ITS

Traffic Control Centre (TCC)

JK TECHNOLOGIES

All devices install on motorway are controlled from Toll Plazas Traffic Control Centers (TCC)) established in various sections of the motorway. These control centers monitor traffic carefully and regulate smooth and free flow of traffic with best possible ground deployment and an active use of all essential components of Intelligent Transportation System (ITS).

[The TCC is] **"The hub of a transportation management system, where information about the transportation network is collected and combined with other operational and control data to manage the transportation network and to produce traveler information. It is the focal point for communicating transportation-related information to the media and the motoring public, a place where agencies can coordinate their responses to transportation situations and conditions. The TCC also links various elements of Intelligent Transportation Systems such as variable message signs, closed circuit video equipment, roadside count stations, etc., enabling decision-makers to identify and react to an incident in a timely manner based on real-time data."**

The Traffic Control Center (TCC) features a dedicated room with video wall having lot of screens that help monitor traffic on the Motorway. The TCC is set up with dedicated Servers and workstations and communication system, which are used to manage the motorway's Intelligent Transportation System (ITS). The center is equipped with:

- The ability to modify traffic signals via a central management software
- Pan-tilt-zoom cameras
- An adaptive signal timing system
- Variable Message Signs (VMS)
- Bluetooth travel time readers
- Magnetometers that collect turning movement counts at over every intersections (for 24 hours/day and 7 days/week)
- An ITS website to help identify and report traffic incidents.

Traffic Management Centers are the nerve center of motorway monitoring and operations. Engineers, radio operators and other staff:

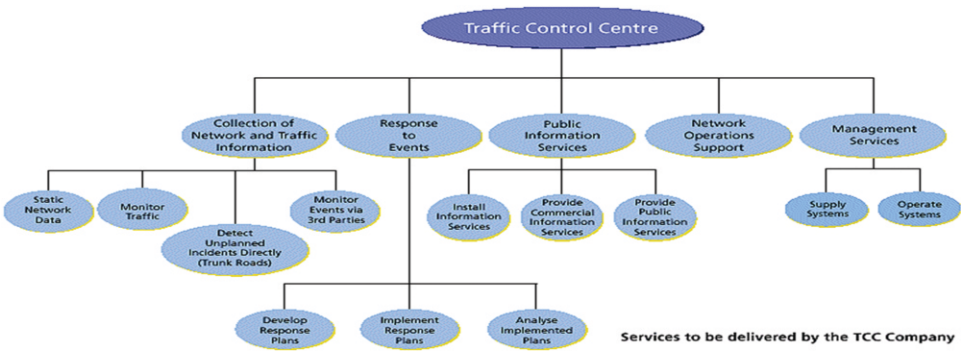
- Monitor traffic and identify problems using hundreds of cameras located throughout the state on the motorway system.
- Use data from traffic detectors on the highways to get a real-time picture of traffic conditions.
- Coordinate response with the law enforcement and emergency response crews when responding to incidents on the highway.
- Coordinate activities of incident response teams who help stranded drivers, move disabled vehicles, and also help keep traffic moving safely while emergency responders help people involved in accidents.
- Operate reversible lane control systems and ramp meters to help managed traffic flow and reduce congestion.
- Provide up-to-the-minute information about what is happening on the roadway and mountain passes, including weather, incidents, construction, and some travel times, to drivers through our highway advisory radios, electronic signs, the web, and the 313 traveler information phone system.
- Provide up-to-the-minute information to news reporters, particularly radio and television reporters.
- Are a critical component of our coordinated response to emergencies and disasters anywhere in the motorway?
- The Traffic Control Centers are in operation 24 hours a day, seven days a week to help clear roads and keep traffic moving safely.

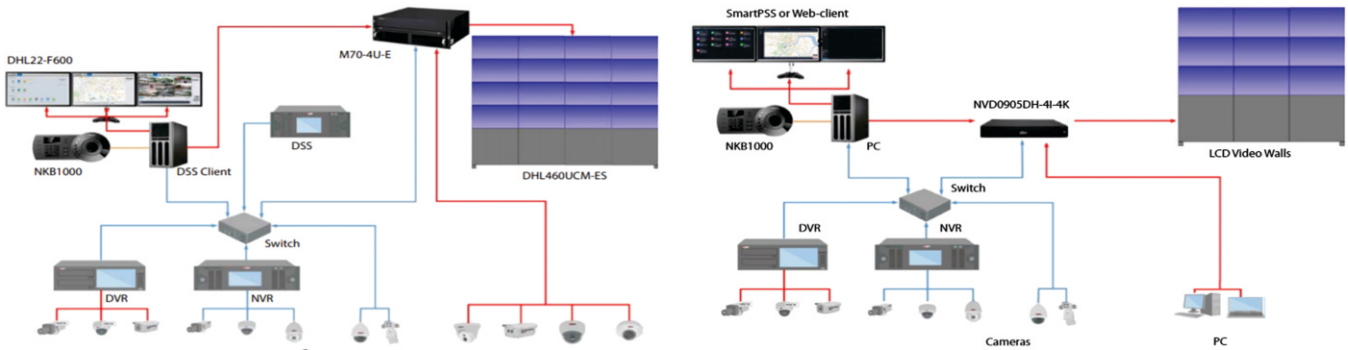
The main goals of TOC operations and functioning are defined as following:

- To improve highway safety
- To improve the efficiency of motorways and highways
- To provide timely and accurate real-time traffic information
- To facilitate cooperative public and private partnerships that integrate transportation services
- To provide customer service directly to the public on the operation of the transportation System

The heart of TCC is software platform that integrates data collection functions, presents it as relevant information to the operators, supports operators in their decision making by suggesting them most appropriate strategies for resolving events and incidents, and transfers executional commands to active elements of the system.

Traffic Control Centre (TCC)





Collection of Network & Traffic Information

The TCC needs decision support information on the network including a database of road network characteristics, information about incidents and other events (roadworks, accidents), traffic flow and journey times, and weather conditions.

This requires the TCC to adopt systems for:

The Network Description & Location Referencing

Obtaining Information About:

- Planned Road works on the Network
- Unplanned Events as soon as they occur
- Planned Events that will have an Impact on Traffic Conditions, such as Major Cultural or Sporting Events
- Planned Road works on the Network

Continuous Monitoring of:

- Traffic Conditions
- Weather Conditions

Traffic Control Centre (TCC) Activities & Services

- Collection of Network & Traffic Information
- Response to Events
- Public Information Services
- Network Operations Support
- TCC Management Services
- Toll Road Operations
- **Traffic Monitoring:** Observing Real Time Traffic Conditions
- **Traffic Management:** Dealing with **"Normal"** Traffic Conditions
- **Incident Management:** Detection, Response & Clearance
- Involvement in other Processes & Procedures

Response to Events

The TCC uses traffic management response plans that support its control strategies and the choice of information to be provided during incidents that affect traffic on the network. When incidents occur the TCC coordinates with its field teams to clear the roadside and send information to commuters using the following systems.

- Variable Message Sign
- Motorway Advisory Radio
- Web Portal/Mobile App.

Public Information Services

These are the means by which a TCC provides information to media organisations, road users and the travelling public. They may include providing VMS at key locations on the road network, providing an internet site for public information - and use of social media and an interactive telephone service.

Specifically the TCC Core Services will be:

- Provision of Information via VMS,
- Provision of Information to the Public via Media Organizations

Network Operations Support

These are activities that enable the TCC to provide information and take action that will improve the ability of other organisations (operating partners) to perform their duties in managing the traffic and operations on their networks. The TCC establishes links with the traffic controllers for site that generate traffic or are major destinations.

They include:

- assistance with planning roadworks, road closures and the movement of abnormal loads
- the preparation of network management and statistical information
- assistance to traffic police, emergency services and mobile Safety Service Patrols
- assistance to other TCCs, passenger transport network operators

TCC Management Services

Management services relate to the day-to-day operation of the Traffic Control Centre and any additional operations that are required, **specifically:**

- staffing, operating and managing the control centre
- Tours, visits and presentations
- Staff training
- Administration of other support services (for example conference room and operations support in emergencies)

Toll Road Operations

For a TCC that covers toll road operations the ITS traffic systems and the electronic tolling systems are usually completely separate. They are not permitted to integrate, at least electronically, to protect the integrity of toll revenues. Toll-road TCCs generally manage incidents in the same way as their non-tolling counterparts. The fact that they operate facilities whose users are paying in real-time increases the pressure to clear incidents quickly.

System Components

- Server Rack 24U
- Server
- Storage Area Network SAN
- Servo Motor 30KVA
- Optic Distribution Fiber (ODF) 36/24 Core
- L3 Managed Switch with SFP Module
- Network Video Recorder (NVR)
- Work Station
- Printer Laser Jet
- Router
- Network Switch

Display

- LED Video Wall
- LCD Monitors

Control

- Video Matrix Platform
- Decoder
- Encoder
- Keyboard

Accessories & Video Software

- Monitor Bracket
- PTZ Controller

DSS

- Stable server with Hardware & Software All-in-One
- All-Around Security Functionality

Smart PSS

SmartPSS is an all-in-one, full-featured video surveillance application that is ideal for the small to mid-size business that needs to monitor traffic on road.

Matrix

- Enhanced processing capabilities
- Flexible configuration with slotted design
- Splicing control modes: zoom/merge/roam/overlay
- Supports multiple connection types
- Redundant power supply optional and smart temperature control fan

Small Control Center Solution

Features

- M70-4U-E supports splicing control for splicing screens
- M70-4U-E supports local signal collecting, encoding and storage in EVS
- Free VMS software Smart PSS operate in preview, playback and e-map
- DHL460UCM-ES: 46", 3.5mm physical seam and module installation. Show remote camera channel and local image such as PC image on the screens
- EVS7024D-R works as a central direct storage with high reliability because of its dual powerful controller and redundant power design
- M70-4U-E can be replaced by other matrix, decoder

Decoder Features

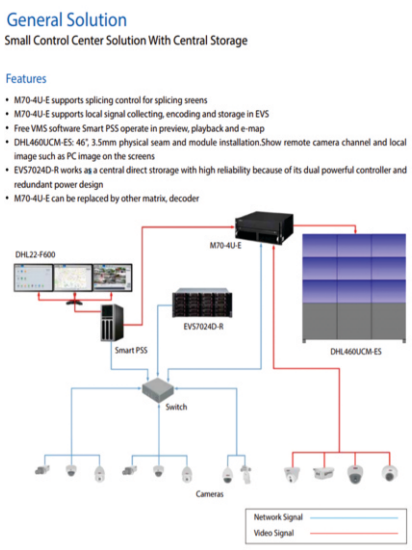
- Support multi-standard interfaces
- Support local PC signal collection
- Splicing screens control for zoom/merge/roam/overlay
- 4K Series Decoder
- Powerful CPU, support 4K & H.265 decoding
- HD Series Decoder
- High performance embedded processor, support 1080P decoding

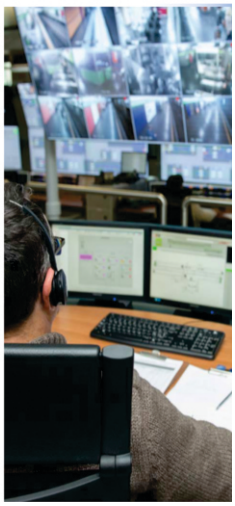
For DVR, NVS, PTZ Dome Camera Control

- RS232, RS485 & Network Connections
- 4D-joystick Control & PTZ Functions
- Support 1080p realtime preview
- Support HDMI/VGA/TV(BNC) sync video output
- Touch screen, external Wi-Fi

TCC System Benefits

- Successful and efficient traffic management of road networks, to the satisfaction of all users.
- Higher safety in traffic.
- Reduction in costs of congestion, incidents and pollution, Higher quality of living.
- Maximizes progression, minimizes stops.
- Reduces congestion, air pollution, fuel consumption and red light running.
- **Saves time and money** – Efficient progression reduces loss of productive time stuck in traffic.
- **Signals timed remotely with minimal staff** – faster, efficient operations.
- Provides capability for incidence management during accidents/events.
- **Notifies staff about malfunction** – reduces maintenance response time.





Emergency Events/Remote Operations

In the event of a disaster that requires immediate evacuation, special circumstances are present and proper traffic management techniques can significantly enhance the speed of evacuation. This requires that a TCC be prepared with a plan, since most such disasters occur without warning. Some may be expected in regions that are prone to certain disasters, such as hurricanes along the motorway and earthquakes. Others, such as terrorist attacks, could occur anywhere. Although these events are infrequent, they are also just the events where everything needs to be functioning in order to have a successful evacuation. Cloud computing offers the ability to manage such events from remote locations. This means that TCC operators do not need to be in the TCC to manage traffic. In emergency events operators can manage traffic safely from a remote location by simply logging into their server via the Cloud. Additionally, if something occurred that directly affected the TCC, operators could move to a location that was unaffected. This could also allow for support from neighboring agencies during such events. Secondly, during an emergency event, bandwidth availability can be an issue, as discussed previously. This means that if wireless cell technology is used, a viable backup system must be available for certain key systems. Fiber is generally available in metro areas and should still be connected to the devices that are deemed to be most important in emergency situations.

JK TECHNOLOGIES, SIA
RIGAS IELA 40, dz.5, OZOLNIEKI,
OZOLNIEKU PAGASTS,
JELGAVAS NOVADS, LV-3018, LATVIJA

JK TECHNOLOGIES

eMail: info@jkteck.com
Hp: www.jktech.com