# Functional Requirement

ID Function Requirement  
SC-1 Scenario Creation The system shall allow users to create custom traffic management scenarios that include lane closures, signal timing changes, and detour routes.  
SC-2 Scenario Simulation The system shall simulate the impact of defined traffic scenarios on traffic congestion and travel times.  
SC-3 Historical Data Tracking The system shall maintain historical data tracking to compare simulated results with real-world outcomes.  
DA-1 Traffic Data Analysis The system shall analyze traffic data to provide insights such as average traffic speed, volume changes over time, and predictive modeling of traffic strategies.  
DA-2 Data Visualization The system shall render built-in visualizations, including heatmaps, line graphs, bar charts, and time-lapse comparisons.  
DA-3 Data Filtering and Drill-Down The system shall allow users to filter and drill down into specific data points for in-depth analysis by technical teams.  
RG-1 Automated Report Generation The system shall generate automated reports using customizable templates.  
RG-2 Report Export The system shall support exporting reports in multiple formats, including PDF, Excel, PowerPoint, and Google Slides.  
RG-3 Recurring Report Exports The system shall allow recurring exports of reports to reduce manual effort.  
RG-4 Summary and Detailed Reports The system shall produce summary reports for leadership and detailed reports for technical teams.  
CO-1 Collaboration Integration The system shall integrate with collaboration platforms such as WeCom, Feishu, and Microsoft Teams.  
CO-2 Real-Time Commenting and Highlighting The system shall allow real-time commenting and highlighting within shared reports.  
CO-3 Task Assignment and Change Tracking The system shall support task assignment and change tracking for collaborative workflows.  
CO-4 Shared Workspace with Version Control The system shall provide a shared workspace with version control for team collaboration.

# External Description

# 5 Constraints  
  
## 5.1 Regulatory Compliance  
The system shall comply with internal data protection regulations and external laws such as GDPR and CCPA. Compliance shall be verified by a third-party audit that confirms the system meets all applicable regulations.  
  
## 5.2 Audit Logs  
The system shall maintain audit logs that are accessible to authorized personnel. Accessibility shall be defined as the ability to view and retrieve audit logs within 5 seconds of a request. This shall be verified by a test case that confirms the system's ability to maintain and access audit logs.  
  
## 5.3 Hardware Requirements  
The system shall be tested and verified to run without performance issues on devices meeting the specified minimum hardware requirements. Performance issues shall be defined as response times exceeding 5 seconds or CPU utilization exceeding 90% for more than 10% of the time during normal operation.  
  
## 5.4 Cloud Scalability  
The system shall support cloud-based processing that is scalable on demand. Scalability shall be defined as the system's ability to increase processing capacity by at least 50% within 10 minutes of a demand spike. This shall be verified by a stress test that simulates a demand spike and measures the system's scalability response.  
  
## 5.5 Browser Compatibility  
The system shall be fully functional and responsive in all listed browsers across major versions. Major versions shall be defined as the latest three versions of each browser (Chrome, Firefox, Safari, Edge). This shall be verified by a test case that confirms the system's functionality in each of these versions.  
  
## 5.6 Data Protection  
The system shall ensure that all network communications are encrypted using HTTPS or equivalent secure protocols. Equivalent secure protocols shall be defined as any protocol that provides at least the same level of encryption and security as HTTPS, as validated by a third-party security audit.