LCI Mid-Atlantic Core Group
Intro to Lean

John Bennett       Rebecca Bettler       Kevin Labrecque       Tom Reed
Agenda

• Introductions
• Why Lean?
• Lean Principles
• Lean Project Culture
• Lean Tools
  – Last Planner® System
  – Target Value Design
  – 5S
• Integrated Project Delivery
• Industry Applications
• Wrap-up
• Next Topics
• Plus/Delta
For construction, owner wants...

- Predictable cost and confident ability to affect cost: make value decisions on the spot
- Predictable delivery time
- High compliance to program, quality & life cycle cost
- Fair cost for delivered product
- Safe environment before and after construction
- No fighting, finger pointing, claims, delays
- Flexibility to change as needs change
- Stable, predictable, reliable long-term partnerships
Why Lean?

- **Predictability:** Low confidence on FINAL cost/scope and schedule with traditional design-bid-build
- **Cost/Risk Assessment:** Inadequate visibility on true risks, associated costs and mitigation options by owner
- **Inefficiencies:**
  - Construction labor efficiency down over last 50 years, while all other industries almost doubled (e.g. typical tool time 52%)
  - Misaligned contracts with individual goals (silo mentality instead of team approach)
  - 50% cost non-value added to customer (i.e. waste)
Why Lean?

- **Healthcare costs** continue to rise as reimbursement rates continue to go down.
- **Aligns** each team member’s goal to common, project goals “Conditions of Satisfaction”
- **More profitable** for every team member.
- **More satisfying** for every team member!
What is Lean?
What is Lean?

A Brief Lean History

• Henry Ford
• Toyota - Taiichi Ohno & Shigeo Shingo
• Kaizen - Masaaki Imai
• Lean Thinking - James Womack & Daniel Jones
• Lean Construction Institute – founded in 1997
Lean in Manufacturing

- Focus on *throughput*, not point velocity
- Controlling processes
- Driving out variation
- Address the bottlenecks
- Reduce inventory
- Reduce batch sizes, shoot for single piece flow
- Quality control, prevent mistakes, stop the line when they occur
- Minimize handling, travel time
- Visual process management
- Decentralizing decisions
- Rapid learning by everyone at every level every day
What is Lean?

The Toyota Way

Continuous Improvement

Respect for People

Challenge  Kaizen  Genchi Genbutsu  Respect  Teamwork

http://www.toyota.eu/
Value Versus Waste

Essentially lean is a distinction between Value and Waste

**Value**
- What the customer is actually willing to PAY for (USEFULNESS/COST), includes Functions, Features, Time & Price
- Changes/transforms the product, service or information

**Waste**
- Anything that adds cost, time or effort without adding value in any work process
Three Tests for Value vs. Waste

**Transformation Test**
Does the action or event advance the transformation of initial information and materials into finished product?

**Value Test**
If you eliminated this element, would the customer pay the same price for your product?

**Customer Test**
If customers watched their product as it went through the process and had to pay cash at each step, would they pay for a particular action or element?
Two Categories of Waste

Type 1 – Not Value Added But Necessary – Support Activities

Creates no value but are *currently unavoidable* because of technology, customer, or regulatory issues

– e.g., OSHA, ISO, Internal Standards of Control, QA/QC

Type 2 – Not Value Added And Unnecessary – Waste

Create no value and are *immediately avoidable*
Mind the Gap!

Manufacturing
- Value Added: 26%
- Support Activity: 12%
- Waste: 62%

Construction
- Value Added: 57%
- Support Activity: 10%
- Waste: 33%

Source: CII Study
1. Overproduction – producing more than is required by the next downstream customer
2. Unnecessary motion – movement by worker that adds no value to the work
3. Inventory or Work in Progress – incomplete work which has to be stored and protected
4. Waiting – Workers waiting to perform value-added work
5. Transportation – movement of materials, equipment to and around the project
6. Extra processing – producing to finer tolerances, finishes, etc. that is not desired by the customer
7. Defects – results in rework
8. Underutilized people – not taking full advantage of their experience, knowledge and creativity
Waste at the Individual Level

CAD Hardware Upgrades

**Background**
- Issues of engineering productivity and cost analysis.
- Recent project analysis indicates a significant error in resource allocation.
- Increased pressure in planning.
- Company efforts to reduce waste have increased productivity.

**Current Condition**
- Each crash costs an individual per minute, estimated at approximately $80/day in lost productivity.
- Average of 4 crashes per day is contributing to productivity loss.

**Goal**
- Reduce the # of average crashes.
- Size planning machines as growth, 2-3 years out.
- Zero planning defects.

**Root Cause Analysis**

1. Overall size of BIM models have been increasing, this needs to be addressed.
2. Multi-tasking need to open several drawings & Navisworks to conduct collision detection and work on the model uses a significant amount of Random Access Memory (RAM).
3. Hardware/Software configuration:
   - AutoCAD 2010 – Autodesk support for AutoCAD 2008 will be coming to an end forcing the switch to AutoCAD 2010 or 2011, which uses more RAM.
   - RAM – as models become larger and software more sophisticated the need for more RAM is increasing, the recommended amount of RAM for CAD is a minimum of 8GB.
   - CPU – 32 bit systems maximum RAM capacity is 3.2GB, 64 bit systems can accommodate up to 16GB.
   - Video Card – recommend 512 MB on laptops and 1GB video cards for desktops.
4. Additional background process running – virus scanning software is typically set to run automatically at night or overnight for these machines connected to the network. Some ‘planner’ machines have been found to be running 24/7.

**Follow-up Actions**
1. Timing of hardware upgrades with database upgrades and TBS EST implementation, we will address in a staggered plan to implement upgrades.
2. Monthly review of individual planner system crash statistics to understand trends.
3. Continued system maintenance best practice sharing in bi-weekly BIM Forum calls.

**LIMBACH**

- The number of crashes is affecting the overall productivity.
- In how to keep drawing files in a single file.
- Make sure you are up-to-date with planning.
- This is the end of this report.

**Revision and Who Made**

**Review and Notify the**

**Project**

**Who**

**When**

- ID: 5/17/10
- July 24th Planning Mtg.: By 5/17/10

**Follow-up Actions**

- Review and notify the planner of planner machine issues.
- Note: Indicator of performance will be the planner's system crash experience through the next transition.

**AS Team Sponsor: Charlie Bacon**

- Updated: May 20, 2010
Waste at the Individual Level
Waste in Project Processes

Waste of waiting on information, 50%
Late/Not Returned RFI’s
*or even worse an RFI returned w/out a resolution that gets sent back through the process, waste of unnecessary processing
Waste in Coordination
Waste in Coordination
Waste in Coordination

Actual Beam Location (note shaded concrete around beam is where hole was filled around embed plate)
Waste at the Jobsite
Waste at the Jobsite
It is often at the intersection of trades/tasks that leaks occur.
It’s Everywhere, GO & SEE

Muda (Waste) Chalk
What does a Lean Experience Look Like? The Scientific Method
What does a Lean Experience Look Like? The Workflow Loop

1. **Request**
   - "Will You?"

2. **Commit**
   - "I Promise I WILL"

3. **Declare Complete**
   - "I'm Done"

4. **Declare Satisfaction**
   - "Thank you"

**Conditions of Satisfaction & Completion Date**

**CUSTOMER**

**PRoVIDER**

- Inquiry
- Negotiation
- Signed
- Accepted
- PO Submitted
- Clarification & Negotiation
- Preparation
- Assurance
- Performance
Elements of a Reliable Promise

- Are conditions of satisfaction clear to both parties?
- Am I competent to perform this, or do I have access to this competence and wherewithal?
- Have I estimated the amount of effort and time required to deliver this promise?
- Do I have the capacity (resources) available and allocated for this effort?
- Am I NOT having a private conversation with myself hoping someone else breaks their promise so I won’t have to really keep mine?
- Will I be responsible and clean up any mess caused if I fail to deliver my promise?
Collaborative Communication: Lean Construction
Collaborative Communication: Integrated Project Delivery
Lean Tools

• Last Planner System

• Target Value Design

• Others
Historical Background (1)

- Historical focus on productivity improvement
- Spot improvements produced little or no improvement on project as a whole
- Problem defined as “foreman planning”
- Question arose – How do they plan now?
Research question – What tasks will you complete by the end of next week?
Make a list.
Question at end of the next week – How many tasks did you actually complete?
What is your guess?
Creating and maintaining reliable workflow

**Should-Can-Will-Did Planning**

**Should**
- **Master Planning**
  - Milestones
  - Master Schedule
  - Establishes promise of project

**Can**
- **Pull Planning**
  - Phase Schedule
  - Collaboratively built plan
  - Focus on handoffs

**Will**
- **Make-Ready Planning**
  - Look-ahead Plan
  - Make work ready
    - Identify constraints
    - Commitments to remove constraints
    - Constraint Log
  - Weekly work plan
  - Reliable promising

**Did**
- **Weekly Work Planning**
  - Daily coordination
  - Percent Plan Complete (PPC)
  - Rapid learning

**Learning**
Last Planner® – Predictable workflow & rapid learning

- Master Schedule
- Pull Planning
- Lookahead Plan & Constraint Analysis
- Percent Plan Complete
- Weekly Work Planning

© 2011 Lean Construction Institute
Weekly Planning and Execution Cycle

Plan
- Make-Ready Planning
- Weekly Work Planning

Check
- Daily Check-in Coordination
- Daily Production

Adjust
- Learning from plan failures

Do

©2012 Lean Project Consulting, Inc.
Last Planner® System
Should-Can-Will-Did Planning

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Master Planning

• High level view of project with limited detail with three purposes:
  1. Confirms feasibility of project
  2. Highlights long-lead items
  3. Identifies phases
Last Planner® System
Should-Can-Will-Did Planning

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Pull Planning Process

- Includes all trades involved in the milestone
- Starts with the milestone completion and works backwards
- Shows only the tasks associated with that milestone
- Results in a phase plan
- Focuses on the handoffs
How we do it

**Task**
Number of work days to complete
What triggers my start of task

**example 1**
Place SOG
Zone A - Bldg G
1 day
Rebar inspection

**example 2**
Electrical Rough-in
Rooms 1101-1105
4 days
Plumbing rough-in complete
Install Rebar
5 days
Stone and Vapor Barrier

Inspect Rebar
1/2 day
Rebar installed
Embeds installed

Place SOG Zone A - Bldg G
1 day
Rebar inspection

Milestone Sept. 15
SOG Bldg G

beginning of phase

Install Embeds
2 days
Rebar in progress

add post-its to wall from right to left

day

end of phase
• Each company has their own color sticky note
• Plotter paper on wall for the teams plan
• End of milestone at the right
• Sticky notes for each task
• Milestone Definition on the wall
• Current drawings in the room
• Chart on wall for issues, concerns and constraints
• Sub foremen making the plan
Desired Outcome of Pull Planning

- Better understanding of project milestones
- Reduced uncertainty
- Activate the Network of Commitments
- Establish a coordinated Plan of Action
- Reduce variability and create reliable workflow
- Improve milestone delivery date
Identify and remove constraints

• Anything that will prevent a task from starting or finishing as scheduled except prerequisite (predecessor) work
Last Planner® System
Should-Can-Will-Did Planning

As Needed

Should

Master Planning
- Milestones
- Master Schedule
- Establishes promise of project

Pull Planning
- Phase Schedule
- Collaboratively built plan
- Focus on handoffs
- Look-ahead Plan

Make-Ready Planning
- Make work ready
  - Identify constraints
  - Commitments to remove constraints
  - Constraint Log

Weekly Work Planning
- Weekly work plan
- Reliable promising

Weekly

Can

Will

Daily

Did

Learning
- Daily coordination
- Percent Plan Complete (PPC)
- Rapid learning

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# Weekly Work Plan

## Commitment Description

- Safe - Defined - Sound - Proper Sequence - Right Size - Able to Learn

<table>
<thead>
<tr>
<th>Activity ID</th>
<th>Area</th>
<th>Level</th>
<th>Elev</th>
<th>Commitment Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Workable Backlog (what work can I do without affecting other trades if above plan breaks down?)</td>
</tr>
</tbody>
</table>
Definition of a task

• What will be done – install lights
• Where it will be done – Rooms 300-312
• When it will be done – Thursday and Friday
• Who will do it – Jack Foreman
• Tasks will complete by the end of the week
  – No phrases like “beginning”, “ongoing”, “continuing”, etc
Daily Stand-Up

- I got this done since our last stand-up
- I’ll get this done by the next
- Let’s replan where necessary
- How can we prevent this from happening again?
Percent Plan Complete (PPC)

- No partial – Either 100% or not

- PPC = \# of tasks completed as scheduled \# of tasks planned for completion
PPC Chart

PERCENT PLAN COMPLETE

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>Sample Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHASE</td>
<td>Sample Phase</td>
</tr>
<tr>
<td>PPC</td>
<td>61</td>
</tr>
</tbody>
</table>
Variances

- Keep track of plan variation by category
- Avoid blame, shift the focus to learning
- Assign individuals to follow up
Variance Chart
**Target Value Design**

- A management approach that drives design to deliver to defined customer values within project constraints.

Drive Value ↑ YET Drive Cost ↓
Target Value Design

- Target costs with continuous estimating creates the circumstances for innovation and cost savings
- TVD speeds design while reducing rework in design and in the field
- When coupled with BIM, TVD dramatically reduces RFI’s and change orders
Target Value Design

- Design to a detailed estimate
- Design for constructability
- Decide before you design
- Carry solution sets into future
- Work in pairs or larger groups
Engage Deeply with the Client to Establish the Target Value

• How will the project generate true customer value?
• How will the project enhance the owner’s ability to achieve more of the organization’s goal?
• What must be “true” when the project is done?
Some of the Other Tools that Support the Behavior

- **5S** – sort, straighten, shine, standardize, sustain
- Improvement programs for everyone
- Prefab
- 5 Why Root Cause Analysis

- Kanban
- BIM
- A3 reports
- Choosing by Advantages
- Multi-party contracts
What is Lean?
A frame of Mind/An operating system

• Provide customer value

• Eliminate Waste

• Continuous Improvement
What is Integrated Project Delivery?
It’s about Relationships/Delivery Method

- Mutual respect and trust
- Mutual benefit and reward
- Collaborative innovation and decision making
- Early involvement of key participants
- Early goal definition
- Intensified planning
- Open communication
- Appropriate technology
- Organization and leadership
What is an IFOA?
Commercial terms

- Relational contract
- Based on relationships
- Open book cost sharing
- Multi-party agreement- eliminate silos
- Shared risk/reward
- Consensus decision making
- Equal partners
- Aligned project goals
What is Lean Construction?

• Integrate Project Delivery and Lean Construction are new delivery methodologies that incorporate the Lean operating system of tools with the relationship founded on trust and assembled under an IFOA.

• It is not absolutely necessary that all 3 concepts are present but it is clearly the most beneficial to all parties when they are.
UHS - IPD Experience

- 50 Projects IPD-ish
  - $1MM to $150MM
- 18 Completed
  - Results: Outstanding
- 17 Under Construction
  - Watching efficiencies improve daily
- 15 in Design Phase
  - Phenomenal collaboration, learning, BIM, results
- 28 Full Consensus Doc 300 IFOA
Program Success

- Predict
- Intent
- Perfect
- Integrity
- Plan
- Capability
- Produce
- Results
• Form a team from the onset that includes design and build subject matter experts.
• Define Conditions of Satisfaction for all parties
• Define tolerable investment threshold
• Design to a detailed budget informed by trade partners and designers together (Target Value Design)
Always develop plan with Conditions of Satisfaction and Target Value Design affecting all decisions

Don’t design alone
  – Multi discipline, one BIM model, real time file share
  – Designers and constructors in “Big Room”

Consider all impacts
  – Interdisciplinary, shared needs
  – Identify risks and mitigation
  – Total life cycle cost
• Team grows through joint selection interviews
• Develop plans through multi-disciplinary work clusters
• Continuous real time budgeting and value decision making
• Set based design to afford multiple options for value and financial management
• Drive construction efficiencies via incremental improvements
• Eliminate non-value added activities
Continuous improvement through thorough communication and regular reflection

- Plus/delta
- Retrospectives
- Collaborate, really collaborate
“Big Room”

Rules of Engagement

• This is a safe zone – encourage everyone to speak their mind without concern for criticism
• No stripes - everyone has an equal voice; leave egos at the door
• Speak up – everyone engage and share ideas; everyone’s opinion is important
• Listen to others – focus on what they have to say and their point of view
• No side bar conversations – only have one meeting at a time
• Turn cell phones off – eliminate disruptions in general
• No multi-tasking – stay focused on the meeting
• Stay on time – includes start, end, breaks
• Encourage participation – everything written is regarded as legible and spelled correctly
**Goal:** “highest confidence for total construction cost at lowest development cost”

**Intent:** Flexible outline, not rigid process

- **Concept**
- **Validation Study**
- **Detailed Design**
- **Build**
- **Move in**
- **Operations & Maintenance**

**Gate #1**
Validation
1%-2% $$$

**Gate #2**
Detailed Design
6%-10% $$$

**Gate #3**
Construction
100% $$$
“THE Deal”

Profit Pool

4 “Buckets” of $$$

Initial Business Plan, Project Cost Est. (PCE)

Current Working Estimate

Project Target Cost Estimate (PTCE)

“Burn-Rate” Validation/Design Budget

Project Timeline

Kick-off (today)  Permit Drwg  Completion

Costs (Direct Indirect O/H)

Risk Mitigation

Profit

Not-at-risk

Enhanced Profit 150% max

Project Cost $$$
The 5S’s

A method of creating a clean and orderly workspace that exposes waste and makes abnormalities immediately visible.
# The 5S's

<table>
<thead>
<tr>
<th>ARE</th>
<th>ARE NOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Part of Lean Thinking - Value vs. Waste</td>
<td>• Mandatory</td>
</tr>
<tr>
<td>• Simple and Practical</td>
<td>• A Spectator Sport</td>
</tr>
<tr>
<td>• Reduce Treasure Hunts</td>
<td>• Carrot or stick</td>
</tr>
<tr>
<td>• Investment (with a payback)</td>
<td>• One time &quot;thing&quot;</td>
</tr>
<tr>
<td>• A good fit with Craft</td>
<td>• Free - takes effort</td>
</tr>
<tr>
<td>• To help Flow the work</td>
<td>• Limited to Craft</td>
</tr>
<tr>
<td></td>
<td>• Just about being neat &amp; clean</td>
</tr>
</tbody>
</table>

From Dennis Sowards – Lean Works in Construction presentation to Limbach
Some Opportunities to Sort
Some Opportunities to Sort

From Dennis Sowards – Lean Works in Construction presentation to Limbach
Some Opportunities to Sort

From Dennis Sowards – Lean Works in Construction presentation to Limbach
Some Opportunities to Sort
Simplifying

Create and identify a place for everything based on how often we use it

From Dennis Sowards – Lean Works in Construction presentation to Limbach
Examples of Simplification

From Dennis Sowards – Lean Works in Construction presentation to Limbach
Examples of Simplification
Examples of Simplification
Carts for Sorting & Moving Materials with Little Effort
Creative Solutions
Standardize Equipment
Examples of Simplification

From Dennis Sowards – Lean Works in Construction presentation to Limbach
Examples of Simplification

From Dennis Sowards – Lean Works in Construction presentation to Limbach
Simplification in the Office

from www.gambapantarei.com
Opportunities Offsite
Before & After Examples

Garage 5
Years ago

From Dennis Sowards – Lean Works in Construction presentation to Limbach
Before & After Examples

Garage 6 months after starting 5S’s

From Dennis Sowards – Lean Works in Construction presentation to Limbach
Before & After Examples

Garage Now

From Dennis Sowards – Lean Works in Construction presentation to Limbach
Before & After Examples
Before & After Examples

1. Workers place Kanban (Re-order) cards in bin when supplies reach specified level
2. Superintendent calls in materials to shop
3. Trailer parked in designated spot at end of work day (empty station)
4. Trailer replenished
5. Trailer moved to designated “Replenished” station for next morning
Industry Applications
Universal Health Services, Inc

- Founded 1979 by current Chairmen, Allan Miller

- One of the largest hospital management companies in the U.S.

  - 231 acute & behavioral facilities
  - $7.5 billion net revenue (2011)
  - Listed on NYSE
  - Fortune 500 Company
Geographic Diversity
UHS Operates Facilities in 38 States, DC, Puerto Rico

Hospitals
- 196 behavioral health hospitals
- 26 acute care hospitals
- 9 outpatient facilities & surgical hospitals

Design & Construction
- $600MM annual construction
- Staff of 12
UHS’ Lean Journey
Manatee Memorial Hospital   2007

- $17MM over budget
- 1 year delayed
UHS’ Lean Journey
Texoma Medical Center  2007-2009
A3 thinking, collaboration, real team work, reliable promises, open communication, waste ID
Daily huddles, dabbled in pull planning, advanced retrospective, kaizen, critical thinking...
Texoma Medical Center

**Conditions of Satisfaction**

- Reduce cost by $4 million – overall goal is $94 million
- Deliver project in 17 months – November 2009
- No punch list
- No injuries
- No rfi’s
- No change orders
- No rework

**Conditions of Satisfaction**

- Final construction cost was $97.9 million
  - $1.7 million in savings pool
  - $7 million in value adds
- Project delivered first week in December despite 87 rain days
- No punch list at owner turn over
- Only 4 minor recordable injuries
- 190 rfi’s
  - 40 related to early steel package
  - Many were confirming
- $1.4 million in change orders
  - $1.1 million was owner driven
- Rework greatly minimized through collaborative efforts
Springwoods Behavioral Health, Fayetteville, AK 2008

- 80 beds/58,000 s.f.
- $213/s.f. construction cost
- $279/s.f. all-in-cost ($249/s.f. in KY)
- $205k per bed ($231k in KY)
Cumberland Hall
Hopkinsville, KY  2011

- 100 beds/68,000 s.f.
- $184/s.f. construction cost
- $250/sf all-in-cost
- $171k per bed
- $184/s.f.
- $171k per bed
- 30% less cost
Project Team’s Monthly Report

[Image: DASHBOARD: JANUARY 17, 2012]
Temecula Valley Hospital, CA 2013

- 40% below market cost
- 30% operational cost improvement
- 200%+ increase in labor productivity
- 7 IFOA partners
- Rapid improvement
- Exceptional team work
- Lots of FUN
The Journey Continues

- All projects $5MM + Integrated Form of Agreement (IFOM)
- UHS Lean Project Delivery Guide-late 2011
- Partnership Charter
The Journey Continues

- Training Curriculum
- Regionalized trade partner teams
- Benchmarking to set price target
- High Expectations!
Why Lean/IPD?...total team effort!

- Fundamental shift in Owner mentality
  - Constructor adds value when solicited
  - More early planning shifts cost but drives benefits and lowers delivered cost
- Delivery model focusing on 3 primary philosophies:
  - Drive Customer Value
  - Eliminate Waste
  - Continuous improvement
Challenges

• Change management – off the beaten path!
• Low-bid mindset among some owner-side stakeholders as best-value
• Lack of experienced Lean/IPD teams
• New roles/responsibilities for team members
• Really understanding “THE Deal”
What Has Enabled H & M to Adopt Lean Construction and Last Planner® System?
Who is Henkels & McCoy?

- Specialty contractor headquartered in Blue Bell, PA
- Nationwide footprint with offices in 80 cities
- One of the largest privately held utility contracting firms
- Rank #1 among mid-Atlantic specialty contractors
- Consistently in top tier nationally on Engineering News-Record’s rankings
Enablers for Lean Construction at H & M

• Two Executive Steering Committees overseeing the Management Systems direction
  – Safety
  – Operational Excellence
  – The Op Ex committee supports prioritization across five Management Systems

• Company uses A3 Thinking / PDCA
  – Exec Leadership maintains Strategic Plans in A3s
  – Improvement Teams develop Problem-Solving A3s
Giving Special Attention to the Last Planner® System

• Current State
  – Just wrapped up deploying Last Planner on target projects
  – Now integrating widely with standard leader guides

• Target by end of 2013
  – Reach and involve every Line of Business Director across the nation
Giving Special Attention to the Last Planner® System

• Not that Complicated
  – Measurable impact to the company thus far has been “testimonial”
  – Deployment is tailoring to dynamics of people on each project
  – Starting with the PM and CM and extending further
Lean Construction
What is Lean?

• The behavior that enables our pursuit of building perfection

[Diagram with circles labeled Plan, Do, Check, Act, and an upward arrow labeled Higher Quality]
North Atlanta High School
Lean Construction Delivery

Boot Camp

Constraint Log

Pull Planning

Weekly Work Plan
Prefabrication

- Electrical Underground Prior to Precast Placement
- Determined early on through Pull Planning and Schedule Development
Digital Plan Room
Mobile Kiosk Digital Plans
Mobile Slates
Things We’re Seeing

- Up to 33% earlier completion
- 60%-80% fewer safety incidents
- Most RFI’s identified and resolved prior to work being started
- Far more satisfied team members
- Far more satisfied clients
Reaching a New Frontier: Leadership, Planning and Management

**Lean Thought**

- **Leadership** facilitates collaborative direction
- **Planning** is collaborative, project-based and seeks to integrate efforts to eliminate negative iterations. It learns as project evolves
- **Management** develops a “network of commitments” to implement the plan, evolves intelligence, measures are integrated and proactive

**Traditional Thought**

- **Leadership** dictates direction
- **Planning** is partitioned by trades and disciplines and is linear. It is predictive and generally fixed, setting parameters for management
- **Management** controls are inflexible, autocratic – processes are fixed and measures are isolated and generally historical
We are what we repeatedly do. Excellence, then, is not an act, but a habit.

- Aristotle
Pulling from the Community

What topics would you like to learn more about at future LCI Mid-Atlantic Community of Practice meetings?
Plus/Delta.....Do More/Do Better

• Plus: “What added value by being in this meeting?” (DO MORE....)

• Delta: “What could we change so that you would receive more value next time?” (DO BETTER....)