European Journal of Navigation

The Leading Journal for Systems, Services and Applications

ESRI Airport and Aeronautical Systems

Offering Air and Ground Geographic Advantage

a GTC publication

Volume 4, Number 2, May 2006

Company's View

ESRI Airport and Aeronautical Systems

Offering Air and Ground Geographic Advantage

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Navigational systems tasked with managing the ebb and flow of people and products through the domestic airports of a nation are crucial to its ongoing commercial health and homeland security. GIS plays a critical role in the development, analysis and management of many aspects of the world's airport and aviation systems.

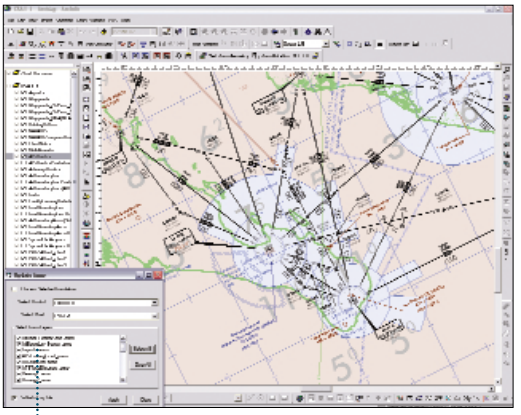
While ports of entry contribute greatly to the lifeblood of a nation, the manner and speed with which aeroplanes can freely move in and out of these transit hubs can stimulate or retard commerce and support or hinder security. Commercial airlines and air-traffic control regulators use GIS from ESRI for airspace planning and routing applications, as well as for facilities management applications. Recent enhancements to three-dimensional GIS allow more advanced airspace-modelling applications to be combined with geographic information from local communities, such as parcels, land use, building heights, new construction and modified terrain around the airport.

GIS in Systems

GIS software from ESRI allows for a greater level of interoperability with other key software tools such as Computer Aided Drafting (CAD) systems and relational database management systems. Users can now take greater advantage of information captured in digital aerial photographs, which can be registered geographically, providing excellent background layers for mapping applications.

Significant growth in traffic has left many airport properties severely constrained for space. Airport managers must carefully manage competing needs for revenue-generating facilities and effectively readjust facilities for the ever-changing needs of their tenants. GIS can be integrated with property-management applications, improving accuracy and timeliness in responding to property information requests.

Many engineering firms have adopted GIS as a tool for expansion studies and design reviews. Using



Aeronautical editing tools.

Database driven chart production.

mapping data from the local community, such as current roadway or railway access to the airport grounds, neighbourhood constraints, and environmental sensitivities, can significantly reduce the time spent in understanding the complexities involved, particularly in expansion of landlocked facilities within large, densely populated urban areas.

Aeronautical PLTS

In 2001 ESRI began to develop software for the geodatabase-driven production of aeronautical charts. Aeronautical charts are used for route planning, in-flight navigation, and takeoff and landing, among other things. It was determined that it was necessary to improve the efficiency with which the charts could be produced, since they are updated frequently and manual chart production methods are slow.

In response, ESRI developed an extension to its ArcGIS software suite for aeronautical chart generation, quality control, and workflow management. Extensive collaboration was essential in understanding the product requirements that would ultimately be a part of the Production Line Tool Set (PLTS) Aeronautical Solution. Because ESRI was under contract to generate and maintain both Enroute and Arrival Charts Depicting Terrain Data (AACDTD) products, the software was developed in a live production setting, with production budgets, deadlines, and quality-control standards by which the software performance was judged.

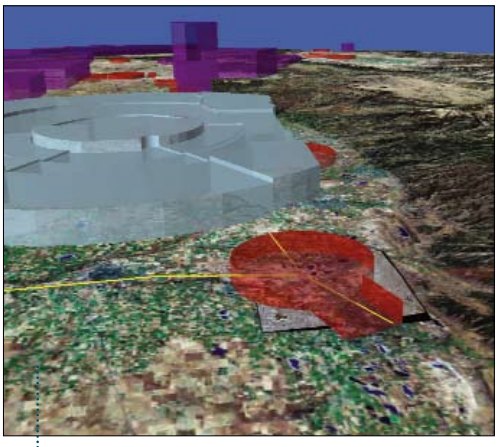
Through this rigorous process, ESRI refined and enhanced the software to create a more efficient workflow during the demanding 28-day update cycles. An open development environment wherein chart production staff sat alongside development staff created an atmosphere of collaboration that facilitated meaningful enhancements to the software. These enhancements were driven by the production of the charts, with software users analysing the production process and finding ways to improve automation and quality through the software.

Once ESRI had completed the initial chart production and maintenance for the customer, several other contractors took over maintenance of the charts. Today, many contractors using the PLTS Aeronautical Solution are producing a wide range of Enroute and AACDTD charts. The contractors continue to maintain these charts, processing thousands of changes in each 28-day cycle.

The FAA's National Aeronautical Charting Office (NACO) is currently working with ESRI to implement its PLTS Aeronautical Solution for an automated, database-centric aeronautical chart-production system. This system will include data editing and validation components to maintain database integrity. Other applications within the PLTS Aeronautical framework will streamline database production, maintenance, and quality control and support high-volume cartographic production.

In 2003, ESRI, working with Eurocontrol, the European Organisation for the safety of air navigation, modified the software to enable the production of European aeronautical planning charts which included Central Flow Management Unit (CFMU), Airspace Management (ASM), and Central Route Charges Office (CRCO). These modifications as a whole will allow other aeronautical agencies throughout the world to adapt the software to their specific requirements.

Because PLTS Aeronautical Solution is a COTS solution being used by a growing number of major aeronautical information providers such as the FAA, Eurocontrol and others, all current and future users of PLTS Aeronautical Solution will reap the benefit of mutual contributions to the technology requirements.



3D visualisation of aeronautical data.

The Future is Now

The security needs of airports have been significantly elevated in recent years. GIS provides a powerful analytic capability for understanding vulnerability in existing facilities, as well as in pinpointing trends in incidents and past security breaches. Tying incident-log information directly to the exact location in the airport's facility maps can help in planning for improvements in security equipment and procedures.

According to ESRI's transportation industry manager Terry C. Bills, "GIS technology fits into the complete airport 'lifecycle', including flight monitoring, tracking and charting, noise-level monitoring and airport management. Airports like McCarran International Airport in Las Vegas, Nevada use GIS in every department, from engineering and construction management to operations and maintenance, security and environmental compliance.

"I believe that the largest opportunity for growth in the industry is aviation and airport security, since each airport will have to develop security command centres and GIS will play an important role in that overall common operational picture."●

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For more than 35 years, ESRI has been helping people make better decisions through management and analysis of geographic information. A full-service GIS company, ESRI offers a framework for implementing GIS technology and business logic in any organization from personal GIS on the desktop to enterprise-wide GIS servers (including the Web) and mobile devices. ESRI GIS solutions are flexible and can be customized to meet the needs of our users.

For More Information

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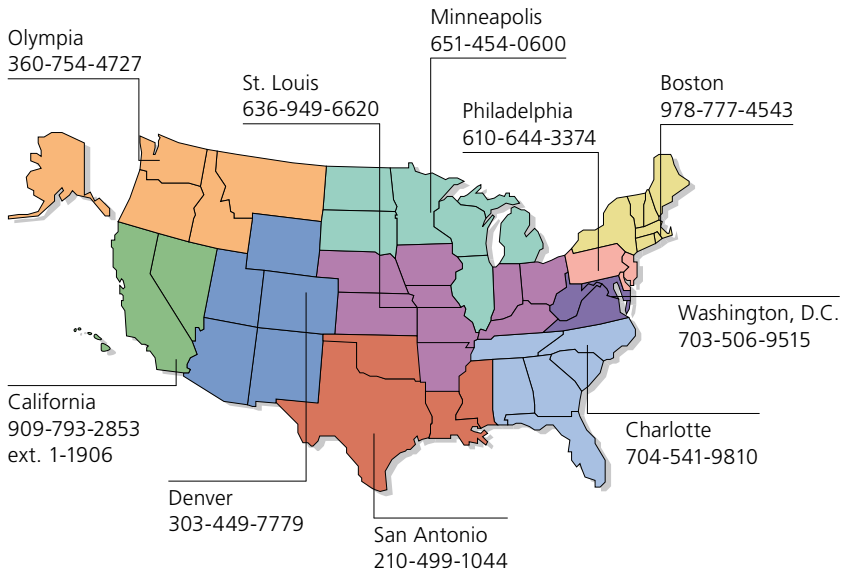

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