

CHAPTER 2

CONCEPTUAL FRAMEWORK

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This chapter deals with the various concepts taken as a base while pursuing the study. Some of the concepts are clear in themselves and are self explanatory. In case of some, because of multiple areas in which they are used, the researcher is forced to pick up the explanation suitable for the subject matter of the study.

The concepts are divided into different parts based on their nature.

A) THE TERMS RELATED TO CAPACITY UTILISATION

The term 'capacity utilisation' has management accounting base and applies in general to activity level of the entire business enterprises. It is stated that the choice of a capacity size is usually the result of capital budgeting decisions, which are reached after studying the expected impact of these capital outlays on operations over a number of years. However, it must be noted that although it can be defined and measured in a particular situation, capacity is an illusive concept in the words of M.G.Pathak.

Therefore, capacity planning requires definition and measurement of capacity in a manner relevant to questions which arise in the planning process. It is to be conceded that a

variety of alternative combinations of capacity and operating patterns is usually possible.

To many people, capacity means the restriction or upper limit and this meaning is generally accepted in industry. The term capacity in most cases is applied to plant and equipments installed in the factory. It is still applicable to other resources i.e. people and materials. The shortage of these other resources also affect production or sales of the unit.

The upper limit of capacity, from the point of view of engineering is not attainable due to various difficulties. However, the upper limit of capacity from economic point of view is different. But the management, for the purpose of planning & control specifies the upper limit of capacity, considering the engineering and economic view points. Thus the upper limit of capacity is fixed and imposed by the management.

In this situation, when we desire to consider capacity utilisation and under-utilisation, we have to select a base and draw the conclusions which are realistic. Whatever is the capacity which the management of the unit has stated, taking into account the engineering and economic view points and other resources and difficulties to be overcome to attain that level, that capacity is to be considered for interpretation in this study. In conclusion, in the words P.R.Brahmanand Capacity Utilisation means Improvement in the degree of utilisation, at the

microlevel of production capacity in every line, with appropriate initial provision for the incremental stocks of inputs necessary to bring into greater use the available capacity, has to be a goal of policy.

The commonly used levels of capacity utilisation are given below.

1. Normal Capacity

It is the level of capacity utilisation (which is some percentage above practical capacity i.e.55) that will satisfy average consumer demand over a span of time, that includes seasonal, cyclical and trend factors.

2. Expected Annual Capacity

It is the anticipated level of capacity utilisation for the coming year.

3. Practical Capacity

Some of the persons may differ regarding the meaning and terminology of capacity utilisation. However, many managements want to keep running at full capacity which really means "Practical Capacity". The "normal capacity" for applying fixed costs is "Practical Capacity". Anything less, reduces profits and is undesirable.

From the above discussion it will be clear that the use of the term capacity and capacity utilisation in MSRTC mean the 'practical capacity' and its utilisation. Therefore, the capacity means the practical capacity 50.40% Load Factor in case of Buses i.e. practical attainable capacity, the maximum level at which

the plant or department or buses can operate efficiently. The practical capacity takes into account the unavoidable difficulties in the production or operating process.

B) TERMS RELATED TO VEHICLES

1. Motor Vehicle

Motor vehicle means any mechanically propelled vehicle adapted for use upon roads, whether the power of propulsion is transmitted thereto from an external or internal source and includes a chassis to which a body has not been attached and a trailer; but does not include a vehicle running upon fixed rails or a vehicle of special type adapted for use only in a factory or in any other enclosed premises.

2. Heavy Motor Vehicle

Heavy Motor vehicle means a transport vehicle or omnibus, the registered laden weight of which does not exceed 11000 kilogrammes.

3. Light Motor Vehicle

Light Motor Vehicle means a transport vehicle or omnibus, the registered laden weight of which does not exceed 4000 kilograms.

4. Medium Motor Vehicle

Medium Motor Vehicle means any motor vehicle other than a motor cycle, invalid carriage, light motor vehicle, heavy motor

vehicle or road roller.

5. Omnibus

Omnibus means any motor vehicle constructed or adapted to carry more than six persons (excluding the driver).

6. Midibus

A small bus with a passenger capacity of approximately 20 to 30 persons.

7. Minibus

A small bus with low passenger carrying capacity (8 to 20) that has wide operating flexibility.

8. Public Carrier

Public Carrier means an owner of a transport vehicle who transports or undertakes to transport goods or any class of goods for another person at any time and in any public place for hire or reward and includes any person, body, association or company engaged in the business of carrying goods.

9. Public Service Vehicle

It means any motor vehicle used for the carriage of passengers for hire or reward and includes a motor cab, contract carriage and stage carriage.

10. Stage Carriage

Stage carriage means a motor vehicle carrying more than six persons excluding the driver which carries passengers for

hire or reward at separate fares paid by or for individual passengers, either for the whole journey or for stages of the journey.

11. Axle Weight

It means in relation to an axle of a vehicle, the total weight transmitted by the several wheels attached to that axle to the surface whereon the vehicle rests.

12. Registered Laden Weight

It means in respect of any vehicle, the total weight of the vehicle and load certified and registered by the registering authority as permissible for the vehicle.

C) TERMS RELATED TO TRAFFIC OPERATIONS

1. Route

"Route" means a line of travel which specifies the highway which may be traversed by a motor vehicle between one terminus and another.

A route is a line of travel between two terminal points of a regular service in operation. Services run occasionally as extras to relieve traffic congestion shall not be considered as independent route. If this is regularised and brought under regular schedules of time tables, then this section shall be treated as independent route.

2. Route Kilometers

The actual distance in kilometers between two terminal points of a route as defined above is the route kilometers.

The total route kilometers operated by a Depot / Division / Undertaking is the sum total of the actual length or distance in kilometers of all the routes in operation by Depot / Division / Undertaking.

3. Trip

Trip means a single journey from one point to another, and every return shall be deemed to be a separate trip.

4. Return Trip

Return trip means a complete to and fro journey on a route.

5. Scheduled Trips

All trips planned as per the approved vehicle schedule are known as scheduled trips.

6. Time Table

Time table is a programme of bus services published for the information of the public showing departure and arrival timings at terminals and important enroute points.

7. Vehicle Schedule

A vehicle schedule is the programme of operation of a vehicle on one or more routes operating one or more trips within 24 hours.

8. Schedules Operated by a Depot

The total number of vehicles required daily for traffic operation of scheduled services according to the approved time table is the number of schedules operated by a Depot (Operating Unit).

9. Running Time

The total time provided for operation of a single journey between the terminals.

10. Standard Time (Layover time)

Time scheduled at the terminals to ensure regularity of service and allowing alighting and boarding of passengers.

11. Effective or Service Kilometers

Kilometers actually operated by public service vehicles for purposes of earning revenue are known as effective kilometers.

12. Dead Kilometers

Kilometers covered by public service vehicles in the following circumstances are considered as dead kilometers.

- i) Movement between stand and depot and vice-versa.
- ii) Movement from stand and/or depot to the fueling point and back.
- iii) Movement of vehicles as relief in case of accidents and break-downs.

- iv) Movement of vehicles sent to the point of docking, repairing and reconditioning, while not on schedule.
- v) Movement of vehicles for testing purposes.

13. Gross Kilometers

The total kilometers covered by public service vehicles for earning revenue and for other purposes is known as gross kilometers. It is the sum total of the effective kilometers and dead kilometers.

14. Seating Capacity

Seating capacity means the number of seats offered in a vehicle excluding the seats allotted to the operating crew.

15. Average Seating Capacity

The average seating capacity is calculated as follows

$$\frac{\text{Total Seating capacity of all the vehicles in the fleet held}}{\text{Number of seat kilometers offered}}$$

16. Seat Kilometers Offered

The average seating capacity multiplied by the effective kilometers operated gives the seat kilometers offered.

17. Carrying Capacity (Pay Load)

Carrying capacity means the number of seats offered in a vehicle plus the standees authorised as part of carrying capacity and excluding the seats allotted to the operating crew. The carrying capacity is also known as the 'Pay Load' of the vehicles.

'Standees' means the number of standees permitted to be carried in the vehicle.

18. Fare

The authorised payment for a ride on a passenger vehicle whether in the form of cash, token transfer or pass.

19. Passenger

A passenger means any person travelling in a public service vehicle, other than the driver or the conductor or an employee or the permit holder while on duty.

The term 'total number of passengers' includes all passengers carried either at full fare or at concessional fare. A child passenger is treated as one passenger for working out the total number of passengers carried.

20. Percentage Load Factor

Load Factor is the percentage ratio of passenger kilometers to capacity kilometers. It is also the percentage ratio of actual passenger earnings to expected passenger earnings at full load including standees allowed. For estimating the load factor only income from sale of passenger tickets is taken into account as is done while estimating passenger kilometers.

$$\text{Load Factor} = \frac{\text{Actual earnings}}{\text{Expected Earnings}} \times 100 = \% \text{age Load Factor}$$

D) TERMS RELATED TO PERSONNEL

1. Conductor

"Conductor", in relation to a stage carriage, means a person engaged in collecting fares from passengers, regulating their entrance into, or exit from the stage carriage and performing such other functions as may be prescribed.

2. Driver

"Driver" includes, where a separate person acts as steersman of a motor vehicle, that person as well as any other person engaged in the driving of the vehicle.

3. Spread-Over Duty

"Spread-over duty" means the period between the commencement of duty on any day and the termination of duty on that day.

4. Steering Duty Hours

It is the time spent on active duty at the wheel plus any terminal layover time i.e. the halting time at any handing over, not exceeding a fixed limit prescribed. It also includes time spent on attendance to work related to the operation of the vehicle.

5. Crew Utilisation

The effective utilisation of the crew is measured in terms of average crew utilisation which is expressed either in terms of hours of duty or in terms of the kilometers covered.

Improvement in crew utilisation is expected as a result of crew overtime-man hours also.

6. Average Crew Utilisation in kilometer

The effective kilometers done per crew on duty per day is the average crew utilisation in terms of kilometers. It is obtained by dividing the total effective kilometers done in a day by the number of crew on duty during that day.

E) TERMS RELATED TO WORKSHOP & FINANCIAL MATTERS

1. Vehicles Held

This represents the total number of vehicles held by the Unit (Depot/Division/Undertaking) at a particular point of time. They include

- i) Vehicles on road
- ii) Vehicles held as spares (roadworthy traffic spares)
- iii) Vehicles in workshops
 - a) Under routine inspection
 - b) in off-road condition
- iv) Vehicle awaiting scrapping
- v) Vehicles in transit.

2. Progressive Kilometers of Vehicle

The sum total of the gross kilometers that a vehicle has covered from the day of its commissioning upto date is termed as the progressive kilometers of the vehicle.

3. Rate of Fuel Consumption

The performance of vehicles in respect of fuel consumption is measured in terms of average kilometer per litre of fuel or litres consumed per 100 km.

a) Kilometer per litre of fuel (KMPL) is calculated as given below.

$$\text{KMPL} = \frac{\text{Total gross kilometer covered by the vehicle}}{\text{Total litres of fuel consumed by the vehicle}}$$

b) Litres per 100 kms. (LPHKM)

LPHKM is calculated as given below.

$$\text{LPHKM} = \frac{\text{Total litres of fuel consumed by the vehicle}}{\text{Total gross kilometer covered by the vehicle}}$$

4. Earnings per Kilometer (EPKM)

This is calculated as given below

$$\text{EPKM} = \frac{\text{Total Earnings}}{\text{Total Effective Kilometers}}$$

5. Earnings Per Seat Kilometer Offered

While EPKM reflects the earning potential of a route, it will not indicate the actual revenue realised per seat KM offered (since the carrying capacities of the vehicles vary). The earnings per seat KM is a useful ratio indicating the revenue realised per seat KM offered.

When seat kilometer is selected as a unit of measurement, the resultant ratio will be earnings per seat kilometer. It is calculated as given below.

$$\frac{\text{Total Revenue (Gross Traffic Revenue)}}{\text{Total effective Kms. x average carrying capacity of buses}}$$

6. Cost Per Kilometer (CPKM)

As in the case of revenue, the cost of operations in absolute terms does not by itself indicate the efficiency or otherwise of the service operated. A relative measure of costs has to be worked out to compare the cost of producing the service with the rate of earnings. Cost per kilometer is one of such relative measures, which is computed by selective effective kilometer as a unit of measurement.

The cost per kilometer or CPKM is computed by dividing the total cost of operations by the total effective kilometers. The CPKM is expressed in terms of 'paise' of trips.

Allocation of Schedules

Schedule is a time-table given to a specific bus on a particular day. Under the present system of city bus service, a schedule is assigned to every bus operating on that day. A schedule gives starting time for bus and the duties which the bus will complete through its trips. Thus a schedule will predetermine the duties and the trips therein, for which a bus will operate during

a particular period of time. For example, there are 93 duties under Kagal depot and 40 city buses working for that depot. We can assume that 10% of these buses will not work as these require servicing or maintenance or some may be held up due to the breakdowns and accidents.

Deducting 10% from 40, only 36 buses will operate regularly. Each bus can have approximately 2.5 duties to operate every day. Some buses which are in good condition may be given more load while some others with, say, inadequate light, lack of indicators etc., will not work during night. Hence a schedule will be given considering the efficiency and overall conditions of the buses.