Last Planner System
Just the Essentials

Advice from the LPC Project Coaches

Lean Project Consulting

*Transforming the
experience of project
work from frustration
and conflict to trust
and mutual respect*

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We prepared this document for people who have been introduced to or are new to the Last Planner® System (LPS) and for those teams who want to improve on the performance they currently experience. The document is not intended to be comprehensive either in the description of the elements of LPS or in how the LPS is implemented on a project. We are explaining the essential terms and practices.

We offer an easy way to remember the highlights of LPS. We refer to it as Last Planner 5 − 4 − 3 − 2 − 1.

5 Linked Conversations:

- Milestone and Phase Planning
- Make-Ready Planning
- Weekly Work Planning
- Daily Commitment Management
- Retrospectives

4 Key Artifacts:

- Milestone and Phase Pull Plan
- Make-Ready Plan including Constraints Log
- Weekly Work Plan
- Performance Charting

3 Roles:

- Last Planner
- Make-Ready Planner
- Facilitative Leader

2 Goals:

- Reliably completing work
- Make the work flow

1 Overarching Principle:

- Do better today than yesterday

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You can read more about Last Planner at www.leanproject.com/last-planner/.

Milestone Schedule

The milestone schedule should divide the project into logical phases. The duration should be established in a manner so that those responsible for the project are confident that the work can complete as planned. This may require the development of a more detailed schedule, conversations with those responsible for work on the critical path or other investigations.

Phase Pull Schedule

All the team members responsible for the work to deliver a milestone will participate in developing the Phase Pull Schedule (PPS).

The PPS should be developed in a face-to-face conversation that establishes context, defines the milestone deliverables (the client value), develops an execution strategy, identifies tasks and organizes them in a pull plan working from the end of the phase back to the beginning.

All work items on the PPS must produce a deliverable defined in terms accepted by their customer. In this case, "customer" is the next person in the flow of work. Each work item on the PPS includes four pieces of information:

- the performing group for the work item (often indicated by the color of the stickie),
- the conditions of satisfaction,
- anything that is needed from others and
- the concentrated effort to complete.

The PPS is complete when the team members agree on the hand-off criteria between activities, sequence and likely timing of the work, are confident they have access to adequate resources and time to complete the work and have identified long lead items. An attempt should be made to establish a work pace that allows each trade to plan their staffing. A steady pace across the phase coupled with the reliable completion of work will produce flow.

Conditions of satisfaction need to be specific. State exactly what will be in place and observable when the work item is complete. This contrasts with the usual activity description. For instance, rather than "frame walls," the conditions of satisfaction indicate which specific walls will be finished.

Concentrated effort is used rather than duration when planning. State who will be working and for how long. For instance, 2 plumbers for 2 days are required. This differs from usual planning practices where someone answers the question, "How much time do you need?" and answers, "Give me a week." By using concentrated effort we are able to work out a pace of

production that is consistent across the performing groups. This is lean.

Make-Ready Plan

Work in the PPS establish tasks in the 6-week Make-Ready Plan (MRP) for each week.

The link between tasks in the MRP and PPS activities should be recorded and maintained. While many teams use spreadsheets for managing this, others use scheduling tools such as MS Project and Suretrack.

Sub-tasks can be created and linked to tasks in the MRP. Typically, the hand off of work between trades is established in PPS level tasks. Sub-tasks are usually managed within each craft.

Tasks and sub-tasks produce deliverables.

Identifying Constraints

Constraints are those directives, resources and prerequisite work not shown on the PPS needed to start and complete a task. Directives refers to requirements placed on the work that come from outside the team. For instance, there may be special inspection requirements needed for a work item or a specific installation procedure that must be followed. Resources refers to any capacity that is required including tools, equipment, space and labor. Prerequisites includes any work that must be completed prior to the work item planned along with materials that must be available.

Maintain the link between constraints and tasks so you never release work that isn't ready.

Tasks (& sub tasks) on entering the MRP planning horizon are screened for constraints by the Responsible Individual (RI) for the performing organization and again when assigned to Last Planners (LP).

The RI will remove those constraints normally within their authority and make requests to the Make-Ready Planner and others for those constraints beyond their authority.

Requests that require a promise from someone outside the RI's organization will be made through the Make-Ready Planner and recorded on the project constraint log.

The Make-Ready Planner maintains the constraint log. Each constraint will include the need date and the promised date along with who needs the constraint resolved. The constraint log will reflect the state of the request in workflow loop terms: in negotiation, promised, in progress, complete.

> **Acronym Finder**
>
> PPS – Pull Phase Plan
> LP – Last Planner
> RI – Responsible Individual
> MRP – Make Ready Plan

The LAP (and perhaps the PPS) will be changed in response to constraints that cannot be removed by the time required.

Managing Constraints

A log of open constraints will be maintained and made readily visible. Status will be reviewed in weekly planning meetings on site and at the OAC level. The log should be kept in electronic form and always be available to RIs involved in planning.

A procedure will be established for updating the log. Normally, changes in the status of constraints are reported when they occur.

Those responsible for removing a constraint will notify the Make-Ready Planner if their promise needs to be revoked or renegotiated.

Typically the General Contractor's project manager is responsible for assuring work is ready to be assigned, i.e., all constraints have been removed, as required to support the MRP.

The General Contractor's Superintendent is responsible for assuring the site and specialty contractors are ready to do the planned work.

The Specialty Contractor's Project Manager is responsible for assuring that requests for all constraints requiring action from other organizations as well as their own have been made, promises received and status accurately recorded.

The Specialty Contractor's Superintendent is responsible for assuring the site and their crews are ready to do the planned work.

Preparing the Weekly Work Plan

All the work items in the Weekly Work Plan (WWP) should be in the 6WMRP and linked to the PPS.

The WWP should contain only work items that are ready to be performed. This means that all constraints have been removed for that week, the LP is confident any remaining make ready needs will be available when needed and the site and workforce are ready.

Only tasks in a condition to start and finish on time should be included in the WWP. In rare cases, work not in a ready condition may be included even though the LP is not confident it can be made ready or completed. In this case, the next LP in the planned sequence of work must be notified that the work may not be delivered.

Assignments on the WWP should be sized for daily completion. Larger assignments may be made if this is not practical, for example when the work will span several days and interim completion is difficult to establish. However, the lean principle of small batch production should be followed when possible.

Inspection tasks should be included in WWP when inspections are required before the next crew begins.

Note that the entire capacity of the crew need not be allocated to promised work. Work necessary to be handed to the next crew must be promised as well as that where close

coordination is required.

No WWP is complete without identifying workable backlog. Workable backlog is work items from the next week or two that if performed in the coming week will not be out of sequence nor create difficulty for other trades. Workable backlog is not promised on the WWP, in other words no YES or NO's – no credit toward Plan Percent Complete. It is identified as alternate work to be performed if the crew cannot do their planned work or better yet, complete their planned work and have capacity to do additional work.

Daily Commitment Management: Declaring Complete & Measuring Planning Performance

Practices for declaring complete – saying, "I'm done" – shall be established. Reporting and recording the declarations that work is complete (or not) should take place in daily stand up meetings (often called "huddles") in each major work area. These meetings should be used to adjust field coordination and to give following crews early notice of expected early or late completion for coming work. (Declaring complete may or may not release following work depending on quality assurance rules for each trade.)

The huddle is attended by an area superintendent or someone acting in that capacity. (It's a great training role for Project Engineers.) The WWP is used as the reference for the meeting. These meetings should last no longer than 15 minutes. The meeting follows a standard protocol:

- Each performer reports on commitments due that day saying, "Done," "Not done" or "Done but not according to plan."

- The performer recommits to the coming day's work or renegotiates a new promise.

- The performer asks for help if needed to complete the current promises or the coming day's promises.

Planning system performance is measured each day by comparing actual completions with promised completions. Reasons for non-completion are identified. The measure is called Plan Percent Complete (PPC). Remember it as Percent of Promises Completed and you won't make mistakes.

Reasons for non-completion are compiled, reviewed and actions taken to prevent recurrence.

Assignments on the WWP that were not foreseen in the 6WMRP and those not made ready should be rare. In the cases where they are not, similar measurements, % Assignments Made Ready (AMR) and % Assignments Anticipated (AA) can be used to monitor the extent to which assignments are not ready when planned or not foreseen on the 6WMRP or WWP.

Manage the Project for High Reliability

Teams can get to 70% PPC without much trouble. You'll find the above practices are sufficient. The difference in a day on the project will be quite noticeable. Firefighting will drop by about 40%. What will you do with all that time? Get more reliable!

High reliability – above 85% and increasing – is the goal. At this level, over 70% of firefighting has been eliminated. Work is flowing. Crews are getting ahead of schedule. Safety incidents disappear. 85% is absolutely doable. How? Follow the overarching principle:

Do better today than yesterday.

How will you do better? One of the best practices is to regularly conduct a team-wide assessment. You'll find a Quick Assessment on the following page. The tool is designed to be used at weekly work planning sessions. Use it often.

LPC also provides a more comprehensive assessment tool that is in wide use. You will find it on the LPC website, www.leanproject.com/lastplanner/.

The assessments are structured forms for tightly coupling learning with action. Some of the less structured approaches are plus-deltas and *retrospectives.*

The plus-delta is used anytime you want quick feedback from participants in a meeting or a process. Ask, "What produced value <u>for you</u>?" (plus) and "What change could be made to produce more value <u>for you</u>?" (delta) Do this publicly. Record the answers as people speak putting the pluses on the left and the deltas on the right. Review the results to make decisions on what you will change for the next time the group is together.

Retrospectives, sometimes called "lessons learned" are done at project milestones or anytime you want a more comprehensive look at how the team has been performing. Unlike the usual end-of-project lessons learned, a retrospective is done with the intention of changing the project underway. For more on this see the LPS website.

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Last Planner® System
Quick Team Assessment

Use this assessment with your team, your customer, and your project sponsor or other interested parties. The ten characteristics are those of high performing project teams. Answering that you strongly agree to just two or three of these characteristics is often a feat. Don't be discouraged by the results. Remember to use this for the basis of action planning and on-going performance improvement.

Project: _____ **Date:**_____
Reviewers: _____

	Assessing Project Performance	
1	The look-ahead plan and weekly work plan are updated and agreed to every week.	⊖
2	We start and end each planning session with a *plus-delta* review.	⊖
3	WWP tasks are proposed by the *last planner* and negotiated with the project manager or other responsible party.	⊖
4	Project performance (*PPC* & *Pareto data*) is prominently displayed in the project work-setting.	⊖
5	*Pareto data* is used to improve project performance.	⊖
6	This project is on an improving path.	⊖
7	Only tasks in a *made-ready* condition go on the WWP.	⊖
8	New project team members get support using the LPS.	⊖
9	Our motto is, *"Reliable everyday."*	⊖
10	We are steering this project rather than just responding to each day's urgencies.	⊖

==Have each person do the assessment. Then discuss the results as a group. Fill the circle to the right of the question if you strongly agree with the statement. Fill the upper half of the circle if you somewhat agree with the statement. Leave the circle empty if you disagree with the statement.==

What action will you take as the result of today's assessment?

How will you know that action will produce the desired effect?

When will you perform the next assessment?