Advancing Campus Efficiencies by Developing and Utilizing Indoors Data

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Michigan State University

SDM – Spatial Data Management

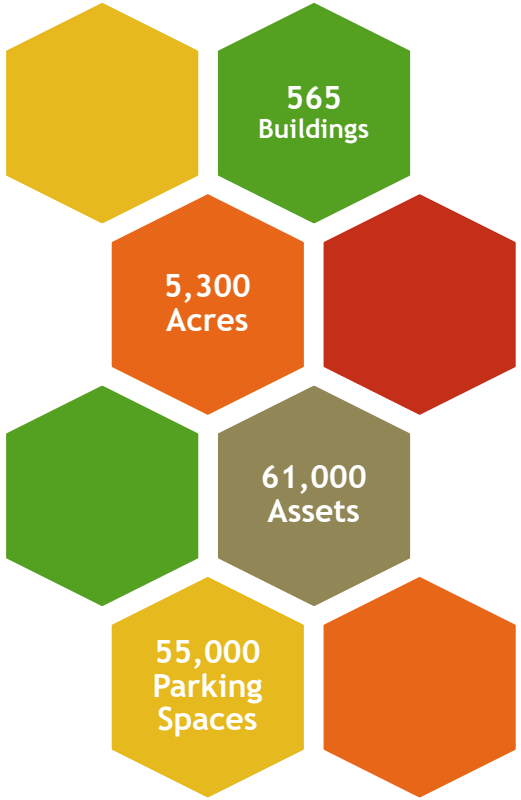
- Team members
  - Jade Freeman – Team Lead
  - Joel Lenz – Sr. GIS Developer
  - Nick Voss – GIS Coordinator
  - Scott Holland – GIS Analyst

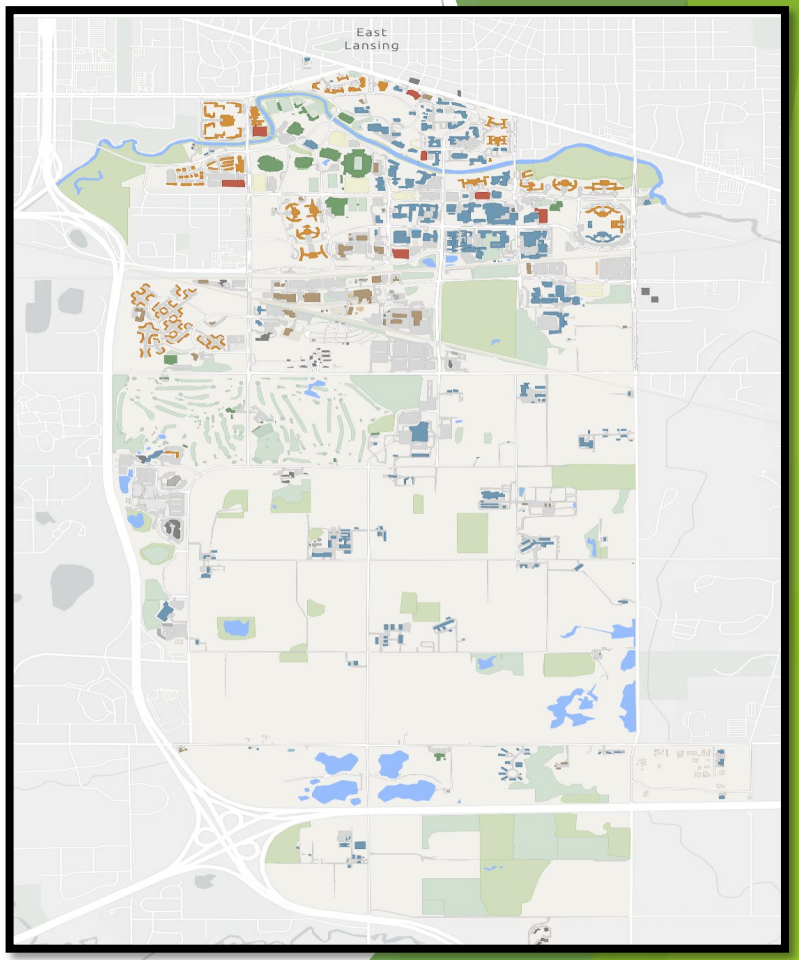
Conversation Leading to Exploration

- "…They don't know where the building is, what door to use, or where to go once they are inside."

  - Rich Brown, MSU Infrastructure Planning & Facilities

Campus is a Big Place





Where to Begin?

- Expand the Spatial Data Infrastructure

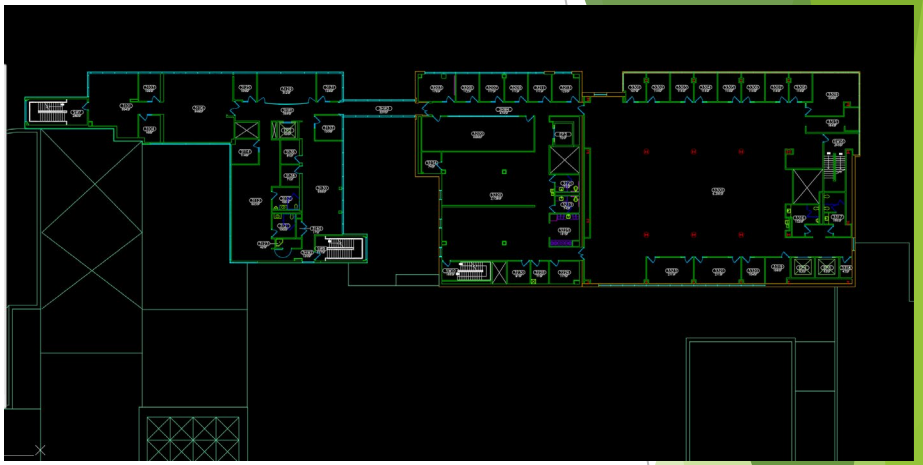
Spatial Data Infrastructure

- Utilities
- Plants (trees, shrubs, etc.)
- Roads/parking, sidewalks (road areas, edges, centerlines)

Benefits of Expanding SDI Inside Buildings

- Improved GIS experience
- Reduction of waste
- Same level of information access
- Improved staff onboarding

How to Expand the SDI?



- Create an Indoors Basemap

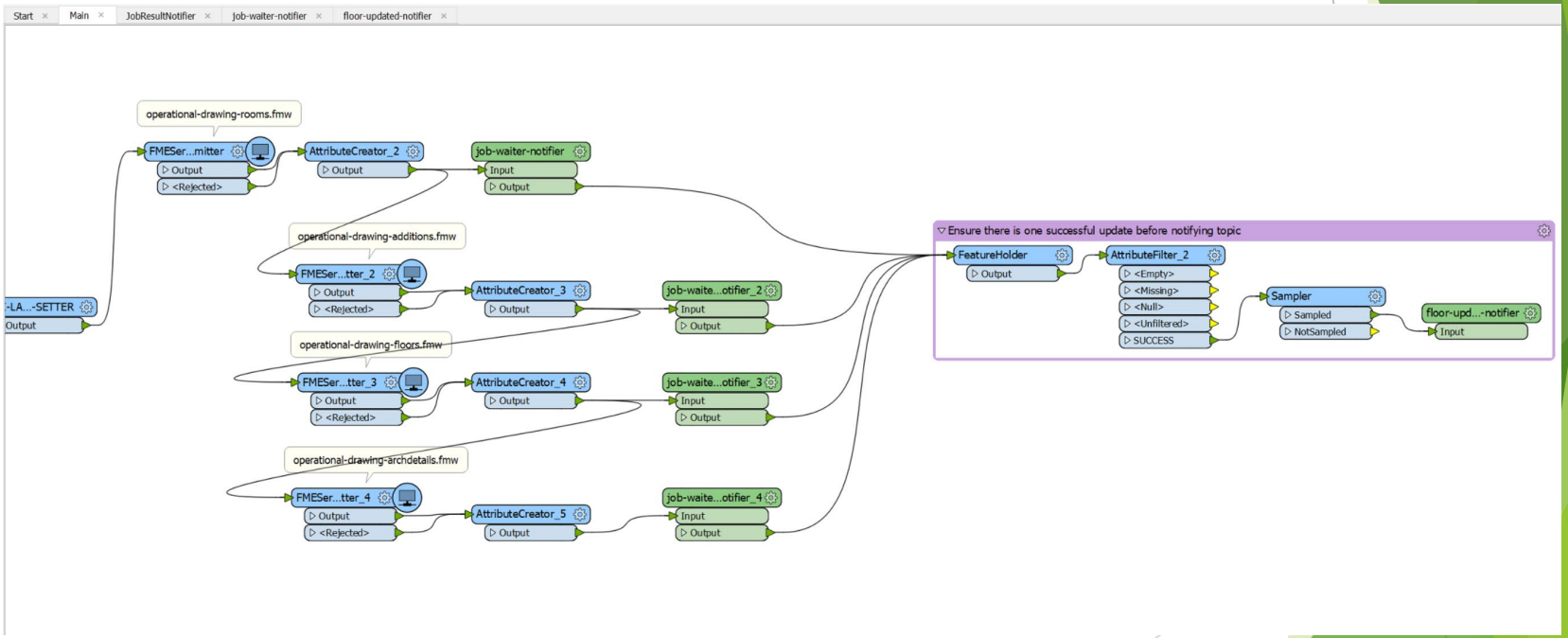
- Steps to get there:

Georeference CAD Building Floorplans

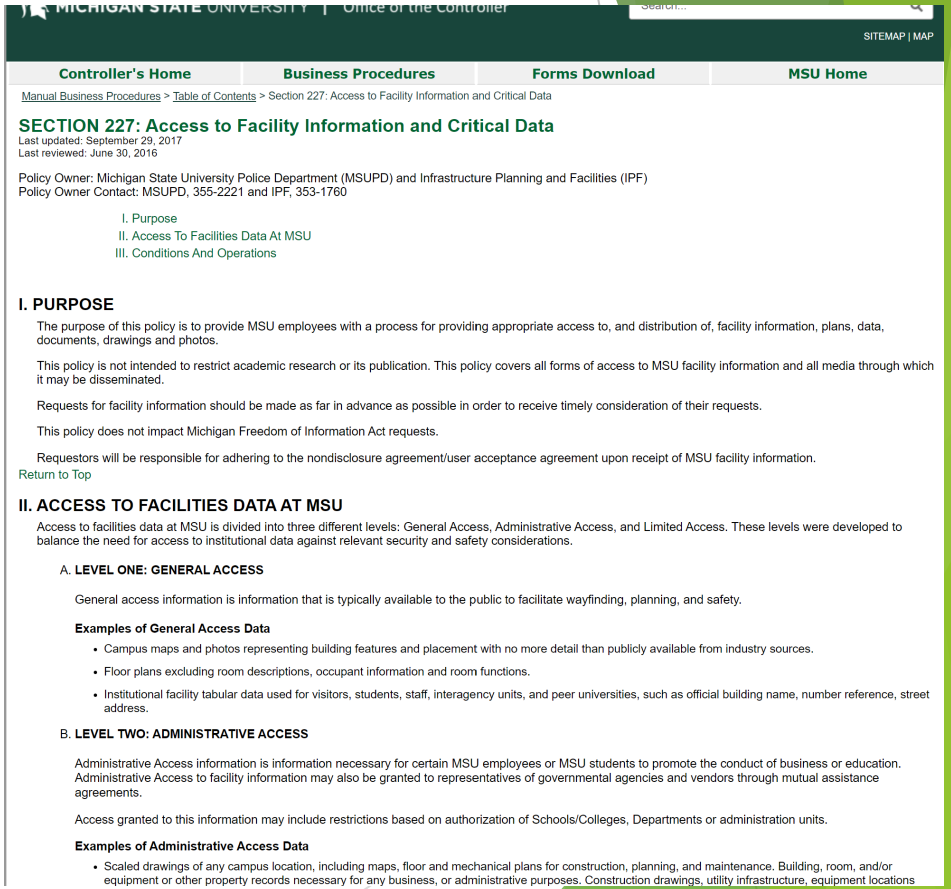
Build ETL Process

Publish Floorplan Service

FME Automation



Establishing Security for Critical Data



MICHIGAN STATE UNIVERSITY | Office of the Controller

SITEMAP | MAP

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Manual Business Procedures > Table of Contents > Section 227: Access to Facility Information and Critical Data

SECTION 227: Access to Facility Information and Critical Data

Last updated: September 29, 2017
Last reviewed: June 30, 2016

Policy Owner: Michigan State University Police Department (MSUPD) and Infrastructure Planning and Facilities (IPF)
Policy Owner Contact: MSUPD, 355-2221 and IPF, 353-1760

I. Purpose
II. Access To Facilities Data At MSU
III. Conditions And Operations

I. PURPOSE

The purpose of this policy is to provide MSU employees with a process for providing appropriate access to, and distribution of, facility information, plans, data, documents, drawings and photos.

This policy is not intended to restrict academic research or its publication. This policy covers all forms of access to MSU facility information and all media through which it may be disseminated.

Requests for facility information should be made as far in advance as possible in order to receive timely consideration of their requests.

This policy does not impact Michigan Freedom of Information Act requests.

Requestors will be responsible for adhering to the nondisclosure agreement/user acceptance agreement upon receipt of MSU facility information.

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II. ACCESS TO FACILITIES DATA AT MSU

Access to facilities data at MSU is divided into three different levels: General Access, Administrative Access, and Limited Access. These levels were developed to balance the need for access to institutional data against relevant security and safety considerations.

A. **LEVEL ONE: GENERAL ACCESS**

General access information is information that is typically available to the public to facilitate wayfinding, planning, and safety.

Examples of General Access Data

- Campus maps and photos representing building features and placement with no more detail than publicly available from industry sources.
- Floor plans excluding room descriptions, occupant information and room functions.
- Institutional facility tabular data used for visitors, students, staff, interagency units, and peer universities, such as official building name, number reference, street address.

B. **LEVEL TWO: ADMINISTRATIVE ACCESS**

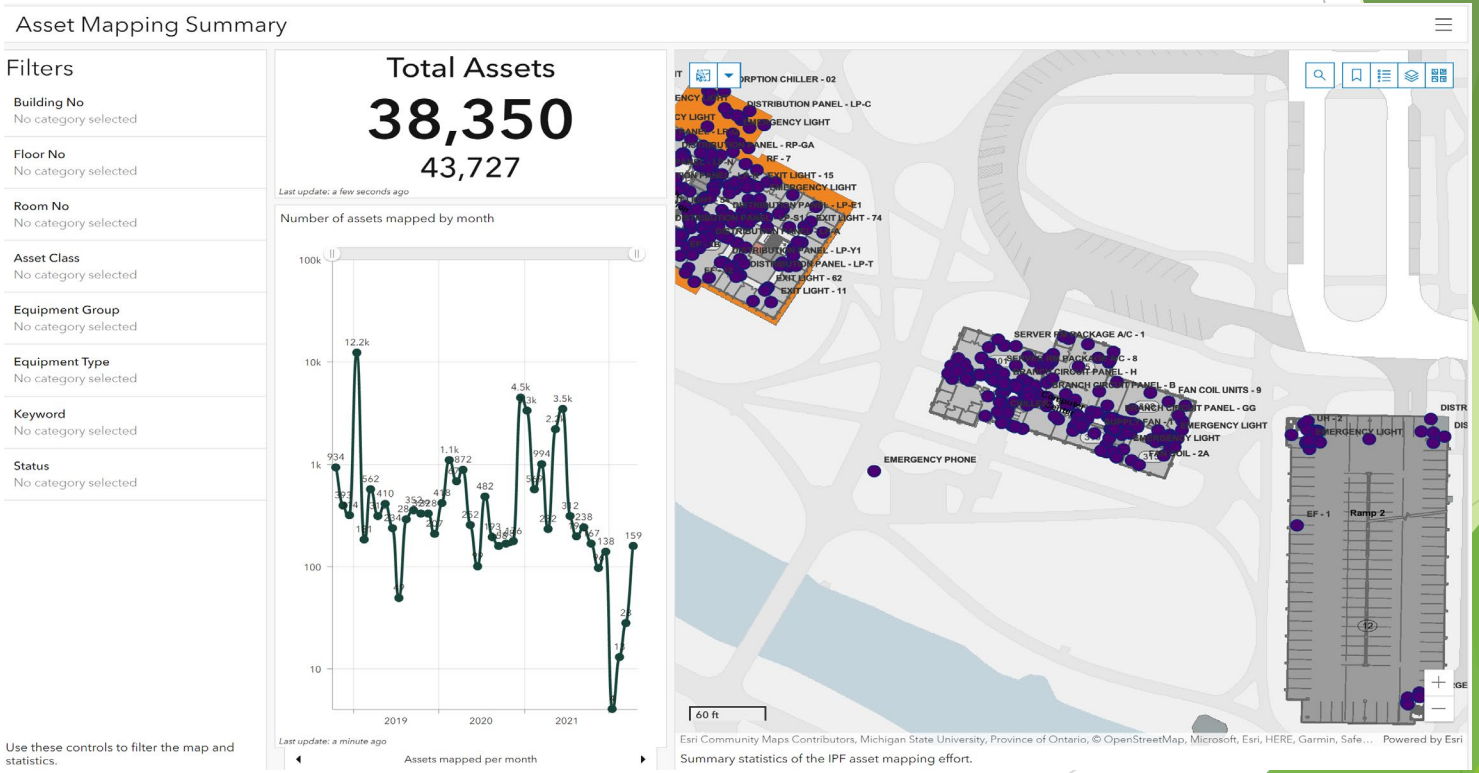
Administrative Access information is information necessary for certain MSU employees or MSU students to promote the conduct of business or education. Administrative Access to facility information may also be granted to representatives of governmental agencies and vendors through mutual assistance agreements.

Access granted to this information may include restrictions based on authorization of Schools/Colleges, Departments or administration units.

Examples of Administrative Access Data

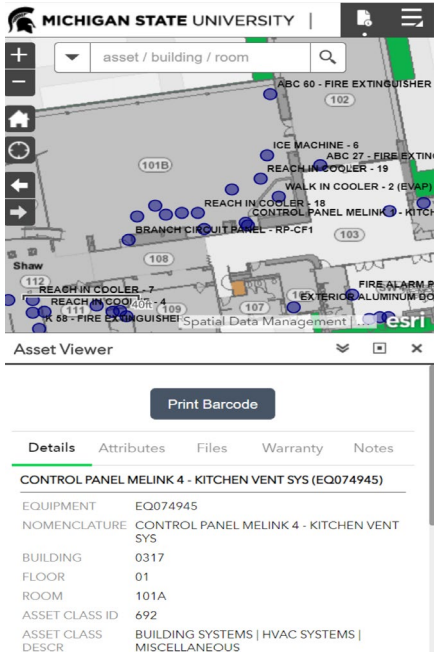
- Scaled drawings of any campus location, including maps, floor and mechanical plans for construction, planning, and maintenance. Building, room, and/or equipment or other property records necessary for any business, or administrative purposes. Construction drawings, utility infrastructure, equipment locations

Evolution of the Indoor Basemap

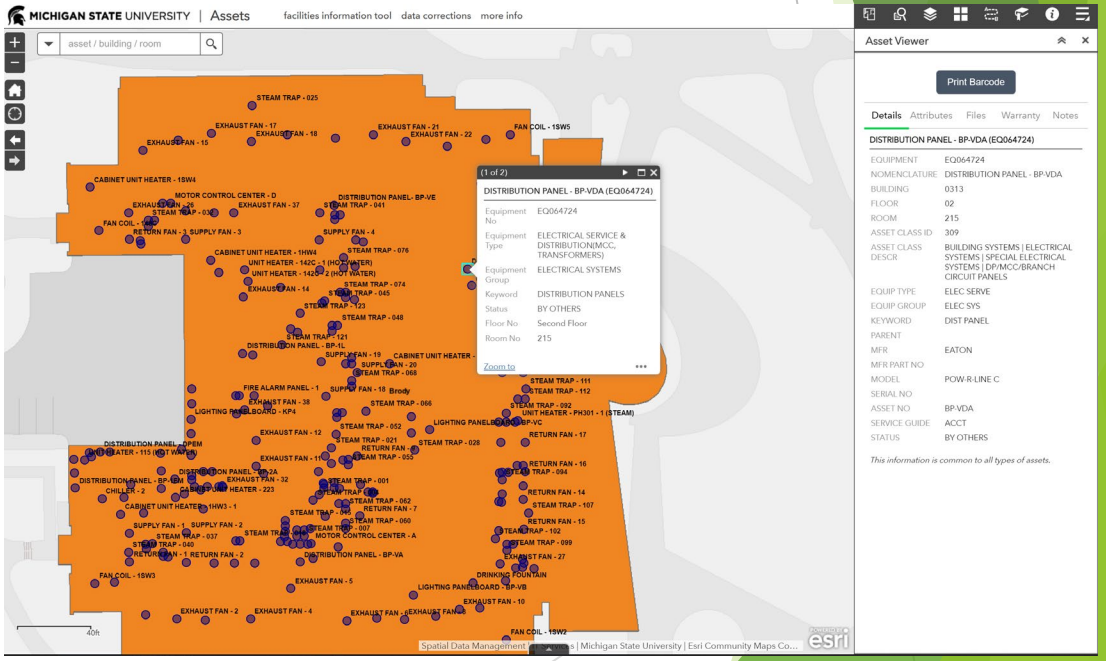


Issues with Original Attempt

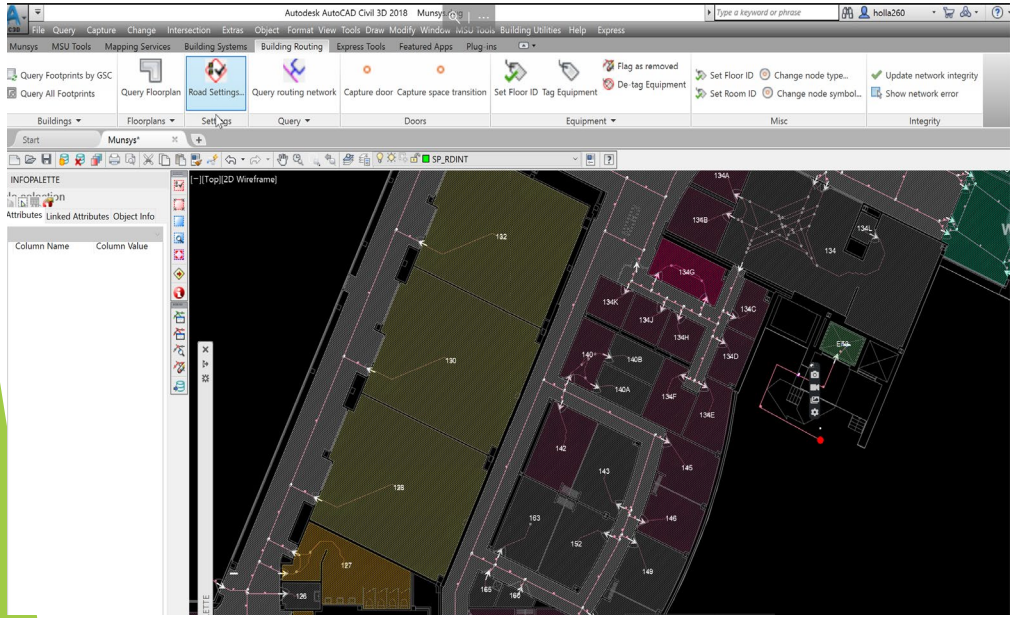
View on iPhone

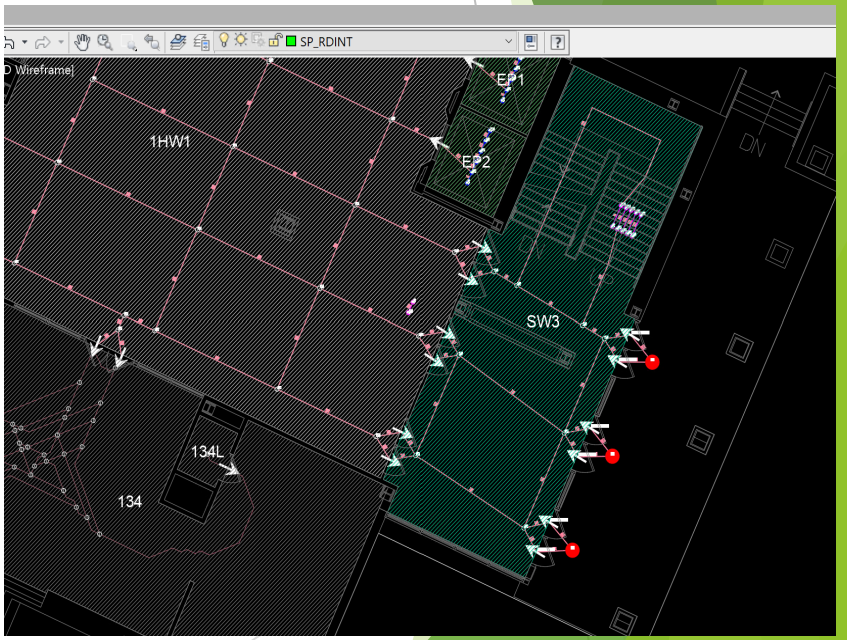


View on Desktop

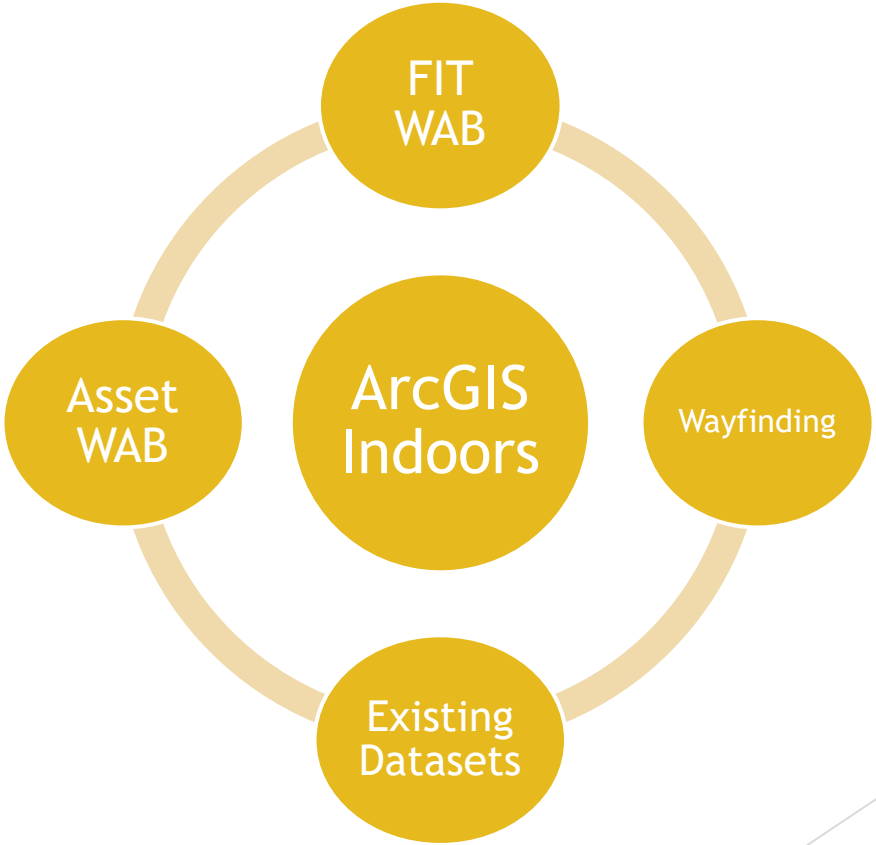


Wayfinding: Creating Exterior and Interior Network Data

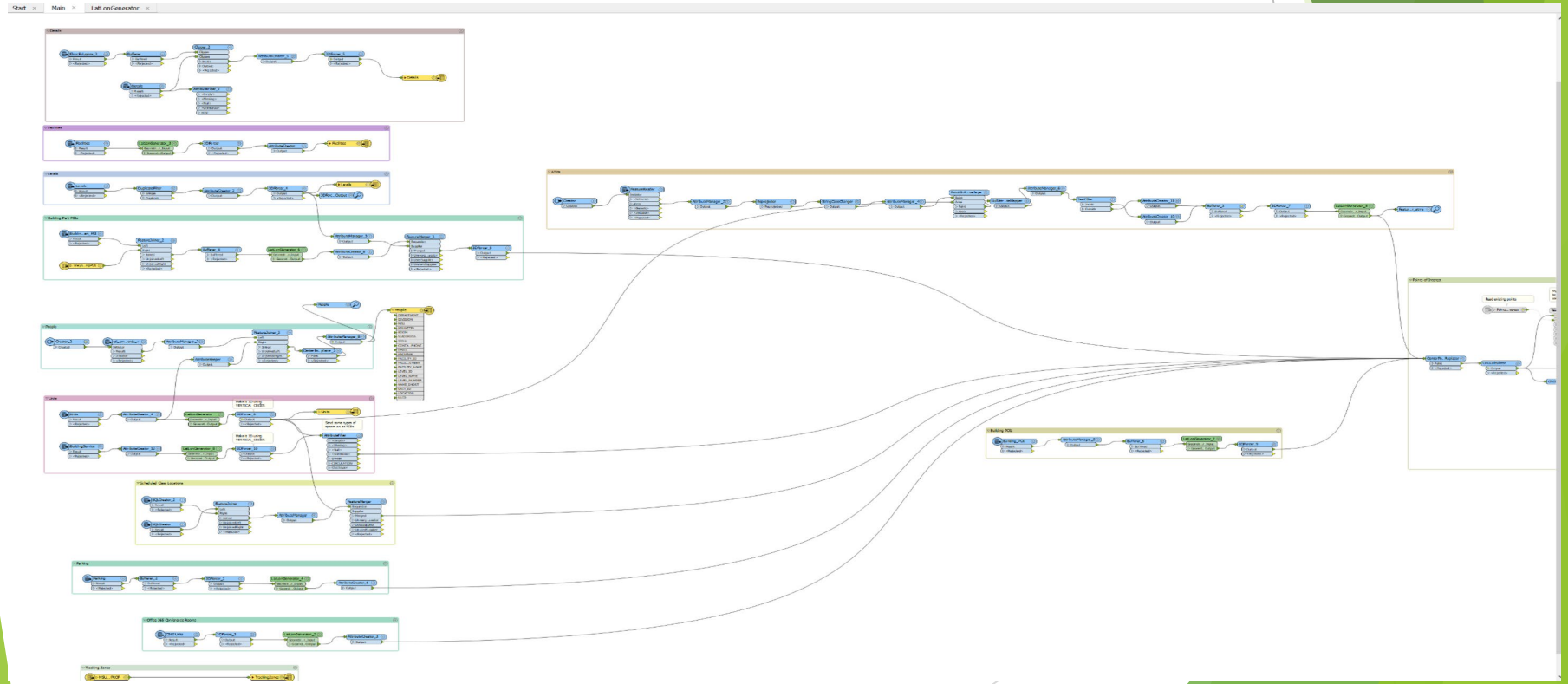




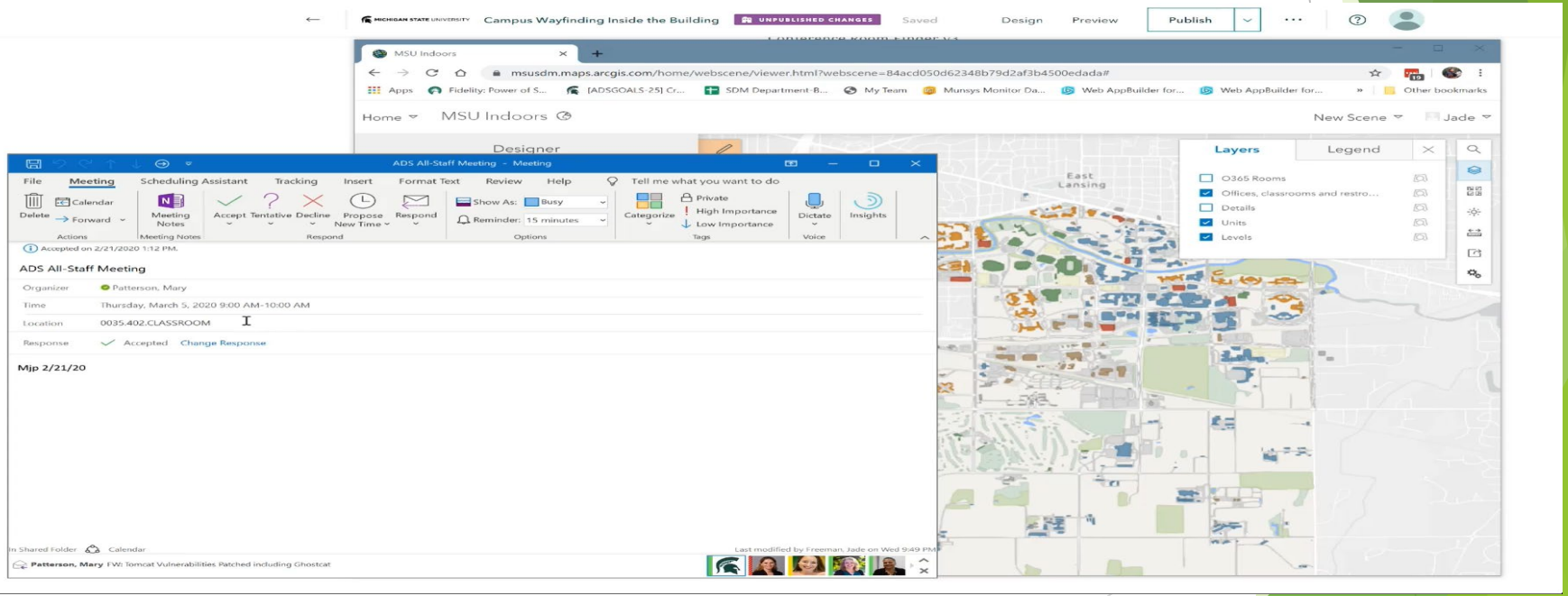
ArcGIS Indoors: Bringing It All Together



The Indoors Data Model: Leveraging the Existing Data Infrastructure

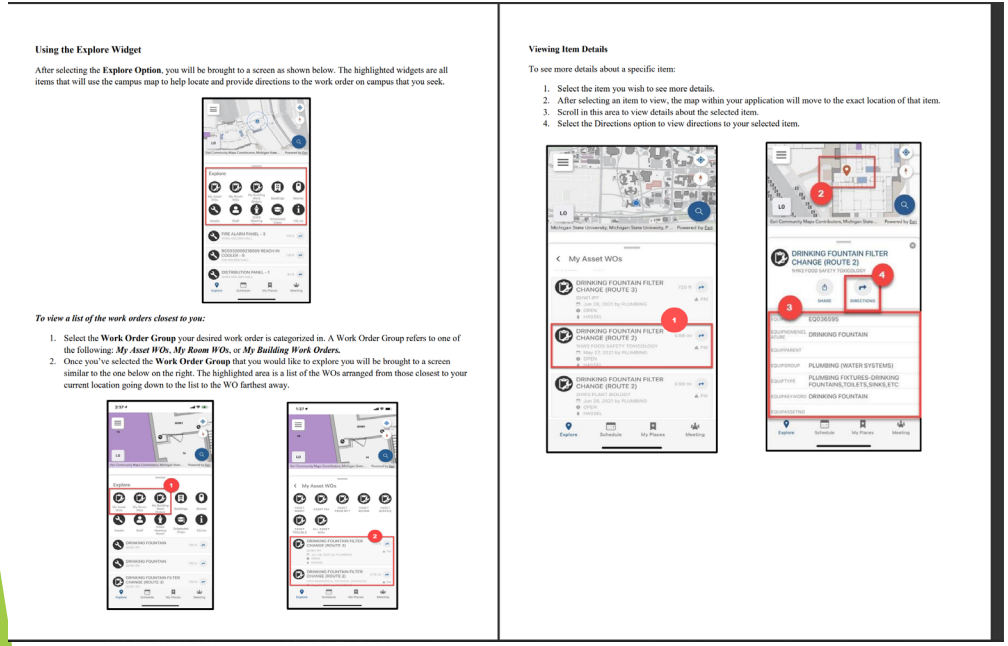


Initial Explorations:
3-D Proof of Concept Application



Pilot Group Training

Indoors Training Guide



Using the Explore Widget

After selecting the **Explore Option**, you will be brought to a screen as shown below. The highlighted widgets are all items that will use the campus map to help locate and provide directions to the work order on campus that you seek.

To view a list of the work orders closest to you:

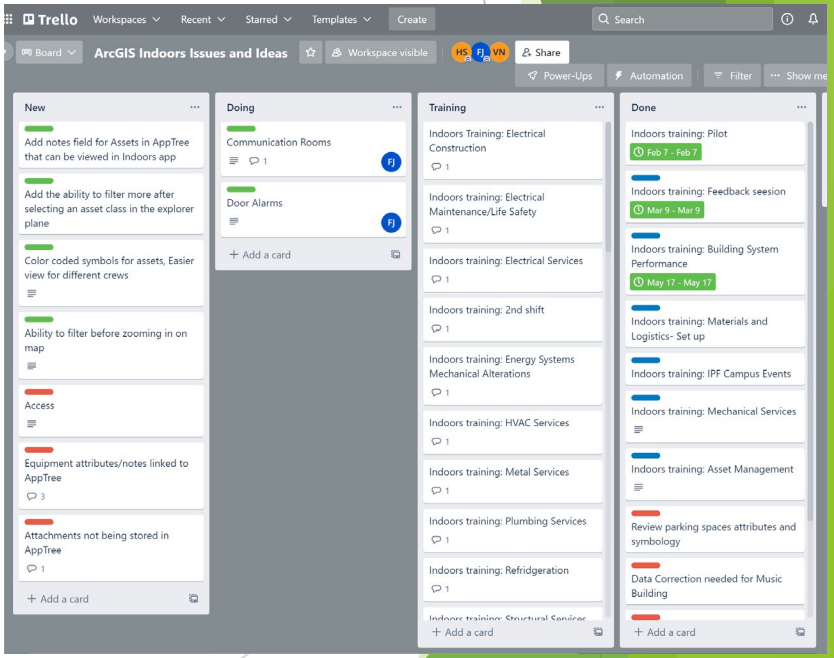
1. Select the **Work Order Group** your desired work order is categorized in. A Work Order Group refers to one of the following: ***My Asset WOs***, ***My Room WOs***, or ***My Building Work Orders.***
2. Once you've selected the **Work Order Group** that you would like to explore you will be brought to a screen similar to the one below on the right. The highlighted area is a list of the WOs arranged from those closest to your current location going down to the list to the WO farthest away.

Viewing Item Details

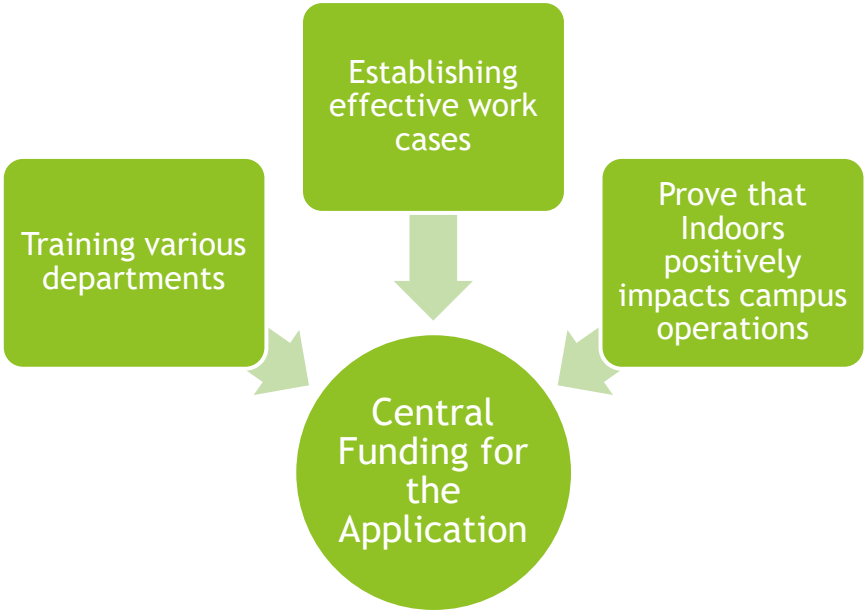
To see more details about a specific item:

1. Select the item you wish to see more details.
2. After selecting an item to view, the map within your application will move to the exact location of that item.
3. Scroll in this area to view details about the selected item.
4. Select the Directions option to view directions to your selected item.

App for Bugs & Improvement Ideas



Pilot Group Training Cont.

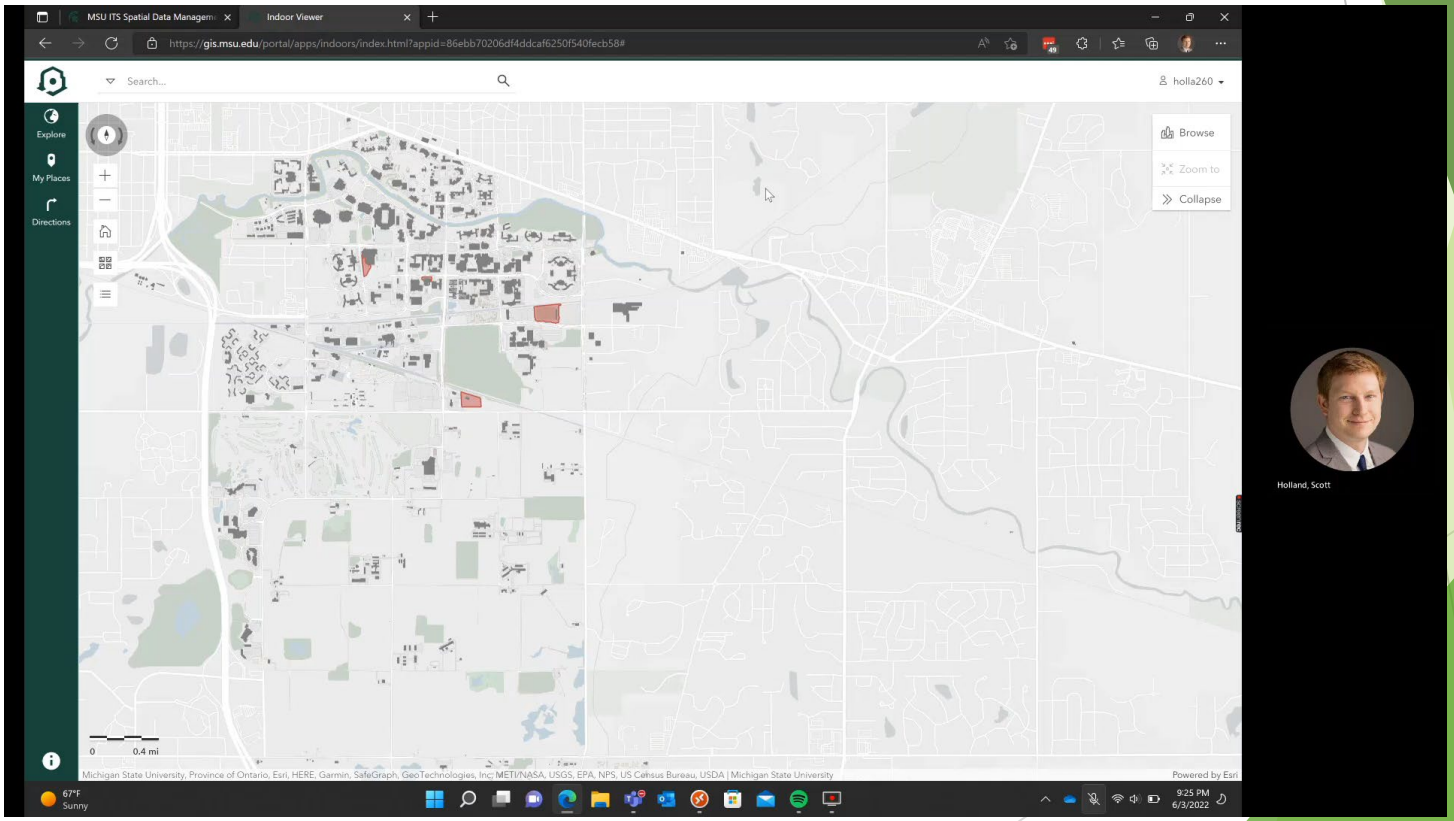


Calculating the Efficiency Net Gains

- “Even if the app saves just a minute or two during a job, helping staff navigate a new workspace, over time that savings will add up to thousands of work hours.”

  - Adam Lawver, MSU Infrastructure Planning & Facilities

Indoors Demo



Limitations

Currently No Editing Capabilities in Indoors

Network Issues when Traveling in Obscure Areas

Cost of the Platform

The Future: Opportunities for Growth of Indoors Data

Multimodal Wayfinding	•Public Access/ MSU Maps •Kellogg campus
Hoteling of Office Space	•Remote/hybrid workers •Reusing space on campus
Emergency Phone App	•Routing for staff •Reporting
Capital Assets	•Asset reporting
Hasmatiz	•Hazardous material reporting
Recycling	•Locating recycling stations •Condition assessments
Indoor/Outdoor Campus Events	•Management of all campus events

Opportunity for a Prize…

Kahoot! Quiz

- MSU Indoors and Mackinac Island questions
- On any Wifi-Connected Device go to kahoot.it
- You'll enter the code that I display in a bit, then add your name to play for a prize

Thank You!