PRINCIPLES OF FREIGHT PRICING

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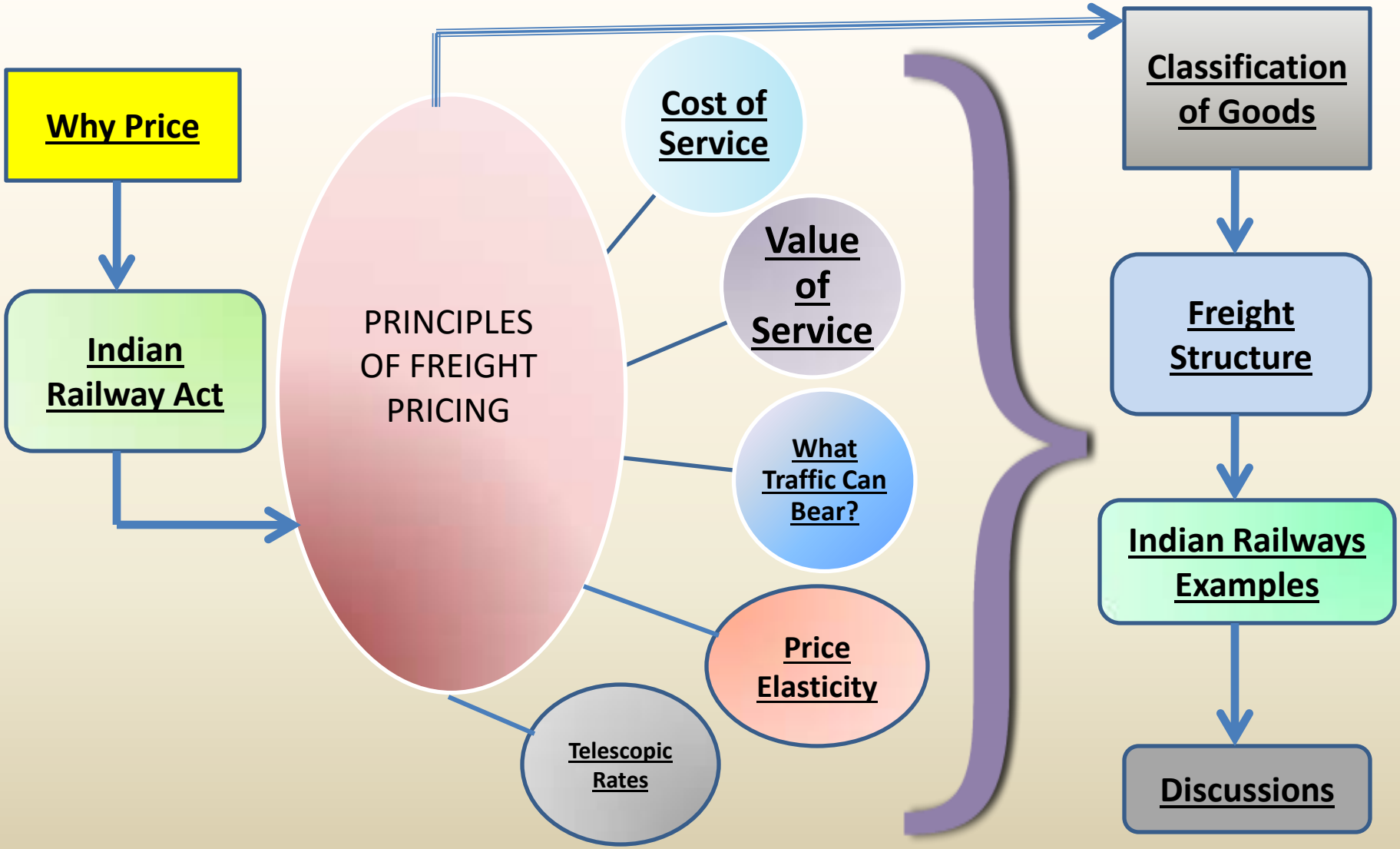
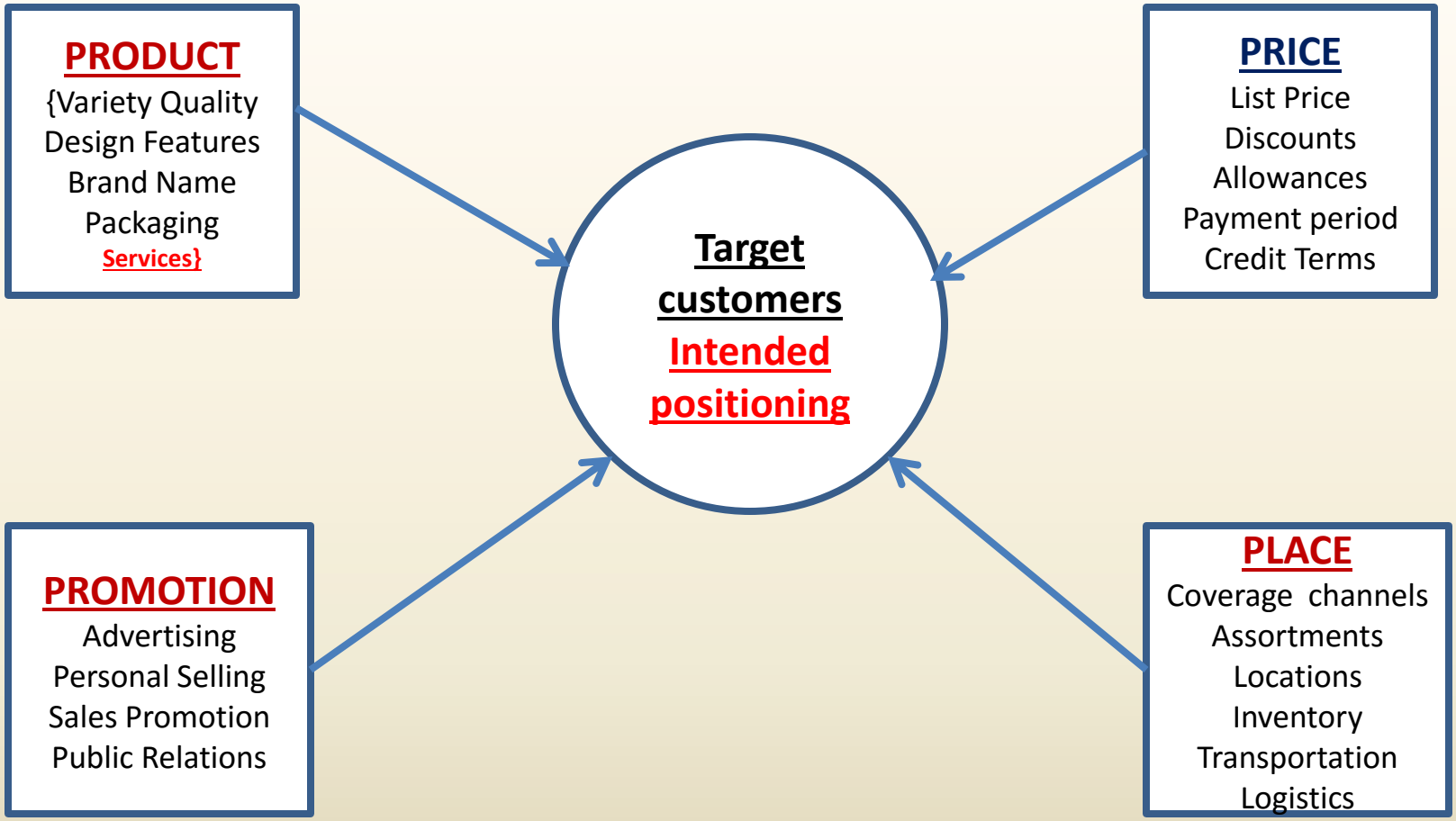
Road Map – Lecture Outline



Four "P"s of Marketing Mix*



Principles of Marketing, Philip Kotler & Gary Armstrong

Railways : Special Features

- Railway Lines -across Length & Breadth of the Country
- Hundreds of Stations
- Multiple Services / Classes : Freight, Passengers, Luggage, Parcels, Railway Mail
- Rail Transportation : **"Perishable"**
- Capital Intensive – Long Gestation Periods
- Suitable Manpower

Railway Freight Business: Special Features

- TRANSPORTATION IS A DERIVED DEMAND & DEPENDS UPON THE GROWTH OF ECONOMY
- RAILWAY FREIGHT BUSINESS LARGELY DEPENDENT UPON THE PERFORMANCE OF CORE SECTOR
- RAILWAYS STILL RETAINS ITS PRE-EMINENT POSITION IN TRANSPORTATION OF BULK COMMODITIES
- EFFICIENT FREIGHT OPERATIONS CRITICAL FOR INDIAN ECONOMY
- COST OF FREIGHT OPERATIONS AND ITS PRICING CRUCIAL

Pricing in Railways : Purpose

- To meet cost of administration
- Maintenance of assets
- **Primary Purpose : Train Operations**
- Liabilities : Pension, Depreciation, Dividend
- Profit Margins for Infrastructure expansion

Railway Pricing

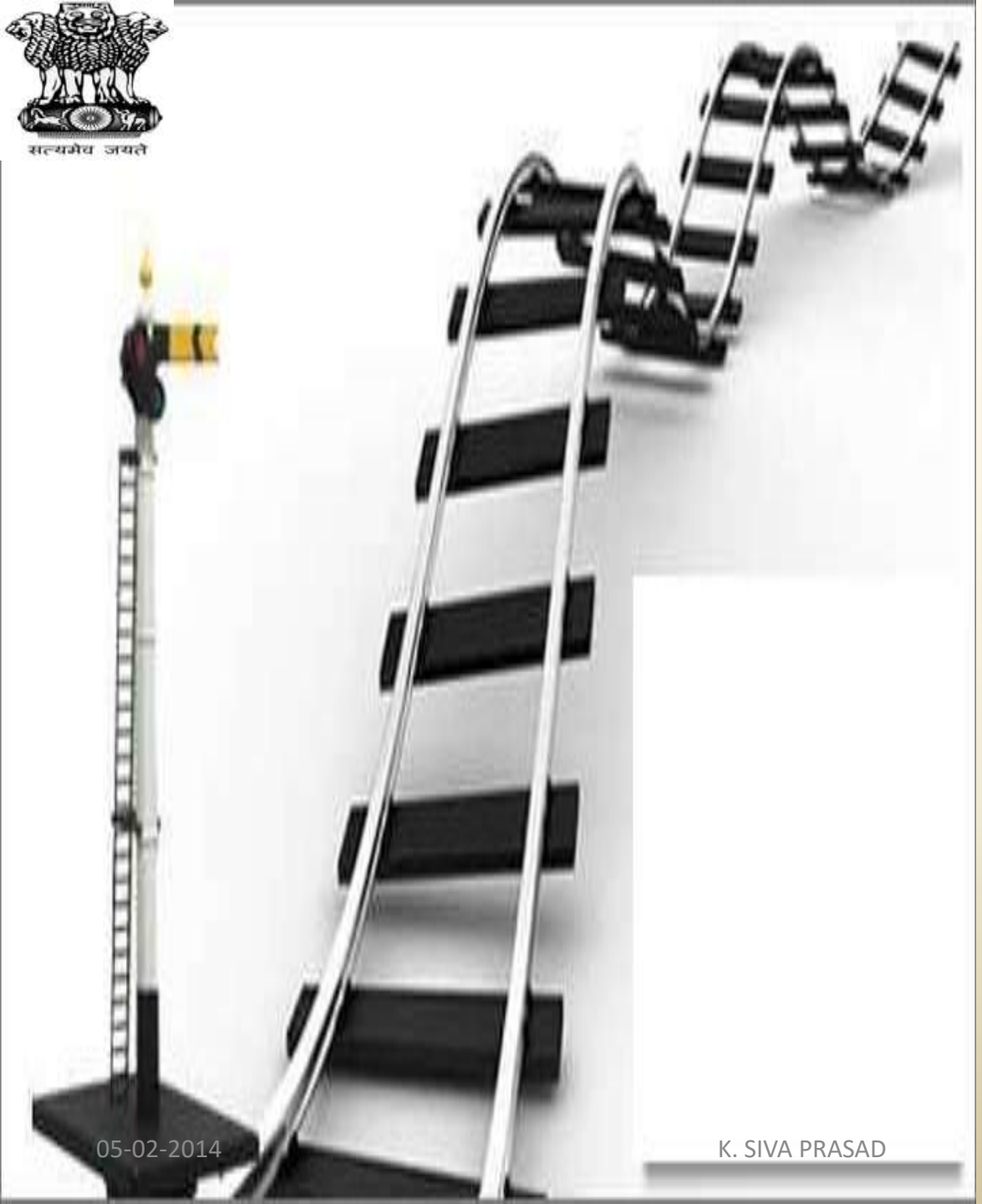
- Concept of margin
- A small unit of output - wagon km of freight
- For a class of service , Class of trains
- Railway costs are variable
- Less than total costs – in short term
- Lead to financial losses
- Do Not Recover All railway running costs
- Common & joint costs are included

Railway Pricing

- ✓ **Competition should be the primary determinant**
- ✓ **Potential competitors**
- ✓ **Least cover a price-floor of the long run variable costs**

Railway Pricing

- To maximize overall economic welfare for the whole community
- Most economically efficient pricing approach prices to equal marginal social costs of railway services
- No prescribed / standard form of market based pricing for railways
- Fixation of Freight Rates – A Centralized Function
- Uniformity of freight rates across the country
- Transparency/seamless provisions for realization of freight charges



Railway Act

Indian Railway Act-1989

Chapter-VI - Fixation of Rates

- Section 30 : Power to Fix Rates

  (i) Central Govt.
- Power to fix rates
- Different rate for different classes of goods
- For whole or any part of Railway

Indian Railway Act-1989

- Section 31 : Power to Classify Commodities or Alter Rates
- Classify/Reclassify commodities
- Increase or reduce the class rates and other charges

Indian Railway Act-1989

Section 32 : Power of Railway Administration to charge Certain Rates

- Quote **Station to Station Rates**
- Increase or Reduce or Cancel
- Alter or Amend Conditions
- Charge **Lump sum Rates**

Indian Railway Act-1989

Chapter IX – Carriage of Goods

Section 70 : Prohibition of Undue Preference

- No undue preference or advantage
- No favor to person or description of traffic

Indian Railway Act-1989

Section 72 : Maximum Carrying Capacity for Wagons

- Normal carrying capacity of wagon
- Now termed as – ***Permissible Carrying Capacity (PCC)*** of Wagons
- Chargeable Weight = PCC of Wagon

P C C of 8 Wheeler Wagons *(in Tonnes)*

Commodity	Type of Wagon	Excepted CC + 6 Routes	Universalized CC + 6 Routes	CC + 8 Routes	Loading Tolerance
Coal & Clinker	BOX N	64	66	68	1
Cement	BOX N	64	66	68	1
Cement	BCN	59	61	63	1
Cement	BCN A/HS	62	64	66	1
Cement	BCNHL	66	68	70	0

Indian Railway Act-1989

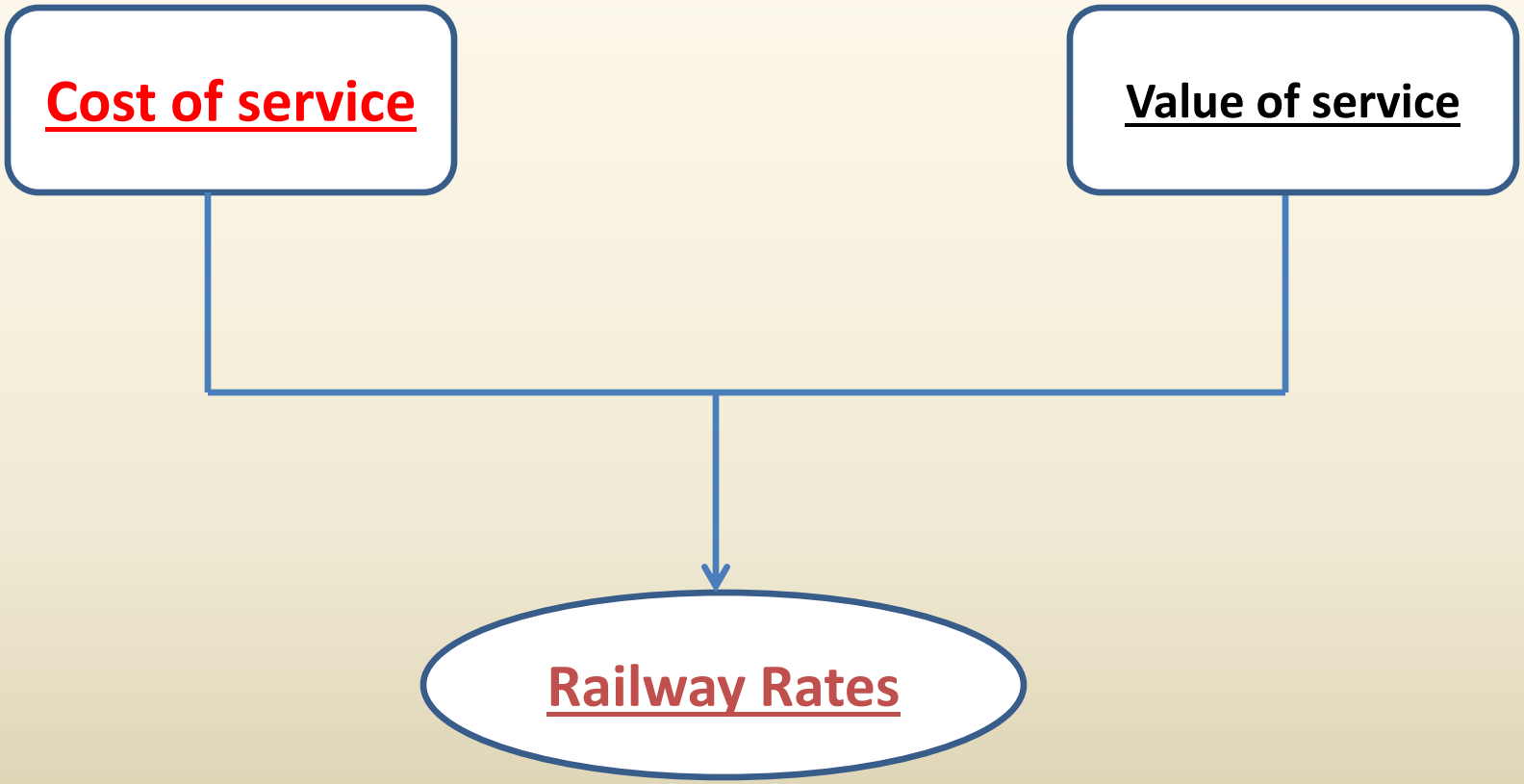
Section 78 : Power to Measure, Weigh etc

Railway administration

- Re-measure
- Re-weigh
- Reclassify any consignment
- Recalculate the freight & other charges

Principles of Railway Rates

Principles of Railway Rates



Cost Of Service

Cost Of Service

- No set Formulae for Costing
- Not an exact Science
- Collection of Data/Trends
- Adjustment to reflect Market Changes
- Railway Working : Domain Knowledge , Basic Understanding

Cost Of Service

- Railways Transport Heterogeneous Goods
- Over Different Distances
- Railways : "Joint Cost Industry"

Cost of service

- Cost of Service ***must not be lower*** than the cost of providing service
- Cost of Service should be the **lower limit** (Floor) for determining the freight rates

Cost of service

Factors determining the cost of service:

- Loadability
- Susceptibility of the commodity to damage
- Railway's liability for claim compensation
- Requirement -Special type of wagons/Special handling
- Size of Consignment
- Type of commodity -damage to other commodities
- Regularity of movement
- Empty haulage of Wagons for providing transport

Value Of Service

Value of service

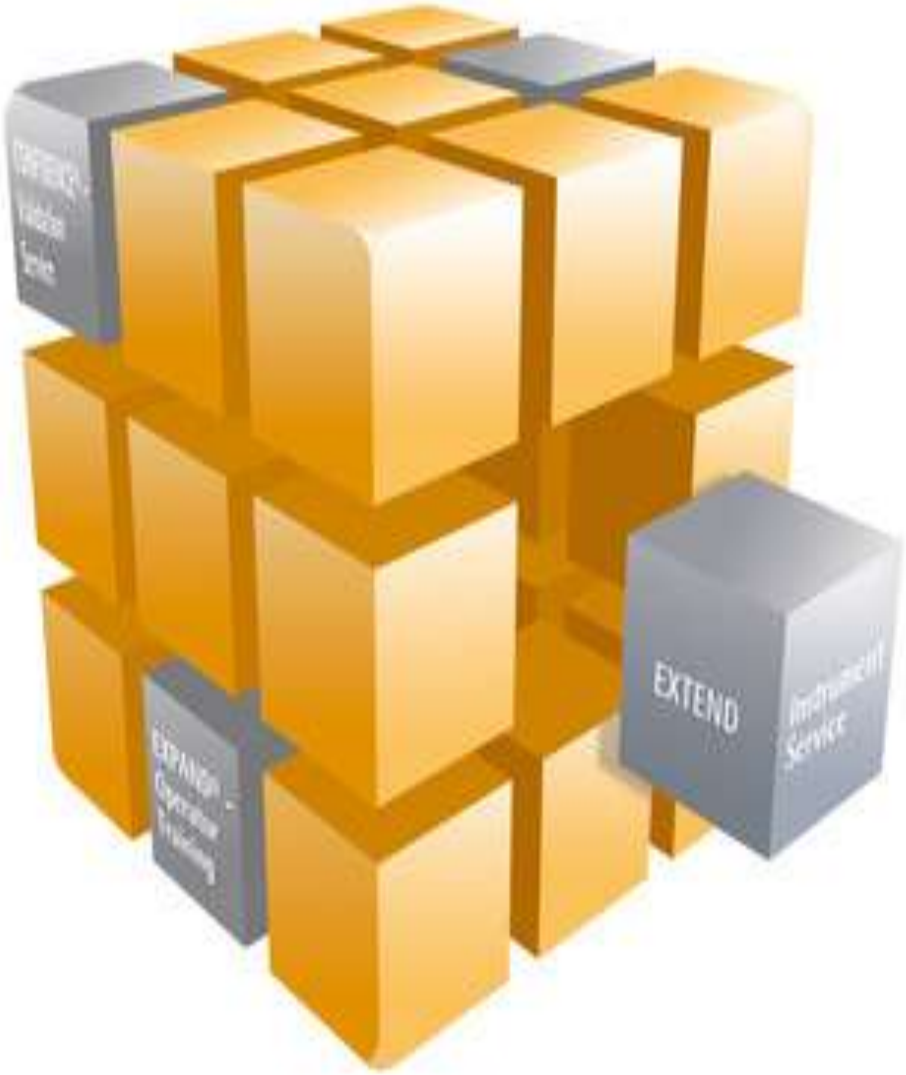
- Enables Railways to try & Realize as much as possible from margin resulting from Transportation from one place to another
- Augmentation of value consequent to transportation
- Value of service must not exceed value of service to the customers
- Value of service should be the **upper limit** (Ceiling) of the freight rate

Value of service

Factors determining value of service

- Value of the commodity at the destination as compared with the value at the originating station
- Competition from other modes of transportation
- Potential competition from new sources of production and new markets
- Classification of comparable and related commodities

Discussion - Cost & Value of service



Cost of service & Value of service

- Railway charges ought to be based on the cost incurred in rendering either a particular service, or the entire gamut of rail services
- For services like transportation conducted under monopolistic conditions, the ideal system of charging would be to ascertain the cost of each service rendered
- To allow a reasonable margin of profit over and above that amount
- Such a basis is impossible as no one knows as to what is the exact cost of transportation

Cost of service & Value of service

- ✓ Difficult to implement, impossible to ascertain the cost of any railway services
- ✓ None of the fixed charges, and Very few of the operating expenses can be assigned
- ✓ Except rather arbitrarily to the various services
- ✓ Railway cost being uncertain and fluctuating, a rate based purely on the cost of service rendered will have no relation to the capacity of the commodity to bear it
- ✓ Thus it is difficult to find any positive, objective basis for a system of railway rates based on costs

Cost of service & Value of service

- Rates must be fixed in advance before the service is rendered
- Cost can be known only after the service has been rendered that too only approximately
- System of Joint Costs
- Railway system is used for diverse goods and services - joint costing
- It is impossible to base railway rates on the principle of cost of transportation alone
- In practice for pricing exercise Cost is of secondary importance

Cost of service & Value of service

- Principle of joint costs - justifies discrimination by the railways
- Competition from alternative modes
- Railways cannot charge up to the physical limit of the rail user can bear
- **"What Commodity is willing to bear"**

Costing/Pricing - Difficult Exercise

- ***"Volumes have been written to show that railway rates ought to be based on the costs of carriage...such a basis is impossible, as no one knows, or can know, what the cost of carriage is. Cost of carriage of a particular item may mean the additional cost of carrying that item; this is normally so small as to be negligible. It may mean the additional cost plus a fair share of the standing costs of the organization... an arbitrarily estimated proportion of a sum that can only be ascertained very roughly."***

- ***"It is an art and not a science"***

"William Acworth, Railway Economist"

“What Traffic Can Bear?”

"What Traffic Can Bear"

"Fixing the charges for each variety of goods according to its ability to pay for transportation"

- High value goods pay more
- Commodities classified at higher classes pay not only - (i) - their approx. share of general costs,

  & (2) - share joint cost that low rate commodities are not able to pay

- Classification

Price Elasticity

Price Elasticity

- Application of Economic principles &formulae – Railway Pricing*
- Long run variable costs are inversely proportional to price elasticity of demand
- Commodities with a low elasticity of demand - coal are charged higher than the customers with high elasticity of demand - Container Shippers
- Difficult to establish precise elasticity of demand for each commodity

Frank Ramsey in 1927, Mathematician

Price Elasticity

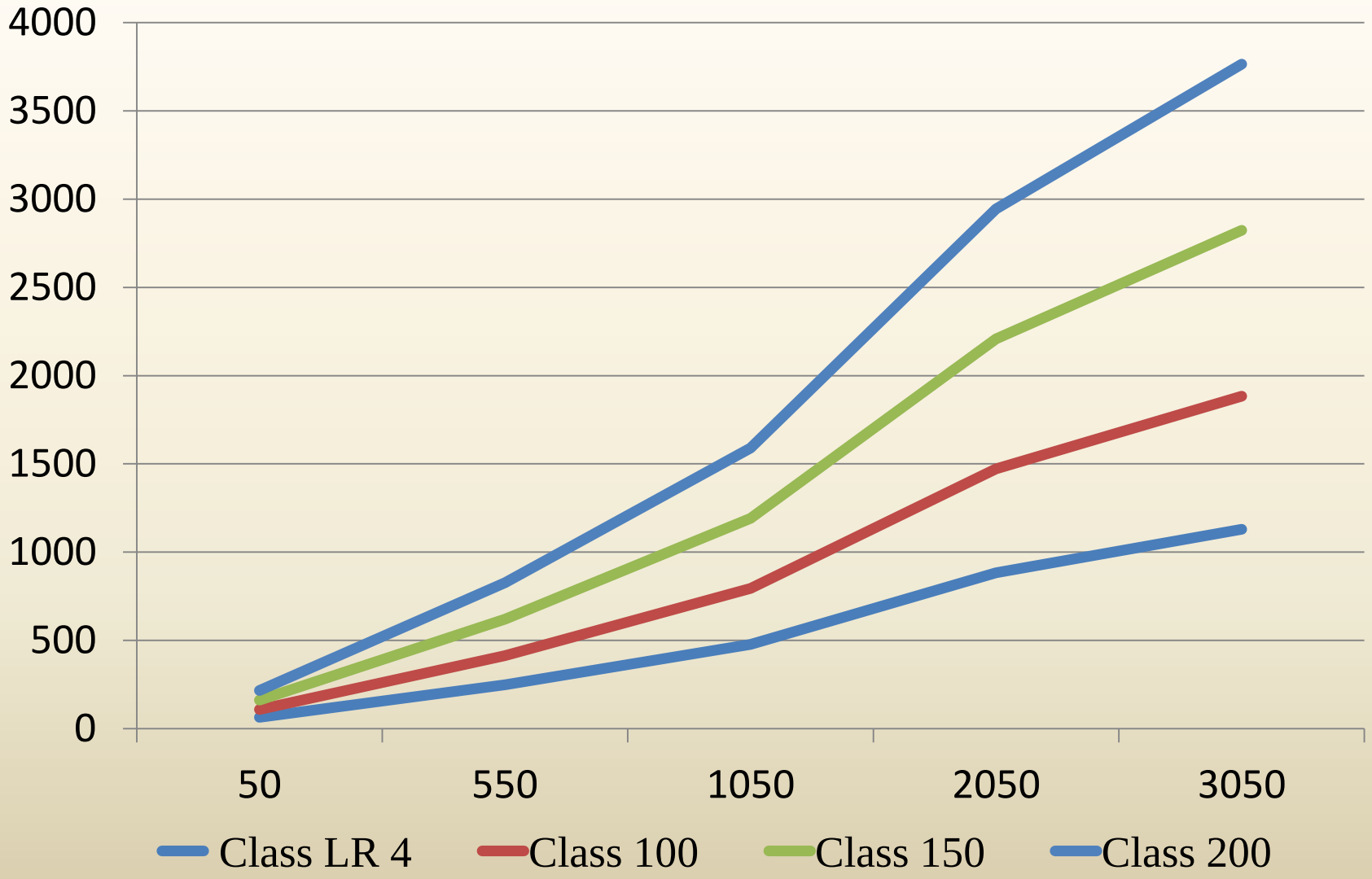
- Necessary – Data on Trends, Competition, effect of prices on customer volumes.
- General principle of commercial pricing - To establish relationship between prices that will maximize contribution to railway fixed costs
- Do not price below long run variable costs

Telescopic Rates

Principle of telescopic rates

- Average haulage cost per km. declines with distance
- Terminal cost remains same for - short distance or long distance Traffic
- "Principle of telescopic rates" –scientific
- Rail user pays less for long distance traffic
- Costs less to railways to carry traffic for longer distances

Telescopic Rates – Tapering Effect



Classification of Goods

Railway Freight Structure

- Country wide uniformity in tariff
- Uniform telescoping of rates for all commodities
- No regional, directional- sensitivity
- Tenuous linkage with input costs
- Cross subsidization across various commodity groups

Classification of Goods

Objective :

"To ensure **maximum traffic** moves **at different scales of rates** and **total traffic increases**"

Principles classification of goods

- Indian Railways carry variety of commodities
- Railways do not charge same rate for all commodities
- Only highly valued commodities will move over longer distances
- Commodities with very low value will not to move by rail
- Grouping of commodities – **"Classification of goods" to fix Tariff**

Principles classification of goods

- Division into different groups for levy of freight charges
- Each group is charged at different rates
- Based on twin principles of – (i) **Cost of Service and (ii) Value of Service**
- Value of service principle – leads to **"What the traffic can bear"**

Principles classification of goods

- Value of the goods
- Relation between Volume (bulk) and weight
- Liability to damage
- Packing for consignment
- Size of the consignment (Smalls/ Wagonloads/ Trainloads)

Principles classification of goods

- Regularity of Traffic
- Type of wagon required
- Empty haulage of wagons
- Railway Risk (RR) Vs Owner's Risk (OR)

Classification of Commodities

- **Goods Tariff Part-I (Volume-II) :**
- **15 Classes for 26 Groups of commodities**

- **22 groups of commodities under General Tariff**

+

4 divisions under Low Rated Tariff

Classification of Goods

- Commodities classified into 15 Classes
- Base class is class 100
- Lowest class is LR-4
- Equivalent to class rate of 60 {Freight cheapest}
- Highest class 200 {Freight maximum}
- All other commodities come in between
- Any commodity does not figure in list - charged at **Composite Base Freight Rates** - of **Wagon Type**

Classification of Commodities

A commodity which has not been included in the Goods Tariff, will be charged at Composite Base freight rates applicable for the wagon type in which it is loaded.

Tank Wagons	**Class 200**
Flat Wagons	**Class 180**
Open Wagons (including Hoppers)	**Class 160**
Covered Wagons	**Class 150**

Classification of Commodities

15 CLASSES

LOW RATED – 4	100	**140**	180
LOW RATED - 3	110	**150**	190
LOW RATED - 2	120	**160**	**200**
LOW RATED - 1	130	**170**	

Class - Commodity

- LR - 4 = Bamboos, Fodder & Husk etc..,
- LR - 3 = Paper, Charcoal etc.,
- LR – 2 = Timber Waste etc.,
- LR – 1 = Jute, Fire Wood, Jagree etc..,
- Class – 100 = Cranes, Floating Fish Feed etc.,
- Class – 110 = Salt
- Class - 120 = Sugar, De-Oiled Cake, Soya been
- Class – 130 = Foodgrains, Chemical Manures
- Class - 140 = Caustic Soda,

Class - Commodity

- Class – 150 = Cement, Coal, Clinker etc.,
- Class – 160 = Bauxite, Dolomite etc.,
- Class - 170 = Coal Tar, Bitumen
- Class – 180 = Aluminium Powder, Iron or Steel
- Class - 200 = Petroleum Products, Acids etc.,

- **Wagon Loads**
- **Train Loads**

Classification of Commodities

	TRAINLOAD CLASS	WAGONLOAD CLASS
(a)	Class LR4 to Class LR1	Class 120
(b)	**Class 100 to Class 140**	**Class 150**
(c)	Class 150 to Class 190	One Class Higher
(d)	**Class 200**	**Class 200 + 5%**

Classification of Goods

- Chargeable carrying capacity was made uniform (01-04-2005)
- Charging - Permissible Carrying Capacity (PCC) of that type of wagon.

CHARGES FOR GOODS TRAFFIC

- Minimum distance for charge: 100 kilometers
- Minimum weight for charge: PCC of wagon
- Minimum freight charge: Rs.50.

Freight Rates for different classes

Railway Board publishes Freight Rate Tables (1)

- Different distance slabs
- Class wise freight rate
- Freight rate per tonne
- There is a taper with increasing distance
- Which is the same for all commodities in that class

Freight Rates for different classes

Railway Board publishes Freight Rate Tables (2)

- Freight Rates are rounded off to next higher Rupee
- Pre Payment – "p"
- To– Pay : **Surcharge** applicable for booking
- Owner's Risk (OR), Railway Risk (RR)
- OR Booked at RR – Payment of **Surchage** (20%)

Freight Rates

Distance	Class LR 4	Class 100	Class 150	Class 180	Class 200
1-100	64.60	107.70	161.60	193.90	215.40
501-550	271.60	452.60	678.90	814.70	905.20
1001-1100	522.40	870.60	1305.90	1567.10	1741.20
2001-2500	1003.30	1672.10	2208.20	3009.80	3344.20
3001-3500	1248.90	2081.50	3122.30	3746.70	4163.00

Distance in KMs | **Class Rates in Rs per Tonne**

Freight rates for different classes

- Rates for different classes are modified –increased/ decreased
- Marginal adjustments -increased/reduced in last couple of years
- Our perception/understanding of what the traffic can bear
- No exercise /analysis of the cost of operation- for fixing rates
- In most cases it is not only difficult but impossible
- Cost of hauling a food grain rake and a cement rake is the same **but are not be charged equally**

Freight Rates for different classes

There are two ways of changing the freight rates.

- Static Method is to change the base freight rate of class 100 at distance slab 1-100 kms.
- Thereafter base freight rate of class 100 across all distance slabs will get changed automatically,
- As per the distance multiplication scale
- Dynamic Method is change the freight rate of a particular commodity without disturbing the freight rates of other commodities.

Freight Rates for different classes

There are two ways of changing the freight rate of any commodity

In case freight rate of a particular commodity is to be increased, then the same can be done

(1) Increasing the freight rate for that class

- in which case freight rate of all commodities in that class will be uniformly increased

(2) The classification of that particular commodity can be increased

- Here the change does not effect any other commodity

Freight Tariff - General

- **Normal Tariff Rate (NTR);**

  (1) Base freight rates: - Rates published in goods tariff

  (2) NTR Will comprise of Base freight rate + various **Demand Management Charges**

  (3) Other charges like punitive charges for overloading, penal charges for mis-declaration will be will be levied on NTR

- **Development surcharge:**

  This charge is levied as a % on NTR

- **Terminal charge:**

This charge is levied on the tariff originating and terminating at Railway owned terminals and sidings and not terminals owned by customers.

Surcharges

LEVIED ON BASE FREIGHT

- Demand Management Charges (DMC):
  - **Busy season Surcharge**
  - **Congestion Surcharge**
  - **Supplementary Surcharge**

- **(Base Freight + DMC) = NTR**

LEVIED ON NTR

- **To Pay surcharge: 5%**
- **To Pay Surcharge (Coal): 10%**
- **Development Surcharge: 5%**

Example of freight estimation

Application of Freight Rates

Entire cycle has following activities

- Goods tariff, Part I (Vol.II)
- Through distance table
- Junction distance table
- Freight rate table

Now FOIS – simplified working

Freight rates for different classes

- Freight structure is simplified to make it field staff friendly
- When a customer comes to book his consignment, the CGSR first checks up Goods Tariff No.46 Pt.1 (Vol.II), which is the book of classification in order to:

  - verify the class of the commodity

  - let us say **Cement**

  - Class is **150**

  - Thereafter the CGSR will calculate the distance through FOIS i.e. through **Rates Branch System (RBS)** application

Example of Freight Estimation

Let us say the customer wants to load Cement from Malkhaid Road (MQR) Station to Whitefield (SGWF) Station in 42 BCNAs

The distance from MQR to SGWF	= 542 KMs
PCC of wagon in CC + 8 route	= 66 Tonnes
The total weight(42 BCNA x 66 T)	= 2772 Tonnes.
Cement	= 150 class
BFR (base freight)	= Rs. 678.90
+ Busy season surcharge @15% on BFR	= Rs.101.84
Normal Tariff Rate (NTR) = (BFR+ BSS)	= Rs.780.74
+ Development surcharge @5%on NTR	= Rs.39.04/-
Freight Rate per tonne (780.74+39.04)	= Rs.819.78

Freight Rate

- For BCNA rake = 2772 T x Rs. 819.78/-
  = Rs. 22,72,430.16.
- Rounded off to = Rs.2272431
- Service Tax@ 3.708% = Rs. 84261.74/-
- Rounded off to = Rs.84262
- Total Freight = Rs.2272431
  + 84262

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Rs.23,56,693/=

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WHEN GOING GETS TOUGH

TOUGH GETS GOING

Thank You!