

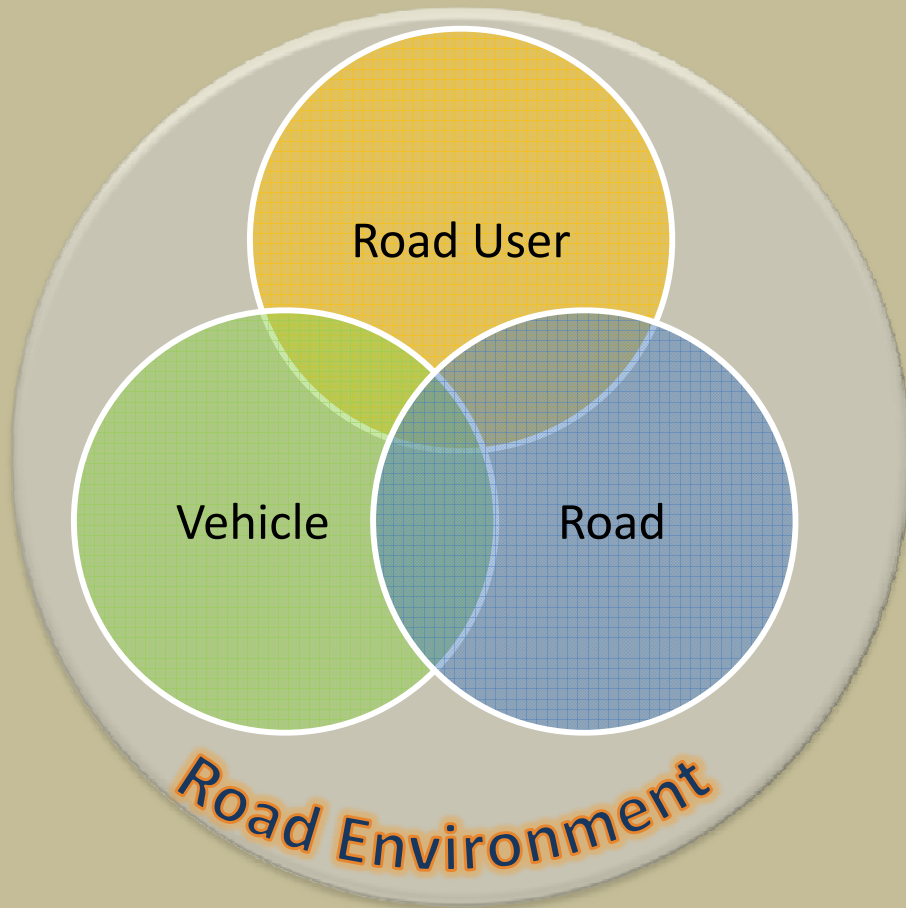


Traffic Control & Management for Highways and Expressways

8th IRF Regional Conference
3-5 October 2013

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Advisor, IRF India Ch.
President, ICT Pvt. Ltd.

Presentation Outline



Traffic Control

Traffic Signs, Signals, Marking, and
Delineation

Traffic Management Systems (technology)

Incident Detection System,
Variable Message Signs,
Enforcement and Emergency
Response,
Toll Management System

warn

warning signs
chevrons at curves
road markings

inform

directional signs
Informatory signs
road markings

forgive

safe roadside
hazard removal
safety barriers

NOIDA - GREATER NOIDA EXPRESSWAY

Police put brakes on expressway speedsters

More Than 2,500 Fined In Past Month, Over ₹1Cr Collected as Penalties

Vandana Keelor | TNN

Noida: Traffic police are coming down heavily on motorists speeding on the Noida-Greater Noida and the Yamuna expressways. In the past one month alone, cops have fined more than 2,500 motorists and collected over ₹1 crore as penalties for traffic rule violations.

Police have also launched a drive to create awareness amongst motorists to follow traffic rules. On Monday, more than 2,000 pamphlets were distributed on Yamuna Expressway to commuters urging them to drive safely.

The move follows directions of the senior superintendent of police to curb rising road accidents on the two expressways. In the past five days alone, in a total of 10 hours of vigilance, the traffic police collected nearly Rs 30,000 and fined 148 drivers speeding beyond the designated speed of 100 kmph on the Yamuna expressway. "Recently, several cases of fatal



SPEED THRILLS NOT KILLS: Cops warned that driving licences of habitual offenders will be revoked

accidents were witnessed due to reckless speeding. This drive will hopefully act as a deterrent for speedsters. Even drunk drivers will be heavily fined," said Gautam Budh Nagar SSP, Preetinder Singh.

"Those driving more than 20kmph over the speed limit are 'dangerous drivers' for which the penalty is Rs 300. For those driving at higher speeds, we fine them Rs 900.

Driving licenses of habitual offenders are being revoked as they are a threat to the safety of others," said Dharmender Yadav, traffic inspector.

The police have also advised motorists not to change lanes and avoid situations which can result in accidents. "Most accidents take place due to sudden and frequent lane changing. Also, heavy and light vehicles should stick to their designated

lanes," Yadav said.

Currently, the police use four portable machines to detect speed violations on the Noida-Greater Noida Expressway while Automated Number Plate Reader (ANPR) cameras detect such offences on the Yamuna Expressway. "These cameras are placed at various stretches taking pictures of speeding vehicles in every lane. This helps us catch the offenders at the toll

plazas," Yadav added.

The Yamuna Expressway, which was open to the public just a year ago, has registered 51 deaths and 167 injured commuters in the past eight months. From August 23 to 29, the expressway recorded a mind-boggling 10 dead and 30 injured raising questions about commuter safety on the stretch. "Since January, we have fined 1,236 motorists for speeding on the Yamuna Expressway. We have posted our district cops till Jewar. However, we will co-ordinate with police of the other four districts that fall along the stretch and intensify our enforcement," SSP Singh added.

A report submitted last month by the Central Road Research Institute recommends immediate enforcement of safety measures for the safety of commuters on the Noida-Greater Noida Expressway. Noida Authority is also in the process of implementing a Rs 15 crore Intelligent Traffic System on the expressway.

Drive fails to stop crashes, 4 die in past couple of days

TNN NEWS NETWORK

Greater Noida: The Noida-Greater Noida Expressway witnessed two fatalities in the past two days even though an intensive drive against speeding motorists is currently being undertaken by the police. On Wednesday, a pedestrian was mowed down by a speeding truck, while Thursday's accident involved a speeding truck crashing into another broken-down stationary one.

Police said Thursday's crash occurred around 4pm on the Noida to Greater Noida carriageway. "A truck had broken down opposite Galgotia College in Greater Noida and was parked on the left shoulder of the road," said Deepak Sharma, SHO, Kasna. Eyewitnesses said another truck came hurtling from the Noida end and while overtaking another vehicle from the

left side suddenly came upon the stationary vehicle. "The driver reportedly lost control of his vehicle and rammed into the stationary truck from behind," Sharma added.

The impact of the crash **On Wednesday, a pedestrian was mowed down by a speeding truck, while Thursday's accident involved a speeding truck crashing into another broken-down stationary one opposite a private college in Greater Noida**

was so severe that emergency vehicles were called to separate the two vehicles. "We had to use cutters to remove the badly wounded body of the cleaner who died on the spot in the accident. While the driver of the mangled truck

was injured, the driver of stationary truck fled after accident," Sharma said.

In the accident on Wednesday, a labourer was mowed down by a speeding truck while he was crossing the expressway near Kundli village. The accident occurred in afternoon when the victim identified as Mohamed GSI, was on his way to a construction site near to work. "An unidentifiable speeding truck going to Greater Noida from Noida Asaf. He was badly wounded and taken to Kailash Hospital where doctors declared him dead," Sharma said.

Two more motorists lost their lives on the Yamuna Expressway on Wednesday morning when their mini-truck rammed a slow-moving truck at them near the Jewar-Jaipur road, police said.

Institutes asked to enroll students in electoral rolls

TNN NEWS NETWORK

Noida: The Gautam Budh Nagar administration has directed all schools and educational institutes in the district to ensure that students turning 18 years of age by January 1, 2014, get enrolled in electoral rolls. Heads of the educational institutes have been directed to help students attaining voting age in filling up necessary forms during the voter registration drive this month so that they can procure their ID cards in time.

sued after a meeting was held with the district magistrate on Thursday.

Institutions have also been instructed to appoint at least one coordinator in their respective institutes who would

Educational institutes have been asked to ensure eligible students fill up Form 6 and submit it with the district administration. The directions were issued after a meeting held with the district

coordinators would act as links between schools and the district administration in sorting out issues related to registration of students in voter lists," said district magistrate, H.L. Gupta.

District officials have also asked the institutes to spare a room within their campuses and name it election office where all necessary work related to enrollment, including filling up of forms, can be undertaken.

At the end of the students' voter registration drive, schools and colleges would be required to furnish an affidavit

Lack of road hits substation work

TNN NEWS NETWORK

Noida: The proposed 132KV electricity substation in Sector 115, which was earlier delayed over non-availability of land, has hit a roadblock yet again. Work has been affected due to the lack of an approach road to the project site. UP Transco, which is going to construct the project, is unable to transport heavy machinery and equipment to the site.

Officials of UP Power Transmission Corporation Limited (UPPTCL) said that it's not possible to transport expensive electrical machinery to the site in any other manner.

The power corporation had been unable to take possession of the plot earmarked for the substation because of land acquisition issues that had erupted in Gautam Budh Nagar district two years ago. After taking possession of the plot



ANOTHER HITCH: UP Transco, which is responsible for constructing the project, is unable to transport heavy machinery and equipment to the site

Dengue threat: The health department has issued an advisory to schools that if mosquito breeding is detected they should report it immediately. TNN

TIME CLASSIFIEDS

Consumer Services

SERVICES- PERSONAL

ASTROLOGY

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COMMON PROBLEMS ON OUR HIGHWAYS

Common Problems on our Highways

- Sharp curves
- Intersections
- Roadside hazards

SHARP CURVES

A wide-angle photograph of a winding asphalt road in a mountainous region. The road curves from the foreground towards the left. In the background, there are several layers of mountains under a blue sky with light clouds. A person in a white shirt and dark pants stands on the shoulder of the road in the middle ground. The image is annotated with white text labels: 'warning sign' on the left, 'chevrons' in the middle ground, 'safety barrier' on the right, and 'road markings' at the bottom center.

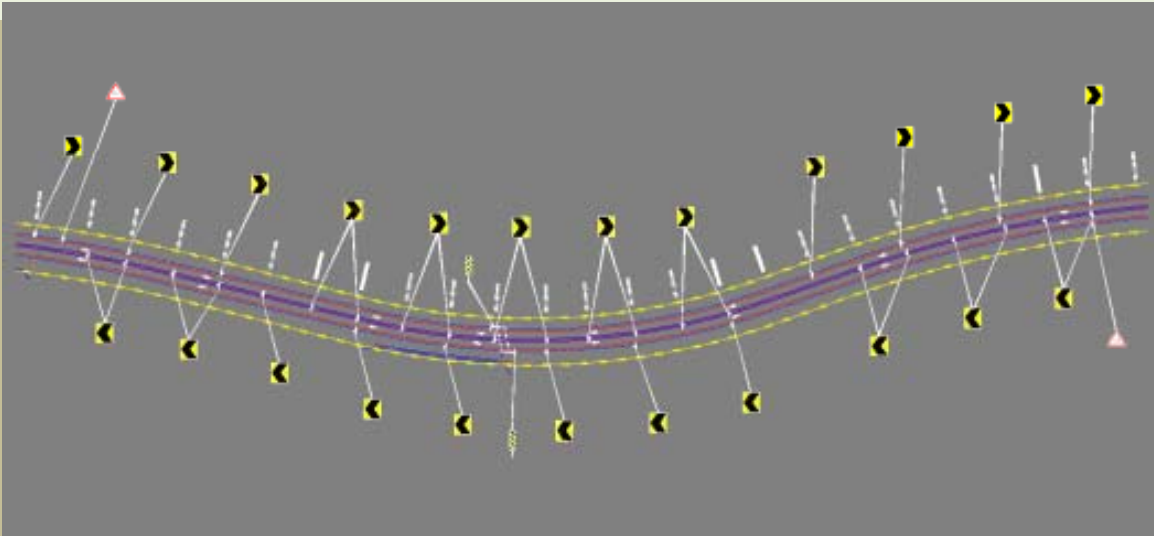
warning sign

chevrons

safety barrier

road markings

Curve Delineation

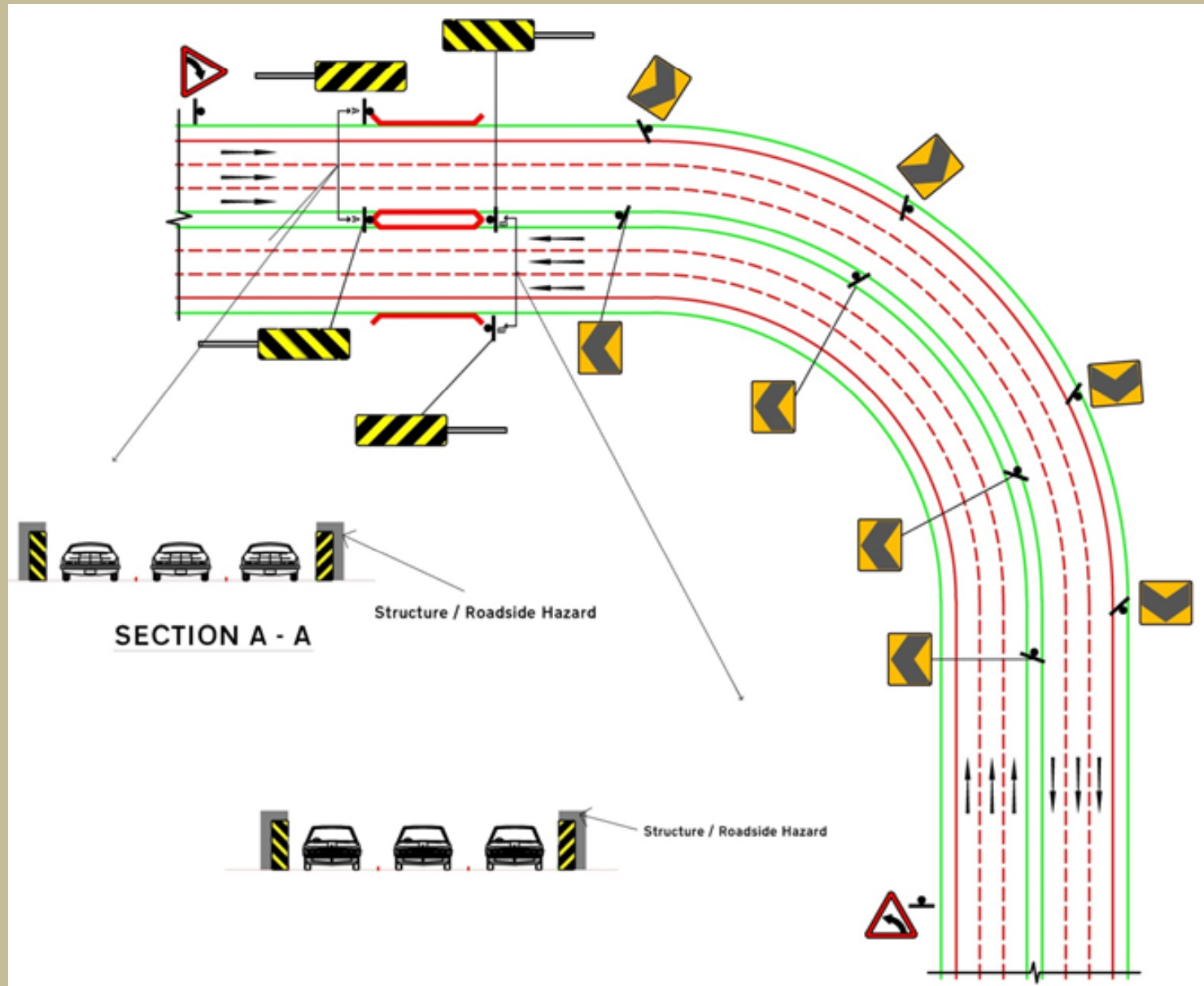


- Drivers should be able to judge the sharpness and change in alignment with alignment marker chevron signs

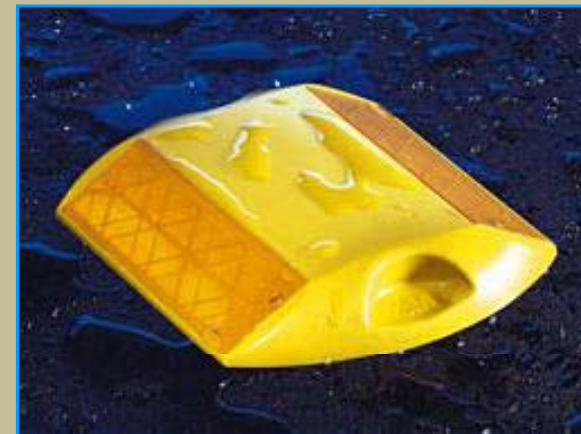
Roadway Delineators

- Alignment Markers
- Road Delineators
- Hazard Markers
- Reflective Pavement Markers (Road Studs)
- Solar Powered Road Markers

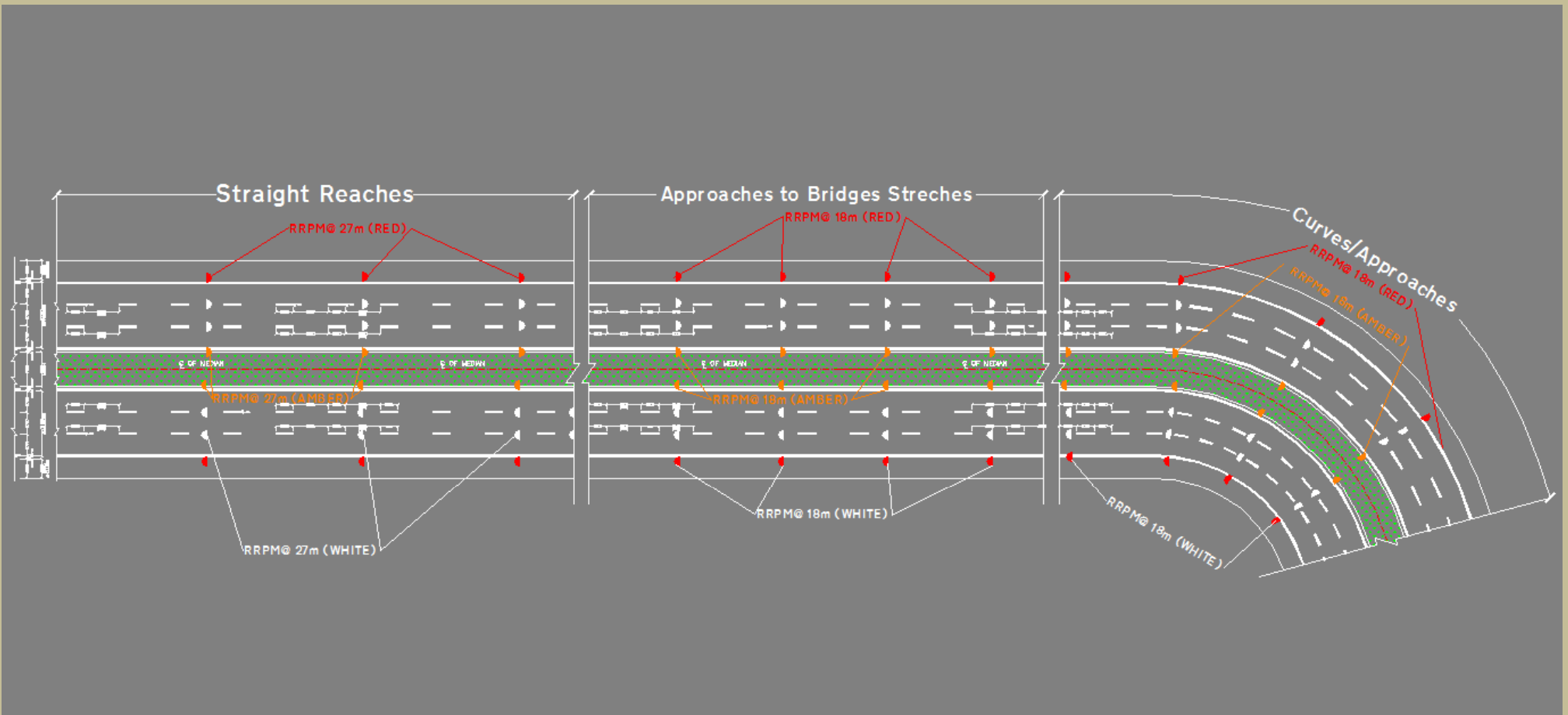
Pavement Markings



Raised Pavement Markers



Pavement Markings & RRPM



STAMARK Tape

- **Features**

- Yellow microcrystalline ceramic
- Beads

- **Advantage**

- Increased reflectivity
- Improved durability
- Corrosive resistance
- No lead in product

- **Benefit**

- Improved reflectivity retention
- Improved nighttime color
- Long term cost savings
- Improved safety
- No VOCs

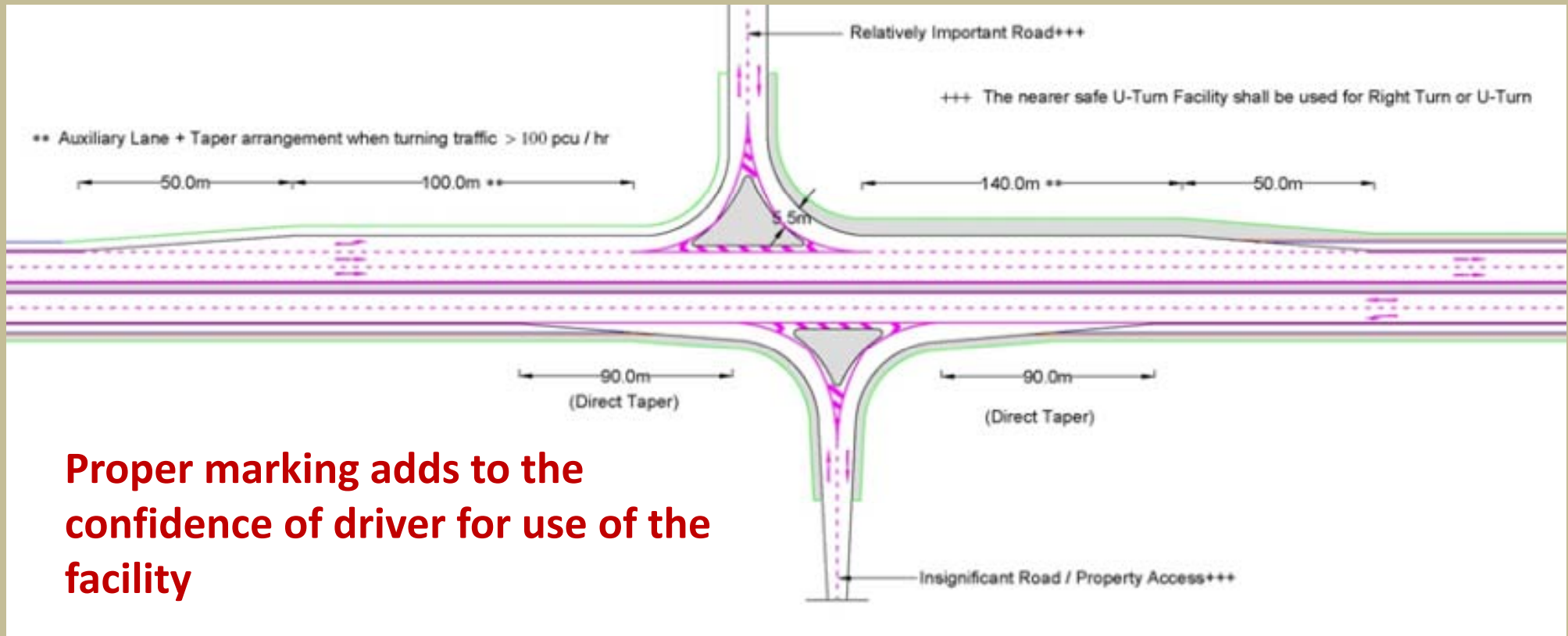


Pavement Markings

- Longitudinal markings
- Diagonal and Chevron Markings
- Bus and truck lane marking
- Longitudinal marking to Toll Booths
- Stop Line and Give way Markings
- Object Markings

IRC-35 1997 Pavement Markings (under revision)

Pavement Markings



Proper marking adds to the confidence of driver for use of the facility

INTERSECTIONS

warning signs

direction signs

traffic calming measures

road markings



Traffic Signs

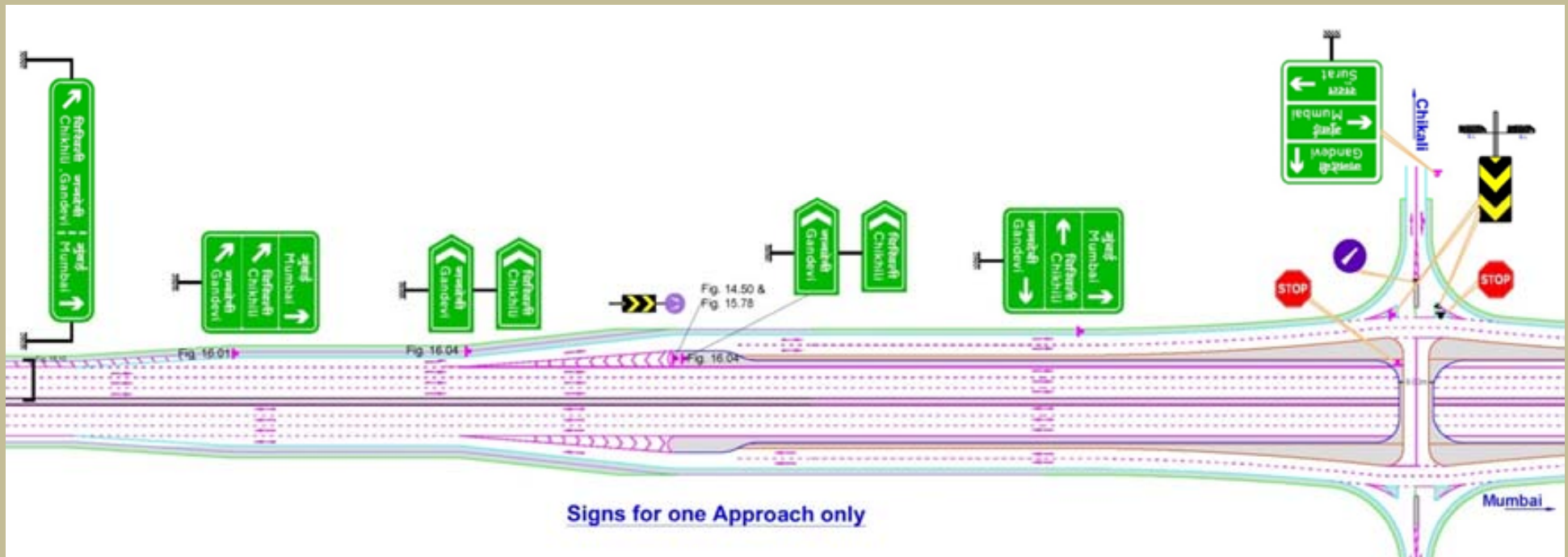
Type	Function
Regulatory & Mandatory signs	To control or prohibit
Warning & Cautionary signs	To warn a hazard
Facility and Direction Information signs	To inform a roadside facility and place names/direction



IRC-67 2012 Road Signs

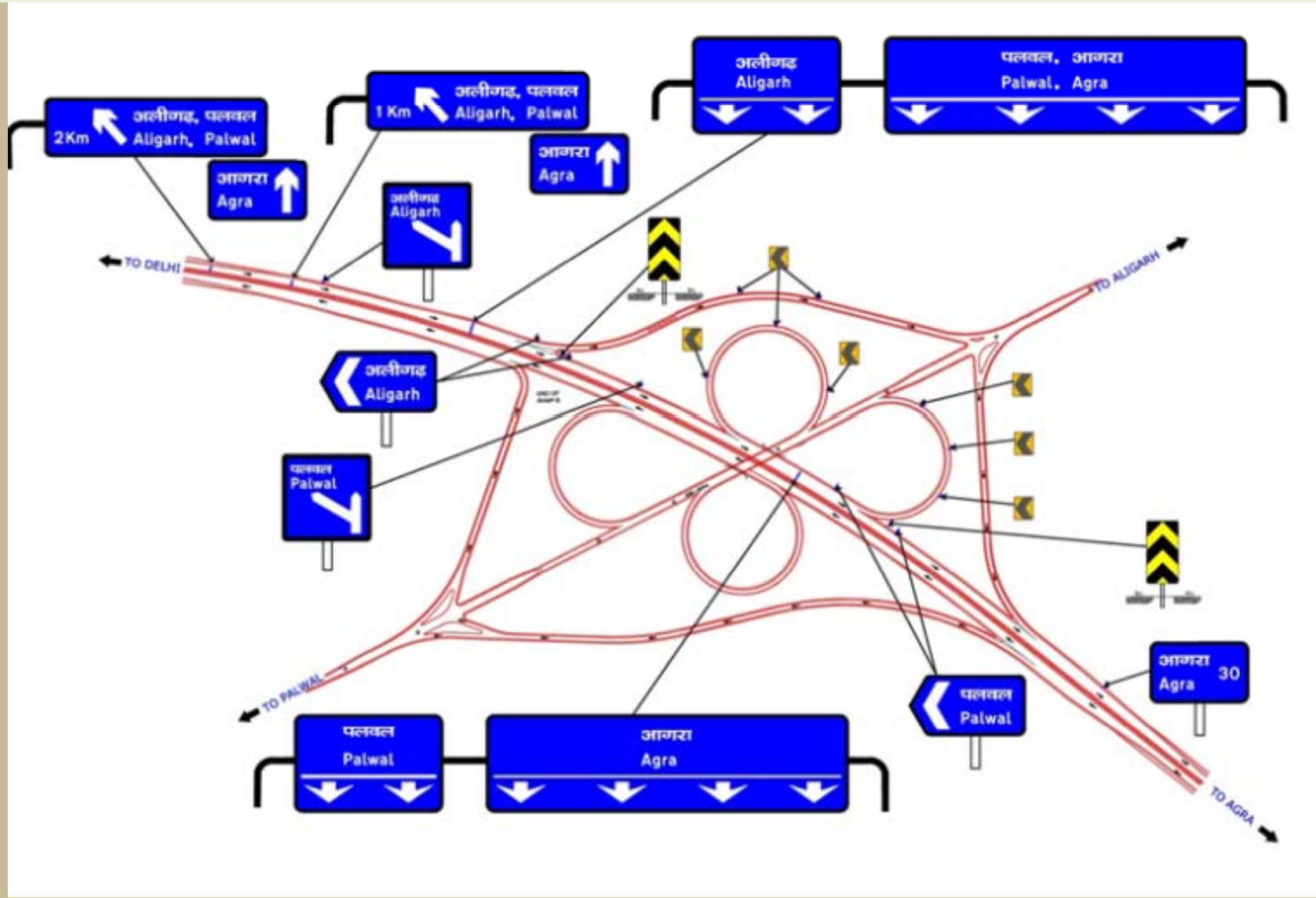
- Color pattern of Direction information signs are different for Highways & Expressway

Advance Direction Information Signs



On approach to grade separators, the adequate direction signs guides the drivers to exit to designated place

Direction Information in Expressway



On expressways Gantry mounted direction information and lane dedicated signs for safe maneuvering

ROADSIDE HAZARDS



Hazardous objects within
5m from edge of road



safety barrier

edge markings

concrete poles



high embankment

safety barrier



high embankment

safety barrier





End Treatment for Safety Barrier



Blunt End



Fishtail or Spoon type Ends

Turned Down Ends



concrete poles



end treatment

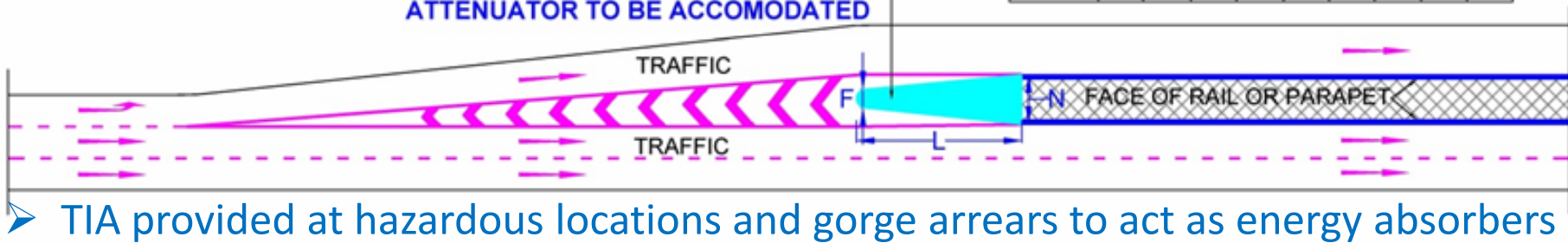


Traffic Impact Attenuators

MINIMUM SPACE REQUIRED FOR CRASH ATTENUATORS.
i.e. RESERVE AREA (In meter)

SPEED OF MAIN HIGHWAY (kmph)	MINIMUM SPACE						PREFERRED SPACE		
	RESTRICTED CONDITIONS			UNRESTRICTED CONDITIONS					
	N	L	F	N	L	F			
50	2	2.5	0.5	2.5	3.5	1	3.5	5	1.5
80	2	5	0.5	2.5	7.5	1	3.5	10	1.5
100	2	8.5	0.5	2.5	13.5	1	3.5	17	1.5
120	2	11	0.5	2.5	17	1	3.5	2.1	1.5

THE AREA IN WHICH CRASH ATTENUATOR TO BE ACCOMODATED



TRAFFIC MANAGEMENT

Channelizing Devices for traffic management



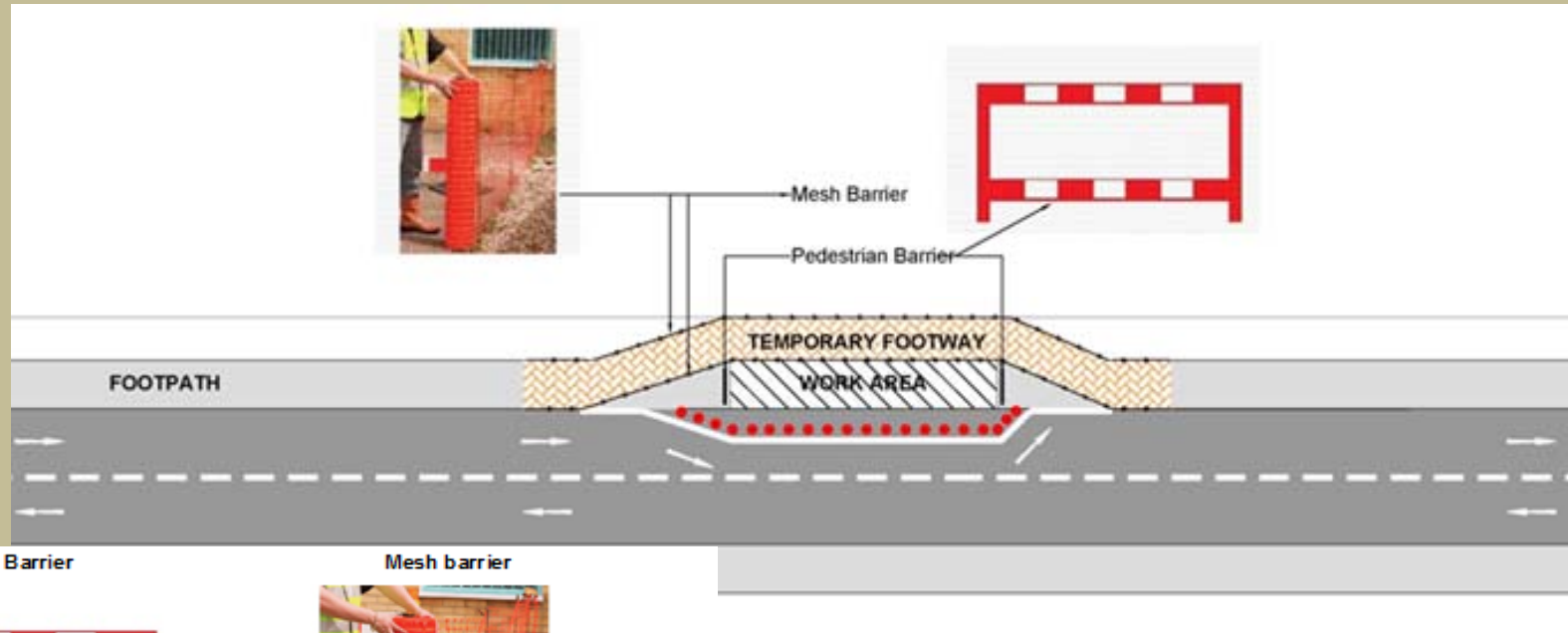
New Jersey Concrete Crash Barrier

Forgiving type barrier where traffic pathway has to be altered

Channelizing devices

- Traffic Cones
- Tubular Markers
- Hazard Markers
- Drums
- Barricades
- Direction Indicator Barricades
- New Jersey Barrier
- Water – Filled Barricades
- Temporary Pavement Markings & Road Studs

Measures for VRUs



Pedestrian Barrier



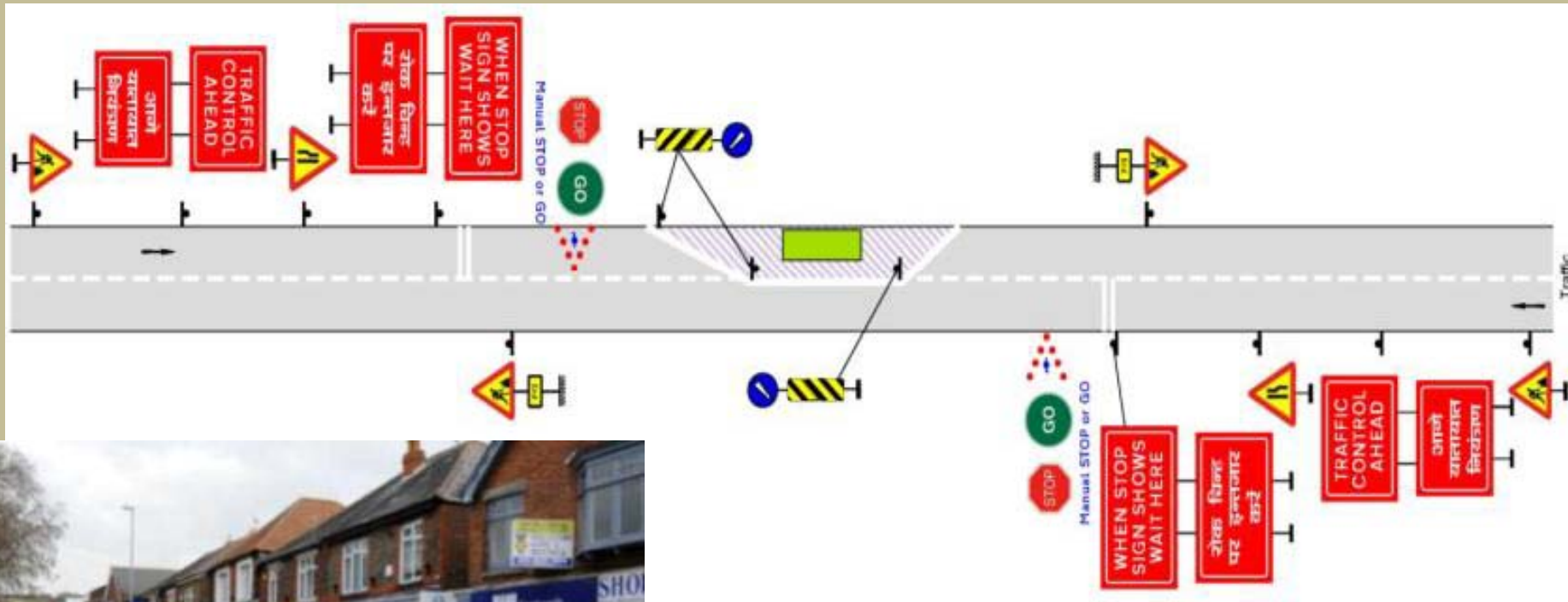
Mesh barrier



Exmaples of Installations

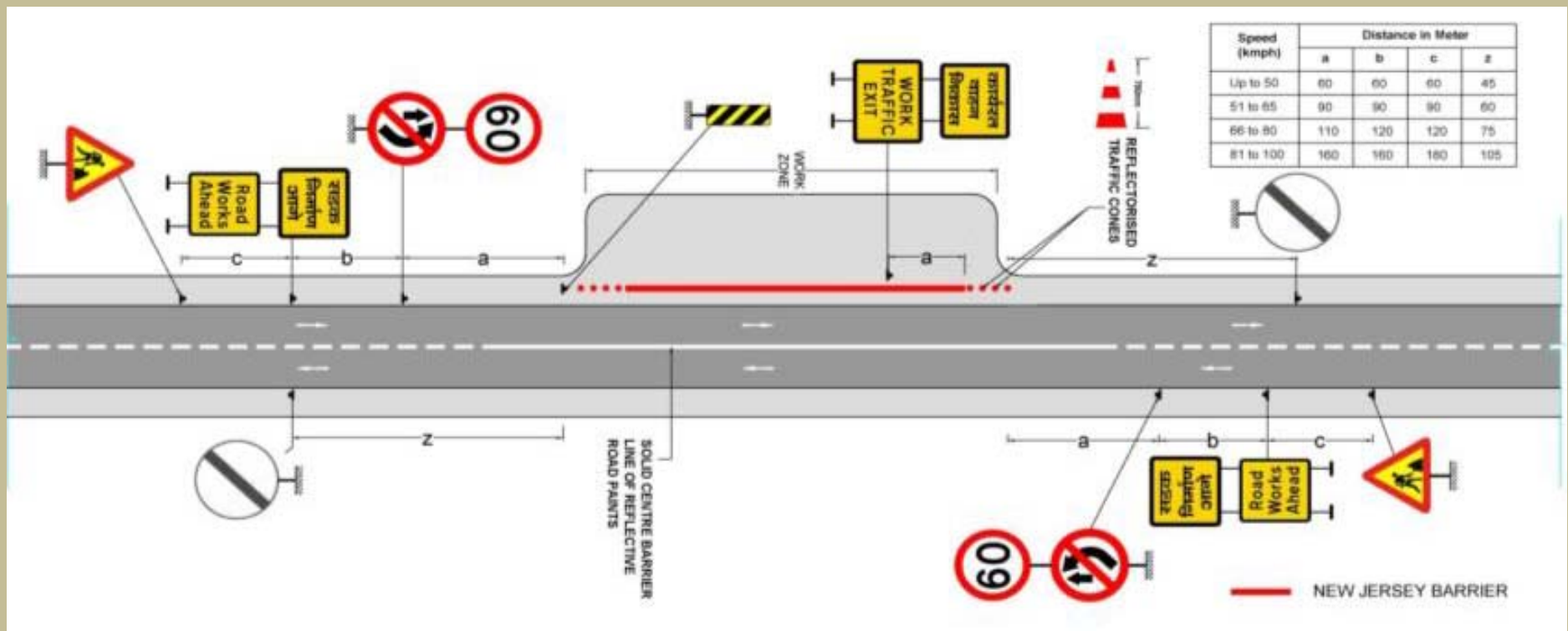


Traffic Management on Two-lane Road

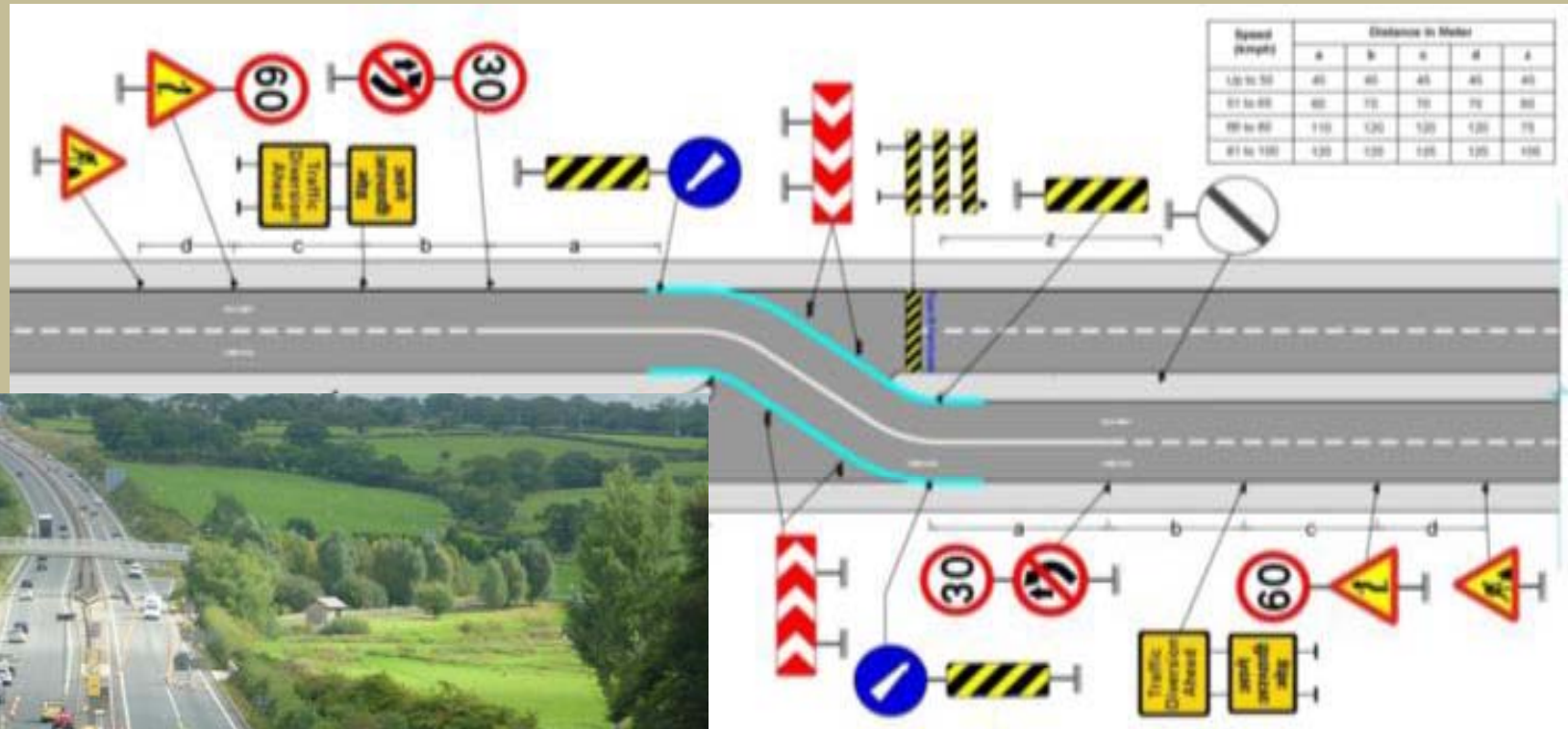


One way traffic control system helps to reduce traffic congestion

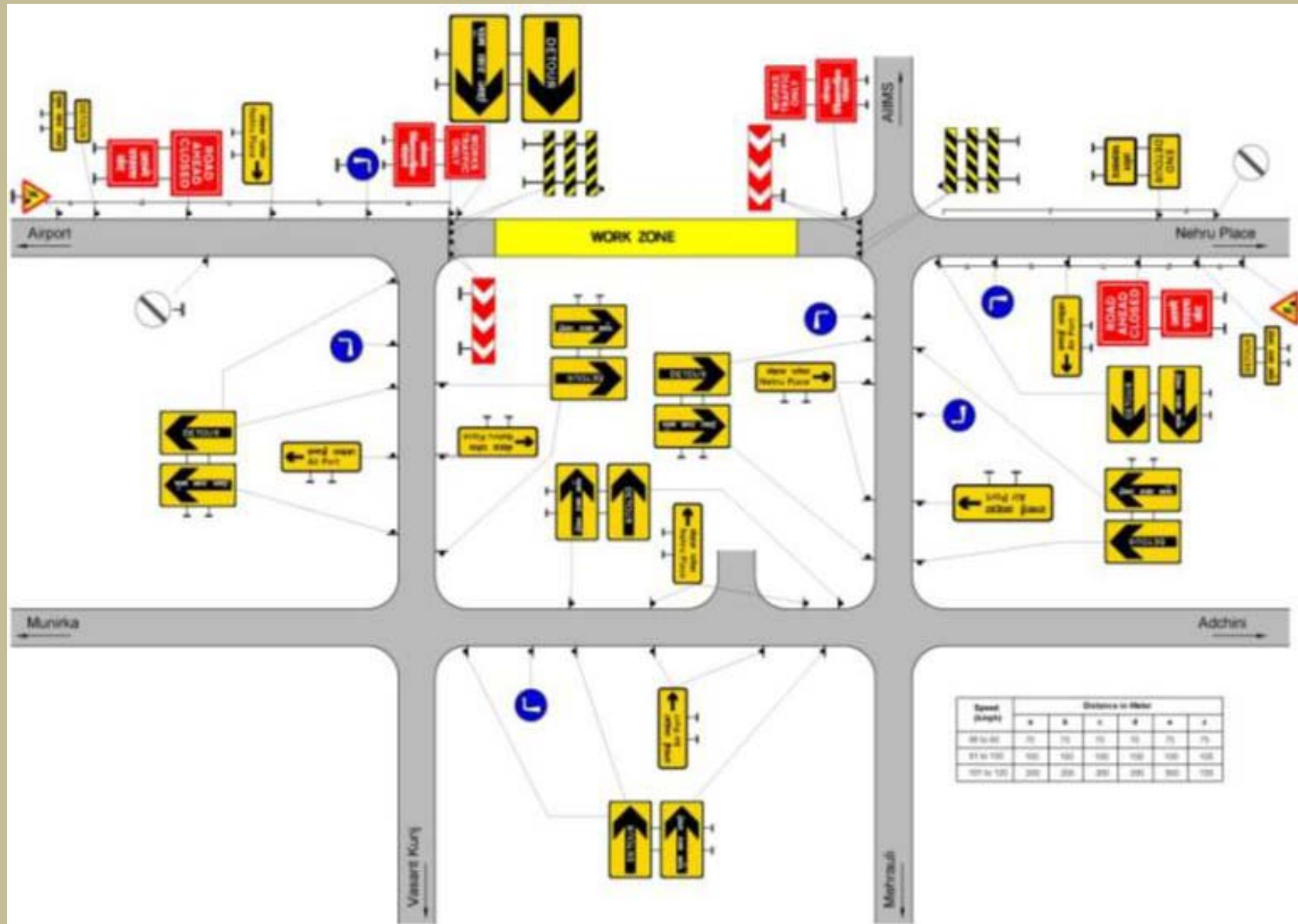
Typical Layout for 2-Lane to 4-lane (Eccentric Widening)



Diverting of Traffic from One Carriageway to Other

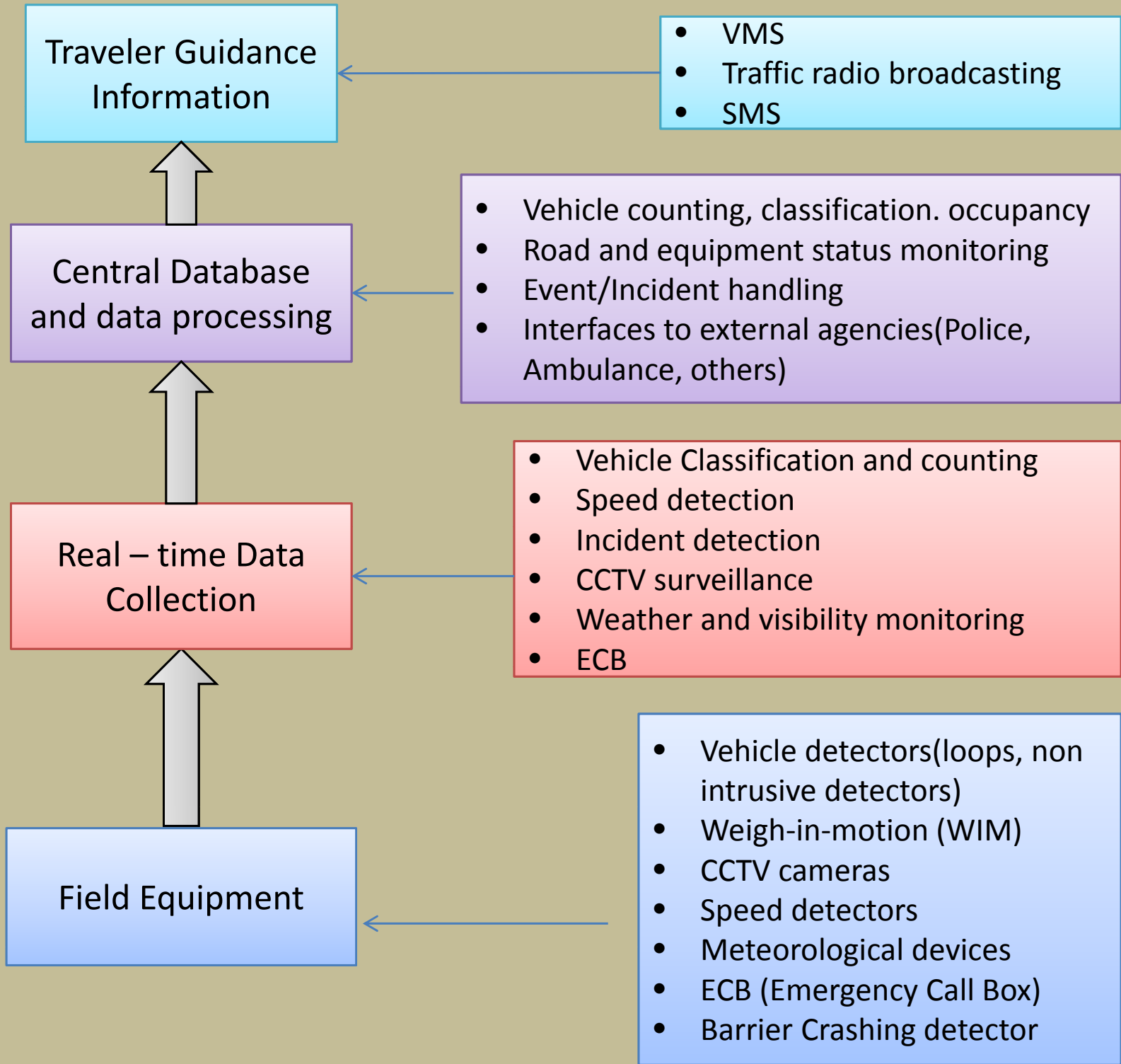


Typical Layout for Detour/Bypassing

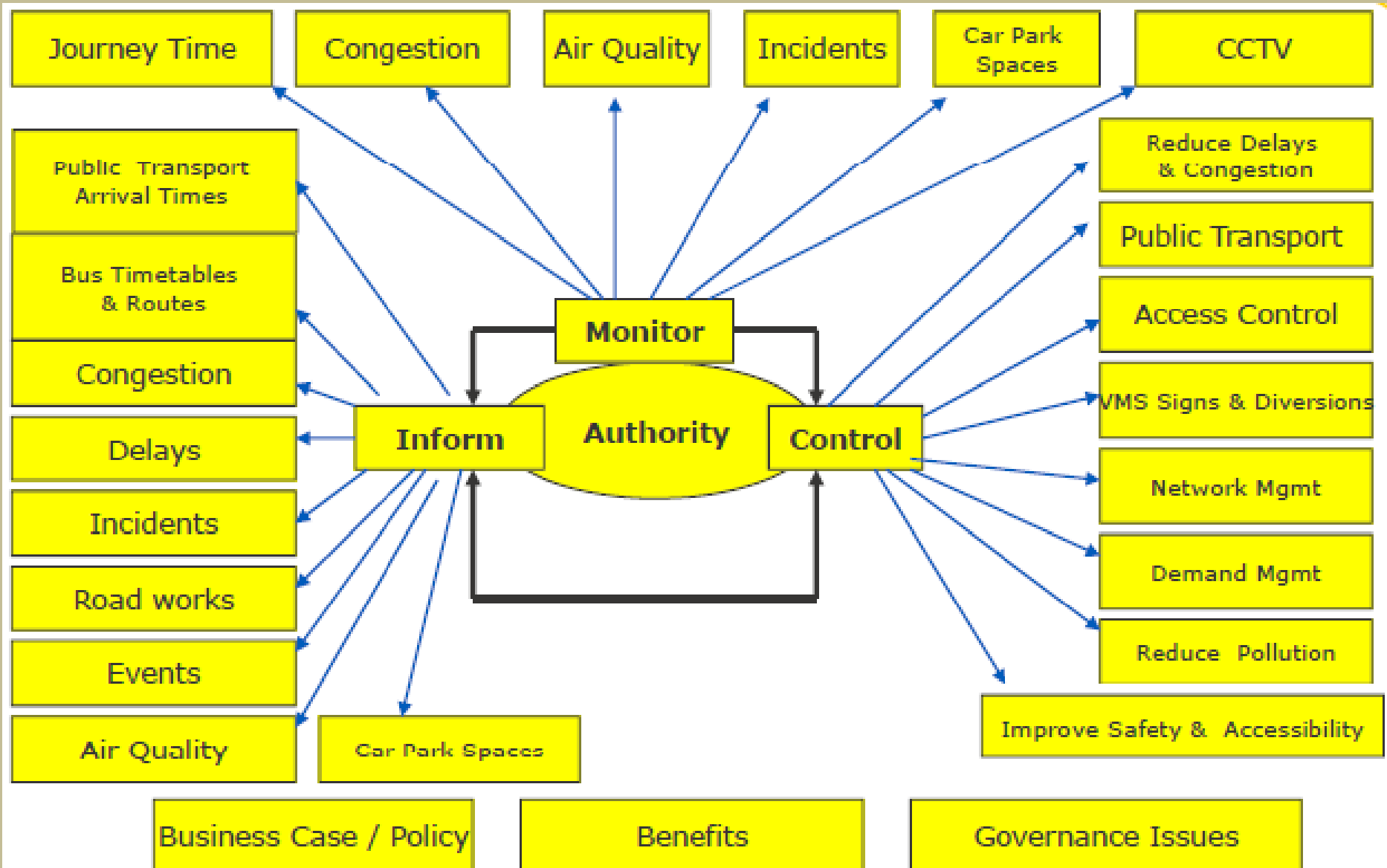


Traffic Management using Advanced Systems

ATMS FLOW CHART



ITS Operational Concept



ATMS on Highways and Expressways

- Safety systems
 - Video Incident Detection System (VIDS)
 - Variable Message Signs system
 - Emergency Call Boxes
 - Speed enforcement
- Toll management
 - Automatic Traffic Counter cum Classifier System
 - Weigh in motion
 - Incident Recording System

Video Incident Detection System

- Monitor the movement of vehicles on highway
- Real-time view of traffic movement
- Detect incidents such as break-down or accident based on image processing / manual system
- Quick emergency response



Dynamic Message System Inform Motorists Continuously



Freeway Dynamic
Message Signs



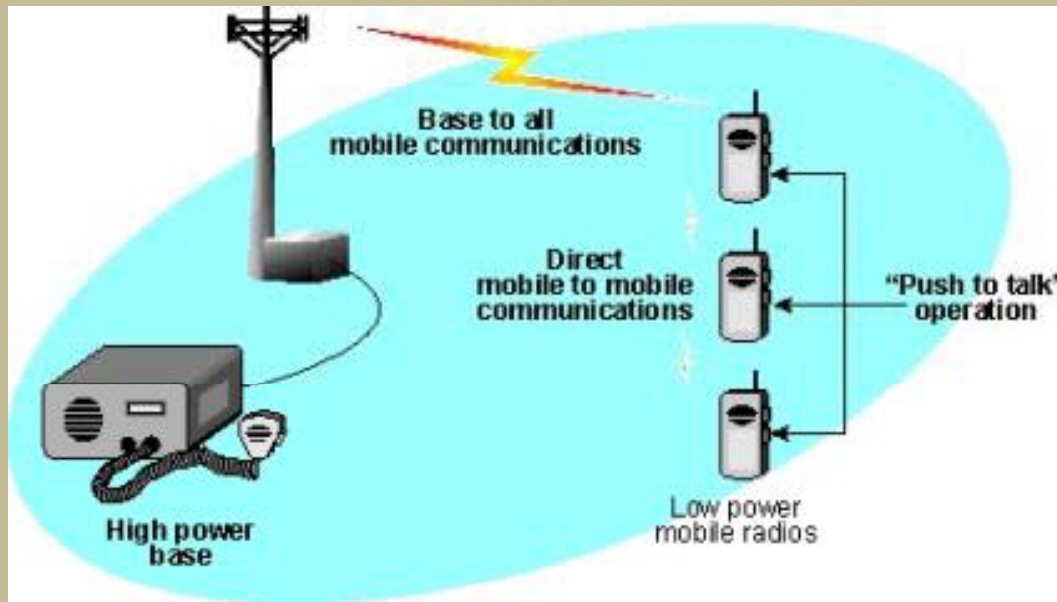
Emergency Call Boxes (ECB)

- installed at uniform distance on the highway,
- hands free speaker and microphone,
- audio processing, transmission and signaling circuitry, and
- distress button connects to the Central Control Room



Mobile Radio Communication System

Establish voice communication on radio between Control Center and the emergency mobile vehicles such as ambulances, cranes and patrolling vehicles



Yamuna Expressway .. *an example*

- RFID based ETC in all lanes of toll plazas
- Variable Message Sign Boards
- Surveillance Camera at every 5 Km and Video Incident Detection System (VIDS)



Yamuna Expressway .. *an example*

- Speed Monitoring and Vehicle Recognition System
- Central Control Centre
- Emergency Call Boxes (ECB) at every 2 kms on either side of the Expressway



A blurred photograph of a multi-lane highway. In the center, a green overhead sign reads "North Exit R6". Several cars are visible on the road, moving away from the viewer. The background shows utility poles and a hazy sky.

What is our focus ?

toll management ?

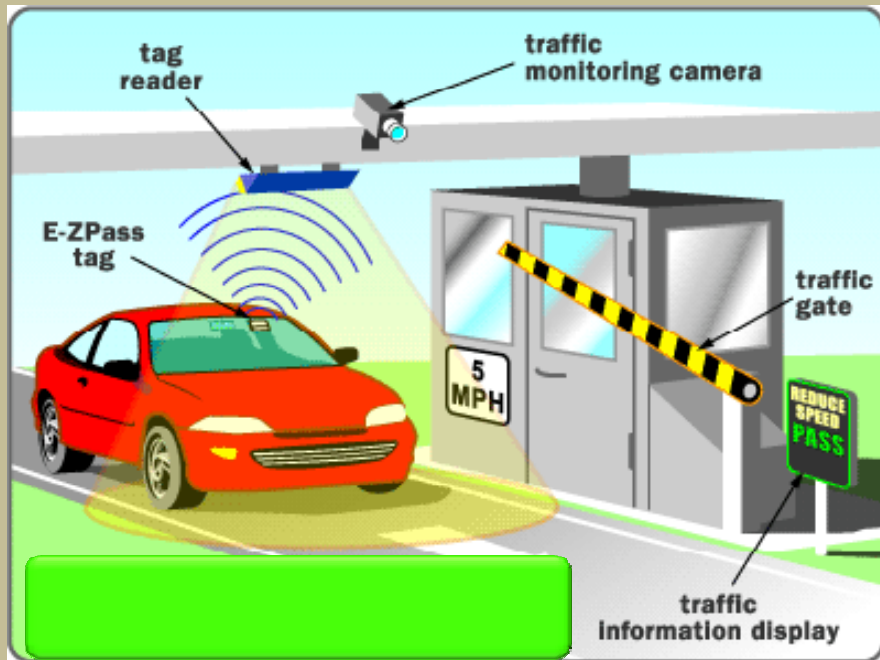
safety ?

or both?

What is our focus ?

- ATMS/HTMS on highways are mostly related to toll management
- E.g. incident detection system (VIDS) on toll plaza, vehicle counter and classifier, etc.
- Do we have uniform ATMS on highways/expressways ?
- Implications ??

ETC to save time, reduce congestion



Why no takers?

- Interoperability
- Centralized standards

UIDAI recommends RFID technology to achieve interoperability



ATMS

Real time
information:
guidance, warning

Enforcement

Emergency
assistance

Efficient toll
management

Less congestion &
pollution,
save travel time

Safety

Toll & Traffic Management

ITS Technology

I AM YOUR IDEA

USE ME



LOSE ME



Summary

- Uniformity & consistency in traffic control and management required
 - Will improve safety by easy understanding by road users
- ITS/ATMS standards also to be used uniformly
 - There should be DPR prepared for it
- Enforcement through ITS/ATMS is a more transparent and efficient system

Thank You

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