

2.4 PARKING SURVEY

There are three major types of parking surveys. They are

1. **In-out survey:** In this survey, the occupancy count in the selected parking lot is taken at the beginning. Then the number of vehicles that enter the parking lot for a particular time interval is counted. The number of vehicles that leave the parking lot is also taken. The final occupancy in the parking lot is also taken. Here the labour required is very less. Only one person may be enough. But we won't get any data regarding the time duration for which a particular vehicle used that parking lot. Parking duration and turnover is not obtained. Hence we cannot estimate the parking fare from this survey.
2. **Fixed period sampling:** This is almost similar to in-out survey. All vehicles are counted at the beginning of the survey. Then after a fixed time interval that may vary between 15 minutes to 1 hour, the count is again taken. Here there are chances of missing the number of vehicles that were parked for a short duration.
3. **License plate method of survey:** This results in the most accurate and realistic data. In this case of survey, every parking stall is monitored at a continuous interval of 15 minutes or so and the license plate number is noted down. This will give the data regarding the duration for which a particular vehicle was using the parking bay. This will help in calculating the fare because fare is estimated based on the duration for which the vehicle was parked. If the time interval is shorter, then there are less chances of missing short-term parkers. But this method is very labour intensive.

PROHIBITED PARKINGS

- ❖ Near intersections
- ❖ Narrow streets
- ❖ Pedestrian crossings
- ❖ Entrance driveways
- ❖ Structures such as bridges, tunnel and underpasses

DESIGN OF PARKING FACILITY

The parking facilities may be broadly classified into two types:

- ❖ On street parking
- ❖ Off street parking

On street parking

On street parking means the vehicles are parked on the sides of the street itself. This will be usually controlled by government agencies itself. Common types of on-street parking are as listed below. This classification is based on the angle in which the vehicles are parked with respect to the road alignment. As per **IRC** the standard dimensions of a car is taken as 5.0m x 2.5m and that for a truck is 3.75m x 7.5m .

1. **Parallel parking:** The vehicles are parked along the length of the road. Here there is no backward movement involved while parking or unparking the vehicle. Hence it is the most safest parking from the accident perspective. But it consumes the maximum curb length and therefore only a minimum number of vehicles can be parked for a given kerb length. Since it consumes least width of the road it produces least obstruction to the on-going traffic on the road.
2. **30° parking:** Here more vehicles can be parked compared to parallel parking. Also there is better maneuverability. It causes minimum delay to traffic.
3. **45° parking:** As the angle of parking increases, more number of vehicles can be parked. Hence compared to parallel and thirty degree parking, more number of vehicles can be accommodated in this type of parking.
4. **60° parking:** Here also more number of vehicles can be accommodated.
5. **Right angle parking:** Here the vehicles are parked perpendicular to the direction of the road. Hence it consumes maximum width. Curb length required is very little. Hence there are chances of severe accidents. Also it causes obstruction to the road traffic. But it can accommodate maximum number of vehicles.

Advantages of on street parking:

1. Angle parking is more convenient for the motorists than the parallel parking.
2. From the point of view of maneuverability, angle parking seems to be better than parallel parking which usually involves backing motion.
3. Delay to traffic is minimum with angle parking
4. Parallel parking makes the least use of the width of the street, and this is an important consideration in narrow streets.

Disadvantages of on street parking:

- ❖ **Congestion:** By parking, there will be loss in the street space which leads to the lowering of the road capacity. Hence speed will be reduced, journey time and delay will also subsequently increase. The operational cost of the vehicle increases leading to great economical loss to the community.
- ❖ **Accidents:** Careless maneuvering of parking and un parking leads to accidents which are referred to as parking accidents. Common type of parking accidents occur while driving out a car from the parking area, careless opening of the doors of parked cars, and while bringing in the vehicle to the parking lot for parking.
- ❖ **Obstruction to firefighting operations:** Parked vehicles may obstruct the movement of fire fighting vehicles. Sometimes they block access to hydrants and access to buildings.
- ❖ **Environmental pollution:** They also cause pollution to the environment because stopping and starting of vehicles while parking and un parking results in noise and fumes. They also affect the aesthetic beauty of the buildings because cars parked at every available space creates a feeling that building rises from a plinth of cars.

Off street parking

When the parking facility is provided at a separate place away from the kerb, it is known as off street parking. There will be some area exclusively allotted for parking which will be at some distance away from the main stream of traffic. Such a parking is referred to as off street parking. They may be operated by either public agencies or private firms.

The different types of off-street parking facilities commonly considered are:

- ❖ Surface car parks
- ❖ Paring lots
- ❖ Multi-storey car parks
- ❖ Under ground car parks
- ❖ Roof parks
- ❖ Mechanical parks

Advantages of off street parking:

- ❖ The main advantage of this method is that there is no undue congestion, accidents, environmental pollution and delay on the road as in on street parking.
- ❖ It gives good safety for the parking vehicles.

Disadvantages of off street parking:

- ❖ Main drawback of this method is, the owners will have to walk greater distance after parking the vehicle.
- ❖ It is also not possible to provide the off street parking facility at very close intervals especially in business centers of a city.

Parking statistics:

Parking accumulation: It is defined as the number of vehicles parked at a given instant of time. Normally this is expressed by accumulation curve. Accumulation curve is the graph obtained by plotting the number of bays occupied with respect to time.

Parking volume: Parking volume is the total number of vehicles parked at a given duration of time.

Parking load : Parking load gives the area under the accumulation curve. It can also be obtained by simply multiplying the number of vehicles with the time interval. It is expressed as vehicle hours.

Average parking duration: It is the ratio of total vehicle hours to the number of vehicles parked.

Parking turnover: It is the ratio of number of vehicles parked in a duration to the number of parking bays available.

Parking index: Parking index is also called occupancy or efficiency. It is defined as the ratio of number of bays occupied in a time duration to the total space available. It gives an aggregate measure of how effectively the parking space is utilized. Parking index can be found out as follows:

$$\text{Parking Index} = \text{parking load} / \text{parking capacity} \times 100$$