# Functional Requirement

ID Function Requirement  
DA-INT-001 Data Integration The system shall integrate and process real-time data from road sensors, GPS devices, and social media platforms for traffic analysis.  
DA-DET-002 Incident Detection The system shall automatically detect traffic incidents (e.g., accidents, construction, weather) and display severity indicators (e.g., color codes) on a map.  
DA-ALR-003 Real-Time Alerts The system shall provide estimated incident duration and impact on travel time in real-time alerts.  
DA-DAS-004 Dashboard Display The system shall display a consolidated dashboard for traffic analysts, including real-time traffic status, service requests, and incident data.  
DA-HIS-005 Historical Comparisons The system shall allow traffic analysts to perform historical comparisons by time-of-day, day-of-week, and seasonal patterns.  
DA-RPT-006 Report Generation The system shall generate reports using pre-defined templates and auto-formatting compliant with SAE J2354 and TMDD standards.  
DA-DAT-007 Data Flagging The system shall flag missing, conflicting, or outdated data for manual review by traffic analysts.  
DA-VAL-008 Data Validation The system shall cross-reference unstructured social media data with structured sensor/GPS data to validate reliability.  
DA-RTE-009 Route Suggestions The system shall provide alternative route suggestions and estimated time savings for delivery drivers based on real-time incidents.  
DA-ZON-010 Alert Zones and Routes The system shall support the definition and management of customizable alert zones and routes for targeted notifications.  
DA-ALR-011 Mobile Alerts The system shall allow delivery drivers to receive real-time, accurate, and detailed incident alerts via a mobile interface.  
DA-REV-012 Incident Review The system shall allow users to manually override or review flagged incidents when needed.  
DA-FLT-013 Data Filtering The system shall support quick search and filtering of traffic data by date, requester, and status.  
DA-FLX-014 Automated Fixes The system shall suggest or apply automated fixes for common data issues (e.g., missing values based on historical patterns).  
DA-ALR-015 Pop-Up Alerts The system shall display location details, severity, and time-saving estimates in pop-up alerts for delivery drivers.  
DA-DRD-016 Drill-Down Capabilities The system may include drill-down capabilities for traffic analysts to review data quality in detail.  
DA-EXP-017 Data Export The system may allow for the export of data in additional formats (e.g., PDF, CSV) for external use.

# External Description

# 5 Constraints  
  
## 5.1 Technical Constraints   
- The system must be built using a cloud-based architecture with support for horizontal scaling.   
- The system must be compatible with major web browsers and mobile platforms.   
- The system must use secure communication protocols (HTTPS, TLS) for all external integrations.  
  
## 5.2 Legal and Regulatory Constraints   
- The system must comply with data privacy regulations (e.g., GDPR, CCPA).   
- The system must ensure that all data exports are compliant with relevant data handling policies.  
  
## 5.3 Environmental Constraints   
- The system must operate within a 99.9% uptime requirement.   
- The system must be able to process 1 million data points per second during peak load.