esri Northeast Africa

GIS IN AIRPORTS

SOLUTIONS & APPLICATIONS

DECEMBER 2017

Agenda

- About Esri Northeast Africa
- What is GIS ?
- GIS In Egyptian Aviation Sector
- GIS For Airport Solutions & Applications
- Atlanta Airport Case
- Live Demo
- Discussion

About Esri Northeast Africa

esri Northeast Africa

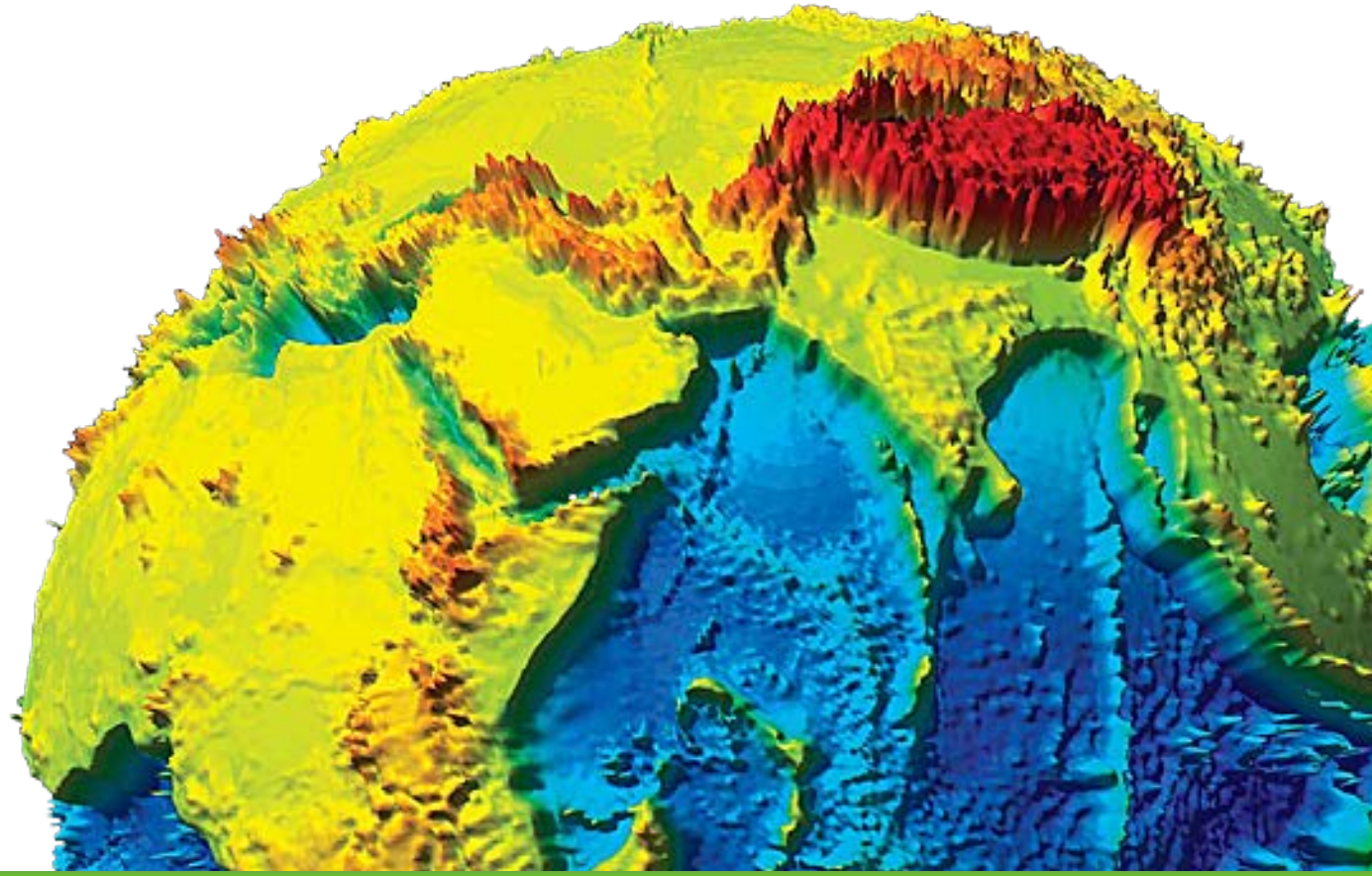
20	Years	Geospatial Solutions & Services Provider	5	Countries	Egypt (as QSIT) Libya, Sudan, South Sudan and Chad (as Esri NeA)
10	Industries	In different sectors	1ST	Branded	GIS Company compliant with CMMI
100	Footprints	Professional Services	150	Technical	Team members

What Is GIS ?

GIS Is Based On Geography –

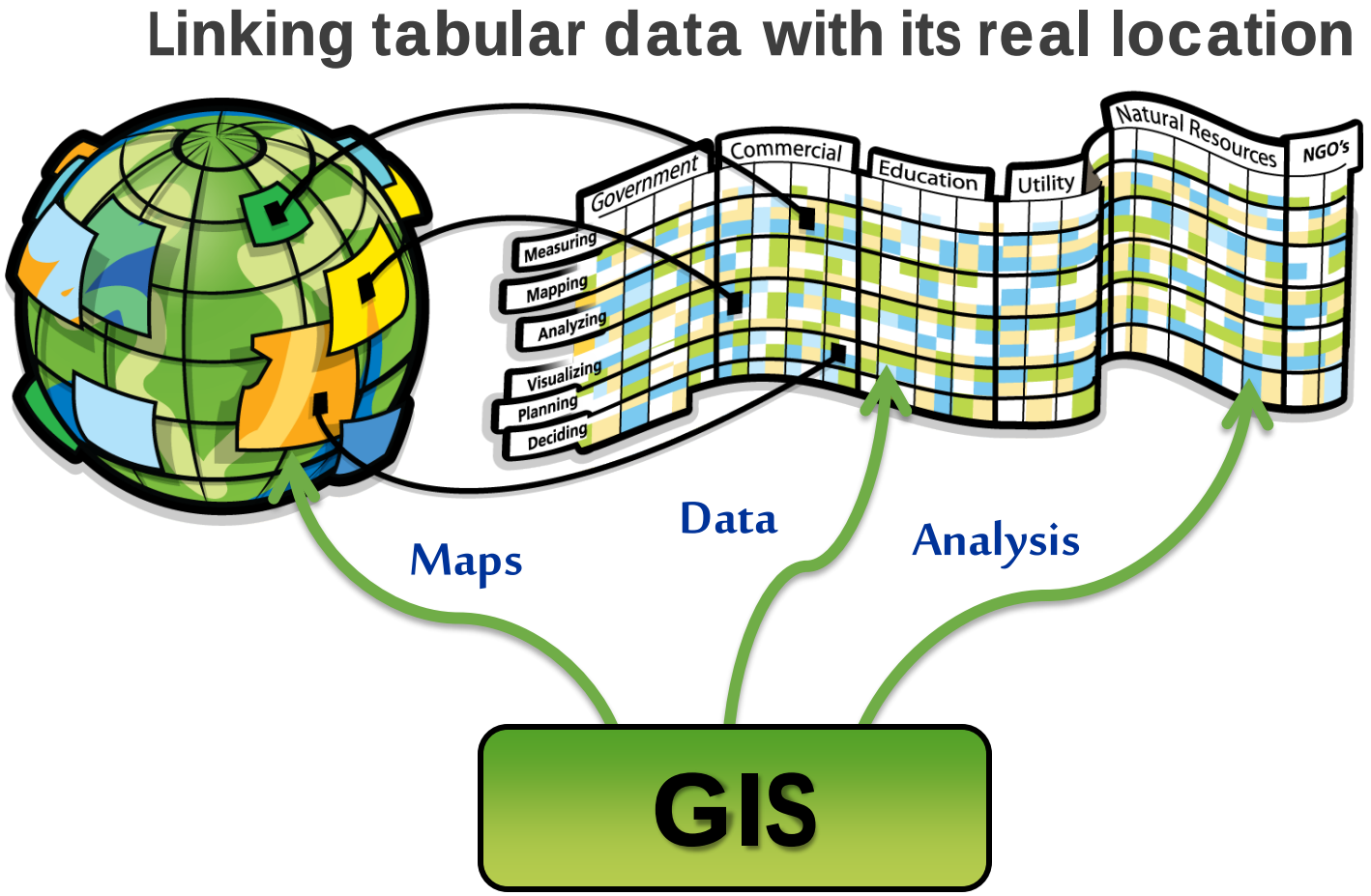
The Science of Our World

- **Understanding**
  - **Patterns**
  - **Relationships**
  - **Processes**
- **Conceptualizing**
- **Modeling**
- **Visualizing**



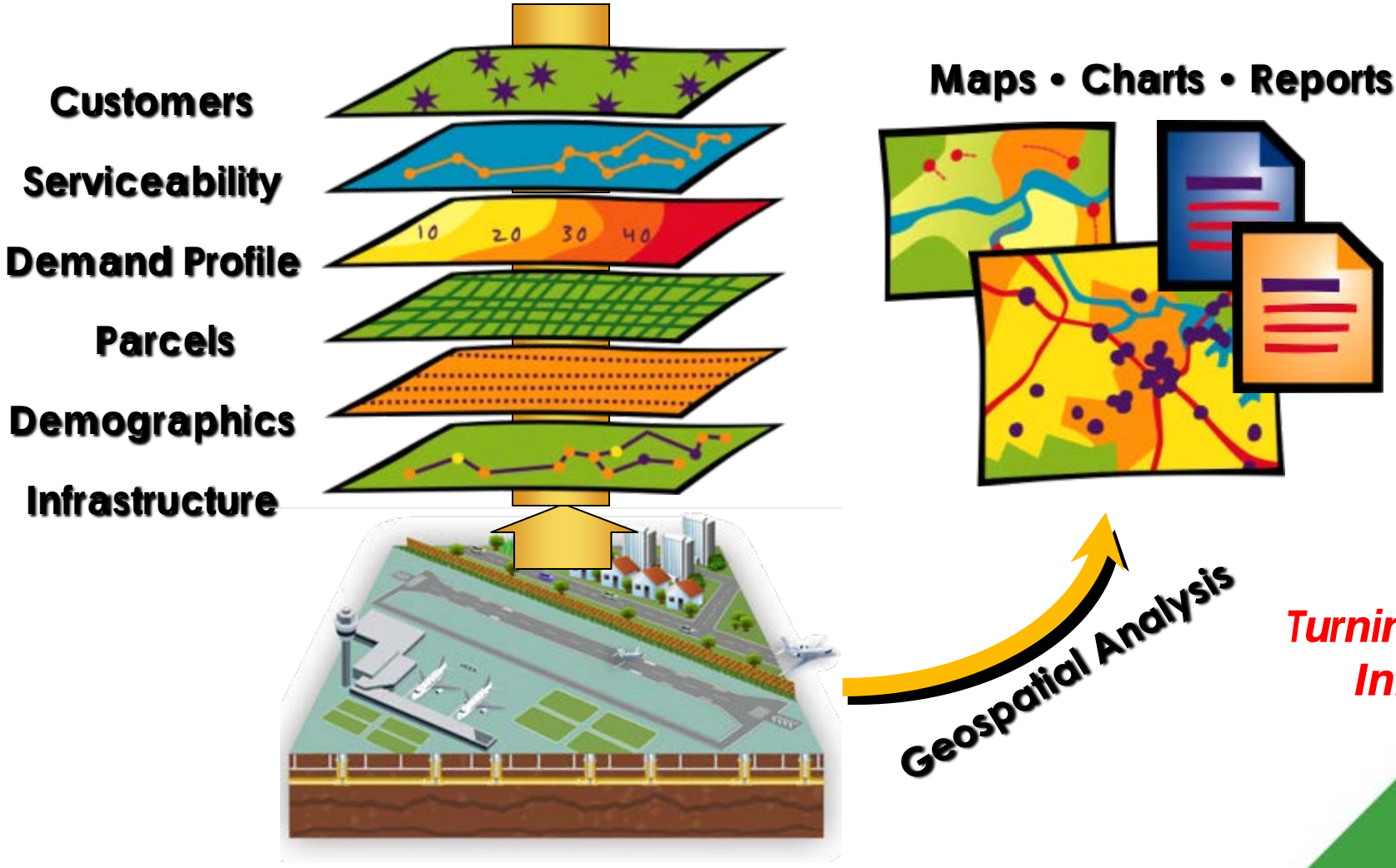
. . . By understanding geography and people's relationship to location, we can make informed decisions about the way we live on our planet. A geographic information system (GIS) is a technological tool for comprehending geography and making intelligent decisions.

GIS Technology



GIS provides several different map layers where each layer holds data about a particular kind of features related to spatial phenomena.

Abstracting Real World Objects into Layers



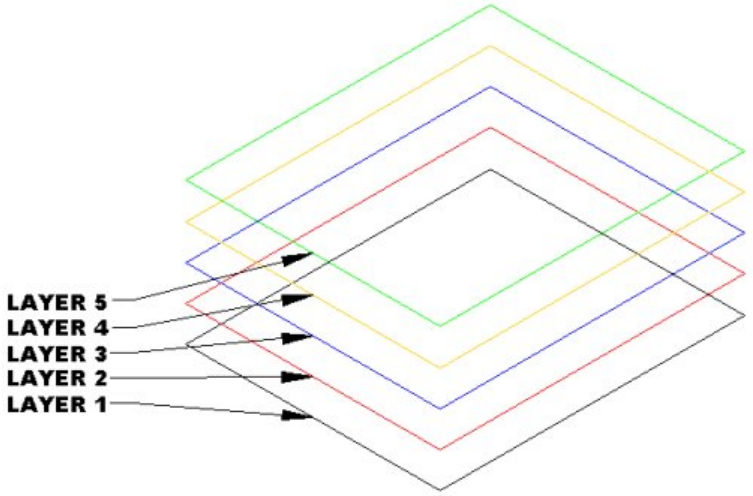
GIS and CAD

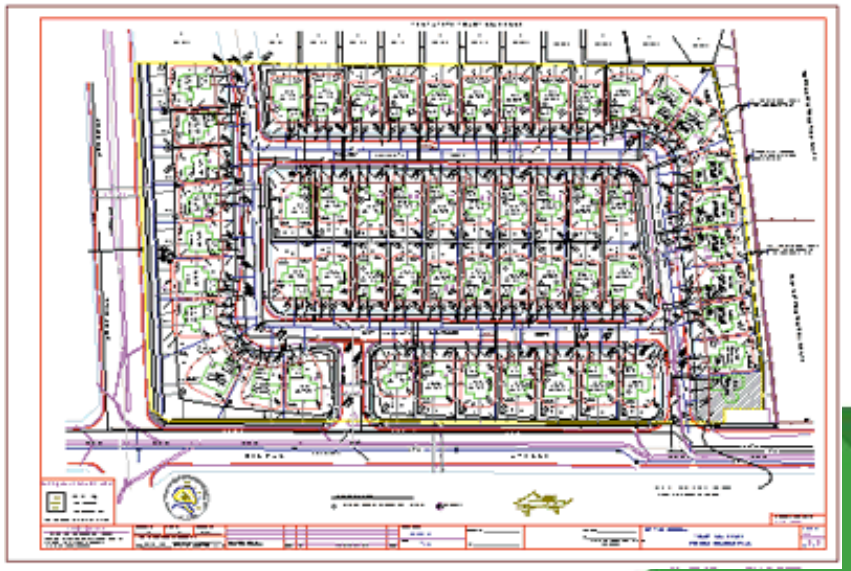
What is the difference between Geographic Information Systems (GIS) and Computer Aided Drafting (CAD)?

CAD Program

CAD is a graphics program

- Graphic elements are described by a mathematical equation or a set of parameters
- Designed to enable and enhance drafting using the computer
- With CAD, it's the lines that are important, i.e. the drawing is the information





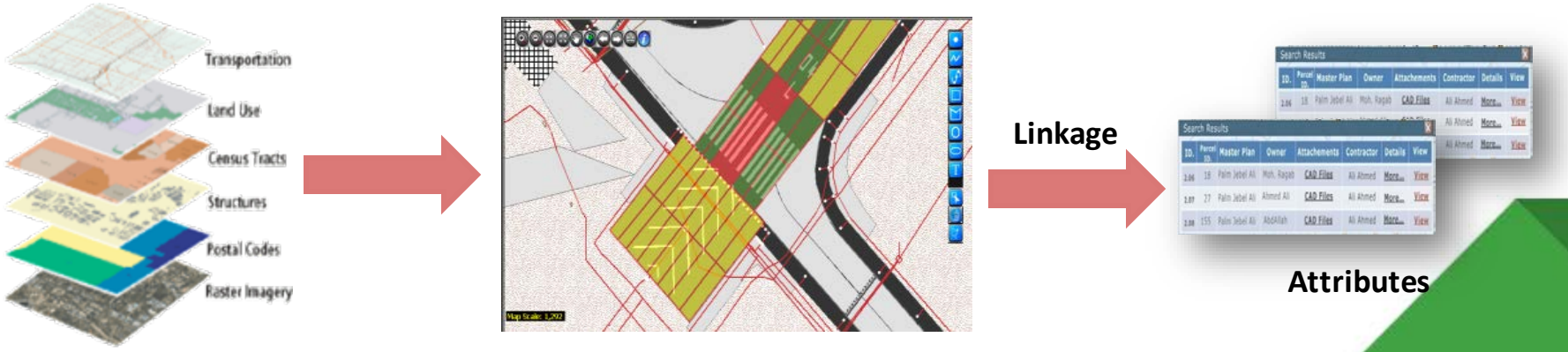
GIS Technology

GIS is a Technology Filling the Gap Left by CAD

- **Links Between Geometry & Attributes**
- **Built on relationships:**

  Features / Features & Features / Tabular
- **Enables:**

  Network-Analysis, Spatial Analysis & what-if scenarios required for tasks



Benefits of implementing GIS

Representing stored tabular data (attributes) with simple cartographic features (points, lines, and polygons)

Understanding networks, enclosed areas…etc

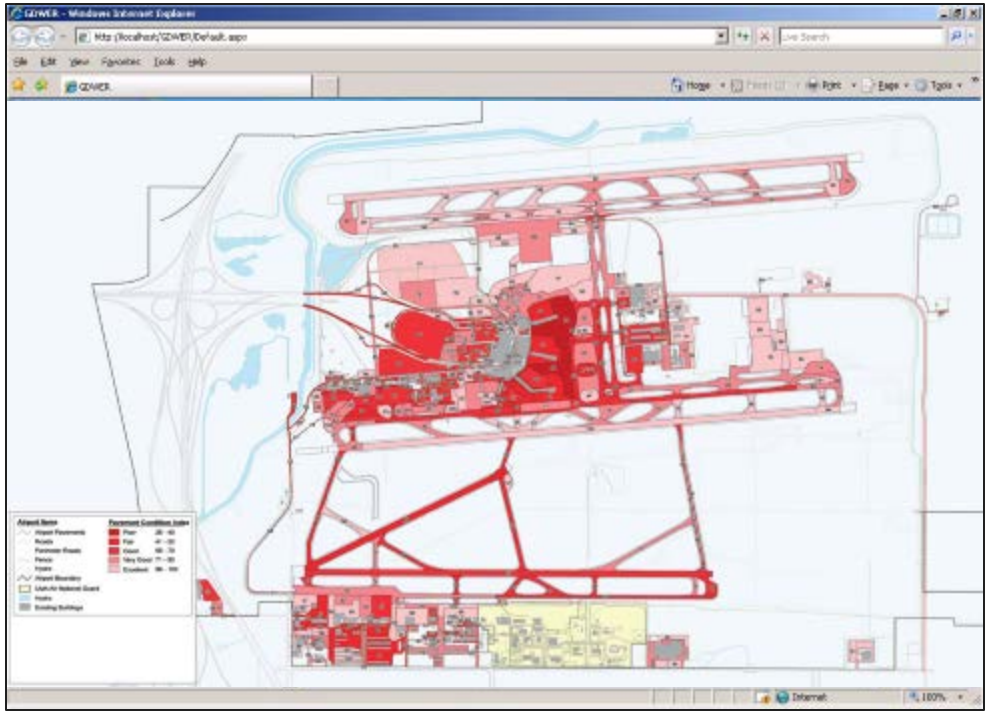
Giving users the flexibility to choose the symbology of the cartographic objects based on attributes in the database

GIS Layers

I SEE MEANS I UNDERSTAND

GIS: A Tool to provide the Visual Details *NOT* Seen with Tabular Data

Research



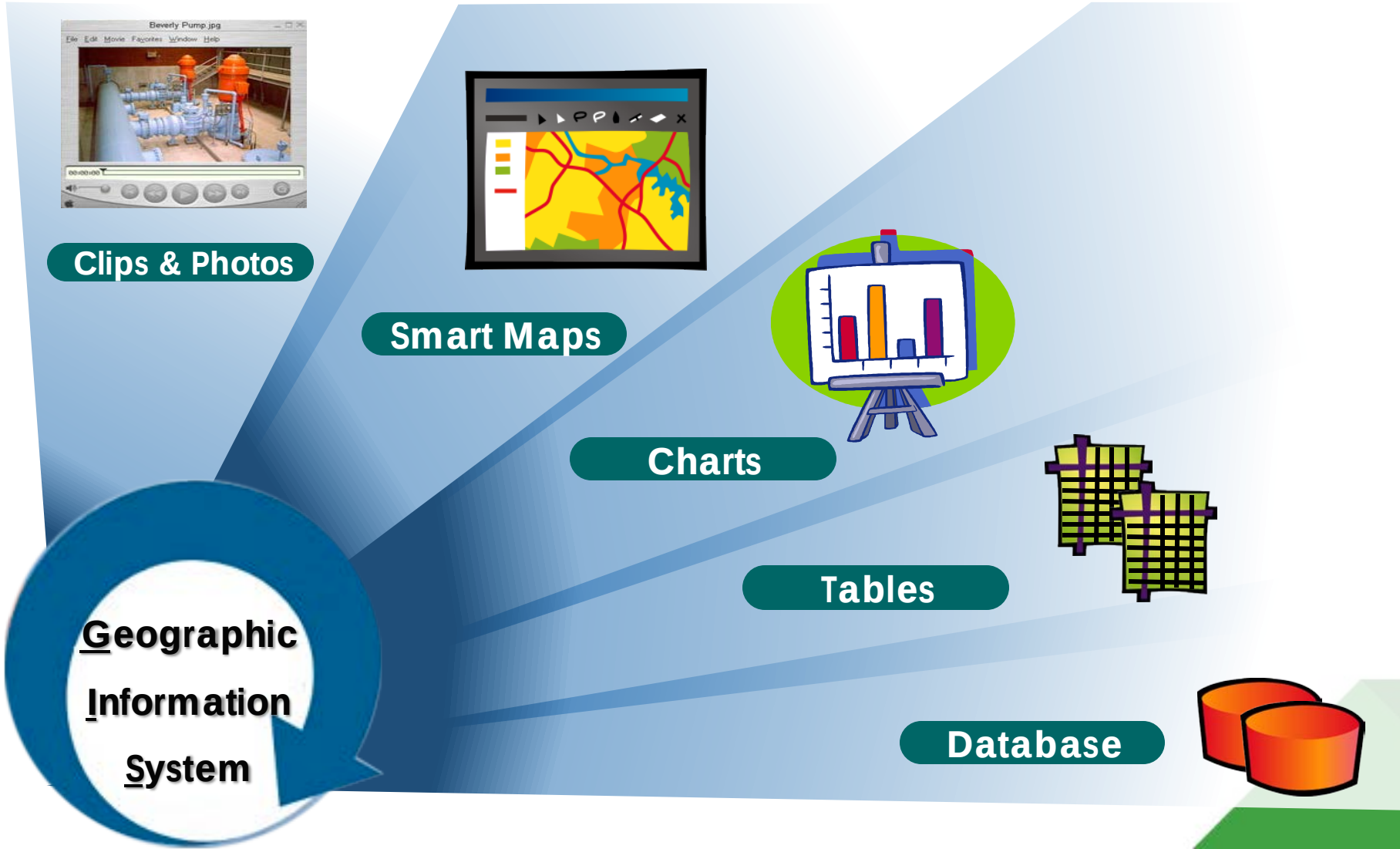
Take Decision

Make Action

GIS Components

- **People**
- **Applications**
- **Data**
- **Hardware**
- **Software**

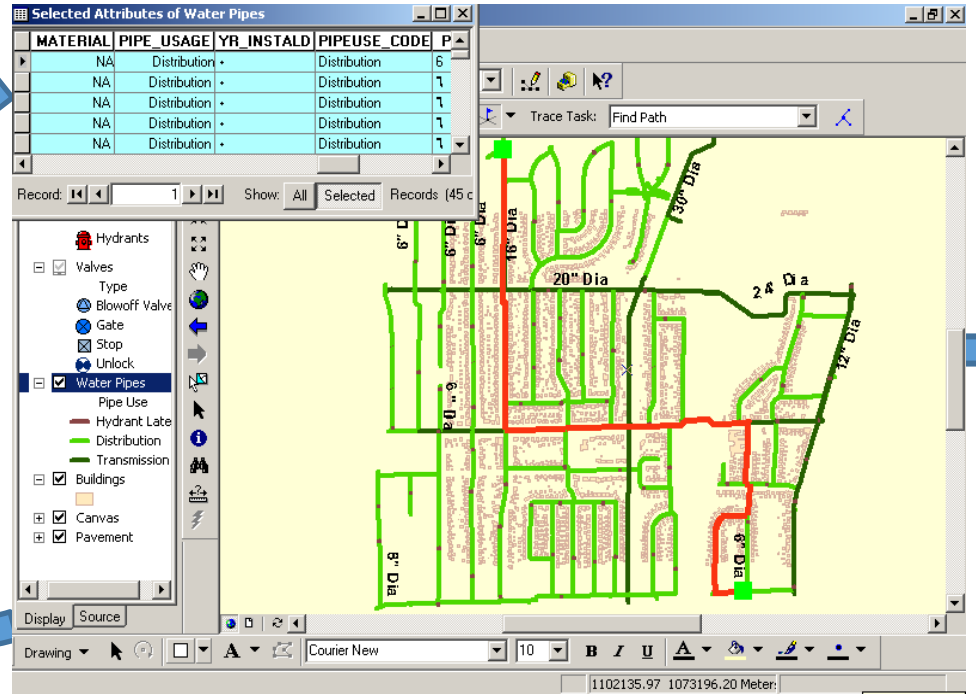
Outputs from GIS



A picture is worth a 1000 words

Smart Maps as a tool for Decision Making

A tool to get not evident information through tabular data

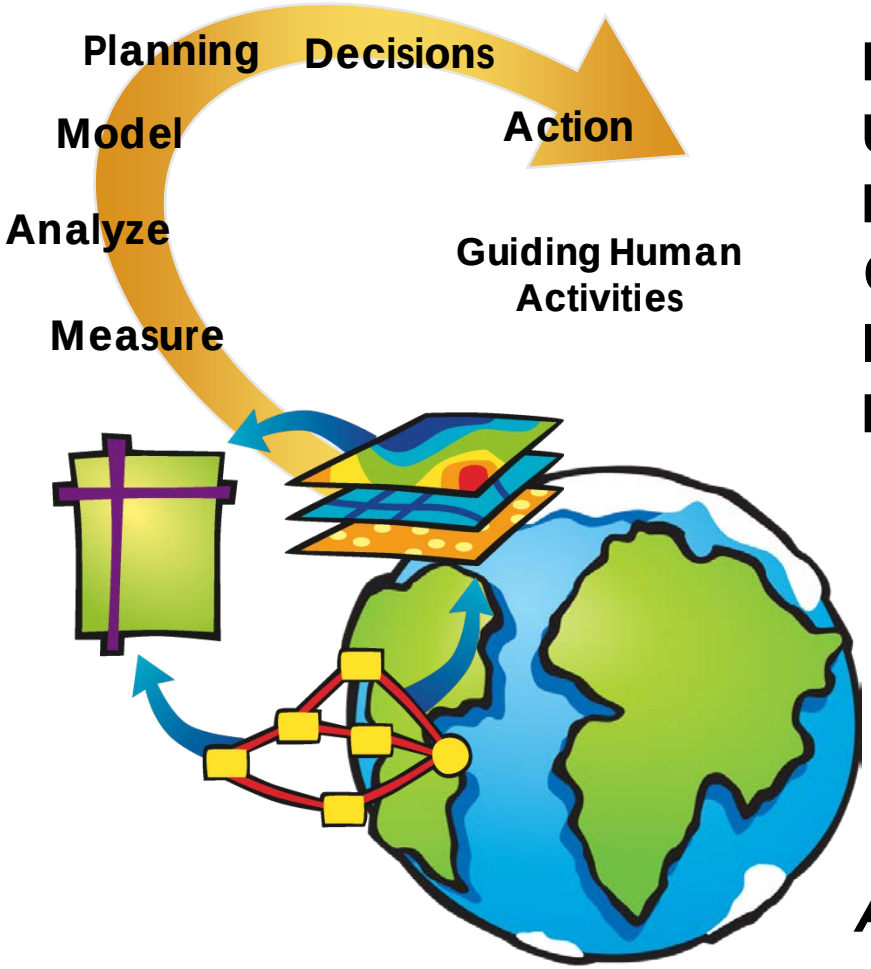


Query , Analyze and Derive Information

Decision Making

Implementation

GIS is particularly valuable…..



Providing Many Benefits

Understanding

Efficiency

Cost Savings

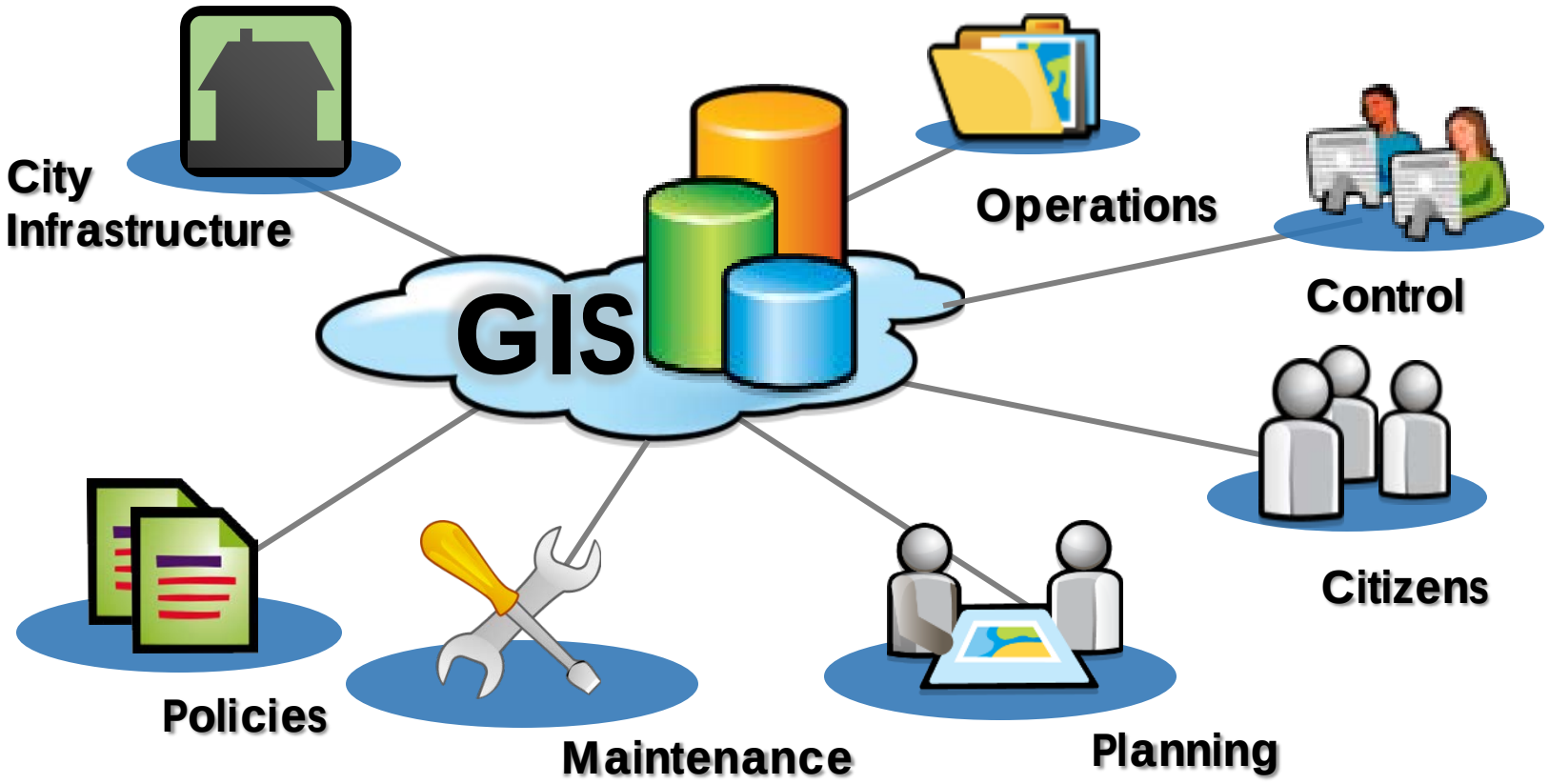
Improved Decision Making

Better

- **Communication**
- **Collaboration**
- **Coordination**

A Framework for Managing Human Activities

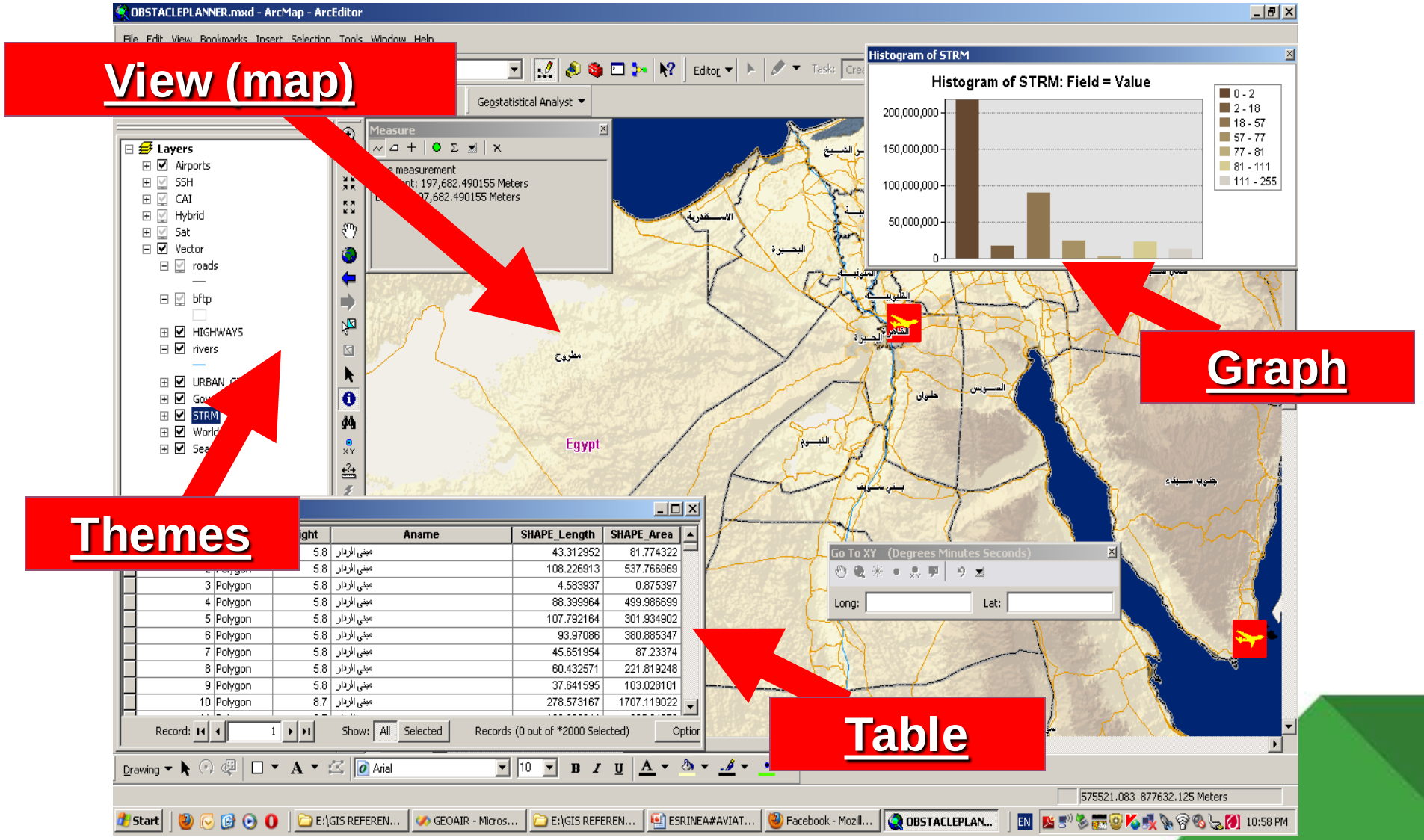
GIS Creates Intelligent Communities



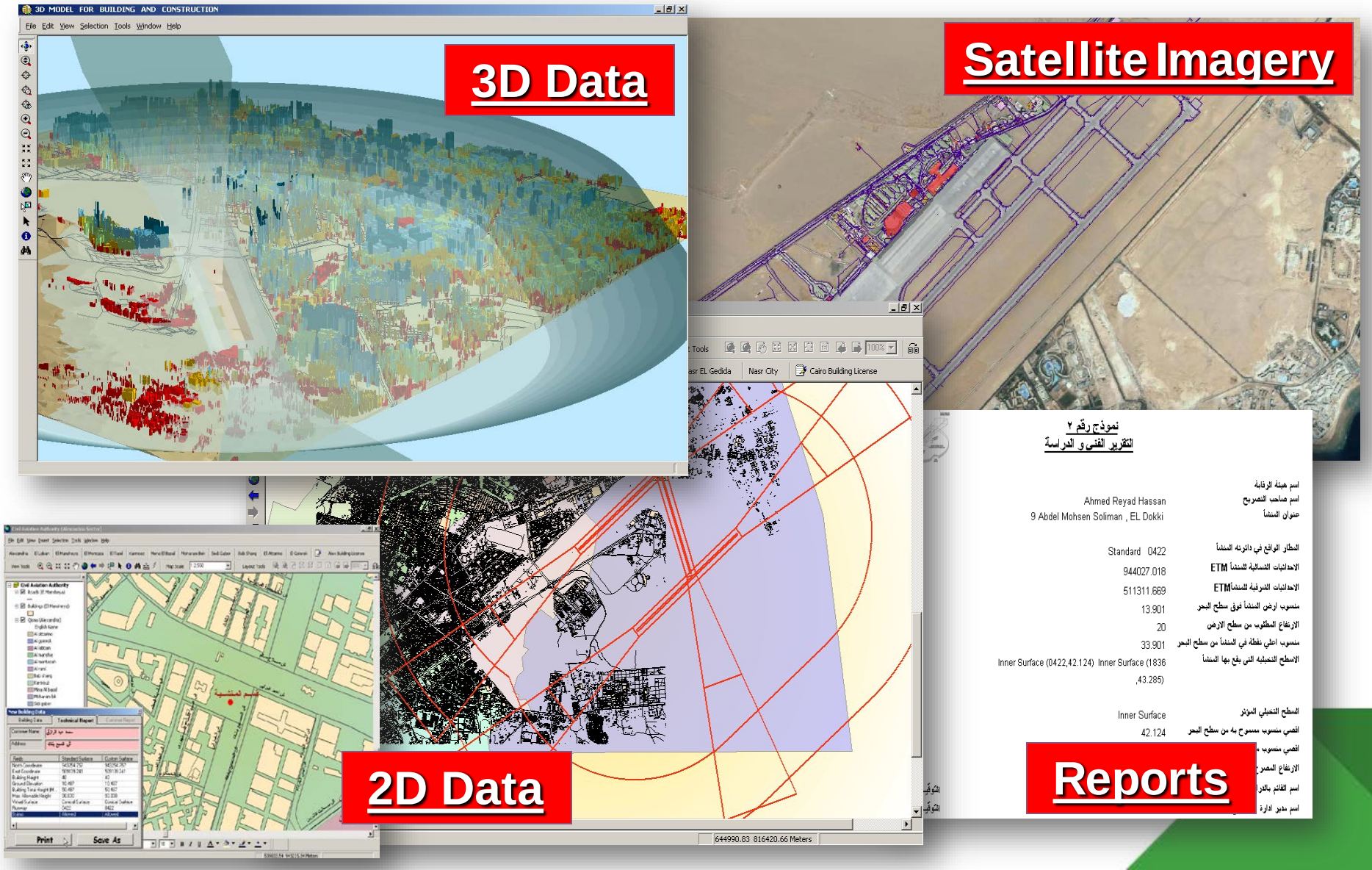
More

- Efficient
- Effective
- Responsive
- Integrated
- Sustainable
- Participatory

Example GIS Display



Example GIS Display



GIS In Egyptian Aviation Sector

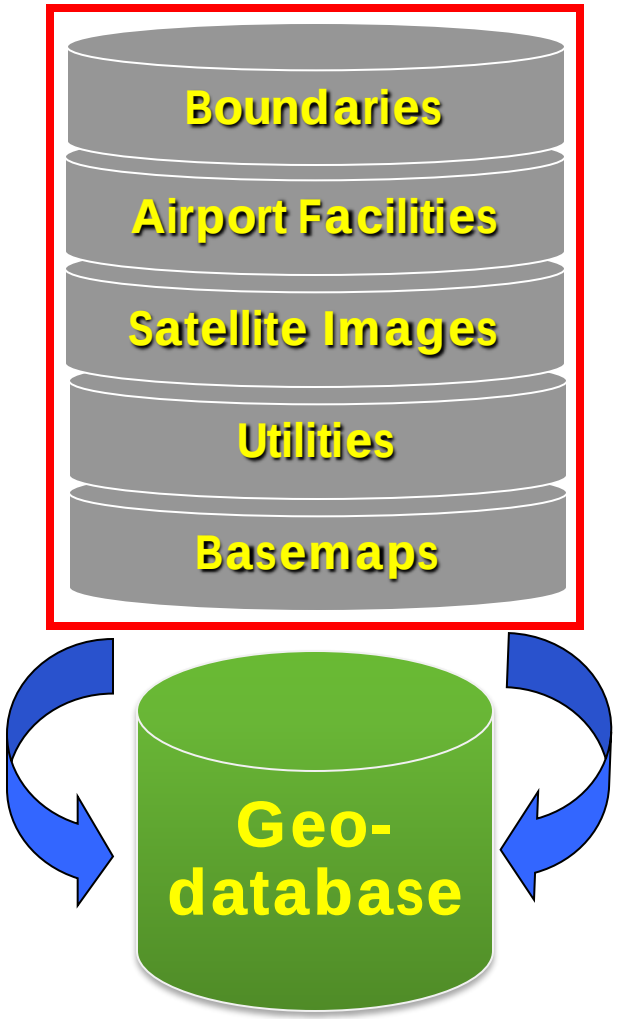
Challenges Facing Airports

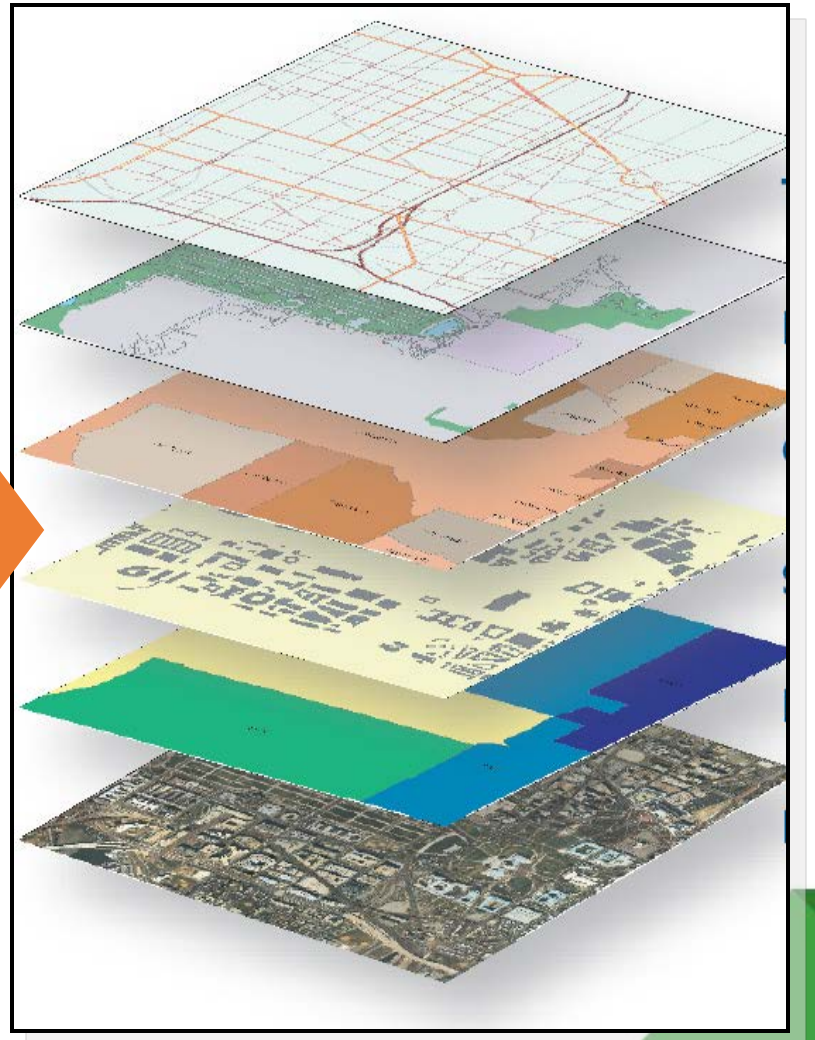
- **New & Evolving Airport Regulations**
  - Compliance Management
- **New Generation of Digital Information**
  - Analog to Digital Data Transition
  - Data Management is critical
  - Data Consistency/Integrity is paramount
- **Improved business efficiencies required**

GIS at Egyptian Airports Company

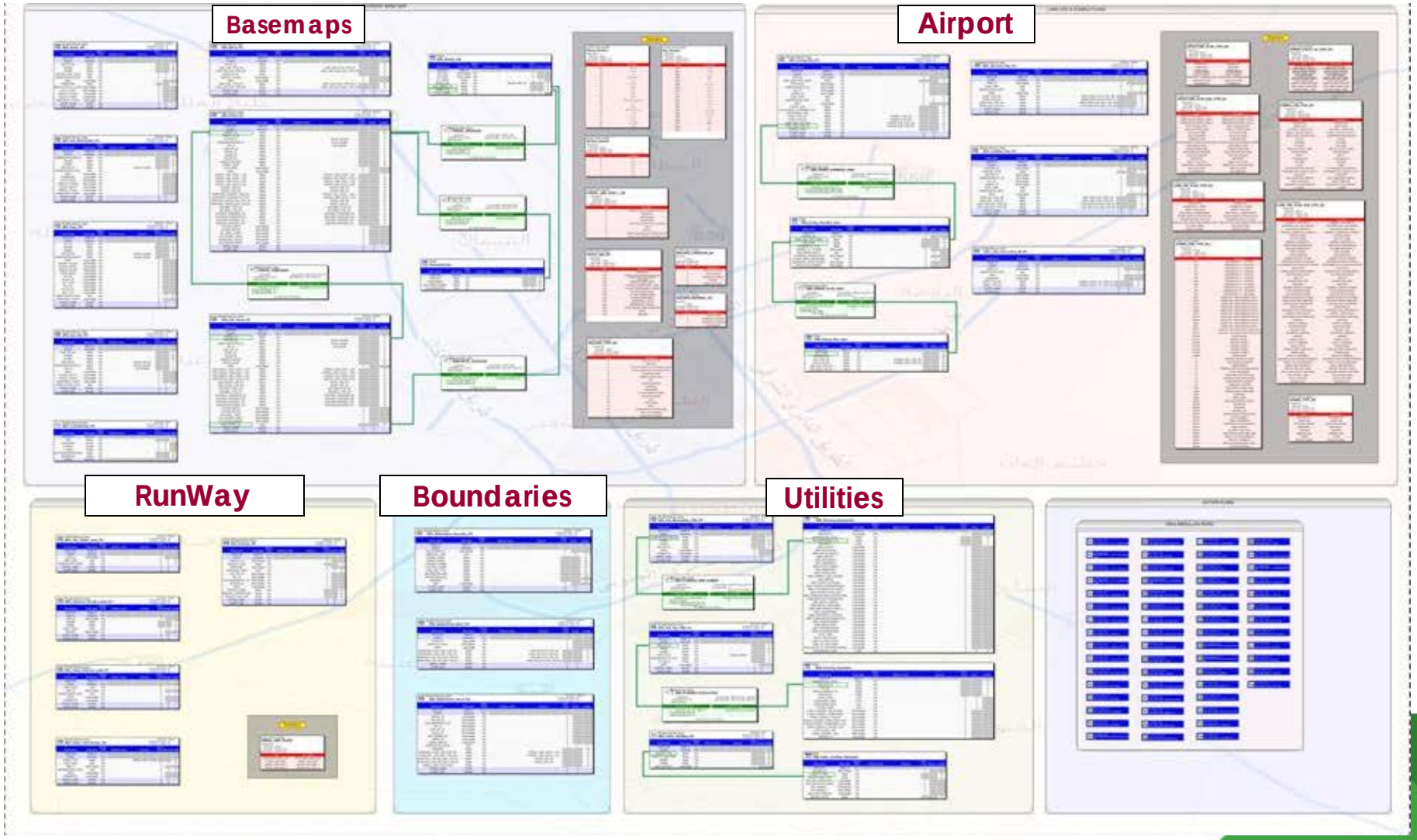
- **Data Management**
  - Standardized/Extensible Data Model
  - Data Exchange
  - Data Validation
- **Obstruction Management**
  - Surface Creation/Modification
  - Obstruction Analysis/Evaluation
  - Visualization

Airport Geodatabase





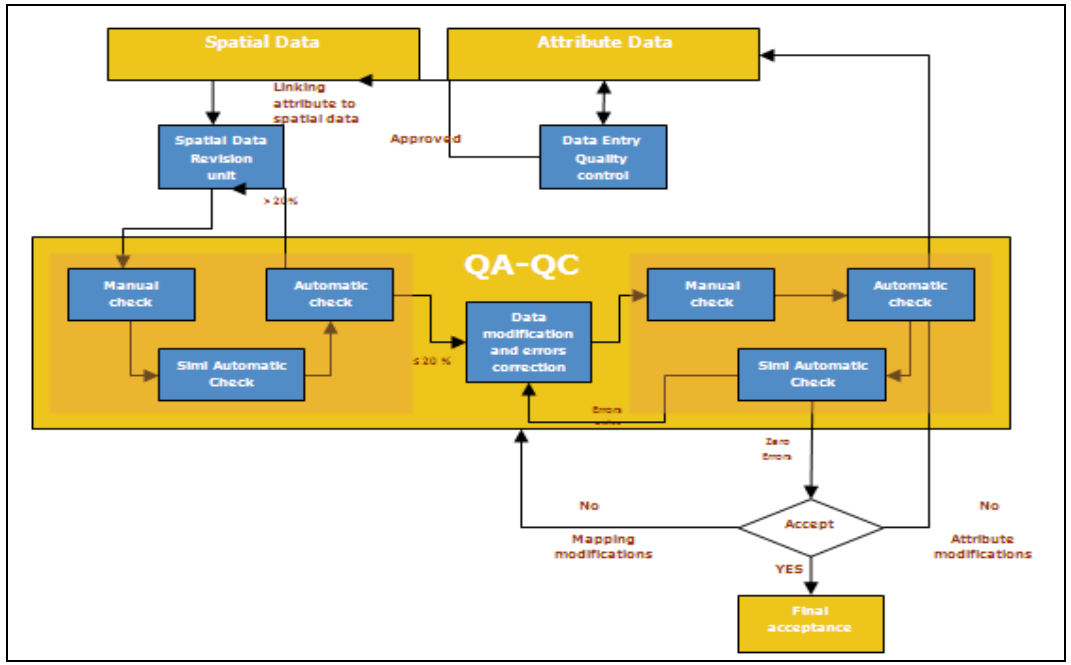
Airport Geodatabase



QA/QC

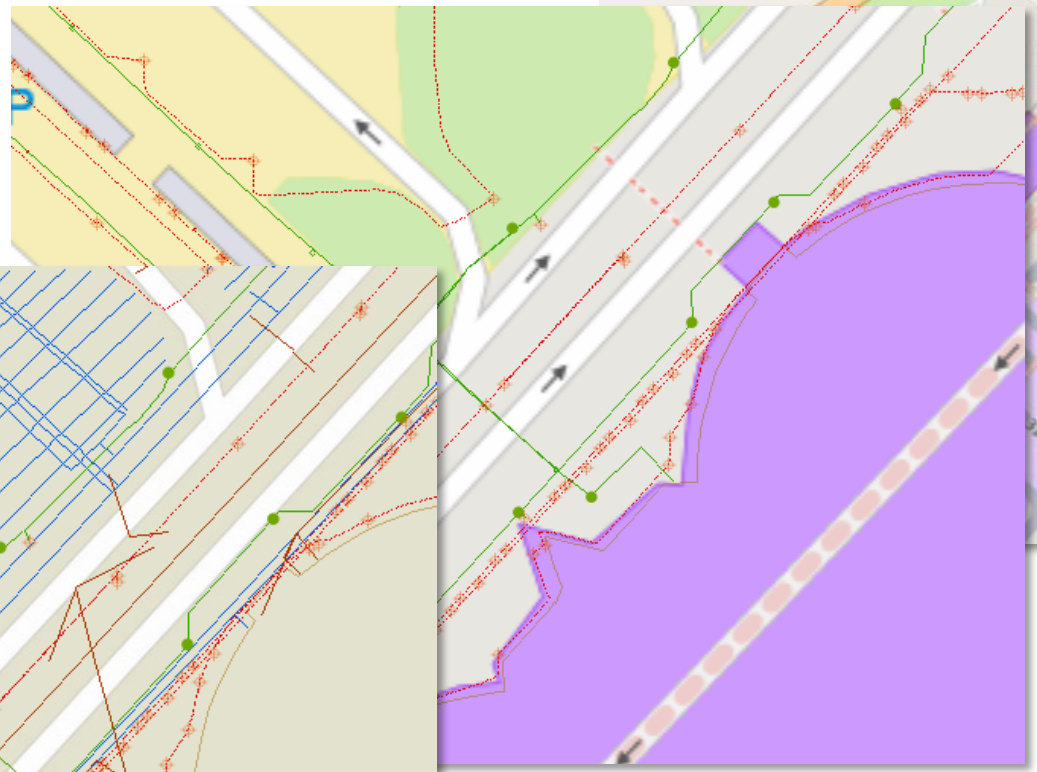
Quality Assurance/Quality Control

QA\QC operations on the data in order to reach the maximum consistency and meet the international data standards.

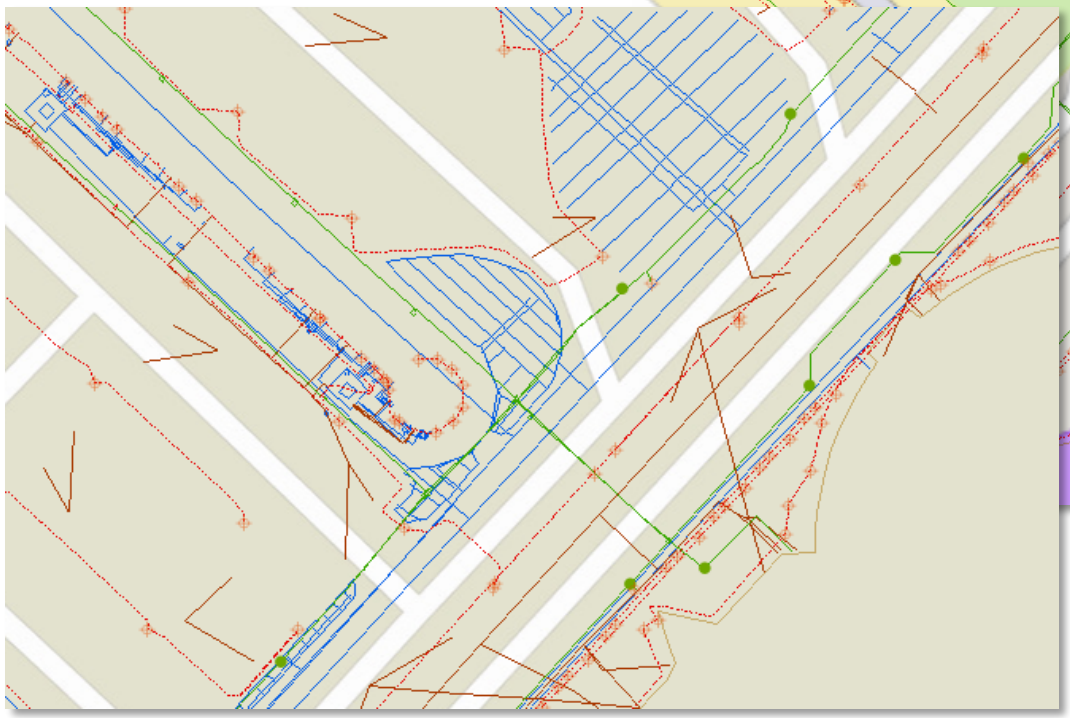


Sharm El Sheikh Airport

Basemap & Runways



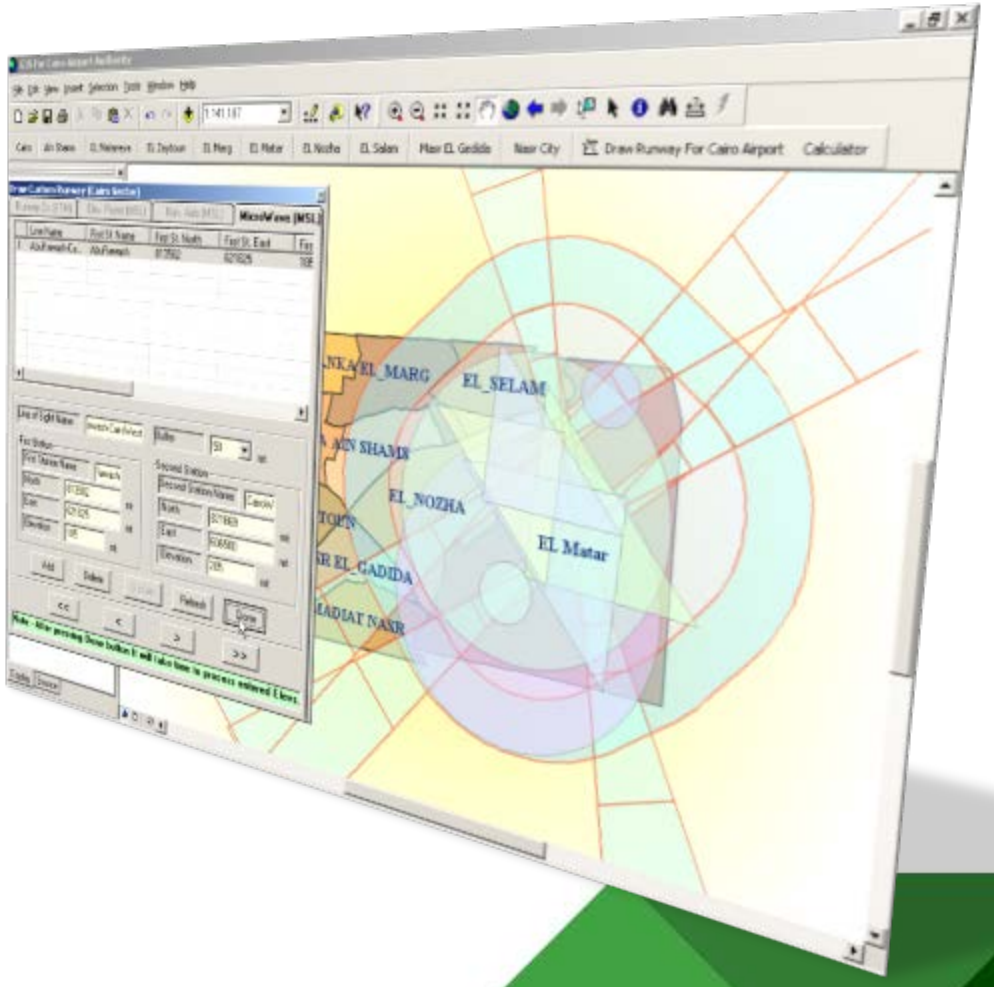
Airport Facilities



Airport Utilities

Obstacles Permitting for Egyptian Civil Aviation Authority

- Egypt’s Civil aviation Authority turned to GIS to support automating permits issuing for obstacles around the Airport areas, Generating both technical and customer reports.

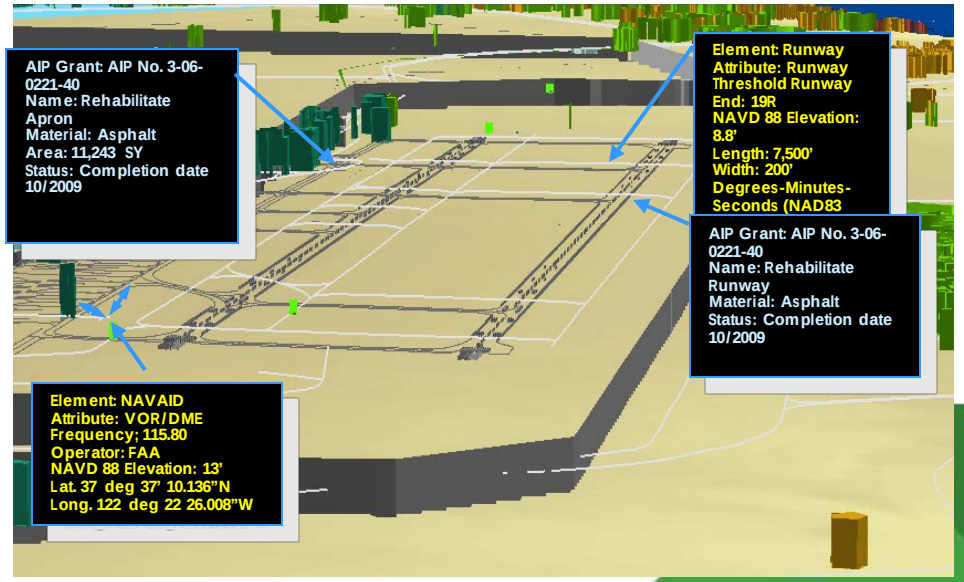


Sharm El Sheikh Airport

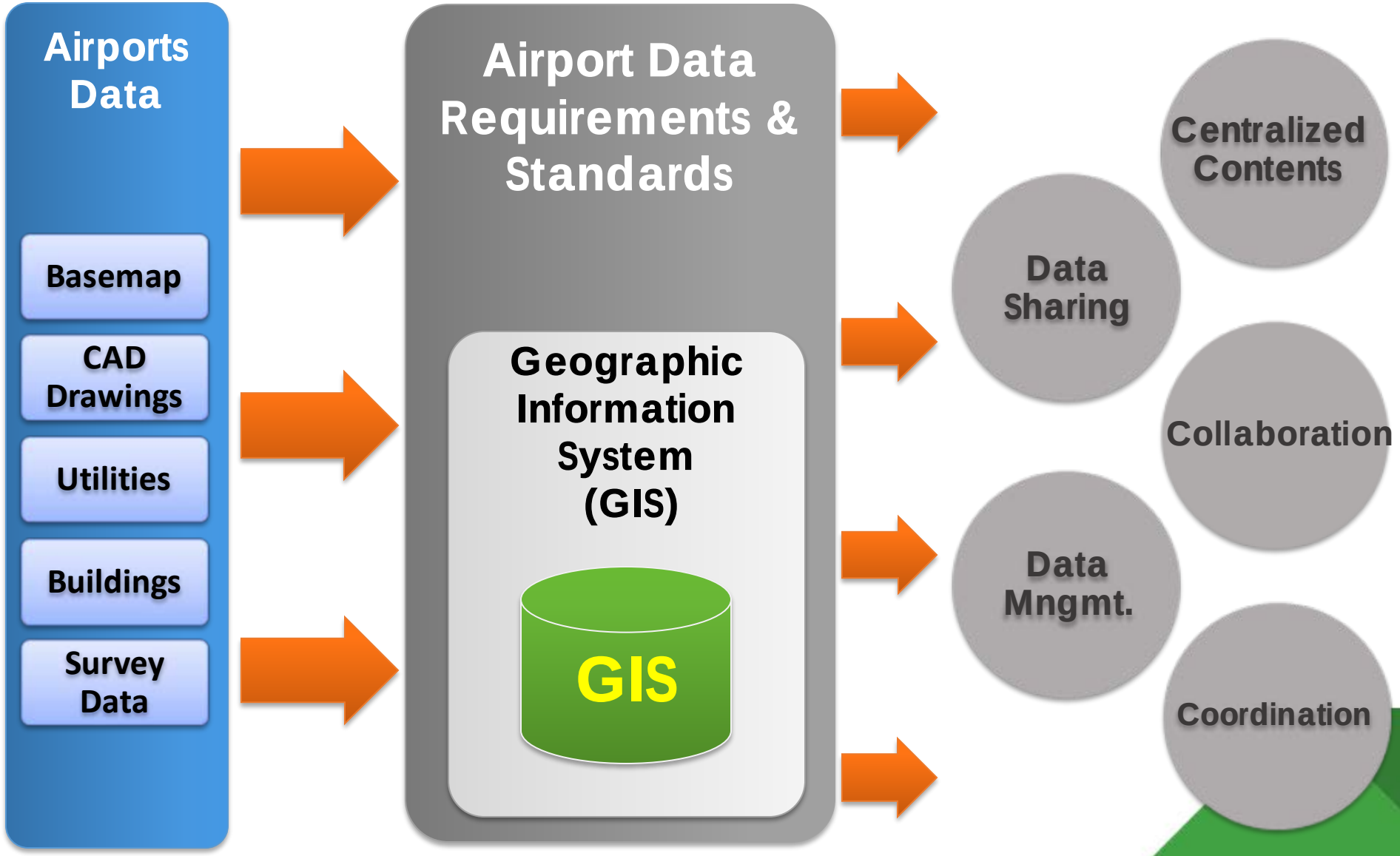
GIS For Airport Solutions & Applications

Vision

What if… We could capture and validate Airport data against a defined standard, export it, and make it available electronically for whoever needs it?

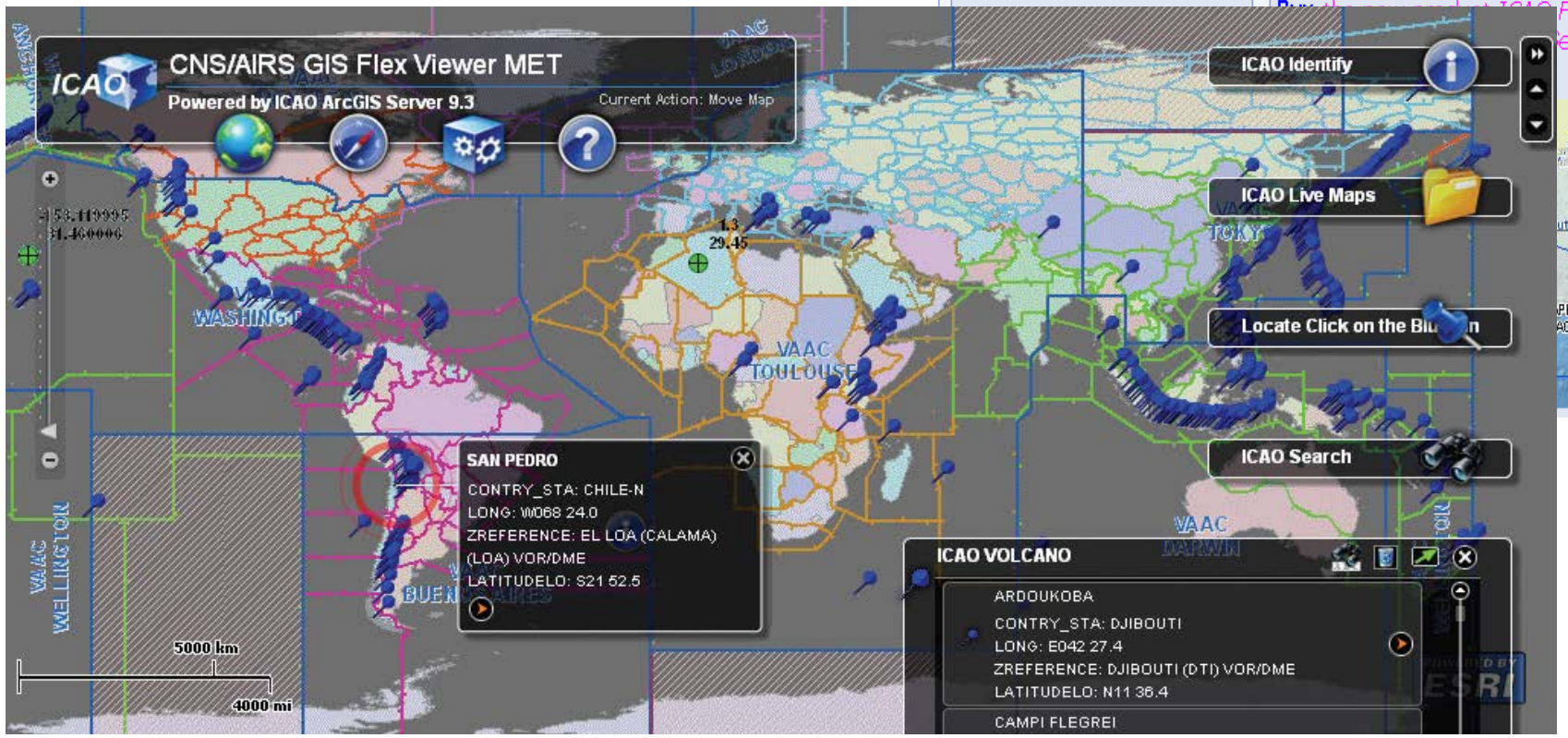


Vision

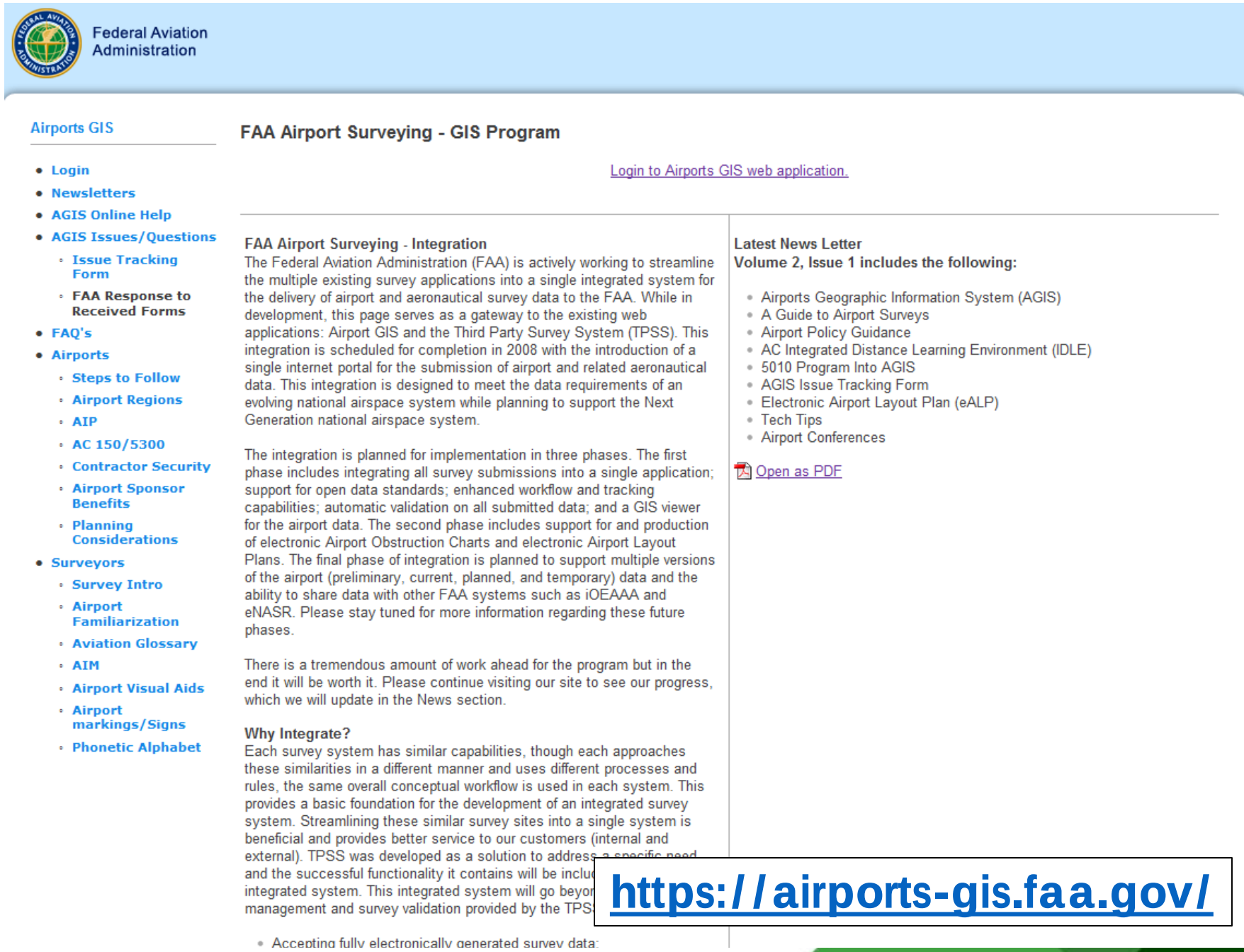

Airports Data
Basemap
CAD Drawings
Utilities
Buildings
Survey Data
Airport Data Requirements & Standards
Geographic Information System (GIS)
GIS
Centralized Contents
Data Sharing
Collaboration
Data Mngmt.
Coordination

Vision

The global aeronautical community can access ICAO GIS information via the Internet using ArcGIS.



Vision



Federal Aviation Administration

Airports GIS

- Login
- Newsletters
- AGIS Online Help
- AGIS Issues/Questions
  - Issue Tracking Form
  - FAA Response to Received Forms
- FAQ's
- Airports
  - Steps to Follow
  - Airport Regions
  - AIP
  - AC 150/5300
  - Contractor Security
  - Airport Sponsor Benefits
  - Planning Considerations
- Surveyors
  - Survey Intro
  - Airport Familiarization
  - Aviation Glossary
  - AIM
  - Airport Visual Aids
  - Airport markings/Signs
  - Phonetic Alphabet

FAA Airport Surveying - GIS Program

Login to Airports GIS web application.

FAA Airport Surveying - Integration

The Federal Aviation Administration (FAA) is actively working to streamline the multiple existing survey applications into a single integrated system for the delivery of airport and aeronautical survey data to the FAA. While in development, this page serves as a gateway to the existing web applications: Airport GIS and the Third Party Survey System (TPSS). This integration is scheduled for completion in 2008 with the introduction of a single internet portal for the submission of airport and related aeronautical data. This integration is designed to meet the data requirements of an evolving national airspace system while planning to support the Next Generation national airspace system.

The integration is planned for implementation in three phases. The first phase includes integrating all survey submissions into a single application; support for open data standards; enhanced workflow and tracking capabilities; automatic validation on all submitted data; and a GIS viewer for the airport data. The second phase includes support for and production of electronic Airport Obstruction Charts and electronic Airport Layout Plans. The final phase of integration is planned to support multiple versions of the airport (preliminary, current, planned, and temporary) data and the ability to share data with other FAA systems such as iOEAAA and eNASR. Please stay tuned for more information regarding these future phases.

There is a tremendous amount of work ahead for the program but in the end it will be worth it. Please continue visiting our site to see our progress, which we will update in the News section.

Why Integrate?

Each survey system has similar capabilities, though each approaches these similarities in a different manner and uses different processes and rules, the same overall conceptual workflow is used in each system. This provides a basic foundation for the development of an integrated survey system. Streamlining these similar survey sites into a single system is beneficial and provides better service to our customers (internal and external). TPSS was developed as a solution to address a specific need and the successful functionality it contains will be inclu integrated system. This integrated system will go beyo management and survey validation provided by the TPS

- Accepting fully electronically generated survey data;

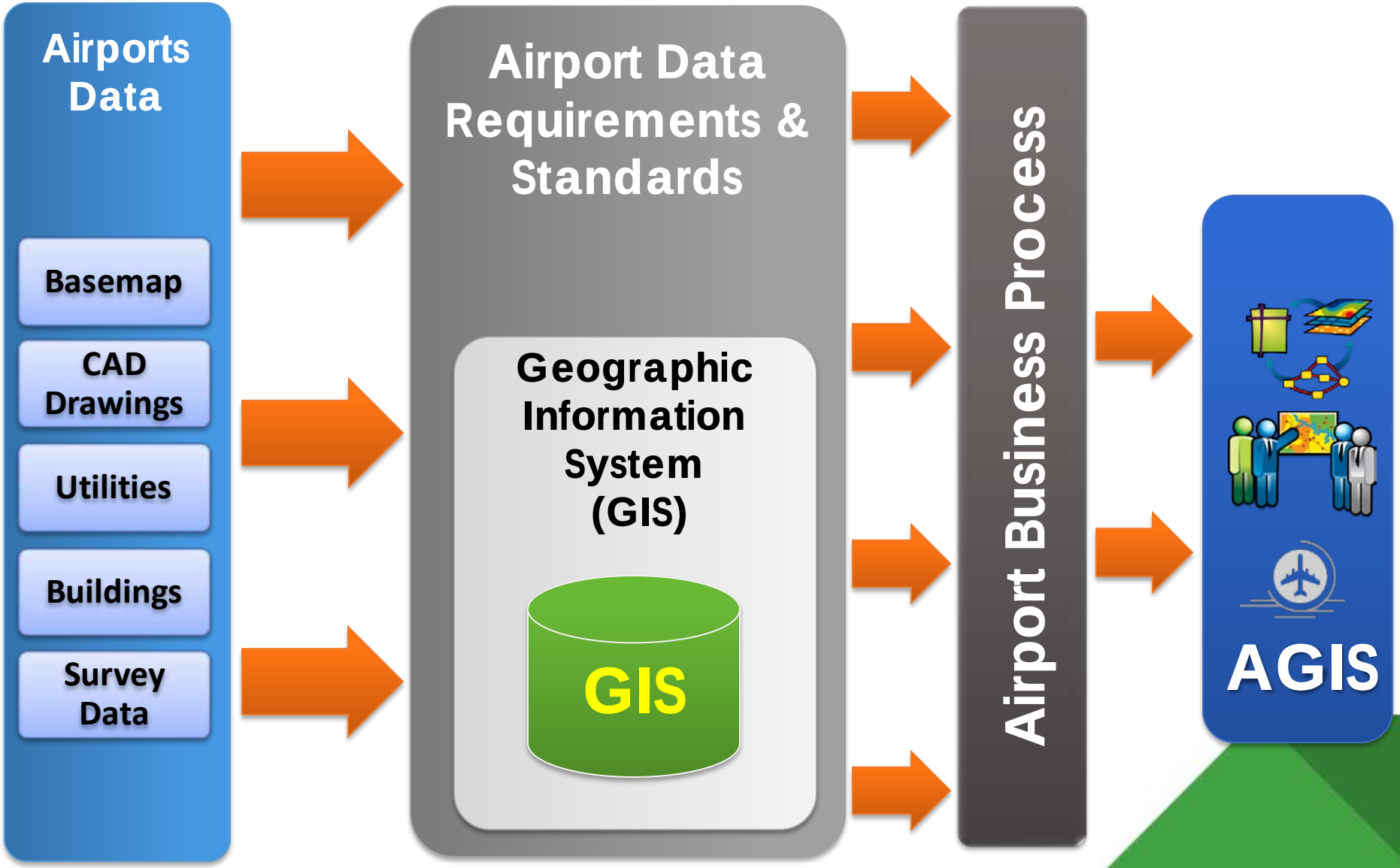
Latest News Letter
Volume 2, Issue 1 includes the following:

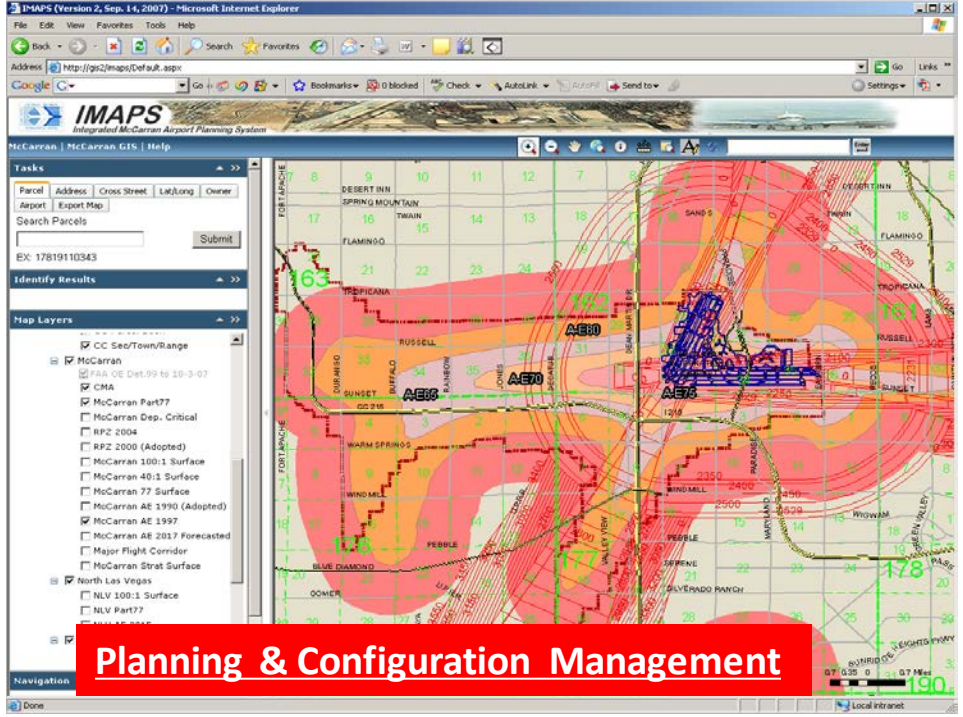
- Airports Geographic Information System (AGIS)
- A Guide to Airport Surveys
- Airport Policy Guidance
- AC Integrated Distance Learning Environment (IDLE)
- 5010 Program Into AGIS
- AGIS Issue Tracking Form
- Electronic Airport Layout Plan (eALP)
- Tech Tips
- Airport Conferences

Open as PDF

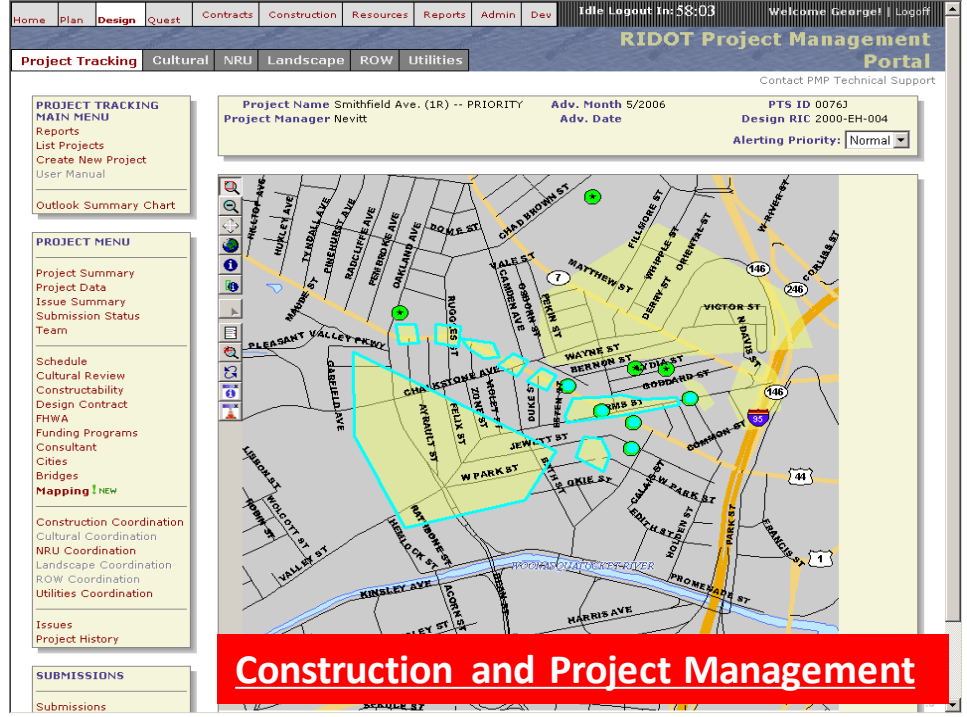
https://airports-gis.faa.gov/

Vision - AGIS

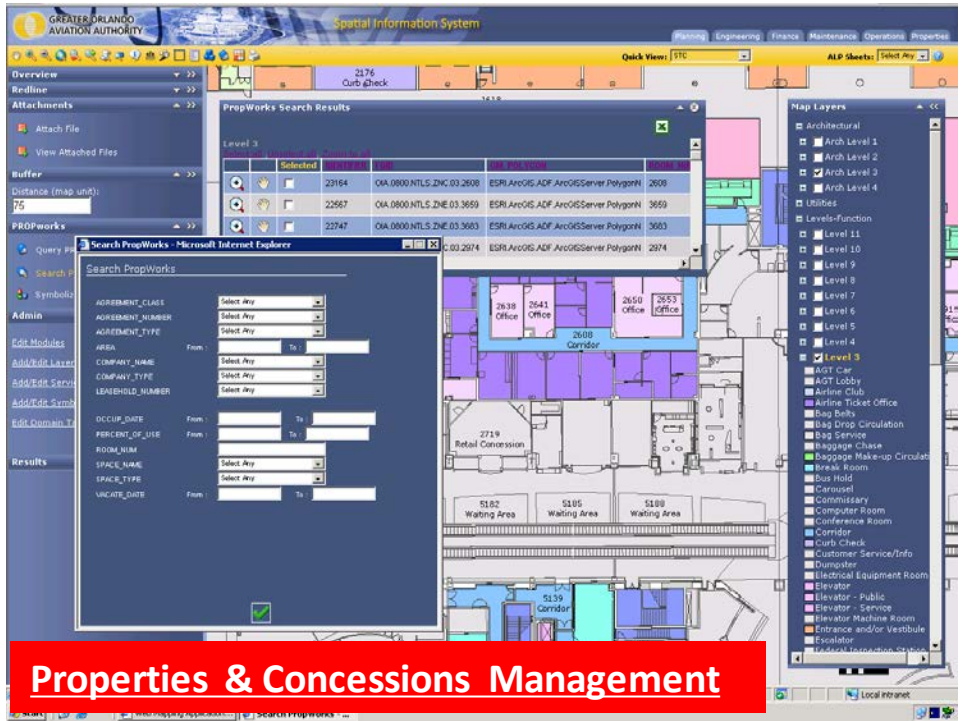

Airports Data
Basemap
CAD Drawings
Utilities
Buildings
Survey Data
Airport Data Requirements & Standards
Geographic Information System (GIS)
GIS
Airport Business Process
AGIS



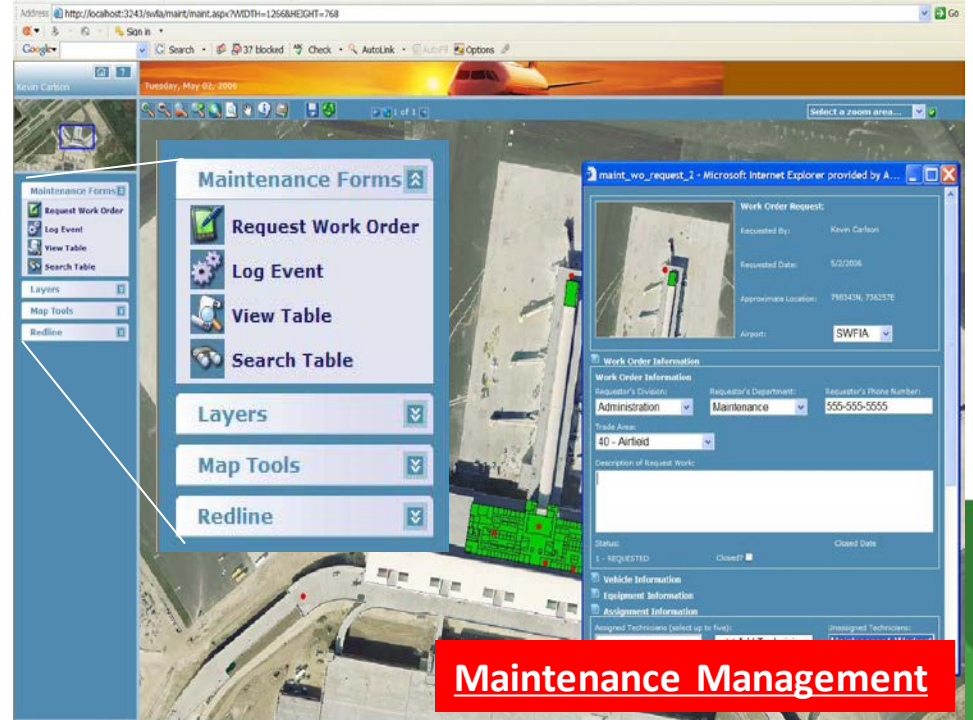
Planning & Configuration Management



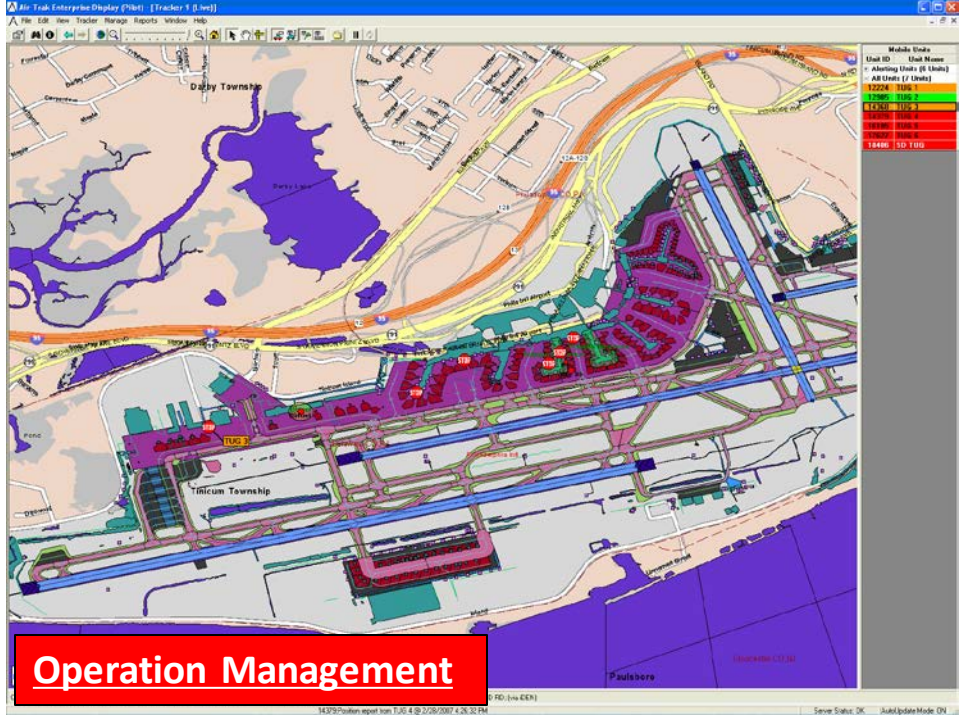
Construction and Project Management

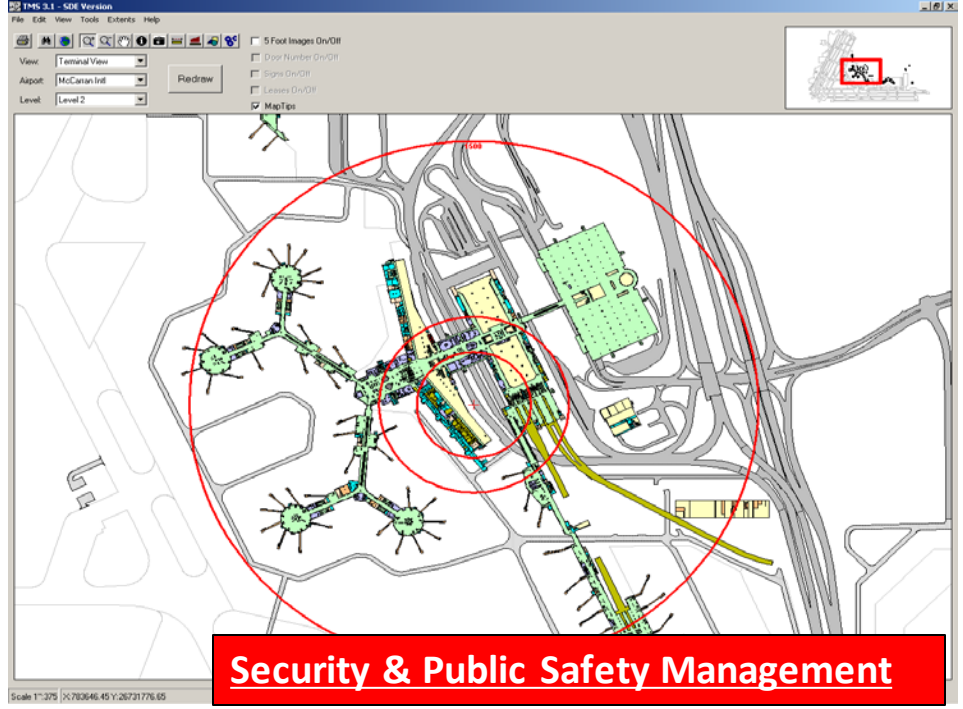


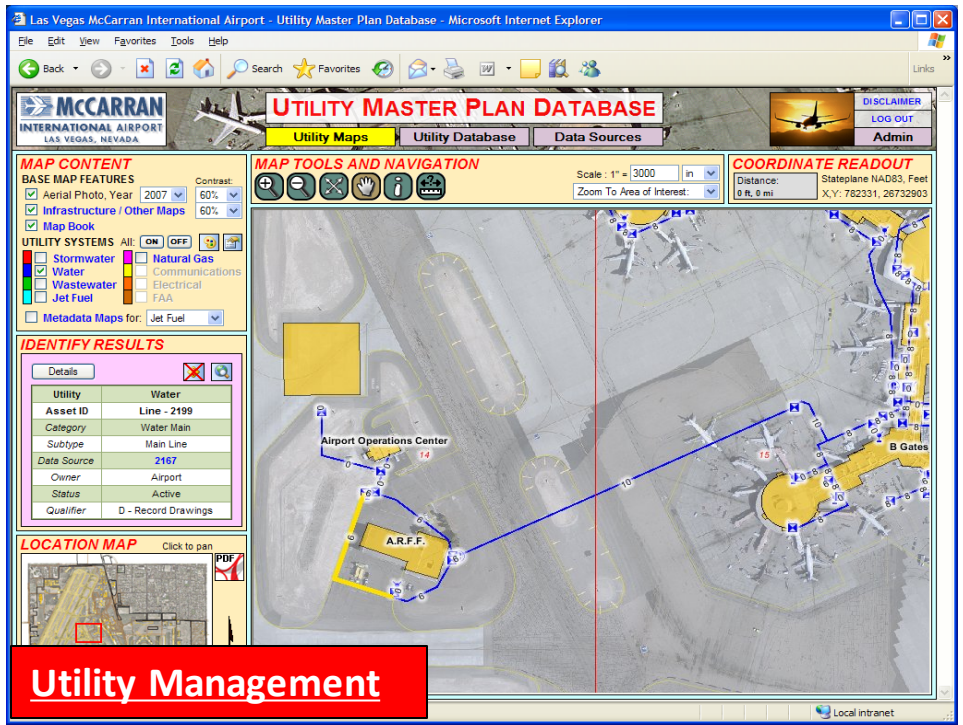
Properties & Concessions Management

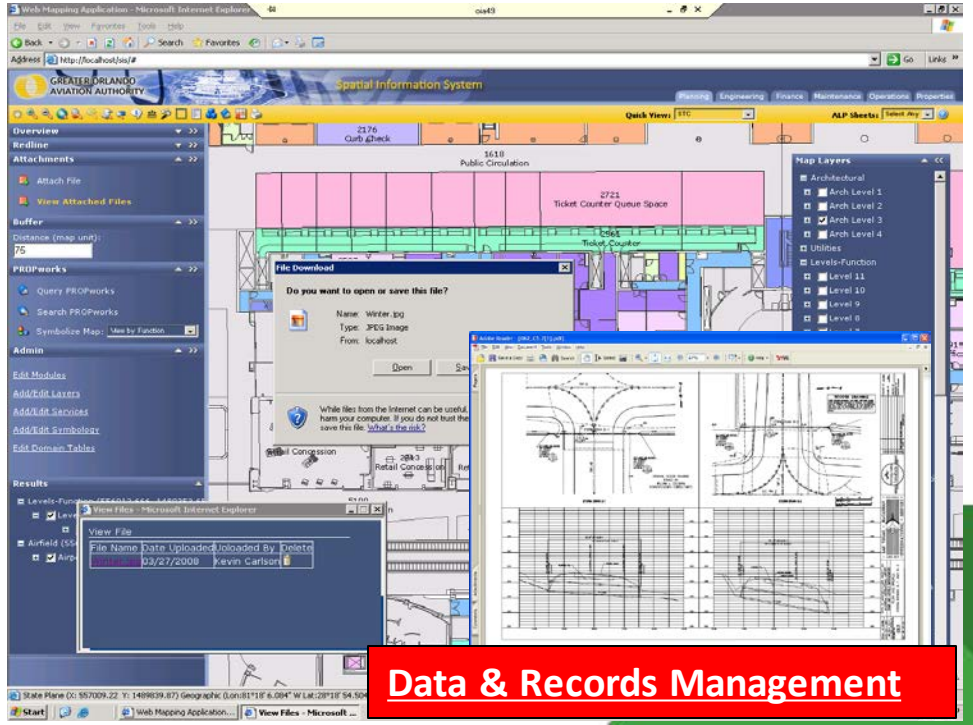


Maintenance Management


Operation Management

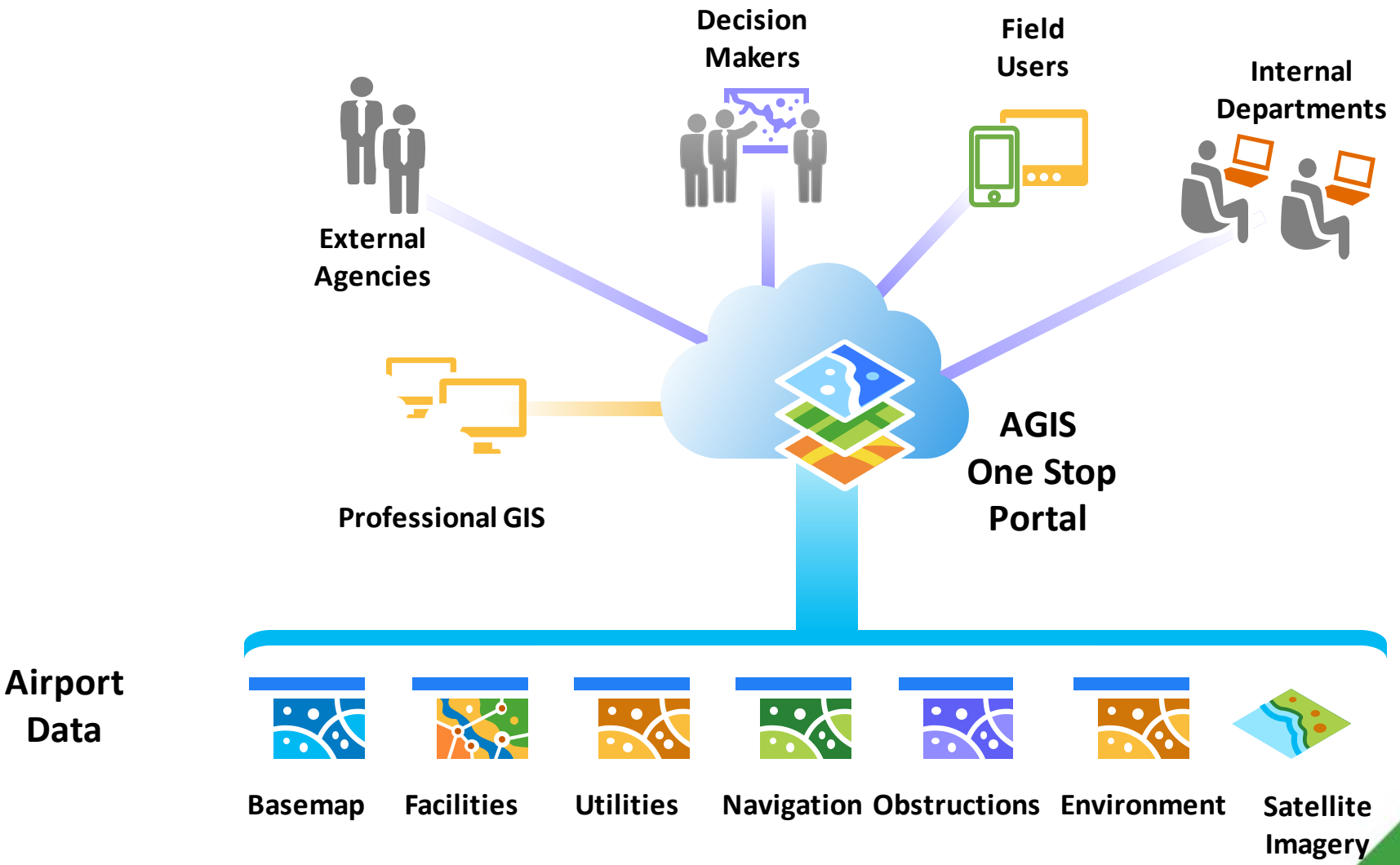

Security & Public Safety Management


Las Vegas McCarran International Airport - Utility Master Plan Database - Microsoft Internet Explorer
MCCARRAN INTERNATIONAL AIRPORT
LAS VEGAS, NEVADA
UTILITY MASTER PLAN DATABASE
Utility Maps
Utility Database
Data Sources
DISCLAIMER
LOG OUT
Admin
MAP CONTENT
BASE MAP FEATURES
Aerial Photo, Year
Infrastructure / Other Maps
Map Book
UTILITY SYSTEMS
Stormwater
Water
Wastewater
Jet Fuel
Natural Gas
Communications
Electrical
FAA
Metadata Maps for:
MAP TOOLS AND NAVIGATION
COORDINATE READOUT
IDENTIFY RESULTS
Details
Utility
Water
Asset ID
Line - 2199
Category
Water Main
Subtype
Main Line
Data Source
2167
Owner
Airport
Status
Active
Qualifier
D - Record Drawings
LOCATION MAP
Airport Operations Center
A.R.F.F.
B Gates
Utility Management


Spatial Information System
Do you want to open or save this file?
Data & Records Management

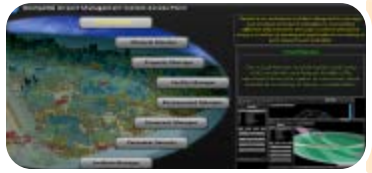
Vision - NextGen

AGIS Solution Approach

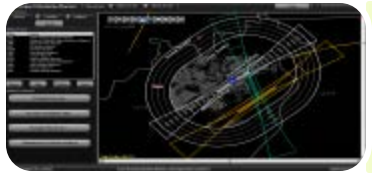


AGIS Applications

AGIS Applications



- **Access Point;** *AGIS system access points.*

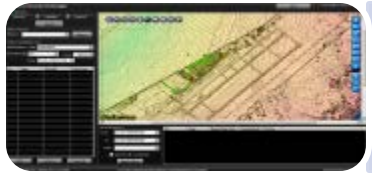


- **V.Surf Planner;** *builds vsurf using ICAO standards and Federal Aviation (FA) standards having the option to customize these standards according to design consideration.*

- **Obstacle Monitor;** *monitors obstacles/constructions around or inside the airport according to the permitted heights retrieved from the runways virtual surfaces with the ability to issue building permits.*

- **Property Manager;** *allows airport authorities to efficiently geographically manage the properties from both lands and buildings owned by airport.*

- **Facility Manager;** *allows airport authorities to efficiently manage the airport facilities from buildings, utilities network in addition to as-built drawings, and route maps to quickly locate and repair utilities.*



- **Environment Manager;** *allows airport authorities to view and analyze noise and pollution data generated by aircraft and infrastructure operations.*

AGIS Applications

- **Pavement Manager;** *allows airport authorities to view and analyze pavement survey conditions activities from assessment of the surface, resurfacing schedules, and other related activities.*

- **Perimeter Security;** *allows airport authorities to view and secure airport premises by providing integrations capabilities with sensors and CCTV.*

- **Incident Manager;** *allows airport authorities to log and analyze incidents that takes place in airport premises.*

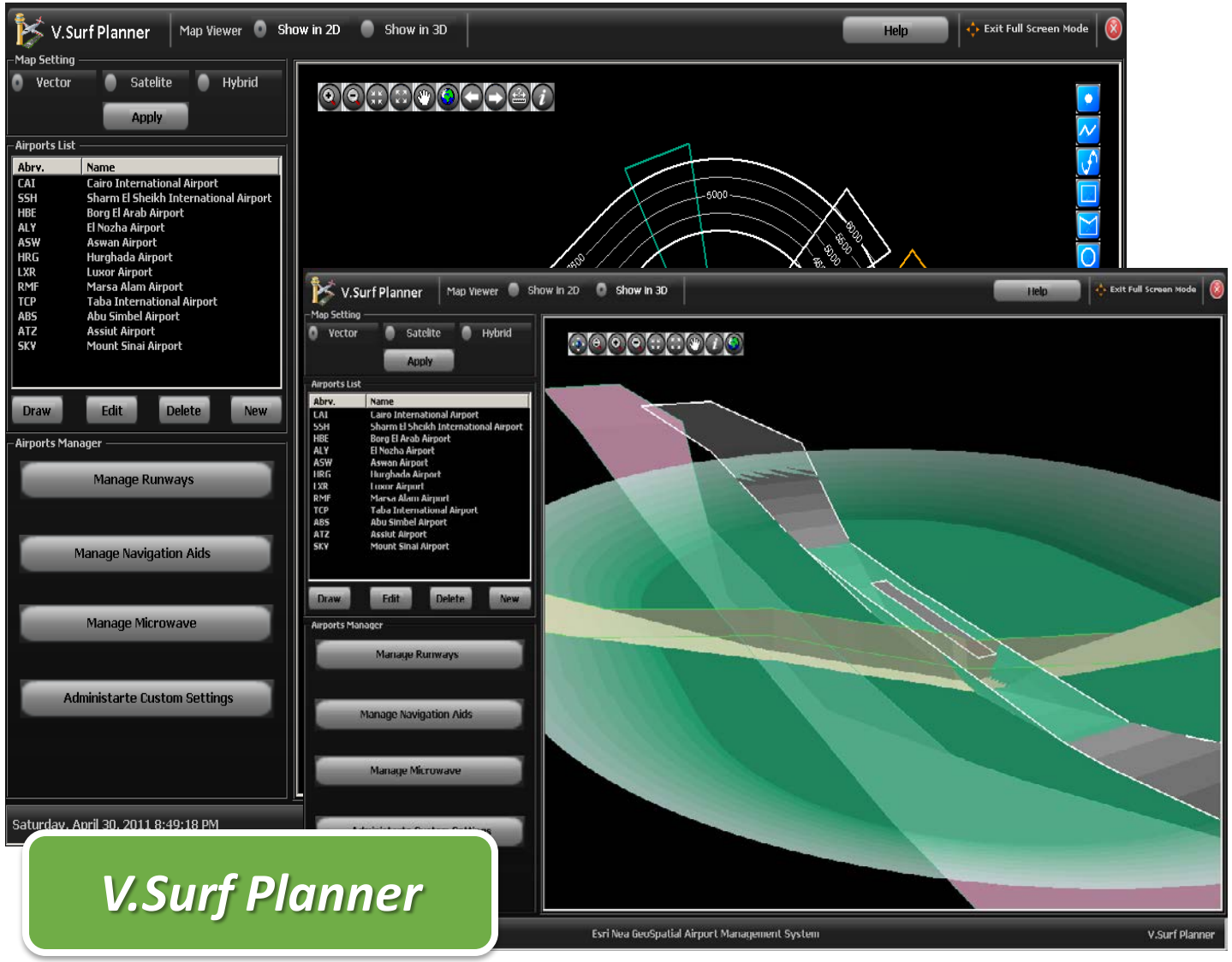
- **AGIS Admin;** *manage logging, to maintain tables & lookups, to configure dispatch policies, and to manage system users.*

AGIS Applications

- V.Surf Planner
- Obstacle Monitor
- Property Manager
- Facility Manager
- Environment Manager
- Pavement Manager
- Perimeter Security
- Incident Manager

Access Point

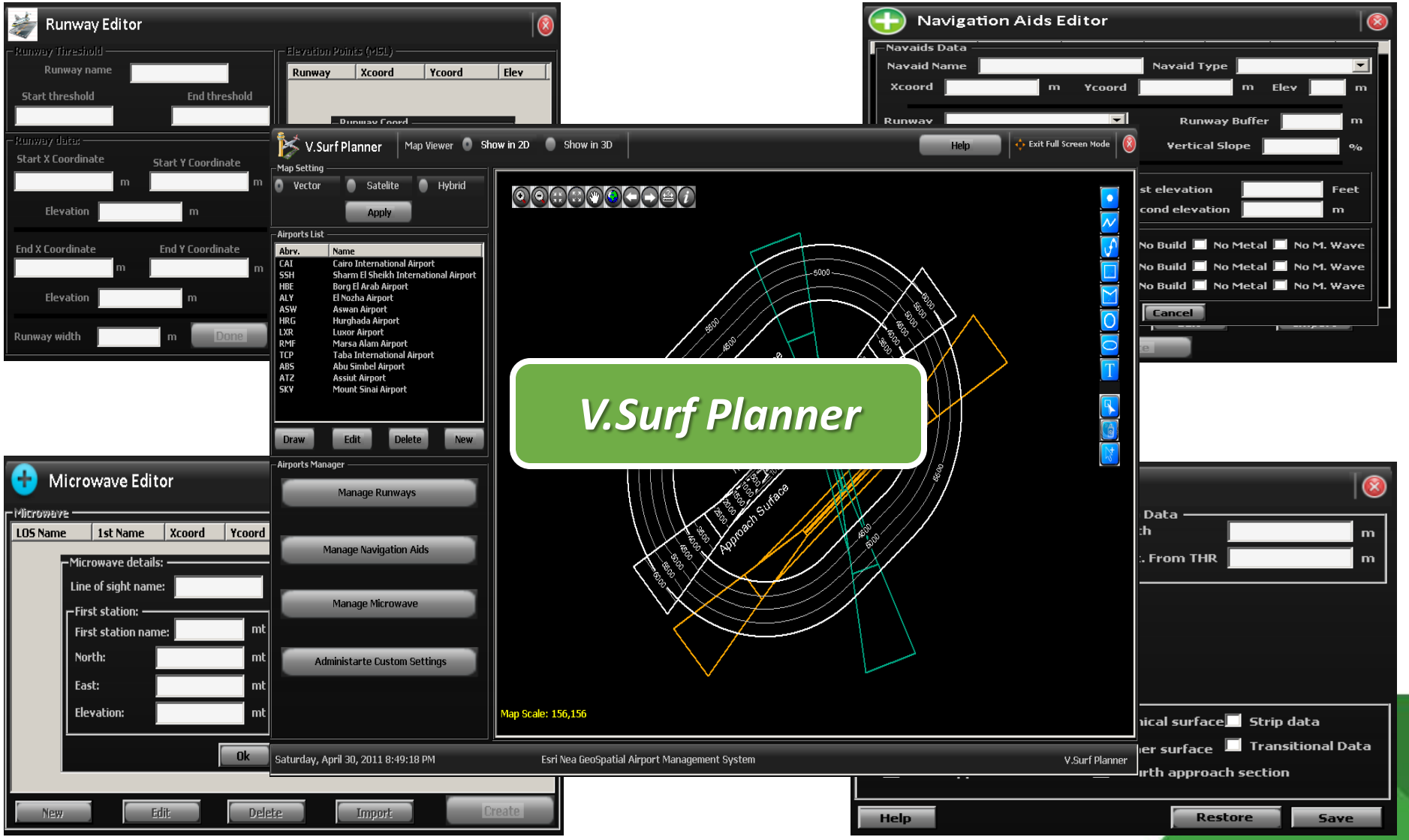
AGIS Applications



V.Surf Planner

- **Build airport virtual surface (Standard / Custom)**
- **Manage Runways**
- **Manage Navigation Aids**
- **Manage Microwave**
- **Administrate Custom Setting**
- **2D/3D views**

AGIS Applications



AGIS Applications

Obstacle Monitor

- Monitor Obstacles
- Violated Buildings Report
- Issue Buildings Permits reports
- Manage issued Permits reports
- Permits Search
- Integrates with:
  - *DMS*
- 2D/3D views

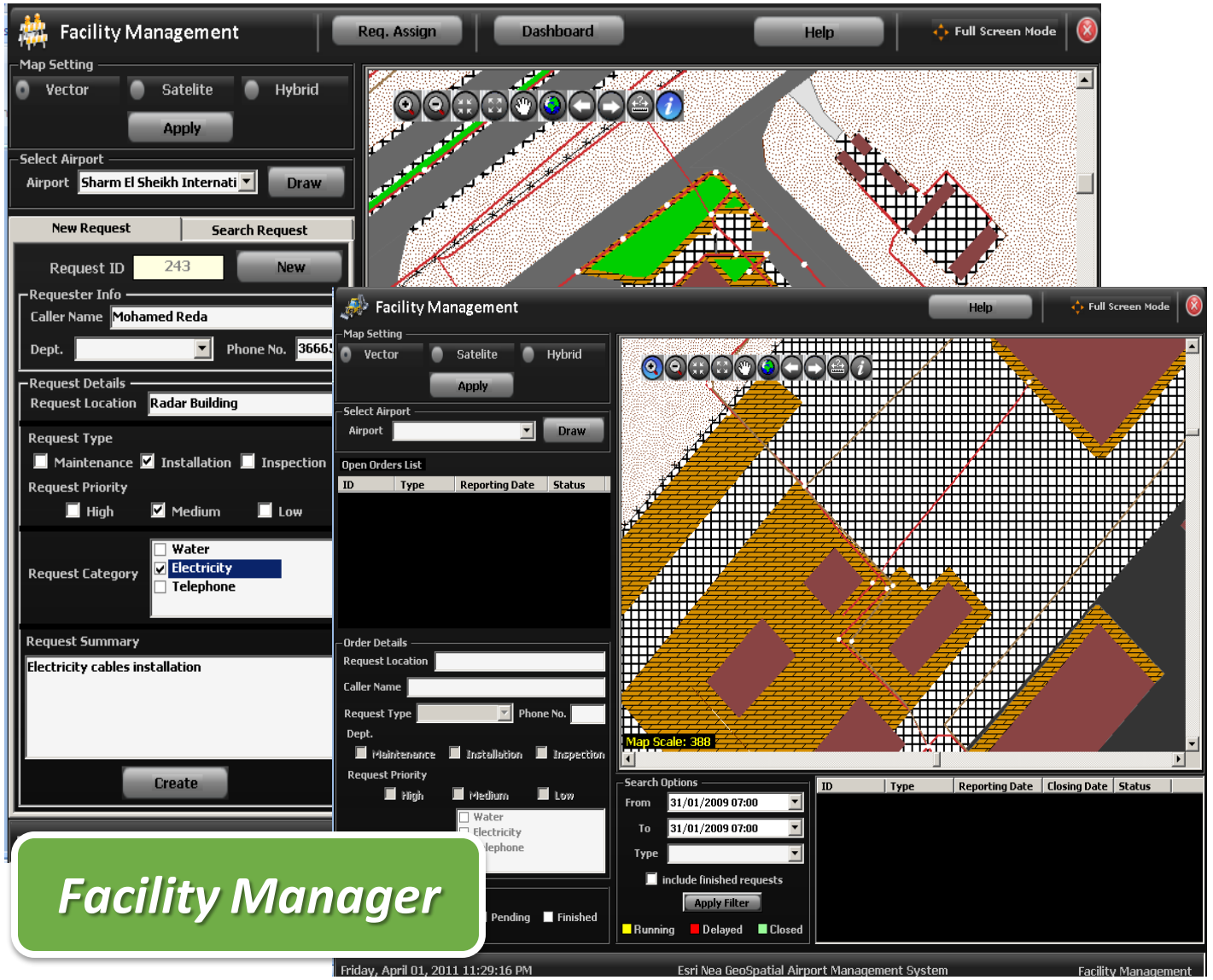
AGIS Applications

AGIS Applications

Property Manager

- **Manage airport properties**
- **Link properties to:**
  - **Deeds**
  - **Layouts**
  - **Images**
- **Properties Search**
- **Integrates with:**
  - ***DMS***
  - ***CAD***
- **2D/3D views**

AGIS Applications



Facility Manager

- **Create work-order requests**
- **Search work-orders requests**
- **Assign work orders**
- **Track requests**
- **Red lining**
- **Route to order**
- **Integrates with:**
  - ***Asset Mngmt***

AGIS Applications

- Alerts
- Key Performance Indicators
- Real Time Statistical Viewer

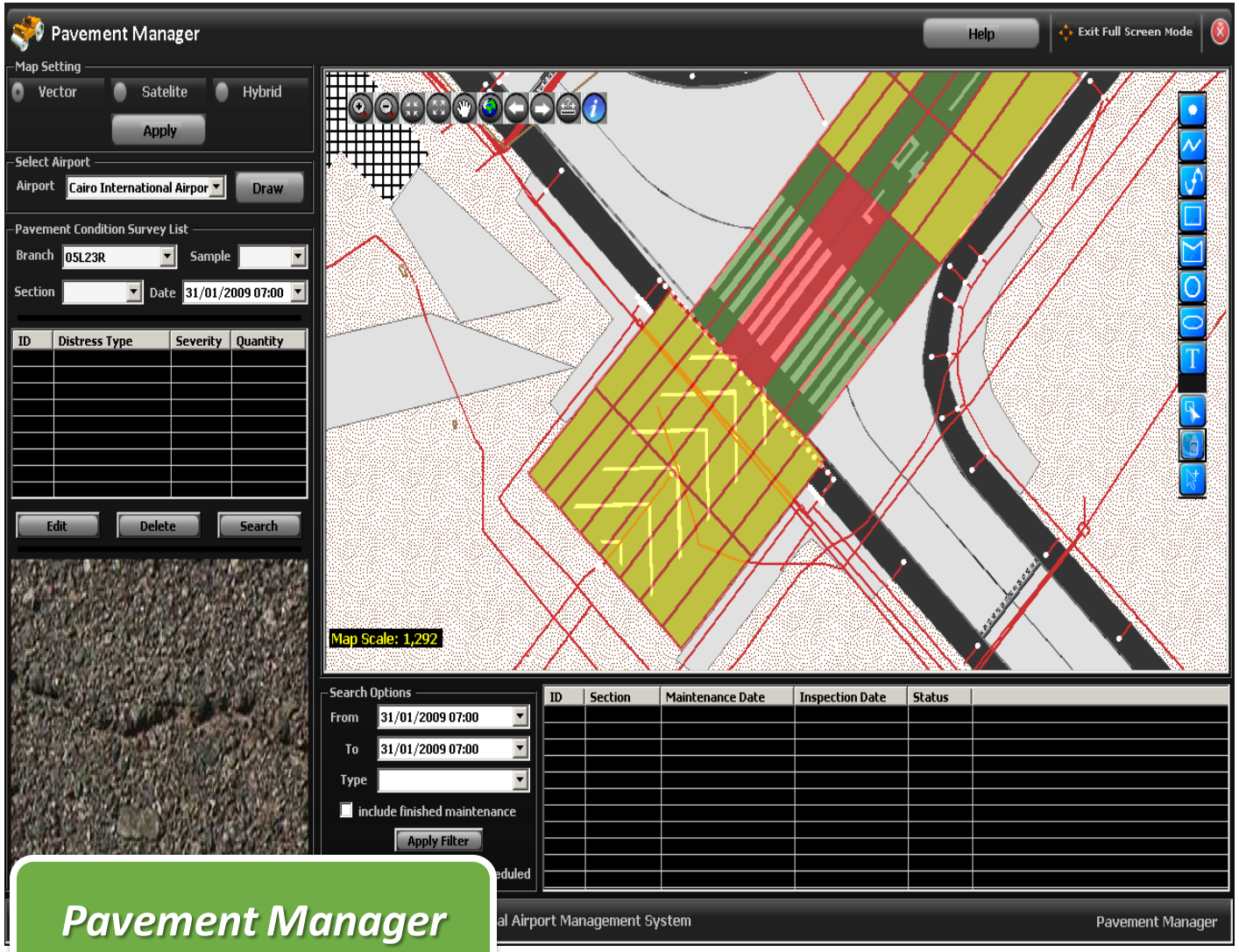
Facility Manager

AGIS Applications

Environment Manager

- **Noise Complaints:**
  - **Add**
  - **Edit**
  - **Delete**
- **Red lining**

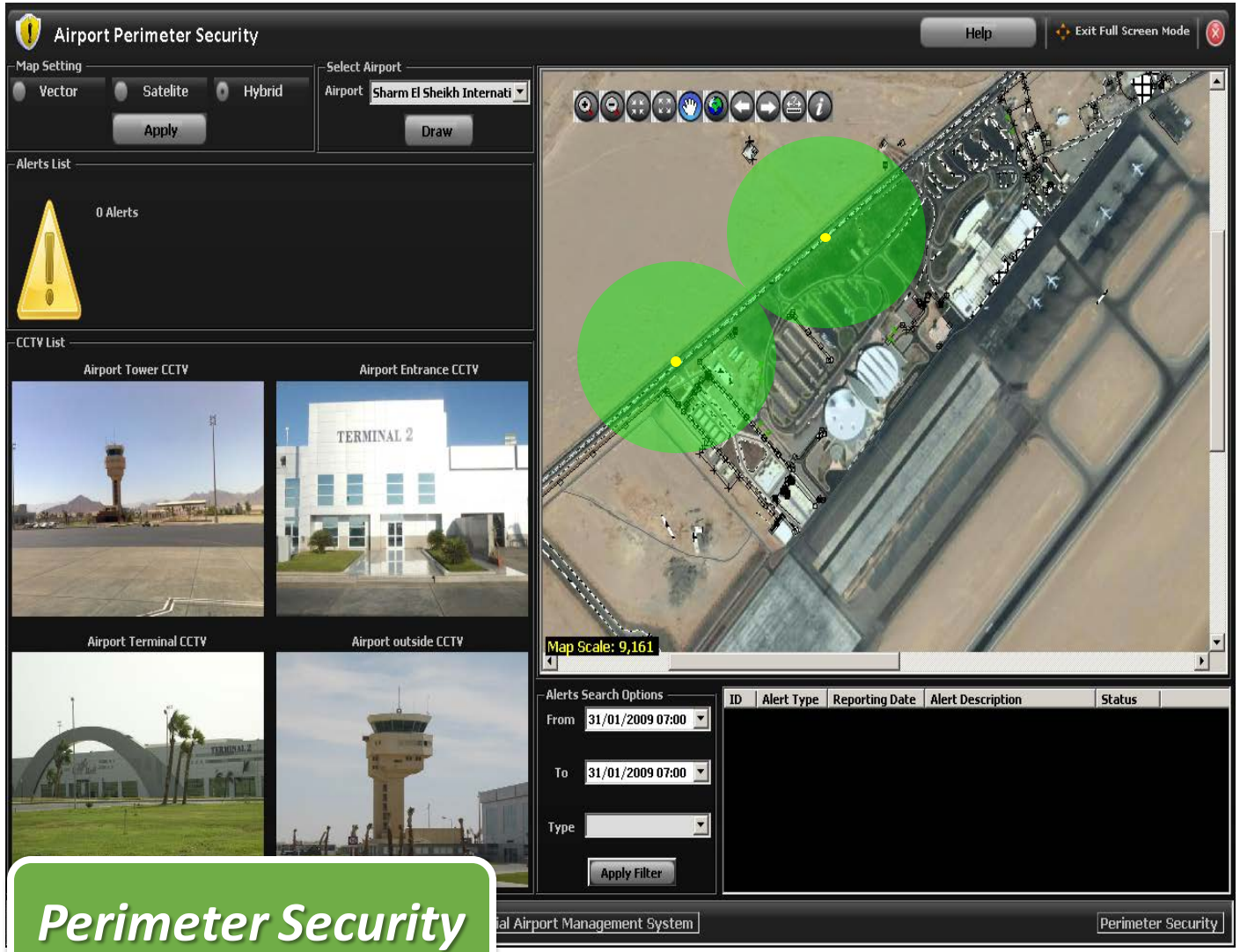
AGIS Applications



Pavement Manager

- **Pavement Survey Condition:**
  - **Add**
  - **Edit**
  - **Delete**
- **Red lining**
- **Integrates with:**
  - **DMS**

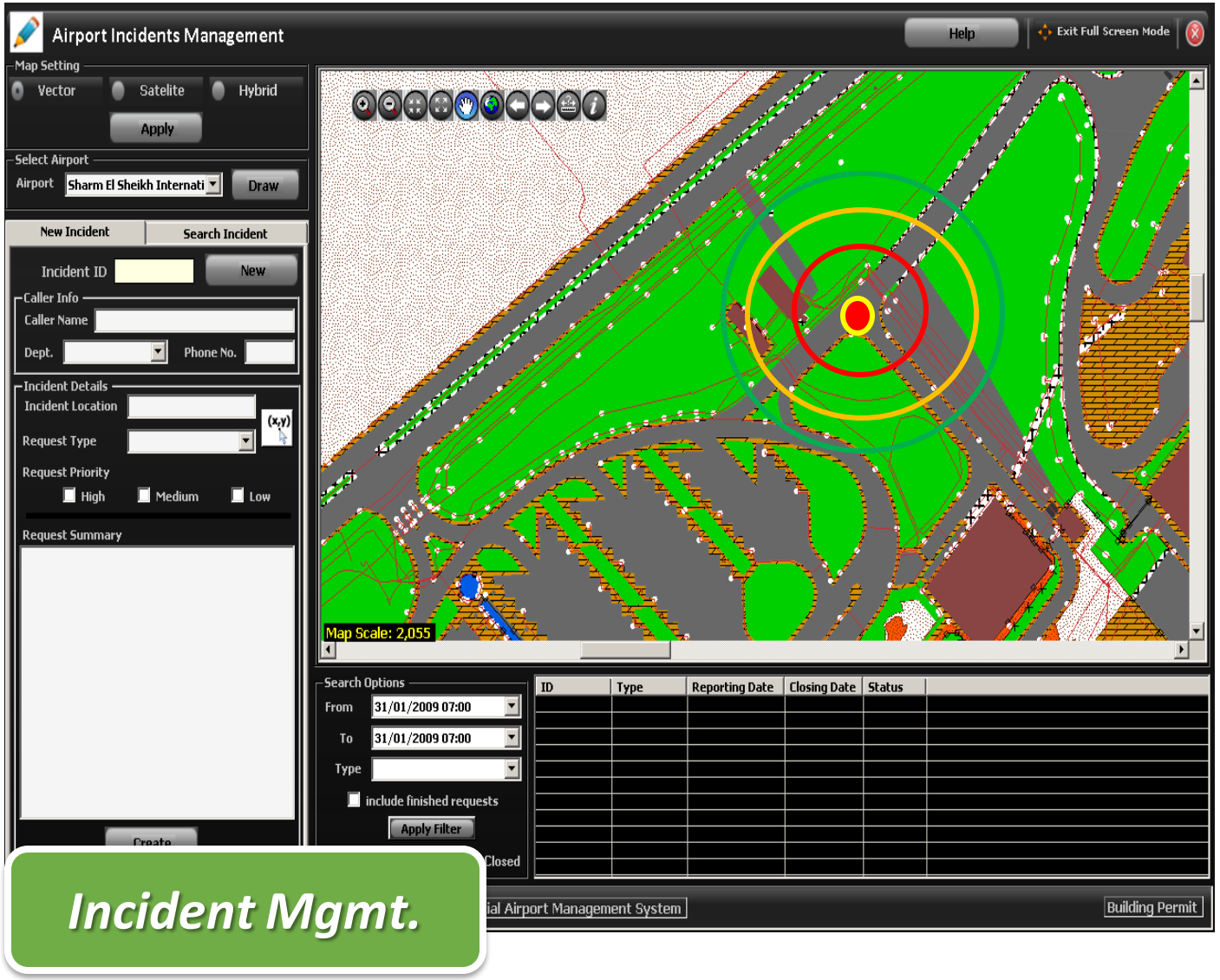
AGIS Applications



Perimeter Security

- **Secure Airport Perimeter**
- **Shows CCTV locations/coverage**
- **Display CCTV live stream**
- **View/Search Alerts**
- **Integrates with:**
  - **CCTV**
  - **Motion Detectors**

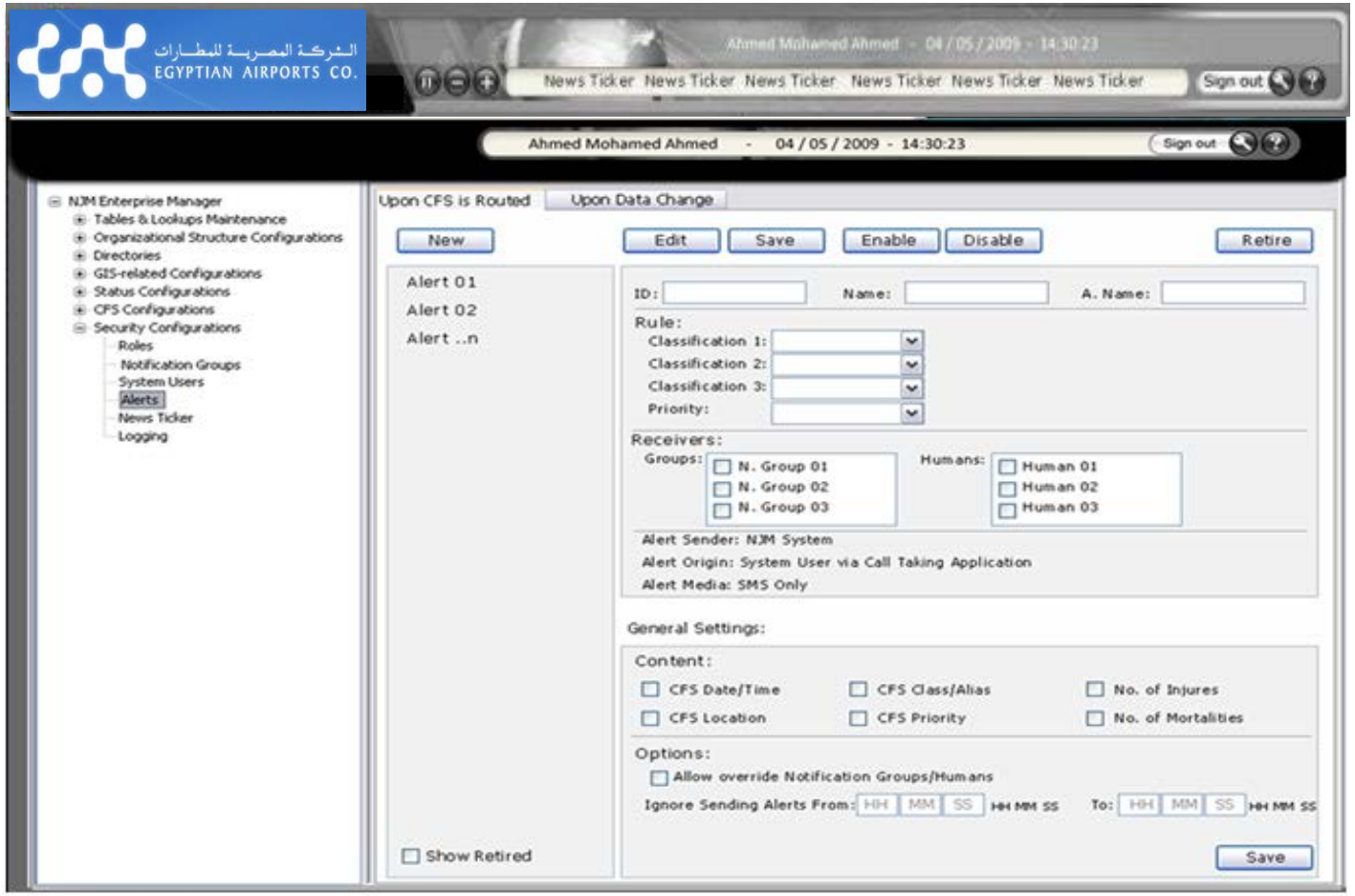
AGIS Applications



Incident Mgmt.

- Create Incident
- Classify Incident
- Search Incidents
- Display CCTV live stream
- Integrates with:
  - CCTV

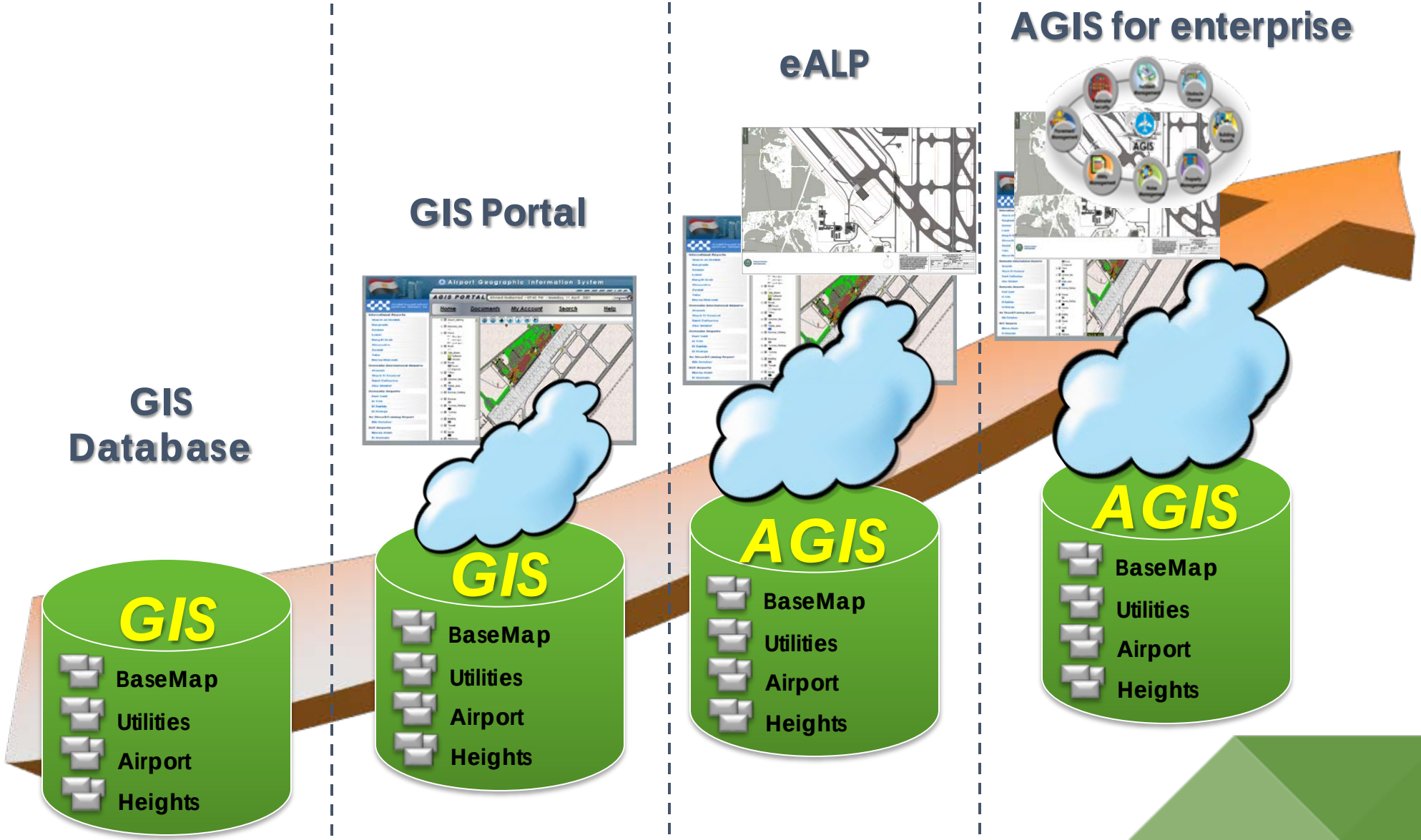
AGIS Applications



- Manage system users
- Administrate application privileges & security policies
- Maintain System tables & lookups
- Administrate system GIS Data

AGIS Admin.

AGIS Road Map

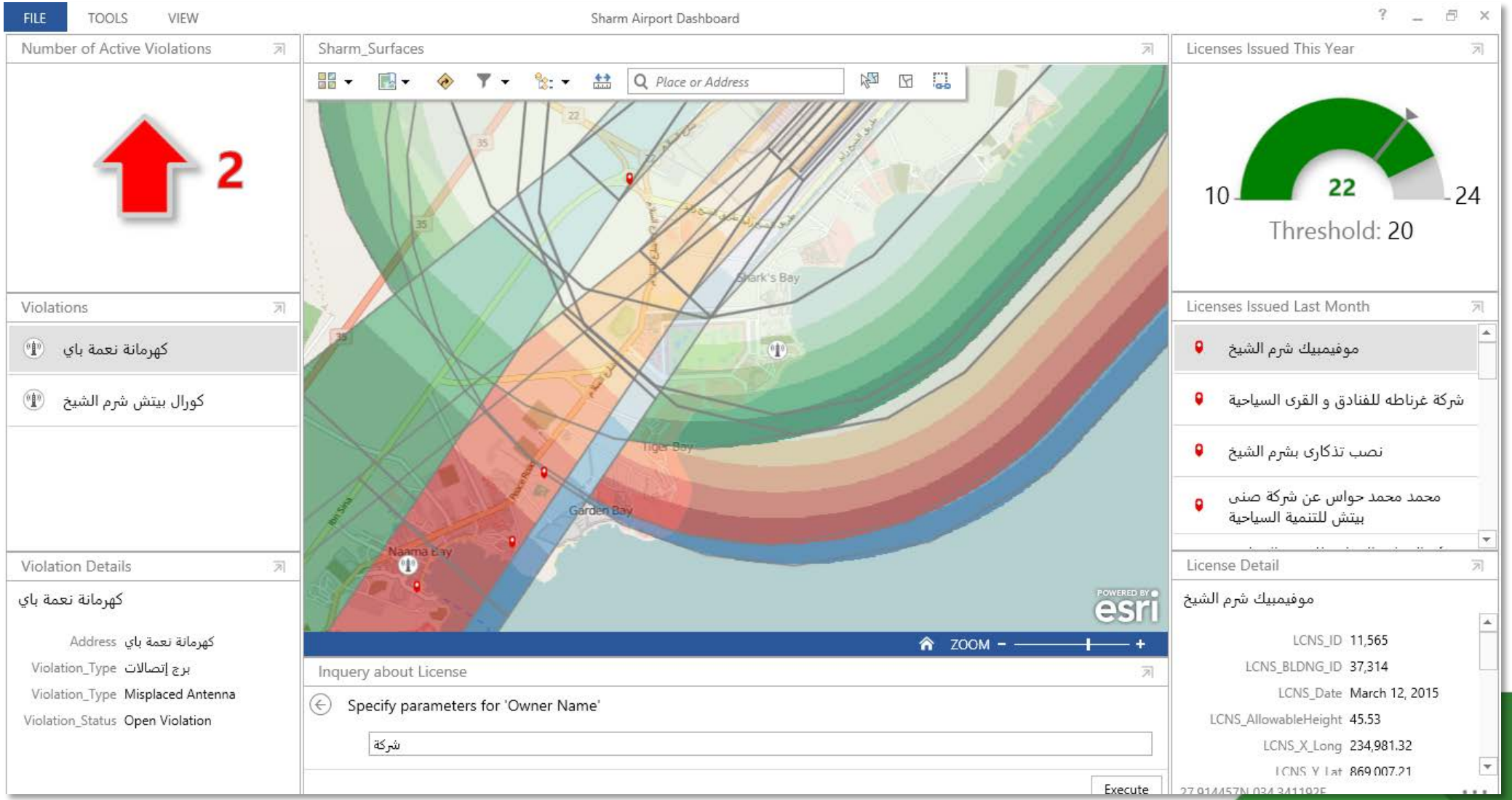


Atlanta Airport Case

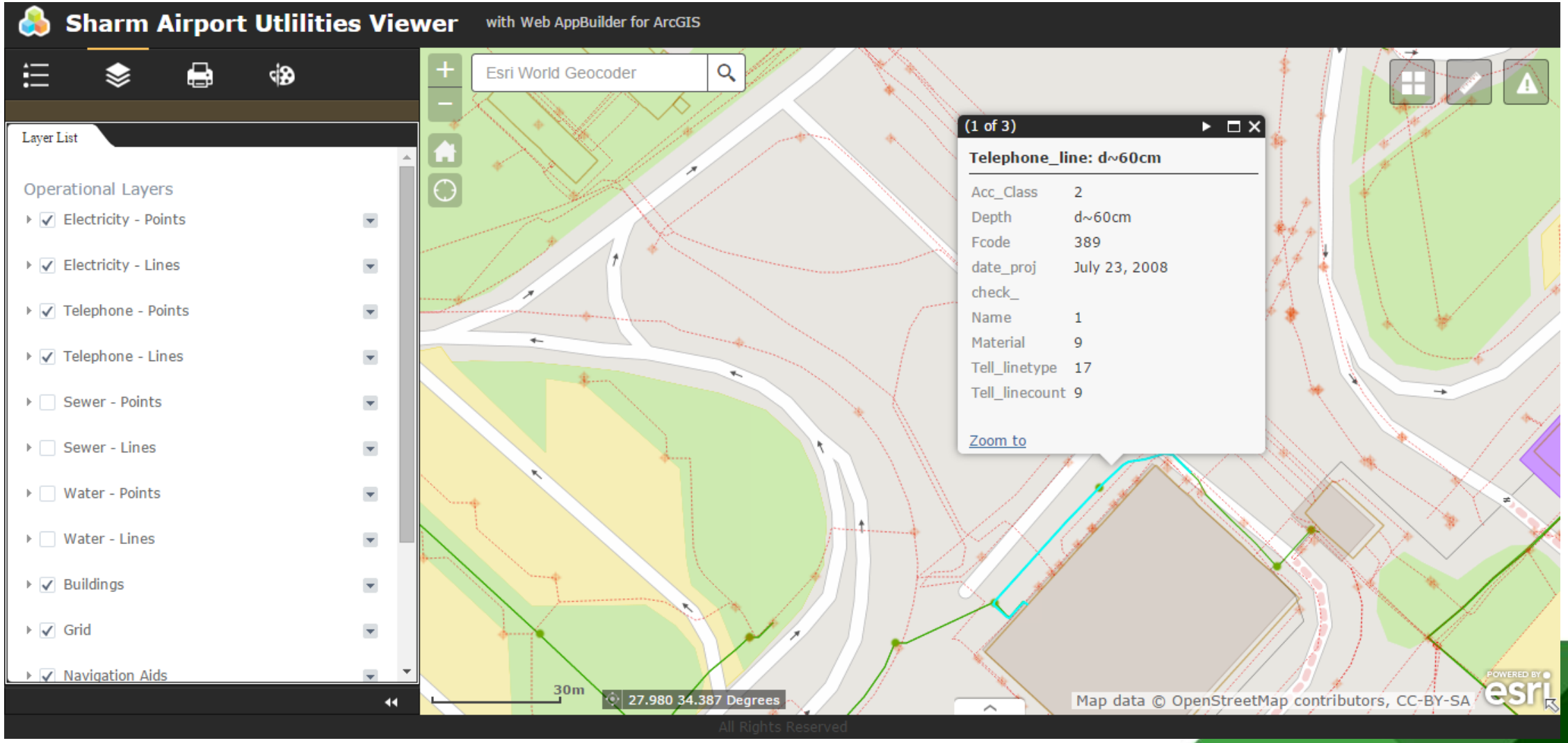
Live Demo

Obstacle Monitoring in field

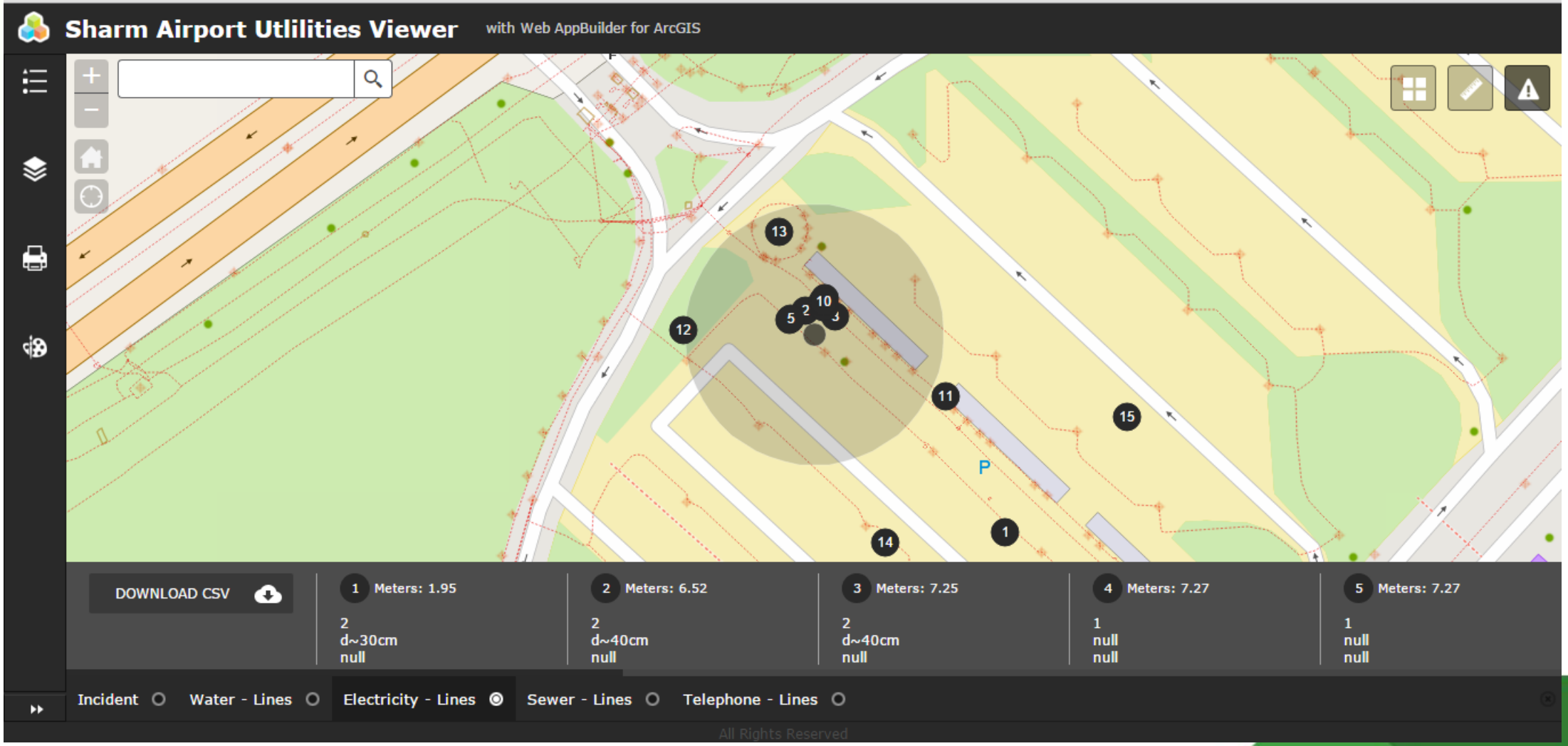
Violations Dashboard



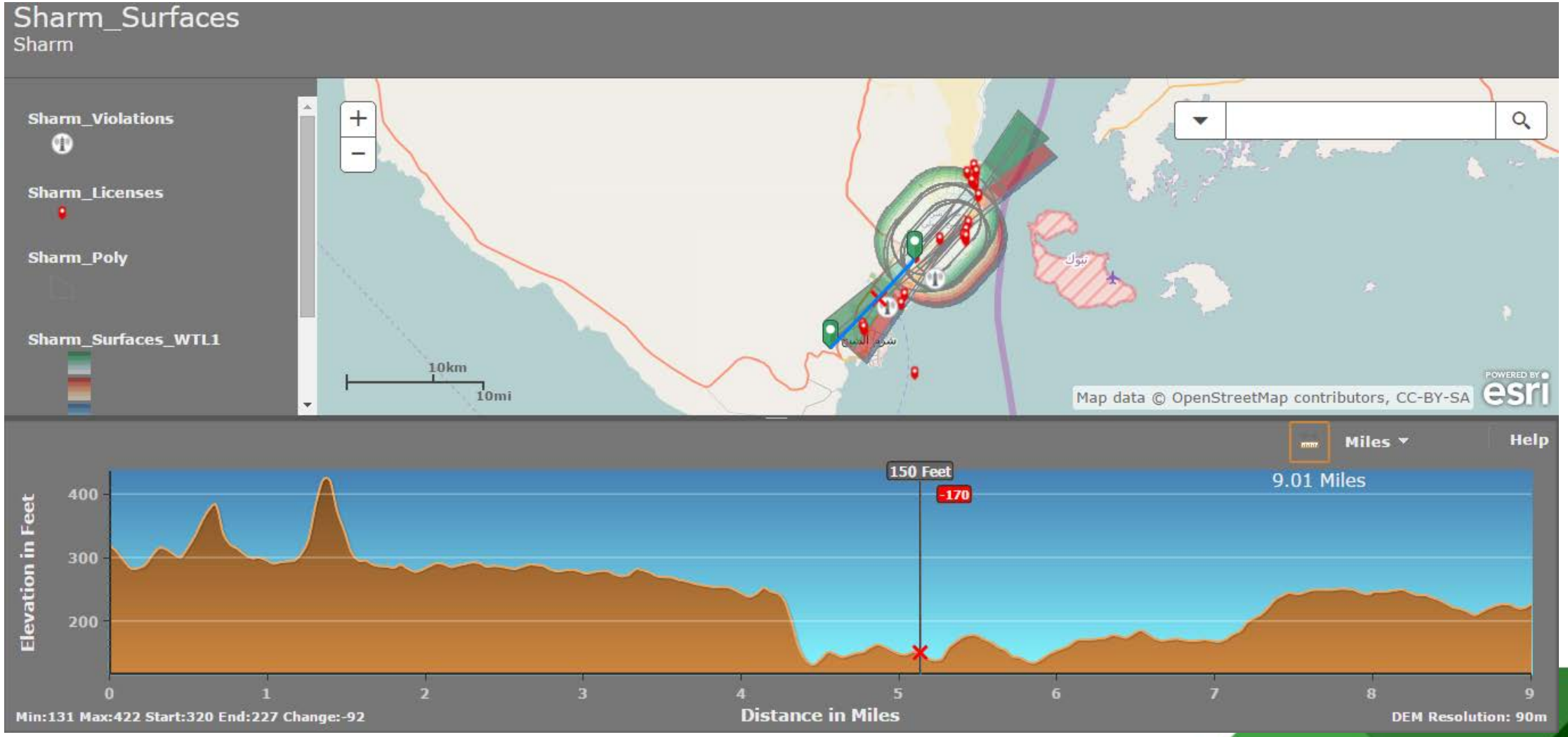
Airport Utilities Viewer



Incident Management



Surface Profiler



Discussion

Thank You

esri Northeast Africa