JK TECHNOLOGIES

Traffic Incident & Emergency Management System (TIMS)

TIM consists of a planned and coordinated multi-disciplinary process to detect, respond to, and clear traffic incidents so that traffic flow may be restored as safely and quickly as possible. Effective TIM reduces the duration and impacts of traffic incidents and improves the safety of motorists, crash victims and emergency responders.

Traffic Incident Management System

Traffic Incident Management is a planned and coordinated program process to detect, respond to, and remove traffic incidents and restore traffic capacity as safely and quickly as possible. This coordinated process involves a number of public and private sector partners, including:

- Law Enforcement
- Fire and Rescue
- Emergency Medical Services
- Transportation
- Public Safety Communications
- Emergency Management
- Towing and Recovery
- Hazardous Materials Agency
- Traffic Information Media
- Emergency Response Services

Law Enforcement

Law enforcement agencies include State Police and Highway Patrols, County Police and County Sheriffs, Township and Municipal Police and other agencies which have officers sworn to enforce laws. On the scene of a traffic incident the duties of these officials include:

- Securing the incident scene
- Providing emergency medical aid until help arrives
- Safeguarding personal property
- Conducting accident investigations
- Serving as incident commander
- Supervising scene clearance
- Assisting disabled motorists
- Directing traffic

Jurisdiction of law enforcement agencies varies widely from state to state and even within a state. Typically, State Police and Highway Patrols have jurisdiction on State highways and county and municipal police have jurisdiction off the State highway system. State Police and Highway Patrols have statewide coverage and many lack sufficient resources to adequately respond to incidents on State highways in urban areas. In many locations, State law enforcement agencies receive assistance from county and local agencies and in some cases local law enforcement has jurisdiction even on State highways.

Law enforcement agencies are first responders at traffic incident scenes, providing 24-hour emergency response and operating under a paramilitary command structure. At most traffic incidents, law enforcement officers act alone and trained to make unilateral command decisions.

Fire and Rescue

Fire and rescue services are provided by county and municipal fire departments, and by surrounding fire departments through mutual aid agreements. Typical roles and responsibilities at traffic incidents assumed by fire and departments include:

- Protecting the incident scene
- Suppressing fires
- Providing emergency medical care
- Serving as incident commander
- Providing initial response and containment
- Rescuing crash victims from contaminated environments
- Rescuing crash victims from wrecked vehicles
- Arranging transportation for the injured
- Assisting in incident clearance
- Providing traffic control until law enforcement arrival

In most jurisdictions, the fire department is the primary emergency response agency for hazardous materials spills. Like law enforcement agencies, fire and rescue departments also operate as first responders under a well-defined command structure providing 24-hour emergency response. Unlike law enforcement, who operate individually for most duties, fire departments operate under a highly organized team structure with the close supervision of a commanding officer. Fire departments and emergency medical service providers (EMS) also act at the direction of one decision maker, & may not respond individually to requests from other response agencies unless their command officer directs them to do so.

In most large urban areas, full time professional personnel staff fire and rescue departments. In many suburban and in most rural areas, volunteers primarily provide fire and rescue services

Emergency Medical Services (EMS)

The primary responsibilities of EMS are the triage, treatment, and transport of crash victims. In many areas, fire and rescue companies provide emergency medical services. In some areas, other agencies or private companies provide these services to local jurisdictions under contract. Typical roles and responsibilities assumed by EMS at traffic incidents include:

- Providing advanced emergency medical care
- Determining of destination and transportation requirements for the injured
- Coordinating evacuation with fire, police and ambulance or airlift
- Serving as incident commander for medical emergencies
- Determining approximate cause of injuries for the trauma center
- Removing medical waste from incident scene

Emergency medical services have evolved as primary care givers to individuals needing medical care in emergencies. As with police, emergency medical personnel have a defined set of priorities. They focus on providing patient care, crash victim rescue, and ensuring the safety of their personnel.

Transportation

Transportation agencies are typically responsible for the overall planning and implementation of traffic incident management programs. Typically, these agencies are also involved in the development, implementation, and operation of traffic operations centers (TOC), as well as the management of service patrols. Typical operational responsibilities assumed by transportation agencies and their service patrols include:

- Assist in incident detection and verification
- Initiate traffic management strategies on incident impacted facilities
- Protect the incident scene
- Initiate emergency medical assistance until help arrives
- Provide traffic control
- Assist motorist with disabled vehicles
- Provide motorist information
- Provide sand for absorbing small fuel and anti-freeze spills
- Provide special equipment clearing incident scenes
- Determine incident clearance and roadway repair needs
- Establish and operate alternate routes
- Coordinate clearance and repair resources
- Serve as incident commander for clearance and repair functions
- Repair transportation infrastructure

Public Safety Communications

Public safety communications services are the 310 call takers and dispatchers. In larger urban areas, call taking and dispatching duties may be separated. Call takers route emergency calls to appropriate dispatch. In some areas, all public safety emergency calls (police, fire and rescue, and emergency medical) are handled in one joint center with call takers sending calls to appropriate agency dispatch depending on the nature of the call. In smaller urban areas and in many rural areas, call-takers may also dispatch public safety response. Larger urban areas have E999 capabilities so that call takers can obtain the location of landline 999 calls. Many rural areas do not yet have E999. Most calls on highway emergencies come from cellular telephones that are currently not able to provide location information for 999 calls.

Emergency Management

State and local governments have agencies whose duties are to plan for and coordinate multi-agency response to large-scale emergencies such as natural and man-made disasters. They have specific responsibilities under both federal and state law. Even very large highway incidents rarely activate emergency response plans unless they necessitate evacuation due to a spill or presence of hazardous materials. Emergency management agencies maintain lists of the location of many public and private sector resources that might be needed in a major emergency. These lists and contacts for activating resources are valuable tools in planning multi-agency response to major highway incidents.

Towing & Recovery

Towing & recovery service providers are responsible for the safe and efficient removal of wrecked or disabled vehicles, and debris from the incident scene. Their typical responsibilities include:

- Recover and remove vehicles from incident scene
- Protect victims' property and vehicles
- Remove debris from the roadway
- Provide other services, such as traffic control, as directed or under contract

Hazardous Materials Agency

Hazardous materials Agency operate in a number of regions in the Pakistan. They are hired by emergency or transportation authorities to clean up and dispose of toxic or hazardous materials. Most common (and small quantity) engine fluid spills (oil, diesel fuel, gasoline, anti-freeze, etc.) can be contained and cleaned up without calling hazardous materials contractors.

Traffic Information Media

Traffic information service providers are primarily private sector companies that gather and disseminate traffic condition information. These private providers are the primary source of information for commercial radio traffic information broadcasts, the most common source of traffic information for motorists. These companies also package specific information on a route or time of day basis to paying clients who subscribe for the information. In recent years, many Internet sites have been created to provide road condition and traffic information. A mixture of public sector agencies and private information service providers maintains these sites.

Emergency Response Services

Emergency services System basically consist of three departments the Police, Fire and Emergency Medical & Ambulance Services. An emergency depending on its type is handled by any one or all of these departments as required. A well-trained, coordinated and equipped service can make all the difference in saving valuable human lives and property thus minimizing the losses both in financial and human terms. Even if the services are equipped but the personnel do not have the necessary training and expertise then the response will still remain poor. Additionally the personnel of these services are uniformed professionals. There can be several departments dealing with emergencies but ultimately the management on site is always the responsibility of these three emergency services

The medical emergency and response centres (ERCs) are established on the motorways and highways in order to provide ambulance service and first aid to cater to road accidents and emergency situations. The setting up of such service would benefit the people and also help mitigate loss of life during accidents and emergencies.

For emergency, the following services had been provided by the system i.e first aid at the accident site, ambulance service, fire extinguishing, evacuation of casualties/seriously injured commuters to the nearest designated hospitals and save lives from Terrorist Events.

These centers would operate 24 hours throughout the week and would be manned by trained para medical staff and equipped with necessary first aid facilities besides ambulances and cranes for rescue and relief operations. The objective of these services is to make traveling along national motorways more safe and to ensure timely help to the injured in case of an accident.

The bullet proof jackets and sophisticated arms and weapons to combat crime are provided to law enforce agency in the areas of their jurisdiction to fight with law breakers who commit crimes on national highways and motorway. The law enforce agency also equipped with laser guns, **"provida"** radars, video radars hand held radars, searchlights, road safety equipment first aid kits and mobile repair service van.

The facility of emergency call booths at a specific distance, ambulance along with doctor and paramedical staff in case of accident and other such emergency, recovery of vehicle in case of any breakdown or accident, fire brigade, mobile workshop free of cost service, wireless message facility in case of any most urgent emergency are provided on entire national highways and motorway.

Technology of System

- **Incident Response Management**
  - **Accident**
  - **Fire**
  - **Terrorist Events**
  - **Mechanical and Electrical Fault**
  - **Vehicle Towing Service.**
- **Mobile Ambulances Service**
- **Fire Extinguishing Services**
- **Rescue Services And First Aid (Ambulances)**

Terrorist Events

Public safety and transportation agencies recognize the importance of managing surface transportation during and after a terrorist incident. The same types of homeland defense information exchanged between transportation and public safety agencies can be applied to the less serious (but more common) incidents of crime and traffic law enforcement. Regular use of information between transportation and public service agencies will heighten awareness of the information's value and increase the skills for using the information. Such an improvement will serve the public well should another terrorist event occur. To prepare for this type of event, TCCs should do the following:

- Anticipate the event may produce large volumes of self-evacuees who utilize the highway system. The TCC will use its traffic monitoring and management capabilities as well as maintain communication and coordination with the EOC and public safety agencies that are responding and working in the field. Monitor camera networks and access control systems for situation developments, and relay observations to EOC and/or public safety agencies as appropriate.
- **Chemical, Biological and Radiological Threats** - The transportation system has particular vulnerabilities with respect to chemical, biological, and radiological threats. Regardless of the cause, the primary considerations for response management are the type and toxicity, quantity and persistence, exposure route, dispersion, and population density in the area at risk. During these incidents, TCCs should do the following:
  - Maintain contacts and relationships with agencies equipped to handle specialized incidents, including those that are chemical, biological, and radiological in nature. Rapid assessment of impacts will aid the speed, effectiveness, and safety of the response. Relay initial scene/site assessment information available to the TCC to the EOC and responding public safety agencies.
  - Help secure the affected area and activate appropriate alternate routes when the affected area will be inaccessible and unusable.

Ambulance Service

Must be equipped with driver, first aid box, provision of oxygen etc. and be ready/ kept in good and perfect condition 24 /7 for (365 days) a year.

- Operation, Management and Maintenance of Allied services on Motorway

Accessories, equipment and standard specification are:

- Portable & Fixed Suction Apparatus with Regulator
- Portable Oxygen Apparatus Capable of Metered Flow with
- Adequate Tubing
- Oxygen Supply & Administration Equipment
- Bag-Valve Mask
- Airway and Ventilation Equipment
- Automated External Defibrillator
- Immobilization Devices
- Bandages
- Obstetrical Kit
- Infection Control
- **Injury** - Prevention Equipment
- Fire Extinguisher
- Moveable Strechter
- First Aid Box

Each Ambulance and Fire Extinguisher Vehicle is to be operational 24 hours by Operator with 08 (Eight) hours shift and the 03 (Three) shifts per day along with but not limited to the following category of staff:

Staff for Ambulance Service

- Medical Assistant
- Nurse Driver
- Staff for Fire Extinguisher Vehicle
- Fireman Fire
- Fighters
- Fire Bergade Operator

Technology of System

Web Service

- **Web based Central Registration System** - This Application will register new users, vehicles, Ambulance Service providers, Vehicle Towing Service providers and the Insurance Companies.
- **Web based Service for the Central Assistance Centre** - The Hospital / Ambulance centre will be logged on to the web based service in order to receive notifications regarding the occurrence of an accident. Once logged on to the web based service the hospital/ambulance centre will automatically receive notifications via pop-up messages even if the browser has been switched out.

Smart Mob Phone Application

- **Android Application for controlling the User Interaction** - This will include an Android Application which will be installed on the Android Tablet that will raise the alarm and ask the user for the conduction of further procedures. This Application will carry out the further procedures by contacting the Online Server using the user's android smartphone.
- The notification of an incident is done by cell phones, internal reports, and television and radio media, dialing 130, traffic incident management systems (TIMS), Variable Message Sign and CCTV etc.

Communication

- Creates stronger communication links between Police dispatchers, the media, and other first responders.
- All devices / signals are to be connected by fiber optic communications
- Partners have access to all CCTV images

SMS Services

- Automatic SMS is generated to Law enforce when a blacklist/wanted vehicle enter on the Motorway.

Fire Extinguishing Service

- Fire extinguishing vehicle along with pressure pump and extended length
- Fire Extinguishing vehicles with all necessary accessories (Gas, Mask, Chemical, Foam & Water)
- Staff per vehicles (Driver, supervisor and fire fighter)
- Incident response Management (Rescue services and first Aid).

Incident Response Management (Rescue Services & First Aid)

Ambulance Services

- Ambulance vehicles
- Toyota Hiace OR Equalant
- Ambulance Accessories

Following accessories but not limited to must be provided Portable and fixed suction apparatus with regulator

- Portable & Fixed Suction Apparatus with Regulator
- Portable Oxygen Apparatus Capable of Metered Flow with
- Adequate Tubing
- Oxygen Supply & Administration Equipment
- Bag-Valve Mask
- Airway and Ventilation Equipment
- Automated External Defibrillator
- Immobilization Devices
- Bandages
- Obstetrical Kit
- Infection Control
- **Injury** - Prevention Equipment
- Fire Extinguisher
- Moveable Strechter
- First Aid Box

Responsibilities of Rescue & Fire Service

This will basically be a provincial service with the role of the Directorate General office in Islamabad to oversee the performance of this service and act as a Secretariat for the Pakistan Emergency & Fire Council.

The responsibilities of the Rescue and Fire Service at the provincial level hereby include the following:

- Establishment and maintenance of communication system to handle all emergency calls related to fires, explosions, hazardous materials incidents, and other related hazardous situations.

- Liaison with the Police Service responsible for establishment and maintenance of a universal emergency call Centre, which must be a distinctive and well-publicized countrywide telephone number. Operators in these communication, Centres, shall be responsible for notifying the relevant emergency service for response.
- Establish continuous liaison with police, emergency medical services, related nongovernmental organizations, and other essential support services.
- Establishment and maintenance of Provincial Rescue and Fire Service for the provision of effective response to all related emergencies including the maintenance of an ambulance service for major emergencies / disasters.
- Enlistment, training, and management of volunteer services and personnel of concerned non-governmental organizations to assist in providing effective response to large-scale emergencies related to fires, explosions, hazardous materials incidents, medical, other hazardous situations, natural calamities and war.
- The investigation of fires, explosions, hazardous material incidents, and other related emergency incidents.
- The regular inspection of buildings, equipment's, systems, and other fire and related life safety situations.
- The review of specifications for life safety systems, fire protection systems, fire/ emergency access, water supplies, processes, and other life safety issues.
- Issuance of permits, fire certificates, notices of violations, and imposition of penalties.
- Fire, emergency and life safety/ first aid education of fire brigades, employees, volunteers, responsible parties, and the general public.
- Mitigation of hazards from outdoor fires in vegetation/wild-land, trash, and other materials.
- The regulation of special events including but not limited to assemblage of people, exhibits, trade shows, amusement parks, and fairs.
- Regulation of the storage, use, processing, and handling of flammable and combustible solids, liquids and gases.
- The regulation of the storage, use, processing, and handling of hazardous materials.
- Collection and maintenance of incidence response data and statistics.

The Key Functionalities of the System are Summarized below

- Incident Management staff to be appointed at each section of motorway for providing ambulances, tow-away cranes and highway surveillance vehicles across all motorway
- Section wise TCC Centre are used for monitoring and operations of TIM
- it will fuse different available real-time traffic information, such as images from closed-circuit televisions, journey times, traffic speed and density data, to perform incident detection
- it will have the capability to coordinate all TCSS so as to facilitate the management of incidents and, in the long term, efficient dissemination of traffic information through variable message signs on a territory-wide basis
- it will provide tools to issue electronic press releases and special traffic news to stakeholders such as the media and the public more efficiently.

System Consist of Following Capabilities

- A robust system to promptly detect accidents and any incidents such as traffic jams or breakdown of vehicles across its stretches
- The incident management system will cover all motorway
- All sections will have adequate deployment of mobile ambulances, surveillance vehicles, towaway cranes at regular intervals
- All these will be mapped, connected and controlled by an IT-based Traffic Control centre for real- time detection of incidents and quick response.

The System Provide

- Two patient capacity' ambulance at every section of Motorway
- 24X7 surveillance vehicles. Surveillance vehicles to cover the assigned stretch at least once every four hours. The in-charge of these vehicles to inform about any incident to the traffic center and police
- They would provide mechanical assistance in case of vehicle breakdowns and basic mechanical repairs
- Provide fuel and water to stranded motorists enabling them to reach the closest fuel station
- Operators will be required to put overhead electronic display to alert users about traffic status on the stretch and other information.

Benefits of Traffic Incident & Emergency Management System (TIMS)

Transportation agencies can gain the following benefits from the system:

- Reducing the time for incident detection and verification
- Reducing response time (the time for response personnel and equipment to arrive at the scene)
- Exercising proper and safe on-scene management of personnel and equipment, while keeping as many lanes open to traffic as possible
- Reducing clearance time (the time required for the incident to be removed from the roadway)
- Providing timely, accurate information to the public that enables them to make informed choices
- Reduced incident duration and quicker recovery
- Earlier dissemination of incident information to the public

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