The Kingdom of Bahrain's strategic location in the Arabian Gulf has given it the chance to broaden its cultural perspective and increase its prosperity through trade and travel. However, its location has made it desirable not only for traders but also for those seeking to establish control over shipping in the gulf.

Among its many duties, Bahrain’s Ministry of Interior (MOI) is responsible for the country’s homeland security and natural resources as well as the maintenance of safe and secure passage in and around the kingdom. The MOI is the first line of defense in managing threat attacks; hence, the ministry’s ability to quickly and effectively access spatial data that can minimize damages and save lives is essential.

The Challenge

The MOI required a nationwide solution that would be used to enforce public security and achieve tight control, leverage data sharing between the various MOI departments, and allow effective emergency response planning and efficient emergency management.

The Solution

After several intensely competitive bid rounds, Esri Northeast Africa was selected to provide a national-scale, state-of-the-art solution, the Geographic Security System (GSS).

- At the core of GSS, a unified geodatabase was established to host the spatial and tabular data of the MOI.
- GSS is built on industry standards based on service-oriented architecture (SOA) to overcome issues concerned with data isolation and the lack of integration among various MOI departments.
- It integrates with and spatially empowers automated vehicle location (AVL) and other existing surveillance systems, and it enables users to visualize incidents.
- The solution is composed of several modules. All the modules provide resource management, analysis, and report generation functionalities.

The modules are as follows:

**Emergency Response System**
- Handles all issues related to receiving calls about incidents and dispatching units accordingly.
- Coordinates between field officers and the control room dispatchers using the in-vehicle devices.

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Traffic GeoManager
- Aids traffic control room staff in viewing traffic status and controlling traffic flow by manipulating street properties and exit and entry points.

Mission Planning System
- Permits users to put forth a suitable plan for dispatching units and allocating them, defining the ideal route for the units, and identifying the nearest medical facilities to the site of an incident.
- Allows selection of the most appropriate live feed sources to acquire immediate feedback from the scene.

Crime GeoAnalyzer
- Allows users to conduct advanced analysis on crime incidents recorded in the system’s database.
- Allows the highest crime activity areas to be located on the map, and investigation to be enhanced, since users can view the coverage of police vehicles in these areas and identify reasons behind the prevalence of such incidents.

Coastal Surveillance System
- Allows users to effectively survey all marine activities, displaying the various locations of outgoing and incoming ships by connecting to radar and other external information systems in other marine-affiliated entities.

Task Force Management System
- Allows users to fully control their fleets and assign tasks based on preplanned missions or developing incidents.
- Useful for any entity requiring a fleet management system.
- Allows decision makers to track and visualize the movement of vehicles on interactive maps.
- Identifies a patrol vehicle of interest by displaying its available information.

Results
- Enables various system users to visualize data, thus ensuring efficient and effective resource allocation and utilization
- Increased response time
- A single common operational picture (COP) for top managers
- Seamless integration between GIS and imaging and radar systems
- Availability of presorted procedures for incident handling
- Seamless communication with mobile units
- Enhanced data sharing between MOI directorates
- Full seamless integration with government databases
- Live situational maps providing a real-time view of the current situation
- Efficient and accurate management of day-to-day operations
- Critical infrastructure information (documents, images, videos, etc.) and location management
- Enhanced response time and analysis capabilities

Esri Software Used
- ArcGIS® Server 9.2 and ArcGIS 9.3 (Network Analyst and Spatial Analyst extensions)
- ArcGIS Desktop 9.3 (Network Analyst, Spatial Analyst, 3D Analyst™, and Tracking Analyst extensions)

Other Software Used
- Windows® 2000/2003 Server
- Windows 2000 Professional

Hardware Used
- IBM Blade Servers