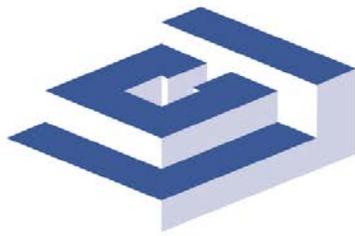




Lean Construction Institute
Transforming the Built Environment

**Lean Construction Institute (LCI)
2017 Annual Report**



Summary

Throughout 2017, LCI worked to increase industry awareness around Lean design and construction processes and tools by offering new sessions at the record-breaking 2017 LCI Congress, rolling out empirical research results with a significant correlation between Lean projects and improved project outcomes to most LCI Communities of Practice (CoPs), and added two new team members to the LCI staff.

Denise Erminger took on the newly created role of LCI's Manager, Communities of Practice Relations and began developing and implementing new guidelines for forming and running CoPs as well as creating a cross-functional event planning workflow to show the many steps involved and to provide clarity around who is responsible for those tasks from both the CoP and LCI national.

Kristin Hill also joined the LCI team in 2017 as Director, Education Programs, working to further standardize LCI education resources, expand and manage the Improved Instructors program and create high-quality education materials for Lean Construction that are in high demand across the industry.

LCI's vision to transform the built environment through Lean implementation remained the same since 2016 as we continuously work toward our goal to increase stakeholder satisfaction and project delivery value. Objectives and strategies supporting the LCI vision and goals are mapped out on the [Journey to Transform document](#) and elaborated upon below.

LCI's Journey to Transform in 2017

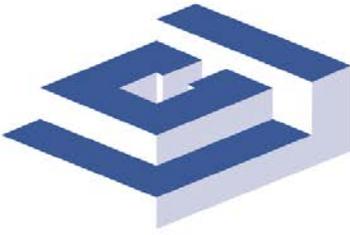
DEMAND - Create demand for Lean

Create a collegial owner group

In LCI's Journey to Transform, creating a demand for Lean is a top priority, and LCI believes owners are the key drivers in elevating the demand for Lean and collaborative approaches in the design and construction industry. Owners can mandate use of Lean and Integrated Project Delivery (IPD) by project teams; therefore, owner engagement is crucial to industry-wide adoption.

The Owner Committee was formed in 2017 with four board-level owners currently implementing Lean and provides owners with opportunities to share best practices and find a common voice demanding improved performance through Lean methodology.

The Owner Committee focused on three strategies:



1. Influence Through Lean Education at Owner Events

The first annual LCI Owner Forum took place June 21, 2017 to highlight breakthroughs, address constraints and connect like-minded colleagues seeking lessons learned in Lean. Over 40 owners actively implementing Lean in 33 different companies benefited from the panel format and Q&A discussions at this owner-exclusive event.

The 2017 LCI Congress program offered an Owner Interest track that attendees could follow to find presentations that relate to the owner's perspective or that have an owner presenting. Liz Fikes, Director, Product Supply Engineering, Procter & Gamble, took center stage at LCI Congress as a keynote speaker before joining two other owner panelists to share their insights into what they expect out of Lean project teams.

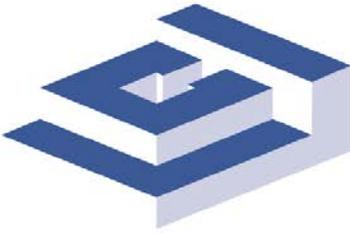
For the first time, an Owner's Lean Coffee was offered at LCI Congress, and 35 owners pre-registered for the owner-only session; a total of 55 owners showed up, leaving standing room only. A full hour after the session was scheduled to end, dozens of owners remained to discuss Lean topics such as use of Integrated Form of Agreement (IFOA) contracting, setting target cost, and aligning teams using IPD.

2. Onboard and Mentor Owner Members

To identify prospective owners to engage, the Owner Committee asked vendors and LCI CoPs to identify the owners in their network as prospective LCI corporate members. Through this, a pipeline of owners was identified, a Lean one-page charter was created in support, and other materials focused on onboarding, integrating Lean internally, and developing partners and suppliers were initiated.

3. Use Owner Communities of Practice to increase participation

Three regional Owner CoPs were in the process of being established by year's end: Great Lakes in Detroit led by General Motors; Eastern New York led by Global Foundries; and San Francisco with Sutter Health as the potential lead. The Great Lakes Owner CoP was the first Owner CoP to gather for a formational meeting in 2017, with 10 companies represented.

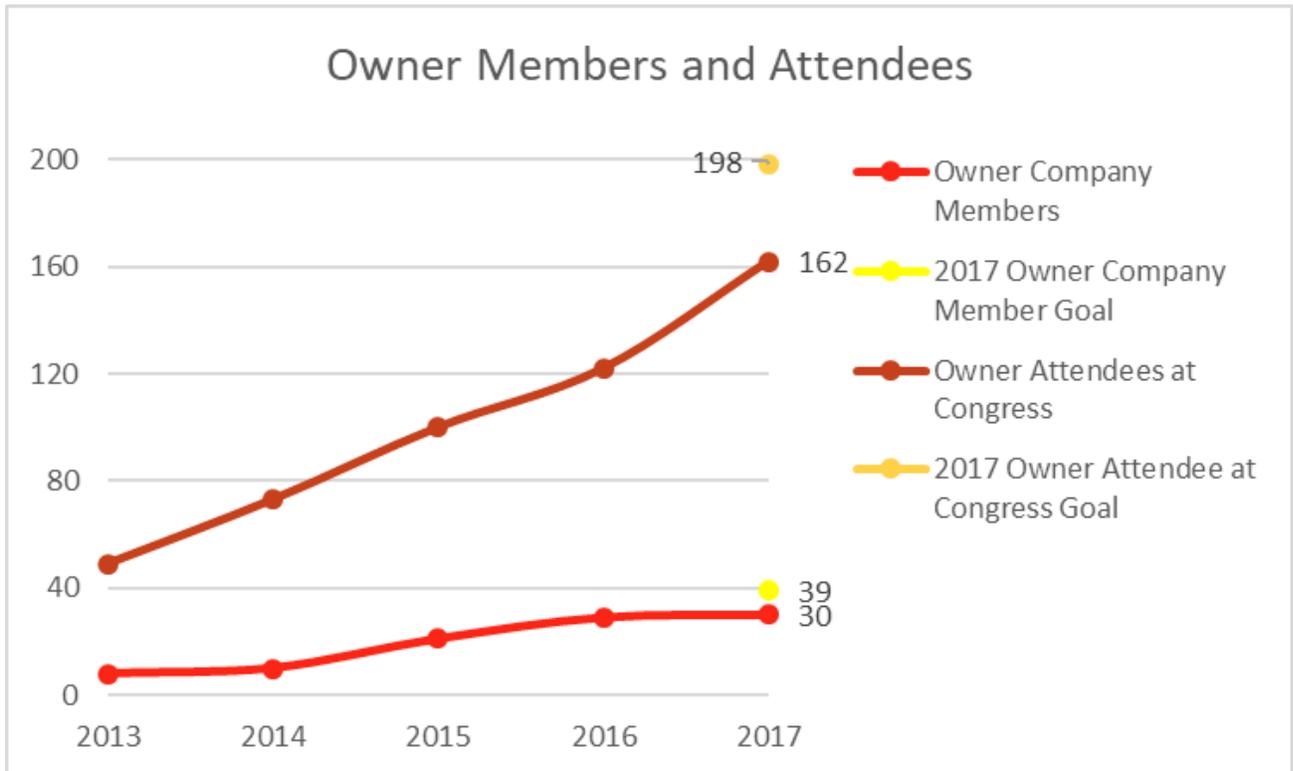


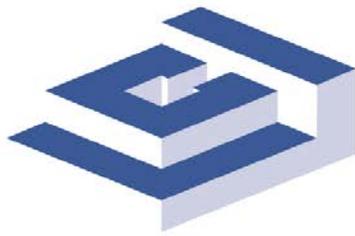
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In an effort to benchmark and track Lean implementation led by LCI owner member organizations, the Owner Committee established an annual system of metrics tracking by members.

See below for owner trends in membership and LCI Congress attendance from 2014 to 2017.





KNOWLEDGE - Develop and deliver standard building blocks for Lean

Increase industry awareness by growing and enhancing LCI Congress

Education sessions within LCI Communities of Practice

The [2017 LCI Congress](#), our 19th annual event, took over Anaheim, Calif. The largest crowd yet turned out from Oct. 16-20 for two days of Lean education, two days of project team breakout sessions and keynote presentations, plus a trip to the Gemba on Friday.

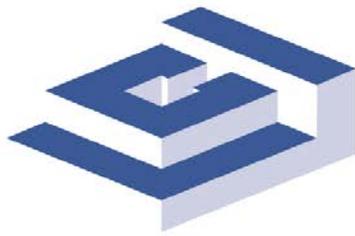
New sessions were added in 2017 in both Lean educational courses and breakout presentation sessions. As indicated in the table below, attendance grew from 1,322 in 2016 to 1,546 in 2017, a 17 percent growth rate.

	2016	% of Total	2017	% of Total	Growth
Owners	122	9%	163	11%	34%
Architect/Design	129	10%	163	11%	26%
Trade Partner	119	9%	212	14%	77%
Construction/GC	774		785		1%
Other	178		223		24%
Total	1322		1546		17%

The 2017 LCI Congress planning team had set goals for 12 percent owner, architect/design and trade partner attendance, and as noted above, we exceeded our goal for trade partners, achieving 14 percent. We saw significant growth in attendance by owners and designers from the previous year, with 34 percent more owners attending and a 26 percent increase in designer attendance.

Sixty-two percent of the 2017 LCI Congress crowd had never attended the event before, which is 11 percent more than at [2016 LCI Congress](#). This first-time attendee growth may indicate an overall increase in industry awareness of Lean as more practitioners hear about the five-day educational event and attend.

“Capture and Leverage the Lean Advantage” was the 2017 LCI Congress theme. The planning team wanted to emphasize the value of the program for those looking to capture or understand Lean for the first time as well as for those further along the Lean journey who look to leverage more advanced techniques.



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Training day capacity increased by 20 percent in 2017 from 2016, and 2017 offered 30 Lean education courses, the most offered to date.

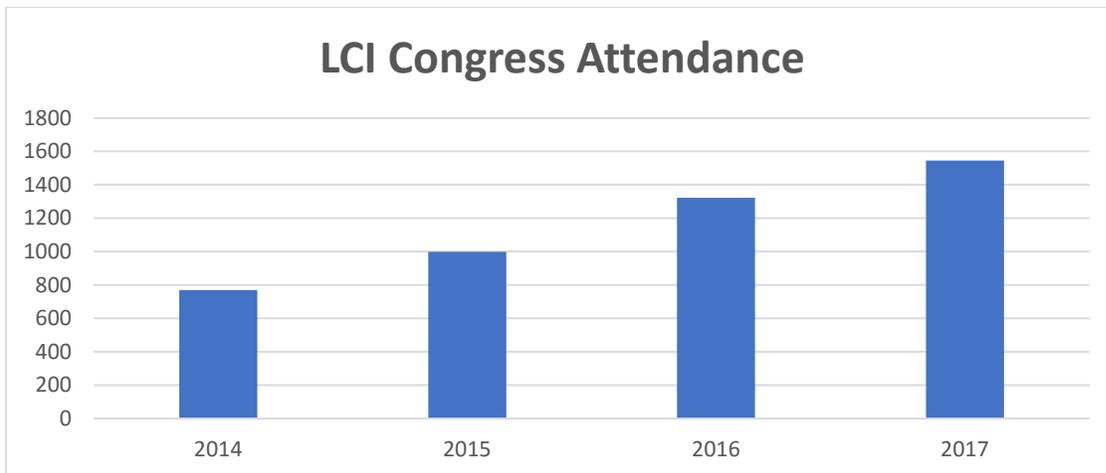
For the first time, top-rated presentation teams were invited to a sendoff reception with closing [keynote speaker](#) Karen Martin, Lean Management & Business Performance Expert, and recognized during the closing plenary session. Top-rated presentation teams were determined by the feedback attendees provided in the LCI Congress event app.

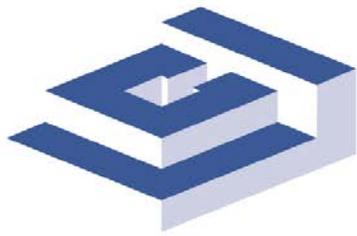
Another LCI Congress first was creating a competition for LCI CoPs to drive up attendance from their state and inviting the top CoPs represented by state attendance to the sendoff reception. California, Texas, Oregon, Florida, Illinois and Minnesota were the top six states in attendance in 2017, which are also home to some of LCI's most active CoPs.

New sessions that enhanced the 2017 LCI Congress program included:

- Owners Lean Coffee
- Advanced Lean Practitioner Panel
- Meet and Greet with Patrick Lencioni, Congress opening keynote, with a book signing for top sponsors
- A Walt Disney Imagineering presentation: *An IFOA in a Galaxy Far, Far Away*, for LCI Congress Champions. (LCI Congress Champions work with the planning team to make the learning experience as meaningful as possible for attendees.)
- Board of directors joint meeting with the Lean Leaders (young professionals)

For a snapshot of LCI Congress attendance growth from 2014 to 2017, see the bar graph below.





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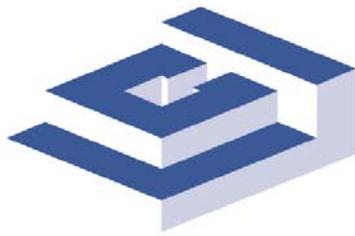
The [LCI board of directors](#) each invited a young professional or “Lean Leader” from their organizations to explore how LCI can improve our already established goal, objectives and strategies, as well as offering new ideas LCI has not yet explored. Both the LCI board and the Lean Leader group met together on the first day of 2017 LCI Congress to review LCI goals, strategies and objectives, but on the second day, the Lean Leaders branched off for a brainstorming session that resulted in four themes the group thought LCI should focus on more:

- Addressing the design and construction workforce capacity issues and stimulate teaching of Lean concepts in university and trade program curriculums,
- Encouraging organizations to realign mindsets to foster Lean, eliminate the bad (non-collaborative) behaviors as new recruits are trained and identify Lean Leaders early on,
- Reconfiguring the LCI Congress program to promote clarity and further enhancements to sessions and networking, and
- Engaging student groups at universities in Lean thinking, concepts and events.

After the Lean Leaders’ new themes were presented, the board voiced their agreement and decided to ask the Lean Leader group to meet and strategize regularly to launch initiatives related to their proposed themes.

Since the Lean Leader meeting at LCI Congress, the Lean Leader group began meeting every other week in 2017 and will continue to do so in 2018 to advance projects such as:

- LCI Congress student volunteer survey to begin to benchmark the current state Lean awareness among young professionals in the design and construction industry
- Lean Starter Kit for students to learn more
- 2018 LCI Congress panel discussion to share efforts made and hear from others.



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VALUE - Establish standard metrics for value and satisfaction

Broadly communicate the business value of Lean

Partner with other industry associations

In late 2016, LCI began to organize a new Research Committee by identifying and signing on seven “academic fellows” from around the country who had demonstrated a commitment to Lean construction education and research, and furthering its acceptance within higher education. These institutions were represented among the fellows: Michigan State University; University of Minnesota (UMN); Arizona State University; University of Texas; University of Nebraska; University of California, Berkeley; and Penn State University. Renee Cheng of UMN was chosen to be the founding chair. The committee’s 2017 program was characterized by getting organized and undertaking survey-style research in project validation and a structured approach by project teams to getting started with Lean.

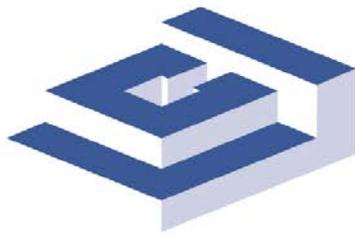
Preliminary results were briefed at 2017 LCI Congress, and these projects are continuing in 2018, along with a review and analysis of Lean construction-related research of the past, present and future. It was also agreed that the chair of the committee would rotate annually into the role of LCI board liaison for the committee, with one-year terms of chair and board liaison following each other in succession each year. The committee will also continue to work towards mapping out a multi-year research agenda for LCI.

To broadly communicate the business value of Lean in 2017, LCI rolled out [two 2016 research studies](#):

- [Why do Projects Excel? The Business Case for Lean](#)
- [Motivation and Means: How and Why IPD and Lean Lead to Success](#) (a LCI-funded research program led by the University of Minnesota)

These projects found empirical evidence of a significant correlation between projects completed with a high Lean intensity (use of multiple tools and techniques in parallel) and improved project outcomes in cost, value and schedule.

LCI rolled out the results of the research to most of our CoPs, plus partner associations across the country, sharing the findings through 27 presentations that reached more than 750 design and construction professionals.



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At the 2017 LCI Congress, another research study, [Why Projects Excel? Great Design Enabled by Lean](#), was presented. Dodge Data & Analytics benchmarked “best” and “typical” projects from 310 designers against key performance outcomes. Of the best projects, Dodge again found a statistically significant correlation between high Lean intensity projects and the likelihood for better client outcomes and design excellence.

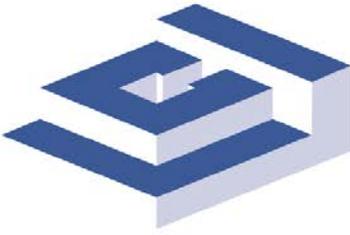
LCI has ongoing partnerships with several national associations seeking to promote awareness of Lean design and construction to a wider market. Some high-level efforts LCI has accomplished or has in the works for 2018 in collaboration with these associations include:

- AGC (Association of General Contractors) – A representative of AGC sits on the LCI board. AGC Lean Construction Education Program courses are offered at LCI’s annual Congress event
- AIA (American Institute of Architects) – An AIA representative serves on the LCI board, and LCI is presenting at the AIA Delivering the Future Symposium in Washington, DC (March, 2018); The AIA Foresight report is also being presented at the LCI/P2SL/AIA Design Forum in June 2018
- ASA (American Subcontractors Association) – LCI arranged to present at the Annual ASA Convention (SUBExcel) in March 2018 and is coordinating efforts between local ASA chapters and LCI Communities of Practice initiatives
- DBIA (Design-Build Institute of America) – LCI and DBIA held a working session to jointly develop a new course offering, Lean in Design-Build, which was offered at the 2017 LCI Congress
- SAME (Society of American Military Engineers): LCI participates in the CEO Round Table that interfaces of the Office of the Assistant Secretary of Defense for Installations, Environment and Energy (ASD IE&E) on project delivery requirements.

Annually, LCI teams up with our partner American Institute of Architects (AIA) and the Project Systems Laboratory (P2SL) – UC Berkeley to put on the Lean in Design Forum, an event for the design community to come together and learn best practices for implementing Lean in the design phase.

LCI hosted the [2017 Lean in Design Forum](#) in Chicago May 31-June 1. Attendance was 159, a 50 percent increase over 2016. Topics included:

- Last Planner® System in design
- Lean transformation of design enterprises



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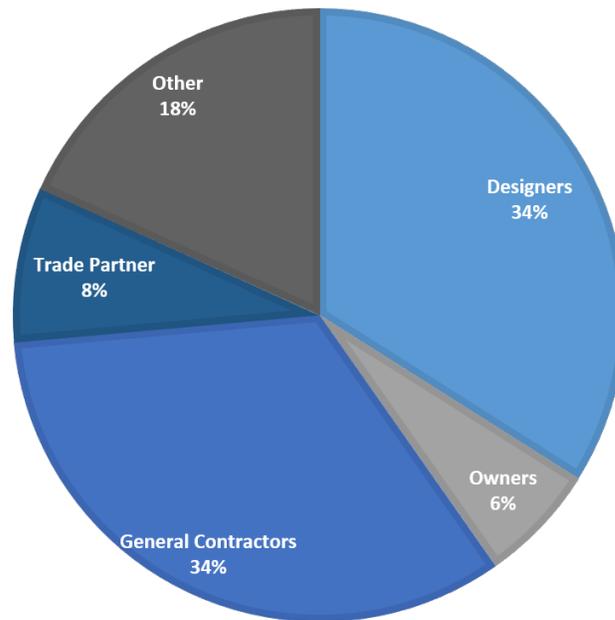
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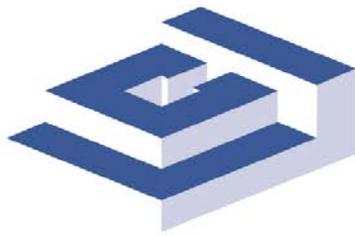
- Effective Big Room for design and construction phases
- Agile/Scrum work planning from the designer's perspective
- Continuous estimating/conceptual estimating

Although the Lean in Design Forum is geared toward architects, engineers and designers, other project stakeholders like owners, general contractors and trade partners attend as well. See the pie chart below for the attendee breakdown by industry from 2017.

2017 LEAN IN DESIGN FORUM ATTENDEES BY INDUSTRY

■ Designers ■ Owners ■ General Contractors ■ Trade Partner ■ Other



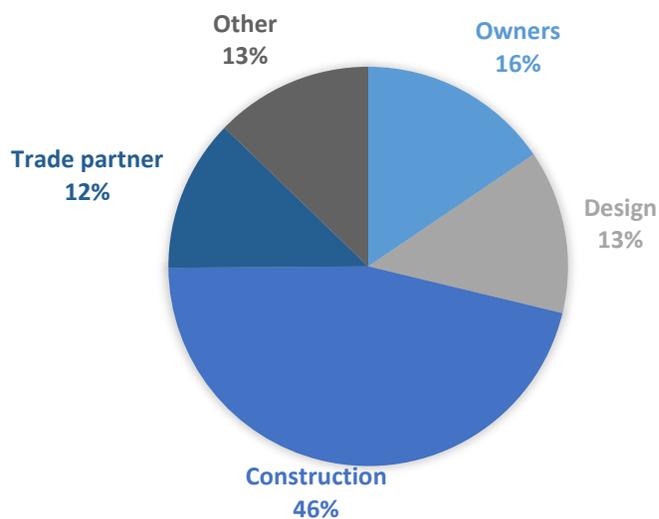


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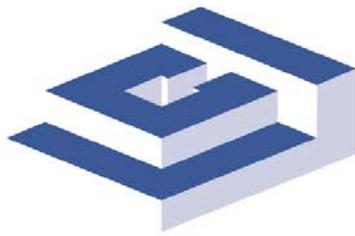
LCI membership provides owners, designers, general contractors, trade partners, and others, with networking opportunities with like-minded Lean professionals seeking to achieve a common vision of transforming the built environment through Lean implementation. LCI corporate membership grew from 195 in 2016 to 219 in 2017. See below for a breakdown of the 2017 LCI corporate members by organization type:

LCI CORPORATE MEMBERS



See below for a chart showing the sustained LCI membership growth from 2014 to 2017 as more organizations are being exposed to and adopting Lean processes.





CAPACITY - Create your capacity for learning and sharing better practices

Leverage strengths of LCI Communities of Practice

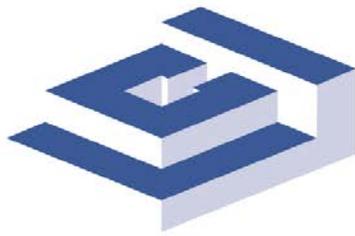
Significantly increase the rate of content development and distribution

The number of [LCI CoPs](#) has increased to 31 from 28 in 2017, making it the most number of active CoPs in LCI's history. The [New Orleans CoP](#) formed in the beginning of 2017, and [Michigan](#) officially finished reforming shortly after; although both are quite new, each has experienced notable interest and growth in their respective markets. Increasing the number of CoPs across the nation provides greater opportunities for Lean practitioners to share best practices face-to-face and learn from the LCI-developed educational resources.

As Denise Erminger took on her new role with LCI CoPs, she began by working with our Practice Committee to better understand and document each of the CoP's current state and assign a maturity levels to each one. At the end of 2017, this is the breakdown:

Maturity Level	Maturity Level Definition	# of CoPs
Performing	Self-sustaining core team focused on continued depth and teaching	3
Norming	Fully functioning core team focused on creating a business plan to market events	5
Storming	Active core team focused on growing to at least 6 core members	9
Forming	At least three practitioners are focused on learning to market and hold events	9
Interest Group	Guaging Lean interest by holding Lean Coffees or general meetings	5

As noted earlier, LCI leveraged the strengths of the CoP network by rolling out 2016 research that established a business case for Lean construction to 25 of the 31 CoPs.



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CoP events increased from 149 in 2016 to 227 in 2017, a 52 percent increase from the previous year with a 36 percent increase in attendance overall.

LCI CoP event breakdown in 2017:

- 103 Lean Coffees
- 116 general CoP events
- 15 LCI learning module events

The National Practice Team, established in 2017, is comprised of the Practice Committee leaders, CoP core group leaders, specific LCI staff and a board liaison to create the one-team environment that promotes collaboration on solving common challenges. The National Practice Team met twice at in-person work sessions and held two conference calls this year. Notably, the spring in-person work session had 90 percent attendance by CoP leaders and the fall work session at the 19th annual LCI Congress had 93 percent attendance.

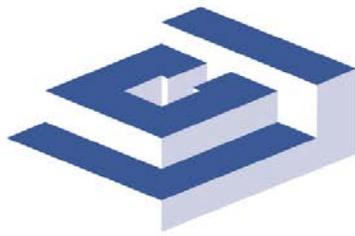
Throughout the year, LCI worked to standardize each of [LCI's education courses](#) (listed below) so that they align with the LCI brand guidelines developed in 2016 and can be more easily taught by LCI Improved Instructors.

- Introduction to Lean Project Delivery (also a webinar)
- Introduction to Last Planner® System
- Mindset of an Effective Big Room
- Target Value Delivery

LCI's [Improved Instructors program](#) received a refresh with an online application as the LCI Education Advisory Group (formerly the LCI Education Committee) seeks to grow the number of LCI Improved Instructors recognized as qualified to teach LCI education material.

Because not everyone is available for in-person Lean education when it is offered, webinars on current Lean topics are added to the calendar to provide more accessible opportunities for the learners.

The most-attended LCI webinars in 2017 were *Using the Last Planner® System in Design*, which attracted 126 participants, and *A Lean Coach's Analysis of Last Planner® Successes and Failures* with 125 participants. By increasing the number of webinars offered from six in 2016 to nine in 2017, LCI was able to increase its reach from 200 to 762 total participants, a 35.6 percent increase in audience.



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Conclusion

The year 2017 was guided by a set of objectives and strategies designed to move LCI closer toward achieving its vision of transforming the built environment through Lean implementation. Notable points indicating an increase in the design and construction industry's adoption of Lean processes include:

- 2017 LCI Congress attendance increased by 17 percent
- 2017 LCI Congress key owner attendance increased by 34 percent and key designer attendance increased by 26 percent
- LCI corporate membership increased by 24, making the total 219
- CoP events increased by 52 percent and CoP reach increased by 36 percent
- Webinar reach increased by 35.6 percent

Although there is a long path ahead of the design and construction industry as we still suffer from unacceptably low productivity, LCI and the Lean community continue to make progress in transforming the industry's approach to project delivery. As we look ahead to 2018 and beyond, LCI's vision continues to be that of a future of on-time, on-budget project delivery that meets and exceeds owner expectations.