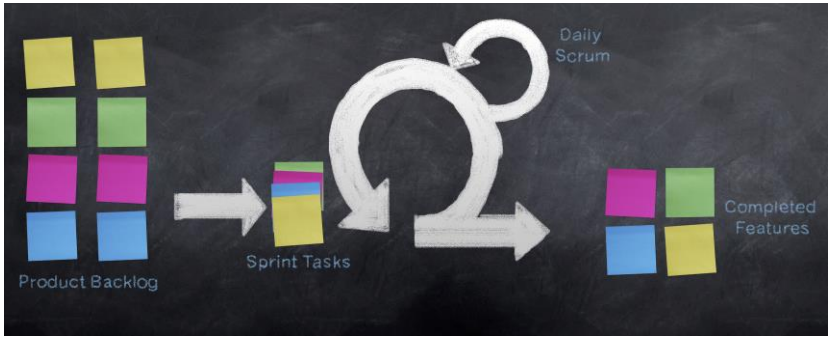
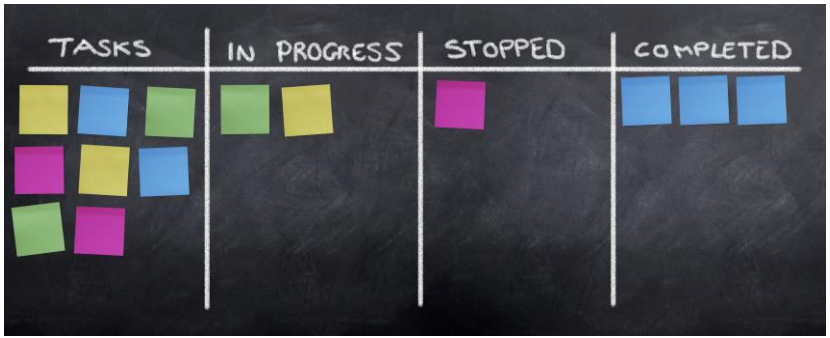
LPS as used herein was influenced by Scrum and Agile software development approaches integrated with Last Planner System principles and approaches.





Who Is The Last Planner

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The *Last Planner* is the person closest to work with authority to make decisions regarding the schedule and to make reliable commitments to complete the work of their discipline.

This may include the lead architect or project manager, the lead engineer, owner's project representative and the constructors as appropriate.

Last Planners

Milestone Planning

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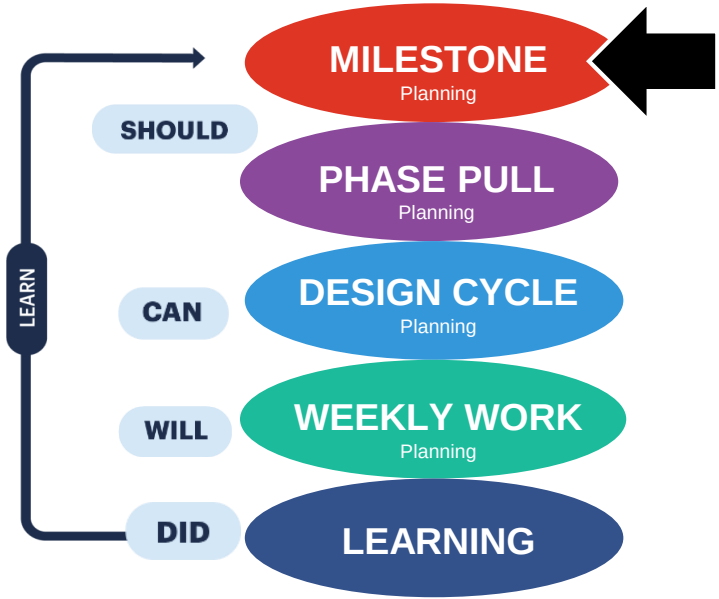
The first conversation of LPS is *Milestone Planning.*

The goal of Milestone Planning is for the team to align on and *set the milestones* for the project.

This starts the we *“should”* be able to do conversation.

5 Connected Conversations



Re-Defining Design Milestones

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Traditional Milestones:

- Percent Complete Sets
  - 30/60/90
- Schematic, Design Development, Construction Documents

Redefined Milestones:

- Handoffs of information
- Decisions, activities and deliverables to meet a specific release of part of the project.

Creating The Milestone Plan

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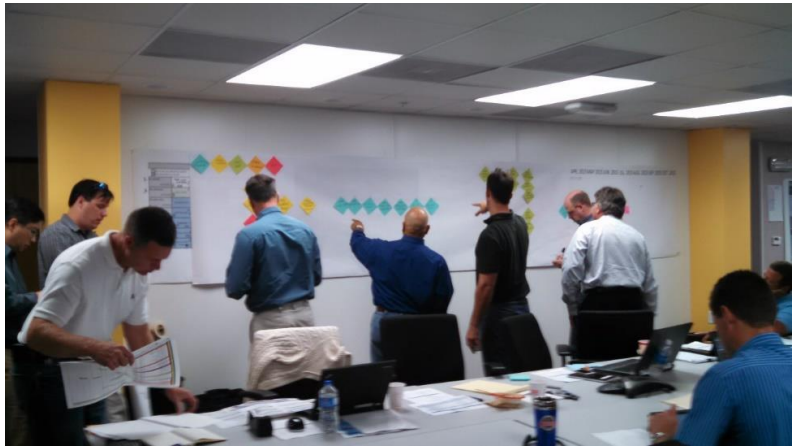
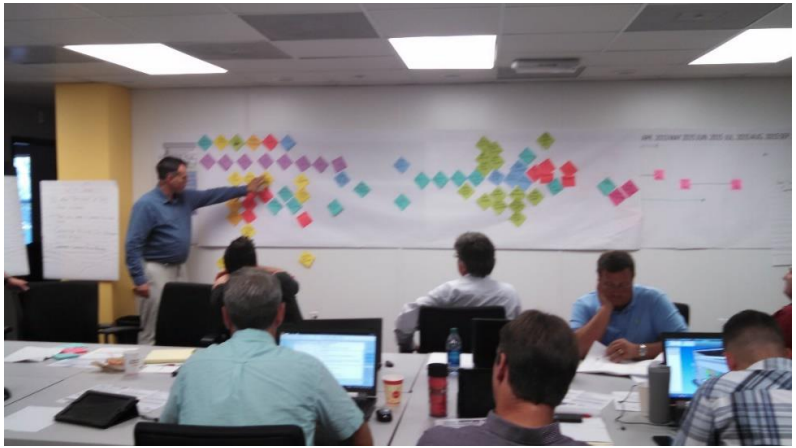
Collaboratively creating the plan

Developing the milestones to structure the flow. The next step will to add estimated durations.



Reviewing the plan

Color coding for different aspects of the plan, i.e. design, approval processes, key decisions, construction, turnover.



Courtesy of: InsideOut Consulting

Creating The Milestone Plan

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Developing the milestones to structure the flow. The next step is to add estimated durations.

Courtesy of : The ReAlignment Group of California

Phase Pull Planning

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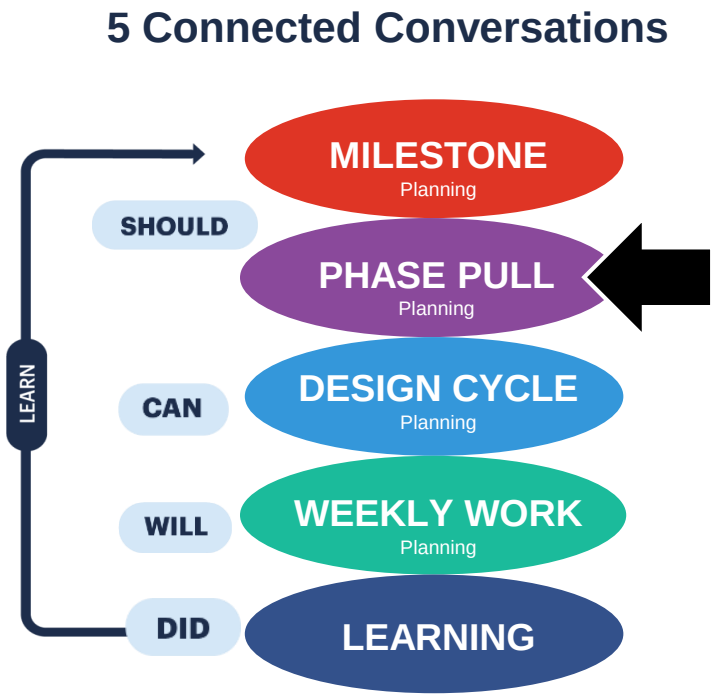
The second conversation of LPS is *Phase Pull Planning.*

The goal of Phase Pull Planning is for the team to determine the key *handoffs* of work or information needed to deliver a milestone.

This continues the we *"should"* be able to do conversation.



Pull-Creating Flow

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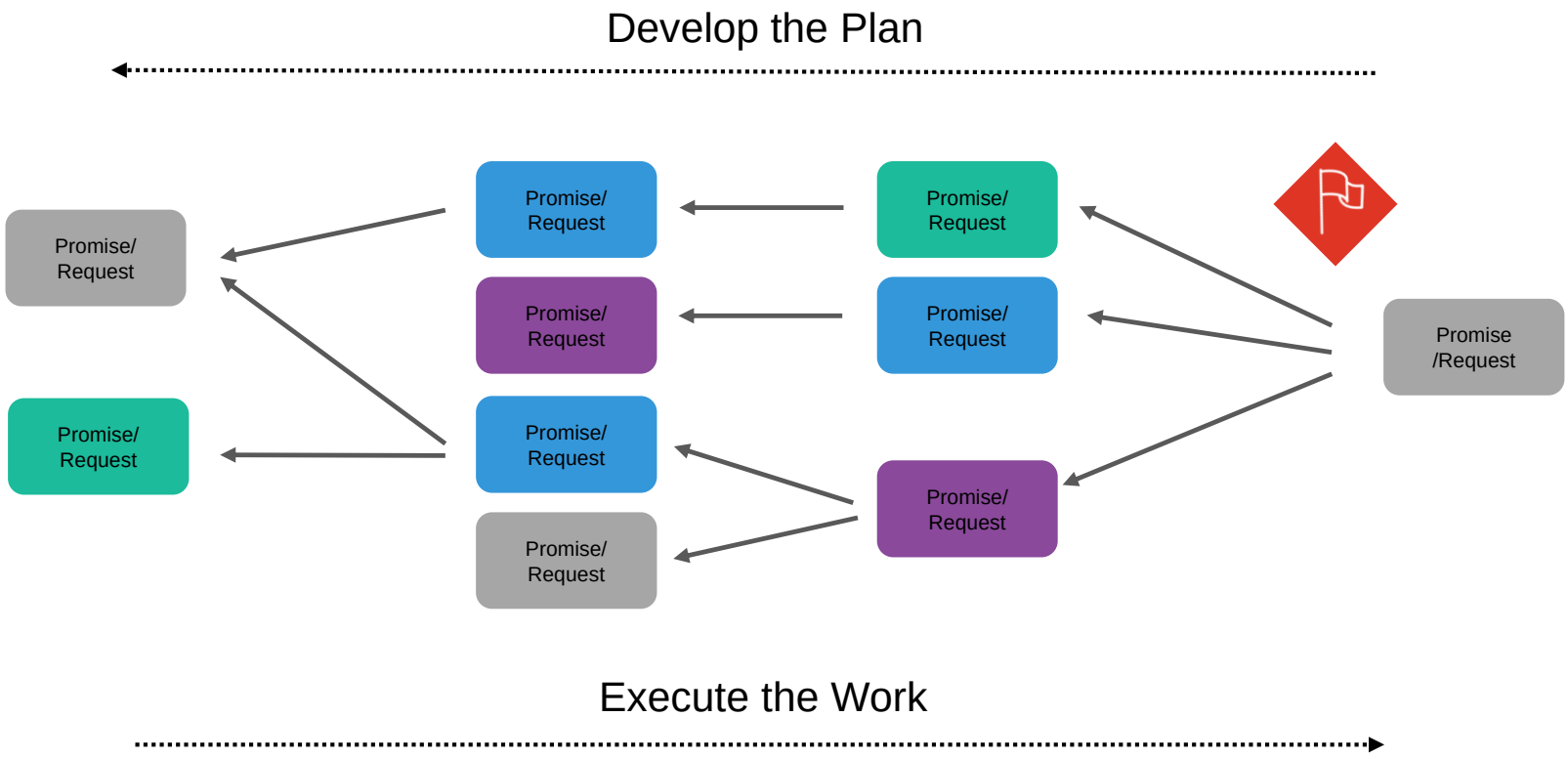

Focus On Handoffs

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Creating Tags For Promises

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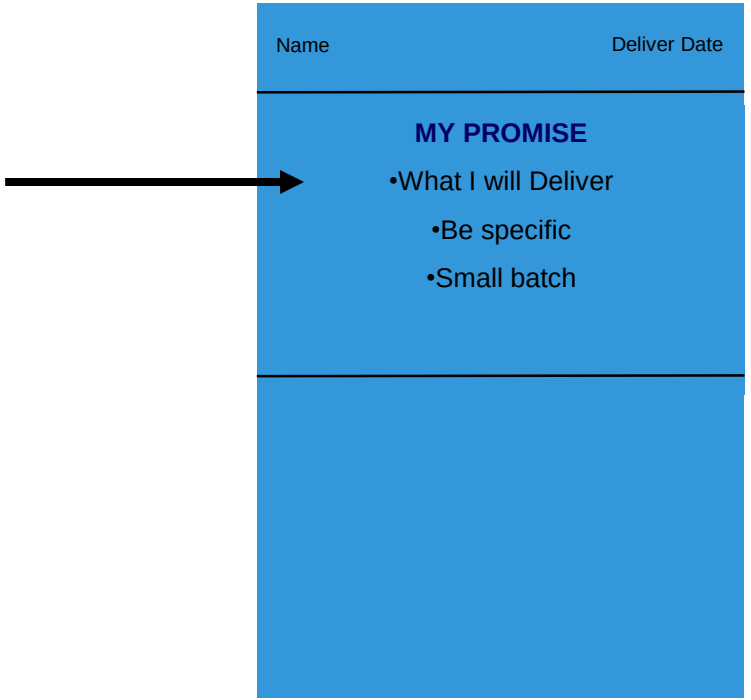
The *Performer* completes a tag to capture their *Promise* for work or information to be delivered to meet the *Request* of the downstream *Customer.*



Creating Tags For Promises

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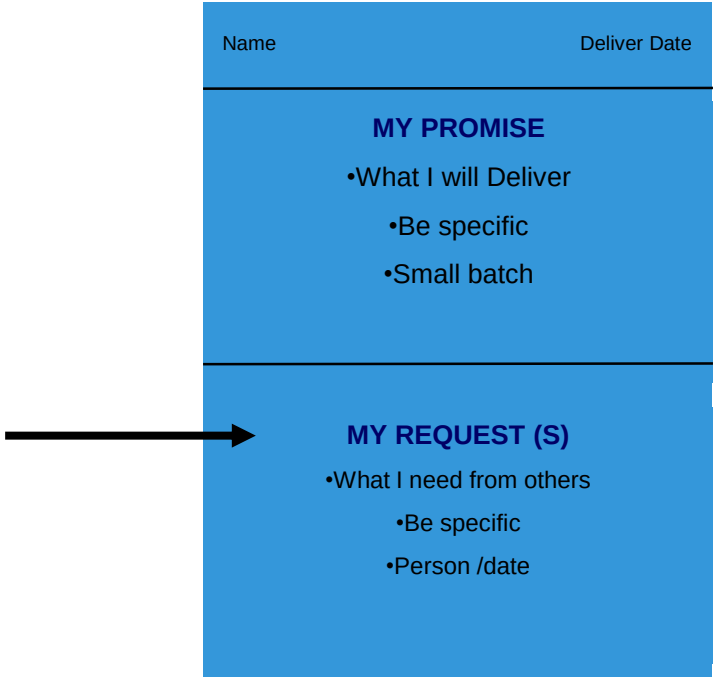
The *Performer* then makes a *Request(s)* for work or information needed from a upstream *Performer* in order to complete their *Promise.*



Creating Tags For Promises

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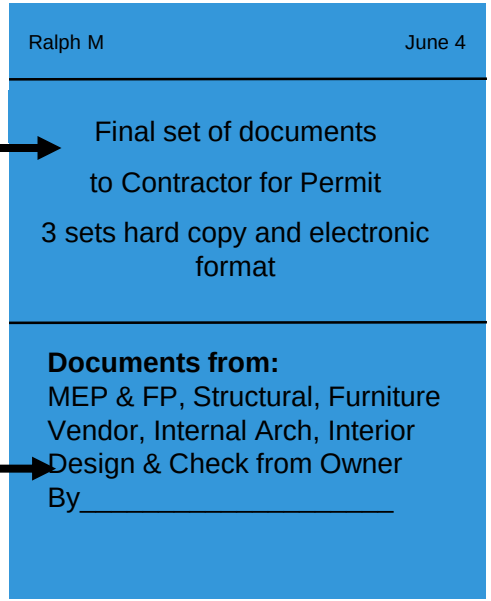
The *Performer* 's *Promise* for work or information they will deliver.

The *Performer's Request(s)* for work or information needed to complete their *Promise.*



Creating Tags For Promises

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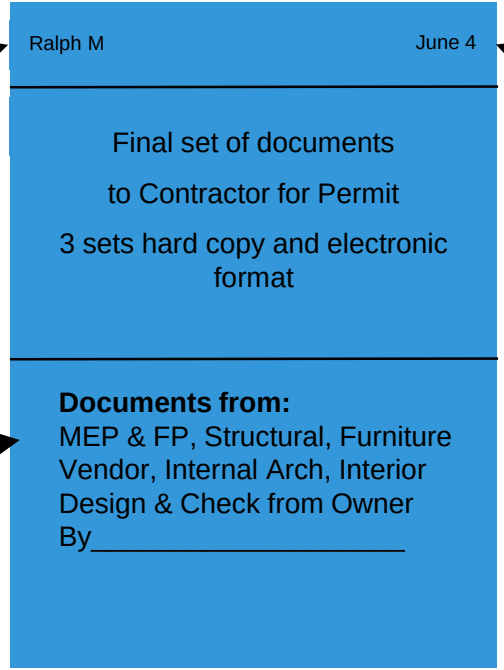
The ***Performer's*** name (not company) is placed on the tag.



Upon negotiation of the Conditions of Satisfaction including a ***delivery date***, the date is noted.

Note additional information that adds clarity to the plan includes ***who*** a request is made of and the ***date*** the request is needed.

Creating The Phase Pull Plan

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Color-coded milestones on the Phase Pull Plan

Pull to date of handoff needed

Involve key discipline leads

Future milestones remain on the Milestone Plan

UHS Temecula Valley Hospital Team

Pull Planning In Action

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Note the 3 tag pull example from this planning session.

Pull Planning In Action

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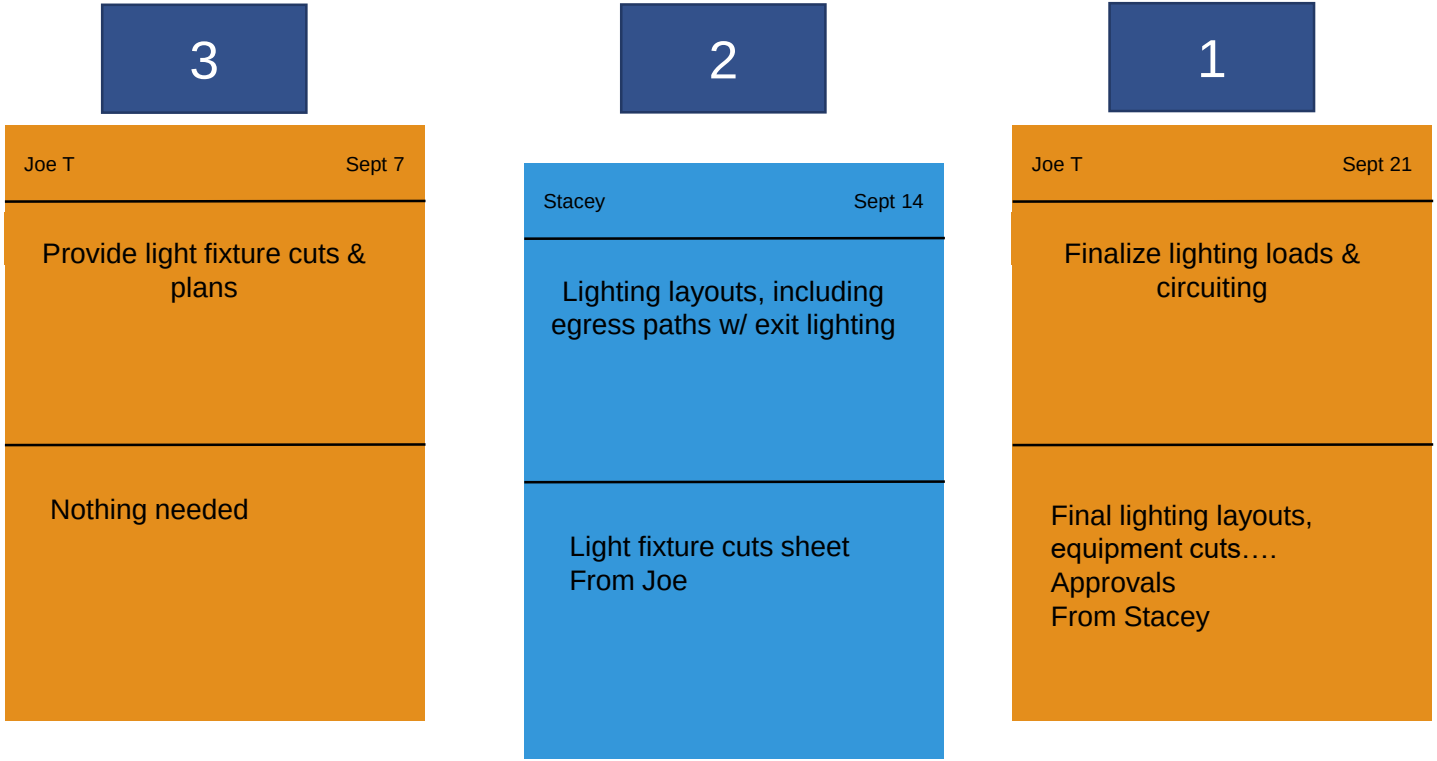

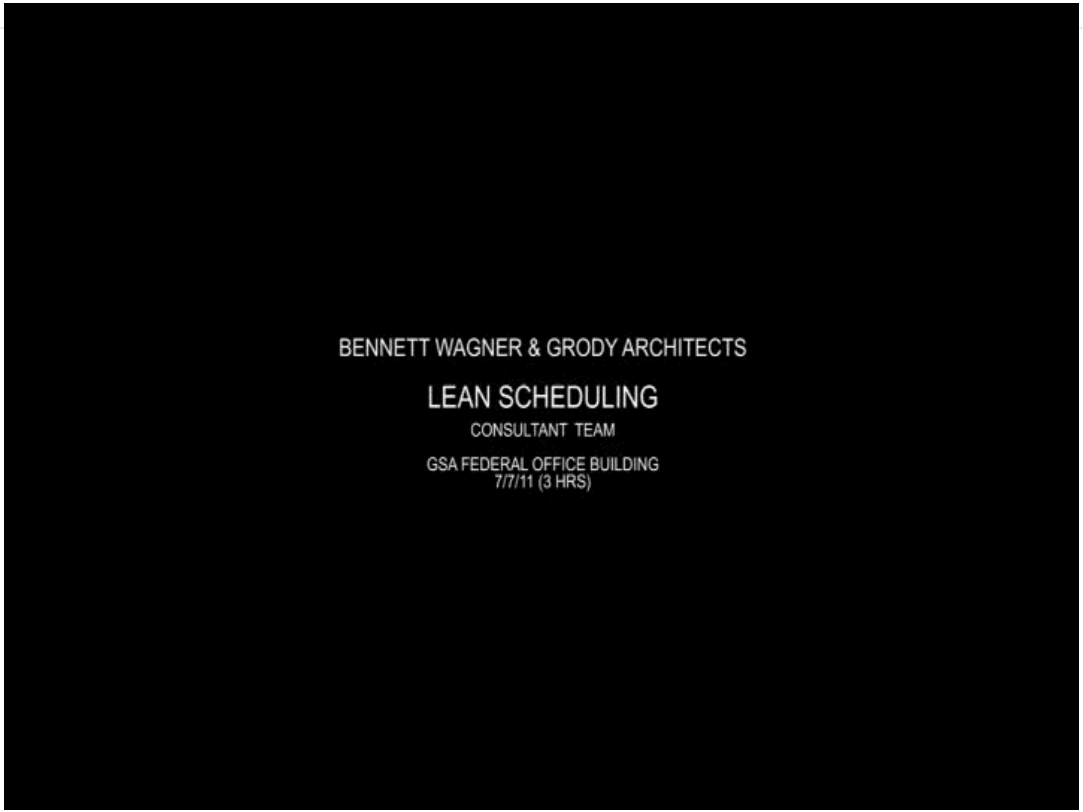
BENNETT WAGNER & GRODY ARCHITECTS
LEAN SCHEDULING
CONSULTANT TEAM
GSA FEDERAL OFFICE BUILDING
7/7/11 (3 HRS)

2. Discussion Question – Breakout Room

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What might be some improved outcomes from implementing a pull planning methodology?

Breakout Room Discussion
10 minutes

Design Cycle Planning

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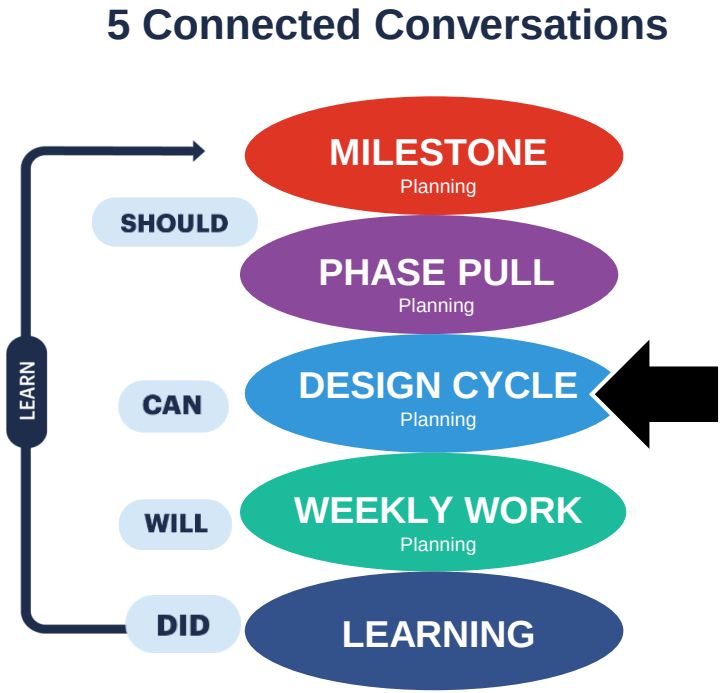
The third conversation of LPS is *Design Cycle Planning.*

The goal of this level is to continuously *advance the level of detail* of the Phase Pull Plan in 2-3 week cycles of time.

The conversation is we *“can”* do this.



Scrum & Design Cycle Planning

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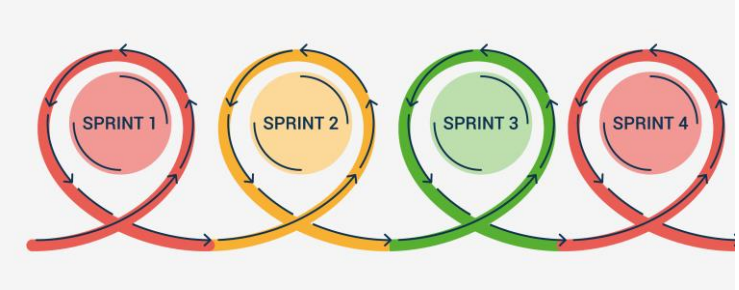
Design cycle planning draws from *Scrum* in software design.

Teams focus on determining what work can be delivered in continuous 2-3 week cycles called sprints.



Advancing The Plan

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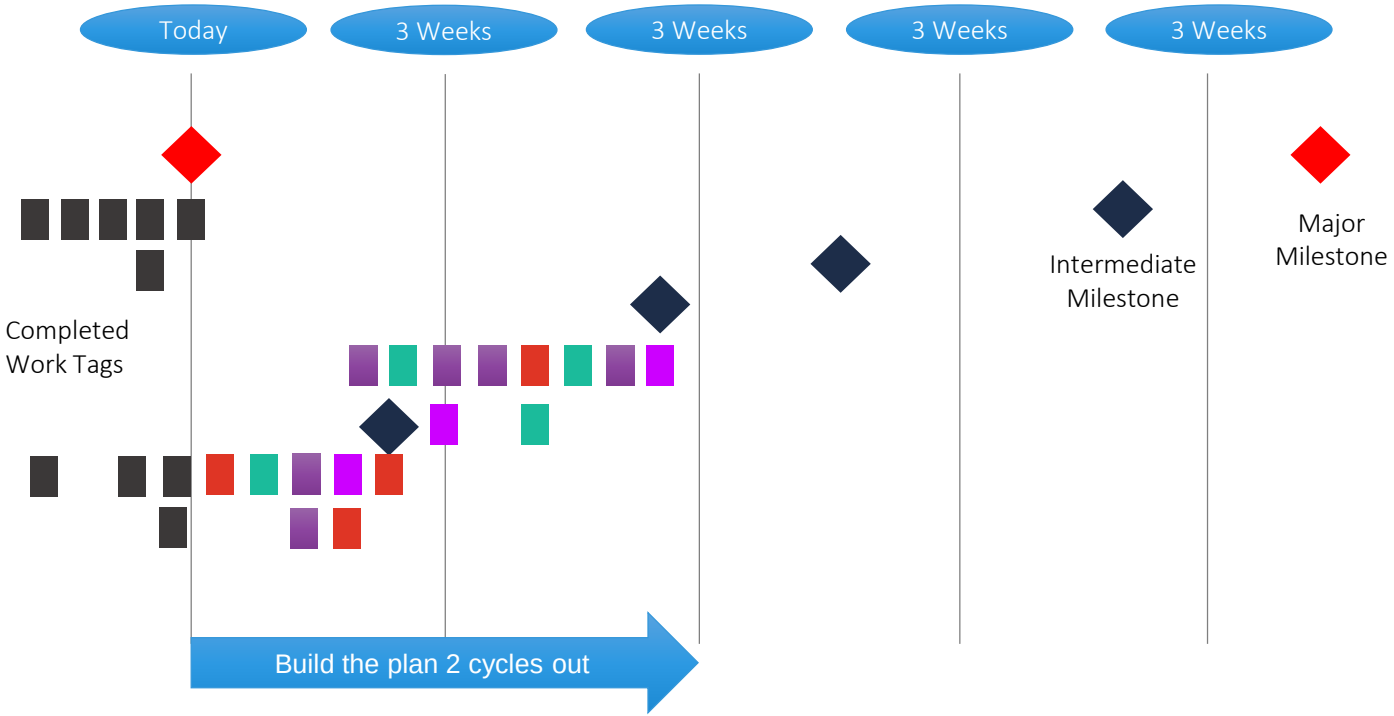

Advancing The Plan

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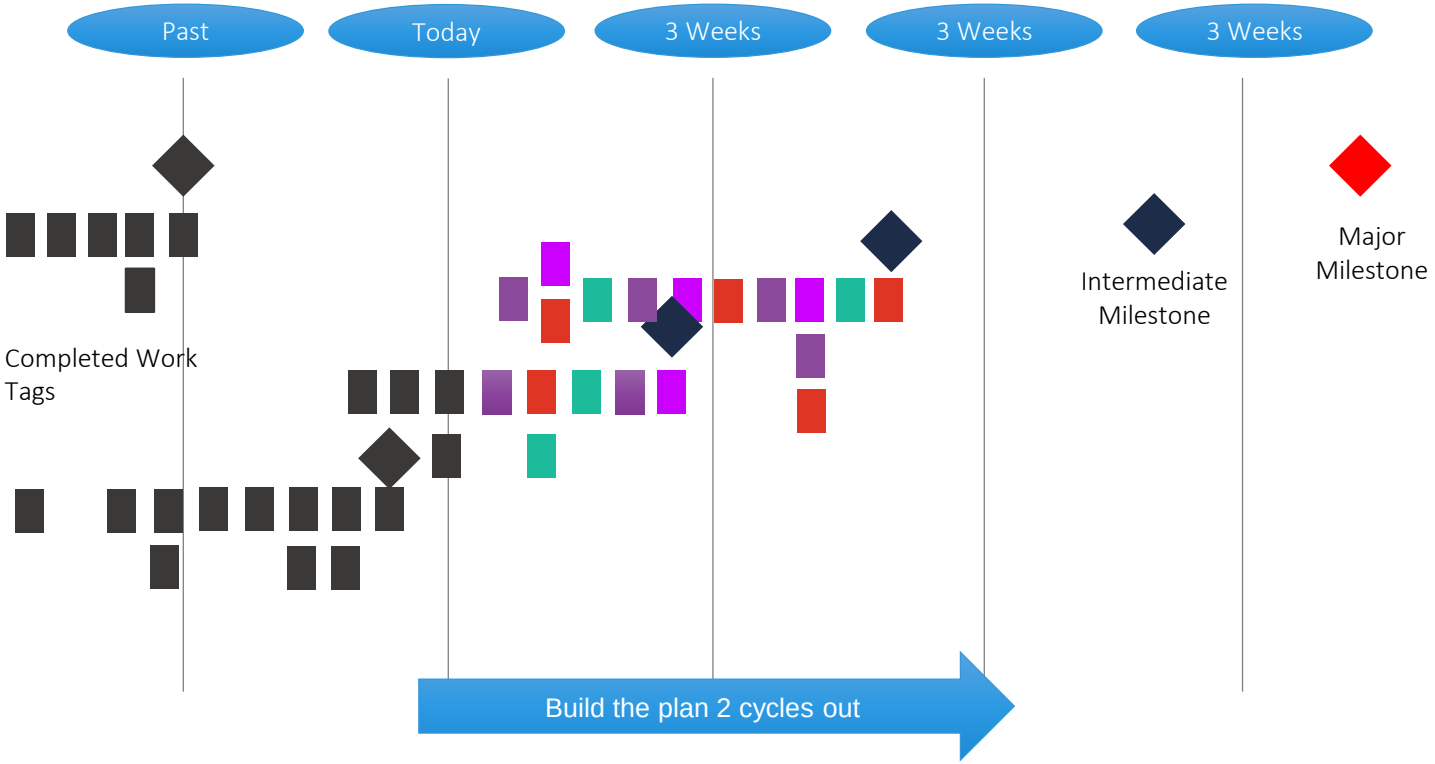

Advancing The Plan

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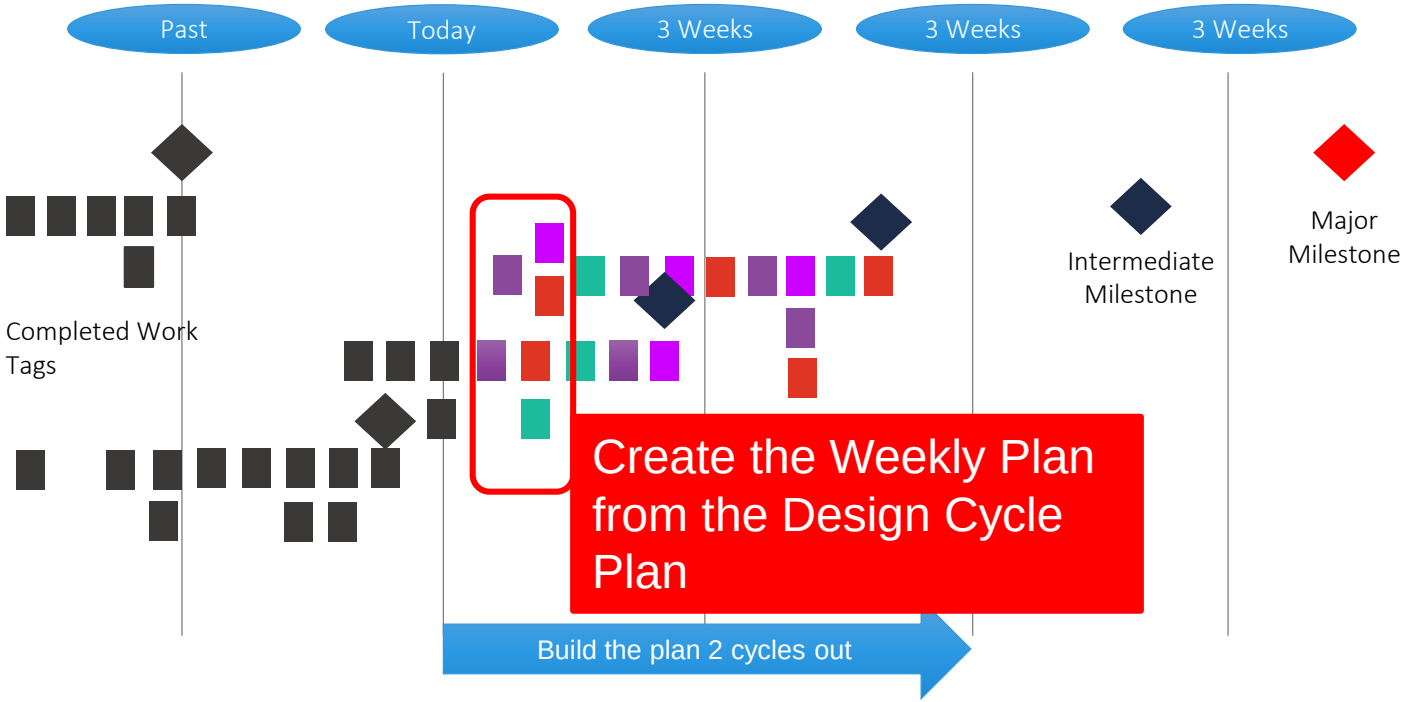

Documenting The Plan

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The promises from the tags are documented in a *Work Register* for people to access at their place of work.

Project:
Date of Pull Plan: 09/30/10

Milestones	Cycle Level Work	Requester	Performer	Disipline	Start Wee	Estimated El	Task Stat
			Week of 9/20				
City B Site Plan	Discuss SCE with Rehm	self	Ward	Architectural	20-Sep		Done
City B Site Plan	User name password Project Wise for Emily	Emily	Vanessa	DPR	20-Sep		Done
City B Site Plan	Conversation w/Margie (see list)	self	Cynthia	Civil	20-Sep		Done
City B Core and Shell	UHST Approval of Space Program						Done
City B Core and Shell	Structural Steel Trade Partner		Turner/DPR		20-Sep		Done
OSHPD "I" Submission 1.1	Appoint/confirm LV designer		Scott	Electrical	20-Sep		Done
City B Site Plan	Obtain COT for building permit and email to team	Team	Ward	Architectural	20-Sep		Done
City B Site Plan	Email first floor to trade partners and Site and CV and LA	Team	Ward	Architectural	20-Sep		Done
OSHPD "I" Submission 1.1	Complete 3rd party code review		Steve	Architectural	27-Sep		Done

UHS Temecula Valley Hospital Team

The Work Register

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The **Work Register** is a combination of :

- The **Commitment Log** to stay on track with the commitments made.
- The **Constraint Log** to track the roadblocks that arise for any commitment.

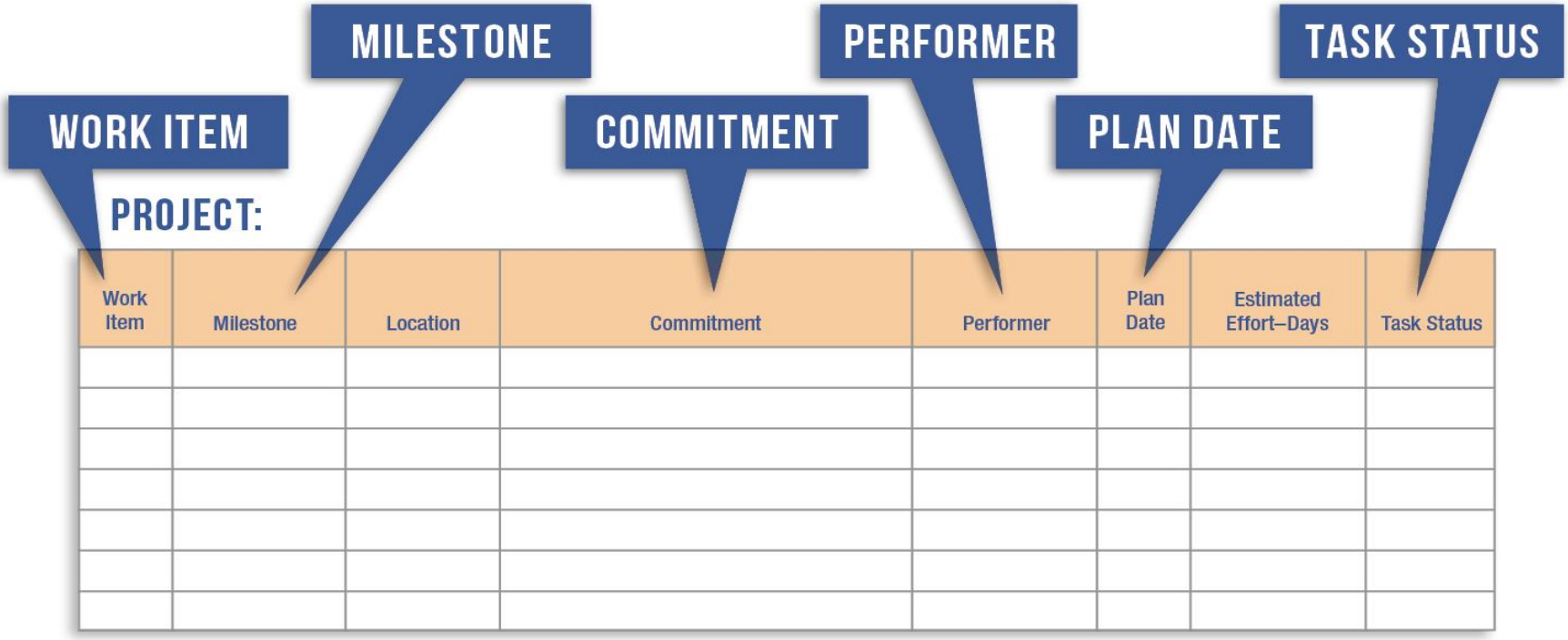
PROJECT: **CONSTRAINT:**

Milestone	Location	Commitment	Performer	Plan Date	Estimated Effort—Days	Task Status	Constraint	Responsible Individual	Resolution Needed	Resolution Promised Date	Date Resolved/ New Plan

COMMITMENT LOG

CONSTRAINT LOG

Elements Of The Commitment Log



Elements Of The Constraint Log

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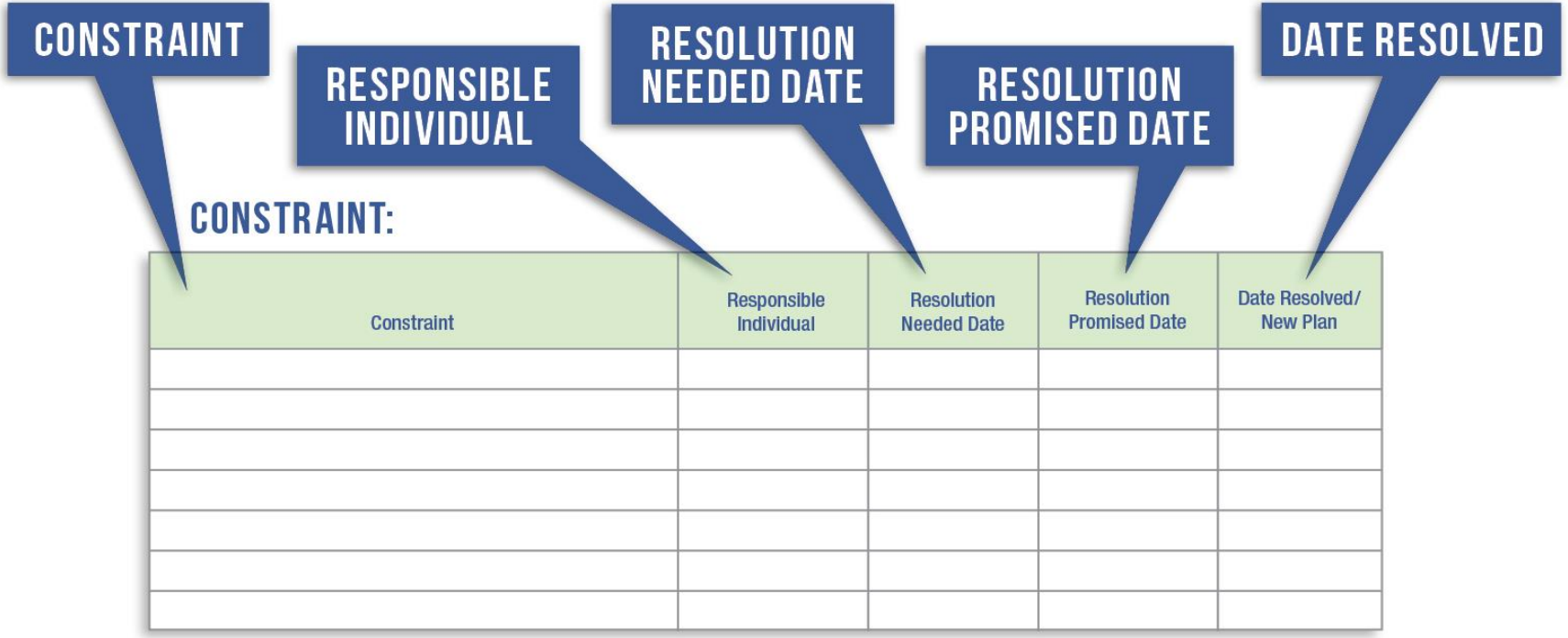

Weekly Work Planning

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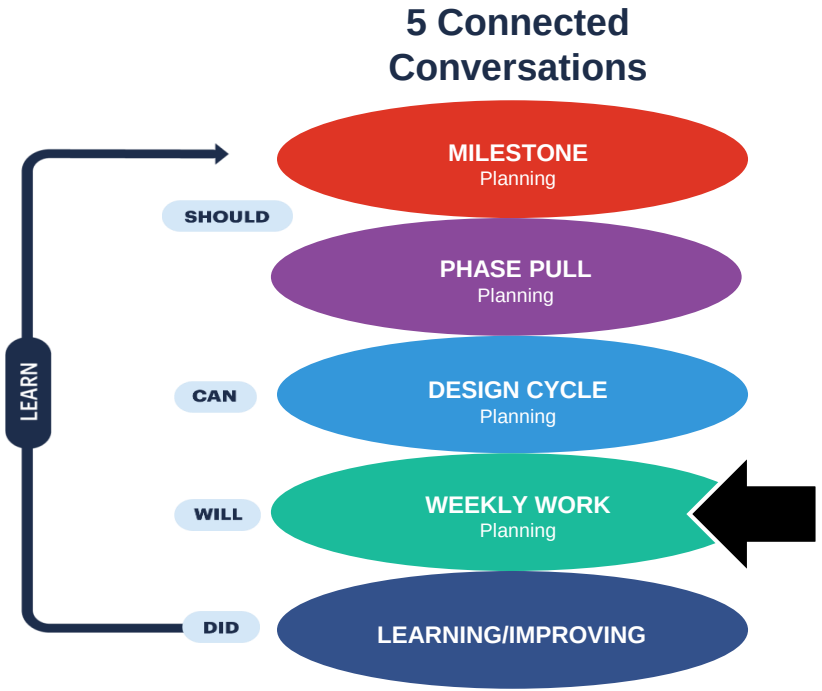
The fourth conversation of LPS is *Weekly Work Planning.*

The goal of this level is for the Last Planners to *establish the plan* for the upcoming week at the daily level.

The conversation is I *"will"* do this.



Weekly Work Planning

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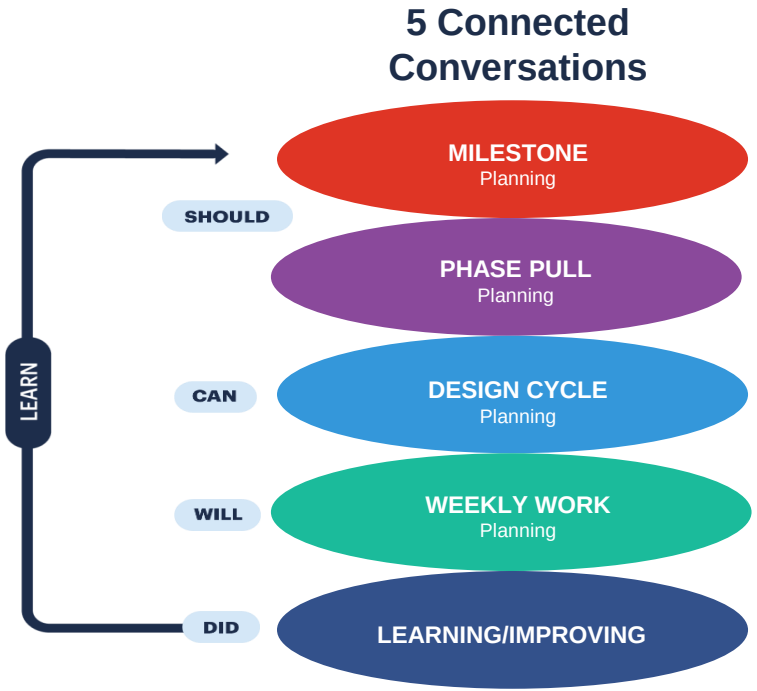
Team identifies the *promised task completions* agreed upon by the *Performers* for the upcoming week.

Then determine the *success* of the planning effort as basis of measuring PPC (Percent Plan Complete).

This is done during a *Check-in Session or Huddle.*



Conducting Check-in Sessions

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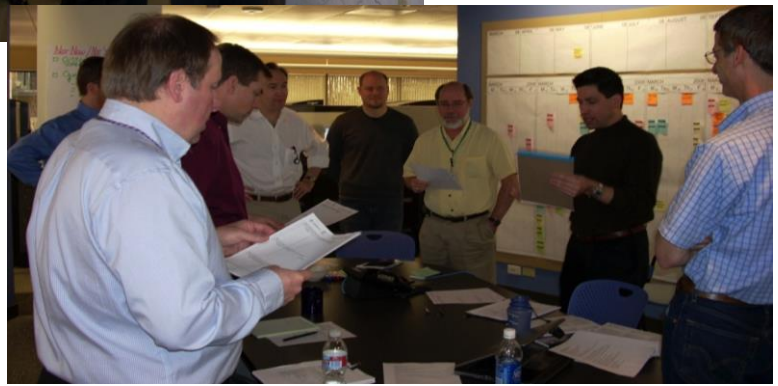
Check-in Sessions are short, high energy touch points conducted standing.

Each person answers:

1. What promises I fulfilled. (Declaring Done)
2. What promises I will fulfilled. (Managing Commitment)
3. What are my constraints or concerns. (Constraint management)
4. What is the status of my commitments overall. (Am I on track).



3. Discussion Question – Breakout Room

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Discuss the advantages of the Check-in Session as presented here

Breakout Room Discussion
10 minutes

Learning/Improving

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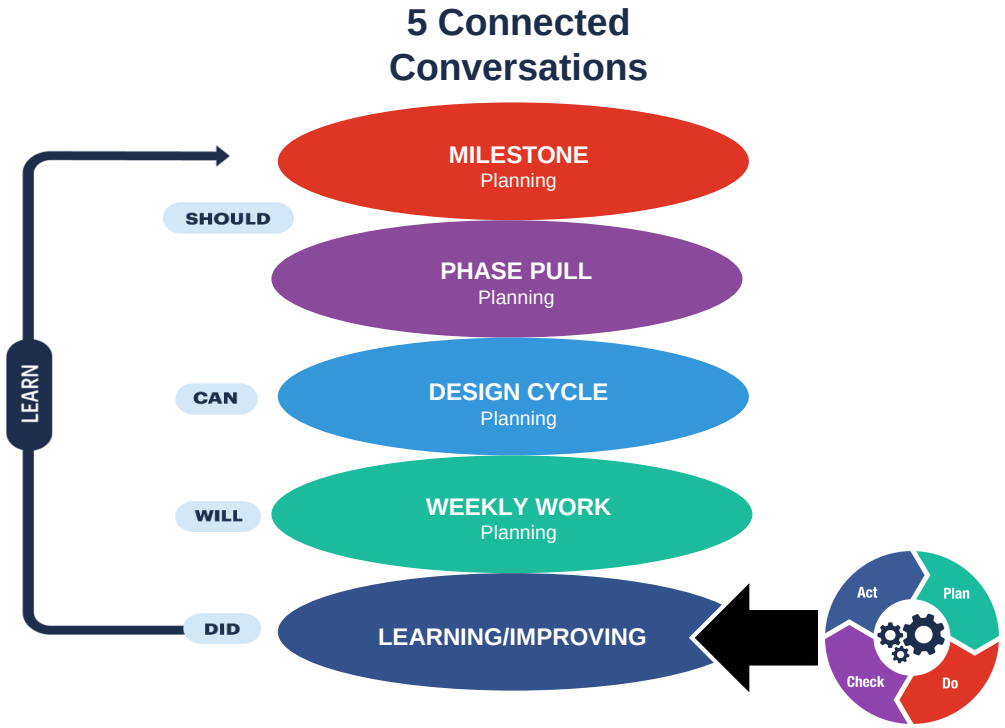
The fifth conversation is *Learning/Improving*.

The goal is for the team to *learn* from the cycle and take *actions for improving* going forward fulfilling PDCA.

The conversation is what we *"Did"* and *"Learned"*.



Learning From Check-in Sessions

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The *Commitment* and *Constraint Logs* are updated live during the Check-in Session.

The *Percent Plan Complete* (PPC) is calculated for the period or week.

PPC is the basic measure of how well the *planning system is working*

PROJECT: CONSTRAINT:

Milestone	Location	Commitment	Performer	Plan Date	Estimated Effort–Days	Task Status	Constraint	Responsible Individual	Resolution Needed	Resolution Promised Date	Date Resolved/ New Plan

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Calculating PPC

$$\text{WEEKLY PPC} = \frac{\text{\# Completed Activities}}{\text{\# Planned Activities}} = \frac{16}{20} = 80\%$$

Track Percent Plan Complete

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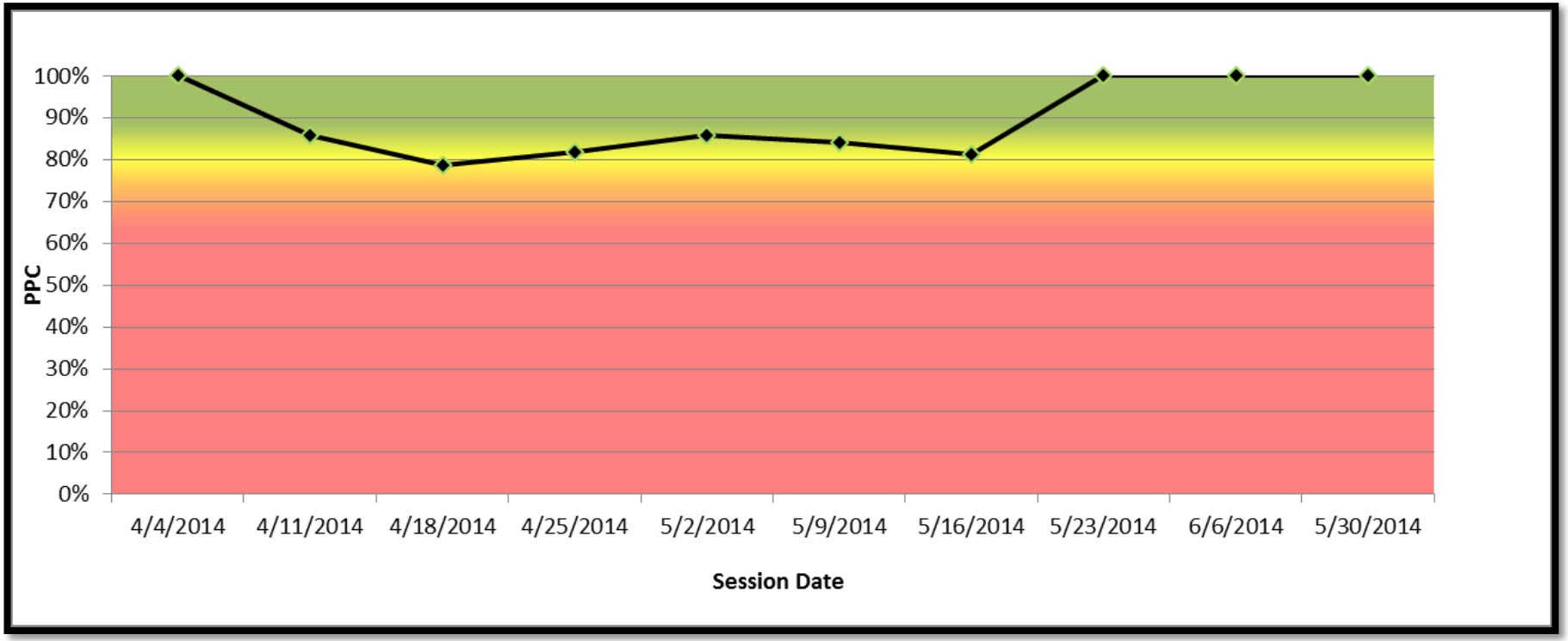

Reasons For Variance

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Reason for Variance:

- Factors that prevented a task from being completed as promised.
- Used by the team to promote learning concerning the failure of the planning system to produce predictable workflow.
- Assigned a category of variance.
- Enable a team to identify those areas of recurring failure that require additional reflection and analysis.

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Reasons for Variance

Design Phase:

1. Overcommitted
2. Miscommunication
3. Previous work not complete
4. Change in work plan
5. Outside constraint
6. Resources not available
7. Other

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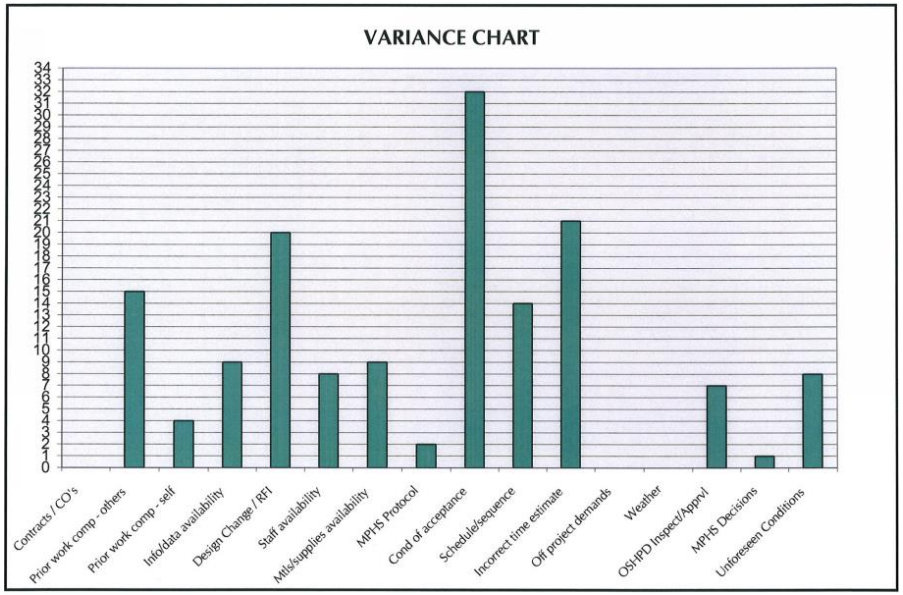
Taking Action For Variance

When a *variance* or failure occurs, the team must discuss the likelihood of it occurring again and determine actions to mitigate such.



Group Discussion Question – Chat Box

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New Actions?

What new actions or ideas that you learned today can you take back to your project?

Chat Box
3 minutes

Lean Journey to Mastery

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How will you reach the next level on your journey?

Target Value Delivery: Classroom & eLearning (release 2019)
Lean in the Design Phase: Classroom & eLearning
Mindset of an Effective Big Room: Classroom & eLearning (release May 2019)
Last Planner® System in Design: Classroom & eLearning (release 2019)
Conducting Gemba Walks: Classroom

Introduction to Lean Project Delivery: Classroom, eLearning & Webinar
Introduction to Last Planner® System: Classroom & eLearning
Lean in the Design Phase: Classroom & eLearning
Introduction to Lean in Design-Build: Classroom
The Business Case for Learn: Classroom

More on Learning

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Books:

Events:

- Local Community of Practice
- Congress (October)
- Design Forum (May)

eLearning:

Learn on your own time without taking time off project work.

Start learning now:

www.LeanConstruction.org

eLearning Courses

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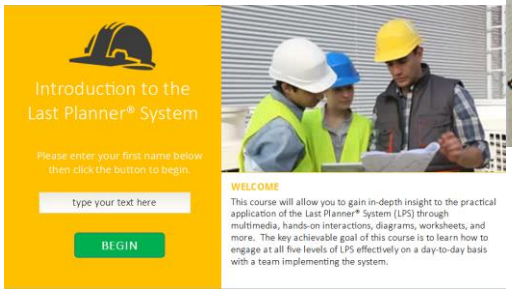
- Introduction to the Last Planner System®
- Introduction to Lean Project Delivery
- Lean in the Design Phase
- Effective Big Room
- Target Value Delivery
- Last Planner System® in Design



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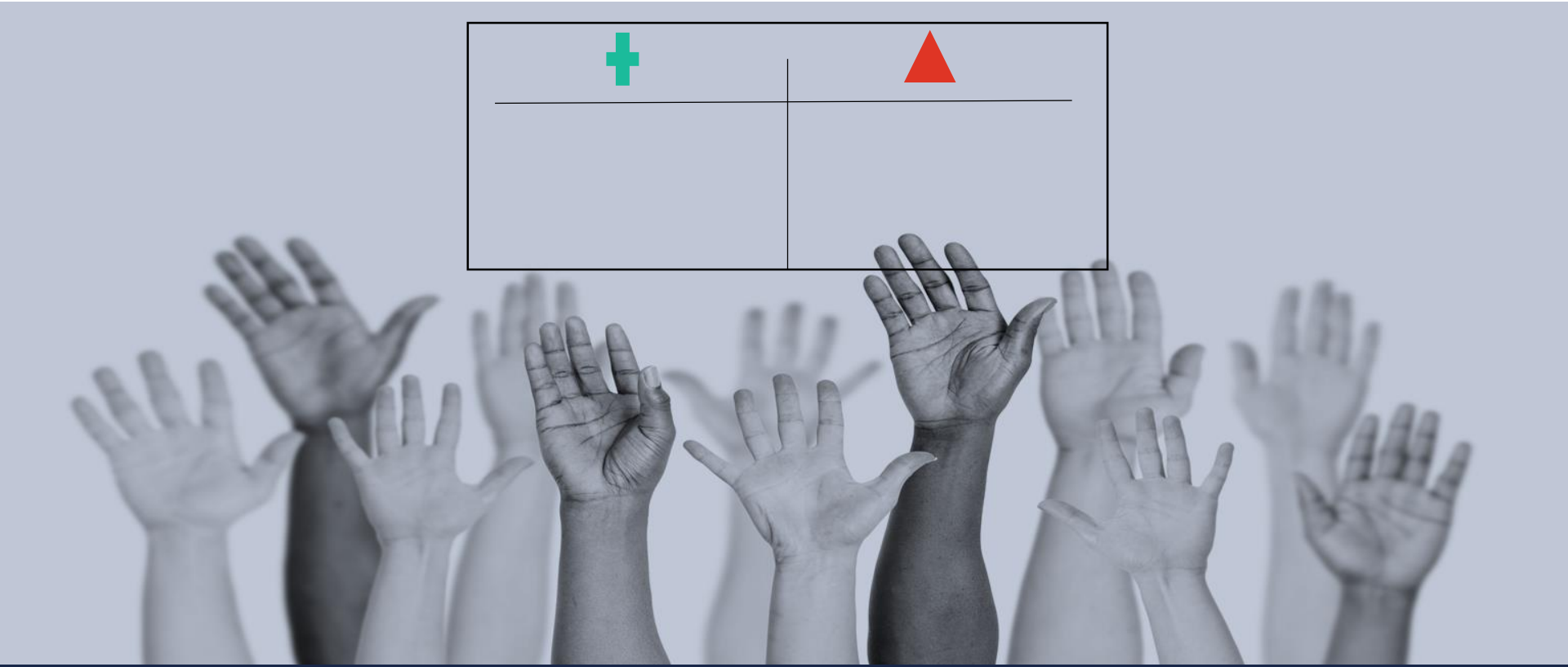
Questions & Plus/Delta



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LCI Contact Information

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This concludes The American Institute of Architects
Continuing Education Systems Course

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