

# **X. Cost Analysis and Financial Planning**

## ***Public Transport Planning and Regulation: An Introduction***



# Planning and Analysis Building Blocks



Schedule  
Building

**Focus of  
Discussion**

Cost Analysis and  
Financial Planning

Performance Analysis

Measures & Standards

Service Monitoring  
and Data Collection

Network and Route Design

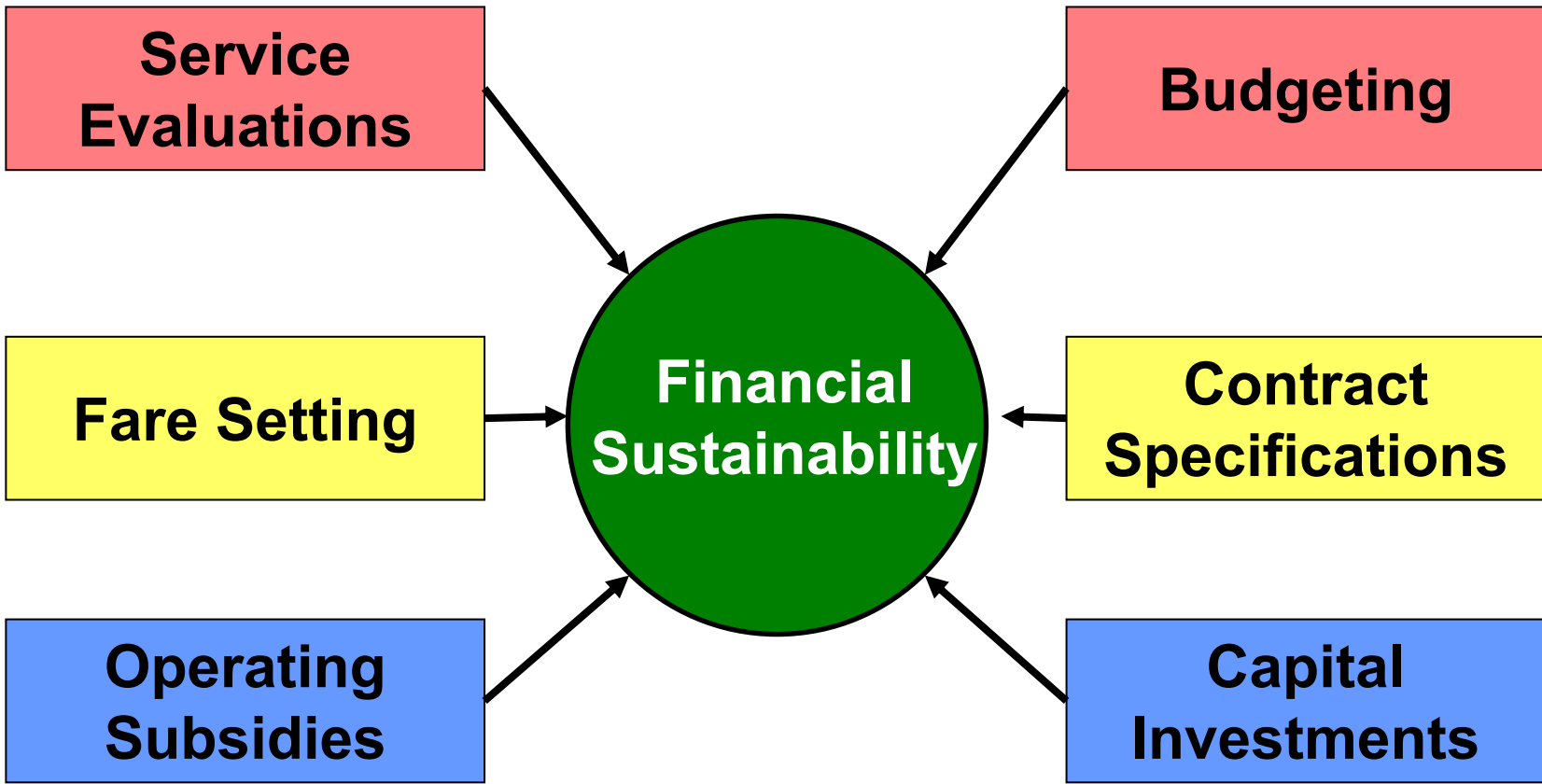
Fares and Revenue: Policy,  
Analysis, and Collection

Market Factors  
and Demand Analysis

Terminology and  
Basic Relationships



# Understanding Costs Is Essential to Effective Management & Governance



# Basic Cost Concepts

- **Total Costs of a Public Transport Operator**
  - **Operating and Capital Costs**
  - **Fixed and Variable Costs**
- **The Key “Drivers” of Public Transport Costs**
  - **KM of Service Operated**
  - **Hours of Service Operated**
  - **Number of Vehicles Operated**



# Total Cost Concept

- **Basic Business Sustainability Principle**

*A public transport system must receive fare and other revenues that are sufficient to cover ALL of its costs*



- **Cost Components**

- **Operating and Capital Costs**

- **Fixed and Variable Costs**



# Total Cost = Operating/Maintenance Costs + Capital Costs

- **Operating/Maintenance Costs** are for items consumed in less than one year  
e.g., labor, fuel, vehicle replacement parts



- **Capital Costs** are expenses for long-term assets, expressed as depreciation  
e.g., buses, maintenance depots, stations,

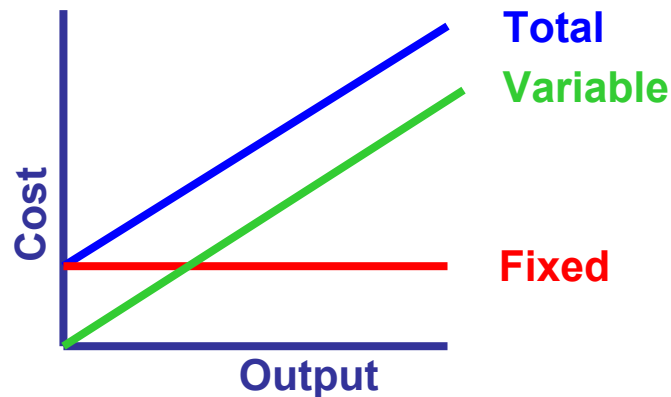


# Life-Cycle and Immediate Costing

- ***Life-Cycle Costing*** considers both operating and capital expenses
  - Funds for eventual bus or infrastructure replacement ***are included***
- ***Short Term “Immediate” Costing*** considers only operating/maintenance expenses (immediate)
  - Funds for eventual bus or infrastructure replacement ***are not included***
- ***Financial Sustainability Depends On Life-Cycle Costing***



# Total Cost = Fixed Costs + Variable Costs



- **Variable costs** vary as service levels change (e.g., operator labor, fuel)
- **Fixed costs** do not vary as service levels change (e.g., administrative salaries, garage electricity)



# Importance of Total Cost Concepts to Public Authority

- **All costs should be included in a financial analysis (e.g., a fare increase)**
  - **Operating/Maintenance and Capital Costs**
  - **Fixed and Variable Costs**
  
- **All costs should be included when assessing the reasonableness of tender bids**
  - **Failure may lead to poor service provision or inability to complete contract**



# Key Cost Parameters

- **Individual expense items change in step with different service and network parameters**
- **Common parameters**
  - **KM of Service Operated**
  - **Hours of Service Operated**
  - **Number of Vehicles Operated**
  - **Passengers**
  - **Facilities (e. g., number of stations, KM of transit way)**





# Colombian Assignment Example

Expense Item	Hours	KM	Peak Vehicles
<b>Staff</b>			
Operations	11.7%		
Maintenance		9.6%	
Gen. Admin			1.0%
<b>Fuel</b>		39.4%	
Parts		2.5%	
Tires		10.1%	
Lubricants		5.1%	
Other Consumables		4.1%	
<b>Depreciation</b>			
Vehicles		13.7%	
Other Assets			2.8%
<b>Totals</b>	11.7%	84.5%	3.8%





# Indian Assignment Example

Expense Item	Hours	KM	Peak Vehicles
Staff			
Traffic	26.1%		
Workshops/Maintenance		3.7%	
Gen. Admin			6.0%
Fuel		37.5%	
Spares & Assemblies		1.2%	
Tyres & Tubes		1.7%	
Lubricants		0.6%	
Other Consumables		1.2%	
Reconditioning		0.3%	
M V Tax		6.5%	
Depreciation			
Vehicles		7.9%	
Other Assets			0.4%
Interest			0.4%
Other Miscellaneous			6.4%
Totals	26.1%	60.5%	13.4%

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# Comparison of Colombian and Indian Examples



- **Fuel is largest single cost item**
- **KM is the most important service parameter driving costs**
  - **Over 60 percent of costs**
- **Differences in examples probably due to differences in the ratio of personnel wages to fuel costs**



# Single Parameter Costing Also May Be Misleading

- Different services have different total unit costs (e.g., cost/KM or cost/hour)
- *Why?* Different combinations of cost driving parameters (e.g., hours, KM)

## Examples

- Local services have *higher driver labor costs/km* than do express services
- Express services *higher fuel and depreciation costs/hour* than do local services



# Problem with Using a Single Parameter Approach: Example

The current contract rate for bus service is \$1.40/KM. What are the estimated costs for new Routes A and B?

Route	Commercial KM	Commercial Hours	Speed (KPH)	Vehicles
A	1,036,800	79,754	13	12
B	1,036,800	39,877	26	6



# Route Cost Using KM Cost Rate

$$\text{Cost} = \text{Commercial KM} * \$1.40$$

$$\begin{aligned} \text{Cost (Route A)} &= 1,036,800 * \$1.40 \\ &= \$ 1,451,520 \end{aligned}$$

$$\begin{aligned} \text{Cost (Route B)} &= 1,036,800 * \$1.40 \\ &= \$ 1,451,520 \end{aligned}$$

*Does this make sense that the costs are identical even though the service on Route B consumes less hours and requires fewer vehicles?*



# Conclusion

## Single Parameter Costing

- ***Be careful*** about using single-factor contract rates for estimating future costs
  - This is particularly important for analyses involving different types of services





# “Good” Incremental Cost Issue in Contracting

- The unit costs beyond the “base service” may be *LOWER* than base service unit cost
- Why?
  - The added service will not require the increase of certain fixed cost items such as supervision and garage facility costs





# “Bad” Incremental Cost Issue in Contracting

- The unit costs beyond the “base service” may be *HIGHER* than base service unit cost
- When?
  - The added service may require the underutilization of new vehicles so that the depreciation cost per KM becomes very high

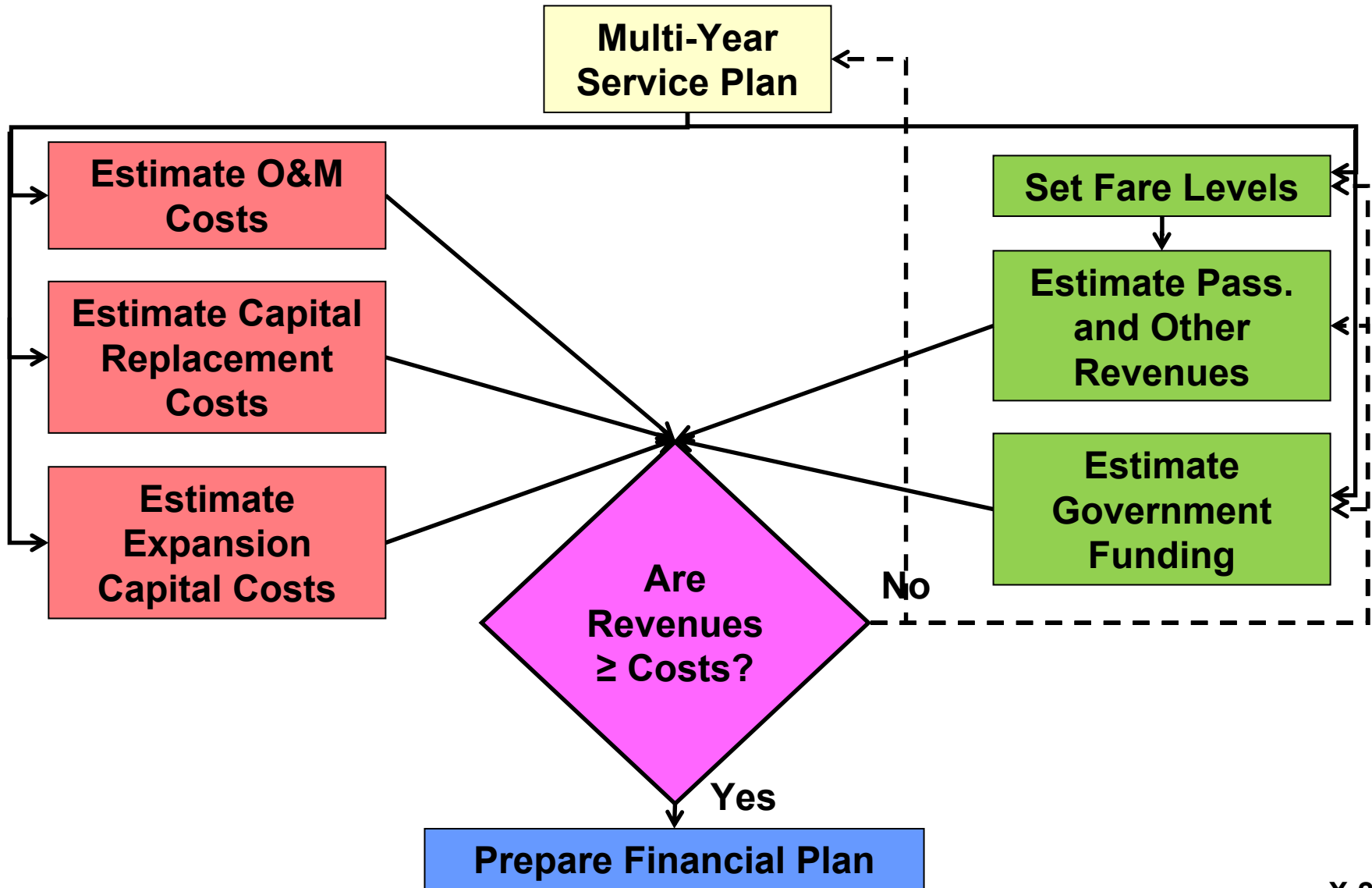


# What is Financial Planning?

- ***Systematic*** approach that produces a ***financially sustainable*** program for implementing a service plan:
  - Maintaining existing services and
  - Adding improved and new services
- **Financial planning addresses:**
  - Operating and maintenance (O&M) and capital financial needs
  - Sources to fund these needs
  - The timely matching of needs and funding



# Financial Planning Process



**Estimate O&M  
Costs**

# Estimating O&M Costs

- **Operation**
- **Administration**
- **Maintenance**
- **Contract Services**



# Estimating Capital Replacement Costs

- **Based on replacing/renewing when needed**
  - **Replaced at the end of their useful lives**
    - e.g., Buses 15 years
    - Shelters 10 years
    - Garages/Stations 50 years
  - **Some items renewed at mid-life points**
    - e.g., Roofs 20 years
    - Repaving 10 years



# Estimating Capital Costs

- **Costs should include additional costs (as needed)**
  - **Engineering**
  - **Procurement**
  - **Testing/inspection**

**Estimate Capital  
Replacement  
Costs**

**Estimate  
Expansion  
Capital Costs**



# Good Public Policies for Setting Fares

- **Fares should be increased as cost inflation increases**
  - **May not have to match inflation if patronage is rising**
- **Regular, small increases are better than infrequent large increases**
  - **Less of a “shock” to riders**
  - **Often less negative public reaction**
  - **Reinforces idea that public transport is no different than other consumer items**





# Options for Addressing Revenue/Cost Gaps

- **Multi-Year Service Plan**

- Delay expansion of selected services
- Revise selected services to reduce costs
- Eliminate selected expansion services

Multi-Year  
Service Plan

- **Fare Levels**

- Move fare increases forward
- Increase the level of fare increases

Set Fare Levels

- **Other revenues**

- Examine potential of capital facilities to be self-supporting or profit-making

Estimate Pass.  
and Other  
Revenues

- **Government Funding**

- Use financial projections to support requests for additional funding

Estimate  
Government  
Funding

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# Summary

- **Defined total cost concepts**
- **Described key cost parameters**
- **Discussed incremental cost issue in contracting**
- **Outlined financial planning process and key activities**
- ***Cost analysis and financial planning are necessary for financial sustainability***

