

①

ID: 7493

Subject: Transportation

Submitted to: Eng. Hamza Mustafa.

Q No 1

Given Data:-

$$PHF = 0.92$$

$$v/c = 0.90$$

All lanes = 20ft

Avg. speed = 35 mph

Crosswalks = 10ft

Deceleration = 10 ft/s²

Solution :-

Determine yellow interval

$$Y = \frac{t + 1.47 S \sqrt{S}}{2a + (64.4 \times 0.014)}$$

As

$$S_{85} = 35 + 5 = 40 \text{ mph}$$

$$S_{15} = 35 - 5 = 30 \text{ mph}$$

$$Y = \frac{2.0 + 1.47 \times 40}{2(10) + (64.4 \times 0.01 \times 40)}$$

$$Y = 4.945$$

Length of all clearance

② No of Pedestrian

$$Q_r = \frac{w + L}{1.47 S_{15}}$$

②

② Significant

$$a_x = \frac{P+L}{1.47 S_{15}}$$

③ Some pedestrian

$$a_x = \max \left[\left(\frac{W+L}{1.47 S_{15}} \right) \left(\frac{P}{1.47 S_{15}} \right) \right]$$

$$S_{85} = 35 + 5 = 40 \text{ mph}$$

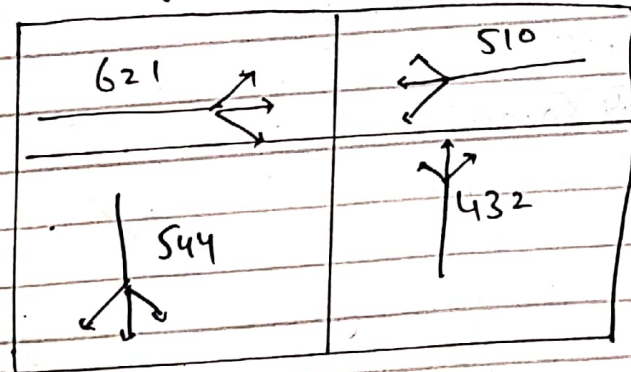
$$S_{15} = 35 - 5 = 30 \text{ mph}$$

$$a_x = \frac{W+L}{1.47 S_{15}} = \frac{35+15}{1.47 \times 30} = 1.133 \text{ sec}$$

$$a_x = \frac{P}{1.47 S_{15}} = \frac{40}{1.47 \times 30} = 0.90 \text{ sec}$$

Ring 1

Ring 2



$$VCA = 621 \text{ tvu/h}$$

$$VCB = 544 \text{ tvu/h}$$

$$V_C = 621 + 544 = 1165 \text{ tvu/h}$$

$$Y = \gamma + a_x = 4.94 + 1.133 = 6.07 \text{ sec}$$

$$t_2 = Y - e = 6.07 - 2.0 = 4.07$$

$$t_L = t_2 + t_1 = 4.07 + 2.0 = 6.07 \text{ sec}$$

$$L = 6.07 + 6.07 = 12.14 \text{ sec}$$

(3)

Cycle length :-

$$C_{des} = \frac{L}{1 - (v_c / 1165 \times PHF \times v/c)}$$

$$= 12.14$$

$$= \frac{1165}{1615 \times 0.92 \times 0.9}$$

$$= 94.26 \approx 95 \text{ sec}$$

Also

$$g_i = g_{Tot} * \left(\frac{V_{ci}}{v_c} \right)$$

$$= 40 - 12.14$$

$$= 27.86 \text{ sec}$$

$$g_A = g_{Tot} * \left(\frac{V_{cA}}{v_c} \right) = 27.86 * \left[\frac{621}{1165} \right]$$

$$= 14.85 \text{ sec}$$

$$g_B = g_{Tot} * \left[\frac{V_{cB}}{v_c} \right] = 27.86 * \left[\frac{544}{1165} \right]$$

$$= 13.00 \text{ sec}$$

Check

$$14.85 + 13.00 + 12.14 = \boxed{39.99}$$

is cycle length.

Q#2 Discuss and Draw different types of traffic signs.

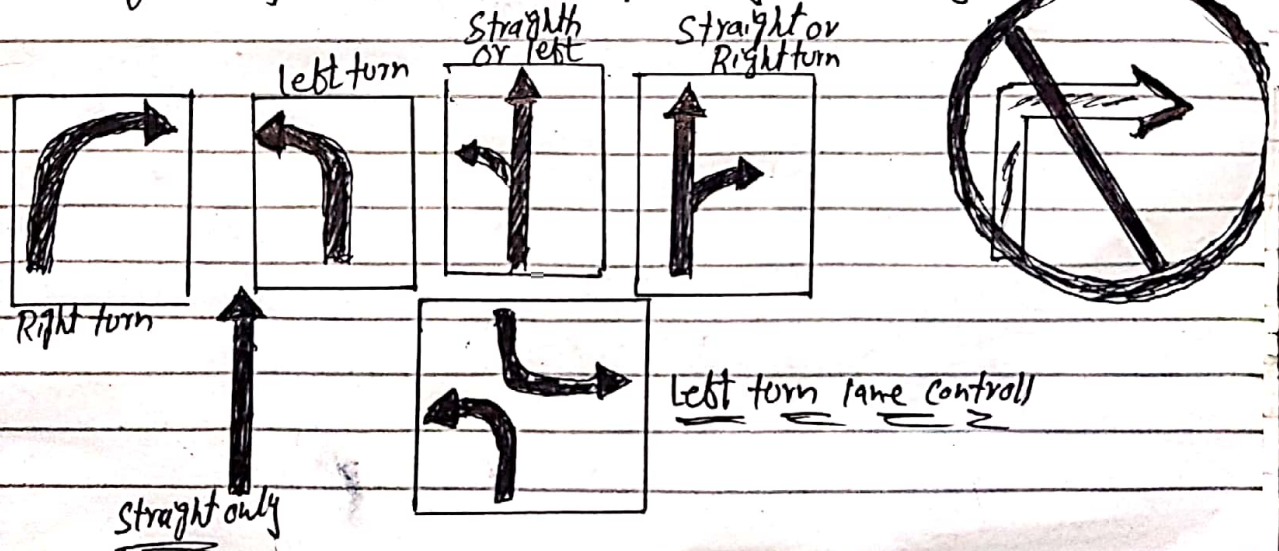
Ans Traffic signs :-

Traffic signs or road signs are signs erected at the side of or above road to give instructions or provide information to road users. The MUTCD provides specifications and guidelines for the use of literally hundreds of different signs for different purposes. In general traffic signs fall into one of three major categories.

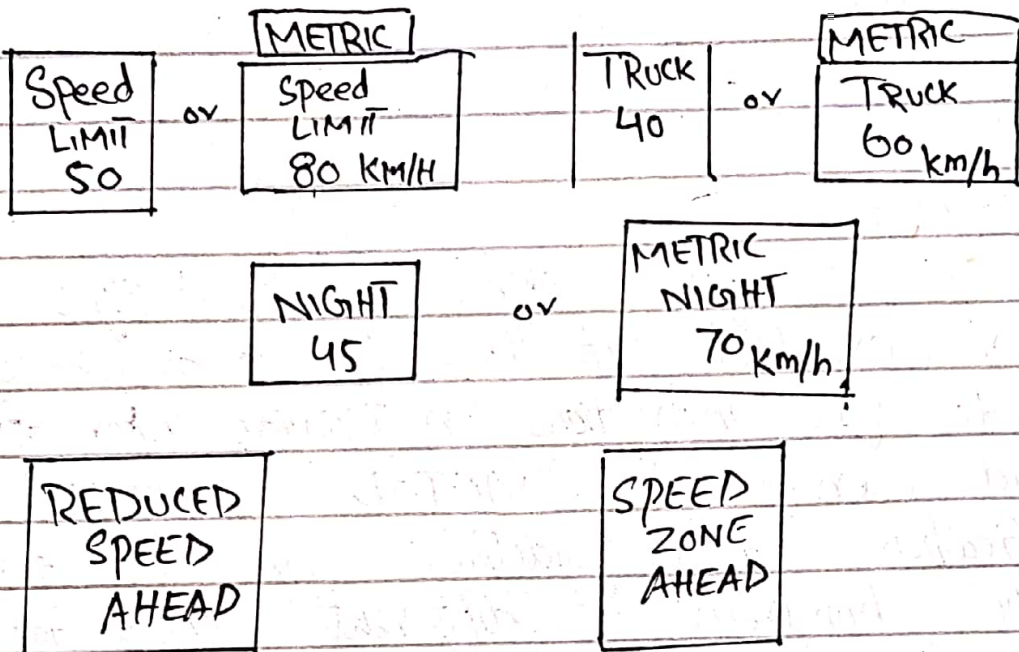
(1) Regulatory signs :-

Regulatory signs convey information concerning specific traffic regulations. Regulations may relate to right-of-way speed limits, lane usage, parking or a variety of other functions.

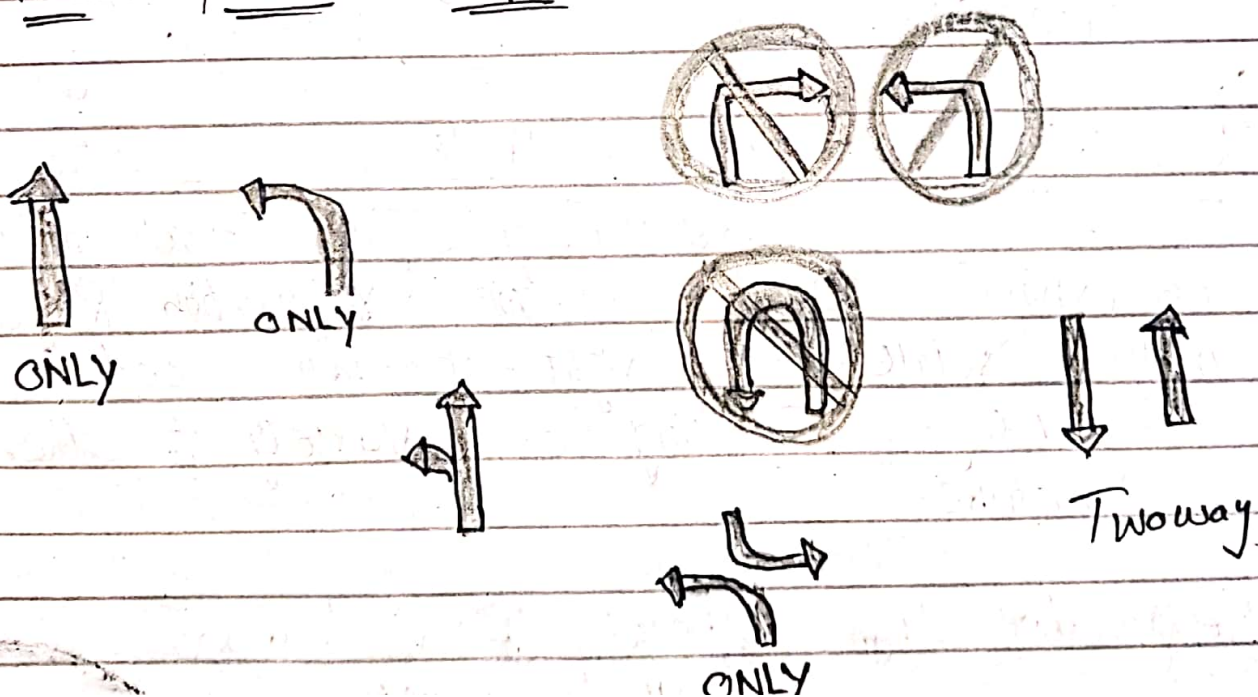
⇒ Regulatory sign Affecting Right of way.



Speed limit sign ::



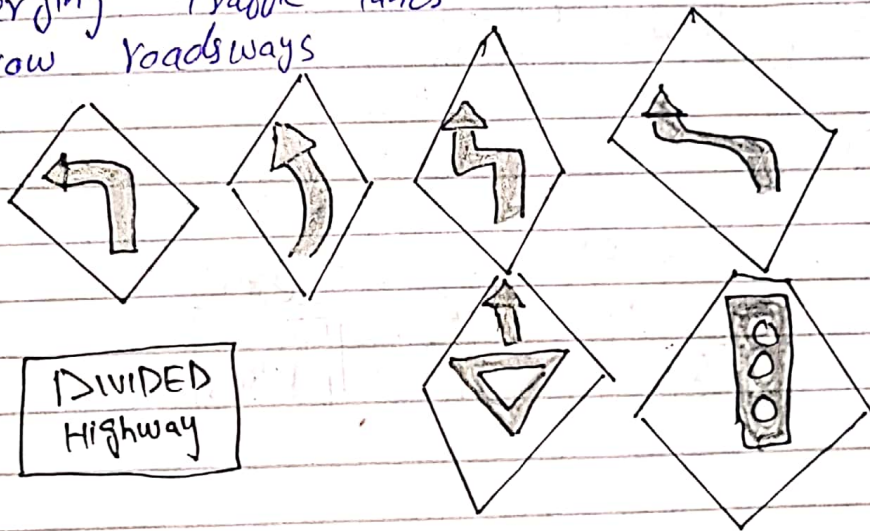
Turn Prohibition signs ::



(ii) Warning Signs:

Warning signs are used to inform drivers about upcoming hazards that they might not see or otherwise discern in time to safely react.

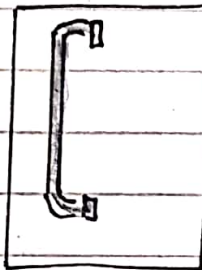
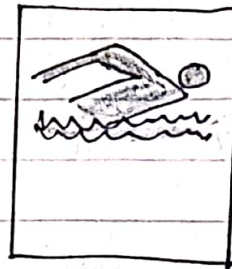
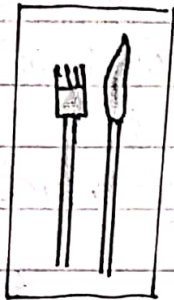
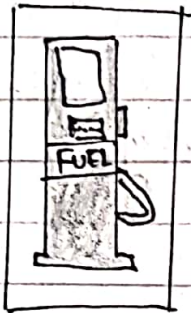
- Changes in horizontal alignment
- Intersection
- Advance warning of control devices
- Converging traffic lanes
- Narrow roadways



(iii) Guide Signs

Guide signs provided information on routes, destinations and services that drivers may be seeking.

- Route Markers and Mileposts.
- Destination signs
- Recreational and cultural-interest Guide signs
- Service Guide signs.



Services

MT
70km



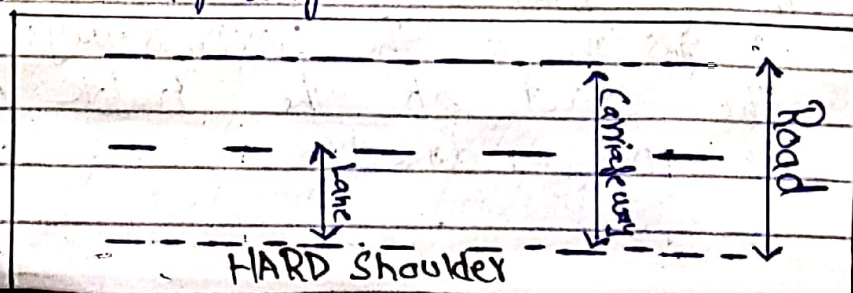
Q No 3 Describe Road Margins.

Ans The portion of the road beyond the carriage way and on the roadway can be generally called road margin. Various elements that form the road margins are given below.

(1) Shoulders =>

=> Shoulders are provided along the road edge and is intended for accommodation of stopped vehicles, serve as an emergency lane for vehicle and provided lateral support for base surface courses. The shoulder should be strong enough to bear the weight of a fully loaded truck even in wet condition.

=> The shoulder width should be adequate for giving working space around a stopped vehicle. It is desirable to have a width of 4.6 m for the shoulder. A minimum width of 2.5 m, is recommended for 2-lane rural highways.



(ii) Parking Lanes :-

Parking lanes are provided in urban lanes for side parking. Parallel parking is preferred because it is safe for the vehicles moving on the road. The parking lane should have a minimum of 3.0 m width in the case of parallel parking.

(iii) Bus - Bays ::

Bus Bays are provided by recessing the kerbs for bus stops. They are provided so that they do not obstruct the movement of vehicles in the carriage way. They should be at least 75 meters away from the intersection so that the traffic near the intersection is not affected by the bus-bay.

(iv) Service Road :-

→ Service road or frontage road give access to controlled highway like freeways and expressways. They run parallel to the highway and will be usually isolated by a separator and access to the highway will be provided only at selected points.

⇒ These roads are provided to avoid congestion in the expressways and also the speed of the traffic in these lanes is not reduced.

(v) Cycle track :-

Cycle tracks are provided in urban areas when the volume of cycle traffic is high. Minimum width of 2 meter is required, which may be increased by 1 meter for every additional track.

(vi) Footpath :-

Footpaths are exclusive right of way to pedestrians, especially in urban areas. They are provided for the safety of the ~~pedestrians~~ pedestrians when both the pedestrian traffic and vehicular traffic is high. Minimum width is 1.5m and may be increased based on the traffic. The footpath should be either as smooth as the pavement or more smoother than that to induce the pedestrian to use the footpath.

(vii) Guard rails :-

They are provided at the edge of the shoulder usually when the road is on an embankment. They serve to prevent the vehicles from running out of the embankment, especially when the height of the embankment exceed 3m. Various designs of guard rails are there. Guard stones painted in alternate black and white are usually used. They also give better visibility of curves at night under headlights of vehicles.