The Last Planner System™

The Last Planner System™ (LPS) is a lean production–based project planning and management system. Application of the LPS to projects has shown that simultaneous improvement in all four dimensions—cost, schedule, quality, and safety—is possible:

- Reduced project cost—workers spend less time waiting for work or working around problems;
- Reduced project duration—available work does not sit idle waiting for workers;
- Improved quality—work is done in its natural sequence and is released from one participant to the next only when it meets established criteria; and
- Improved safety—the work environment is more stable so fewer ad-hoc efforts are required.

With LPS, all parties benefit from improved project performance.

The Last Planner System™, the new "operating system" for project management, maximizes value and minimizes waste. Planning takes place in a series of conversations. Each conversation confirms and expands project value - that which helps the clients achieve their purposes. Value flows to the client because the planning system links milestones to crew level assignments. Making workflow predictable reduces waste. Current project management practice lacks a mechanism to manage workflow; it cannot reduce the combined effects of dependence and uncertainty. As a result, each craft tries to optimize its own productivity and speed with little concern for predictable release to the next activity. "Partnering" and "Design/Build" try to solve the problem by applying organizational or contractual fixes, but these have limited impact because they rest on incomplete models of work and the way they are managed.

There are two kinds of work in projects: the physical work of putting materials in place, and the organizational work of making and keeping commitments at every level. The LPS is a distributed planning system that manages work by progressively reducing uncertainty and making work ready. Responsible Individuals (RIs) prepare phase Pull Schedules. Working backward from project milestones, RIs establish the best sequence of activities and their durations, and allocate float to maximize plan stability. Six weeks before action, activities drop from the Phase Schedule to the Lookahead Plan and are made ready. Activities do not advance from week to week on the Lookahead Plan if the RI loses confidence that the work will be ready when required. This gives the team and management the maximum time to remove the constraint. Assignments are prepared by the Last Planners (foremen, lead hands, design squad leaders, etc.) and must meet criteria or be rejected. Planning system performance itself is measured and improved by identifying and acting on reasons for incompletions. Typical actions include redesign of the planning and logistics systems or training for Last Planners and their supervisors.

Preparation of assignments links work to client value through milestones, and coordinates action to deliver it. The team prepares to be in action together as work advances through the system. Assignments are promises to one another and to those downstream. When planning system and the people who work within it create reliable workflow, the result is simultaneous improvement in all key criteria—time, cost, quality, and safety.

Contact: Gregory Howell, P.E. • Lean Construction Institute • P.O. Box 1003 • Ketchum, ID 83340
208-726-9989 • Fax 707-248-1369 • ghowell@leanconstruction.org • www. leanconstruction.org

The Last Planner System™

Elevating Project Performance

The time/cost/quality tradeoff is the consequence of a basic law of production physics. This rule relates productivity and duration. As a system with two components approaches full productivity (utilization) of one, the delivery time of the other increases. This may seem counterintuitive at first, but think of rush hour. It takes longer to get home as the utilization of the highways' capacity increases.

Consider the time/cost tradeoff on a project at Point "A" in Figure 1. Keeping the crews well separated will increase productivity but lengthen the project. Conversely, crowding the project will shorten the duration but reduce productivity. And variation in flow does matter—just one erratic driver can bring the highway system to a standstill, causing that cascade of brake lights.

In fact, the shape of the curve is determined by the amount of variation in the system. In Figure 2, the lower line is the result of more predictable workflow. Delays on that curve still mount as productivity increases, but at higher levels of productivity. The gains in performance from reduced variation can be invested in improved productivity (1), or reduced duration (2), or both (3). Quality improves as well because work is completed to hand-off criteria rather than to earn progress, and fewer accidents occur in the more stable environment.

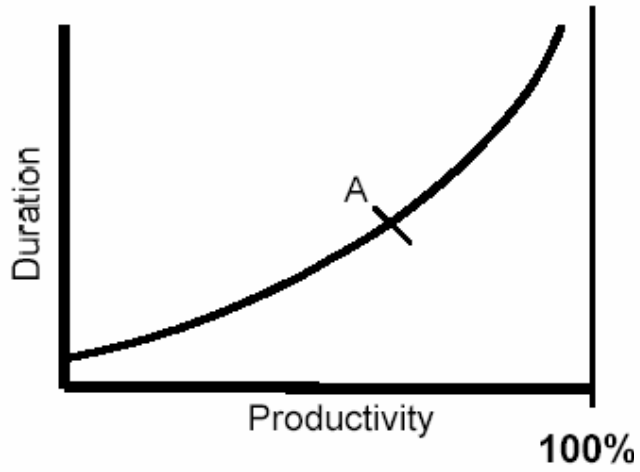

Figure 1

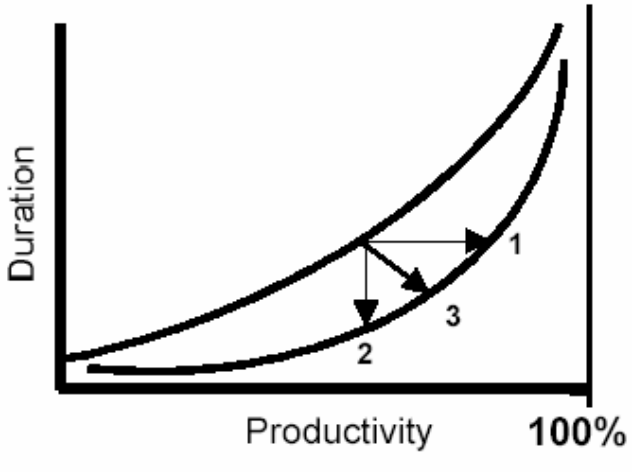

Figure 2