VI. Measures and Standards

Public Transport
Planning and Regulation:
An Introduction

Planning and Analysis Building Blocks

Schedule Building

Cost Analysis and Financial Planning

Performance Analysis

Focus of Discussion

Measures & Standards

Service Monitoring and Data Collection

Network and Route Design

Fares and Revenue: Policy, Analysis, and Collection

Market Factors and Demand Analysis

Terminology and Basic Relationships

Relationship Between Measures and Standards

Measure

The Quantitative Degree of Attainment of An Objective

e.g., Operating ratio (total revenues/ costs) helps assess financial performance

Standard

The Lowest or Highest Level of Performance Which Is Acceptable

e.g., The operating ratio for each route (or system) should be greater than 1.00

Why Are Measures and Standards Needed for Public Transport?

- **Public transport resources are limited**
  - **Must ensure resources put to most effective and efficient use in design and operation of services**
- **Standards needed to define government expectations for private operators**
  - **Regulation: Competition *in* the market**
  - **Tendering: Competition *for* the market**

Key Development Criteria for Measures and Standards

- **Reflective of government policies and community needs**
- **Understandable to government decision makers and private companies/ operators**
- **Measurable**
  - **Quantifiable**
  - **Replicable**

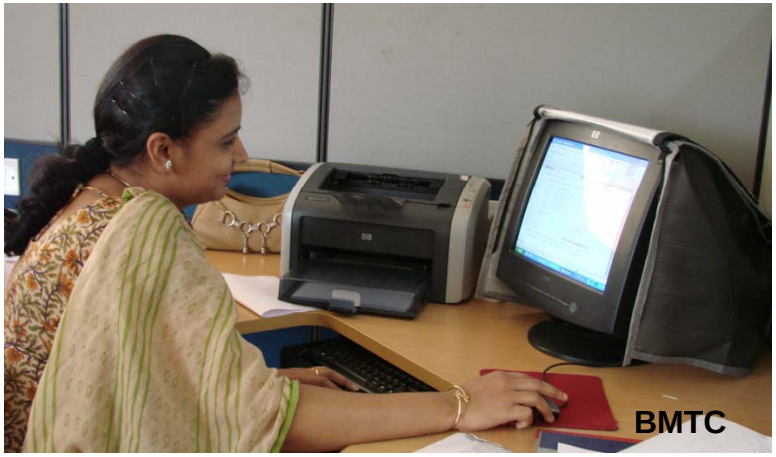
Note

- **The examples in the following slides reflect *measures* that are consistent with best professional practice**

- **However, *standards* should reflect local policies, operating conditions, and financial resources**
  - **The standards in the following slides may not be applicable to all situations**

Design Measures and Standards

- **Often define the minimum criteria for a bus service, e.g.,**
  - **Geographic Coverage**
  - **Stop Spacing**
  - **Policy Headways**
  - **Service Span**
  - **Transfers**



- **Generally address user concerns**

Geographic Coverage

Measure	**Walking Distance to Bus Stops**
Application	**Network**
Standard	**Maximum Walking Distance**
	Maximum of 500 meters

Bangalore Metropolitan Transport Corporation

Bangalore

Stop Spacing

Measure	**Distance between Designated Bus Stops**
Application	**Route**
Standard	**Maximum Distance**
	Trunk 500 meters
	Feeders 300 meters

Megabus Pereira

Policy Intervals

Measure **Minutes between Bus Arrivals**

Application **Route**

Standard **Maximum Interval**

Route Type	Minutes
Trunk	8
Feeder	15

MetroCali, Colombia

Service Span

Measure — **Clock Hours During Which Service is Operated**

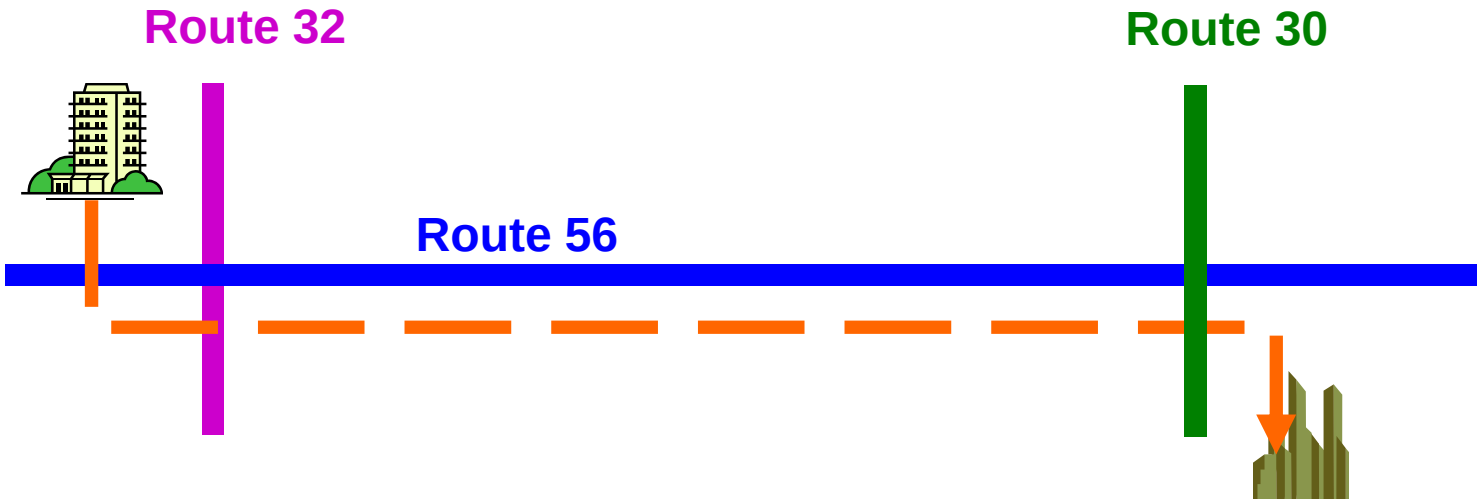
Application — **Route**

Standard — **Minimum Hours**

Day	Service Span
Work	Cover work travel (Longest span)
Non-Work (weekend)	Cover main shopping hours

Transfers

Measure	**Percent of Passengers Making One or More Transfers**
Application	**Route**
Standard	**Maximum Depends on Network Design** **Grid: 50-70%** **Radial: 20-30%**



Quality of Service

- **Attributes important to users**
  - **Some measures may be used in contacts as incentives or penalties**

- **Examples**
  - **Vehicle Reliability**
  - **On-Time Performance**
  - **Occupancy Rate**

Vehicle Reliability

Measure	**Average Kilometers between Mechanical Breakdowns**
Application	**Company/Type of Service**
Standard	**10,000 to 20,000 KM**
	Depends on local street conditions

Schedule Dependability (Regularity) Low Frequency Routes

Measure — **Percentage of Trips Operated On-Time**

Application — **Network/Company/Route**

Standard — **On-time = 0 to 5 Minutes Late**

Minimum of 80% to 95%

Depends on local traffic conditions

Measure used when passengers rely on published schedule

Schedule Dependability (Regularity) High Frequency Routes

Measure — **Percentage of Trips Within ± 90 Seconds of Scheduled Time**

Application — **Network/Company/Route**

Standard — **Minimum of 80%**

Bogotá TransMilenio

Occupancy Rate/Load Factor

Measure — **Passengers at Maximum Load Point as a Percent of Capacity**

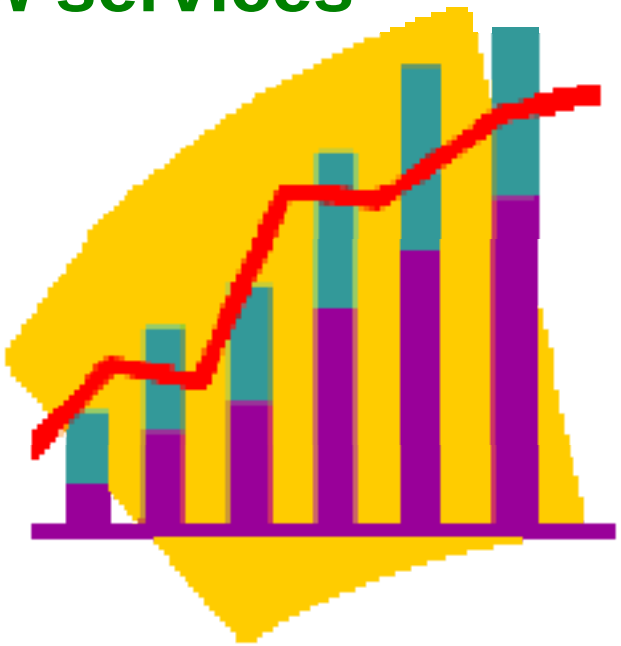
Application — **Route/Time-of-Day**

Standard — **Depends on local conditions, social mores, seating configuration, standing areas, and route characteristics**

Balance between passenger comfort and vehicle efficiency (passengers/vehicle)

Financial Performance

- **Measures used to:**
  - **Evaluate current or new services**
  - **Revise fare levels**
- **Examples**
  - **Passenger Volumes**
  - **Operating Ratio**



Passenger Volumes

Measure Daily Passengers per Operating Bus

Application Network/Company/Route

Standard Minimum Daily Passengers/Bus

Type of Bus	Crush Capacity	Daily Passengers per Bus
Single-deck	80	1,000-1,200
Single-deck	100	1,200-1,500
Single or Double-Deck	120	1,500-1,800
Articulated or Double-Deck	160	2,000-2,400

World Bank Technical Paper 68 *Bus Services: Raising Standards and Lowering Costs*

Highly dependent on local experience

Daily Passengers per Bus
Colombia and Morocco Examples

Colombia	
Armenia	400
Bogotá	432
Bucaramanga	407
Manizales	409
Medellín	392
Morocco	
Casablanca	700

Operating Ratio

Measure — **Total Revenue Divided by Cost (Operating + Capital Depreciation)**

Application — **Network/Company/Route**

Standard — **Minimum of 1.05 to 1.08**

Sufficient to cover costs, stimulate investment and growth

World Bank Technical Paper 68 ***Bus Services: Raising Standards and Lowering Costs***

Total revenue can be viewed in different ways

- ***Company — All revenues including subsidies***
- ***Government — All revenues excluding subsidies***

Some public transport systems (e.g., Bangalore) allow individual routes to be lower than 1.00 and are cross-subsidized by other profitable routes

Summary

- **Defined and provided examples of measures and standards.**
- ***Remember,* many transport systems use similar measures.**
- ***However*, there is less commonality among standards since they depend on local conditions, available funding, and public policy.**