



Client Story

Fire Department Uses Real-Time Data to Improve Emergency Services

When it comes to emergency response, every second counts. With help from Insight, one metro fire department transformed the way it serves its community by migrating its legacy database to the cloud and building out a real-time analytics solution.

Today, fire departments across the U.S. depend on data to support public safety. The ability to readily identify the status of equipment and personnel is essential to ensuring effective direction of resources and rapid response times in the event of an emergency.

In 2019, one major metropolitan fire department recognized an opportunity to improve its services to the community by modernizing its existing data environment. By making the shift from a brittle, legacy data system to a cloud-based infrastructure, leaders hoped to better position the 135-year-old organization to address current and future challenges with real-time intelligence.

Reporting roadblocks

For many years, the fire department had relied on an Oracle® database to manage all incoming data and outbound reporting. This included information collected from emergency calls, first responders and GPS-tracked equipment. But a high volume of records, numbering in the hundreds of millions, created bandwidth and performance challenges.

Additionally, while they had the ability to generate basic reports, IT leaders realized that leveraging their real-time system for broader analytics didn't align to best practices. The organization determined it was time to make the switch to a modern, cloud-based data platform that would enable a unified view of all assets and events while supporting both real-time and long-term reporting needs.

When one of Microsoft's cloud and data specialists heard about these challenges, he recommended Insight for the project. Since the fire department had previously turned to Insight for support on cloud and data center initiatives, the CIO and his team felt confident we could help them reach their goals.

The organization determined it was time to make the switch to a modern, cloud-based data platform that would enable a unified view of all assets and events while supporting both real-time and long-term reporting needs.

Industry:
Public sector

The challenge:

Migrate from outdated database to modern cloud platform to better support reporting needs with real-time intelligence

The solution:

A real-time reporting dashboard that provides up-to-date insights on emergency events, facilitating rapid decision-making and reducing response times

Insight provided:

- Proof of concept for modern data architecture
- Framework for data modernization at scale
- Implementation of multiple phases of the project
- Self-service solution education and training

Insight services:

- Professional Services
- Consulting Services
- Training

Phase one: Data modernization

An Insight architect and senior systems engineer began implementing a Proof of Concept (PoC). They worked closely with the client's IT team to pull data from the legacy Oracle database and other peripheral systems into a centralized data lake. Azure® Data Factory was leveraged for ingestion, with Databricks used to support processing before landing the data in Delta Lake.

The PoC was successfully completed within four weeks, and IT leaders immediately recognized the value of the unified reporting platform and the ability to bring in real-time data to support data science projects.

With the PoC approved, Insight's team began implementing the full data modernization project at scale. We automated significant portions of the infrastructure deployment, data cleansing and configuration processes, and the new data architecture was up and running in a matter of weeks — rather than months.

Phase two: A real-time dashboard

While the modern data architecture greatly improved the way the fire department managed its data, leaders wanted to add a real-time channel to the reporting infrastructure to serve up critical information through a centralized dashboard.

The primary data sources for the dashboard included the city's 911 system, as well as GPS trackers from fire department equipment and personnel. The goal was to display this information on a map that would automatically update with locations and incidents. This view would need to be as accurate and up to date as possible to facilitate rapid decision-making on resource and equipment deployments.

Insight's team leveraged Azure Event Hubs to ingest event data at rates of up to 100+/second. A Databricks® analytics platform with Spark structured streaming was then used to stream events from the ingestion platform into Delta Lake. This served as the high-performance, big data ACID store to capture and store processed data, allowing it to be merged with previous records. Finally, Power BI® was used for real-time visualization with automatic updates triggered directly by data changes in Delta Lake

In just a few weeks, the PoC was complete and approved for full production. The full-scale solution was quickly delivered, providing a single-pane-of-glass view of citywide emergency response data.

The real-time reporting solution has enabled improved staging of 15,000 vehicles and assets and helped to reduce emergency response times.

Rapid response to preserve life and property

Today, the fire department has greater visibility into current events and long-term trends.

Fire chiefs regularly rely on real-time information to optimize "move up" operations. As events appear on the map, nearby resources are quickly rerouted to respond to incidents. This has enabled improved staging of 15,000 vehicles and assets and helped to reduce emergency response times.

Furthermore, this system lays the groundwork for future predictive capabilities and the organization may soon be able to analyze historical trends and automatically identify preemptive placement of resources.

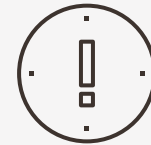
By building on their work with Insight, the fire department is equipped not only to better serve its community, but also to transform the way it responds to challenges in the future.

Benefits & outcomes:

Improved staging of

15,000

vehicles and assets



Reduced
emergency
response times

Enabled
the IT team
to manage
data systems
in house



Foundation for
future predictive
analytics
capabilities

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