

Project Summary

Tip & Cue's project addresses the critical and growing vulnerability of America's Position, Navigation, and Timing (PNT) infrastructure, primarily GPS/GNSS. Today, such critical navigational signals and systems face growing threats of interference and disruptions such as jamming and spoofing, as witnessed in global conflicts around the world, but also domestically. These interferences are easily deployed at low-cost and threaten both civilian and government transportation networks, costing organizations millions of dollars and placing American lives at risk. This will soon be an even larger issue as autonomous aerial vehicles (AAVs) and unmanned aerial vehicles (UAVs) are gaining traction and will soon be fully deployed in operations where human intervention to respond to signal risk is simply not an option. It is not that platforms do not exist to provide some insight into GNSS signal availability, but such solutions are hardware-intensive, difficult to deploy at scale, cost tens of millions of dollars, and only provide insights that are limited by geographic region, granularity, or rapid results.

Tip & Cue's Scout software offers the U.S. transportation industry the "signal source of truth," offering holistic, granular, and highly precise GNSS signal awareness. This is achieved through a software-only, cost-effective approach that leverages existing, already-deployed commercial and government data sources (i.e. ADSB, AIS, cellular RSSI, satellite telemetry, etc.). Scout integrates millions of data points from various domains (ground, sea, sky, space) using proprietary data fusion techniques, AI/ML algorithms for anomaly detection and availability forecasting, Time Difference of Arrival (TDOA) based approaches for novel interference geolocation.

Key capabilities include accurately mapping signals globally for safe navigation, detecting signal anomalies to guide navigational routes, predicting potential signal availability and interference, enhancing route planning, and precisely geolocating interference emitters like spoofers (tested in a real-world spoofed arena at a sub-60m Circular Error Probability accuracy). This approach replaces restrictive \$100M GNSS awareness satellite systems with a solution that requires \$100 hardware, highlighting significant cost advantages and demonstrating the scalability for broad civilian adoption.

The proposed project focuses on an 18-month plan to re-engineer Scout for scalable commercial deployment, broadening its access from defense and security to everyday civilian activities, and enabling new DOT oversight over the GNSS spectrum. This will enhance safety, strengthen resilience, and address escalating costs across the transportation sector, with a conservative market estimate of approximately \$23 billion.