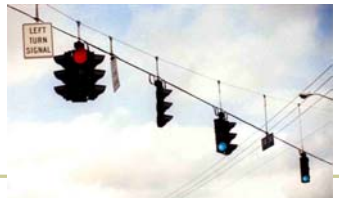
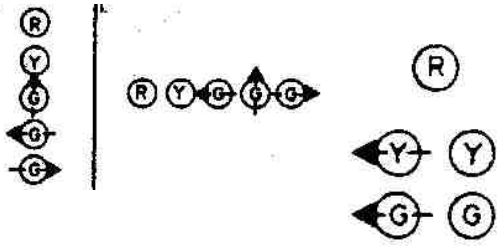


Part IV - Signals

Number of Lenses per Signal Face (4B-7)

- Each signal face, except in pedestrian signals, shall have:
  - At least three lenses
  - But not more than five
  - There are a few of exceptions (e.g., ramp metering signal, continuous green arrow)
- The lenses shall be red, yellow, or green in color, and shall give a circular or arrow type of indication

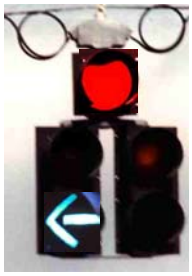
Arrangement of Lenses in Signal Faces (4D-3)



3 Lenses

4 Lenses

5 Lenses



HORIZONTAL MOUNTING

Size of Signal Lenses

- Two sizes allowed
  - 8” and 12” diameter
  - 12” most commonly used for overhead intersection installations

Visibility and Shielding of Signal Faces

- Each signal face shall be adjusted so that its indications will be of maximum effectiveness to the approaching traffic for which they are intended
  - Visors help focus signal indication to a specific approach, and reduces “sun phantom”
  - Back plates increase the signal target value
  - Louvers help restrict signal focus to specific lanes

Signal Head Placement

- Minimum number of signal heads necessary for an approach
- Minimum and maximum heights of signal head placement

Span Wire vs. Mast Arm

- Design consideration
- Guidance not given in MUTCD

Signal Warrants

1. Eight-Hour Vehicular Volume
2. Four-Hour Vehicular Volume
3. Peak Hour
4. Pedestrian Volume
5. School Crossing
6. Coordinated Signal System
7. Crash Experience
8. Roadway Network

1. Eight-hour (A)

- The Minimum Vehicular Volume, Condition A, is intended for application where a large volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

1. Eight-hour (B)

- The Interruption of Continuous Traffic, Condition B, is intended for application where the traffic volume on a major roadway is so heavy that traffic on a minor intersecting roadway suffers excessive delay or hazard in entering or crossing the major roadway.

2. Four-hour

- The four-hour vehicular volume warrant conditions are intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal.

3. Peak-hour

- The peak hour warrant is intended for use at locations where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-roadway traffic suffers undue delay when entering or crossing the major roadway.

4. Pedestrian

- The minimum pedestrian volume conditions are intended for application where the traffic volume on a major roadway is so heavy that pedestrians experience excessive delay or hazard in crossing the major roadway. The warrant given in Section 7D.4 is applicable where the fact that school children cross the major roadway is the principal reason to consider installing a traffic control signal.

5. School Crossing

- The need for a traffic control signal shall be considered when an engineering study of the frequency and adequacy of gaps in the vehicular traffic stream as related to the number and size of groups of school children at an established school crossing across the major streets shows that the number of adequate gaps in the traffic stream during the period when the children are using the crossing is less than the number of minutes in the same period and there are a minimum of 20 students during the highest crossing hour.

6. Coordinated Signal System

- Progressive movement in a coordinated signal system sometimes necessitates installing traffic control signal installations at intersections where they would not otherwise be needed in order to maintain proper platooning of vehicles.

7. Crash Experience

- The crash experience warrant conditions are intended for application where the severity and frequency of accidents are the principal reasons to consider installing a traffic control signal.

8. Roadway Network

- Installing a traffic control signal at some intersections may be justified to encourage concentration and organization of traffic flow on a roadway network.