

TRAFFIC ENGINEERING

Civil Engineering Department

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Third Class

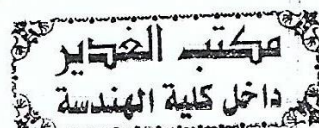
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Driver Characteristics

One of the problem that faces traffic and transportation engineers when they consider driver characteristics in the course of design is the varying skills and perceptual abilities of drivers on highway. This is demonstrated by the wide range of people's abilities to hear, see and react to information.

Driver personality: the driver personality is a broad-based body of knowledge that deals with the driver's natural abilities, learned capabilities and the motives and attitudes.

1. Natural abilities



a) Senses: the driver can receive useful information through feeling, seeing, hearing and smelling.

- Feeling: a driver experiences forces acting on a vehicle, such as the force gravity, acceleration, braking deceleration and corner acceleration.

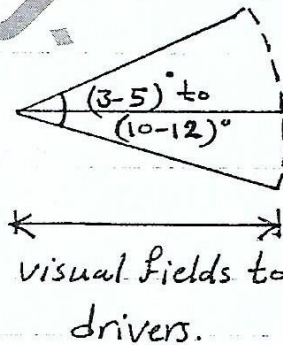
- seeing: is the most important means of acquiring accurate information.

Certain characteristics of visual acuity are of special interest in transportation:

1. Static and dynamic visual acuity.
2. Peripheral vision.
3. d-visual sensitivity.
4. depth perception.
5. glare recovery and night vision.

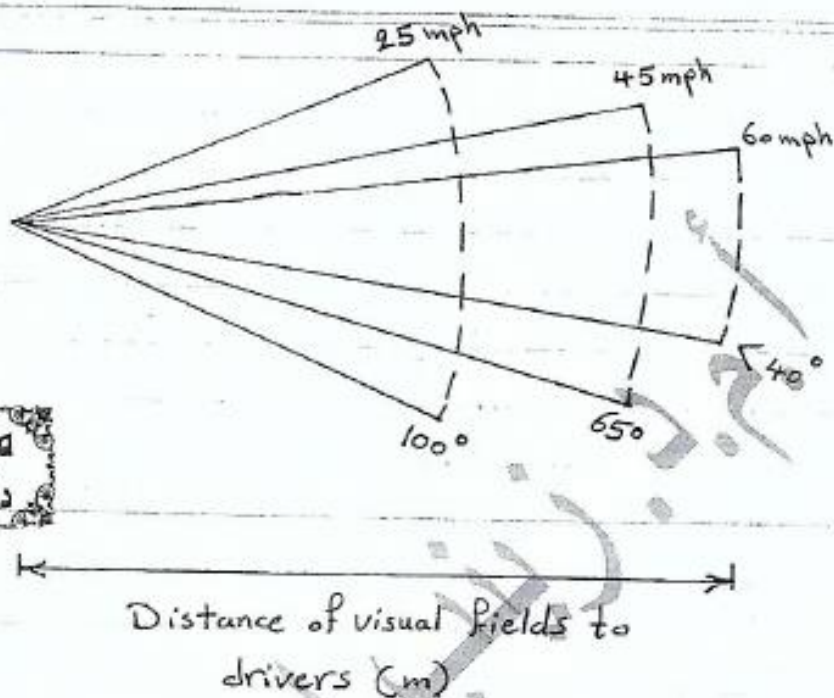
1) Visual acuity : is the ability to see fine details clearly, the most acuit vision is within 3° to 5° and fairly to $(10-12)^{\circ}$ degree clear.

age affect on visual acuity.



2) peripheral vision : ability of people to see object beyond the cone of clear vision. Although object can be seen within this zone, details and color are not clear. Angle of peripheral vision varies between $(120-180)^{\circ}$ degree. speed affects on the peripheral vision.

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- 3) Depth perception: ability of person to estimate speed and distance, it is important in two-lane highway during judging passing maneuvers, where accidents results from lack of proper judgment of speed and distance.
- ⇒ d-sensitivity to colors: it is estimated about 8% of all men and 4% of all women suffer from some degree of color blindness (reduce the ability to distinguish between red and green).

- 3) Glare recovery and night vision: glare from approaching headlights greatly reduces visibility. Night vision and effects of glare have been shown greater negative impacts with increasing age.

Hearing and smelling: hearing is an important to the driver and pedestrian. Although usually not as important vision in the act of driving hearing can be helpful in preventing collision.

The sense of smell is useful to driver in detecting such emergencies as an overheated engine, burning brakes, smoking exhausts, and fires.

b) Mind

- Intelligence: high level not necessary or especially helpful in taking the right decision and is different from one driver to another.

c) Bones and Muscles: by which the driver directs and controls his vehicle.

- stature to fit vehicle and its controls.
- strength to operate controls.

2) Learned capabilities

- Knowledge or information: gained by reading, instruction and by quizzing.
- Skill and habits: gained by practice.

3) Motives and attitudes

How the driver think and feel about many things often lead him to drive unsafely even he can know how to drive well.

motives: makes a driver try to drive well as he can and knows how to.

It is associated with fear of injury and feeling of social responsibility.

attitudes: determine how a driver reacts to a driving situation.

- playing games with other car.
- racing.
- showing off.

4) Circumstances that affect Personality

Which include the following:

- Fatigue.
- Drugs, alcohol.
- illnesses.
- Comfort.
- Time of day, temperature, noise.

Pedestrian Characteristics

- Pedestrian characteristics affect on the design and location of pedestrian control device. Such control device include special pedestrian signals, and crosswalks, safety zones and islands at intersection.
 - Walking characteristics play a major part in the design of some of these controls.
 - observation on pedestrian movements have indicated the walk speed vary for male and female.
 - 4.93 ft/sec. male.
 - 4.63 ft/sec. female.
- The MUTCD suggest use 4 ft/sec. for design purpose.