23RD ANNUAL

23RD LCI CONGRESS
OCTOBER 19-22

Advocate Aurora Health's Prefabrication Journey

Scott Nelson - AAH; Jeff Niesen/Jenny Han - Boldt; Mike Doiel - HDR;
Troy Hoggard - Cannon; Amy Marks - Autodesk

LEARN BY DOING FROM THOSE WHO DO

Thursday, October 21 2:35p – 3:15p



© LEAN CONSTRUCTION INSTITUTE

PANEL DISCUSSION



Melanie Gilbertson
Flintco
Champion



Scott Nelson
Advocate Aurora Health



Jeff Niesen
Boldt



Amy Marks
Autodesk



Jenny Han
Boldt
Moderator



Michael Doiel
HDR



Troy Hoggard
CannonDesign

© LEAN CONSTRUCTION INSTITUTE

Health precautions to keep everyone as safe as possible at Congress:

- Wear masks at all times in indoor events.
- Complete your daily health screening on your phone and bring it with you when you enter the center each day.
- Practice social distancing to the extent possible. Seating at plenary sessions is structured to help with this.
- If you feel ill at any time, please leave the conference and return to your room/consult a physician as necessary.
- Ultimately, our collective health and safety at Congress is up to all of us. Thanks for your support!



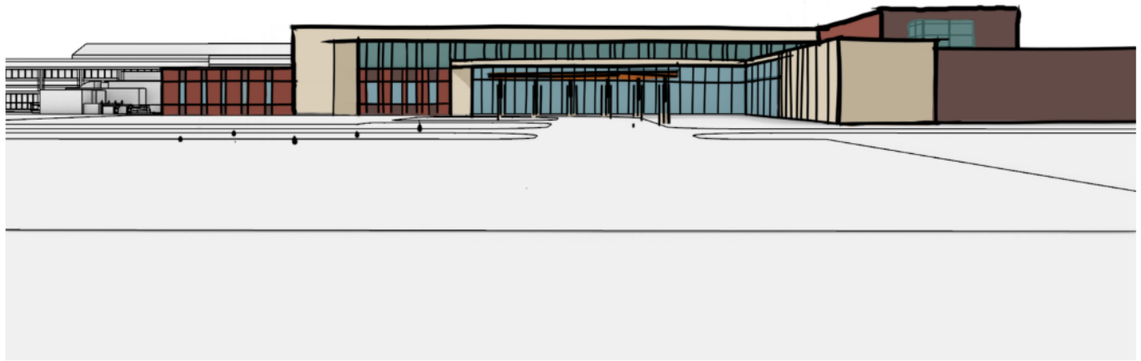
© LEAN CONSTRUCTION INSTITUTE

Agenda

1. **PAST** – How Did We Get Here?

2. **PRESENT** – Enterprise Case Study





3. **FUTURE** – Owner's Playbook

4. **TAKEAWAYS**

Problem Statement



How does a Healthcare Institution transition from **conventional to prefabricated construction**?



What is the **Value Proposition**? How can you achieve **authentic buy-in**, collaboration and commitment from all stakeholders?



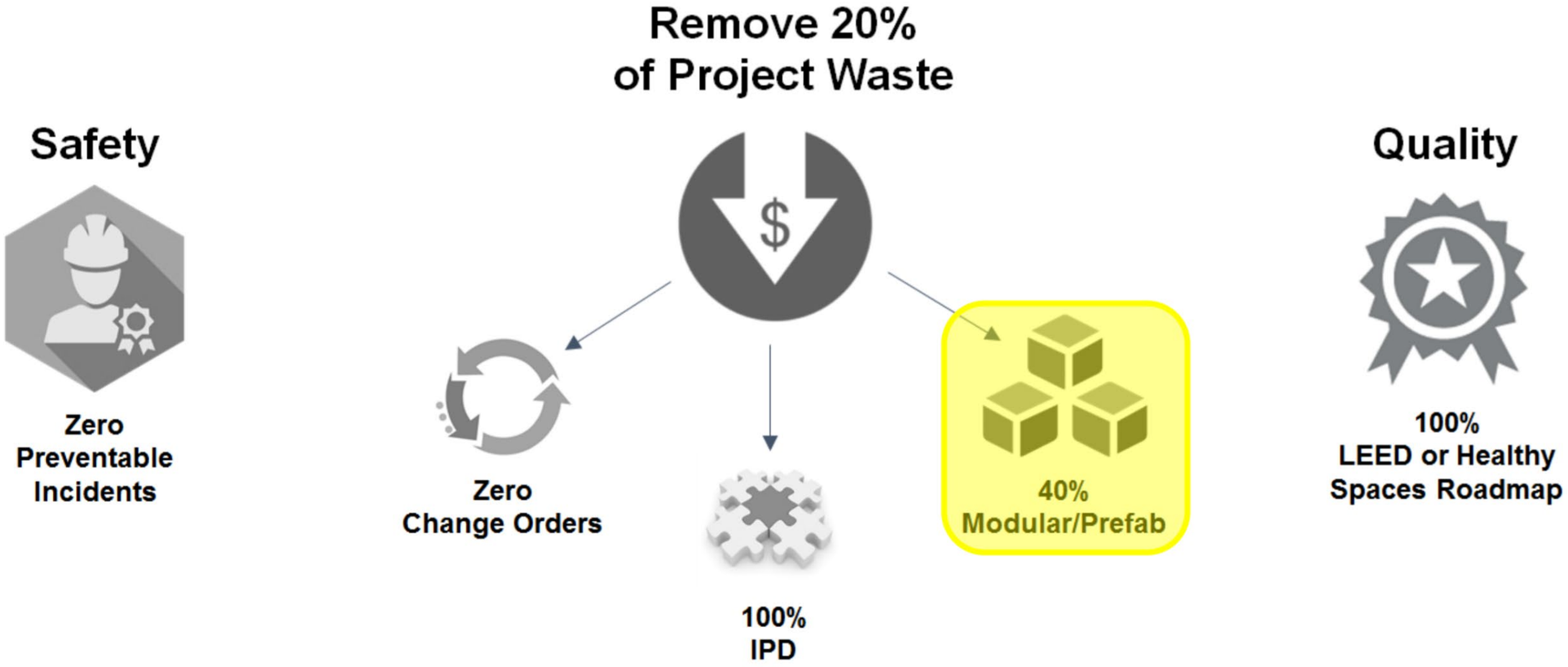
What are some lessons learned and how are we applying them?

© LEAN CONSTRUCTION INSTITUTE

PAST: How Did We Get Here?

© LEAN CONSTRUCTION INSTITUTE

PAST: 2020 DESIGN/CONSTRUCTION GOALS

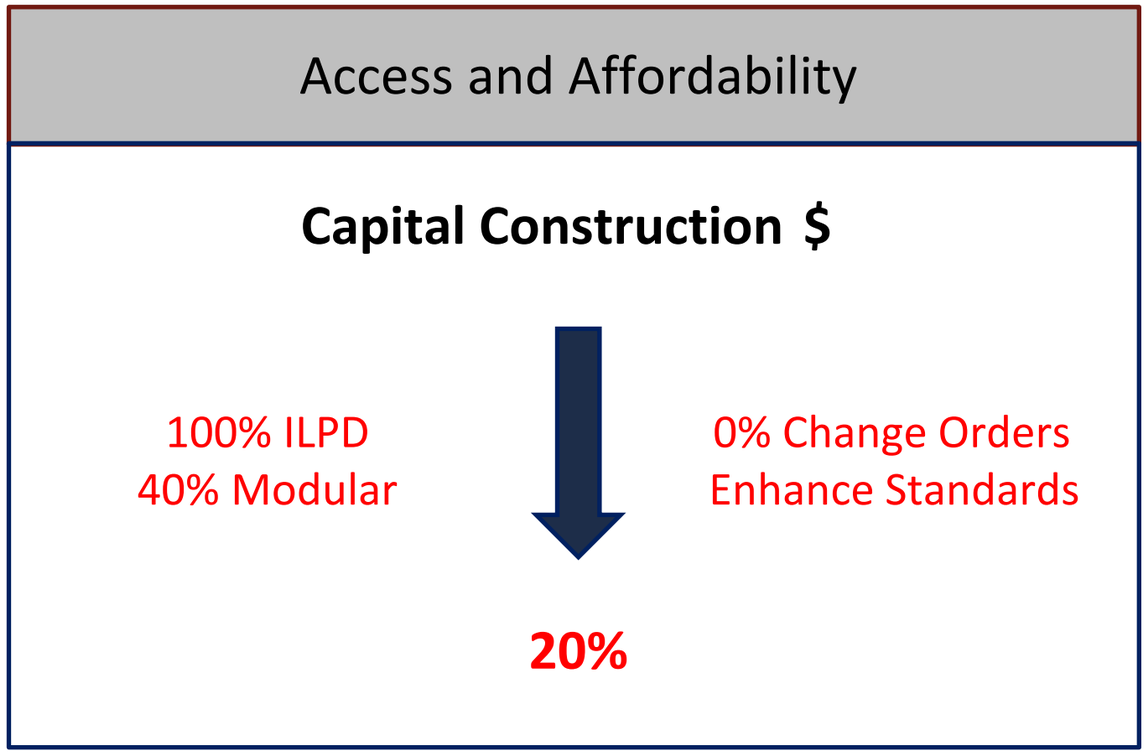


"Create safe and healing environments through thoughtful collaboration and innovation."

PAST: Design & Construction 2020 Goals

PD&C Mission Statement:

"*AAH Planning, Design & Construction will lead teams to provide safe and healing environments through thoughtful collaboration and innovation that is **S**afe, **P**atient focused, **E**fficient, **C**ost effective and **S**ustainable."*



PAST: AAH Outpatient Collaborative (AAOC)

PREFABRICATION

Year	System	AAOC
2015:	2.0%	2.0%
2016:	6.1%	10.2%
2017:	18.0%	20.3%
2018:	21.4%	24.2%
2019:	21.9%	18.5%
2020:	24.5%	16.9%

40% GOAL:

4 Projects exceeded 20% at:

26%, 26%, 43% and 47%

PAST: Change Management



CHANGE ORDERS

Year	System	AAOC
2015:	1.4%	NA
2016:	1.1%	0.37%
2017:	1.2%	0.27%
2018:	1.6%	1.82%
2019:	1.1%	0.05%
2020:	**0.1%**	0.13%

GOAL: Zero Change Orders by 2020

PAST: Reduced Capital Spend



SYSTEM METRICS

Year	New	TI
2015:	NA	NA
2016:	- 0.0%	- 6.%
2017:	- 8.7%	- 10.9%
2018:	NA	- 18.9%
2019:	- 13.3%	- 18.7%
2020:	NA	- 20.0%

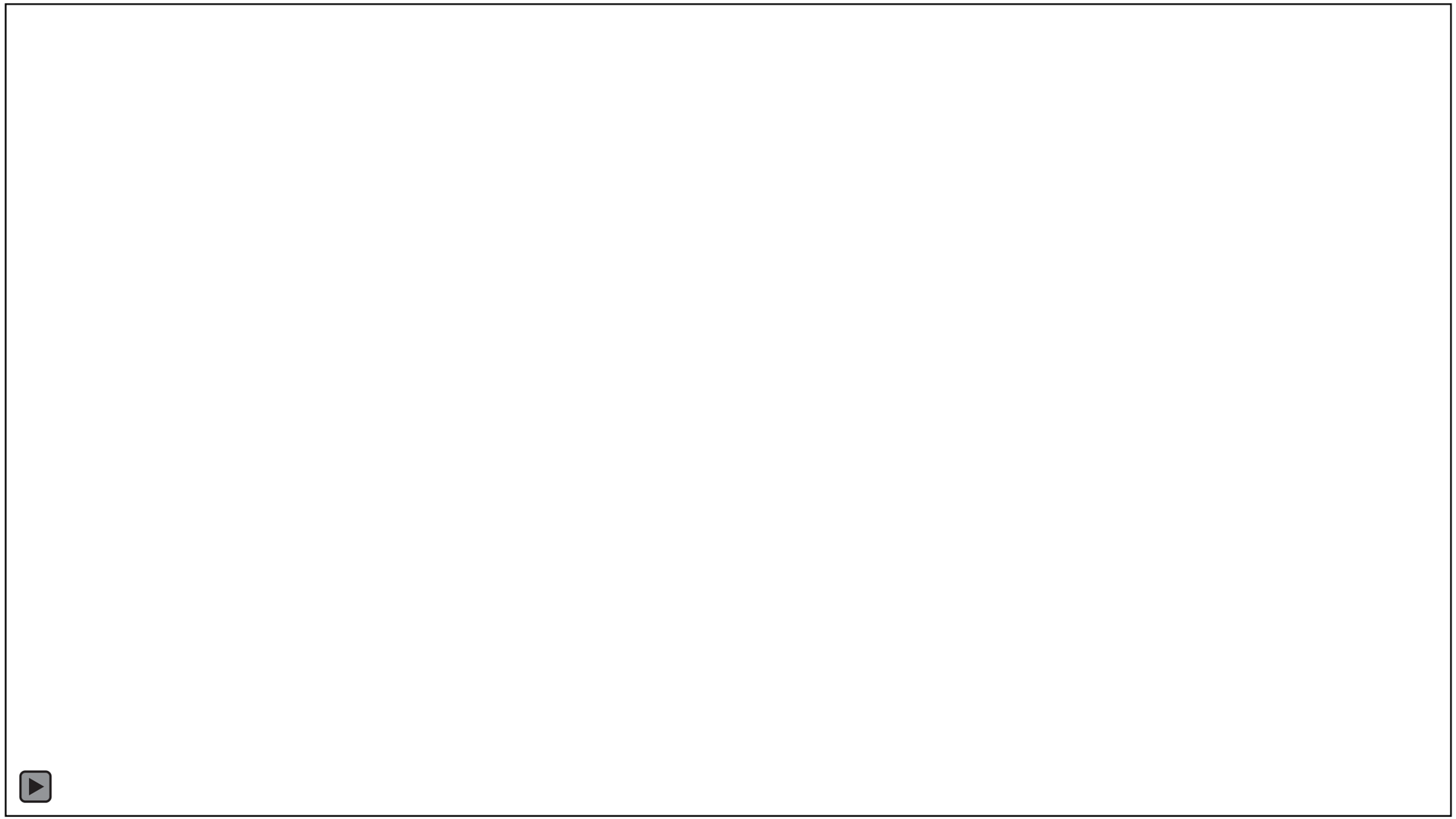
20% Reduced Capital Construction $ by 2020

PRESENT: Enterprise Case Study

© LEAN CONSTRUCTION INSTITUTE

Lean Construction Institute
Transforming Design and Construction

CASE STUDY: VIDEO



© LEAN CONSTRUCTION INSTITUTE

CASE STUDY: Design to Fabrication-Workflow

DESIGN DEVELOPMENT | CONSTRUCTION DRAWINGS | PERMIT DWGS | TRADE COORDINATION | FABRICATION

FLOOR PLAN LOCKED



MODULAR PLAN LOCKED

HDR REVIT DESIGN MODEL

CEILING GRID LOCKED

REF FRAMED WALLS



REF CEILINGS/ WALLS

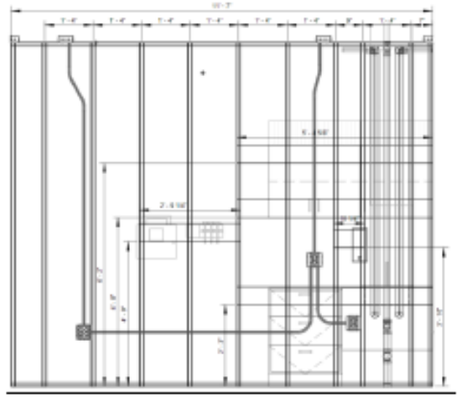
STUD WALLS POPULATED

TRADE PARTNER FABRICATION MODEL

MODULAR SHOP DRAWINGS

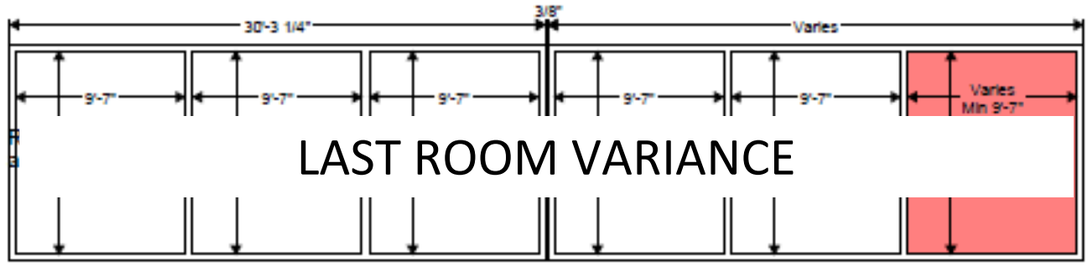
.

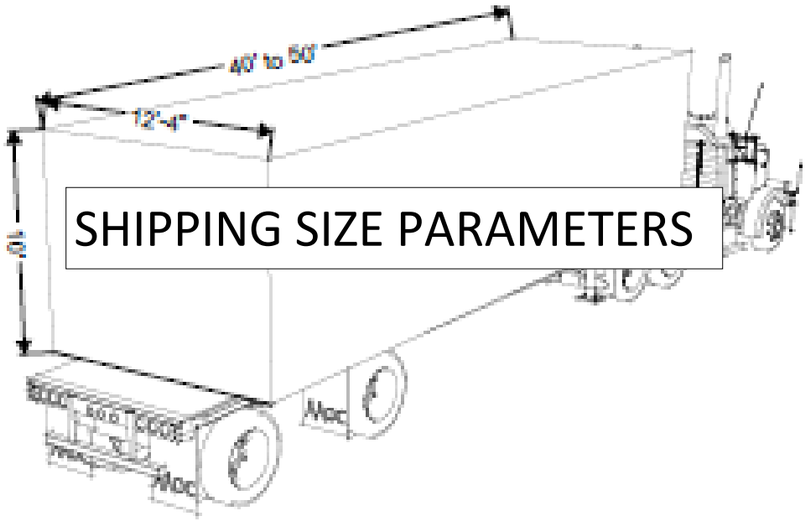
INTEGRATED MODEL



© LEAN CONSTRUCTION INSTITUTE

CASE STUDY: Design to Transport-Logistics

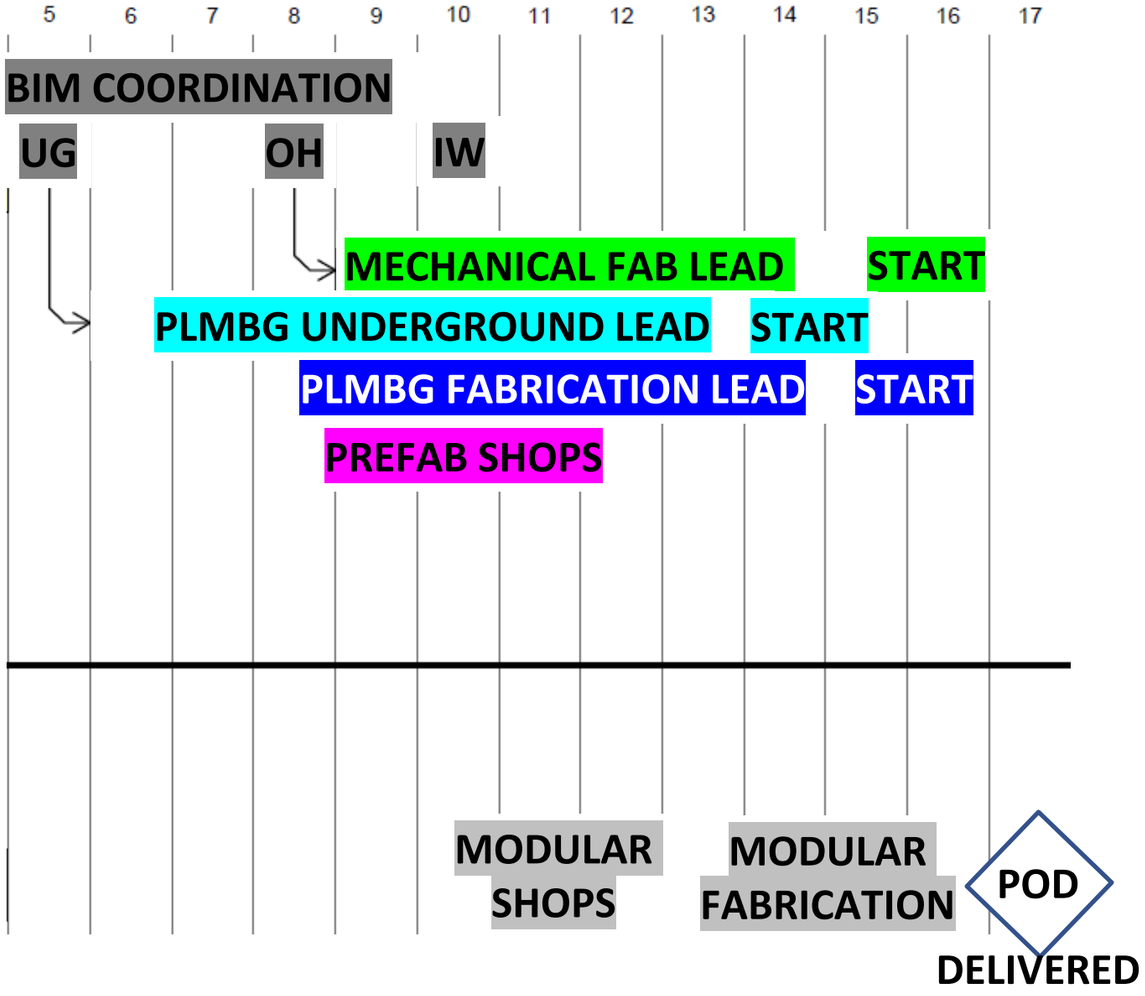






© LEAN CONSTRUCTION INSTITUTE

CASE STUDY: Design to Delivery-Timing





© LEAN CONSTRUCTION INSTITUTE

CASE STUDY: Design to Installation-Next Gen Modular



© LEAN CONSTRUCTION INSTITUTE

FUTURE: Owner’s Playbook



© LEAN CONSTRUCTION INSTITUTE

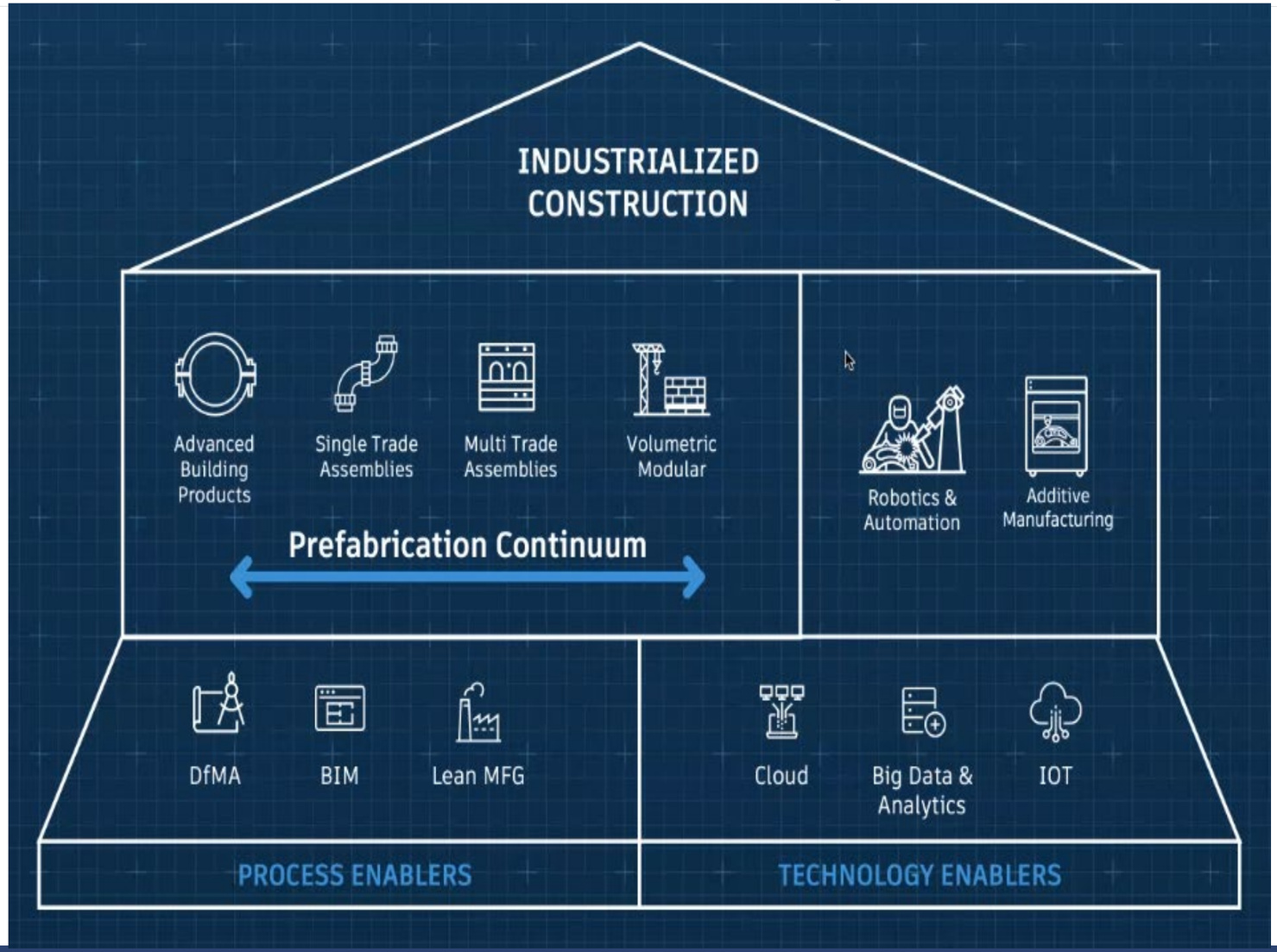
Lean Construction Institute
Transforming Design and Construction

AAH'S NEXT STEPS: Big, Hairy and Audacious



© LEAN CONSTRUCTION INSTITUTE

AAH'S NEXT STEPS – Owner's Playbook

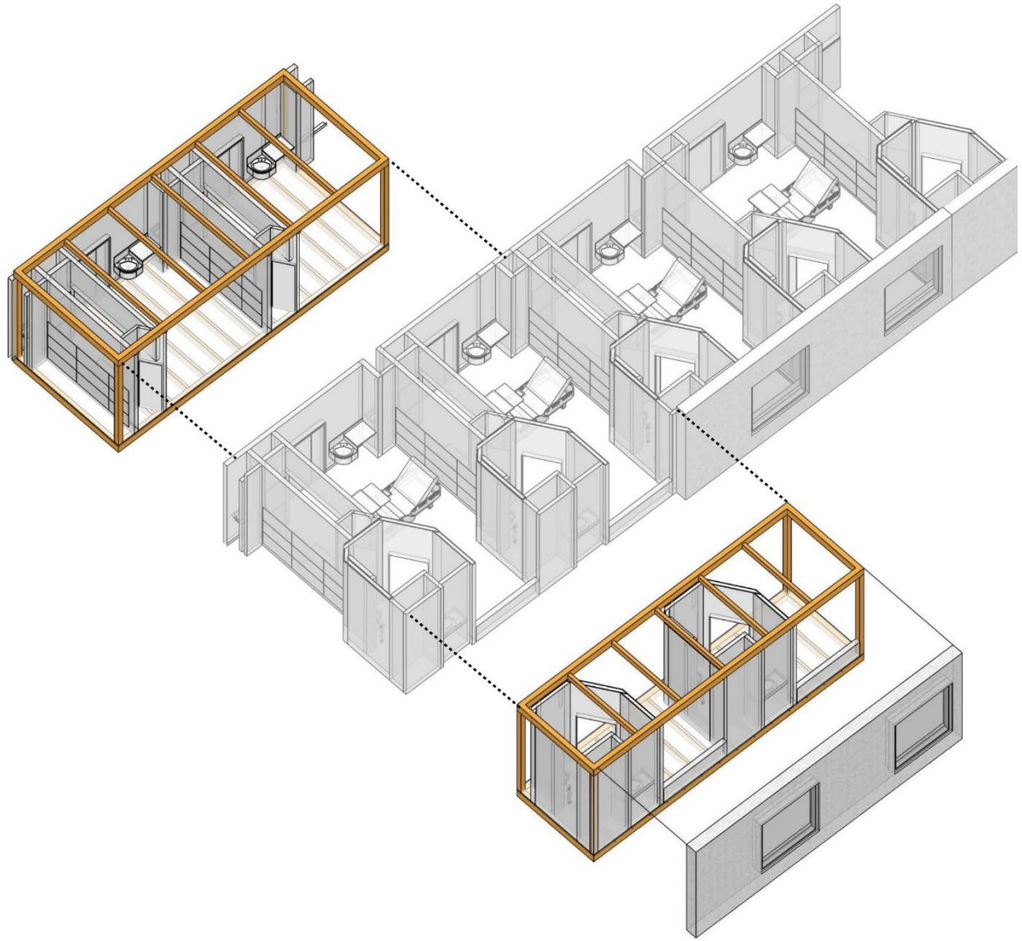


© LEAN CONSTRUCTION INSTITUTE

AAH'S NEXT STEPS: Industrialized Templates

- Authors of inpatient standards and templates





© LEAN CONSTRUCTION INSTITUTE

AAH'S NEXT STEPS: Why Fond du Lac?

Visionary Owner



405 rooms (2016)

Advocate Aurora Health™

Experienced Builder

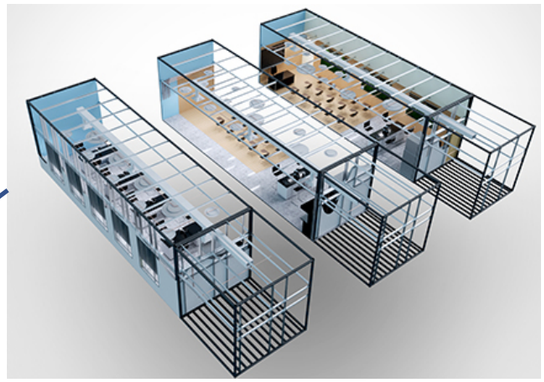


STAT MOD®

BOLDT®

CANNONDESIGN

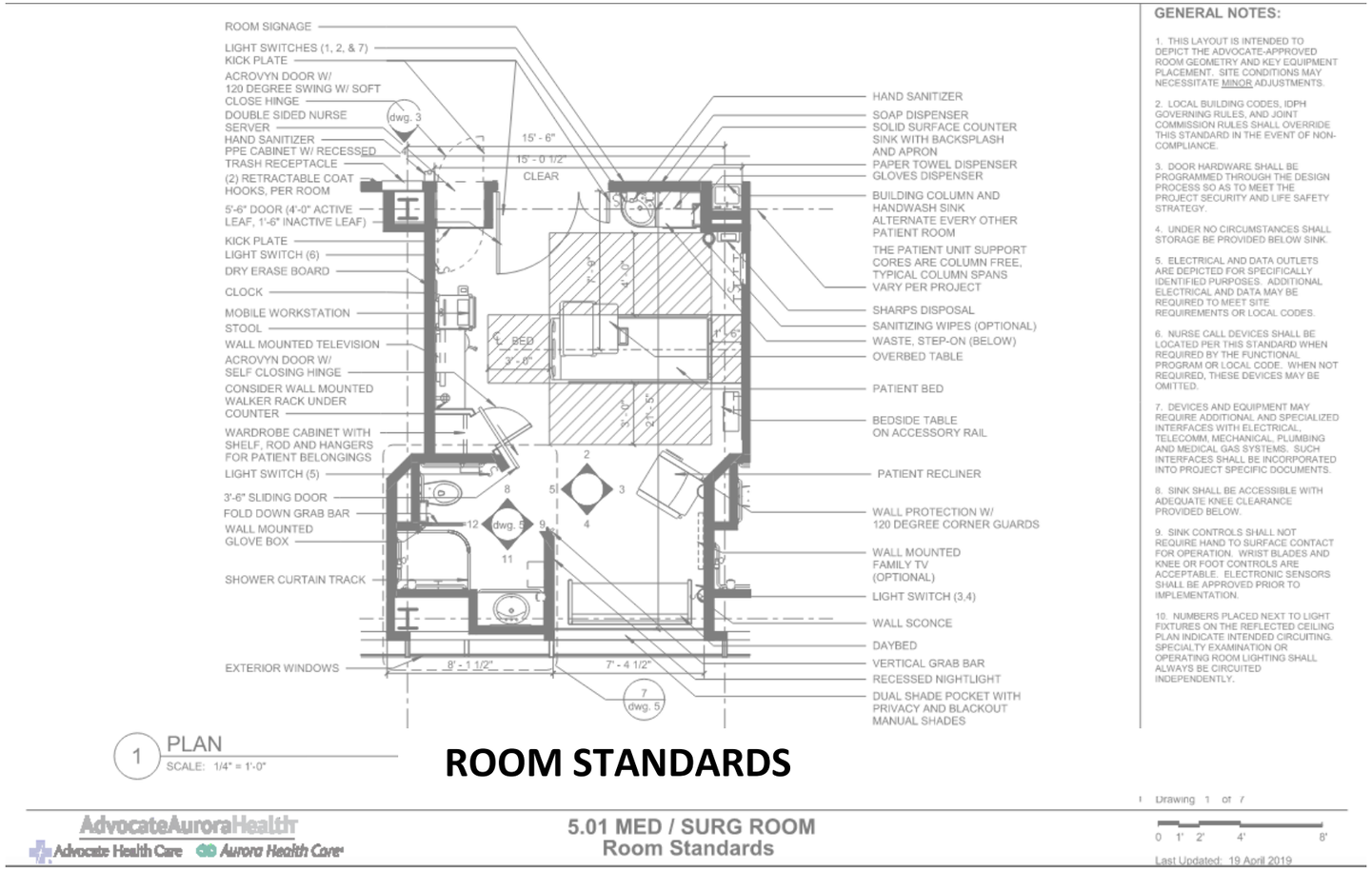
Committed Designer



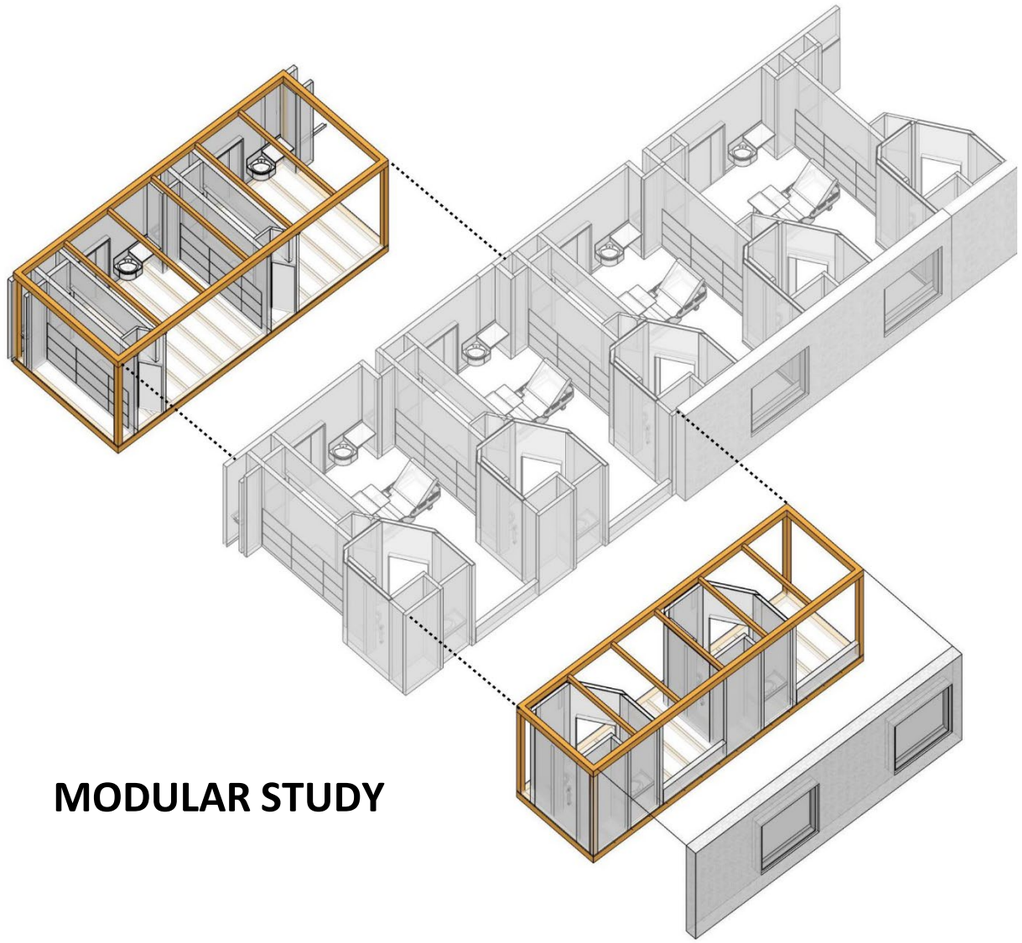
ModularDesign+

© LEAN CONSTRUCTION INSTITUTE

AAH'S NEXT STEPS: Industrialized Templates



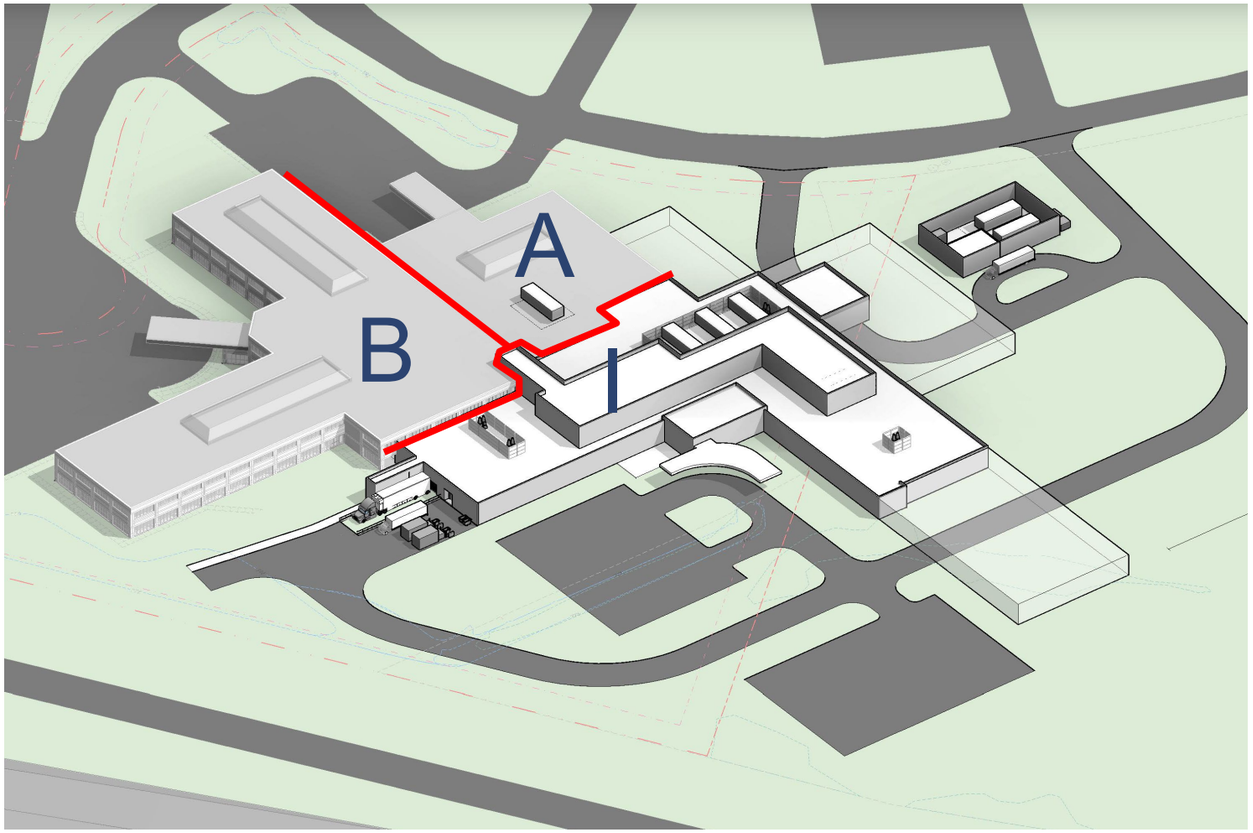
ROOM STANDARDS

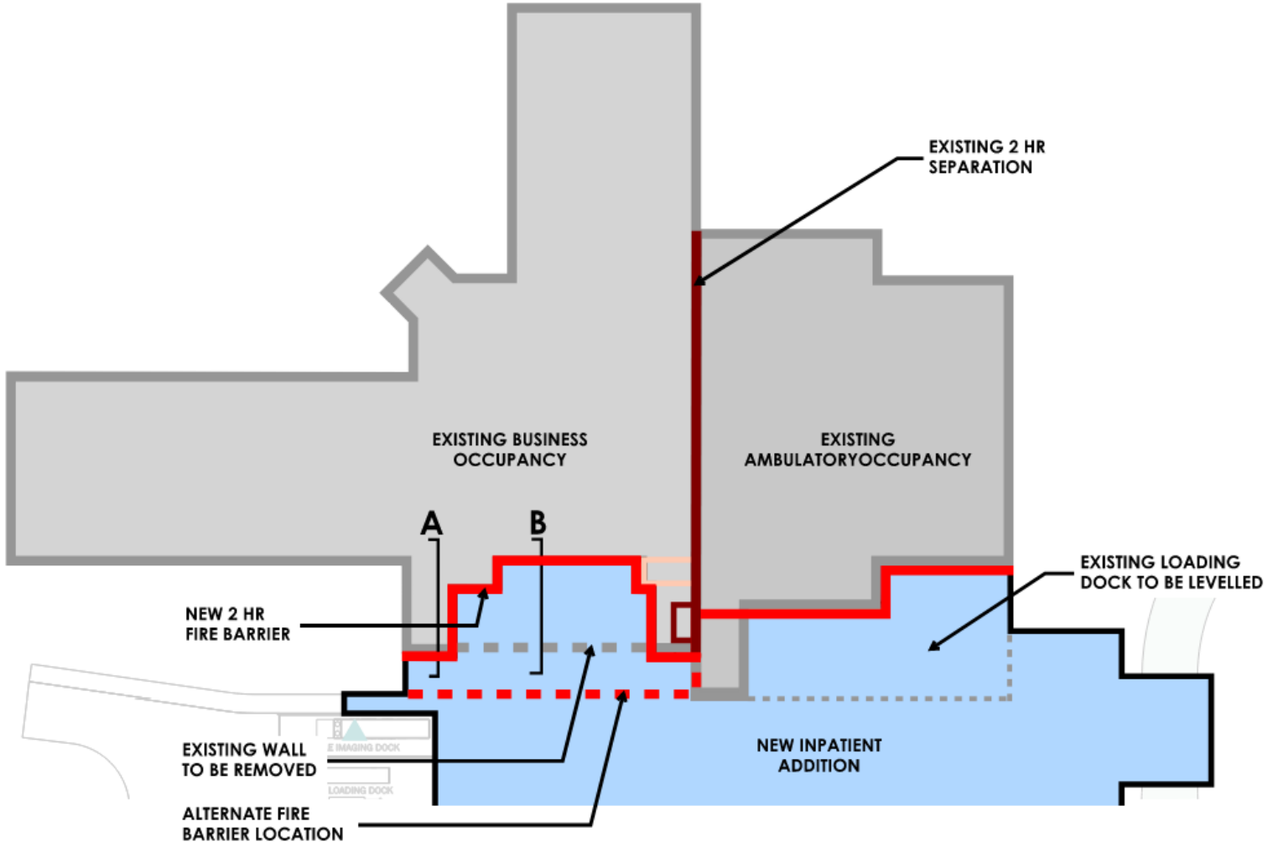


MODULAR STUDY

© LEAN CONSTRUCTION INSTITUTE

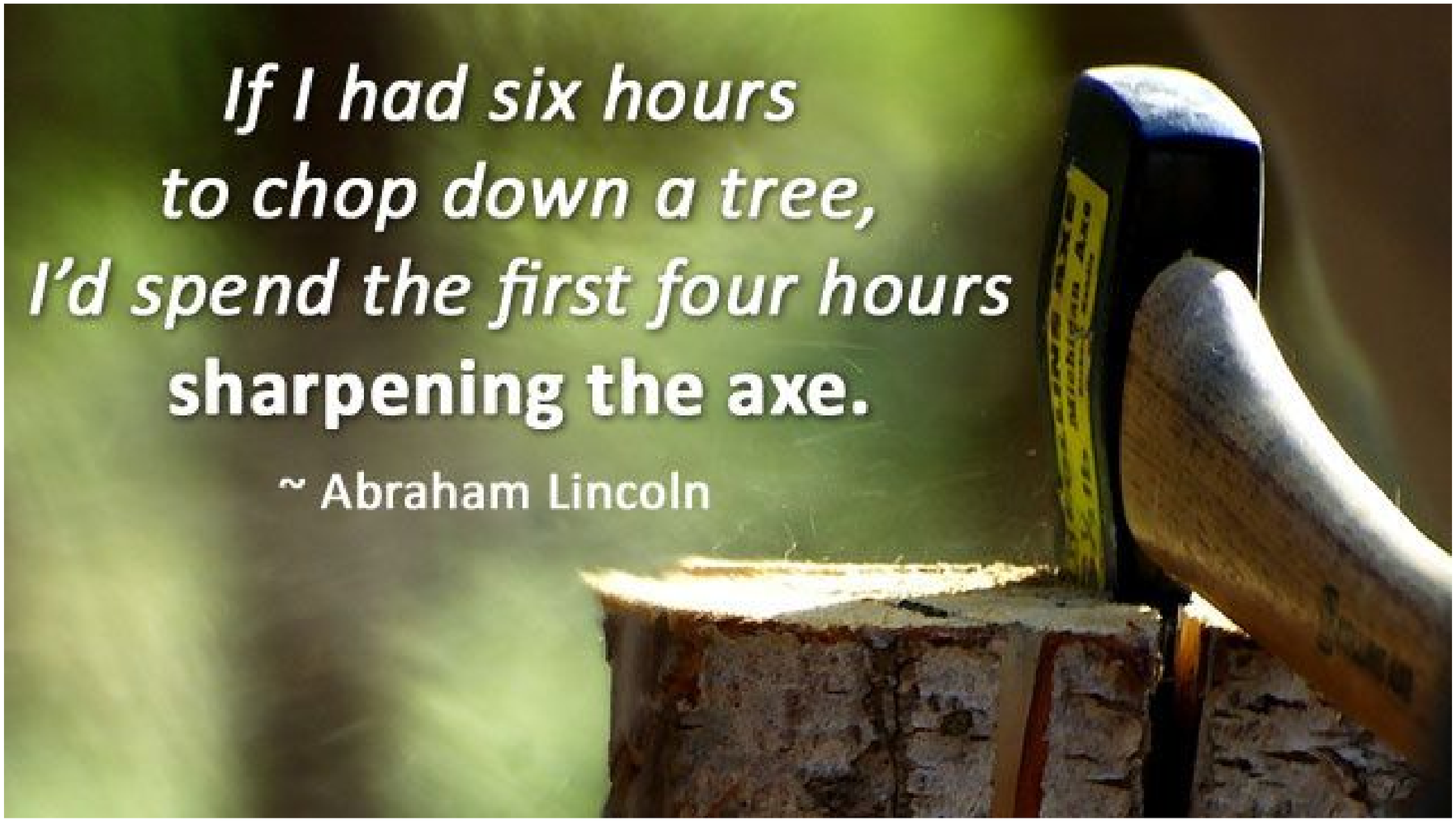
AAH'S NEXT STEPS: Inpatient & Retro Fit Hurdles





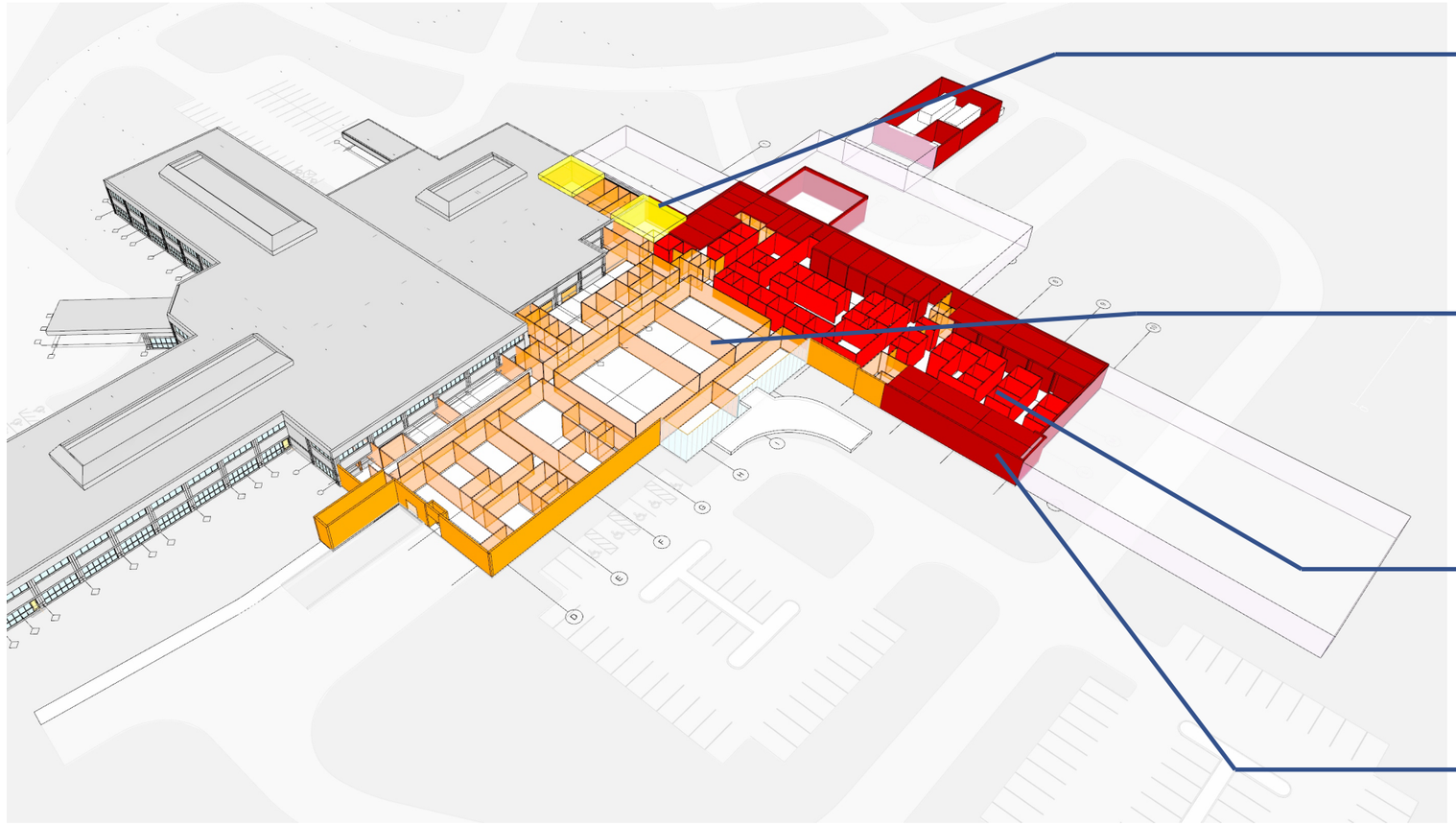
© LEAN CONSTRUCTION INSTITUTE

AAH'S NEXT STEPS: Big, Hairy and Audacious



© LEAN CONSTRUCTION INSTITUTE

AAH'S NEXT STEPS: Owner's Playbook



- Advanced ***Product*** selection
- Multi-trade ***Racks***
- Single trade ***Assemblies***



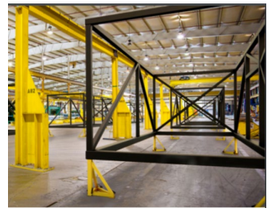
- Single trade ***assemblies***
- Multi-trade equipment ***Skids & Racks***
- Prefabricated Exterior / Interior ***Walls***



- Single Trade Assemblies
- Multi-Trade assemblies
- Prefabricated Partitions
- Slide in ***Pods***



- **Volumetric** Structural Modules



© LEAN CONSTRUCTION INSTITUTE

LEARN BY DOING FROM THOSE WHO DO

Amy Marks

Vice President of Industrialized Construction Strategy and Evangelism

Industry thought leader on Industrialized Construction

Alumna of Harvard Business School and graduate of the UF

Ambassador of Advancing Prefabrication Conference

Trainer for Mechanical Contractors Association of America (MCAA)

Singapore Govt. Panel of Experts on Construction and Productivity

Worked on six of the seven continents consulting on large-scale projects to optimize Industrialized Construction



© LEAN CONSTRUCTION INSTITUTE

DATA

~~Design~~

for Manufacturing and Assembly (DfMA)



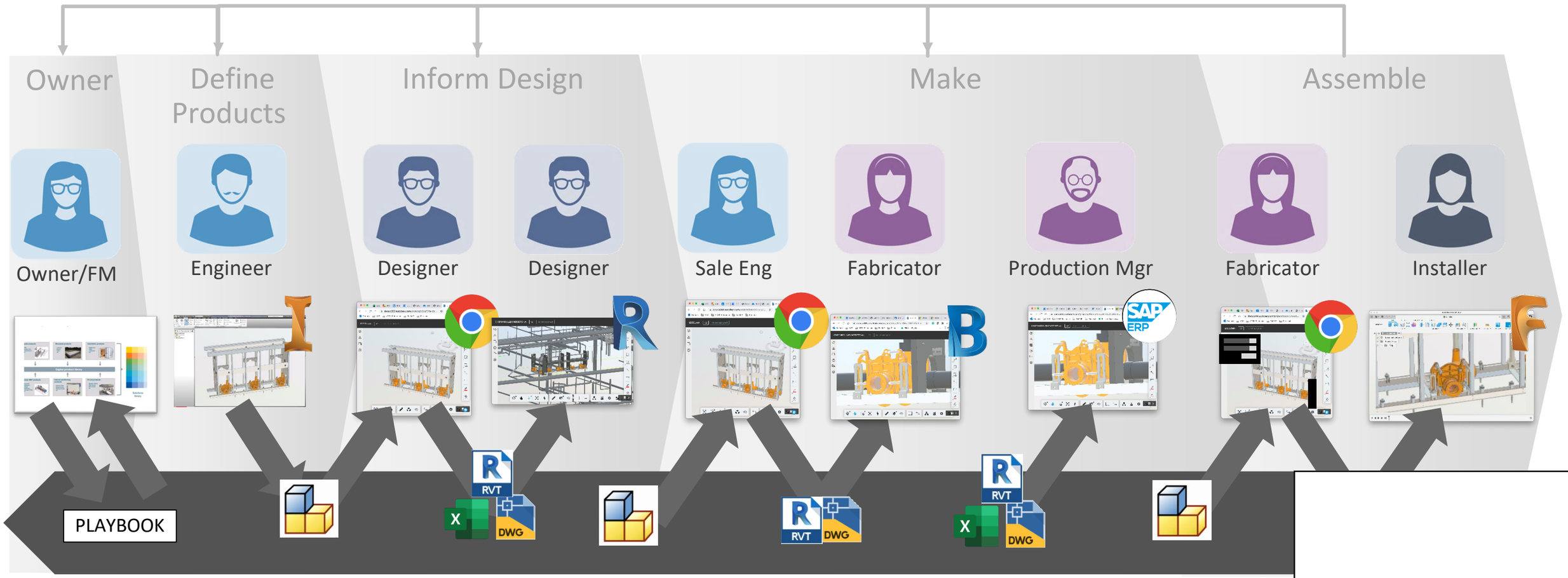


Industrialized Construction

The application of **manufacturing techniques** to the built environment

Convergence Workflows

Delivering a Connected Workflow



© LEAN CONSTRUCTION INSTITUTE

LEARN BY DOING FROM THOSE WHO DO

Amy Marks

Vice President of Industrialized Construction Strategy and Evangelism

Catch me on Peloton, LinkedIn, Instagram and Twitter

amykulkamarks

@QueenofPrefab

#QueenofPrefab

@QueenofPrefab



© LEAN CONSTRUCTION INSTITUTE

How can you apply this tomorrow?

- **Control Your Destiny**

© LEAN CONSTRUCTION INSTITUTE

How can you apply this tomorrow?

- **Control Your Destiny**
- **Consistent Data Points Over Multiple Years**

© LEAN CONSTRUCTION INSTITUTE

How can you apply this tomorrow?

- **Control Your Destiny**
- **Consistent Data Points Over Multiple Years**
- **Be Brave, Be Bold, Be Daring**

© LEAN CONSTRUCTION INSTITUTE

How can you apply this tomorrow?

- **Control Your Destiny**
- **Consistent Data Points Over Multiple Years**
- **Be Brave, Be Bold, Be Daring**
- **Create Trusting Environments**

© LEAN CONSTRUCTION INSTITUTE

How can you apply this tomorrow?

- **Control Your Destiny**
- **Consistent Data Points Over Multiple Years**
- **Be Brave, Be Bold, Be Daring**
- **Create Trusting Environments**
- **Keep Telling Your Story**

© LEAN CONSTRUCTION INSTITUTE

23RD LCI CONGRESS
OCTOBER 19-22



In the spirit of continuous improvement, we would like to remind you to complete this session's survey! We look forward to receiving your feedback.

© LEAN CONSTRUCTION INSTITUTE

23RD LCI CONGRESS
OCTOBER 19-22

Thank you for attending this presentation. Enjoy the rest of the 23rd Annual LCI Congress!



© LEAN CONSTRUCTION INSTITUTE

Contact Us

Scott Nelson, System VP PD&C

Advocate Aurora Health

Scott.Nelson@AAH.org

Jeff Niesen, President

The Boldt Company

Jeff.Niesen@Boldt.com

Mike Doiel, Senior VP

HDR

Mike.Doiel@HDRinc.com

Troy Hoggard, Design Leader

CannonDesign

THoggard@CannonDesign.com

© LEAN CONSTRUCTION INSTITUTE

Contact Us

Jenny Han, Design Integration

The Boldt Company

Jenny.Han@Boldt.com

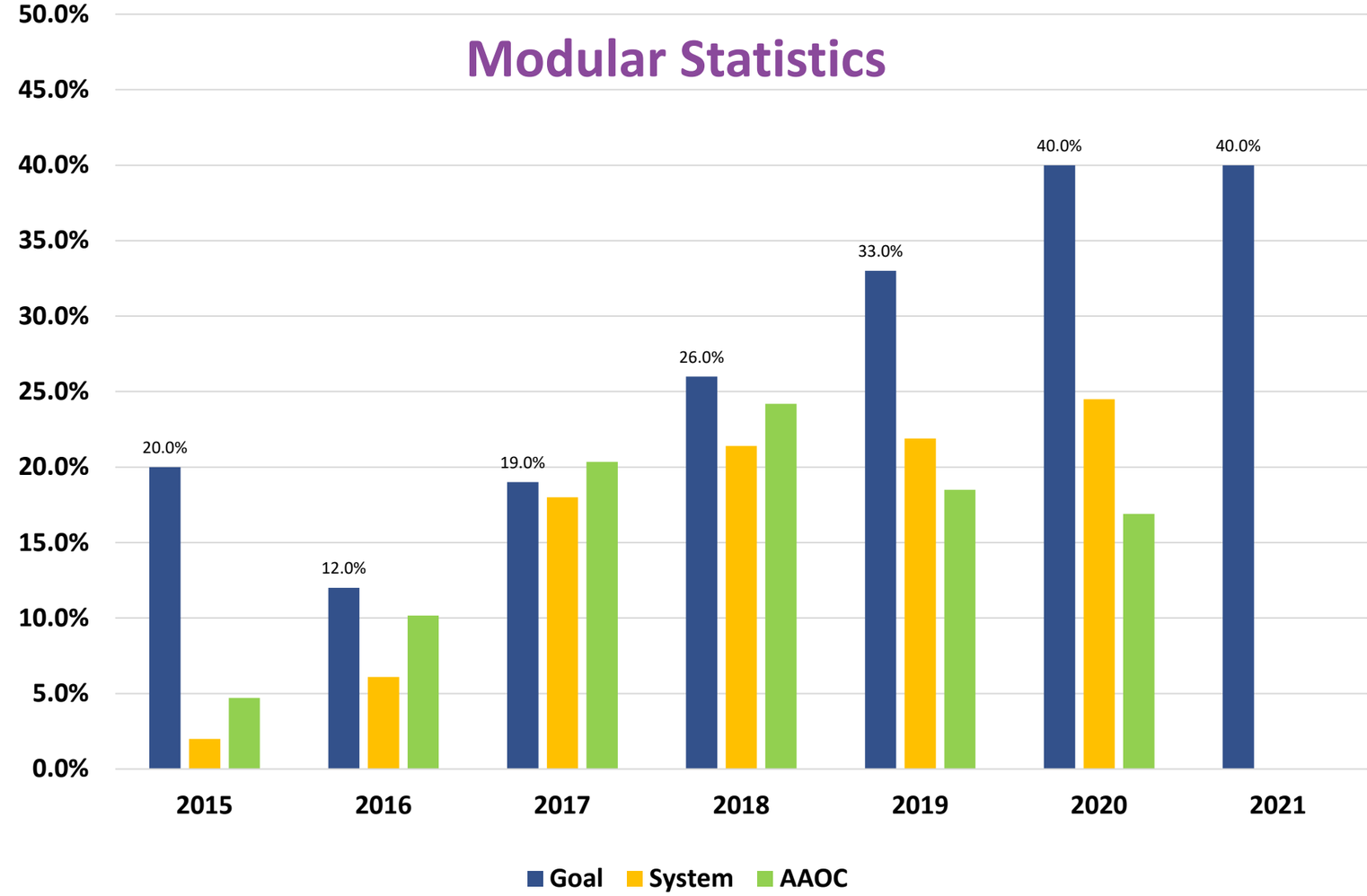
Amy Marks, Queen of Prefab

Autodesk

Amy.Marks@Autodesk.com

© LEAN CONSTRUCTION INSTITUTE

PAST: AAH Outpatient Collaborative (AAOC)

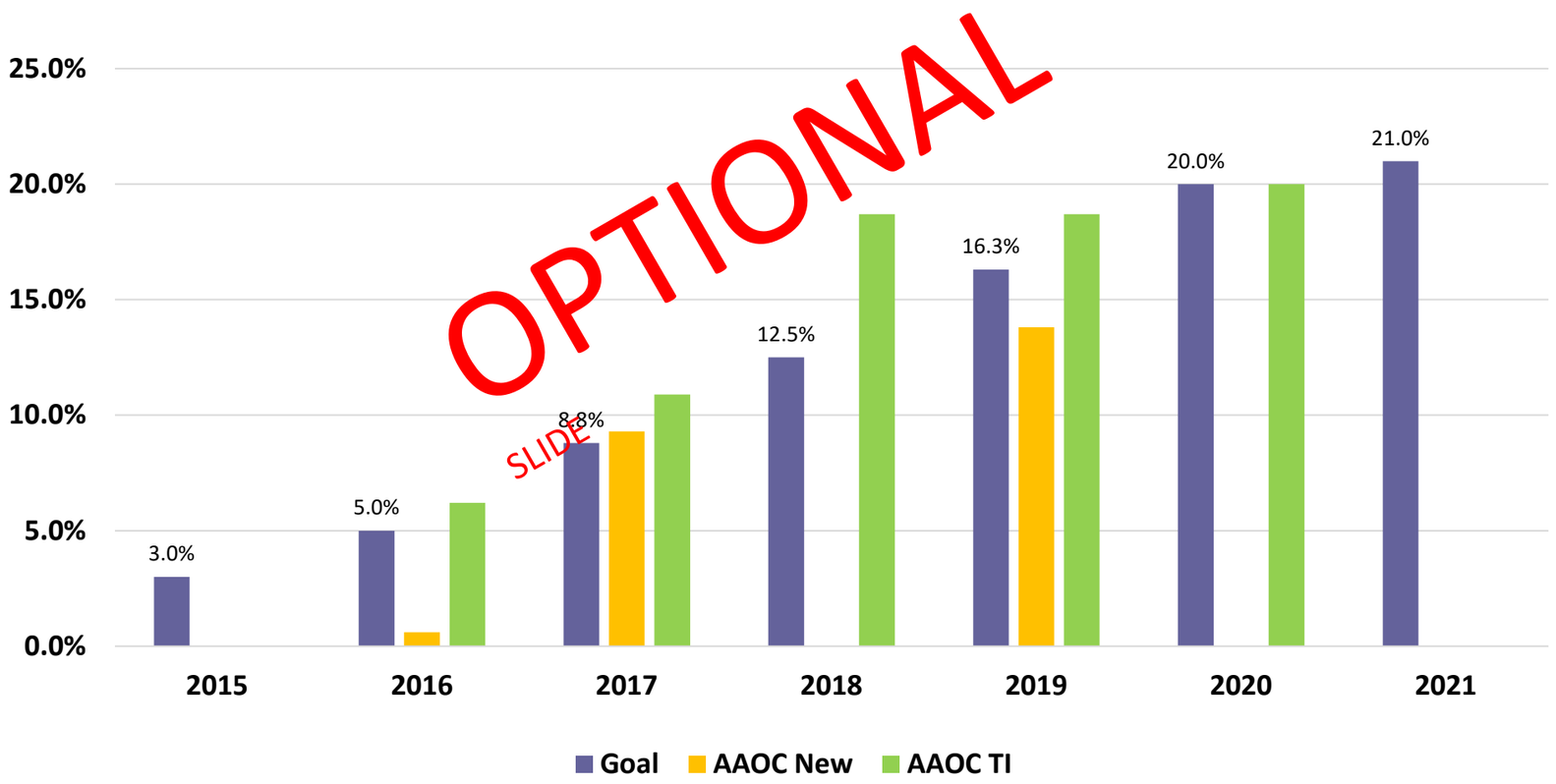


PAST: Reduced AAH Capital Spend

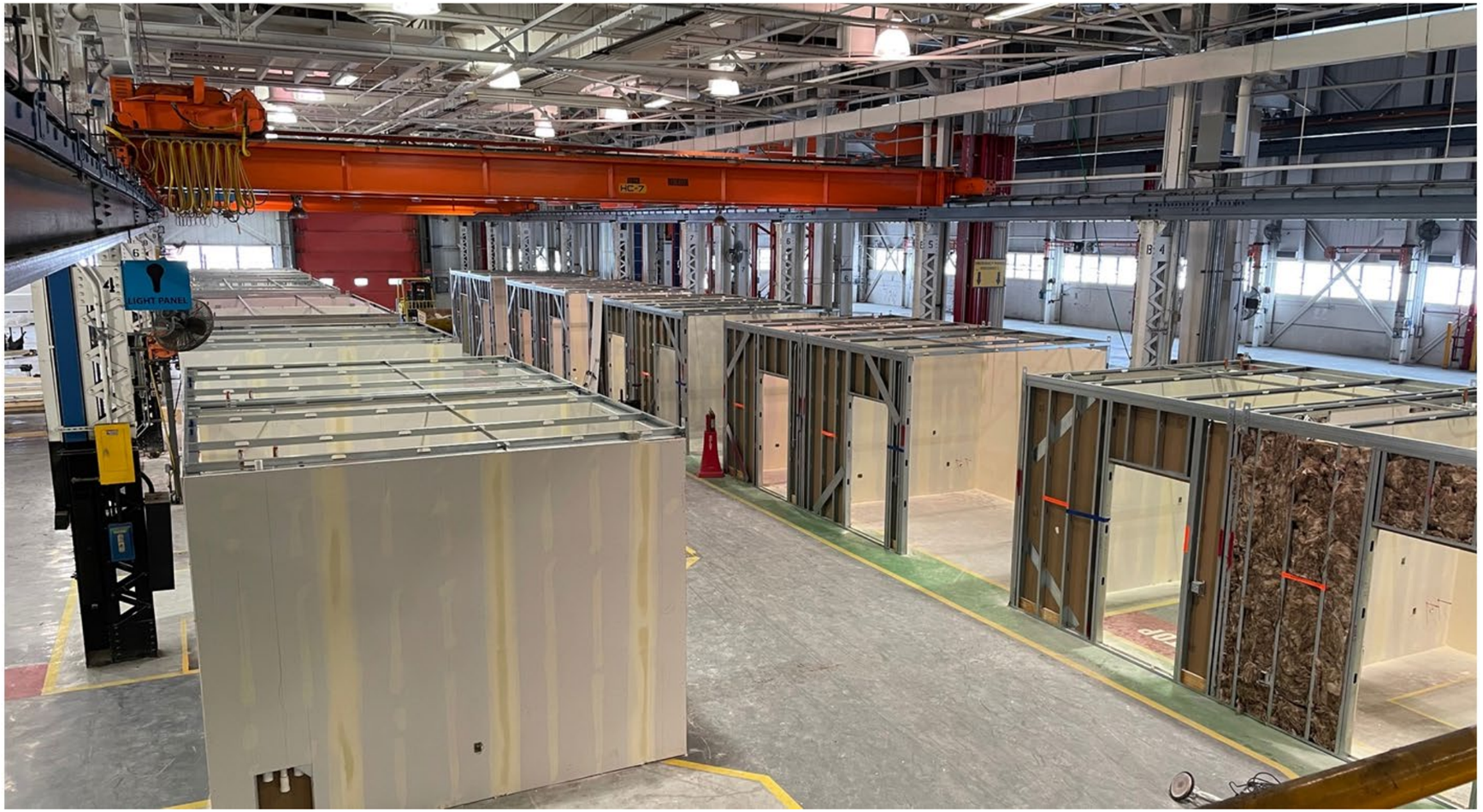


ILPD Savings
20% Reduced Capital Construction by 2020

OPTIONAL SLIDE



CASE STUDY: Clinic Modules in Prefabrication



© LEAN CONSTRUCTION INSTITUTE

CASE STUDY: Multi-Room Pods Preparing for Transit





© LEAN CONSTRUCTION INSTITUTE

CASE STUDY: Delivering and Staging Modules







© LEAN CONSTRUCTION INSTITUTE