



MEFO DATA E-ITS TRAFFIC DIRECTOR

E-ITS_TD



INTRODUCTION

- The system receives information from TMCs (Traffic Management Center) and shares information with other TMCs when needed. In addition, the system also provides shared information (traffic information page, emergency phone number, etc.); communicate, connect, and share traffic information with agencies, units, people participating in road services, police, ambulance, etc.;
- Information exchange, connection and sharing of shared ITS data is standardized traffic data messages according to ISO/IEC 8824-1:2015, ISO/IEC 11179-3:2003, IEEE 1489:1999 standards
- The data sharing connection will follow a communication standard and use the security methods necessary for Web services to ensure network security.
- Data stored in the shared ITS (Intelligent Transportation Systems) data-sharing connection system is backed up periodically.
- Decentralization of access, and authentication
- Regular account: use 2-factor authentication (FA) that supports TOTP according to RFC 6238
- High-level admin accounts: use an asymmetric code key that is protected by biometrics.
- Comply with cryptographic specifications according to RSA 3072-bit; SHA-256; AES 256-bit



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OPERATE

- Ensure system availability and continuity: 24/7 operation, minimized downtime, backup plans, and availability to meet data sharing and exchange needs.
- Meet performance and processing speed requirements: capable of handling a large number of query requests and returning results quickly. The system's response time is optimized to ensure the user experience.
- Ensure data accuracy and integrity: The system has a mechanism for periodic data backup and recovery to ensure integrity. Shared data is guaranteed to be accurate, free from distortion or loss during transmission.
- Compliance with regulations and standards on information safety and security: Apply standards and regulations on information security during system operation. Implement security measures to prevent unauthorized access, cyberattacks, and data leaks.
- Provides scalability and integration with other systems: The system is scalable in scale and number of connections to meet growth needs. Supports integration with other ITS systems through standard protocols and APIs.
- Monitoring, maintenance and technical support: Continuously monitor the operation status of the system, perform periodic maintenance, upgrade the system, and provide technical support services to answer questions and handle arising problems.

FUNCTION

- Data collection & storage: collect & store data from route TMCs: traffic data, event data, surveillance data, etc.
- Data Processing & Analysis: Analyze, process, clean and standardize the data obtained to extract useful information for traffic management and administration.
- Data Sharing & Exchange: Provides a means of communication to share data with online TMCs. Support two-way information exchange with the route quickly and accurately.
- Information security and security: Ensure the safety and security of data stored and transmitted; Decentralize access and manage system users.



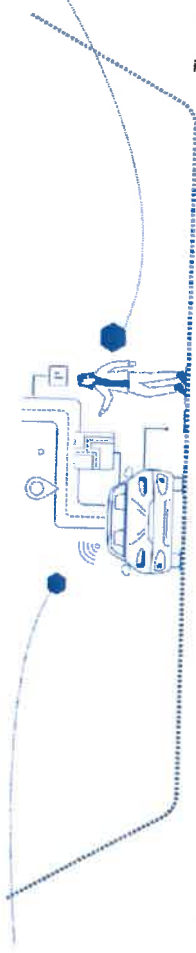
CONNECT DATA SHARING

- Traffic data collection: capable of collecting data in compliance with ISO/IEC 8824-1:2015, ISO/IEC 11179-3:2003, IEEE 1489:1999 and encrypted, filtering and analyzing data before saving it to the database. Data collected from TMC line:
 - o 101 - Highway Information
 - o 103 - Vehicle Detection Data
 - o 105 - Vehicle Identification Data
 - o 106 - Vehicle Load Test Data
 - o 107 - Traffic Event Information

- Data processing and analysis: The data received is checked and returns error messages if the newsletter is insufficient, and in accordance with the required format: number of fields, data type, time of send, receive. The data if it is a newsletter will be indexed and saved to the Database; if it's an image, the video will be stored in a designated folder with structured and decentralized access. From there, it will serve the operations of processing, analyzing, synthesizing and saving in data tables that have been exported to: route traffic flow, vehicle detection data for each route section, interlinear, traffic event data, for each route section, interlinear, statistical data, etc reporting and predicting general traffic conditions, notifying and warning traffic conditions and incidents according to the threshold.

- Data sharing: Critical data is packaged in accordance with ISO/IEC 8824-1:2015, ISO/IEC 11179-3:2003, IEEE 1489:1999 and encrypted before transmission on the transmission line, collecting big data, filtering interference and analyzing data from information transmission systems to related monitoring management systems.

- Support reporting and analysis: support reports and analysis on traffic performance on route segments:
 - o Report on the number of vehicle turns, vehicle type
 - o Traffic Safety Report
 - o Vehicle Load Control Report
 - o Report a violation
 - o Event Reporting



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WEBSITE PROVIDING TRAFFIC INFORMATION

Information from the shared ITS data sharing connection system will be provided to road users on the highway through the Website. The system provides services on a public cloud platform to meet the large number of users accessing via the Internet. In addition to providing information about traffic conditions on the expressway in real time, the Website also provides information about incidents that occur on the route in the form of a list: Stopped vehicles or traffic accidents, vehicles running in a line, vehicles running in the opposite direction, vehicles running in the emergency stop lane, etc. pedestrians, animals on the highway, smoke restricting visibility, falling objects.

MOBILE APP FOR USERS

The mobile application provides useful functions and features to help users receive traffic information quickly and manage their journey optimally on highways. Providing services on a public cloud platform that meets the large number of users accessing via the Internet.

SOS CONTACT CENTER

Provide a shared hotline, each line will have its own branch. When an incident occurs, road users can contact the hotline call center in one of two forms:

- Call with a mobile device and click select branch
- Use the call function from the mobile app for users (mobile app) and automatically transfer calls.

SYSTEM MANAGEMENT

- Manage and edit system configurations.
- Manage adding or removing connected routes.
- Manage accounts and access.
- Monitor system performance, security, and data backup.
- Record the operation and operation of the system

ACCESS CONTROL

The system provides a module for managing route TMC links, allowing for the creation or deletion of route connections. Provide a separate account to grant access to each route link or route data:

- Receive requests, responses, digitally signing/authenticating request packets, responses from Information systems/databases.
- Manage authentication keys and digital signing keys.
- Monitor activity and save service query history, data exchange.
- Providing digital certificates for authentication and digital signing as well as providing Live electronic timestamps to authenticate responses of the network, authenticating digitally signed packets, information exchange between member nodes:
 - o Certification Authority (CA)
 - o Online Certificate Status Protocol (OCSP)
 - o Time-Stamping Authority (TSA)

