X. Cost Analysis and Financial Planning

Public Transport Planning and Regulation: An Introduction
Planning and Analysis
Building Blocks

<table>
<thead>
<tr>
<th>Schedule Building</th>
<th>Cost Analysis and Financial Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus of Discussion</td>
<td></td>
</tr>
</tbody>
</table>

Performance Analysis

<table>
<thead>
<tr>
<th>Measures &amp; Standards</th>
<th>Service Monitoring and Data Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network and Route Design</td>
<td>Fares and Revenue: Policy, Analysis, and Collection</td>
</tr>
<tr>
<td>Market Factors and Demand Analysis</td>
<td>Terminology and Basic Relationships</td>
</tr>
</tbody>
</table>
Understanding Costs Is Essential to Effective Management & Governance

- Service Evaluations
- Budgeting
- Fare Setting
- 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**
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

<table>
<thead>
<tr>
<th>Expense Item</th>
<th>Hours</th>
<th>KM</th>
<th>Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff</td>
<td>11.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maintenance</td>
<td>9.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gen. Admin</td>
<td>1.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel</td>
<td>39.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parts</td>
<td>2.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tires</td>
<td>10.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubricants</td>
<td>5.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Consumables</td>
<td>4.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depreciation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicles</td>
<td>13.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Assets</td>
<td>2.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>11.7%</td>
<td>84.5%</td>
<td>3.8%</td>
</tr>
</tbody>
</table>
## Indian Assignment Example

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

<table>
<thead>
<tr>
<th>Route</th>
<th>Commercial KM</th>
<th>Commercial Hours</th>
<th>Speed (KPH)</th>
<th>Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1,036,800</td>
<td>79,754</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>B</td>
<td>1,036,800</td>
<td>39,877</td>
<td>26</td>
<td>6</td>
</tr>
</tbody>
</table>
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
Financial Planning Process

- Estimate O&M Costs
- Estimate Capital Replacement Costs
- Estimate Expansion Capital Costs

Are Revenues ≥ Costs?

- Yes: Prepare Financial Plan
- No:
  - Set Fare Levels
  - Estimate Pass. and Other Revenues
  - Estimate Government Funding

Multi-Year Service 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
    - Buses 15 years
    - Shelters 10 years
    - Garages/Stations 50 years
  - Some items renewed at mid-life points
    - Roofs 20 years
    - Repaving 10 years
Estimating Capital Costs

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

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

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

- Government Funding
  - Use financial projections to support requests for additional funding
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