

## Sample Question Paper - I

International Course on Road Safety Audit, 01-15 December 2020,

TRIPP, IIT Delhi

Name of Candidate:

Please submit your answer at <.....>

### I Urban Roads

**1.1** What is the most important Principle for ensuring urban safety? **Mark the correct answer.**

- a. Urban residents must be given intensive training for observing safety on the road
- b. Roads must be designed to adapt to the limitations of the road users.

1.2 Urban roads must be designed to ensure safety to the most vulnerable group of road users. Highest proportion of road crash victims in urban areas are (mark the correct statement):

- a. Car occupants
- b. Bus and three wheeler occupants
- c. Pedestrians and Motorised two wheelers

**2.1** Mark the Safe speed limit on urban arterial :

- a. 20km/h
- b. 50 km/h
- c. 80km/h

**2.2** Near Schools the safe speed limit should be reduced to 20km/h because:

- a. presence of too many cars
- b. presence of young children who can run across the road suddenly
- c. presence of school buses

### **3.1 Cross section of urban roads**

**Mark the correct statement:**

- a. Local roads should be designed for 50 km/h speed
- b. Local roads may not have a separate bicycle track.
- c. Local roads should have a separate bus lane.

### **3.2 Minimum width of pedestrian path should be 1.8 m because**

- a. pedestrians safety is improved
- b. this meets the Universal accessibility requirement(wheel chair movement)
- c. It can be used by bicyclists too

## **4 Safe Intersections in urban areas**

4.1 Most effective method of improving safety at unsignalised intersections is :

- a. Cutting all trees around the junction
- b. Increasing lighting level
- c. Constructing speed humps/rumble strips on all four approaches

4.2 List three reasons why a well-designed round about is safer than a signalised crossing:

- i. Number of conflict points are reduced,
- ii. Speeds are reduced
- iii. Angle of impact is usually less than 90 degrees

4.3 What should be done to reduce pedestrian crashes on a signalised junction where a large number of vehicles are observed to jump red light?

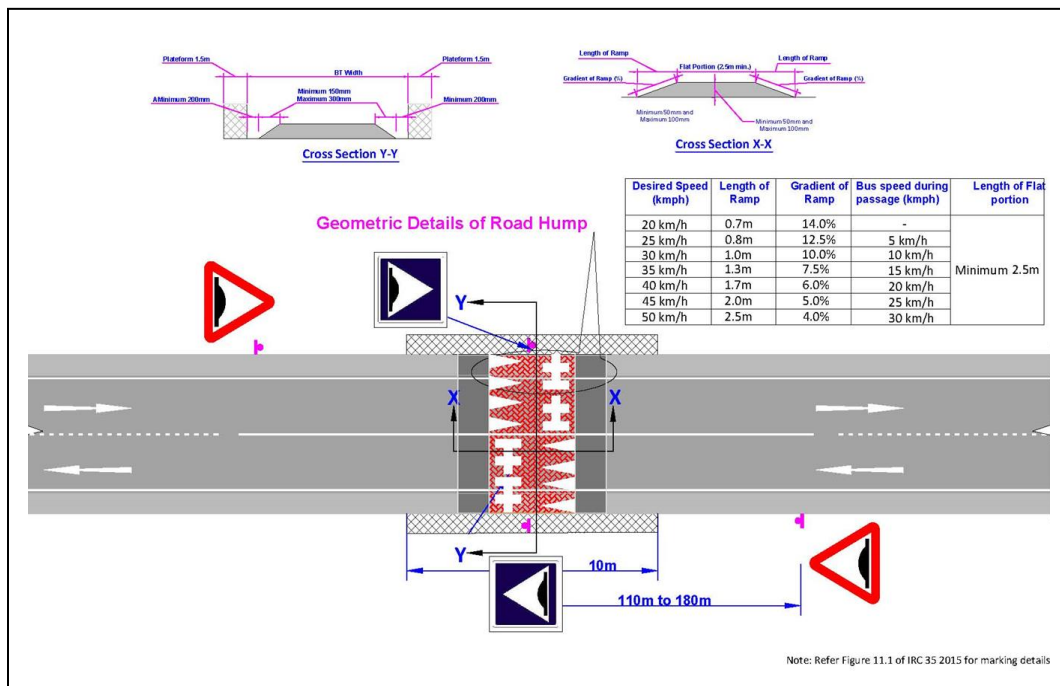
- a. Double the lumen level at the junction
- b. Install rumble strips before the painted zebra crossing
- c. Design pedestrian refuge

## 5 Traffic calming principles

5.1 You have to install a flat top hump near school (20km/h zone) to ensure children's safety. What height and gradient will you suggest ?

**Height: 100 mm-150mm**

**Gradient:14%**



5.2 IRC SP 99 (Traffic Calming) recommends repeated bar markings on two lane road before approaching a habitation, why: Mark the most appropriate answer:

- reduce speeds from 80km/h to 40km/h
- Caution drivers of cross traffic
- Warn drivers of approaching habitation(40/km h zone), and gradually reduce speed

## 6 Before and after(2)

6.1 list three features in Figure 2 which have been introduced to improve traffic safety as compared to figure 1

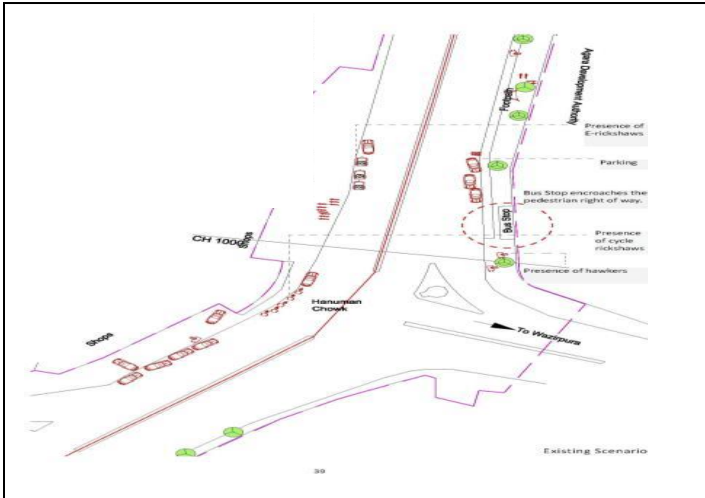


Figure 1

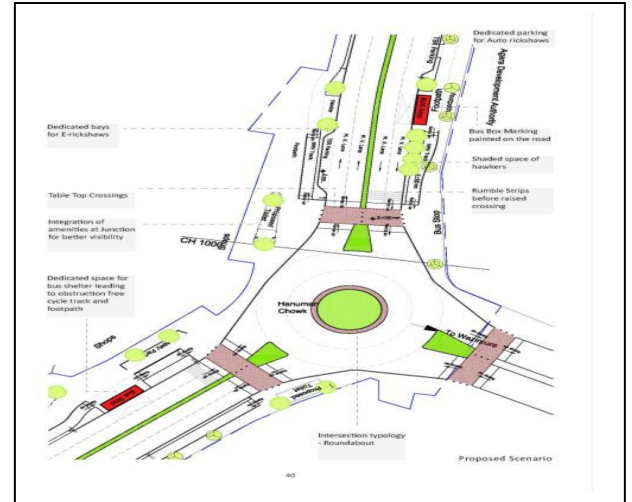


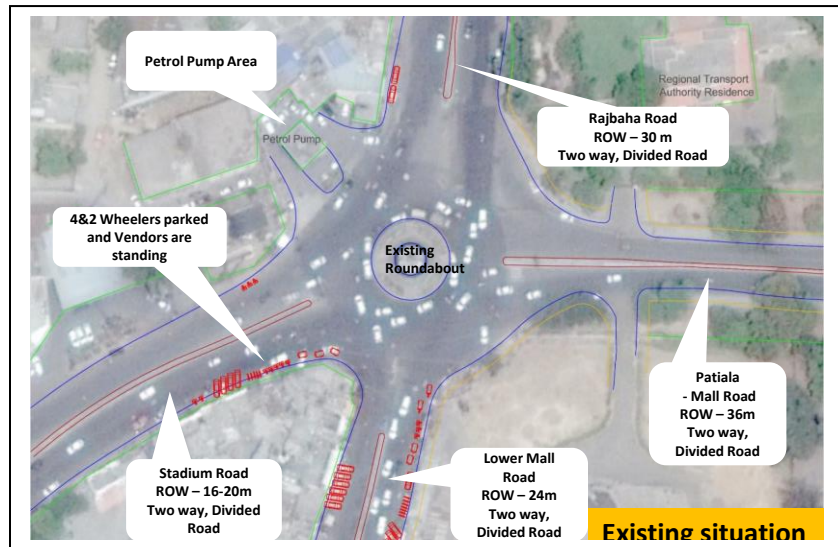
Figure 2

i. round about

ii. Raised pedestrian crossing

iii. bus stop near raised crossing

**6.2 Mark three features present in the roundabout shown in figure 3 that may result in traffic safety problem, explain briefly why.**



**Figure 3**

- i. Wide circulatory lanes creating conflicts**
- ii. Possibility of high speeds of entering vehicles**
- iii. wide free left turns**

## **II Expressway**

### **7.Safety principles(2)**

#### **7.1Mark the most appropriate statement for designing safe expressway**

- a. Design must provide for driver error and emergency manoeuvres
- b. Design should be safe for well trained drivers
- c. Design should prevent overtaking manoeuvres

**7.2 “Clear zone” width requirement in expressway is higher than non access control highways because:**

**a. Higher design speed requiring longer stopping distance**

**b.**

**c.**

## **8 Cross sections**

### **8.1 Mark the correct answer:**

a. Lane width on expressways and urban arterial roads should be the same

b. Lane width on expressways should be higher than the urban arterial lanes

c. Lane width on expressways should be less than the urban arterial lane

### **8.2 Most important reason for not permitting raised median on expressways:**

a. It prevents U turns

b. It can result in single vehicle over turning and roll over

c. It discourages animal crossing

### **8.3 Mark the best option for expressway median:**

a. 200 mm raised and 6 m wide

b. Flush with carriageway, 6 m wide with a double sided crash barrier

c. Depressed median, 20 m wide with shrubs in the middle

## **9. Safe barriers(4)**

### **9.1 Difference between W beam and Thrie beam barriers(mark the most appropriate answer):**

a. Height of Thrie beam above ground is more than the W beam barrier

b. Thrie beam is installed in a concrete base and W Beam is hammered into the compacted earth

c. W beam has retro reflective paint, and Thrie beam does not have retro reflective paint

**9.2 Ideal location for installing wire rope barrier is:**

- a. Valley side of a hill road
- b. Rolling terrain with at least 2 m flat surface beyond the shoulder
- c. In place of a bridge parapet wall

**9.3 Why is W beam not safe for heavy vehicles(HV)?**

- a. Strength of the material used for W beam cannot withstand the impact from heavy vehicles
- b. Centre of Gravity of HV is higher as compared to cars, W beam height of 730 mm is not able to prevent roll over
- c. W beam does not have concrete base

**9.4Wire rope barrier is preferred over W beam barrier because:**

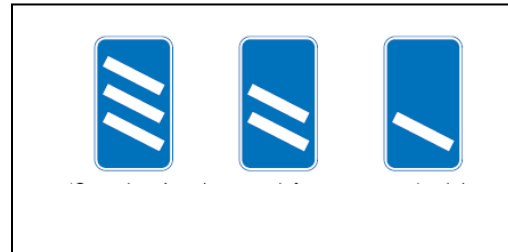
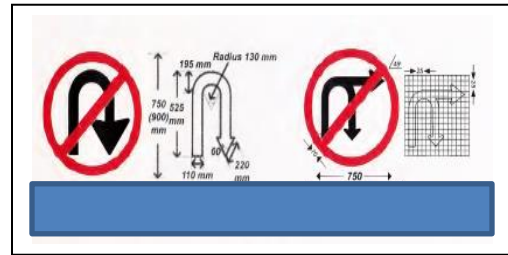
- a. re-installation is easier
- b. initial cost is more than a W beam barrier
- c. It is better for 2 wheelers

**10Markings(3)**

**10.1 Standard road markings are given in the following IRC code**

- a. IRC 35
- b. IRC. SP 99
- c. IRC 67

## 10.2 Identify the correct signs.

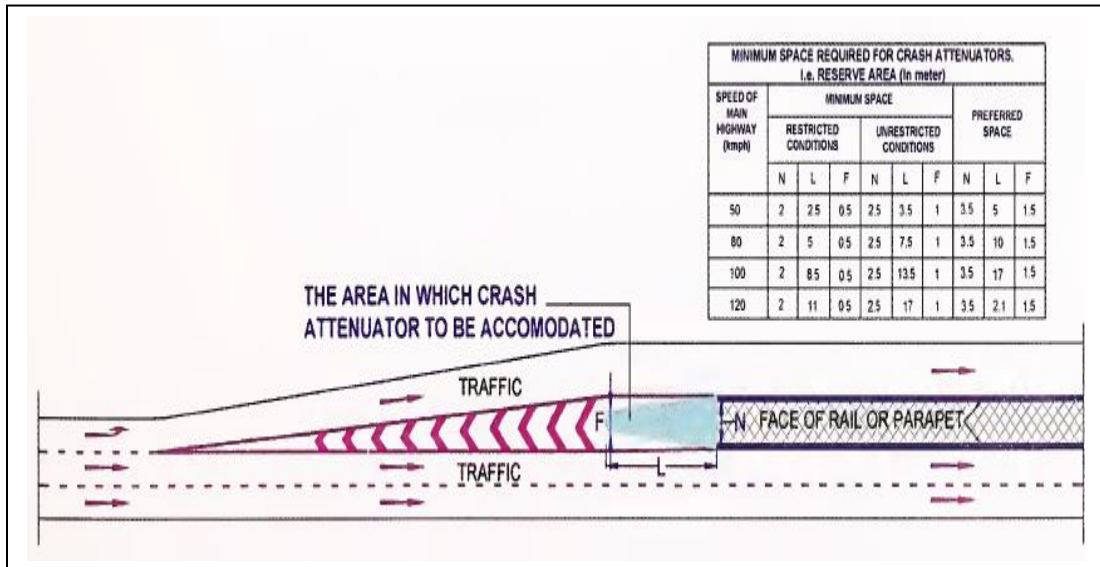


- a. U turn not permitted 2
- b. distance marker for exit ramp 4
- c. Audible markers 3
- d. Advance guide sign 1

## 11. Crash Cushion



**11.1 Length and design of crash cushion is important to ensure safety of errant vehicles.**



**a. Recommend appropriate length for crash cushion for an expressway (120km/h):**

**17 m**

**b. Recommend appropriate length of a four lane road(80km/h)**

**7.5 m**

**12 Good practice identification**

**12..1 List two important safety features in figure 4 of a modern toll plaza:**



**Figure 4**

i. Lane markings

ii. crash cushions

**12.2 List three important safety features in figure 5 of a modern highway:**

**Wide depressed median, audible marker, W beam barrier**



**Figure 5**

**13. Problem identification and remedial measures**

**13.1 Expressway crash data shows 25% of roll over crashes involving buses and trucks after hitting the W beam crash barrier. What would you recommend to address this problem:**

- a. Replace W beam crash barrier with wire rope barrier
- b. Replace W beam barrier with New Jersey barrier
- c. Replace W beam barrier with modified Thrie beam barrier

13.2 List two important features in figure 6 which would increase probability of a road crash, and suggest corrective measures



Figure 6

i. Gantry pole in front of the crash barrier

ii. raised median