

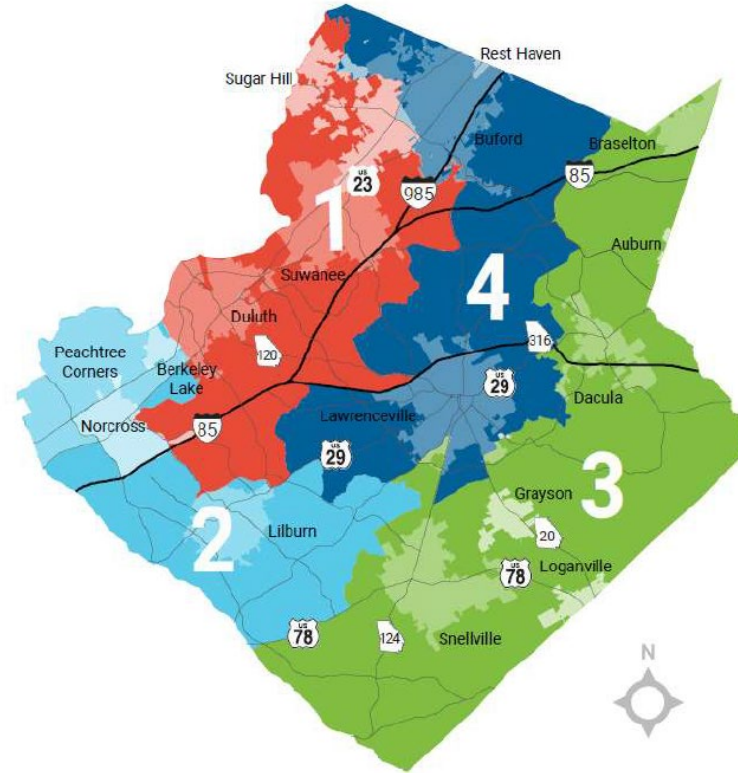
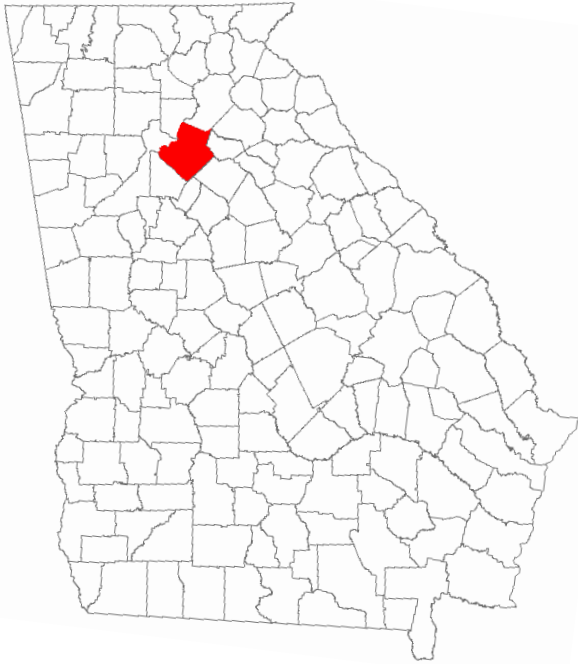
# Gwinnett County Indoors

# Introduction

## Gwinnett County Geospatial Solutions

- Tamarin Gullett, M.B.A.
- Lee Irminger, B.Sc.

# Gwinnett County, Georgia



- Humid Subtropical Environment
- 437 square miles (1,130 km<sup>2</sup>)
- 2<sup>nd</sup> most populous county in Georgia
- Population 920,000+
- Lake Lanier – Regional Reservoir for Atlanta Metro
- Chattahoochee River Corridor runs through the County and along the County border
- County Commission Government

# Indoors User Department

- Department of Information Technology Services (200+ staff positions)
- **Geospatial Solutions** (formerly Land Information Solutions) - **GIS & Accela**
- Implementation completed for ITS Department with a plan to bring on other departments as requested
- Gwinnett County Government (5,700+ staff positions)



# Why We Created The Application

## **Replace a spreadsheet headache**

### **Space Planning Concerns for COVID-19**

- 6ft (1.8m) spaced seating
- Easily share office and telecommute schedules

### **Desk availability for hot desking**

- Daily check of office use and capacity
- Understand available and safe spaces for walk-up contractors

### **Staff Metric Dashboards**

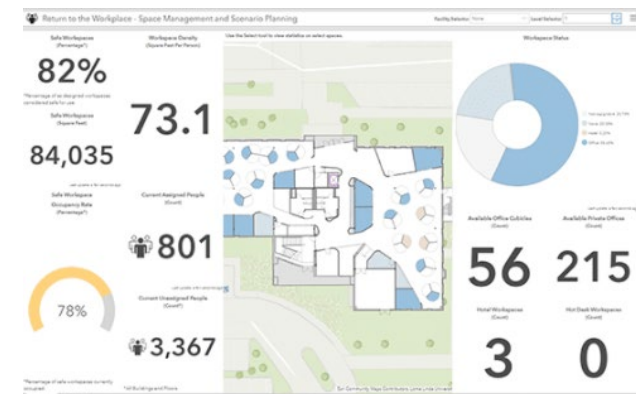
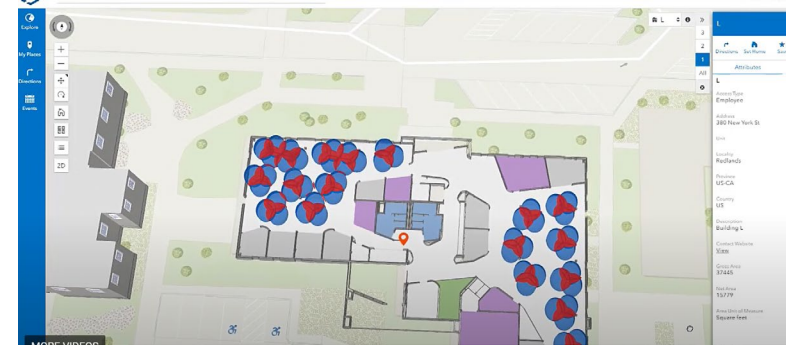
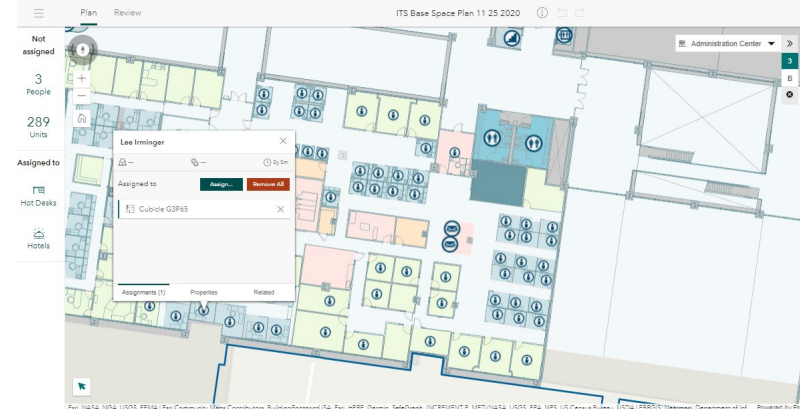
- Reports for staff locations and space utilization

### **Manage HR-related information**

- Easily report up to the County Administrator
- Track COVID cases and timelines

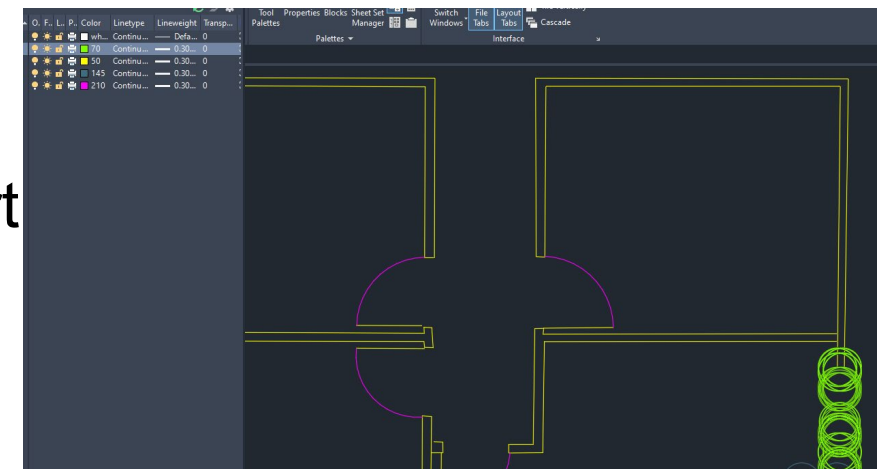
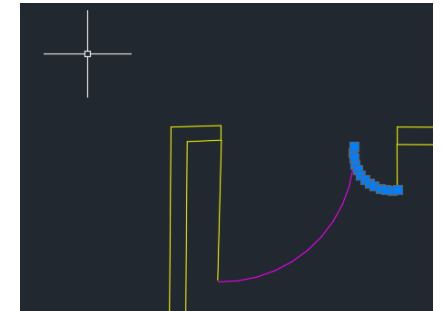
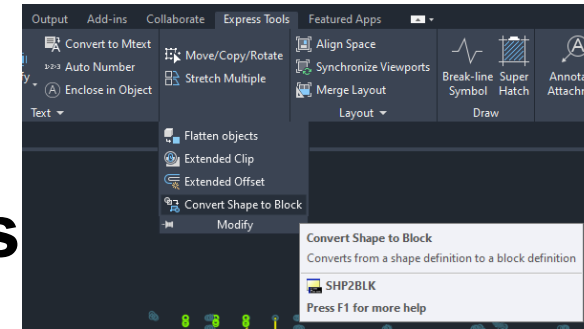
# How We Started

- Leveraged Esri Advantage Program to set up:
  - Indoor Viewer
  - Indoor Space Planner
- Knowledge-transfer session with Esri
- From this foundation we built the custom solution



# CAD Drawing Preparation

- **Understanding Initial Quality Standards**
  - Coordinate System Check.
  - Layer Content Examination, Consolidation, Exclusion.
    - Feature type consistency – Polylines, blocks, units.
    - Design considerations for indoor routing.
    - Handling empty features.
    - Potential complications in feature types.
    - Annotation and external references.
  - Data Cleaning – Topology QAQC prior to import
    - Direct editing.
    - AutoCAD tools vs Esri tools.



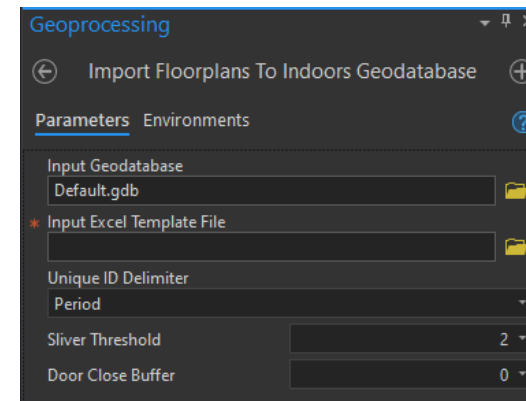
# Data Considerations

## Plan ahead for editing if using CAD

- CAD DWG files required a lot of time
- Configuration Spreadsheet for the schema
- People, Details, Units, Points of Interest, Levels, Facilities, Areas

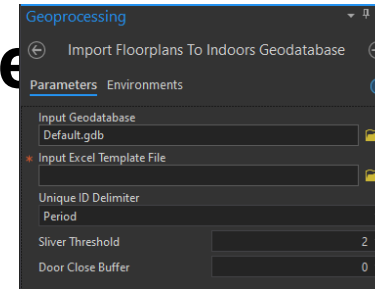
## Field verify workspace dimensions

- Directly edited the feature layers to correct
- Why measurement counts
- Placement of furniture

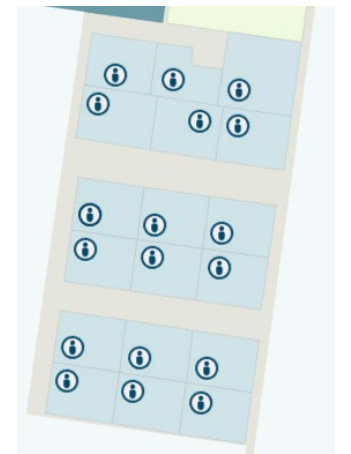
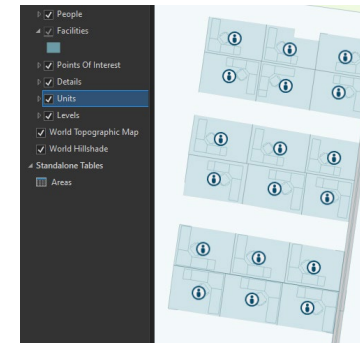


# Importing CAD Data

- **Import Floorplans to Indoors Geodatabase**
  - AutoCAD DWG Files
  - Configuration Spreadsheet
  - People, Details, Units, Points of Interest, Levels, Facilities, Areas
- **Field verify workspace dimensions**
  - Found that they were not to scale
  - Directly edited spatial errors in Arc Pro
    - Ease of duplicating needed features
    - Final QAQC of spatial aspects
    - Occupant loading



Result of Import tool  
in Space Planner



Corrected dimensions  
and seating locations



# Staff Locations and Hybrid Schedules

**ITS Office Space Console for Managers and Supervisors**

Daily Schedule | Scheduling | Add/Edit Staff | Staff Metrics

---

Daily Schedule | Location: GJAC Floor 3 | Staff: All | Team: All | Classification: All

**Day of the Week**

**Monday**

Field Support | Holiday | Onsite  
Sick | Telecommute | Vacation

**Tuesday**

Field Support | Onsite  
Telecommute | Vacation

**Wednesday**

Field Support | Onsite  
Telecommute | Vacation

**Thursday**

Field Support | Onsite  
Telecommute | Vacation

**Friday**

Field Support | Onsite  
Telecommute | Vacation

**Daily Staff List**

- ⓘ
- ⓘ
- ⓘ
- ⓘ
- ⓘ
- ⓘ
- ⓘ
- ⓘ

Name: \_\_\_\_\_

Ac: \_\_\_\_\_

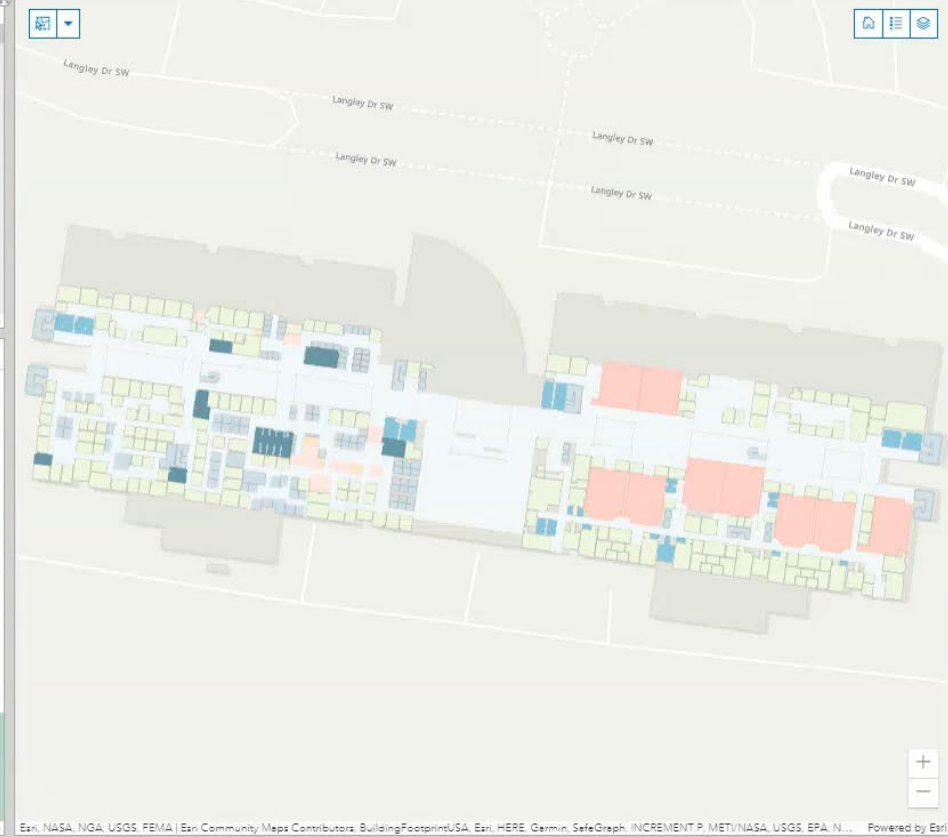
**Team**

Network & Telecom

**Unit ID**

GBP28

**Submit**

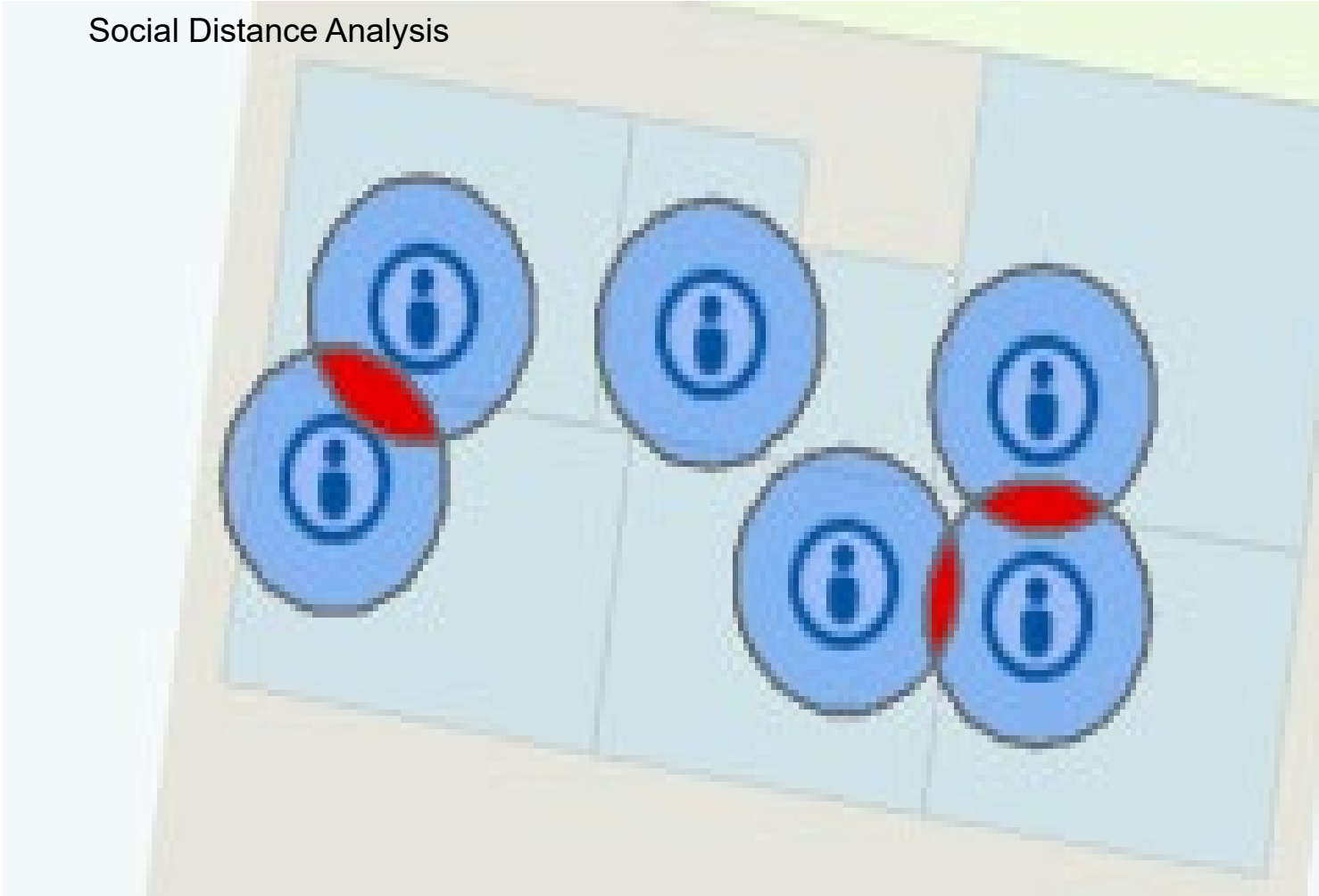


Map showing office space layout with various colored rooms and surrounding streets (Langley Dr SW).

Last update: a few seconds ago | Esri, NASA, NGA, USGS, FEMA | Esri Community Maps Contributors, BuildingFootprintUSA, Esri, HERE, Garmin, SafeGraph, INCREMENT.P, METI/NASA, USGS, EPA, N... Powered by Esri

# Properly Spaced Seating

Social Distance Analysis



# Properly Spaced Seating

ITS Office Space Console for Managers and Supervisors

Daily Schedule | Scheduling | Add/Edit Staff | Staff Metrics

Daily Schedule | Location: GUAC Floor 3 | Staff: All | Team: All | Classification: All

Day of the Week

Monday  
Field Support | Holiday | Onsite  
Sick | Telecommute | Vacation

Tuesday  
Field Support | Onsite  
Telecommute | Vacation


Wednesday  
Field Support | Holiday | Onsite  
Telecommute | Vacation

Thursday  
Field Support | Onsite  
Telecommute | Vacation

Friday  
Field Support | Onsite  
Telecommute | Vacation

Daily Staff List

Team: Network & Telecom  
Unit ID: GBP28  
Submit



Map showing office space layout with seating areas highlighted in yellow and red. The map is titled "Langley Dr SW" and includes a legend for "Team" and "Unit ID".

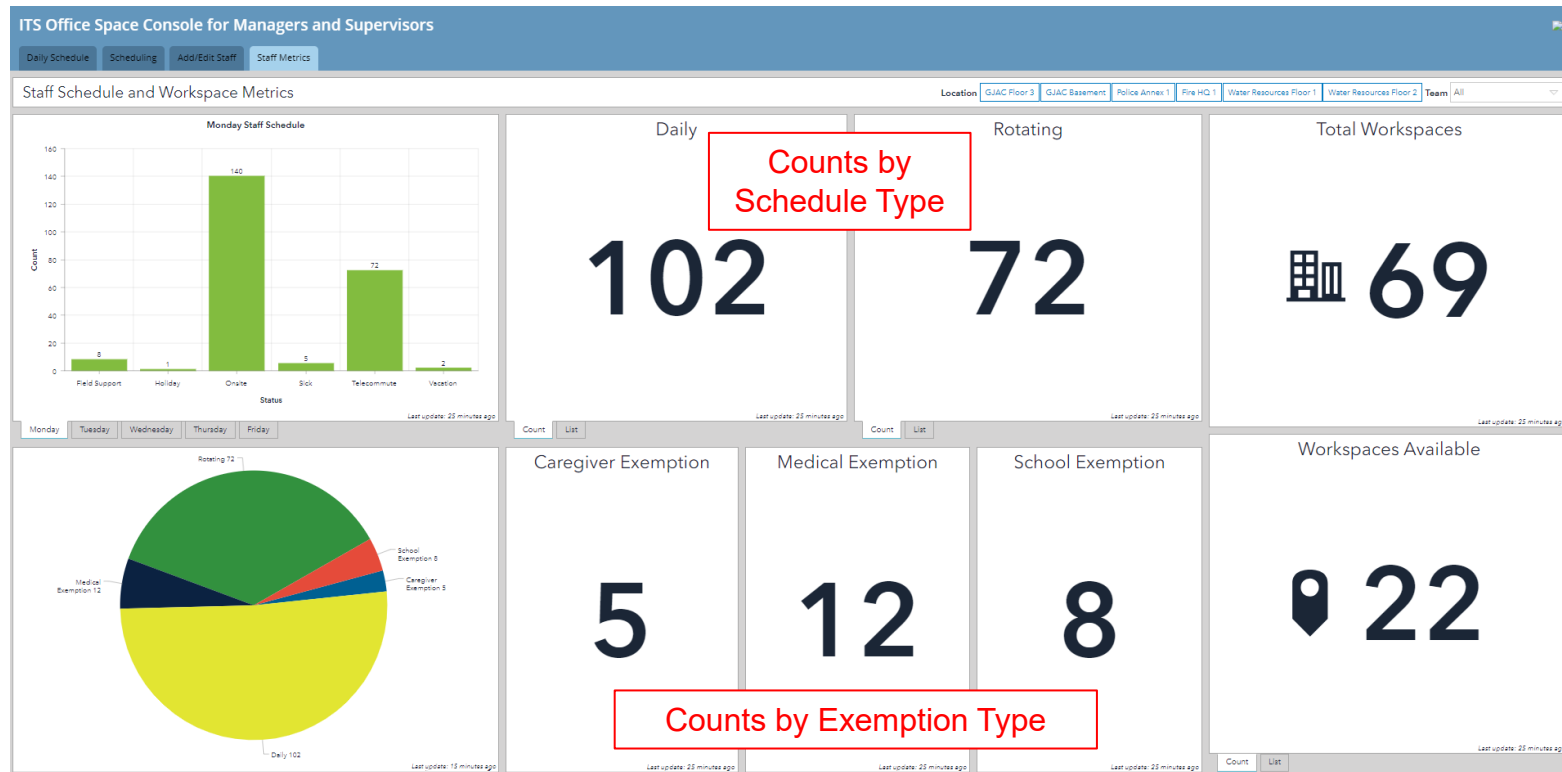
Powered by Esri

# Dashboards for Staff and Office Space

## Location data report

View Distribution of Staff by Location

Tabs by day



Counts by Exemption Type

# COVID-19 Information



## Key Requirements

- Track Exposures and Positive Tests
- Identify Key Dates (Exposure/Test Date, Return Date, Policy Notification)
- Auto Calculate 5<sup>th</sup> Day, 14<sup>th</sup> Day, Return Date

Secure Visibility

History   History Metrics   COVID Incident Tracking

Staff Name\*

Title

Team

Supervisor

Date Reported\*

COVID Status\*

Date of Exposure / Positive Test

Fifth Day

Fourteenth Day

Return Date

Policy Notification

Comment

Submit

# Historical Information

ITS Office Space Console

No issues detected × Story not shared × Edit × Gwinnett

Daily Schedule | Scheduling | Add/Edit Staff | Staff Metrics | History | History Metrics | COVID Incident Tracking

Staff History

Location: GJAC Floor 3 | Team: All | Staff: All

Date

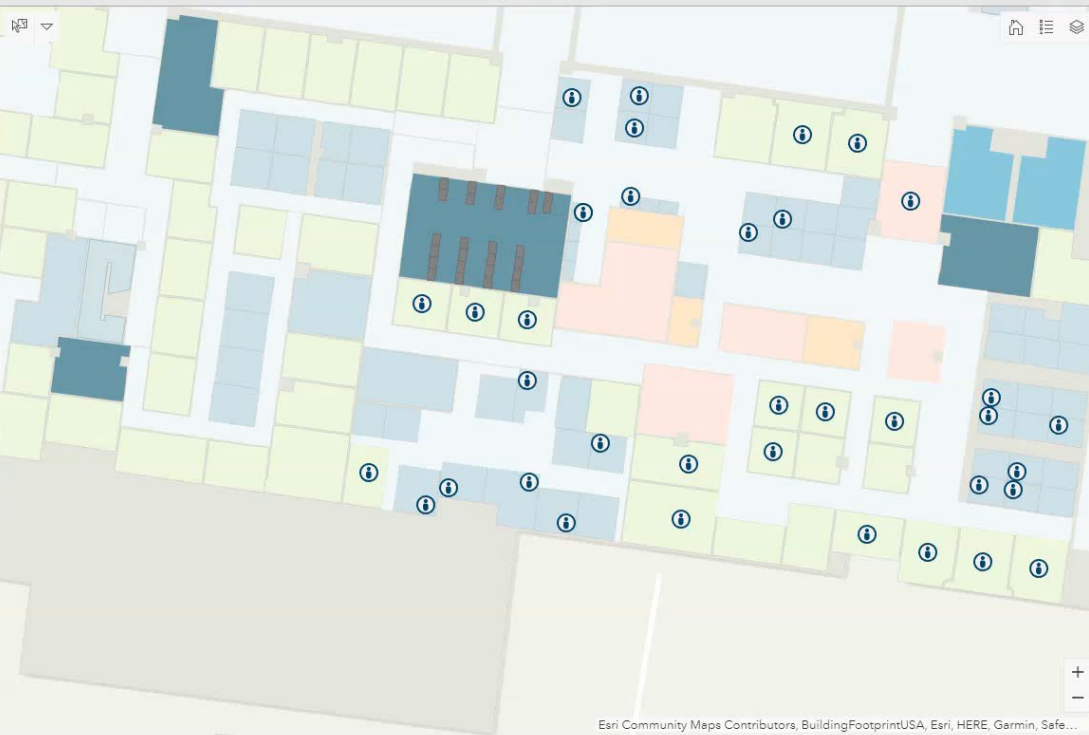
Date Range (Start Date - End Date)

6/1/2021

6/1/2021

|   |          |
|---|----------|
| A | 2021     |
| A | /2021    |
| A | 021      |
| A | 021      |
| B | 2021     |
| B | 021      |
| C |          |
| C | /1/2021  |
| C | 2021     |
| C | 021      |
| D | 1        |
| D | 021      |
| D | 021      |
| D | 021      |
| E | 6/1/2021 |

Last update: 13 minutes ago



Esri Community Maps Contributors, BuildingFootprintUSA, Esri, HERE, Garmin, Safe...

# Staff and Schedule Management



- Staff Table

| OBJECTID | Team | Title | Email | Department | Contact Phone | Delivery Office | Job Title | Unit ID * | Knownas | Monday | Tuesday | Wednesday | Thursday | Friday | Classification | Status |
|----------|------|-------|-------|------------|---------------|-----------------|-----------|-----------|---------|--------|---------|-----------|----------|--------|----------------|--------|
|----------|------|-------|-------|------------|---------------|-----------------|-----------|-----------|---------|--------|---------|-----------|----------|--------|----------------|--------|

| Alias             | Data Type |
|-------------------|-----------|
| OBJECTID          | Object ID |
| Unit ID           | Text      |
| Knownas           | Text      |
| Team              | Text      |
| Title             | Text      |
| Email             | Text      |
| Department        | Text      |
| Contact Phone     | Text      |
| Delivery Office   | Text      |
| Contact Extension | Text      |
| Department        | Text      |
| Job Title         | Text      |
| Start Date        | Date      |
| Monday            | Text      |
| Tuesday           | Text      |
| Wednesday         | Text      |
| Thursday          | Text      |
| Friday            | Text      |
| Saturday          | Text      |
| Sunday            | Text      |
| Classification    | Text      |
| Status            | Text      |
| Date              | Date      |
| GlobalID          | Global ID |

| Unit ID * | Knownas | Monday      | Tuesday     | Wednesday   | Thursday    | Friday      |
|-----------|---------|-------------|-------------|-------------|-------------|-------------|
| GBP11     |         | Onsite      | Onsite      | Onsite      | Onsite      | Onsite      |
| GBP28     |         | Onsite      | Onsite      | Onsite      | Onsite      | Onsite      |
| GBP32     |         | Telecommute | Telecommute | Telecommute | Telecommute | Telecommute |
| GBP27     |         | Onsite      | Onsite      | Telecommute | Telecommute | Onsite      |
| GBP31     |         | Onsite      | Onsite      | Telecommute | Telecommute | Onsite      |
| LL800D    |         | Onsite      | Onsite      | Onsite      | Onsite      | Onsite      |
| GBP36     |         | Onsite      | Onsite      | Onsite      | Onsite      | Onsite      |
| GBP26     |         | Telecommute | Telecommute | Telecommute | Telecommute | Telecommute |
| GBP22     |         | Telecommute | Telecommute | Telecommute | Telecommute | Telecommute |
| GBP21     |         | Onsite      | Onsite      | Onsite      | Onsite      | Onsite      |
| GBP14     |         | Telecommute | Onsite      | Onsite      | Telecommute | Telecommute |
| GBP23     |         | Telecommute | Telecommute | Telecommute | Telecommute | Telecommute |
| GBP20     |         | Onsite      | Onsite      | Onsite      | Onsite      | Onsite      |

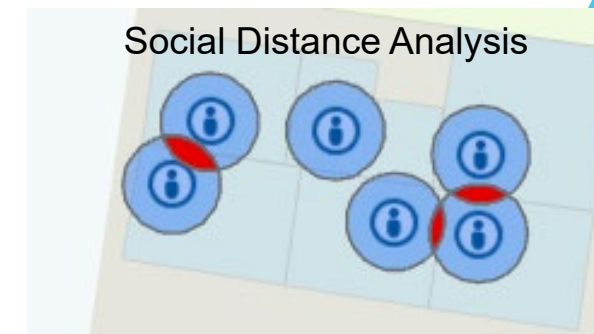
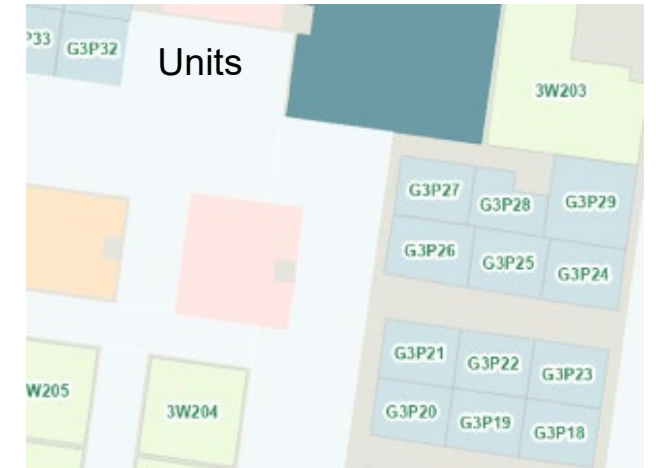
# Space Management

## • Polygons

- Units feature class for office spaces created from CAD data
  - Label polygons for office space IDs
- Hand-measured office spaces and adjusted
- 3-ft buffers and intersects generated from desk chair points

## • Points

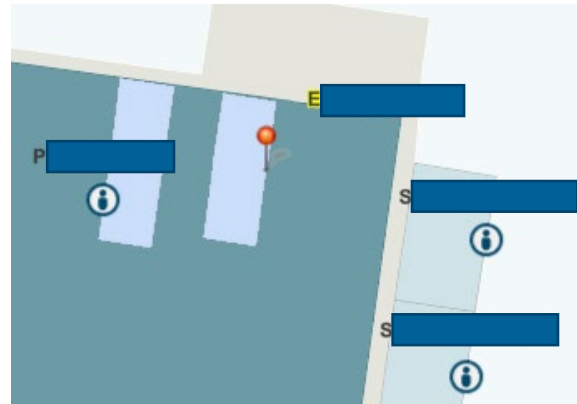
- Created a centroid from each workspace polygon “Staff Unit Points” and “Hoteling Unit Points”
  - Label points with staff name
- Adjusted the location of the point to the location of each desk chair
  - Required us to visit and measure each desk and cubicle



# Schedule Management

- **Joins**

- Staff table with schedules to Staff Unit and Hoteling points based on Unit ID to show where staff are assigned

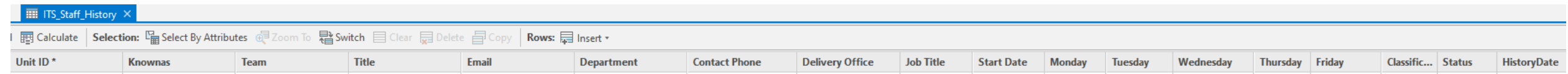


# COVID Response

- **Table**

- Staff History Table

- Contains history of Staff Schedule through time from a weekly export



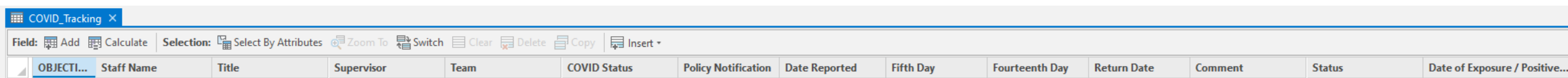
ITS\_Staff\_History

Calculate | Selection: Select By Attributes | Zoom To | Switch | Clear | Delete | Copy | Rows: Insert

| Unit ID * | Knownas | Team | Title | Email | Department | Contact Phone | Delivery Office | Job Title | Start Date | Monday | Tuesday | Wednesday | Thursday | Friday | Classific... | Status | HistoryDate |
|-----------|---------|------|-------|-------|------------|---------------|-----------------|-----------|------------|--------|---------|-----------|----------|--------|--------------|--------|-------------|
|-----------|---------|------|-------|-------|------------|---------------|-----------------|-----------|------------|--------|---------|-----------|----------|--------|--------------|--------|-------------|

- **COVID Tracking Table**

- Track HR-related information



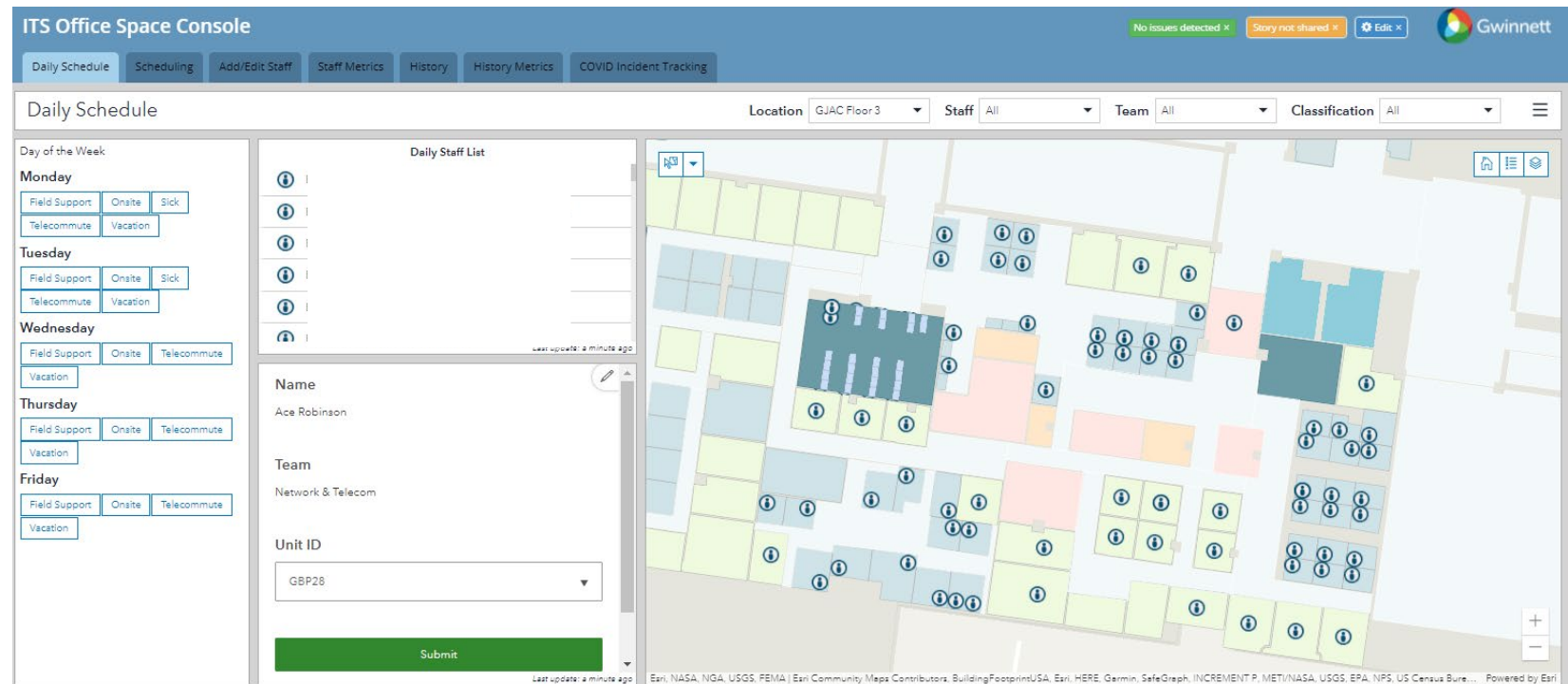
COVID\_Tracking

Field: Add | Calculate | Selection: Select By Attributes | Zoom To | Switch | Clear | Delete | Copy | Insert

| OBJECTI... | Staff Name | Title | Supervisor | Team | COVID Status | Policy Notification | Date Reported | Fifth Day | Fourteenth Day | Return Date | Comment | Status | Date of Exposure / Positive... |
|------------|------------|-------|------------|------|--------------|---------------------|---------------|-----------|----------------|-------------|---------|--------|--------------------------------|
|------------|------------|-------|------------|------|--------------|---------------------|---------------|-----------|----------------|-------------|---------|--------|--------------------------------|

# Architecting Application



- ArcGIS Online Organization
  - Gwinnett County Indoors
- Story Map Series
- Dashboards
- Web Maps
- Survey123 Surveys
- Python scripts running as scheduled tasks
  - Survey123 Media Folder Update
  - Staff\_History\_ITS Download and Append





# Web Maps

## • Indoors Staff Map

- Hoteling Pts Staff
  -  Hoteling
- Units Pts Staff
  - 

Filter: Hoteling Staff

View Edit

All of these expressions must be true:  
Classification is 'Hoteling'  
Status is 'Active'

REMOVE FILTER

CLOSE

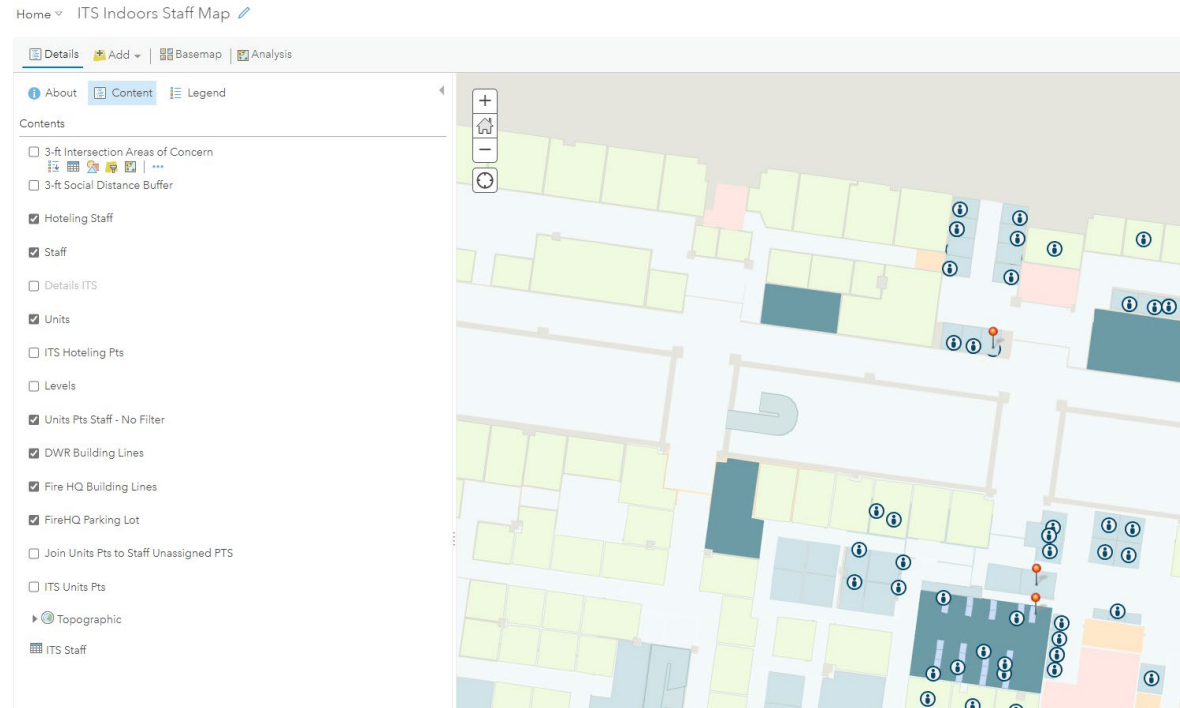
Filter: Staff

View Edit

All of these expressions must be true:  
Classification is not 'hoteling'  
Classification does not contain 'hoteling'  
Status is not 'Inactive'

REMOVE FILTER

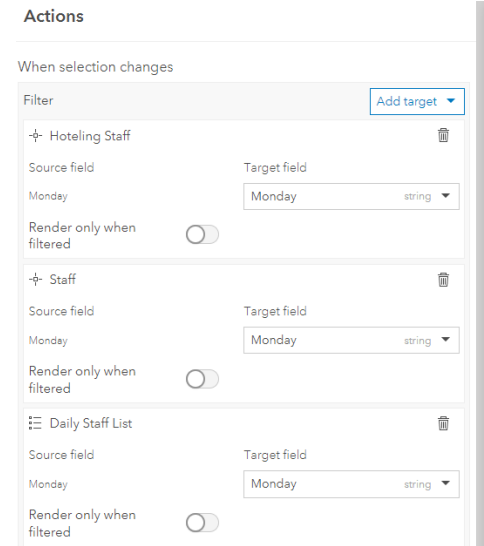
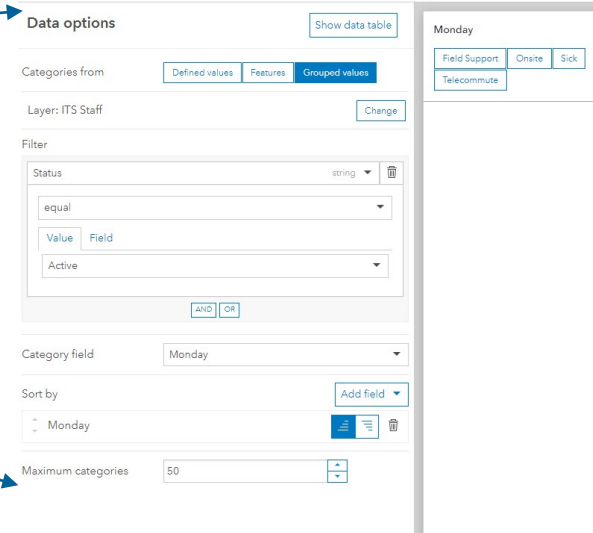
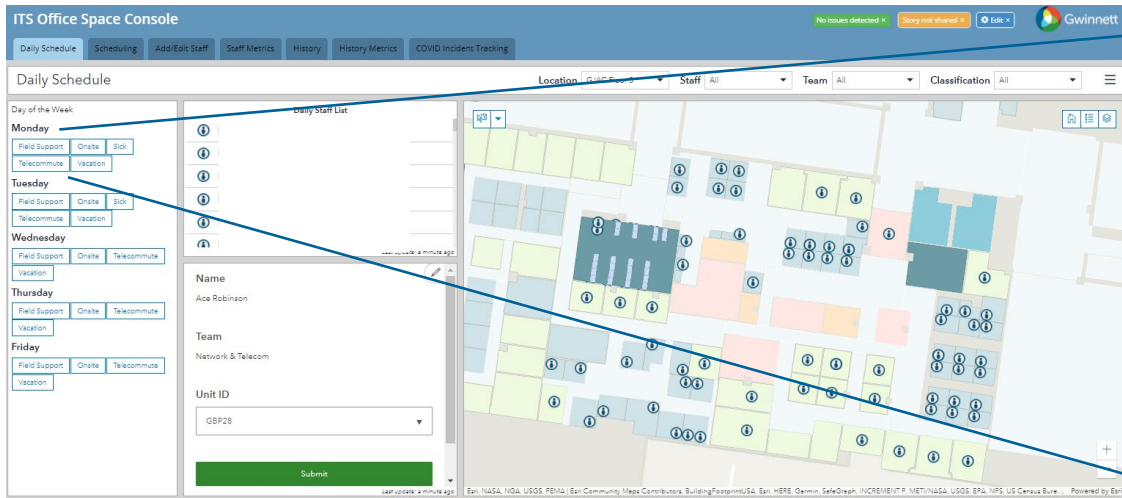
CLOSE



## • Indoors Staff History Map

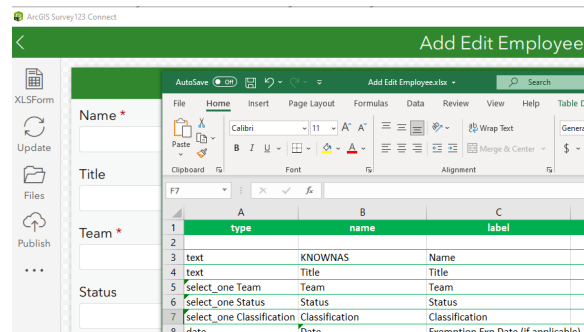
# Dashboards

- Configured with selectors, indicators, lists, maps, and



# Survey123

- Four surveys created with Survey123 Connect used to add and update Staff HR information, seating location, and for COVID Incident Reporting
- Form choices
  - Internal lists used on all forms except one
  - External select used for COVID Incident Tracking Dashboard, automatically adds staff Title and Team



## Choices

|                           |                |
|---------------------------|----------------|
| text                      | KNOWNAS        |
| text                      | Title          |
| select_one Team           | Team           |
| select_one Status         | Status         |
| select_one Classification | Classification |

|    |         |                        |
|----|---------|------------------------|
| 28 | Team    | Project management     |
| 29 | Team    | BRC - Business Relatio |
| 30 | Team    | Systems & Storage      |
| 31 | UNIT_ID | 3W105                  |
| 32 | UNIT_ID | 3W201B                 |
| 33 | UNIT_ID | 3W202                  |

## External selects

|   | type                    | name                    | label          | calculation   | constraint   | constraint_message | relevant |
|---|-------------------------|-------------------------|----------------|---|--|--------------------|----------|
| 1 | select_one_from file    | ITS_Staff.csv           | Staff_Name     | Staff Name  |  |                    |          |
| 1 | select_one_from file    | ITS_Titles.csv          | Position_Title | Title   | pulldata('ITS_Titles','name','Staff_Name', \${Staff_Name}) |                    |          |
| 1 | select_one_from file    | ITS_Teams.csv           | Team           | Team  | pulldata('ITS_Teams','name','Staff_Name', \${Staff_Name})  |                    |          |
| 1 | select_one_from file    | ITS_Staff.csv           | Supervisor     | Supervisor  |  |                    |          |
| 1 | date                    | Date_Reported           | Date Report    |   |  |                    |          |
| 1 | select_one covid_status | COVID_EXP_POS           | COVID Statu    |   |  |                    |          |
| 1 | date                    | Date_Of_Exp_or_Pos_Test | Date of Exp    |   |  |                    |          |
| 0 | date                    | Fifth_Day               | Fifth Day      | date(decimal-date-time(\${Date_Of_Exp_or_Pos_Test})+4)  |  |                    |          |
| 1 | date                    | Fourteenth_Day          | Fourteenth     | date(decimal-date-time(\${Date_Of_Exp_or_Pos_Test})+13) |  |                    |          |
| 2 | date                    | Return_Date             | Return Date    | date(decimal-date-time(\${Date_Of_Exp_or_Pos_Test})+13) |  |                    |          |

```

source_file = source_loc + updated_file
source_file2 = source_loc + updated_file2
source_file3 = source_loc + updated_file3

dest_file = download_folder + "_extracted/esriinfo/media/" + updated_file
dest_file2 = download_folder + "_extracted/esriinfo/media/" + updated_file2
dest_file3 = download_folder + "_extracted/esriinfo/media/" + updated_file3

shutil.copyfile(source_file, dest_file)
shutil.copyfile(source_file2, dest_file2)
shutil.copyfile(source_file3, dest_file3)

print (updated_file + " updated to: " + download_folder + "_extracted/media/")
print (updated_file2 + " updated to: " + download_folder + "_extracted/media/")
print (updated_file3 + " updated to: " + download_folder + "_extracted/media/")

# Delete the old zip file that was previously downloaded. This will prevent any
# In[7]:

os.remove(savedZip)
print ("Old zip file deleted from: " + download_folder)

### Upload the updated survey
# We will now zip the updated survey and place it in the download folder. The co
# In[8]:

zipFileName = surveyProp['title']
os.chdir(download_folder)
updateZip = shutil.make_archive(zipFileName, 'zip', download_folder + '_extracte
print (updateZip)

# Upload the new zip file and update the Form Item with the new Media folder co
# In[9]:

itm.update(1,updateZip)

```

# COVID Tracking Table Scripts



- **COVIDTrackerData Update**

- Creates DataFrame from Staff Table, processes data
- Creates three CSVs - Staff Names, Staff Titles, Staff Teams

```
try:
    df = pandas.read_csv(r'Cs/Temp/Indoors/ITS/updatecovidstatus/
    df = df[["KnownAs", "Team", "Title", "Status"]]
except:
    print('Failed to read staff csv table into pandas dataframe
    email('Subject: Indoors COVIDTrackerDataUpdate Script Failu

##Filters the contents to only the staff that are active

try:
    df = df[df['Status'] == 'Active']
except:
    print('Failed to filter dataframe by active')
    email('Subject: Indoors COVIDTrackerDataUpdate Script Failu

#copy the dataframe to three deep copies
dfnames = df.copy()
dftitles = df.copy()
dfteams = df.copy()
```

- **Updatemediafolder Python Script – from Esri**

- Keeps CSV files referenced by COVID Incident Tracking Survey updated



- These run every 5 minutes to capture changes to staff table and keep the information available in the COVID Incident Tracking survey

| # | type                    | name                    | label          | calculation   | constraint   | constraint_message | relevant |
|---|-------------------------|-------------------------|----------------|---|--|--------------------|----------|
| 1 | select_one_from_file    | ITS_Staff.csv           | Staff Name     | Staff Name  |  |                    |          |
| 1 | select_one_from_file    | ITS_Titles.csv          | Position Title | Title   | pulldata('ITS_Titles','name','Staff Name', \${Staff Name}) |                    |          |
| 1 | select_one_from_file    | ITS_Teams.csv           | Team           | Team  | pulldata('ITS_Teams','name','Staff Name', \${Staff Name})  |                    |          |
| 1 | select_one_from_file    | ITS_Staff.csv           | Supervisor     | Supervisor  |  |                    |          |
| 1 | date                    | Date_Reported           | Date Reported  |   |  |                    |          |
| 1 | select_one_covid_status | COVID_EXP_POS           | COVID Status   |   |  |                    |          |
| 1 | date                    | Date_Of_Exp_or_Pos_Test | Date of Exp    |   |  |                    |          |
| 0 | date                    | Fifth_Day               | Fifth Day      | date(decimal-date-time(\${Date_Of_Exp_or_Pos_Test}) + 4)  |  |                    |          |
| 1 | date                    | Fourteenth_Day          | Fourteenth Day | date(decimal-date-time(\${Date_Of_Exp_or_Pos_Test}) + 13) |  |                    |          |
| 2 | date                    | Return_Date             | Return Date    | date(decimal-date-time(\${Date_Of_Exp_or_Pos_Test}) + 13) |  |                    |          |



# History Table Script

- **Python Script**

- **Modules:** `import` `arcgis`, `pandas`, others

- **Open staff table as pandas dataframe**

- **Filter to active and onsite staff**

- **Add and populate history date field**

```
try:
    now = datetime.now()
    now = now.strftime("%m/%d/%Y %H:%M")
    df['HistoryDate'] = [now]*len(df)
```

- **Saves to csv**

- **Adds csv table to arcgis online**

- **Appends the table to the Staff History table**

```
##Append the new data to the staff history table
try:
    dataset_tbl.append(item_id = historytoappend_csv_item_ID, upload_format = 'c
```

- **Automated to run every day at 2pm.**

# Adding new spaces/making changes

- **Adding Locations (ArcGIS Pro)**
  - Digitize polygons on top of the AutoCAD DWG backing layers
  - Copy new polygons into current Units polygon hosted feature layer
  - Create staff unit point and hoteling unit points
  - Update attributes
- **Change Existing / Small Additions (ArcGIS Pro)**
  - Easily make edits within hosted feature layers

# Results

- Everyone can quickly see seat availability, check social distancing, and review schedules
- Human Resources can easily obtain and send COVID-19 incident reports
- Accomplished historical review
- Managers found the process intuitive



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