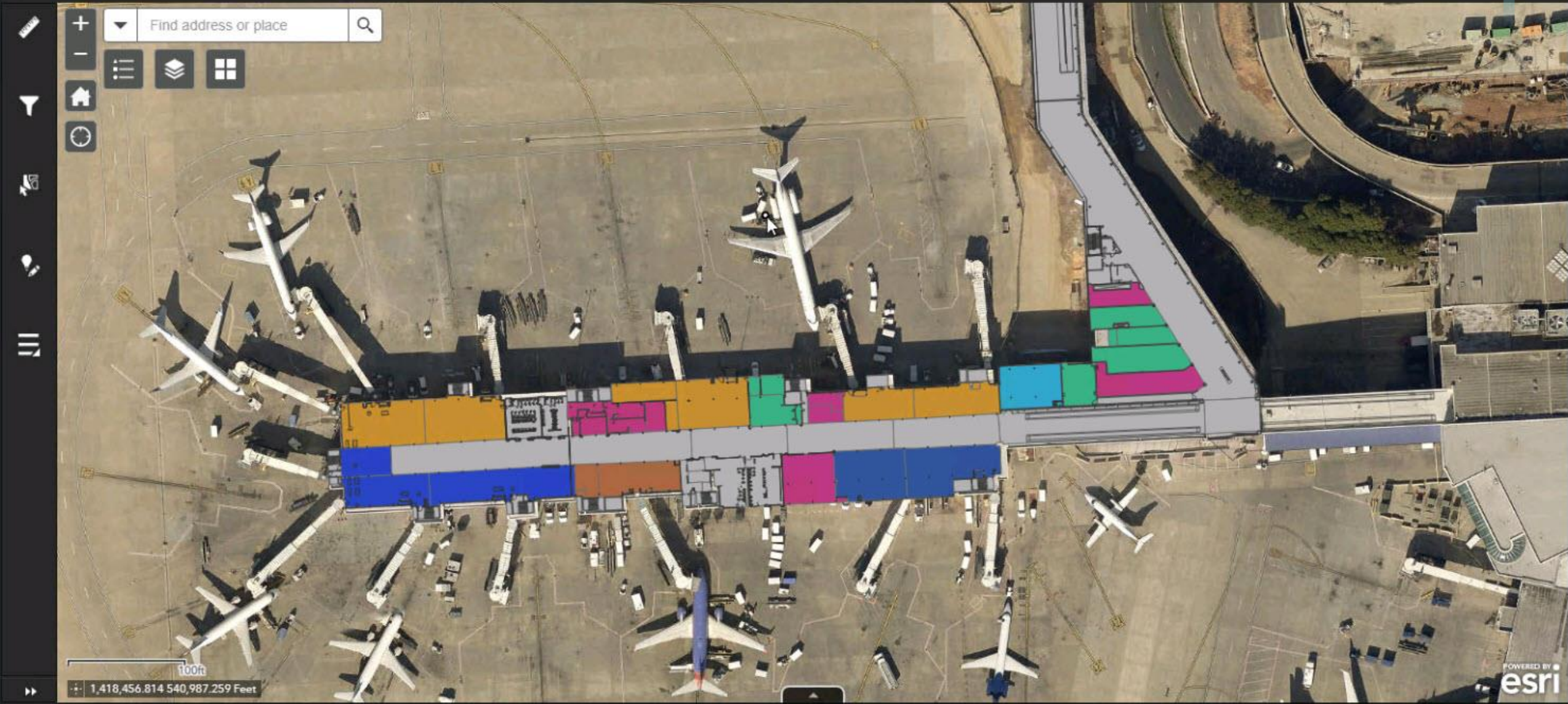


The bottom of the slide features the 'X-SPATIAL' logo in a stylized, blue, blocky font. To the right of the logo is a small screenshot of a game interface. The interface shows a top-down view of a game area with a green character, a yellow and red striped object, and a blue and red striped object. On the right side of the interface, there are several icons: a double right arrow, a cube, a left arrow, and a green airplane icon. Below these icons, the text 'Max Decision' is visible.

EPIC's Simplify Team Proprietary Information

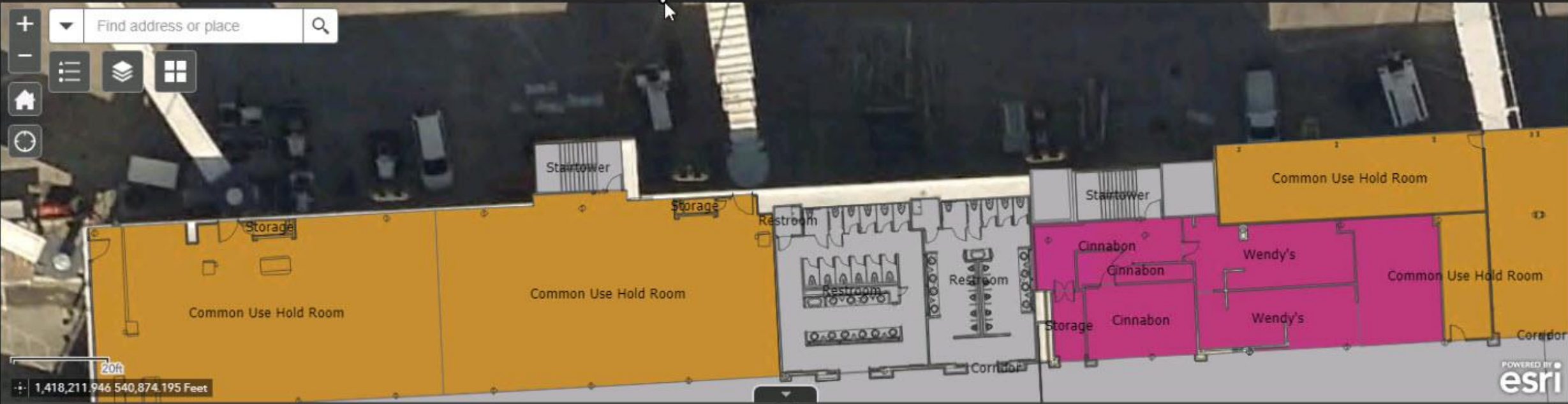
Leased Assets Data

Terminal and Concourses Web Application X-Spatial



Leased Assets Data

Terminal and Concourses Web Application X-Spatial



Options Filter by map extent Zoom to Clear selection Refresh														
LeaseTermination	Tenant	Description	OBJECTID_1	A_LOC_ID	Location Code	AEGIS Room No	Interior Space Identifier	Short Name	Full Name	Concourse	Room Type	CommRoom	Status	Access
December 31, 2021	CLT	Mechanical Chase	96	CLT_TERM00030	CLT_TERM00030	2.000000	1002A2-MC07	A2-MC07	100-A2-MC07	A	Mechanical Chase	A1483	Active	Private
October 1, 2021	HMS Host	Common Use Hold Room	104	CLT_TERM00030	CLT_TERM00030	10.000000	1002A2-0420	A2-0420	100-A2-0420	A	Hold Room	A1483	Active	Private

48 features 0 selected

Pavement Inspections

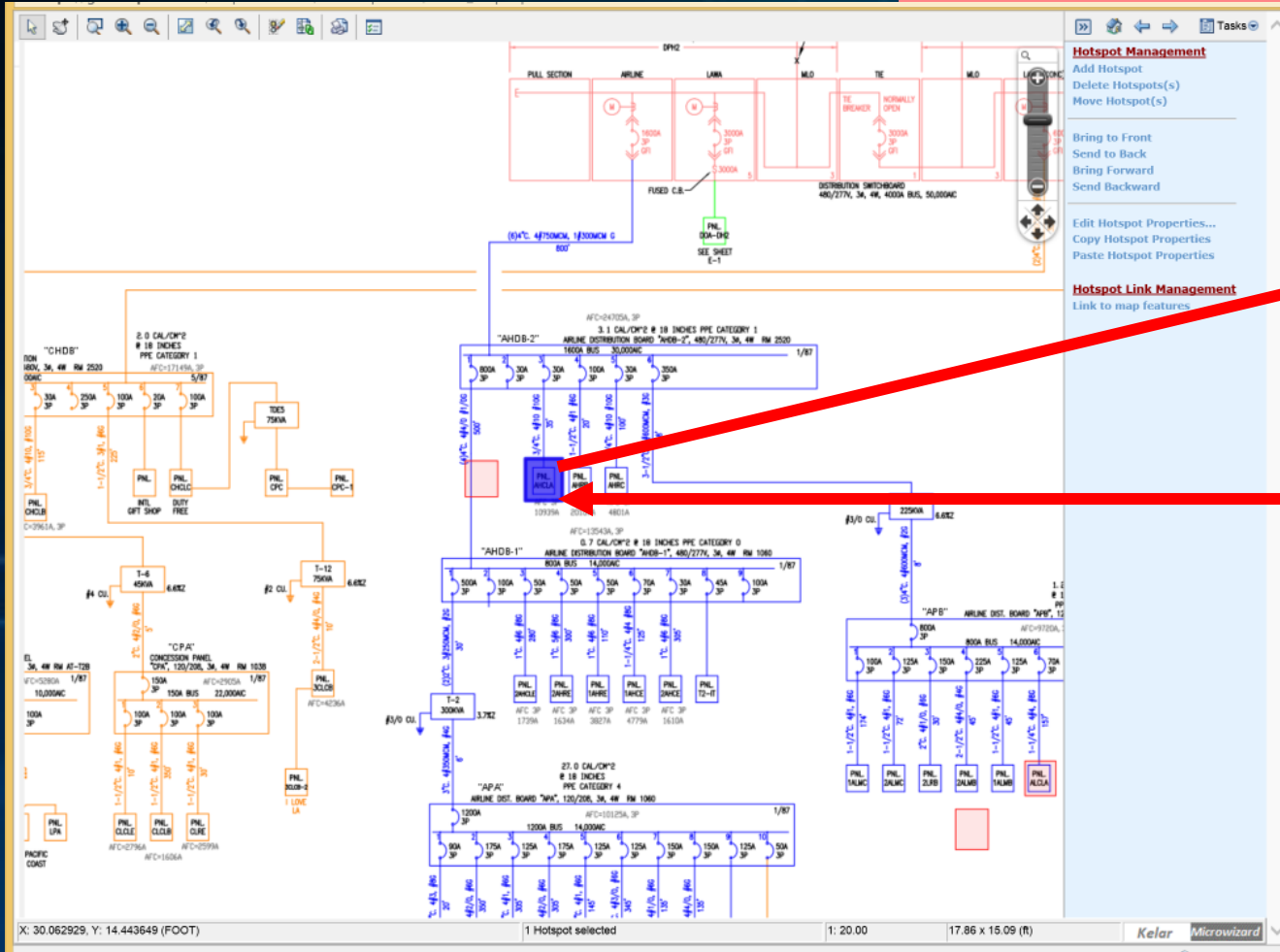
(2 Records)

100%

Integrated Electrical Panel Data



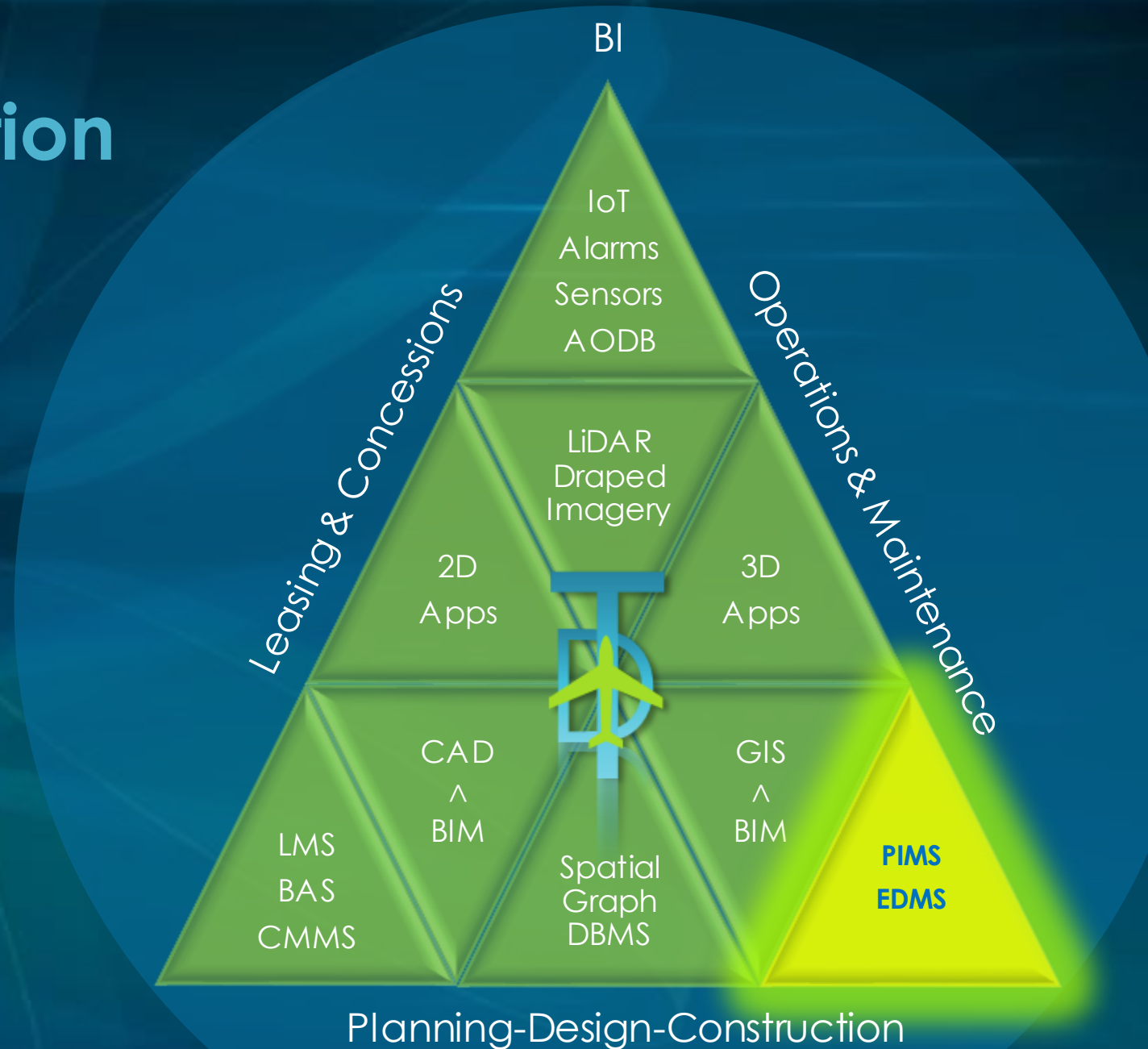
Mapped Electrical Panels with 2-Way
Hyperlinked One-Line Diagrams



Datalink ID: 11954082
Entity Type Name: electrical_panel_area
Type Discriminator: NORMAL_PWR
DDMS Source: [2021515](#)
Comment: AHCLA
Panel Name: AHCLA
Related Documents (first 20):
: [2021511_AHCLA_1_T2 Equip Assessment Report 2009-11-01 342.pdf](#)
Hyperlinked Drawings:
[20060029A-11-E03 - Panel AHCLA \(4\)](#)
[20060029A-12-E04 - Panel Sch AHDB - AHCLA \(3\)](#)

Project Information & Electronic Documentation

- ALP Change Requests / 7460s
- BIM Design & Construction
- Construction Logistics
- Construction Photos w/LiDAR
- Survey Data
- Operational Readiness Activation Training (ORAT)
- As-Builts / O&M Manuals



Project Location & Timing (Logistics)



Project Start Date

Today

Next 7 Days

Next 30 Days

Next 60 days

Next 90 days

Next 120 days

Next 365 days

Date Range

9/1/2021

×

📅

Select End Date

×

📅

✓

Generate Report

Project Status

Planned x

Active x

Complete

◀

November 2021

▶

Su	Mo	Tu	We	Th	Fr	Sa
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	1	2	3	4

today

+

Find address or place

-

📍

Calgary International Airport

Select Area

Layers

Tools

Layers

🗑️ ⏮️ ⏭️ ✕

☐ ALL

☐ Filtered

☒ Calgary International Airport

☒ Projects

☒ APO - Airport OPS Project

☒ CIP - Tenant Project

☒ FAC - Facilities Project

☒ GLC - Capital Project

☒ GWO - Groundside Maintenance Pr

☒ IOC Project

☒ MWO - Airside Maintenance Projec

☒ Work Orders

☒ BaseLayer

☒ YYC CAD

☒ SDS20210216-105442-04apr-23 - tem

Project Location & Timing (Logistics)



Simplify i3®

All

Search for..

Project Start Date

☒ Today ☐ Next 7 Days ☐ Next 30 Days ☐ Next 60 days ☐ Next 90 days ☐ Next 120 days ☐ Next 365 days ☐ Date Range

Project Status

Planned x

Active x

x v

+ -

Find address or place

Calgary International Airport

Fire Sprinkler Protection System
(1 of 2)

Project ID: GLC - Capital Project-0023
Status: Planned
Start Date: 05/03/2021
Estimated Completion Date: 12/17/2021
Zoom to

Select Area

Layers

Tools

Layers

☒ All ☐ Filtered

☒ Calgary International Airport

- ☒ Projects
 - ☒ APO - Airport OPS Project
 - ☒ CIP - Tenant Project
 - ☒ FAC - Facilities Project
 - ☒ GLC - Capital Project
 - ☒ GWO - Groundside Maintenance Pr
 - ☒ IOC Project
 - ☒ MWO - Airside Maintenance Projec
- ☒ Work Orders
- ☐ BaseLayer
 - ☐ YYC CAD
 - ☐ SDS20210216-105442-04arv-aa - terr
 - ☐ SDS20210216-105442-04dep-aa - ter
 - ☐ SDS20210216-105442-04mez-aa - tei
 - ☐ SDS20210216-105442-04utl-aa
 - ☐ SDS20210216-105442-20arv-aa
 - ☐ SDS20210216-105442-20dep-aa

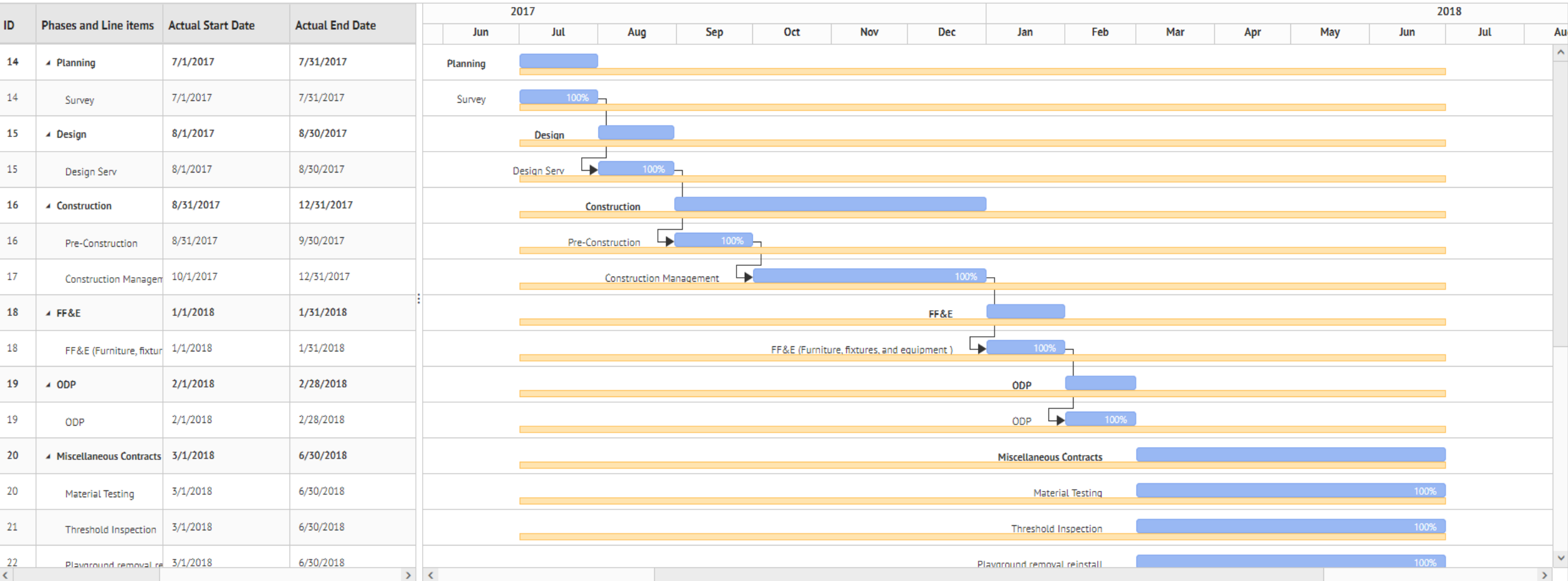
Project Scheduling



[Back](#)

#CAPEXP-0058 | Millennium MS

[Dashboard](#) [Info](#) [Phases](#) [Funds](#) [Budgets](#) [Schedule](#) [Milestones](#) [Contacts](#) [Documents](#) [Purchase Orders](#) [Invoices](#) [Notes](#) [Associations](#)



Project Photos



City of Orlando(UAT) > Inspections > #Insp-0003 : Insp 003 Project Dean Road v1.2 > Pictures

Back

#Insp-0003 | Insp 003 Project

Info

Pictures

Documents

Pictures



2021-10-14_16-15-4...

Audio

Annotate Image



Note: Please click on save to update your changes.

Cancel

Save

Comments

1

Ellana Moncaleano commented

Lining is Incompleted

10/15/2021 10:31:56

2

Ellana Moncaleano commented

Silt fence is missing

10/15/2021 10:32:52

3

Ellana Moncaleano commented

10/20/2021

10/20/2021 13:43:25

No Audios are available for Insp 003 Project Dean Road You can add a new Audio by clicking Record Audio.

Record Audio

AirportDigitalTwin.org Proprietary Information

Project Documentation



SCPS (DEMO) | Default | Millennium MS | Documents | Explorer

Back

#CAPEXP-0058 | Millennium MS

Upload

Dashboard | Info | Phases | Funds | Budgets | Schedule | Milestones | Contacts | Documents | Purchase Orders | Invoices | Notes | Associations

Explorer | Expiring Documents

Millennium MS

Search

+

-

Millennium MS

Bid Docs

POs

Invoices

Schedule of Values

Comment Attachments

Contract Docs

Construction

Design

Inspection Attachments

Note Attachments

Project

Construction

Electrical

Mechanical

Pictures

Design

Project Setup

Budget

Meeting Notes

Project Plan

Site Surveys

Name	Type	Date modified
Bid Docs	Folder	05/05/2019 08:17:41
Comment Attachments	Folder	05/01/2019 09:30:59
Contract Docs	Folder	05/05/2019 08:18:19
Inspection Attachments	Folder	05/01/2019 09:30:59
Note Attachments	Folder	05/01/2019 09:30:59
Project	Folder	05/05/2019 08:18:51
20190319_Req68_Construction Report 2018-19 Projects.pdf	File	05/05/2019 07:57:42
nmms_08202018_01.jpg	File	05/05/2019 09:02:56
nmms_08202018_02.jpg	File	05/05/2019 09:02:56
SMS Canopy Permit 2510.pdf	File	11/16/2019 12:50:52

10 items : 1 item selected 70.30 KB

Whorton-Smith, Inc.

Millennium Middle School

08-20-18

Comment: No Comment Provided.

File Size: 70.30 KB File Type: .jpg

Uploaded by Shreyas Kulkarni on 05/05/2019 09:02:56

Updated by Shreyas Kulkarni on 05/05/2019 09:02:56

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EPIC Enterprise Base-DEMO, Version: 1.0.0.5

AirportDigitalTwin.org Proprietary Information

Document & Drawings Mgm't



- ➔ File
- ➔ Attribute
- ➔ Search & Retrieve

Document Administration

Update Search Context

Document Types
Attribute Groups
Document Metadata
Document Metadata Domains

Folder Views

DDMS

[Home](#) | [Overview Guide](#) | [Logout](#)

Document Set **Folder View**

Building Name, Project Type, Sheet Type

- + Administration Bldg (6)
- + Airport Station (13)
- + Alamo Rent A Car (54)
- + All Hangers Terminals Utility (1)
- Amelia Earhart Bldg Support (241)
- + Asbuilt (69)
- Design (52)
 - Architectural (21)
 - Electrical (8)
 - Fire Protection (3)
 - Hvac (5)
 - Landscape (8)
 - Mechanical (1)
 - Plumbing (4)
 - Structural (1)
 - Title (1)
- + Taa_As (85)
- + Taa_Des (35)

List Document Set Drawings

Download Files (Zip)

Export Query Result to Excel

Print Query result (PDF)

Add files to Document Set

Remove files from Document Set

LAWA Spatial Admin - DDMS Admin

Document Search

Bar Code No. contains
Drawing Set contains
Drawing No. contains
Project Title contains
Discipline Code contains
Sheet No. contains
Sheet Title contains
Document Date is
Rev No. contains
Rev Date is
Media Sub Loc contains
UTM Dwg contains
Comments contains
Alias contains
Document Type contains
Document Subtype contains
Dwg Media contains
Doc Status contains
Airport Loc Code contains
Sheet Type contains
Project Id contains
File Path contains
Filename contains
File Size is
File Date is
Drawing Set Desc contains
User Name contains
Time Stamp is
DocId is
Archive is
Is Published contains
Grid Code contains

Document Attribute Values - Personal

95 distinct values found for 'Discipline Code'

OK Cancel

Data Administration View

Bar Code No.	Drawing Set	Airport Code	Drawing No.	Project Title	Discipline Code	Sheet No.
0002501	0000974	LAX	59110-443	COMPLEX III & COMPLEX IV - PHASE 1	ELEC	U E.1
0002502	0000974	LAX	59110-443	COMPLEX III & COMPLEX IV - PHASE 1	ELEC	U E.1
0002503	0000974	LAX	59110-443	COMPLEX III & COMPLEX IV - PHASE 1	ELEC	U E.1

08/21/1959 4 07/01/1960 P002A YES

airports.x-spatial.com/UMS/cfscrip/Forms/SDS_Domain_Result.cfm?RecordID=d_ddms_drw_me

Not secure | airports.x-spatial.com/UMS/cfscrip/Forms/SDS_Domain_Result.

Domain: DDMS - List of drawing media

	Value	
BRF	BROWN FILM	
DISK	OPTICAL MEDIA	
ELC	ELECTRONIC	
LIN	LINEN	
MICR	MICROFILM/APERTURE CARD	
MICRO	MICROFILM/APERTURE CARD	
MYL	MYLAR	
PAP	BOND/PAPER	
PHO	PHOTO	
SEP	SEPIA	
SOS	FLAG FOR FURTHER RESEARCH	
VEL	VELLUM	

Attributes Data Structure

X·SPATIAL



- 75 out-of-the-box attributes for use
- May be reduced or expanded
- LAX has activated these 34 attributes

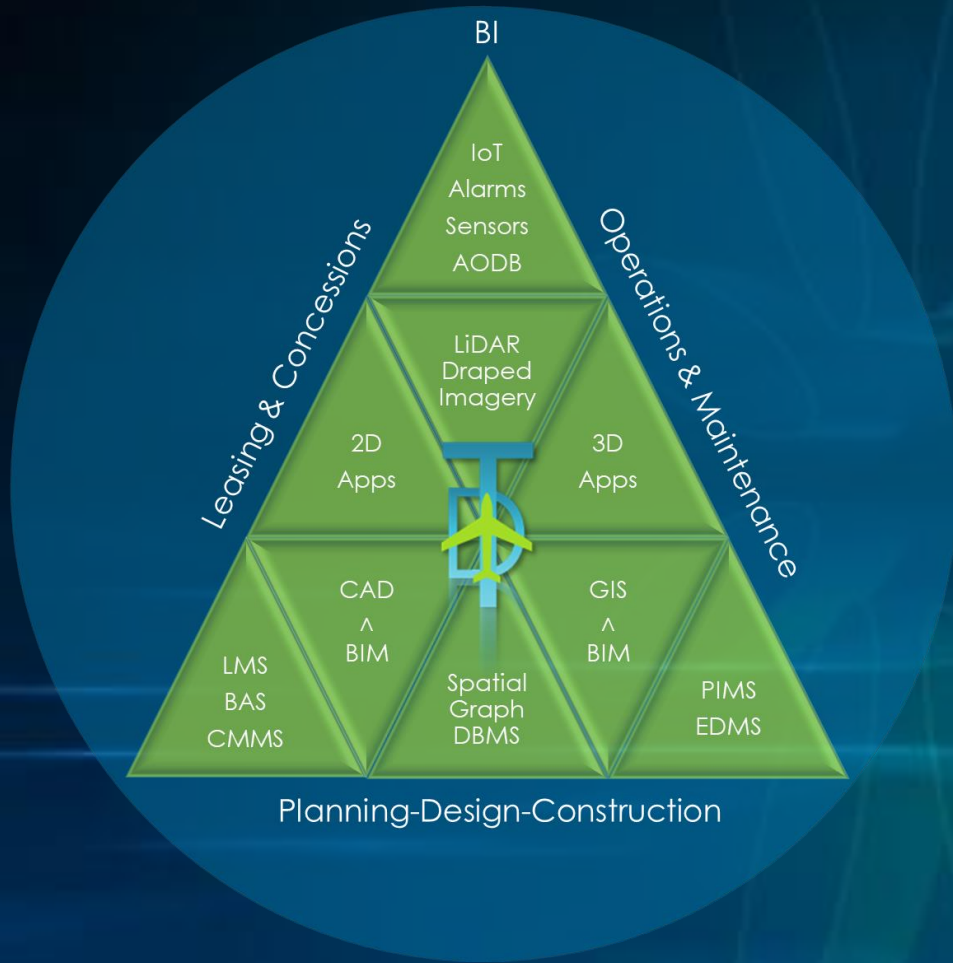
Document Search

Bar Code No.	contains ▼
Drawing Set	contains ▼
Airport Code	contains ▼
Drawing No.	contains ▼
Project Title	contains ▼
Discipline Code	contains ▼
Sheet No	contains ▼
Sheet Title	contains ▼
Document Date	is ▼
Rev No	contains ▼
Rev Date	is ▼
Media Sub Loc	contains ▼
Util Dwg	contains ▼
Comments	contains ▼
Alias	contains ▼
Document Type	contains ▼
Document Subtype	contains ▼

Dwg Media	contains ▼
Doc Status	contains ▼
Airport Loc Code	contains ▼
Sheet Type	contains ▼
Project Id	contains ▼
File Path	contains ▼
Design Code	contains ▼
Filename	contains ▼
File Size	is ▼
File Date	is ▼
Drawing Set Desc	contains ▼
User Name	contains ▼
Time Stamp	is ▼
Docid	is ▼
Archive	is ▼
Is Published	contains ▼
Grid Code	contains ▼

Search

Webinar Outline



AirportDigitalTwin.org

2. Jul 26: Information Integration

- ➔ Objective & Introductions
- ➔ Disparate Information Correlation via Spatial Common Denominator
- ➔ Multi-Dimensional Information Association
 - ➔ BIM-CAD-GIS-LiDAR with Draped Imagery
 - ➔ IoT Devices-Sensors-Alarms...
 - ➔ Documents-Files-Photos-Videos...
 - ➔ Process Workflows-Communications-Tasks...
- ➔ Business Intelligence (BI) Rollup

Enterprise BI Analytics



- Airport Digital Twin Rolls Up to Provide Business Intelligence (BI)
- Airport Enterprise BI Requires various Analytics Correlation via Spatial Common Denominator
- Strong Spatial Analytics Tools Needed



BI

List View



- Home
- Map
- Assets
- Service Requests
- Work Orders
 - Corrective Action
 - Safety Hazard Mitigation
 - Preventive Maintenance
 - Training/Communication
 - All Work Orders
- Projects
- Inspections
- Leases
- Contacts
- Setup
- Trainings
- Documents
- Administration
- UserReports

Status

Auto Fit

Select View

Demo View

Search

Columns

Actions	Work Order ID	Work Order Name	Priority	Due Date	Status	Assigned To	General Description	Age[Days]	Postal Address	Attachments
▼ Status: Active - 7 items										
	WO-Corrective-000004	Aircraft Collision Through Fence	1 - Critical	08/28/2022	Active	Airport Demo	Aircraft Collision Through Fence	58		0
	WO-Corrective-000018	Ramp Repair	2 - High	08/28/2022	Active	Manisha Wangikar		0		0
	WO-Corrective-000009	Taxiway Signage Light Is Out	2 - High	08/05/2022	Active	Felipe Bergano	Signage Light Is Not Functioning And Needs To Be Repaired	56		0
	WO-Corrective-000003	Repaint Runway Markings	2 - High	08/28/2022	Active	Felipe Bergano		58		0
	WO-Corrective-000008	Runway Marker Damaged	2 - High	08/02/2022	Active	Felipe Bergano		57		0
	WO-Corrective-000001	Repair Airfield Pavement	2 - High	08/12/2022	Active	Aviation Demo		69		0
	WO-Corrective-000019	O&M - 08/24/2022 - 09:52 PM	3 - Medium		Active	Felipe Bergano	Cracks Noticed	0	Valley Int'l Airport, 3002 Airport Dr, Harlingen, TX, 78550, USA	2
▼ Status: Closed - 2 items										
	WO-Corrective-000002	Replace Signage Light	3 - Medium	07/20/2022	Closed	Airport Demo		58		0
	WO-Corrective-000010	Daily Wildlife 1	4 - Low	07/29/2022	Closed	Airport Demo	During The Daily Wild Life Inspection. Bird Nests Were Found Too Near The Runway	31		0

1

20

Items per page

1 of 1 pages (18 items)

Valley International Airport Reports

Reports My Favorite Reports Standard Reports Scheduled Reports Inspection Reports

Work Order Aging Report

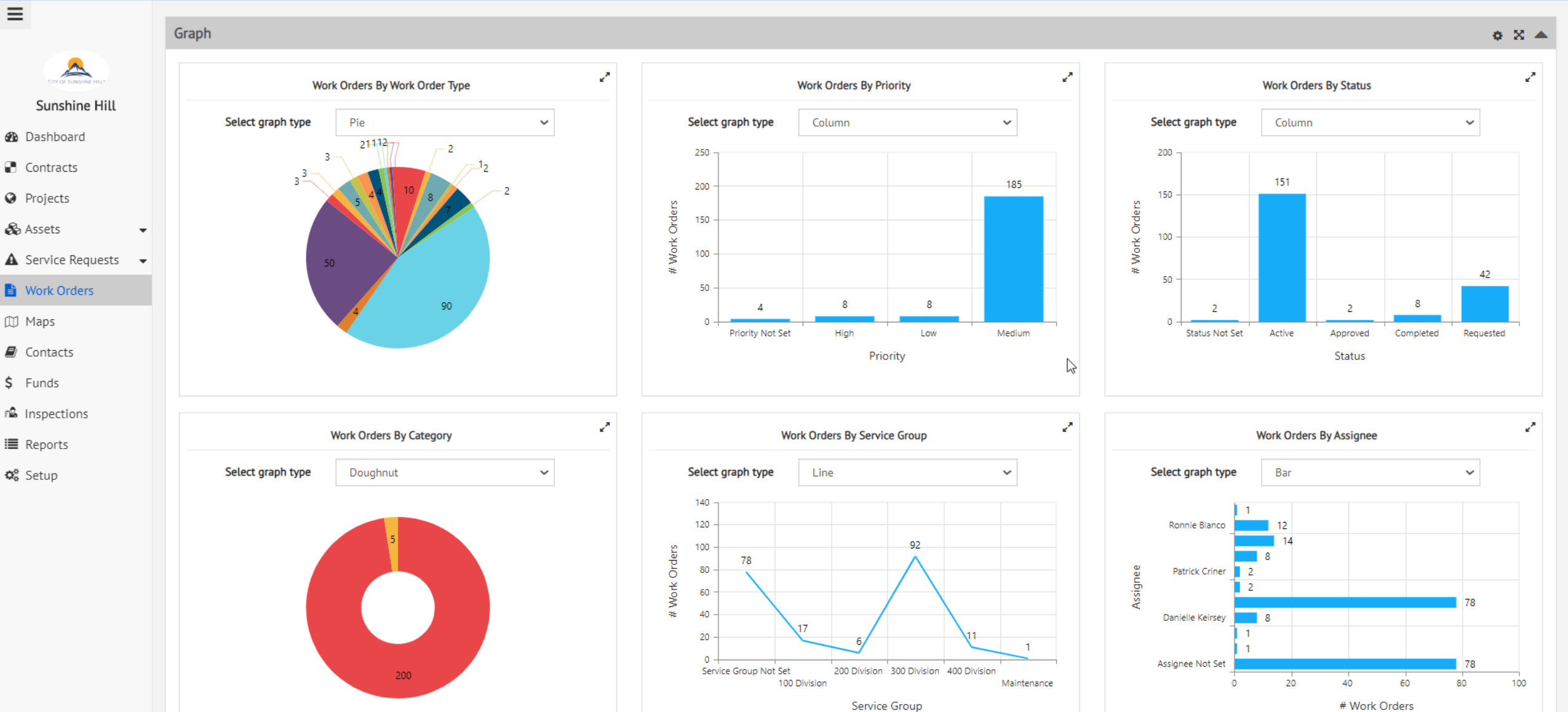
Export Print

Duration ☐ Today ☐ Past 7 Days ☒ Past 30 Days ☐ Past Quarter ☐ Past Year ☐ Date Range

Inspection #	Work Order #	WO Created By	WO Created Date	WO Assigned To	Days Open
139DLY-0218	WO-0074	ARFF Department	03/11/2021	Albert Cano	0
139DLY-0232	WO-0077	ARFF Department	03/16/2021	Albert Cano	0
139DLY-0235	WO-0082	ARFF Department	03/17/2021	Albert Cano	2
139DLY-0241	WO-0083	ARFF Department	03/19/2021	Albert Cano	0



Dashboard View



Dashboard View



Valley International Airport ▶ Work Orders Dashboard

Work Orders Dashboard

Save View

4

ACTIVE WORK ORDERS

1

WORK ORDERS CREATED TODAY

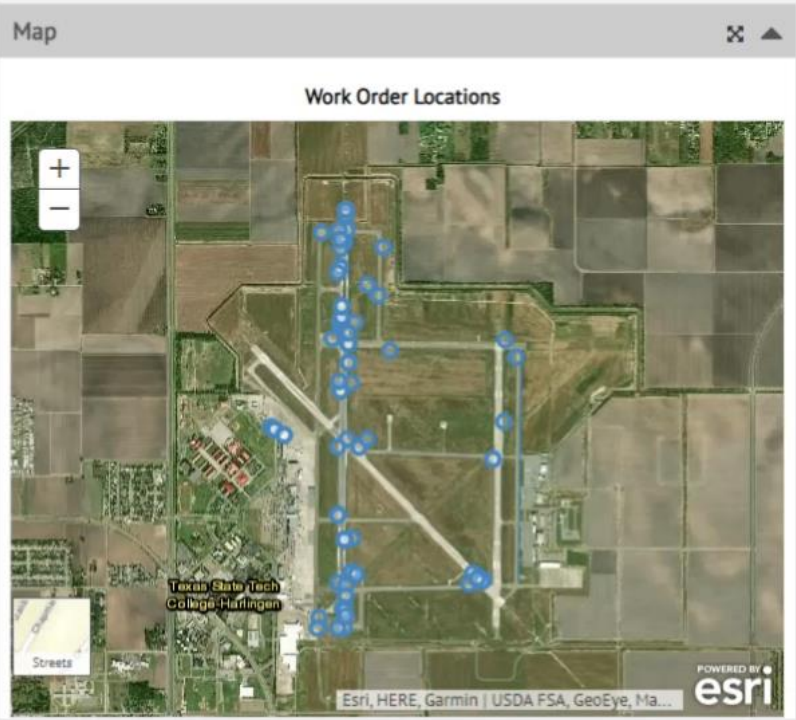
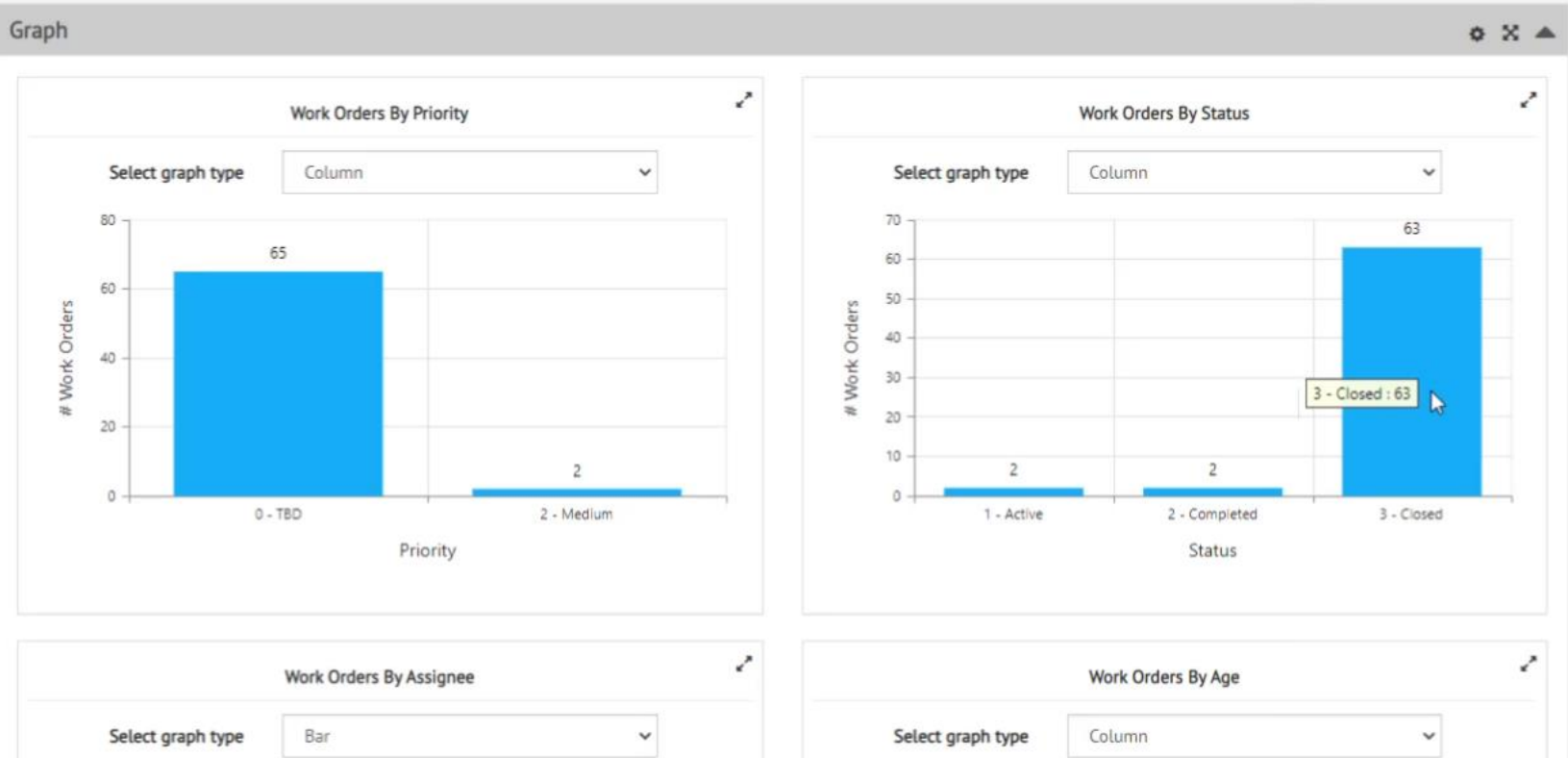
0

HIGH PRIORITY WORK ORDERS

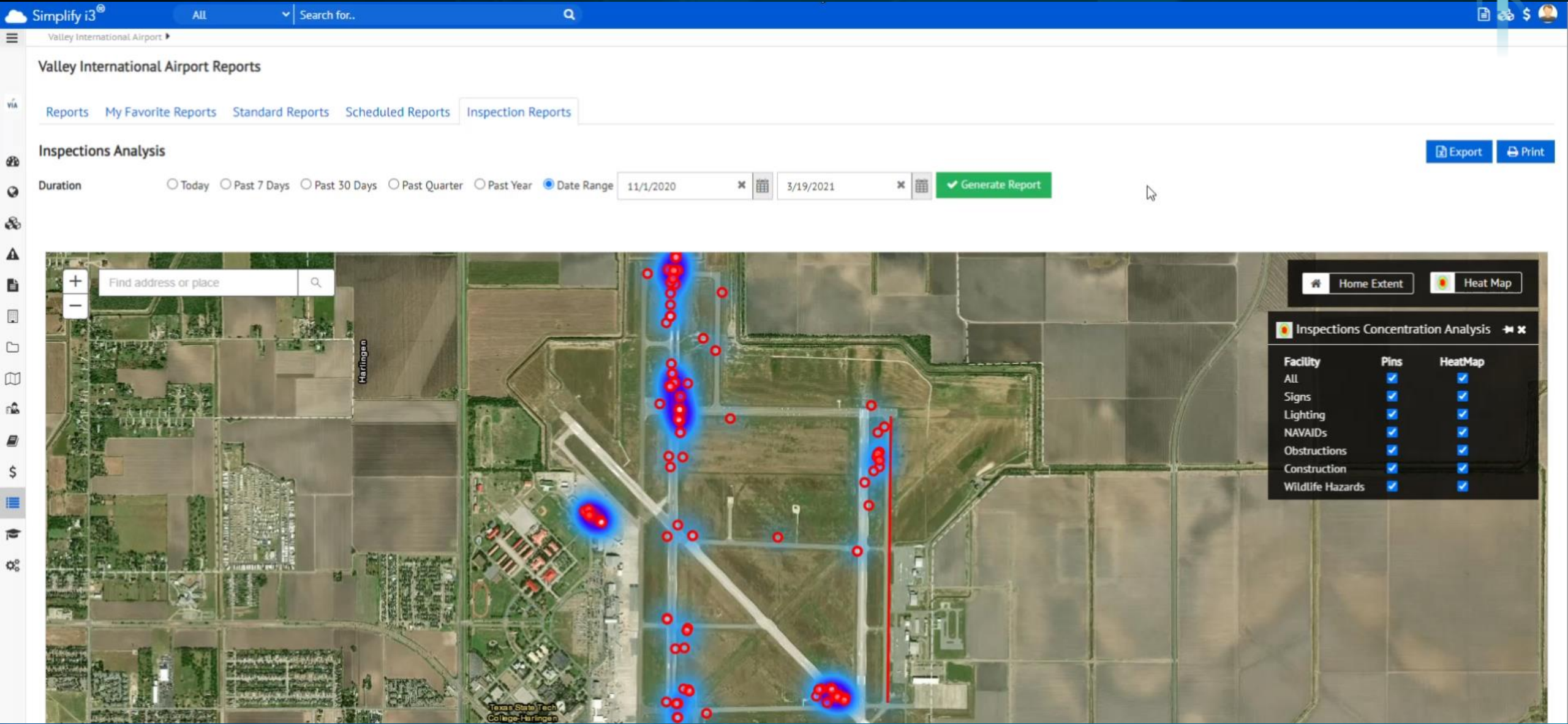
0

OVERDUE WORK ORDERS

Select Filters



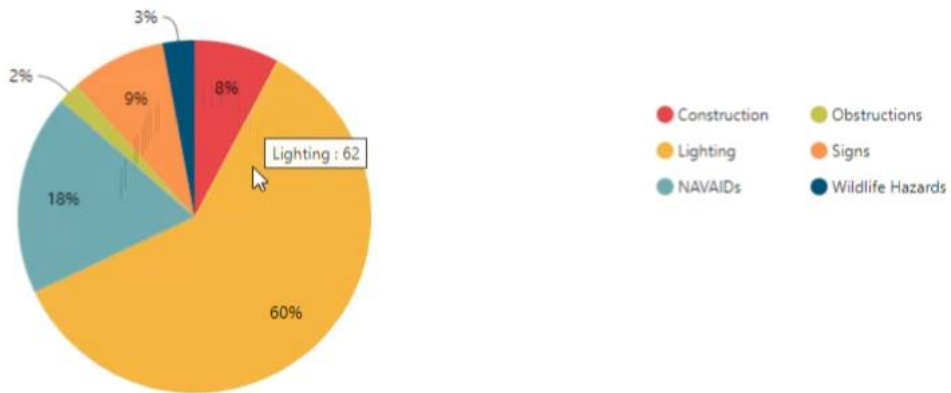
“Heat” Map View



Heat Map View



Summary of unsatisfactory categories



Category	Count
Construction	8
Lighting	62
NAVAIDs	19
Obstructions	2
Signs	9
Wildlife Hazards	3



CLT Leaseh...

Tenant:

Description:

Concourse:

Floor:

Lease Termination:



Leases To Expire

21

This Quarter

Last update: a few seconds ago

Leases To Expire

53

Next Quarter

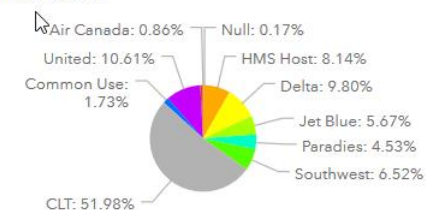
Last update: a few seconds ago



Total Lease Area:
230,554.4 ft²

Last update: a few seconds ago

Total Lease Area



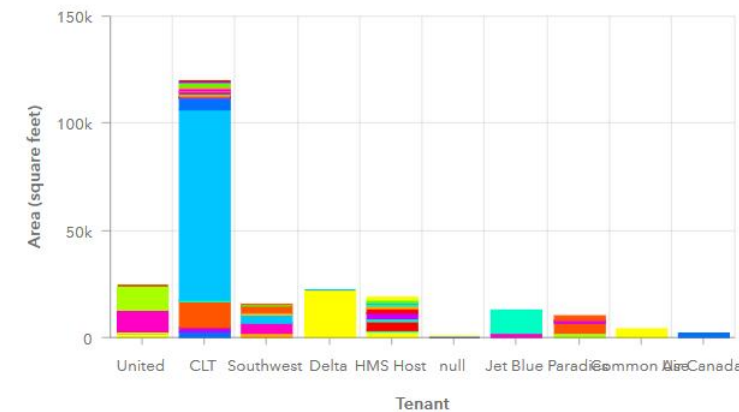
Last update: a few seconds ago

Lease Expiration Timeline



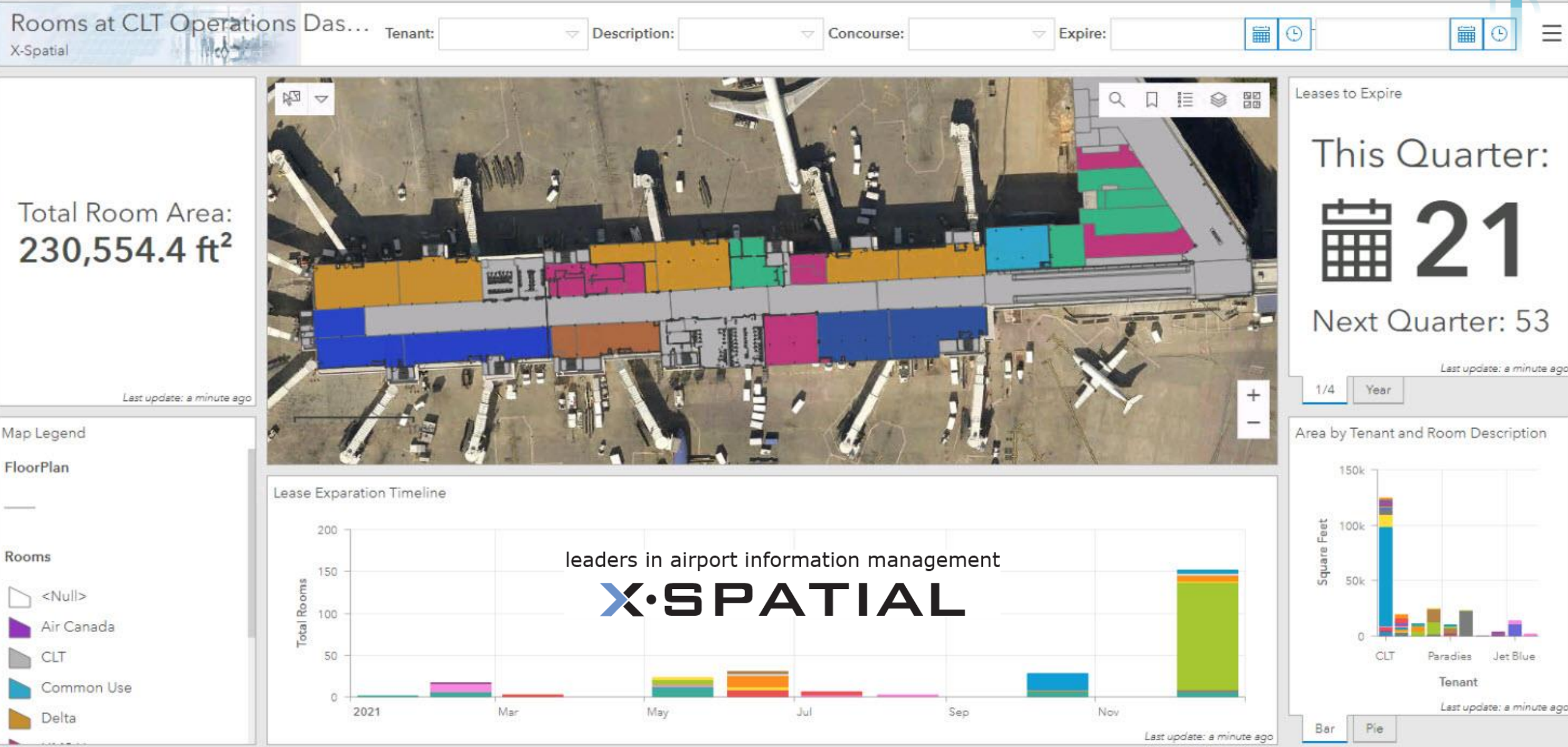
Last update: a few seconds ago

Total Lease Space Area by Tenant



Last update: a few seconds ago

BI Analytics Dashboards

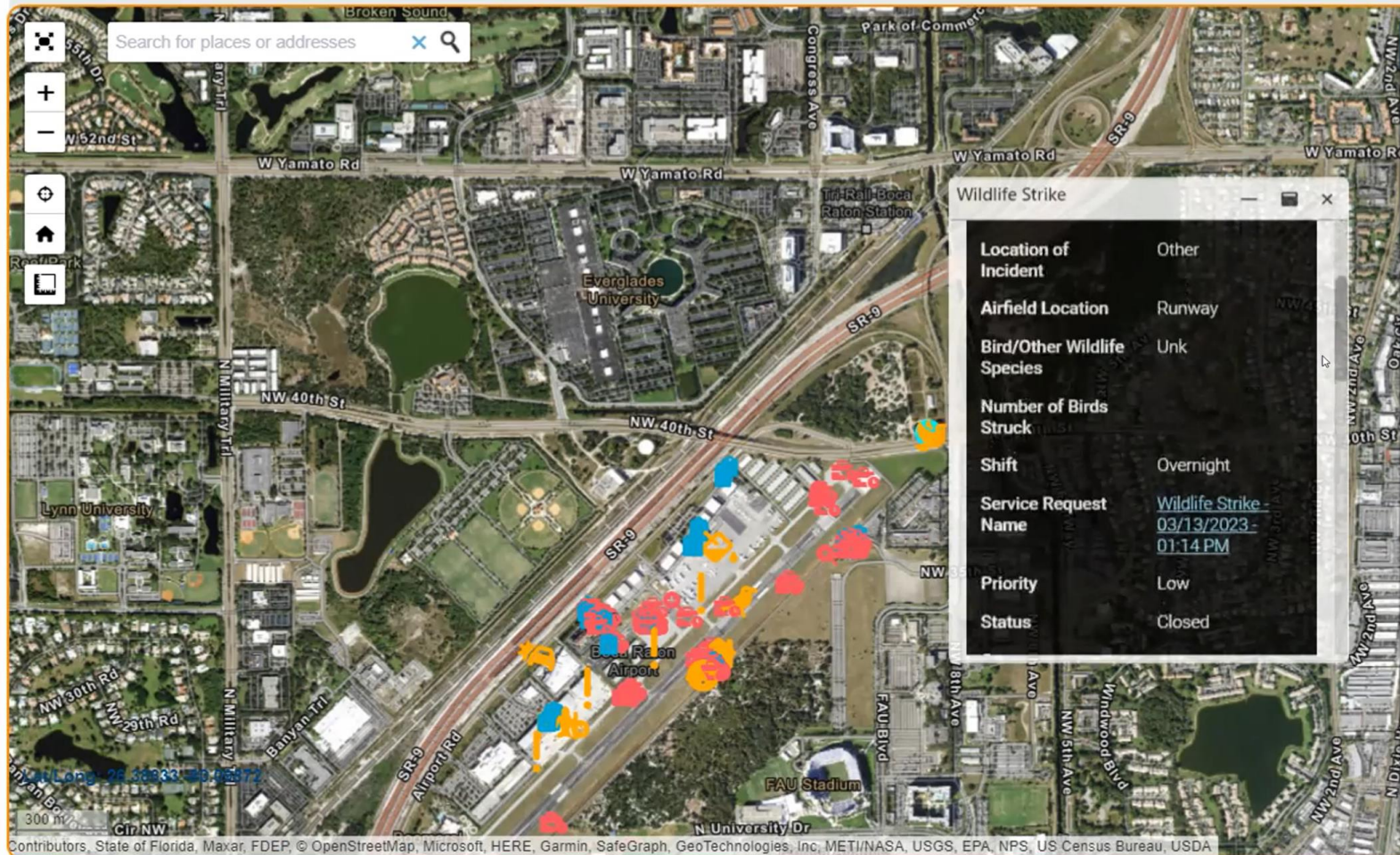


Symbolized Map Views



- Dashboard >
- Map >
- Global Map
- Service Requests >
- Inspections >
- Work Orders >
- Projects >
- Contacts Directory >
- Security Badges >
- Trainings >
- Documents >

Global Map | Map • Global Map



Legend

i3 Data Layers

Work Orders

Corrective Action

Preventive Maintenance

Safety Hazard Mitigation

Projects

Airport Project

Safety Mitigation Project

Service Requests

Aircraft Damage

Aircraft Incident

Alert 2

Alert 3

Auto Accident

Break-In/Theft

Disabled Aircraft

Fuel Spill

General Incident

Hazard Identification

Incident Template

Injury

Operational Changes

Property Damage

Research Tasks & Studies

SMS

Suggested Improvements

Trespassing

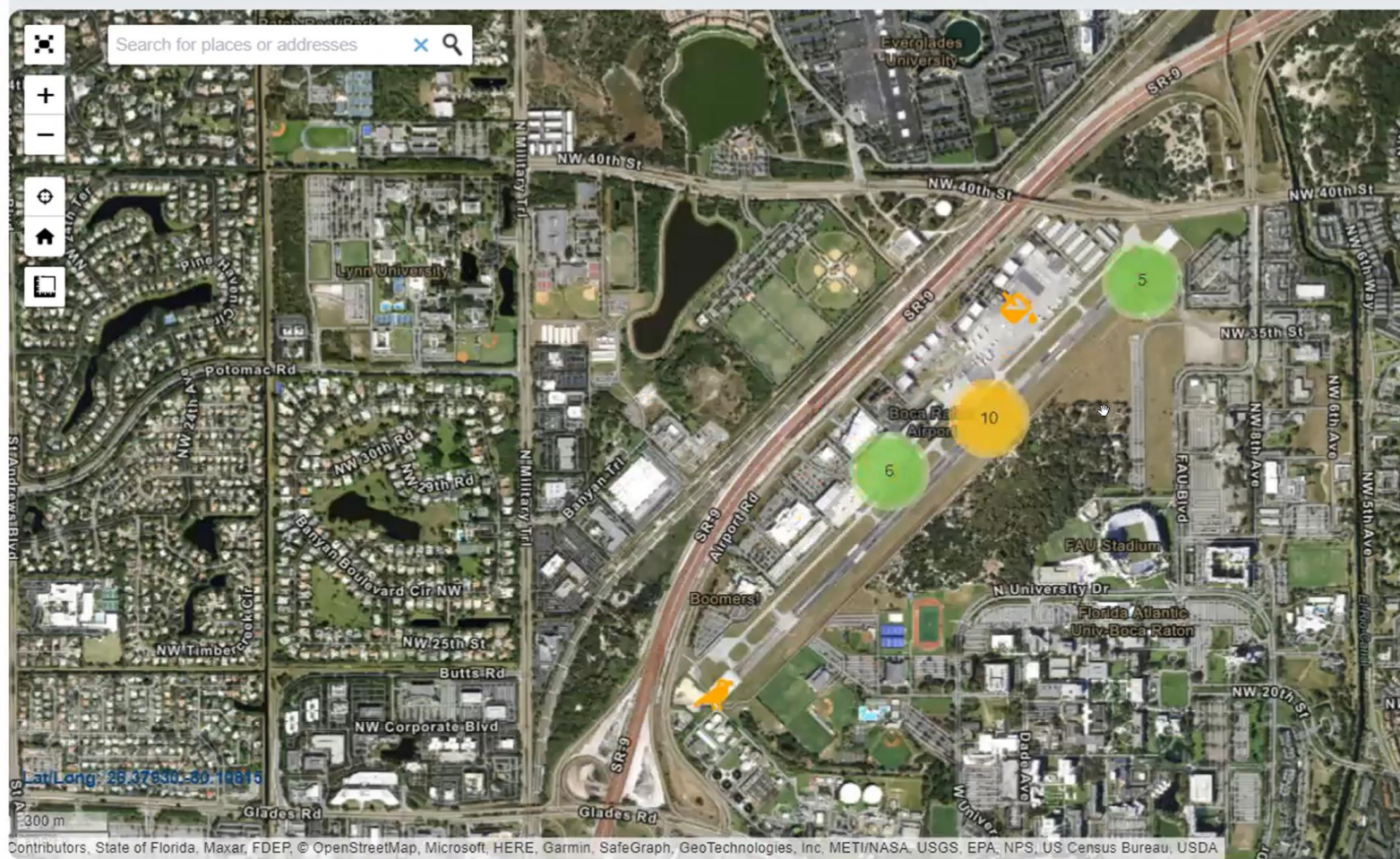
Vandalism

Concentration Cluster Map Views



- Dashboard >
- Map >**
 - Global Map**
- Service Requests >
- Inspections >
- Work Orders >
- Projects >
- Contacts Directory >
- Security Badges >
- Trainings >
- Documents >

Global Map | Map • Global Map



Layer List

- ☒ Enable Clustering
- ☐ Enable Heatmap
- ☒ Enable Pin
- ☐ All ☒ Filtered ☐ Advanced Filter
- > ☒ Work Orders
- > ☐ Assets
- > ☒ Projects
- > ☒ Service Requests
- > ☒ Contacts Directory
- > ☐ Inspections
- > ☒ CAD Layer

Concentration “Heat” Map Views

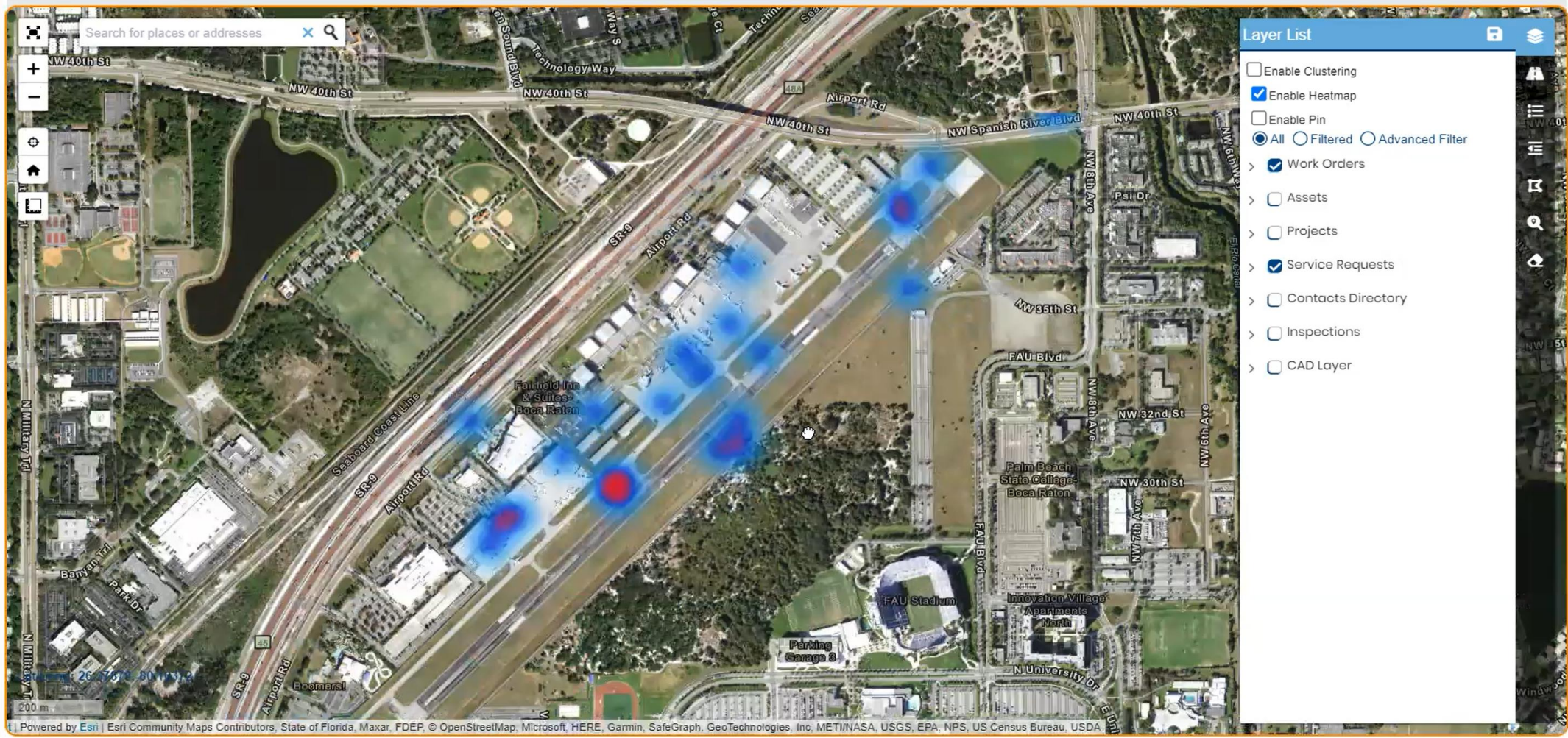


75 YEARS BOCA RATON AIRPORT Hi, Good Morning Robert Pratt R

Simplify i3 <<

- Dashboard >
- Map >
- Global Map
- Service Requests >
- Inspections >
- Work Orders >
- Projects >
- Contacts Directory >
- Setup >
- Trainings >
- Documents >
- Administration >
- Reports Designer
- User Reports

Global Map | Map • Global Map



Spatial BI Analytics

Leading Software Options

X·SPATIAL



- Tableau with Embedded Esri Maps
- PowerBI with Embedded Esri Maps
- Esri
 - ArcGIS Dashboards
 - ArcGIS Insights
 - ArcGIS Web Applications

Takeaways

- ➔ Data Integration via Shared Spatial DBMS is Key
- ➔ Support Data from Various SW Tools & Platforms
 - ➔ Autodesk & Esri
 - ➔ Web-Enabled
 - ➔ Mobile iOS / Android
- ➔ Data Standards Compliance Facilitates Integration
- ➔ Automation Tools to Check & Convert Non-Compliant Data
- ➔ Power User Tools that Minimize Need for DBAs

Q&A



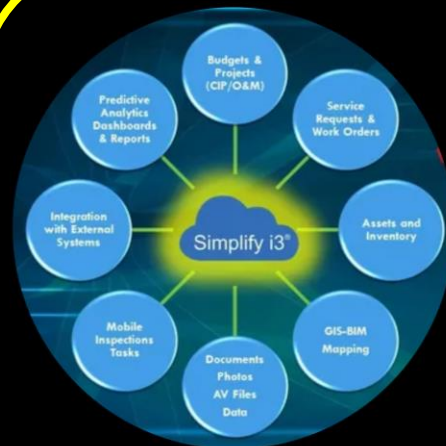
Thank You

AirportDigitalTwin.org



Welcome About Us Q&A Solution Webinars

INTEGRATED SOLUTION PLATFORM



Simplify i3

Airport Digital Twin Transformation Platform
by EPIC Engineering & Consulting Group

[Learn more](#)



AEGIS

Airport Enterprise Geospatial Information
System by x-Spatial

[Learn more](#)



BIM

Building Information Modeling Standardization
Harvesting and Integration by PDBM/x-Spatial

[Learn more](#)

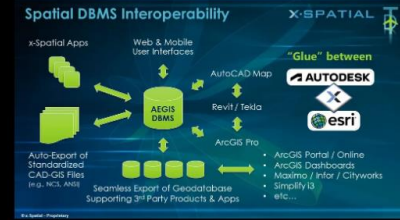


Welcome About Us Q&A Solution Webinars

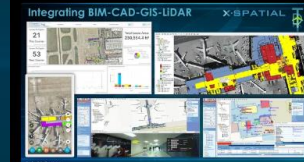
AEGIS

Our Airport Digital Twin solution leverages x-Spatial's Airport Enterprise Geospatial Information System (AEGIS) as the "common denominator" component, providing the spatial skeleton supporting the correlation of various airport data.

AEGIS includes an airport specific spatial Database Management System (DBMS), integrating both Autodesk and Esri data structures and functionality. The AEGIS DBMS is:

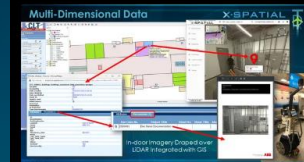


AIRPORT DIGITAL TWIN ENABLING CAPABILITIES



Integrating BIM deliverables

AEGIS enables the best of both worlds -- Autodesk and Esri. It integrates Autodesk Revit BIM models, delivered for airport AEC projects, with our overall digital twin solution spanning the entire airport campus. AEGIS enables data feeds from both AutoCAD and ArcGIS Pro. It also serves spatial data for analysis to both Autodesk and Esri tools and applications.



Integrating Business Analytics Spatially

Airport Business Intelligence (BI) requires correlation of various disparate analytics data. The most effective means for correlating multiple such datasets for airport use cases is via spatial dashboarding. x-Spatial leverages the power of Esri's ArcGIS spatial analytics, as shown in this example involving lease management data.



Integrated Pavement Condition Data

AEGIS includes airport pavement management functionality for both

Spatial Integration Platform

The x-Spatial AEGIS backbone of our Airport Digital Twin solution, leverages state-of-the-art technologies from Autodesk, Esri, Trimble, SOLV3D, Oracle, and Microsoft to integrate BIM, CAD, GIS, and LIDAR with draped imagery.



Integrating Multi-Dimensional Data

The x-Spatial AEGIS platform allows integration of multi-dimensional data types, including 2D and 3D interconnected facility views, with embedded asset attribute data, as well as asset documentation.

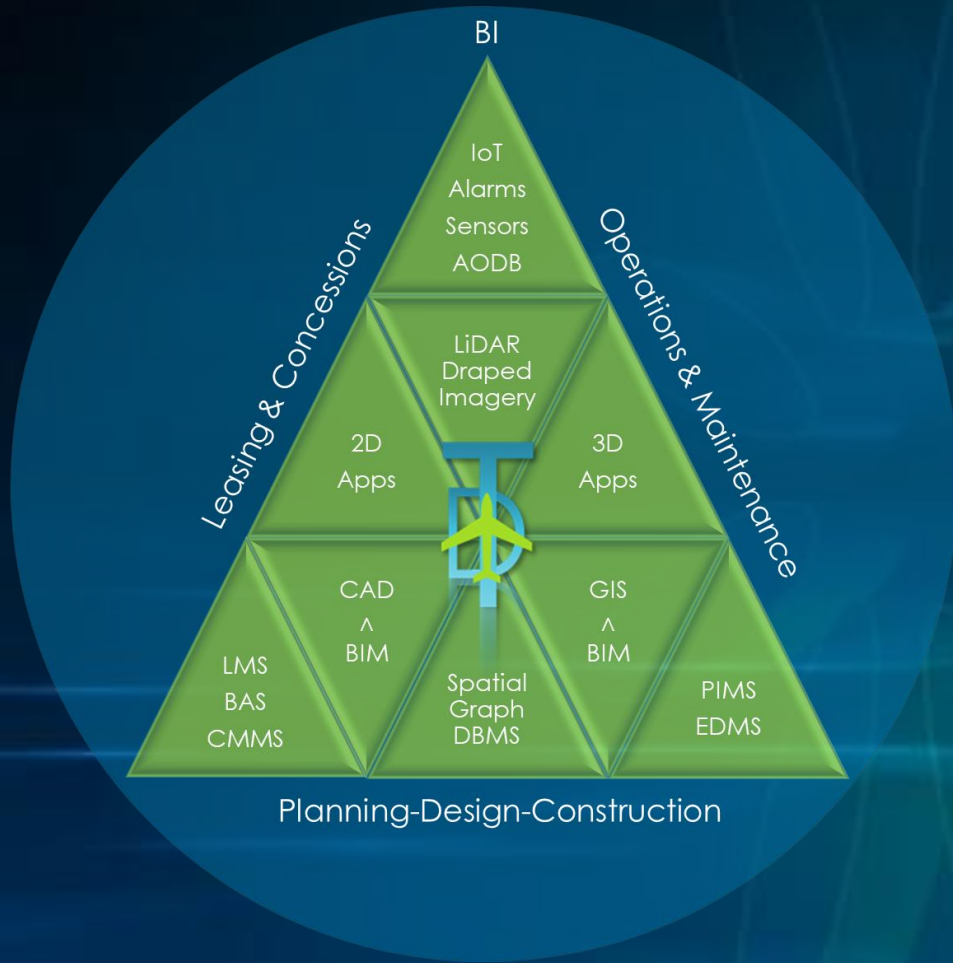


Integrated Signage Data

The AEGIS system supports integration of various types of airport signage data spanning the airfield per FAA requirements, terminal indoor signage, and outdoor signage covering the remaining airport campus including roadways, wayfinding, buildings, etc.



Webinar Series



1. Jul 19: **BIM Processing**

2. Jul 26: **Information Integration**

3. Aug 2: **Enabling Integrated SMS**

4. Aug 9: **Holistic Business Intelligence**

5. TBD: **Leveraging Video Analytics**

6. TBD: **Predictive Modeling**