



# INTELLIGENT TRAFFIC MANAGEMENT SYSTEM (ITMS)

## KEL-ITMS

AI-DRIVEN ENFORCEMENT | SMARTER MOBILITY | SAFER ROADS

*A Unified, Interoperable Platform for Enforcement, Traffic Optimization & Public Safety*



# ITMS OVERVIEW, KEY FEATURES & API ECOSYSTEM

The Intelligent Traffic Management System (ITMS) is a fully integrated platform powered by advanced Computer Vision, edge AI, and secure enterprise-grade software. It automates rule enforcement, optimizes mobility, enhances public safety, and integrates seamlessly with national platforms, including VAHAN, e-Challan, and state police/ motor vehicles department systems.

## CORE OBJECTIVES

- Drive safer roads through automated enforcement
- Support police authorities with real-time situational awareness
- Improve traffic flow & reduce congestion
- Enable legal compliance with national transport systems
- Provide data-driven intelligence for urban mobility planning

## KEY SYSTEM FEATURES

### ADMIN CONSOLE

#### Role and User Management

- Creation and management of user accounts, roles, and privileges
- Role-based Access Control (RBAC) for all application modules
- Multi-level approval levels for critical operations
- User activity log, session monitoring, and audit trails



## **Application Configuration**

- Centralized configuration of camera sources, locations, and device metadata
- System-level settings for enforcement rules and violation handling
- Threshold settings for speed, region configuration, violation categories
- Time-zone, localization, and language configuration
- Notification, alerting, and integration configurations

## **Vehicle Watch List Management**

- Addition, modification, and deletion of watch-listed vehicles
- Categorization of watch lists (Stolen, Wanted, Blacklisted, High-Risk, VIP, etc.)
- API-based synchronization with departmental databases
- Real-time alerts on watch-list vehicle detection
- Evidence-linked watch list event management

## **Live View of Selected Camera**

- Real-time camera stream viewing
- Multi-camera grid view
- Stream health monitoring (FPS, bitrate, uptime)

## **Video Record and Download**

- Video snippet recording and evidence bookmarking
- Download options based on operator permission levels
- Configurable retention and watermarking

## **Real-Time Traffic on GIS Map**

- Map-based visualization of all active cameras
- Traffic density visualization (heatmap)
- Real-time congestion alerts

## **Live Alerts**

- Instant notifications for detected violations
- Alerts for watch-listed vehicles
- Device health, connectivity, and system fault alerts

## **List View of Violations**

- Unified view of all detected violations
- Sorting and filtering by date, location, violation type, etc.

### **Advanced Search Facility**

- Search by vehicle number, location, timestamp, violation type
- Boolean filters for complex queries

### **Allocation of Pending Violations to Operators**

- Auto or manual allocation rules
- Load-balancing among operators
- SLA-based processing queues

### **Operator View – List of Pending Violations**

- Clean UI showing operator-assigned tasks
- Real-time progress tracking

### **Detailed View for Verification**

- High-resolution evidence pack display (image + video)
- Metadata display: speed, lane, date/time, GPS, camera ID
- AI-detected fields for verification

### **Approval / Rejection of Violations**

- One-click approval/rejection
- Mandatory rejection reasons with configurable list
- Evidence-based decision workflow

### **Dashboard of Violations**

- Real-time performance metrics
- Operator performance analytics
- Violation volume trends

### **Automation of Violation Verification**

- AI-driven auto-verification of high-confidence violations
- Priority sorting for low-confidence anomalies
- Continuous model learning capabilities

### **Manual Entry of Violation**

- Custom violation entry by authorized users
- Evidence attachment via upload
- Audit trail for every manual entry

### **Violation Integration with VAHAN System**

- Real-time API call to fetch vehicle owner details
- Automated challan generation via VAHAN/e-Challan interface
- Pushback of challan details, payment status, and update logs
- Error handling, retry logic, and queue-based message dispatch

### **Watch List Integration with Department System**

- API-based sync of departmental watch list
- Auto-updating of dynamic watch lists
- Two-way data exchange with audit trails

### **All Vehicle ANPR / ALPR**

- AI-based plate detection in multi-lane, high-speed scenarios
- Regional language number plate support
- Day/night and weather-resistant performance

### **ANPR List View with Search & Filters**

- Chronological list of all ANPR detections
- Filters for plate type, camera, date, class, etc.

### **Vehicle Advanced Search**

- Search using partial vehicle numbers
- Metadata-based analytics and pattern lookup

### **Vehicle Search by Image**

- Image upload and similarity search
- AI-based matching for damaged/incomplete plates

### **Vehicle History and Map View**

- Movement trail visualization
- Historical sightings with timestamps and location pins

## **REPORTS AND DASHBOARDS**

### **Live Dashboards**

- Camera health, traffic density, and system status
- Real-time violation statistics

### **Violation Overview**

- Location-wise, category-wise, and time-based summary
- SLA compliance reports

### **Trend Analysis**

- Weekly/Monthly/Yearly traffic and violation trends
- Peak-hour analytics, heatmaps

### **Reports (Comprehensive List)**

- Repeated Violation – Vehicle Wise
- Operator / Employee Performance
- Violation Summary & Drill-down
- Vehicle Detection Count
- Live Tracking & Movement History
- Violation Search & Evidence Report
- Wanted Vehicle Alerts
- Challan Reports & Payment Status
- Damaged/Unreadable Vehicle Plate Report
- System Performance & Uptime

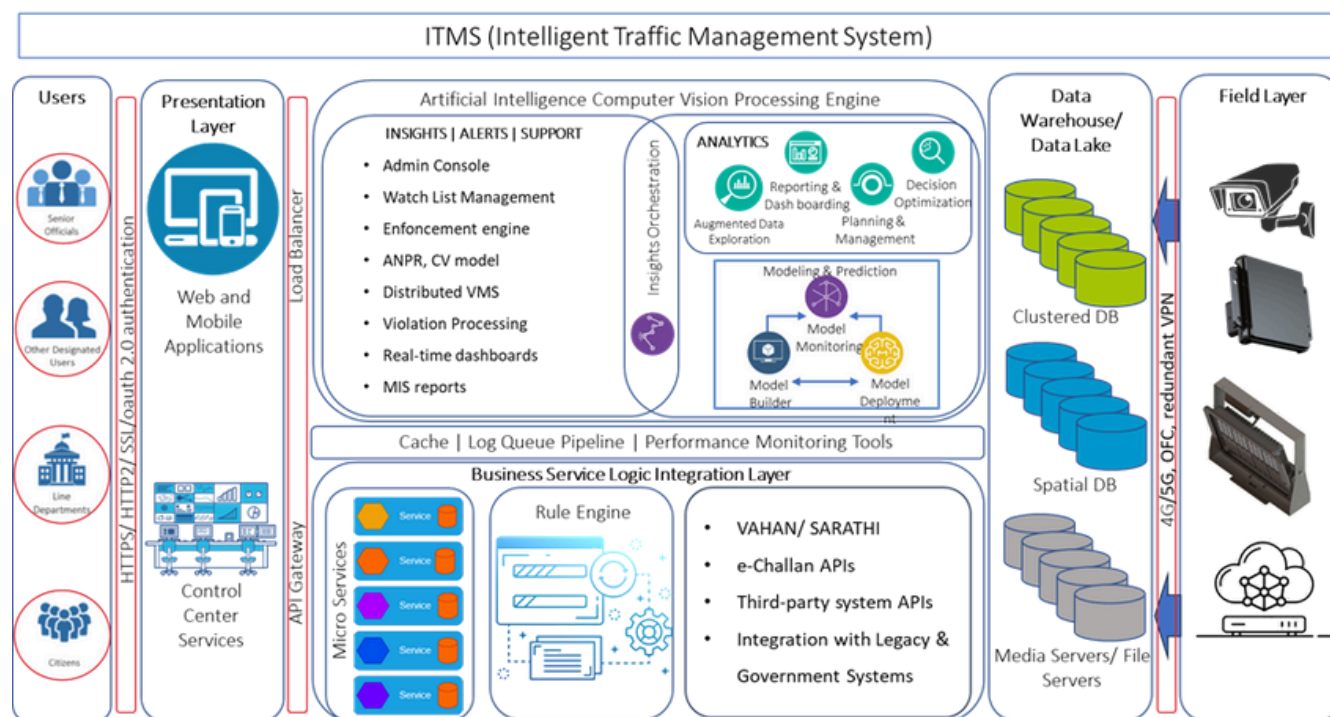
### **Configurations (System-Wide)**

- Device Configurations
- Location Type & Metadata
- Rejection Reason Management
- Language Configuration
- Time Restrictions & Schedules
- Height & Size Configuration for vehicle class
- System Configuration & Security Policies
- Vehicle Registry
- Face Registry
- Automated Violation Rules
- Location & Zone Configuration
- Face Recognition Configuration
- Alert Configuration
- ANPR Settings
- General Application Settings
- Violation Configuration & Thresholds
- Speed Configuration Templates
- Analytic Feature Override
- Live Stream Configuration
- External Endpoints & API Integrations





# ARCHITECTURE, COMPONENTS & ADVANTAGES



## Software Components

- Enforcement Management System
- Automated Challan Engine
- High-accuracy ANPR engine
- Evidence pack generator
- Secure API middleware layer
- Health monitoring & diagnostics
- Audit trails, role-based access control

# ADVANTAGES

## For Government & Police

- Seamless interoperability with national transport systems
- Automated, unbiased enforcement with full auditability
- Integrated e-Challan processing
- Rapid incident response & monitoring

## For Citizens

- Transparent enforcement
- Quick challan notifications & online payment
- Improved road discipline

## For Planners & Administrators

- Traffic heatmaps & forecasting
- Trend analytics for long-term planning
- Unified data from multiple sources



# SOCIAL & ECONOMIC IMPACT

- Reduction in accidents & fatalities
- Improved public safety & traffic discipline
- Increased revenue through system-driven enforcement
- Reduced congestion & fuel savings
- Scalable foundation for smart mobility



## WHY CHOOSE KEL ITMS

- Indigenous AI & CV technology
- Proven integrations with national transport systems
- High-accuracy ANPR & detection models
- End-to-end project implementation expertise
- Compliant with MoRTH, NHAI, Smart City & international standards



Contact us today to learn more....

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