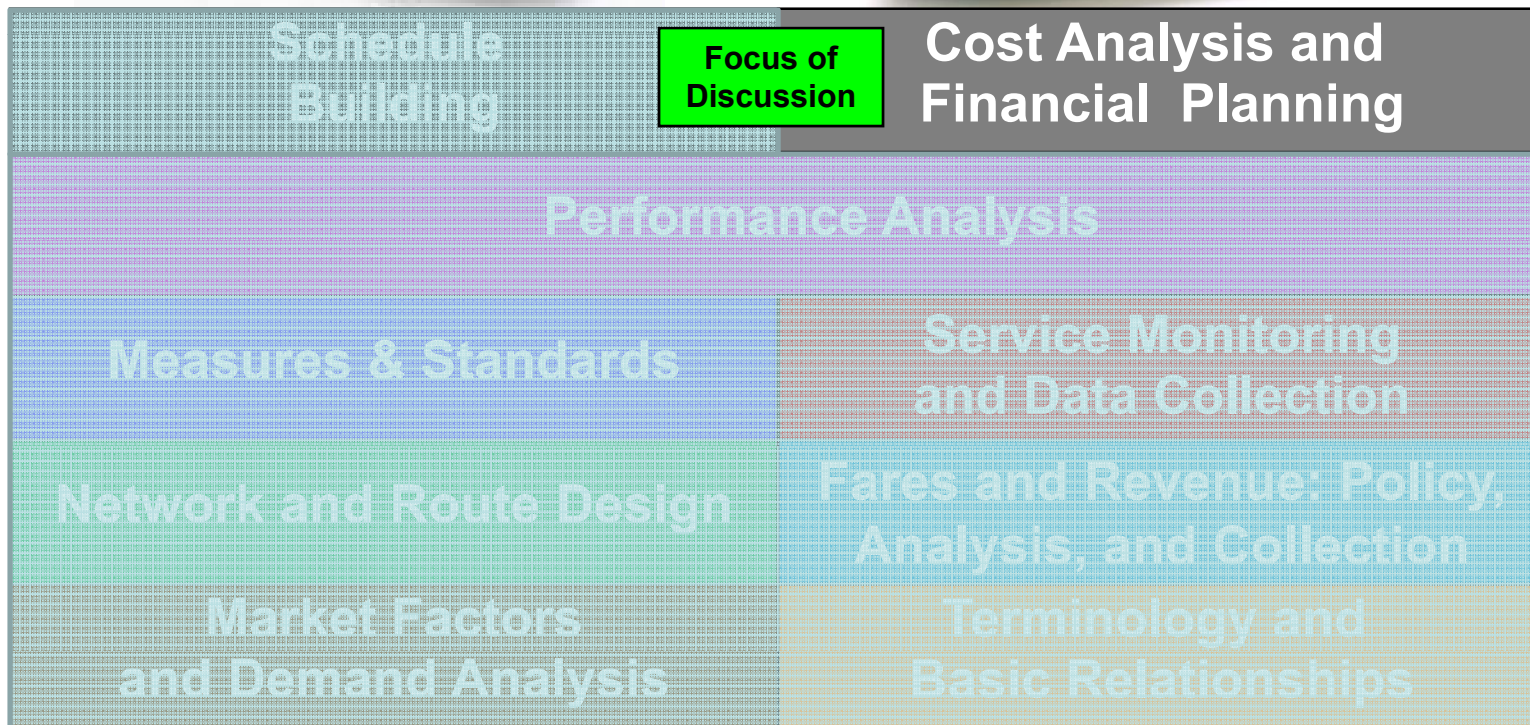# X. Cost Analysis and Financial Planning

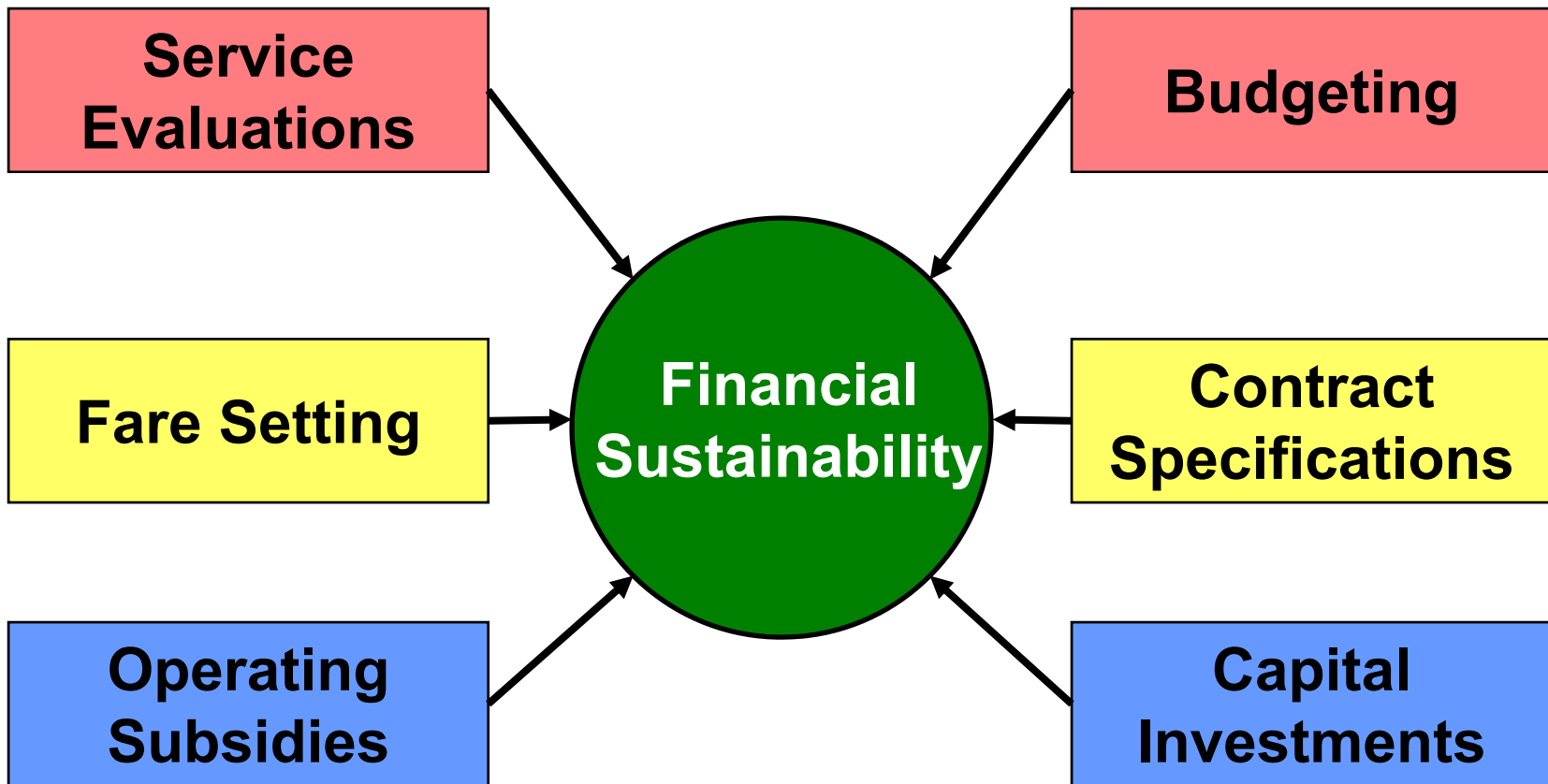*Public Transport*

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

Service Evaluations

Budgeting

Fare Setting

Financial Sustainability

Contract Specifications

Operating Subsidies

Capital Investments

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*

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Total Cost = Fixed Costs + Variable Costs
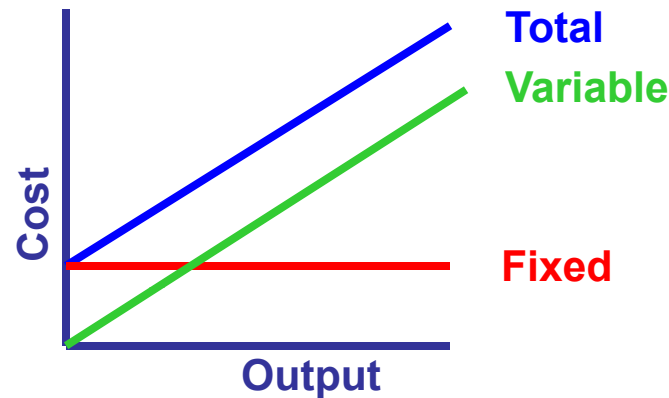
- *Variable costs* vary as service levels change (e.g., operator labor, fuel)

- *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
Staff			
Operations	11.7%		
Maintenance		9.6%	
Gen. Admin			1.0%
Fuel		39.4%	
Parts		2.5%	
Tires		10.1%	
Lubricants		5.1%	
Other Consumables		4.1%	
Depreciation			
Vehicles		13.7%	
Other Assets			2.8%
Totals	11.7%	84.5%	3.8%

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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%

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

Cost = Commercial KM * $1.40

Cost (Route A) = 1,036,800 * $1.40
= $ 1,451,520

Cost (Route B) = 1,036,800 * $1.40
= $ 1,451,520

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
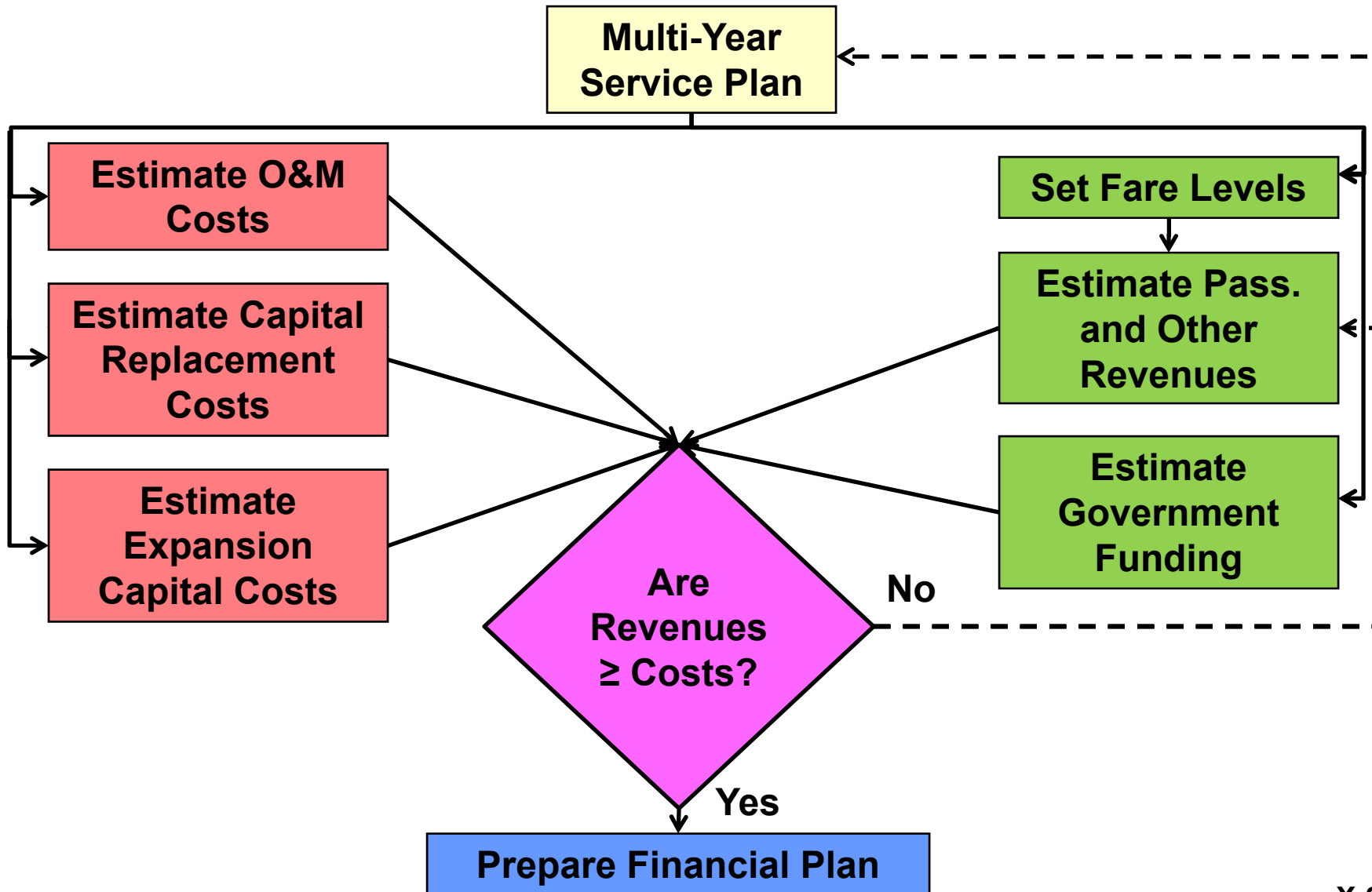
What is Financial Planning?

- *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
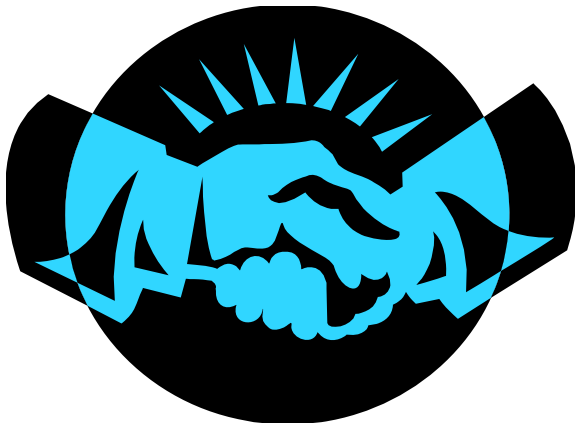 - The timely matching of needs and funding

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Financial Planning Process

Multi-Year Service Plan

Estimate O&M Costs

Estimate Capital Replacement Costs

Estimate Expansion Capital Costs

Set Fare Levels

Estimate Pass. and Other Revenues

Estimate Government Funding

Are Revenues ≥ Costs?

No

Yes

Prepare Financial Plan

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

Are Revenues ≥ Costs?

- **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 activites**
- *Cost analysis and financial planning are necessary for financial sustainability*