# SYSTEM SAFETY ANALYTICS

Vast amounts of data are key to unlocking aviation safety gains wherever aircraft fly—and on the airport surface too. At MITRE, we've tapped into the power of that data to provide the Federal Aviation Administration (FAA) with a suite of tools that work to enhance safety in the air and on the ground.

Applying Analytics to Aviation Safety

One such tool is MITRE Global Flight Informatics, which provides analysts with insights into aviation safety and efficiency challenges throughout the world. For instance, it can help them detect flights that came too close to terrain or had to abort a landing. The collective data from those incidents can then be used to identify and correct systemic safety issues.

The MITRE-developed National Airspace System Operations Dashboard, or NOD, combines data from multiple feeds into one comprehensive view, allowing FAA traffic managers and their industry counterparts to better monitor system changes, receive alerts about potential problems, and collaborate to address them.

Several other MITRE-developed tools provide the FAA with faster, more fine-tuned information about too-close encounters.

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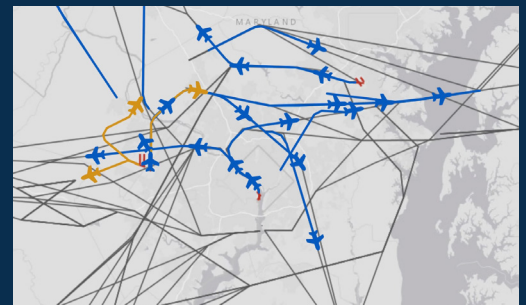
Our Aviation Risk Identification and Assessment (ARIA) capabilities are giving the FAA enhanced insight into both airborne and ground-based safety issues in the National Airspace System (NAS).

Airborne ARIA analyzes surveillance data from the entire NAS and identifies events that might pose a safety concern. It then ranks them by severity so FAA investigators can focus their attention on the incidents representing the greatest risk. And it does so daily, in near-real-time.

Surface ARIA performs similar functions, flagging and ranking risk events occurring on the airport surface or very close to it for further study.

With the insights these capabilities offer, FAA safety experts can make better-informed decisions for enhancing air traffic safety.

Our safety analytics expertise has been applied to meet unique, emerging needs as well.

When COVID-19 introduced aviation challenges worldwide, we captured, analyzed, and integrated relevant data—from local infection rates to global air traffic trends. We then presented it in game-changing forecasts and dashboards that assisted aviation stakeholders in making proactive, data-driven decisions for safe and effective service delivery in a constantly changing environment.

Expanding the Range of Analytics Applications

Today, we're applying our analytics know-how to a wide range of efforts.

Analytics are a key element of our vision for achieving the next level of safety in all transportation domains, from aviation to commuter rail and roadways. One of our research focuses is on how to combine data analytics and artificial intelligence to automatically identify aviation safety issues and their contributing causes.

In the automotive realm, we're researching how data analytics can help reduce traffic accidents and fatalities, how the telemetry data that today's increasingly automated vehicles are producing can be leveraged to create safer vehicles, and to better understand how effective advanced driver assistance systems are in the real world.

Our researchers are also working to realize the promise of automated driving systems while mitigating their risks. We're researching the little-understood safety implications of micromobility services, from bicycles to e-scooters, which have taken our cities by storm. We're also working with the Washington Metropolitan Area Transit Authority and other transit providers to improve bus and commuter rail safety.

Teaching others how to use data and analytics to enhance safety in their organizations is part of our Safety Management System (SMS) training program as well. Participants learn how to use tools and techniques to identify safety issues, analyze them, mitigate any identified risks, and then monitor the effectiveness of those mitigations.

With data and the analytics that make them meaningful, we are taking safety to new heights across the transportation landscape.

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MITRE's mission-driven teams are dedicated to solving problems for a safer world. Through our public-private partnerships and federally funded R&D centers, we work across government and in partnership with industry to tackle challenges to the safety, stability, and well-being of our nation.

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