

Enhanced Workflows to Successfully Implement BIM 360 Ops - CS322863

Michael Zeppieri, Danielle O'Connell and Lisa Neal

Skanska Innovative Construction Solutions





About the speaker

Michael Zeppieri (No One)

As a change agent in our legacy industry of construction, Michael is actively driving Skanska's innovation and digitalization strategy. Michael holds a Bachelor of Science (BS) degree in Engineering Management from West Point and dual Master of Business Administration (MBA) and Construction Management (MS) degrees from MIT. He previously held operations and IT management positions while at Boeing, and US Army active duty leadership positions as a combat Engineer platoon leader, executive officer and general's aide.

“A man needs a unique asset name.”



About the speaker

Danielle O'Connell (Wildling)

As Senior Manager for Skanska's Innovative Construction Solutions team, Danielle brings over 10 years of both BIM/VDC and project management experience to the team. Her focus has been on the integration of new technologies into design and construction processes, both as a CM/GC and as an Owner. Danielle holds a Bachelor's Degree in Architecture and Design from the University of Massachusetts, Amherst.

“You know nothing about Enhanced Turnover.”



About the speaker

Lisa Neal (A Girl)

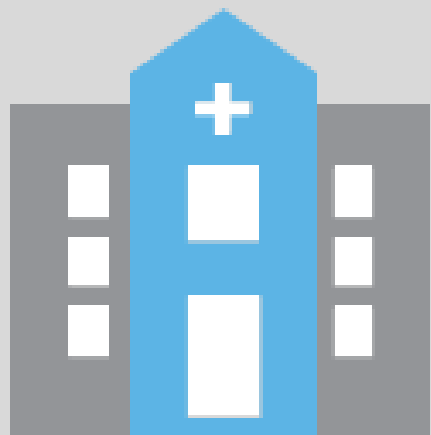
As a VDC Engineer for Skanska's Innovative Construction Solutions team, Lisa is focused on delivering value-add services to project teams and clients throughout the country. Our key services include BIM, Asset Management, Reality Capture, AR/VR, Aerial Photography, and more. Lisa has worked with Skanska for five years, using Autodesk tools daily for the past two years.

“What do we say to the incomplete COBie spreadsheet?”

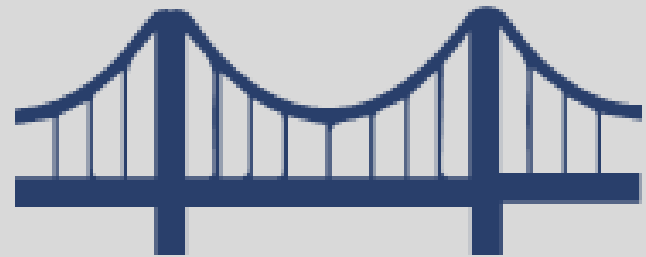
“NOT TODAY!!!”

Skanska USA

3 business units



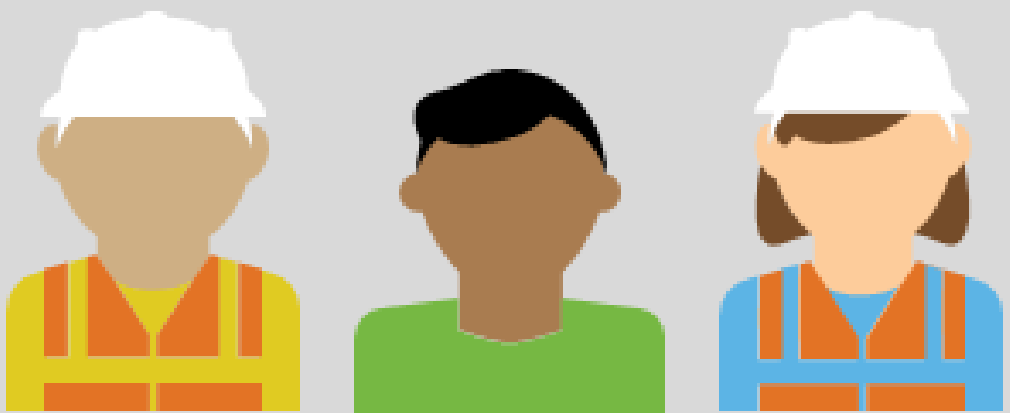
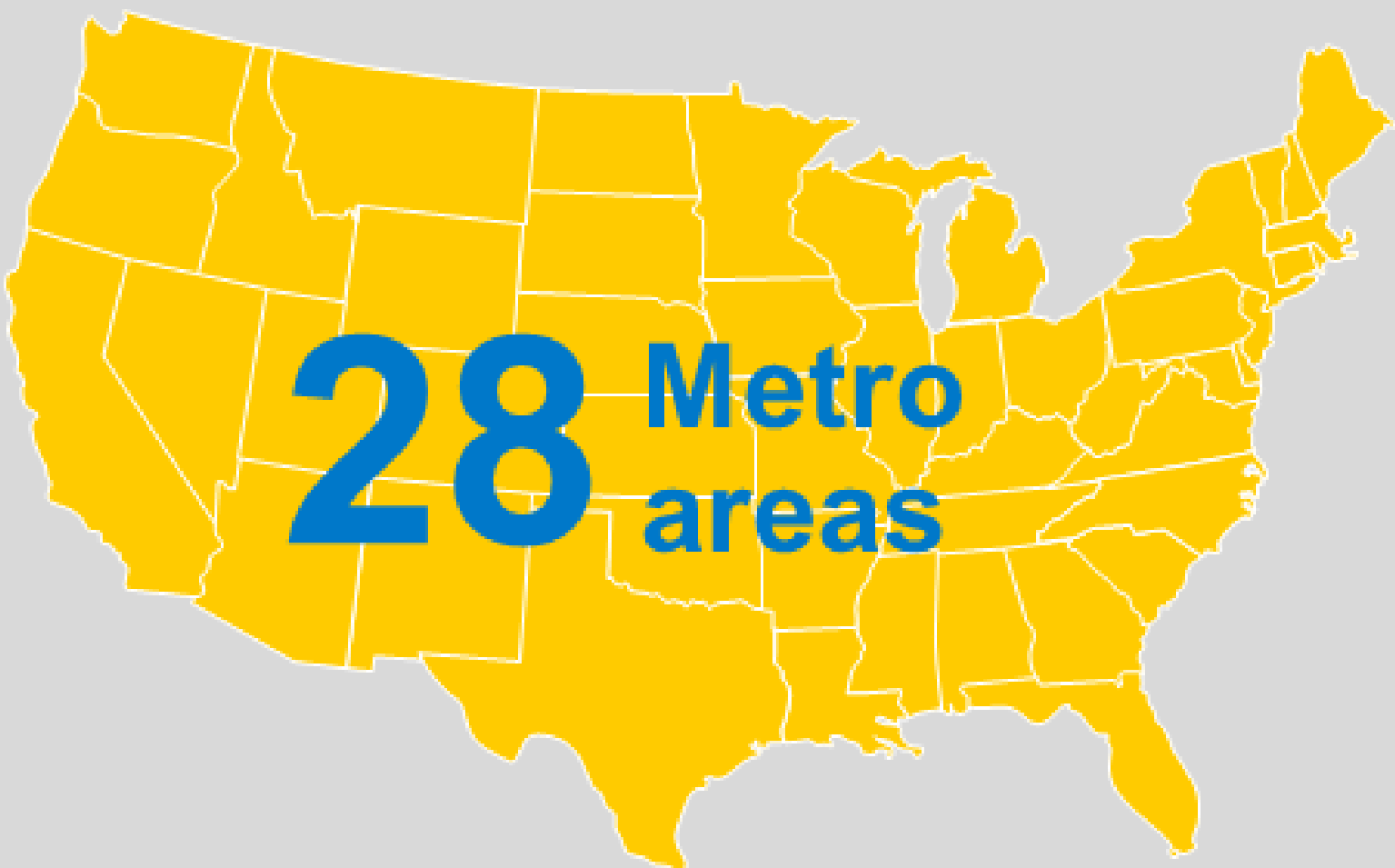
Building



Civil



Commercial Development



9,000
employees

\$3M

annual
community
investment



\$8.1B

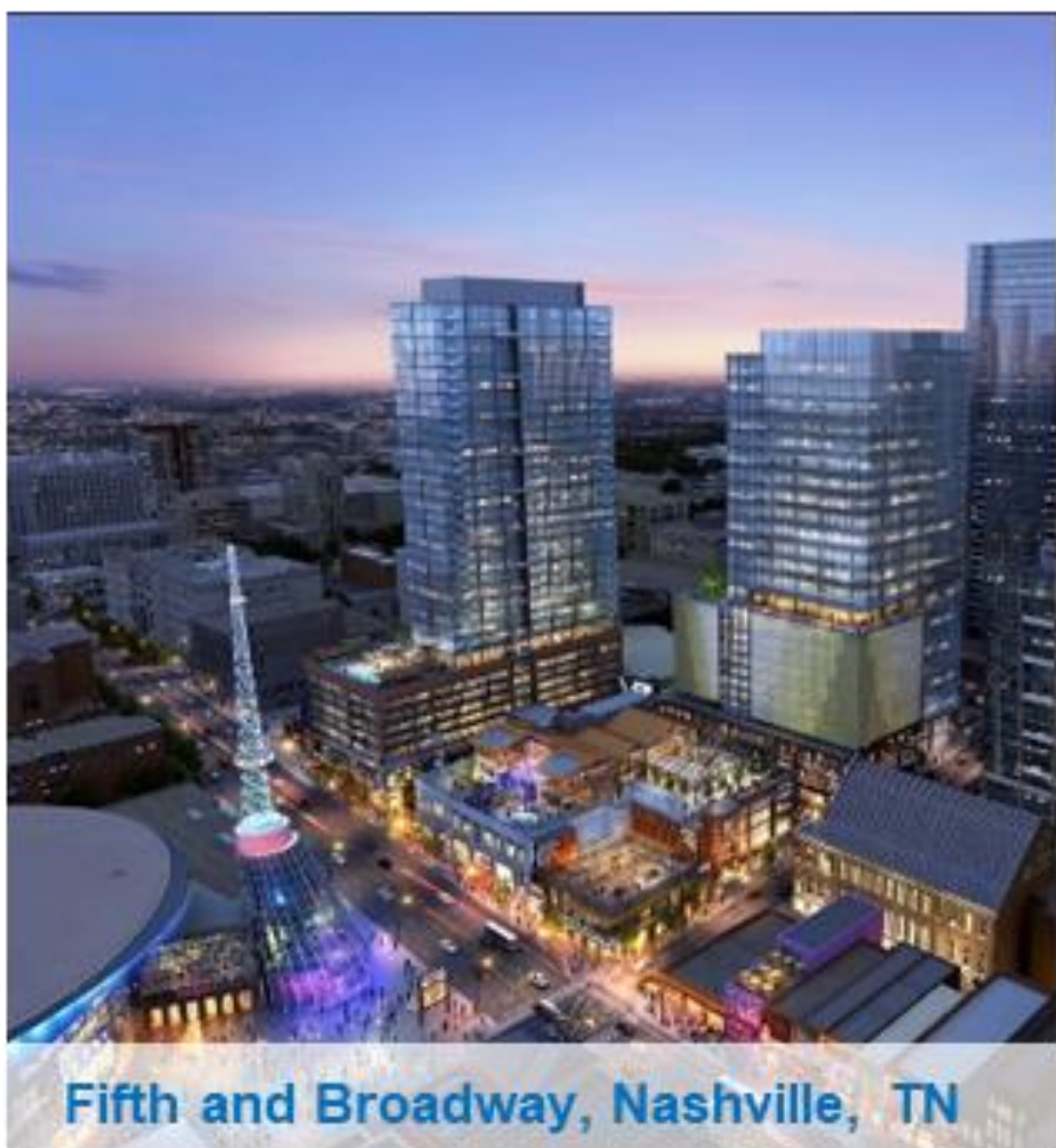
in 2018 revenue



Notable Projects



LaGuardia Airport Terminal B Redevelopment, New York, NY



Fifth and Broadway, Nashville, TN



George Washington Bridge, New York, NY



Bank of America Tower, Houston, TX



Moynihan Train Hall, New York, NY



Florida Polytechnic University, Lakeland, FL



2+U, Seattle, WA



The Westside Subway, Los Angeles, CA



Portland International Airport (PDX) Concourse E Extension, Portland, OR



Expo Line, Los Angeles, CA

Enhanced Workflows to Successfully Implement BIM 360 Ops - CS322863

Course Description

Learn how Skanska USA Building's Innovative Construction Solutions (ICS) Services Team implements BIM 360 Ops software for its clients by proactively managing the aggregation of building asset data throughout design, construction, and project turnover. During design and construction, project teams capture a wealth of asset data that is incredibly valuable to an owner's facility maintenance, space, and operations management processes. Postconstruction, customers may lack the time, expertise, or resources to use this turnover data, leading to ineffective interim solutions, increased operational costs, delayed work order resolution, and frustrated building occupants. In this class, ICS Team members will share lessons learned and workflows for implementing BIM 360 Ops using Revit software, Navisworks software, BIM 360 Glue software, BIM 360 Field software, and Bluebeam. The team will also share its expansion and exploration of complementing technologies such as Matterport and API integrations with Building Management Systems (BMS).

Learning Objectives

Working with Data

Different workflows for aggregating and building your digital asset database

As-builts

Leverage complementary technologies like Matterport to expand the definition of what constitutes “as-built” drawings

Planning & implementation

Understand the planning conversations you need to have with owners and design teams around asset and space naming schemas to successfully implement BIM360 Ops

Tailoring BIM360 Ops to meet specific client needs and challenges

The Problem



The Problem

I don't have a fully functional, operationally ready work order management system at building turnover



How do I digitize my preventative maintenance institutional knowledge, discipline and accountability?



Facility management data not consolidated in one place, making it difficult to identify trends or triage systemic problems



O&M manuals, checklists and other relevant documents not easily accessible from the field when performing maintenance operations



We need to improve communication and increase responsiveness between tenants and facility management staff



Working with Data



Data Use Across Building Lifecycle

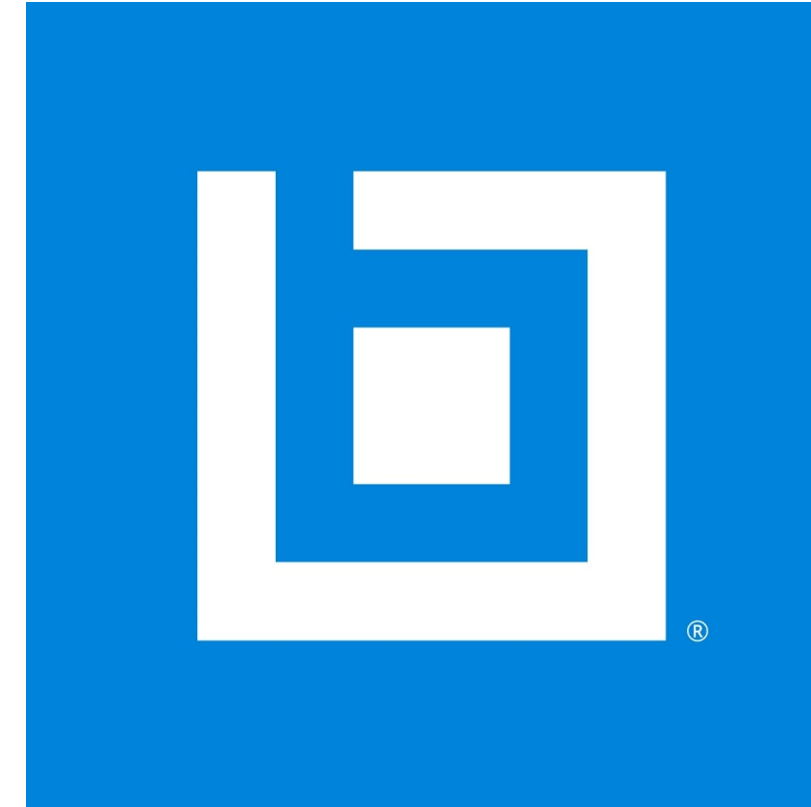


Data is Cool

**“Data is a precious thing
and will last longer than
the systems themselves.”**

– Tim Berners-Lee, inventor
of the World Wide Web





Data Collection

- The first step requires collecting and compiling of project documents containing Asset Data.
- Examples include 100% CD equipment schedules and specs, as-built drawings, product data submittals, and closeout files such as O&M and warranties.

Data Conditioning

- Organization is critical. Our workflow uses Bluebeam Revu as a shared workspace.
- An intuitive folder structure and a master equipment matrix is maintained and later reformatted as equipment records for import into BIM 360 Field.

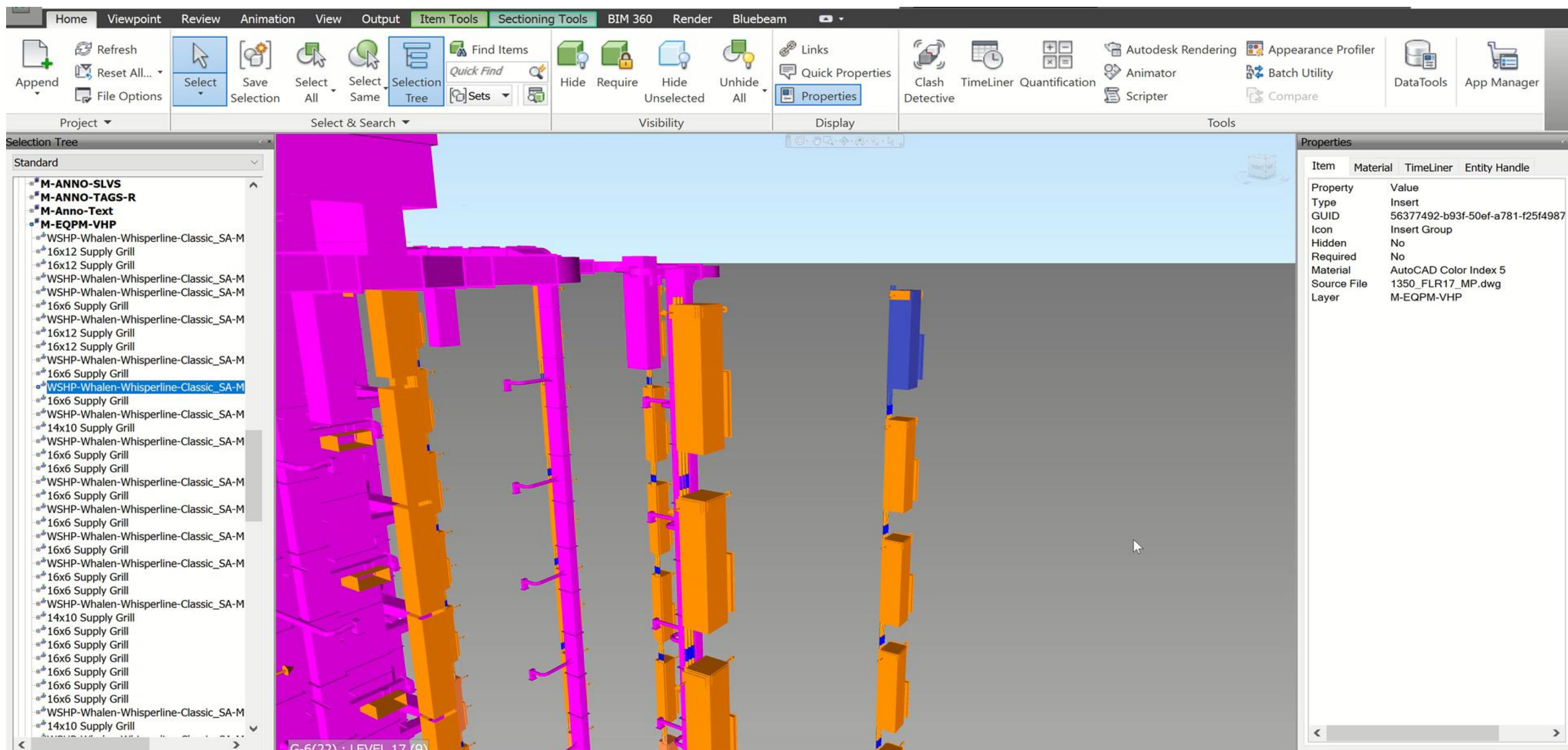
Challenges

Models can be **CONFUSING**

- Time-Consuming, Reactive Workflows
- Missing Parameters
 - Requires manual data entry by object
- Missing Geometry
 - Results in lost time searching for non-existent objects
- There are two options:
 - Design cheap – maintain expensive
 - Design expensive – maintain cheap



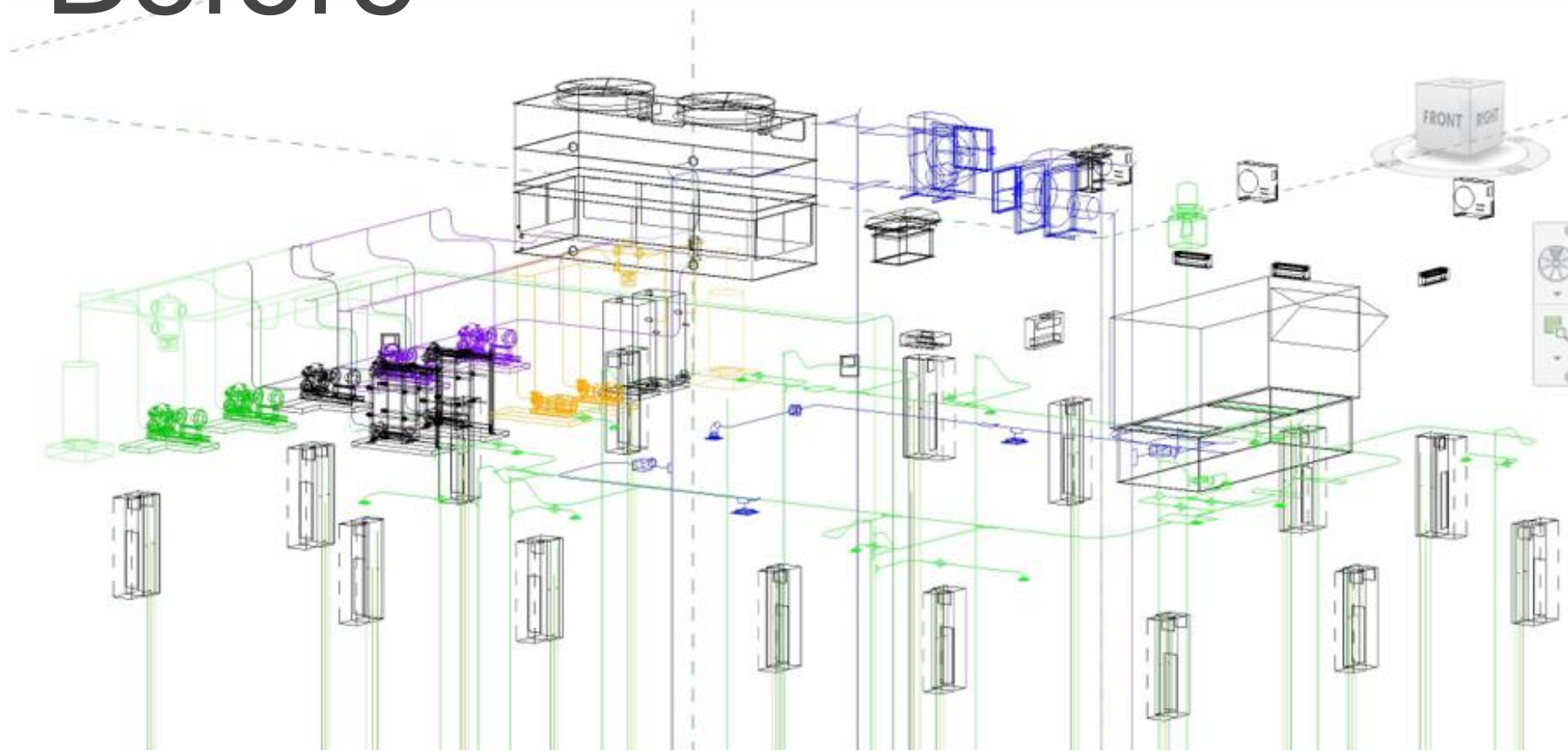
The Pains of Manual Data Entry



Facts & Numbers



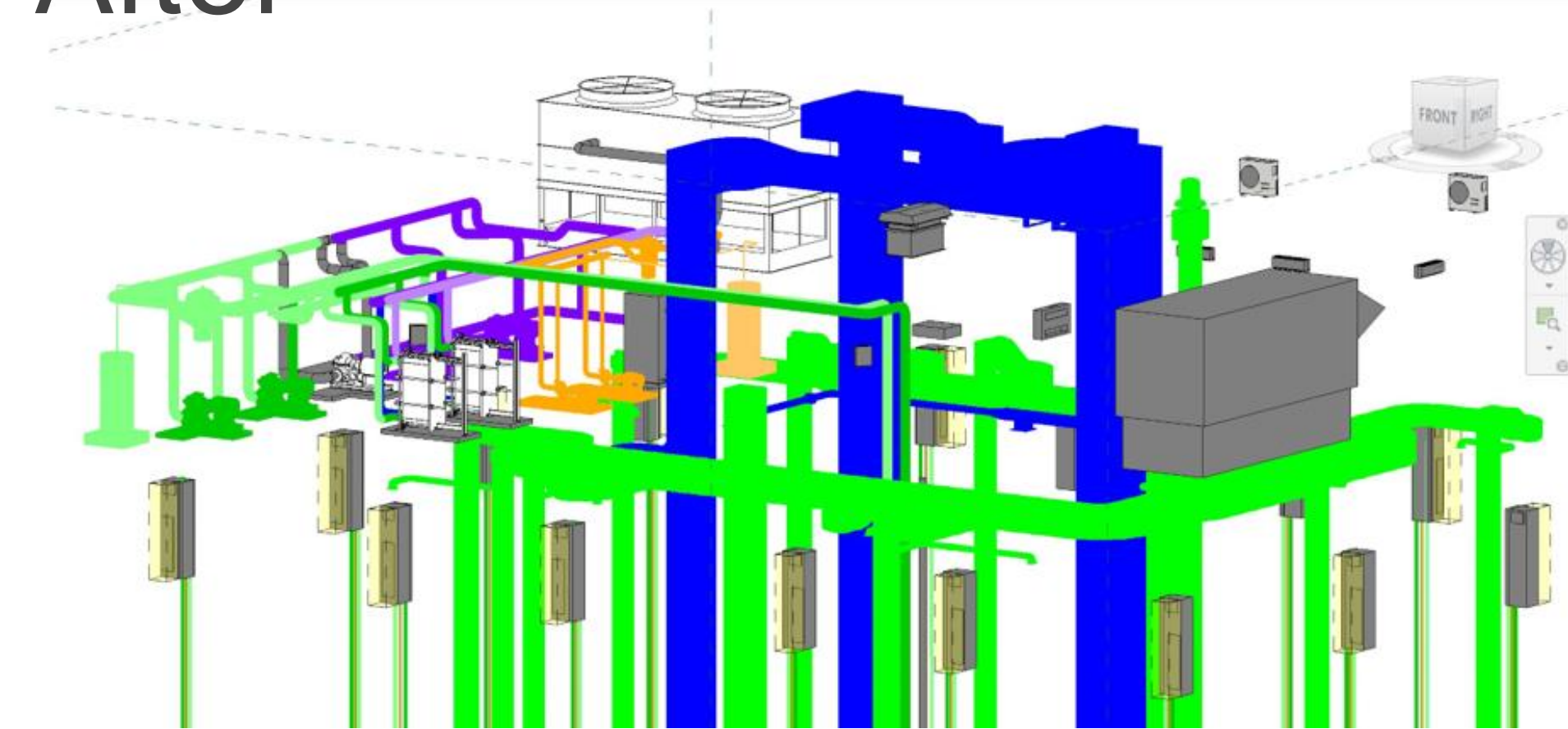
Before



Revit → Navisworks

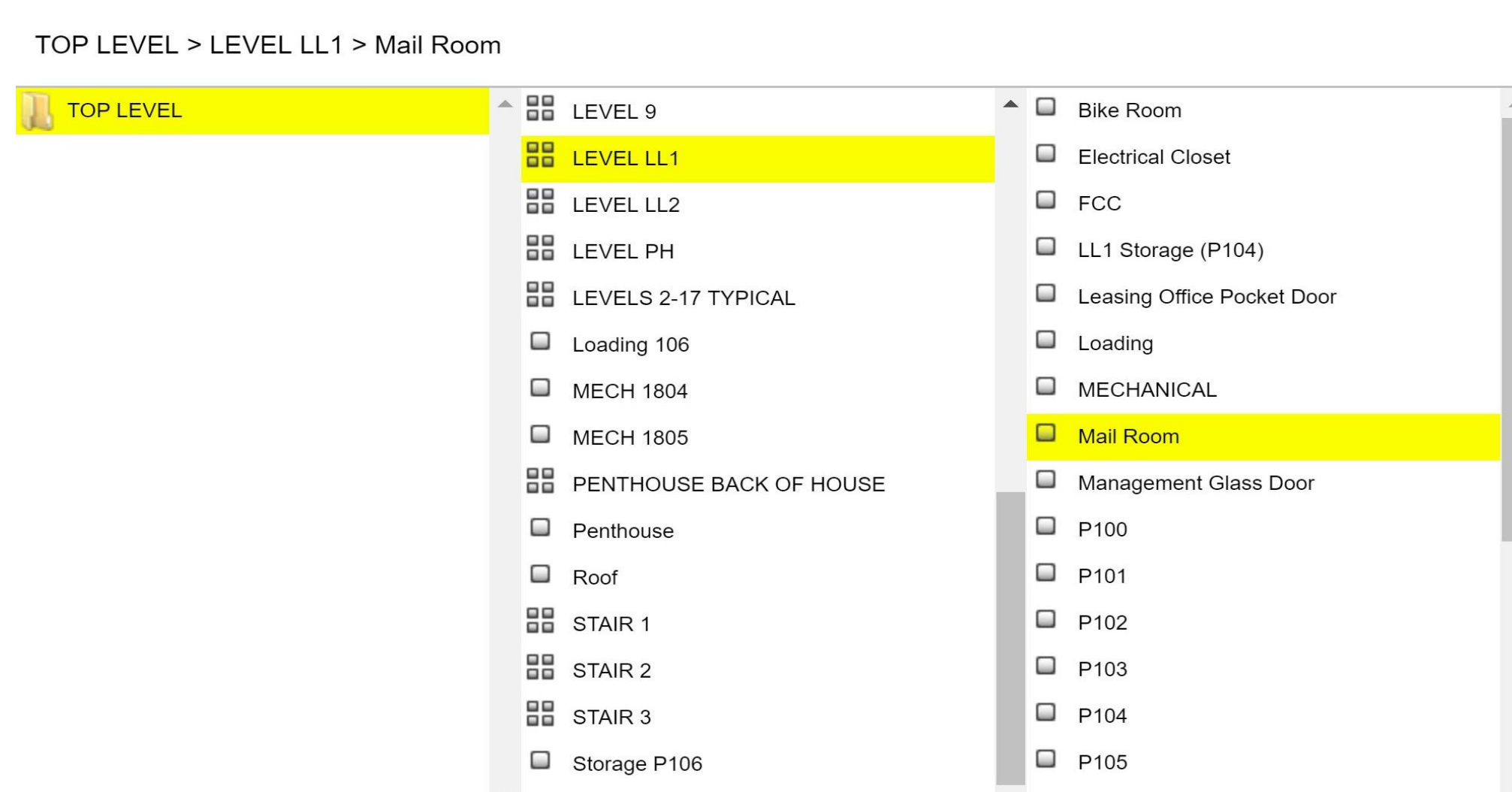
- Most clean up and preparation takes place in Revit.
- Our workflow prefers changing defaults to fine lines and consistent colors.
- Federating models by trade and/or floor is done in Revit before export to Navisworks.

After



Navisworks → BIM 360 Glue

- Choosing Navisworks versus Glue depends on preference. We chose to add data and create equipment sets in Navisworks.
- Reorganizing equipment into sets does not permit batch mapping in Field but it does provide some additional filter options for an organized mapping session.



Add Locations & Equip Types

Project setup in BIM 360 Field requires establishing a

- location hierarchy
- adding custom categories and equipment types
- assigning standard and/or custom properties to those types



Add Model from BIM 360 Glue

- Add the model from BIM 360 Glue. Import It may take several minutes depending on the LOD and file size.
- By default, no equipment will be mapped, whether equipment sets are created in Navisworks or Glue.

Mapping Equipment in BIM 360 Field



Implementation



Project Plan

PHASE 1

PROJECT KICKOFF

Define expected outcomes, project Conditions of Satisfaction, naming conventions, points of contact, meeting schedule and project milestones.

PHASE 2

DEFINE WORKFLOW

Develop process map for typical Work Order process from ticket inception to completion. Discuss reactive (occupant ticket) vs. proactive (PM) workflows and tasks.

PHASE 3

DATA AGGREGATION

Confirm data needs, collect attribute information, and migrate (and test) building/location, asset, contact, preventative maintenance, operation data, etc..

PHASE 4

STARTUP

Workflow and data testing, user guide development and training, building occupant communication and Ops launch.

Client Engagement

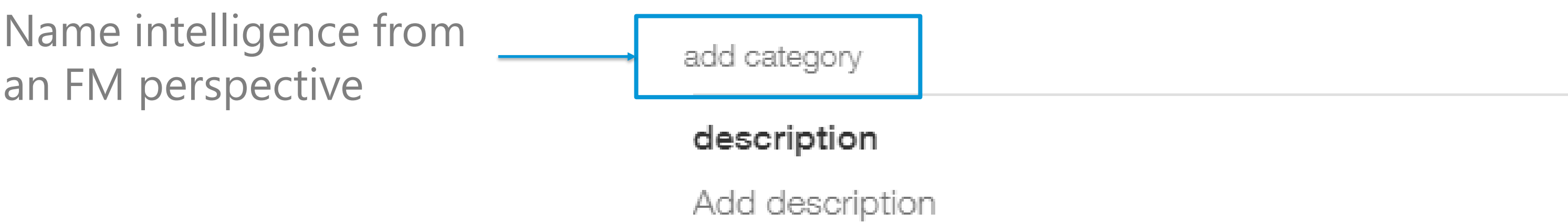
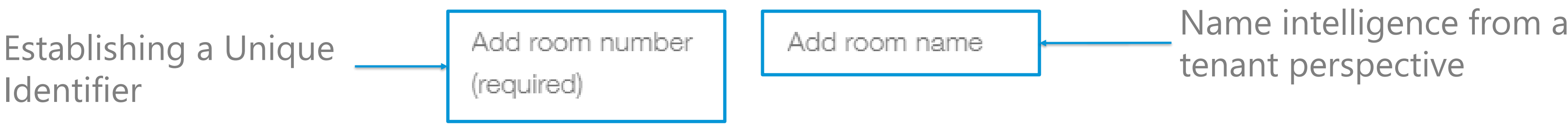
Conditions of Satisfaction

- Develop a working relationship between the client and the Autodesk BIM360 Ops product team
- Single sign on
- Positive outcome and a repeatable process we can replicate at other facilities
- Leverage expertise of the team



Space Naming

A Space Naming schema is a balance of:



Venetian
Building

4
Floor

-

204
Number

A
Other

barcode / QR code	floor
Add >	None (required) >

Asset Naming

An Asset Naming schema is a balance of:

- Establishing a Unique Identifier
- Name intelligence from the perspective of Managers and Technicians

UniqueID (can have intelligence or not)

AEF--

Add description (required)

Description
(for your Managers and Technicians)

Category (to help filter reports)

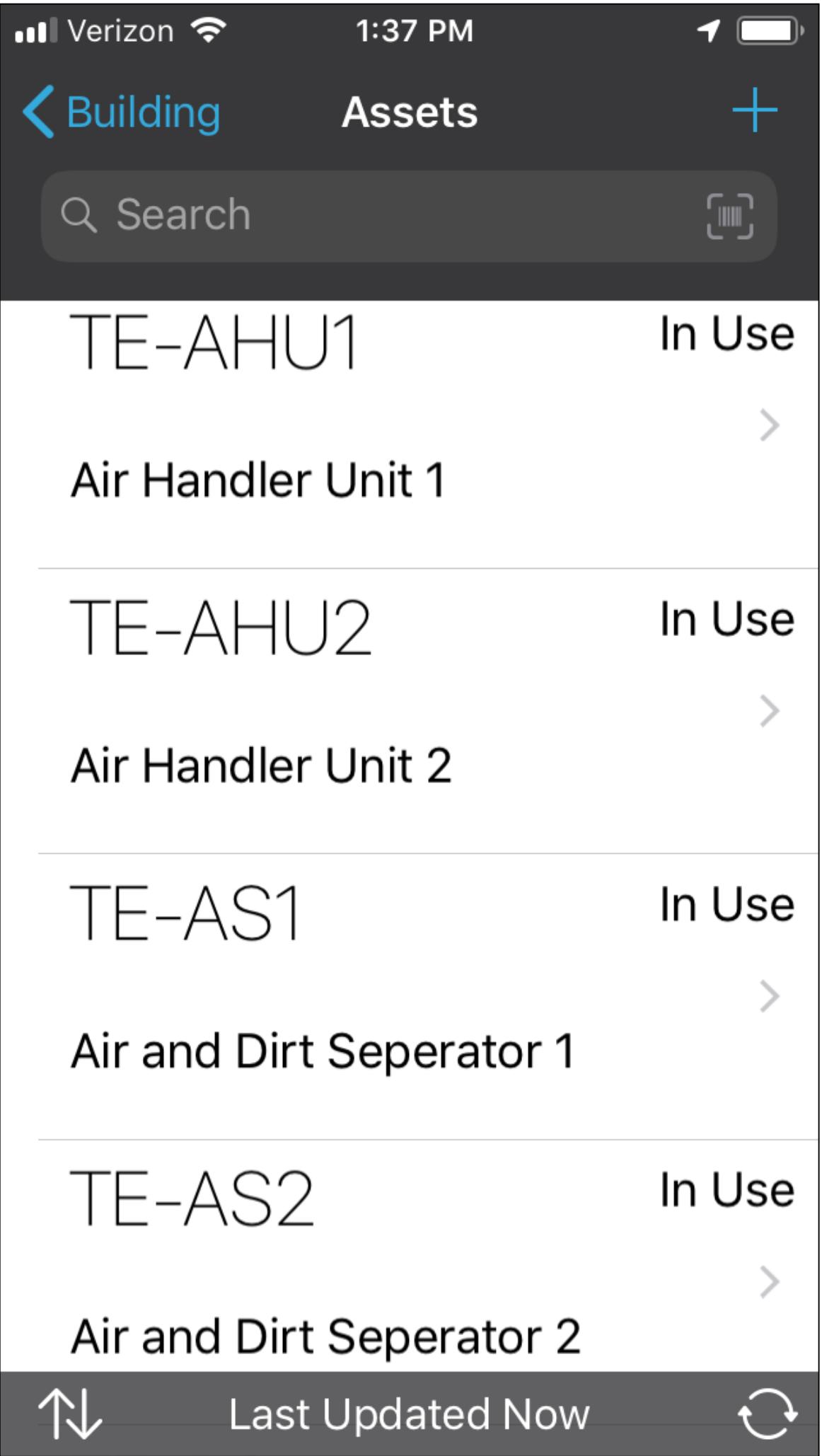
add category

barcode / QR code

Add >

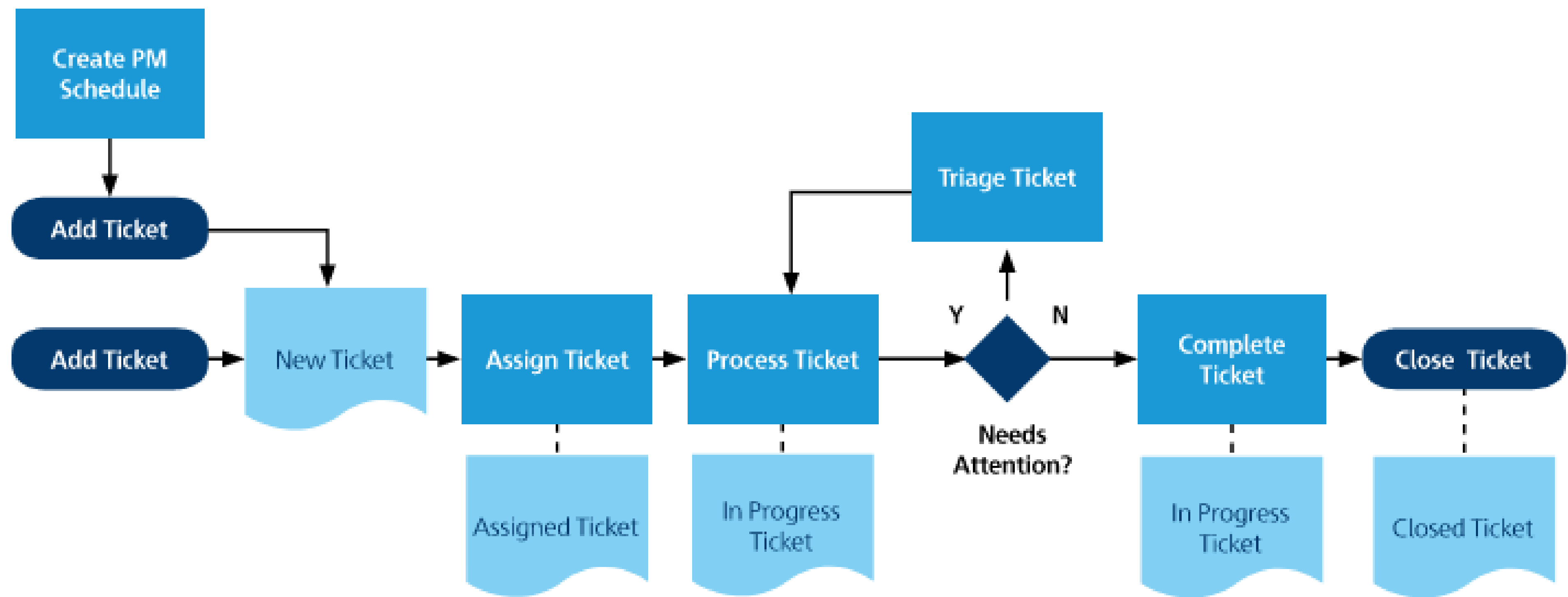
location

Add floor or room



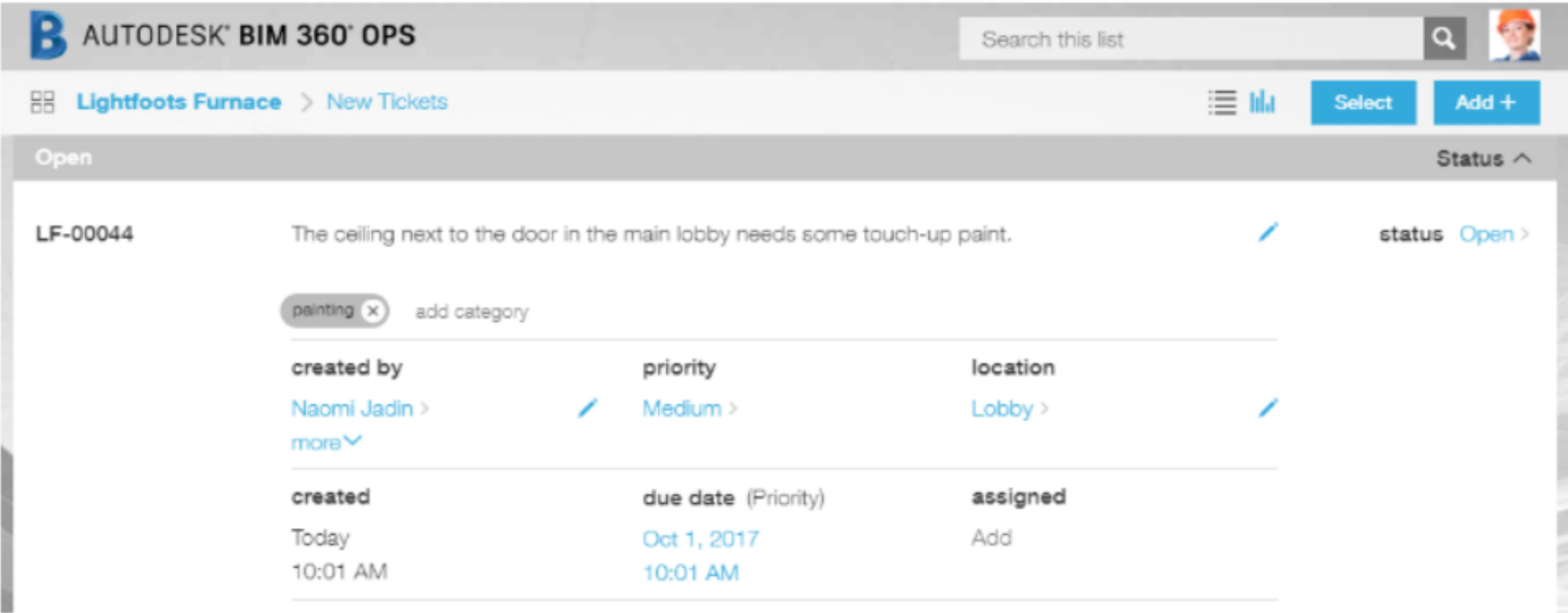
Workflow

Define Facility Manager and Occupant ticket creation and response process to drive best possible experience



Categories

- Review which categories will be used by the team and how
- Limit the list to 20 or less – what is really needed
- Configure Quick Tickets to apply Categories
- Consider SLAs and Category Groups





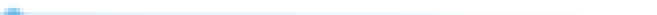
Using Categories

October 4, 2017
By Katie Murff | [Managing Tickets](#)

Roles & Responsibilities

Define permissions based on role:

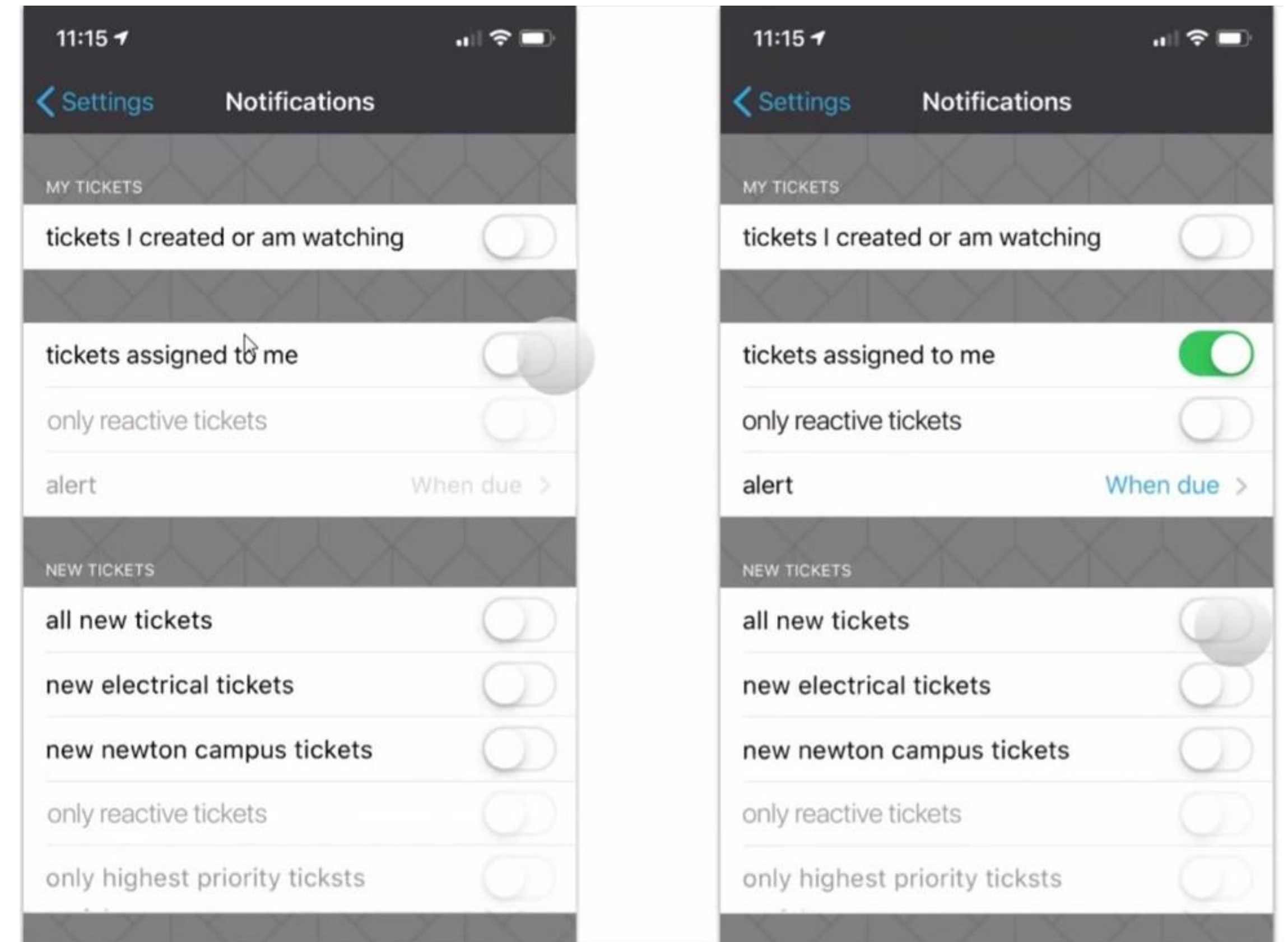
- Ticket creation
- Ticket assignment
- Add information to ticket
- Close vs. complete ticket

Task	Co-Owner	Manager	Technician	Vendor	Occupants
Add Ticket	✓	✓	✓	✓	✓
Assign Ticket	✓	✓	✓		
Edit Ticket: Priority	✓	✓			
Edit Ticket: Assets	✓	✓			
Edit Ticket: Assignment	✓	✓	* 		
Edit Ticket: Status	✓	✓	✓	✓	
Edit Ticket: Close Ticket	✓	✓			
Edit Ticket: Attachments/Comments	✓	✓	✓	✓	✓
View Submitted Ticket	✓	✓	✓	✓	✓
View Assigned Ticket	✓	✓	✓	✓	
View any ticket at level of assignment	✓	✓			
View any ticket across portfolio	✓				
Add Assets	✓	✓	✓		
Add PM Schedule	✓	✓			
Add Checklist	✓				
Create Contact	✓	✓			
Record Hours Worked	✓	✓	✓		✓

Facilities Team Notifications

Things to understand:

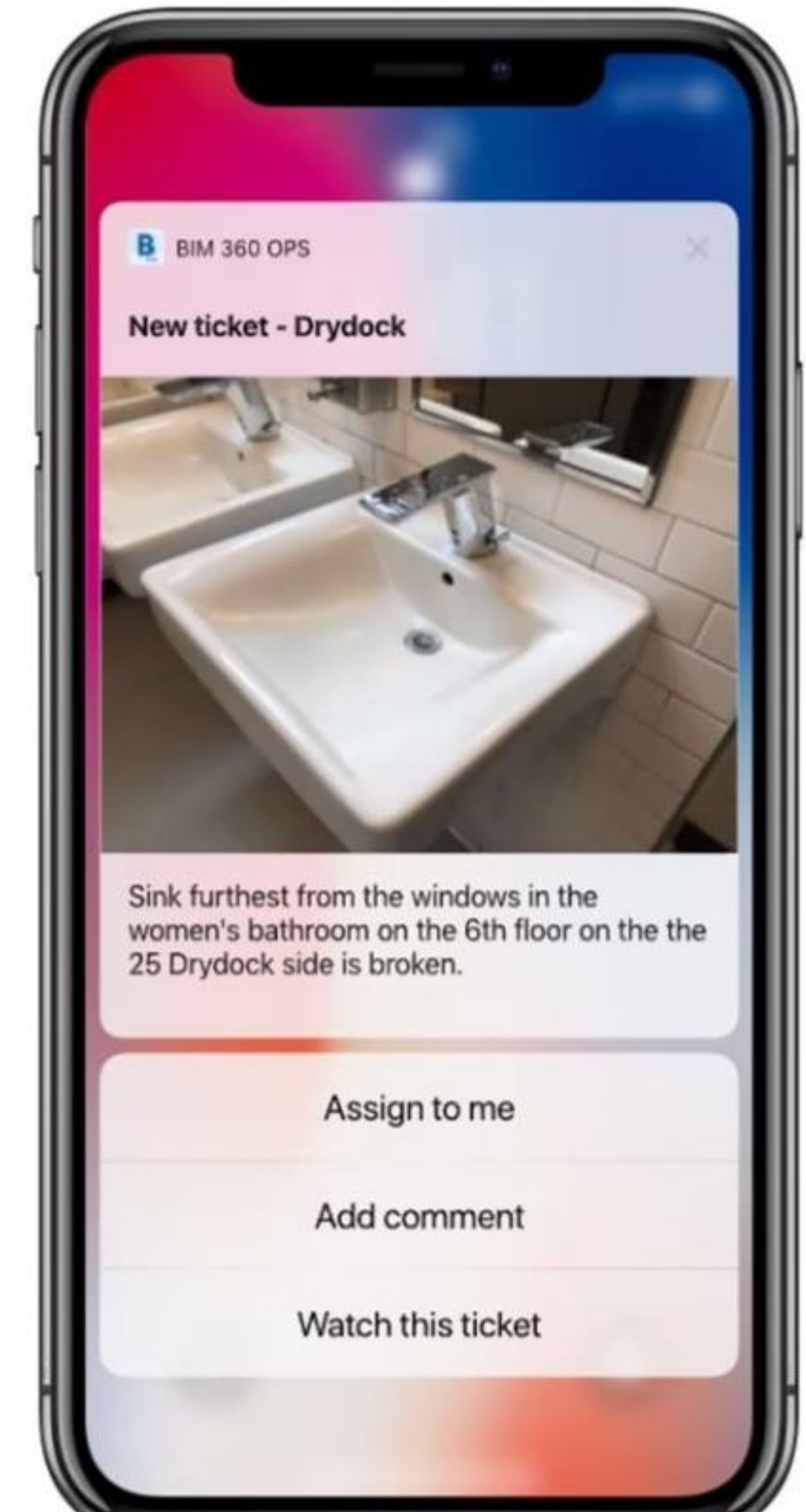
- Maintenance hub vs. team
- Managers vs. Technicians
- Mobile app vs. Mobile Chrome
- Push, Text, and Email Notifications



Occupant Notifications

Occupants are notified when:

- Their ticket is added
- Attachments or comments are added to their ticket
- View submitted ticket



Customization

- Custom checklists help Facility Managers perform critical tasks related to work orders and inspections.
- Attaching relevant documents such as O&M, warranties, and photos to their respective Asset records in Ops provides the FM with additional context during maintenance and inspection.

Revit and BIM 360 Field export code

[GENERATE EXPORT CODE](#)

checklists



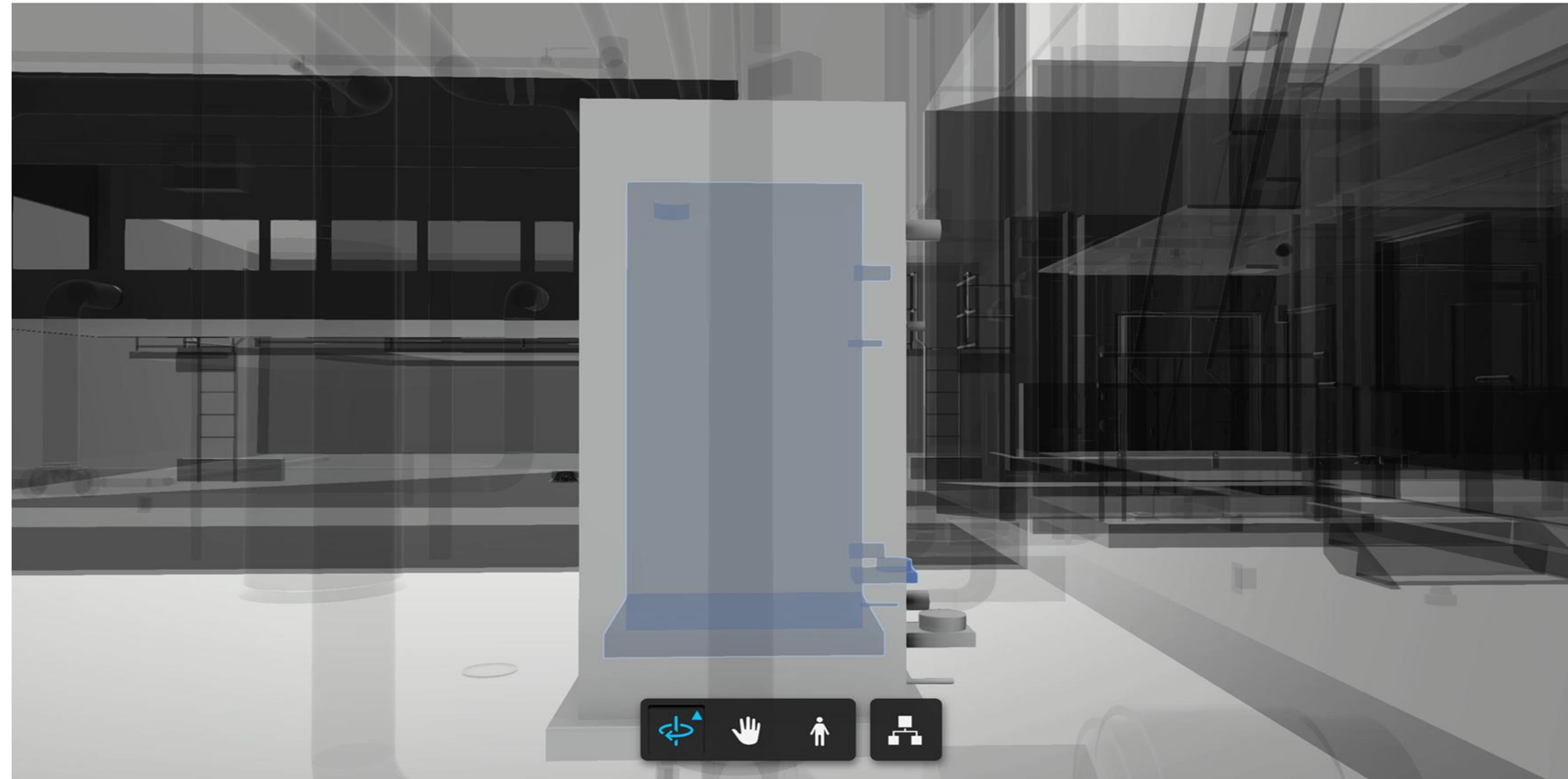
all assets



Testing 3D Views

- All the time and effort spent conditioning model elements for 3D-enabled views in Ops is put to the test here.
- Depending on the model's LOD, file size, and the number of mapped equipment records, the 3D views may take longer to load but should not exceed 2-3 minutes per view.

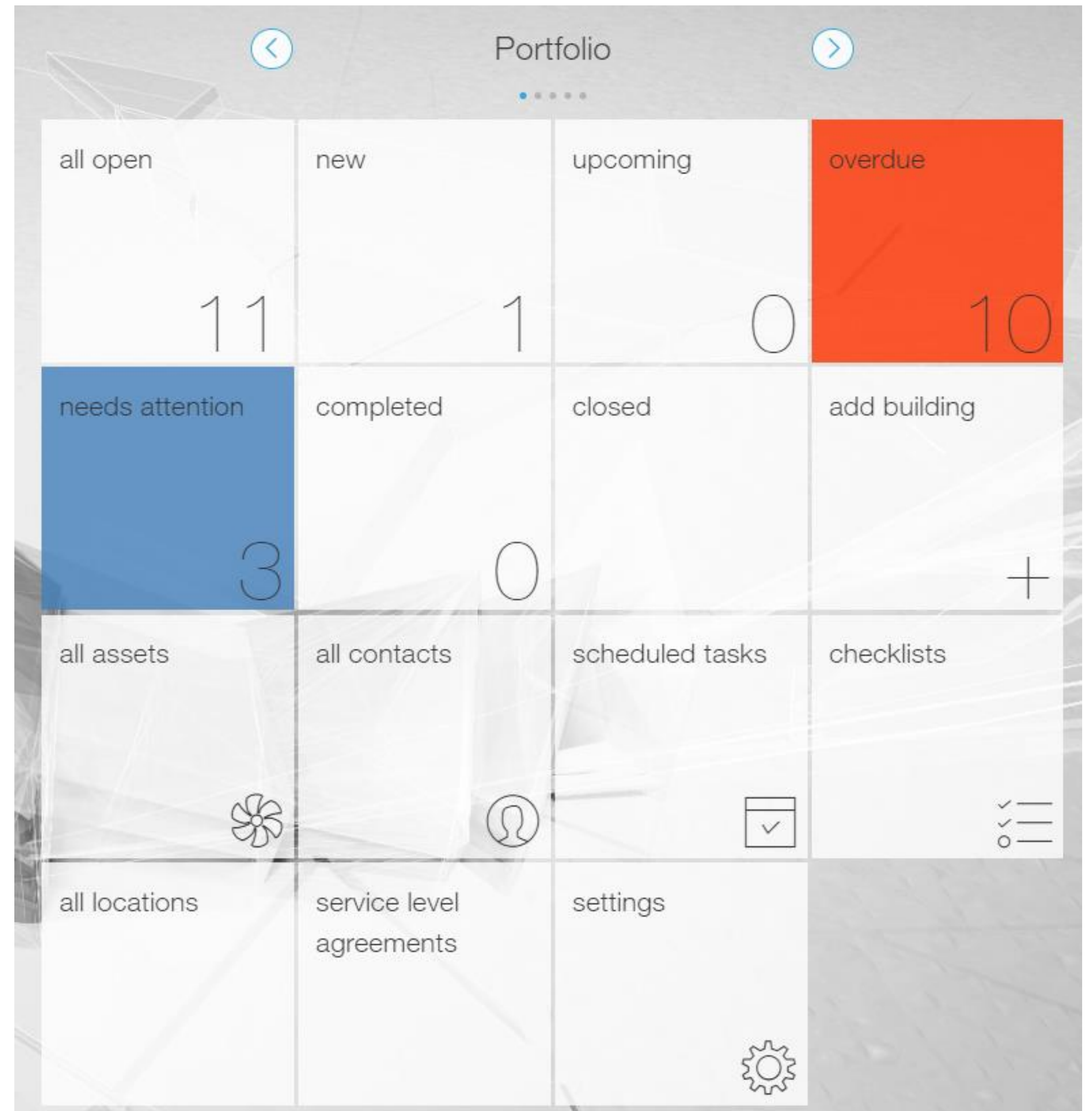
3D model



Reporting

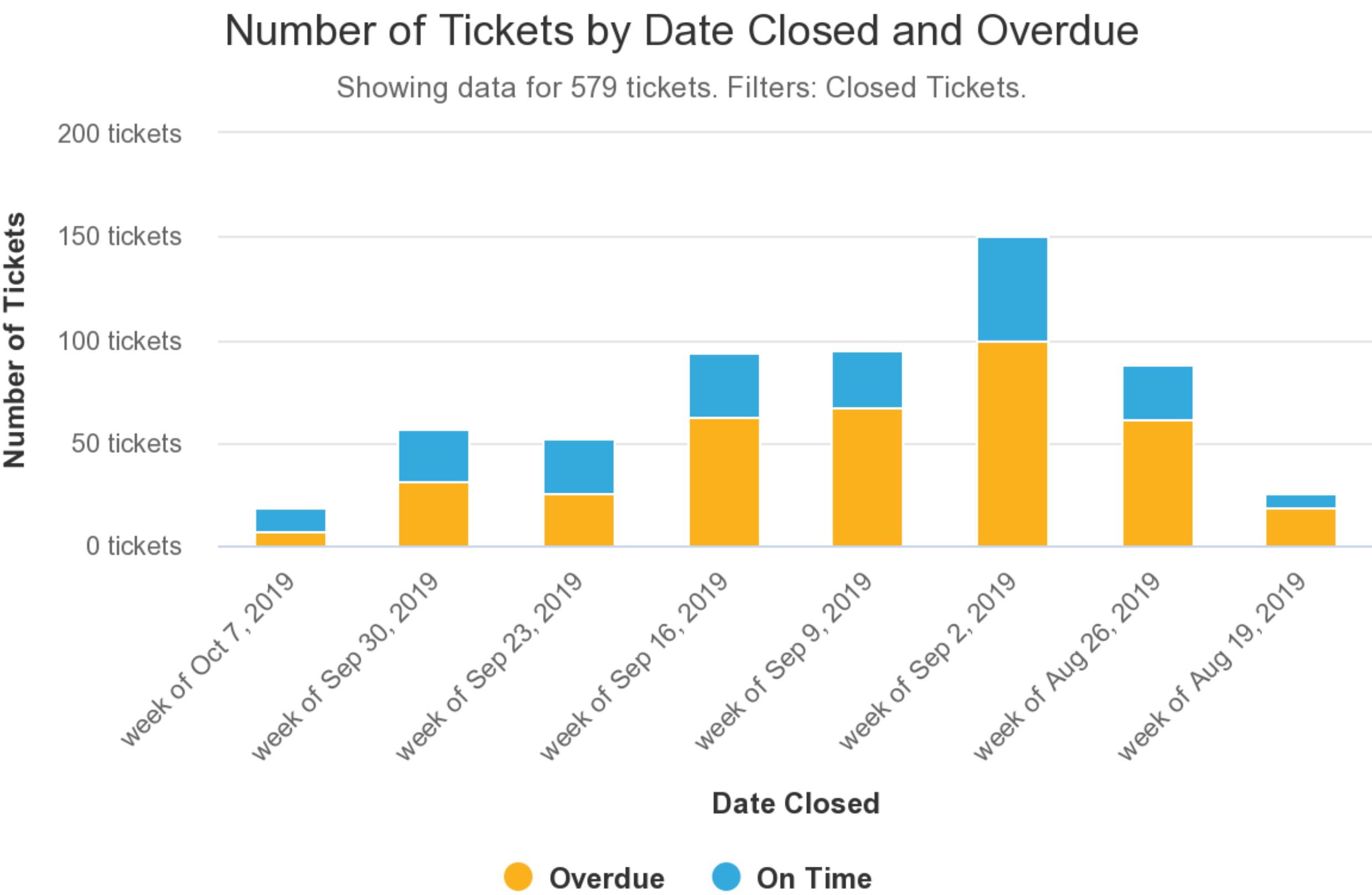
Could, at any given time, review the status of tickets

- Open Tickets
- New Tickets
- Overdue Tickets
- Needs Attention



Reporting

- Gained insights into demand patterns from your students, and your responsiveness to service levels
- This can inform your prioritization and triage strategy



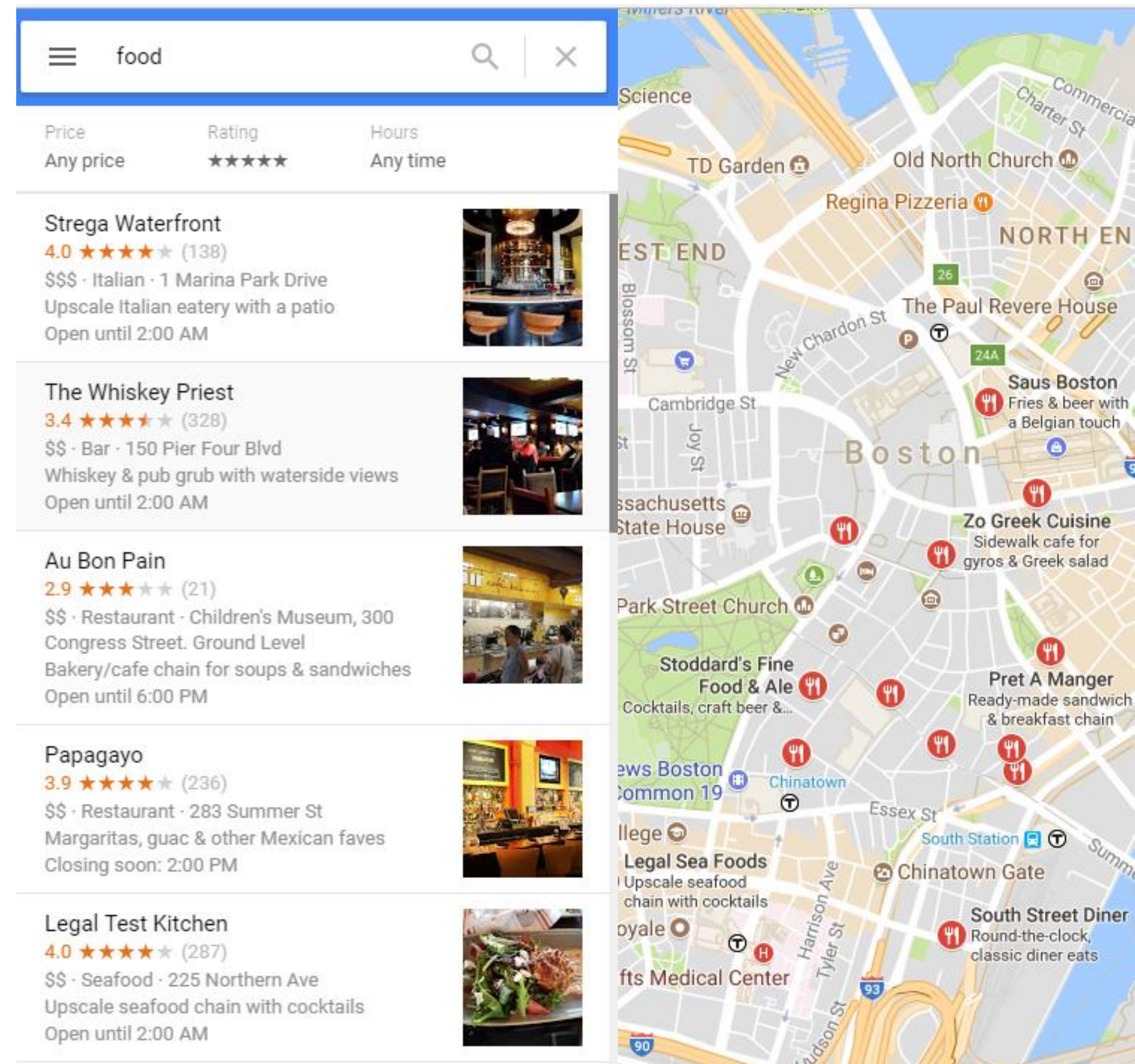
As-Builts



Where the Industry is Heading

Mapping Software Example

- Geometry and visualization as the primary interface
- Contextual information, pulled from numerous other systems through open APIs
- Filter, search and tailor information
- Actionable data

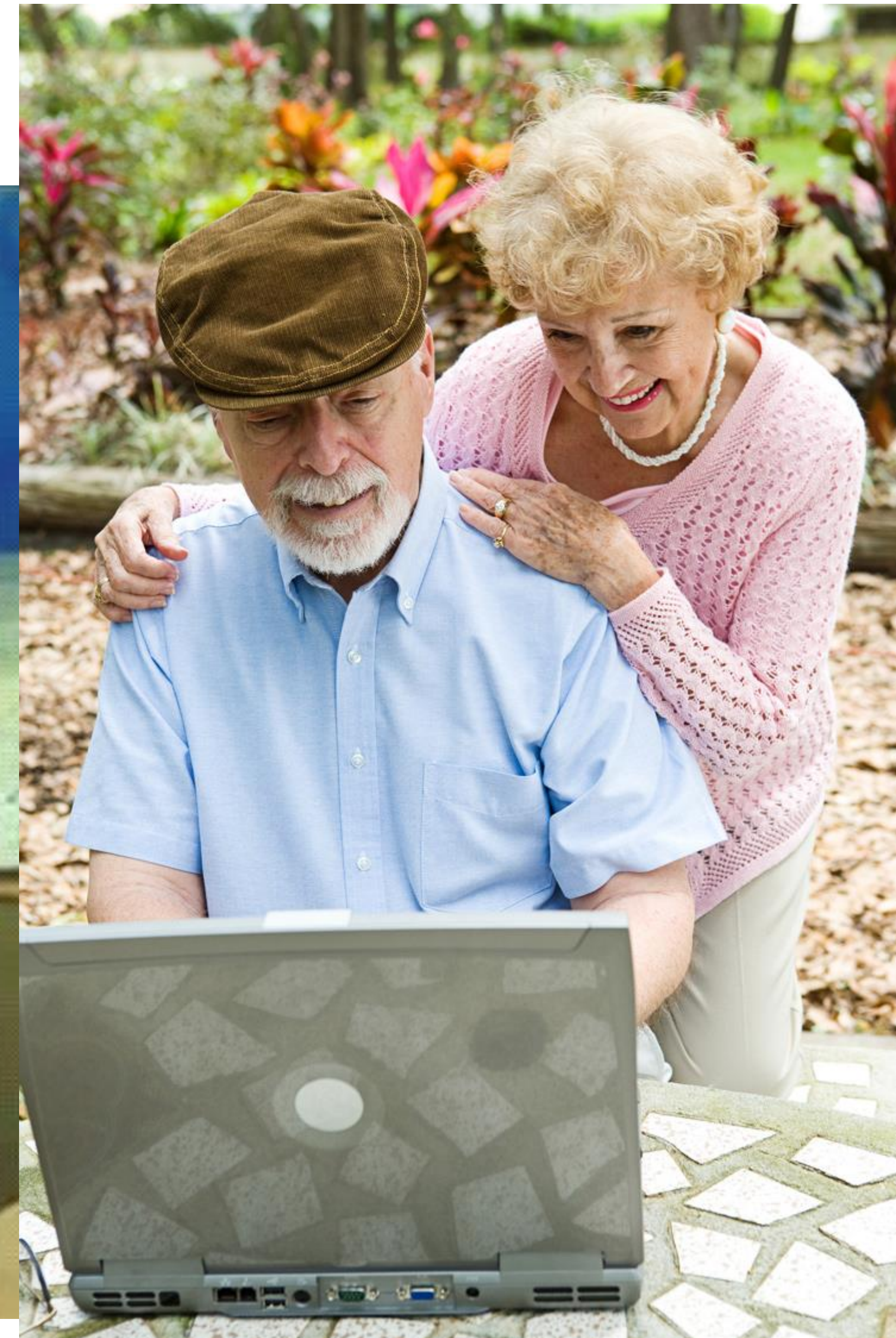




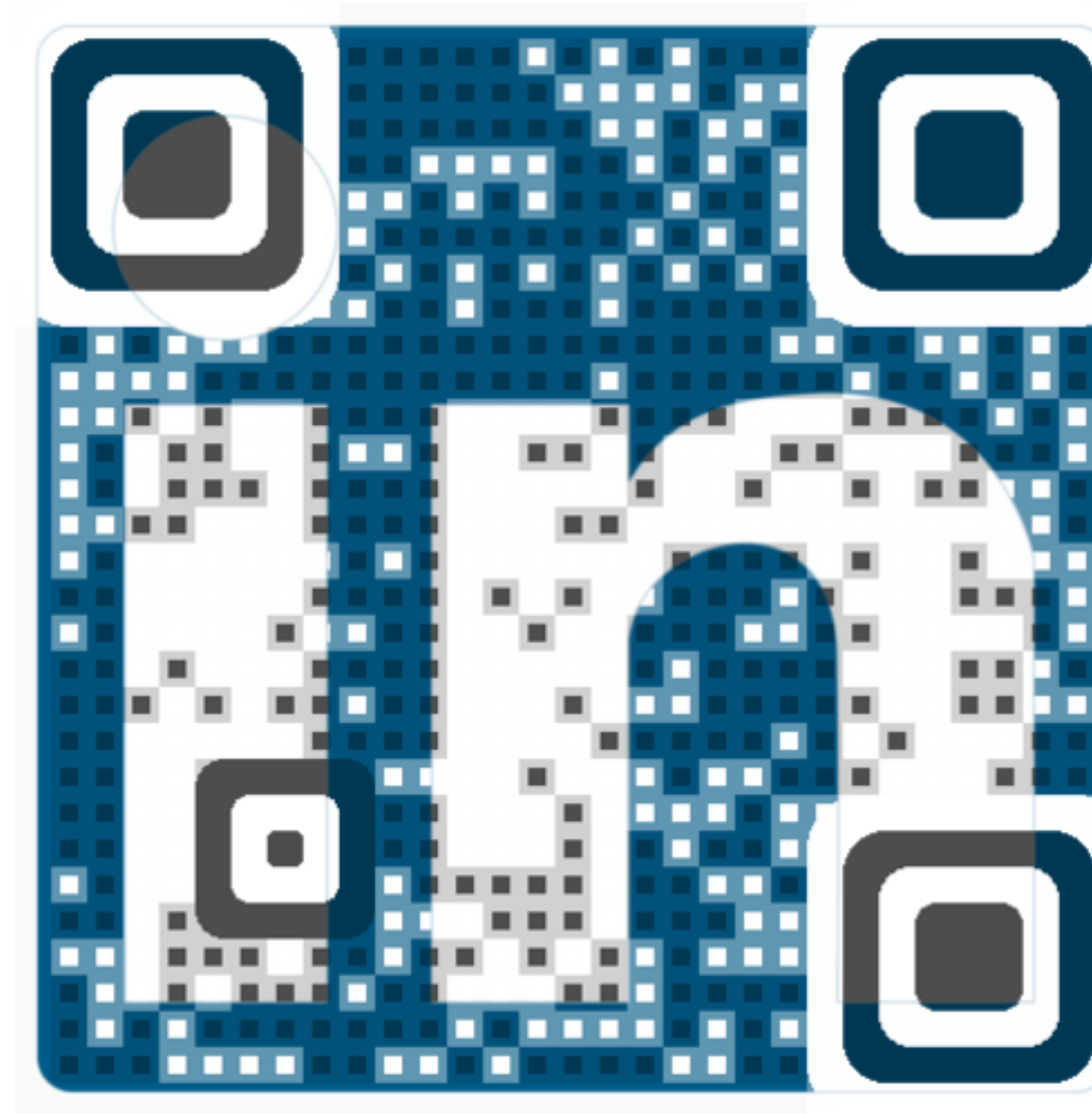
Conclusion



Myth Busters



Connect With Us





AUTODESK®

Make anything™

Autodesk and the Autodesk logo are registered trademarks or trademarks of Autodesk, Inc., and/or its subsidiaries and/or affiliates in the USA and/or other countries. All other brand names, product names, or trademarks belong to their respective holders. Autodesk reserves the right to alter product and services offerings, and specifications and pricing at any time without notice, and is not responsible for typographical or graphical errors that may appear in this document.

© 2019 Autodesk. All rights reserved.

