



IoT Analysis at Scale for a U.S. Government Agency: Energy, Air Quality, and Fleet Management

THE CHALLENGE

A government agency wanted to use IoT data to optimize its operations, cut costs, and offer new, data-driven services to the public. The agency's IoT sensors were producing data at high speed and massive scale which required timely insights to take action.

The agency is responsible for a sprawling network of 20,000+ buildings worldwide, resulting in an energy bill of over \$500M a year, largely the result of inefficiencies and energy waste. In addition, it was difficult to plan for the differing qualities of energy infrastructure in various countries. In areas where power surges or blackouts were common, valuable equipment would often be damaged and operations knocked offline as a result of inconsistent power levels. The agency wanted to use data from its power meters to address these issues and tap into alternate sources of energy generation when necessary.

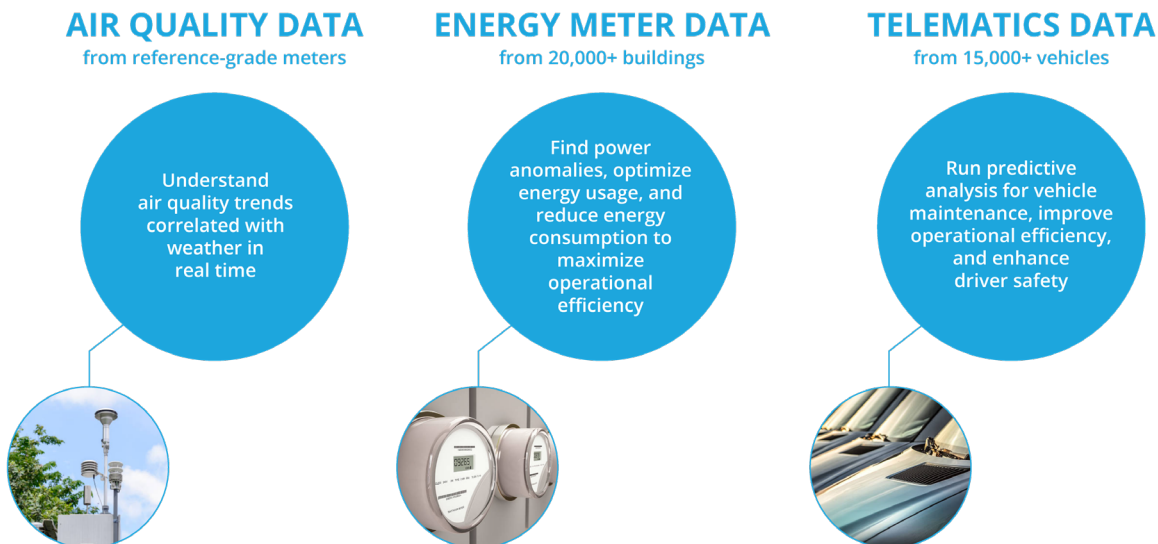
The agency also manages reference grade air quality meters around the world, from which it wanted to track and predict air quality in real-time. These results could be shared across the government, enabling more accurate planning on a variety of operations, and used for external dashboards, letting the public know when it is safe to go outside while abroad. In addition, the agency operates a fleet of 15,000+ vehicles, from which it wanted to collect live telematics data to improve operational efficiency and driver safety, while enabling predictive maintenance.

THE KINETICA SOLUTION

With Kinetica, the agency can derive insight from vast volumes of streaming IoT data in milliseconds. Kinetica's wide breadth of real-time analytical techniques enables the agency to make the fast, data-driven decisions necessary to improve operations while reducing costs, and offering new, modern services to the public.

Sophisticated meters on the agency's buildings produce millisecond data on energy quality, which Kinetica simultaneously receives and analyzes, in real-time. The agency leverages Kinetica to deploy machine learning algorithms to identify anomalies and predictively understand fluctuations in power quality. By fixing energy wasting scenarios ranging from air conditioning left on over the weekend to lights left on overnight, the agency estimated it could save \$100M yearly by taking quick action wherever anomalies were identified. Additionally, predictive analytics can identify patterns in power fluctuations, preparing the agency for surges and drops, protecting valuable equipment and preventing operations from going offline.

IoT Sensor Data Analysis



Kinetica's ability to derive insight from multiple complex streaming data feeds is also key to the agency's efforts on understanding air quality. By analyzing air quality data from reference grade meters, and correlating this against weather and other data elements, Kinetica provides a real-time picture of air quality around the globe. Leveraging Kinetica for predictive analytics in this case enables the agency to understand air quality trends by location. The agency will use these results for internal use as well as on a public dashboard, allowing its citizens to be better informed on their safety when traveling overseas.

The telematics data from the agency's fleet of vehicles consists of high-velocity data with a geospatial component that Kinetica is uniquely positioned to derive value from. By leveraging Kinetica's native geospatial support and high-speed ingest, the agency gains a real-time picture into the operations of its fleet. Live tracking of vehicle movements enables the agency to optimize routes to save on time and fuel, automating trip logs, and gain a greater understanding of driver safety, such as identifying when a driver drove above the speed limit due to necessity. The agency can also leverage Kinetica to perform predictive maintenance analytics, ensuring a fine-tuned and mission-ready fleet.