# LCI Lean Project Delivery Glossary

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| A3 | A one-page report prepared on a single 11 x 17 sheet of paper that adheres to the discipline of PDCA thinking as applied to collaborative problem solving, strategy development or reporting. The A3 includes the background, problem statement, analysis, proposed actions, and the expected results. |
| 5S | A disciplined approach to maintaining order in the workplace, using visual controls, to eliminate waste. The 5S words are Sort, Set in Order, Shine/Sweep, Standardize and Self-Discipline/Sustain. |
| 5 Why Analysis | The problem solving technique used to dig for the root cause of a condition by asking *why* successively (at least five times) whenever a problem exists in order to get beyond the apparent symptoms. As each answer to the why question is documented, an additional inquiry is made concerning that response. |
| Activity | An identifiable chunk of work with recognized prerequisite requirements to begin and a recognized state of completion – or conditions of satisfaction. Another way to look at an activity – establish the hand-offs for each chunk of work thus defining the activity. (see also "task") |
| Actual Cost | The sum of the total Cost of the Work actually incurred by Architect and CM/GC in connection with the performance of all Phases of the Project, plus CM/GC's Fee. (IFOA -Integrated Form of Agreement Definition) |
| Allowable Cost | The absolute maximum Project Cost, based on the Project Business Case as outlined in Exhibit 2, which will be the subject of the Validation Study. (IFOA – Integrated Form of Agreement Definition) |
| Assignment | A request or offer that has resulted in a Reliable Promise and is ready to be placed on the Weekly Work Plan for performance. An assignment must meet the characteristics for a Quality Assignment prior to inclusion on the WWP. |
| Buffer | As a verb: "to isolate one activity from the next." A mechanism for deadening the force of reality unfolding in a manner that is contrary to what was anticipated in the plan. For example, a capacity buffer is created by committing to complete less work than what would be achieved according to the planned capacity of the resource. If production falls behind schedule, there is capacity available for catching up. (Lean production/construction generally prefers capacity buffers to inventory buffers.) |
| BIM | The process of generating and managing building data during the life cycle of a building. BIM uses three-dimensional (3D), real-time, dynamic building modeling software. BIM includes building geometry, spatial relationships, geographic information, and quantities and properties of building components. BIM can include four-dimensional (4D) simulations to see how part or all of the facility is intended to be built and 5D capability for model-based estimating**.** BIM provides the platform for simultaneous conversations related to the design of the |

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| | "product" and its delivery process. |
| Capacity | The amount of work that can be produced by an individual specialist or work group in a given period of time. |
| Commitment Based Planning | A planning system that is based on making and securing reliable promises in a team setting. |
| Conditions of Satisfaction | An explicit description by a Customer of all the actual requirements that must be satisfied by the Performer in order for the Customer to feel that he or she received exactly what was wanted. |
| Constraint | An item or requirement that will prevent an activity from starting, advancing or completing as planned. Something that stands in the way of a task being executable. It is not a preceding element of work already shown on the look-ahead plan, but something that is not shown such as a new client requirement, a contract that must be issued prior to work beginning, approval from an architect to change a design, etc. Constraints should be identified by the Screening Process.(see Screening) |
| Constraint Log | A list of Constraints with identification of an individual promising to resolve the item by an agreed date. Typically developed during a review of the Six Week Look-Ahead Plan when it is discovered that activities are not constraint free. |
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| Customer | The individual engaged in a conversation for action who will receive the results of performance either requested from, or offered by, the Performer. |
| Cycle Time | The time it takes a product or unit of work (e.g. a room, building, quadrant) to go from beginning to completion of a production process; i.e., the time it is work-in-process. |
| Defined Task | A Quality Task must be "Defined" -- it must have a beginning and end – it should be clear to all when it has been completed. |
| Dependence | Where two or more tasks are sufficiently related that one cannot be started (or finished) without a certain measure of progress or completion having been achieved by the other. Waiting on release of work. |
| Expected Cost | An expression of the team's best estimate at the conclusion of the Validation Phase of what current best practice would produce as a price for the facility reflected in the accompanying basis of design documents. Typically, the Expected Cost will also be supported by benchmarking or other market data to calibrate the Expected Cost in light of the market context. |
| First-run Study | Trial execution of a process in order to determine the best means, methods, sequencing, etc. to perform it. First-run studies are done at least a few weeks ahead of the scheduled execution of the process, while there is time to acquire different or additional prerequisites and resources. They may also be performed during design as a basis for evaluating options or designing the portion of the work. |
| Flow | Movement that is smooth and uninterrupted, as in the "flow of work from one crew to the next" or the flow of value at the Pull of the customer. |
| Five Big Ideas | A set of organizing concepts that support Lean Project Delivery. They |

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| | were developed to explain and organize the Sutter Health Lean Construction Initiative: Optimize the project not the piece, Collaborate, Really Collaborate (originally implied "specialty contractors involved at schematic design"), Projects as Networks of Commitment, Increase Relatedness, and Tightly Couple Action and Learning. |
| Gemba | The Japanese term for where value is added or where the work takes place. |
| Hand-off | The act of releasing an item or activity to the person or group performing the next step or operation on that item or activity. |
| Hand-off Criteria | The Conditions of Satisfaction discussed and explicitly agreed upon between the parties to a hand-off. |
| Integrated Project Delivery (IPD) | A delivery system that seeks to align interests, objectives and practices, by reconceiving the Organization, Operating System and Commercial Terms governing the project. The primary Team Members would include the Architect, key technical consultants as well as a general contractor and key specialty contractors. It creates an organization able to apply the principles and practices of the Lean Project Delivery System. |
| Just-in-Time | A system for producing or delivering the right amount of parts or product at the time it is needed for production. ("JIT") |
| Kaizen | The Japanese word for continuous improvement. Kaizen has come to mean the philosophy of continuous improvement. |
| Kanban | Japanese term meaning "a signboard." A communication tool used in JIT production systems. The signal tells workers to pull parts or refill material to a certain quantity used in production. |
| Last Planner® | The person or group that makes assignments to direct workers. Project Architect and 'discipline lead' are common names for last planners in design processes. 'Superintendent' or 'foremen' are common names for last planners in construction processes. |
| Last Planner System (LPS) | The collaborative, commitment-based planning system that integrates should-can-will-did planning (pull planning, make-ready look-ahead planning with constraint analysis, weekly work planning based upon reliable promises, and learning based upon analysis of PPC and Reasons for Variance. |
| Lean Project Delivery System | An organized implementation of Lean Principles and Tools combined to allow a team to operate in unison. |
| Load | The amount of output expected from a production unit or individual worker within a given time. |
| Look Ahead Planning | The portion of the Last Planner System that focuses on making work ready – assuring that work that should be done, can be done, by identifying and removing constraints in advance of need. |
| Look Ahead Plan | A short interval plan, based on the pull/phase plan, that identifies all the activities to be performed in the next 6 (or other) weeks. The 6W Look-ahead Schedule (LAS) is updated each week – always identifying new activities coming 6 weeks out so that the project management team can make appropriate arrangements to assure that the work will be ready to be performed in the week indicated. |

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| Look Ahead Window | The duration associated with Look Ahead Planning. Typically look-ahead windows extend from 3 to 12 weeks into the future. |
| Make Ready Process | To "make ready" is to take actions needed to remove constraints from assignments to ensure the work can be done as planned. |
| Master Schedule | A schedule that identifies major events or milestones in a project (start-up, turn-over to client, order long delivery components, mobilize in field, complete design, government reviews, etc.) and their timing. It is often the basis for contractual agreements between the owner and other team members. |
| Milestone | An item on the Master Schedule that defines the end or beginning of a phase or a contractually required event. |
| Muda | Japanese word for "Non-value-added" or Ohno's 7 Wastes. |
| Mura | Japanese word for "Unevenness" – fluctuation in demand that causes the workflow to be uneven. |
| Muri | Japanese word for "Overburdening" – excessive demand on a system that causes the system to produce beyond its reasonable capacity. Pushing a machine or person beyond natural limits. Overburdening people results in safety and quality problems. Overburdening equipment causes breakdowns and defects. |
| Network of Commitments | The web of promises necessary to deliver any project. The role of management is to articulate and activate the unique network of commitments required to deliver each project. |
| PDCA | Stands for Plan – Do – Check - Act. The cycle introduced by Walter A. Shewhart and popularized by Dr. W. E. Deming as a method of continuous improvement. |
| Phase | A period of the project where a specific group of activities is scheduled to be accomplished such as building design, completion of foundations, erection of exterior walls, building dry-in, etc. A phase can be either a time period or a group of activities leading to the accomplishment of a defined goal/milestone |
| Phase Plan or Pull Plan | A plan for executing a specific phase of a project using a pull technique to determine hand-offs. It is prepared by the team actually responsible for doing the work through conversation. Work is planned at the "request" of a downstream "customer". |
| Performer | The individual engaged in a conversation for action who agrees to undertake performance either requested from or offered to a Customer. |
| Plan Reliability | The extent to which a plan is an accurate forecast of future events, measured by Percent Plan Complete (PPC). |
| Planning | The act of conversation that leads to well-coordinated action. |
| Plus/Delta Review | A continuous improvement discussion preformed at the end of a meeting, project or event used to evaluate the session or activity. Two questions are asked and discussed. Plus: What produced value during the session? Delta: What could we change to improve the process or outcome? |
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| Poke yoke | A Japanese term for mistake-proofing method or device developed by Shigeo Shingo that is used to prevent an error or defect from happening |

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| | or being passed on to the next operation. |
| PPC (Plan Percent Complete) | A basic measure of how well the planning system is working – calculated as the "number of assignments completed on the day stated" divided by the "total number of assignments made for the week". It measures the percentage of assignments that are 100% complete as planned. |
| Prerequisite work | Work that must be performed by others in order for you to perform your work. |
| Process mapping | A flowchart identifying all the activities, operations, steps and work times for a process. |
| Promise | The action taken by "Performer" to commit to a "Customer" to take some action to produce a mutually understood result ("Conditions of Satisfaction") by a definite time in the future. (See Reliable Promise, below). |
| "Pull" | A method of advancing work when the next in line customer is ready to use it. A "Request" from the customer signals that the work is needed and is "pulled" from the performer. Pull releases work when the system is ready to use it. |
| "Push" | "Push" - an "Order" from a central authority based on a schedule; advancing work based on central schedule. Releasing materials, information, or directives possibly according to a plan but irrespective of whether or not the downstream process is ready to process them. |
| Quality | Conformance to a Customer's valid and agreed upon Conditions of Satisfaction. |
| Quality assignment | Assignment that meets quality criteria for release to the customer process. The quality criteria are: (1) definition, (2) soundness, (3) sequence, (4) size, and (5) learning. |
| Reason for Variance | Factors that prevented an assignment from being completed as promised, used by the team to promote learning concerning the failure of the planning system to produce predictable workflow. By assigning a category of variance to each uncompleted task, a team is able to identify those areas of recurring failure that require additional reflection and analysis. |
| Request | The action taken by a Customer" to ask a "Performer" to take some action to produce a mutually understood result ("Conditions of Satisfaction") by a definite time in the future. |
| Reliable Promise | A promise made by a performer only after self-assuring that the promisor (1) is competent or has access to the competence (both skill and wherewithal), (2) has estimated the amount of time the task will take, (3) has blocked all time needed to perform, (4) is freely committing and is not privately doubting ability to achieve the outcome, and (5) is prepared to accept any upset that may result from failure to deliver as promised. |
| Root Cause Analysis | A systematic method of analyzing possible causes to determine the root cause of a problem. See also 5 Why Analysis. |
| Sequenced | A "sequenced" assignment should release work to another Performer and in no case should it hinder another assignment or cause other crews to do additional work. Quality criterion for selecting assignments among those |

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| | that are sound in priority order and in constructability order. |
| Screening | Determining the status of tasks in the look-ahead window relative to their constraints, and choosing to advance or retard tasks based on their constraint status and the probability of removing constraints. |
| Shielding | Preventing the release work to production units because it does not meet quality criteria; the work is not a quality assignment. It is akin to "stopping the assembly line," rather than advancing a defective product. The purpose of shielding is to reduce uncertainty and variation, thereby providing production units with greater opportunity to be reliable. |
| Should-Can-Will-Did | To be effective, production management systems must tell us what we *should* do and what we *can* do, so that we can decide what we *will* do, then compare with what we *did* to improve our planning. |
| Sized | Quality criterion for assignments whereby the amount of work included in an assignment is made to match the capacity of the production unit that will do the work. The Performer should have a very reasonable expectation that the assignment can be completed by the number of people available to do the job. |
| Sound | Quality criterion for assignments that tests whether or not assignments have had all constraints removed. The Performer of an assignment should know that the materials, tools, staff and information to complete an assignment are available before accepting it. |
| Target Cost | The cost goal established by the delivery team as the "target" for its design and delivery efforts. The Target Cost should be set at less than best-in-class past performance. The goal is to create a sense of necessity to drive innovation and waste reduction into the design and construction process. |
| Target Value Design | A disciplined management practice to be used throughout project to assure that the facility meets the operational needs and values of the users, is delivered within the allowable budget, and promotes innovation throughout the process to increase value and eliminate waste. |
| Task | An identifiable chunk of work. |
| Throughput | The output rate of a production process. |
| Under-loading | Making assignments to a production unit, or a resource within a production unit, that absorbs less than 100% of its capacity. Under-loading is necessary to accommodate variation in processing time or production rate, in order to assure plan reliability. Under-loading is also done to release time for workers to take part in training or learning, conducting first-run studies, implementing process improvements, or for equipment to be maintained. |
| Utilization | The percentage of a resource's capacity that is used in actual production. |
| Value | What the Customer wants from the process. |
| Value Stream | Includes all the processes and activities used to design, produce and deliver the product or service to the Customer. |
| Value Stream Mapping | A diagram of every step involved in the material and information flows needed to bring a product from request to delivery. |
| Variance | When an assignment is not completed as stated, it is considered a |

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| | variance from the weekly work plan. |
| Visual Management | Placing tools, parts, production activities, plans, schedules, measures and performance indicators in plain view, This assures that the status of the system can be understood at a glance by everyone involved and actions taken locally in support of system objectives. |
| Waste | The opposite of value. There are seven basic types of waste including: defects, waiting, transportation of goods, motion, inventory, overproduction, and unnecessary process steps. |
| Weekly Work Plan | The commitment-level ("will") planning step of LPS identifying the promised task completions agreed upon by the Performers. The WWP is used to determine the success of the planning effort and to determine what factors limit performance. It is a more detailed level than the Look-ahead and is the basis of measuring PPC (Percent Plan Complete). |
| Weekly Work Planning | The process by which the Last Planner establishes the plan for the coming period. |
| Work flow | The movement of information and materials through networks of interdependent specialists. |
| Work Structuring | Designing the production system to determine who does what, when, where and how, usually by breaking work into pieces, where pieces will likely be different from one production unit to the next. The purpose of work structuring is to promote flow and optimize system throughput by focusing on handoffs and opportunities for moving smaller batches of work though the production system. |
| Workable Backlog | An activity or assignment that is ready to be performed, but is not assigned to be performed during the active week in the WWP. If the team agrees that performance of this activity will not hinder other work then it can be placed on the list of Workable Backlog as part of the WWP. Completion or non-completion of these activities are not recorded or counted in calculation of PPC. |
| Work In Process | The inventory between the start and end points of a production process. |