Public Transport Planning and Regulation: An Introduction
Day 1: April 24, 2008
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<tr>
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<th>Session Title</th>
<th>Presenter(s)</th>
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<tr>
<td>8:00 – 8:30</td>
<td>Registration</td>
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<tr>
<td>8:30 – 9:00</td>
<td>Welcome and Course Introduction</td>
<td>PPIAF: Banque Mondiale: Ajay Kumar</td>
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<tr>
<td>9:00 – 10:30</td>
<td>1. Strategic Planning for Sustainable Metropolitan Transport</td>
<td>Sam Zimmerman</td>
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<td>10:30 – 10:45</td>
<td>Coffee Break</td>
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<td>10:45 – 11:30</td>
<td>2. Institutions for Urban Transport</td>
<td>O.P. Agarwal</td>
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<td>11:30 – 12:30</td>
<td>3. Measures &amp; Standards</td>
<td>Brian McCollom</td>
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<td>4. Public Transport Reform</td>
<td>Ajay Kumar</td>
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<td>3:45-3:30</td>
<td>5. Public Transport Contracting</td>
<td>Roland Lomme</td>
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<td>3:30-3:45</td>
<td>Break</td>
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<td>3:45-4:30</td>
<td>6. Major Investments as Catalysts for Reform</td>
<td>Gregoire Gauthier</td>
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<td>4:30-5:15</td>
<td>7. Managing the Transition</td>
<td>Roland Lomme</td>
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<td>5:30-7:00</td>
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<td><strong>Day 2</strong></td>
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<td>8:30-10:00</td>
<td>8. Market Factors and Demand Analysis</td>
<td>Sam Zimmerman</td>
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<td>10:15-11:15</td>
<td>9. Network and Route Planning</td>
<td>Brian McCollom</td>
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<tr>
<td>11:15-12:15</td>
<td>10. Public Transport Monitoring</td>
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<td>3:00- 4:15</td>
<td>12. Fares and Revenue: Policy, Analysis and Collection</td>
<td>Brian McCollom</td>
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<td>4:15 – 5:15</td>
<td>Next Steps, Open Discussion, Close</td>
<td>Team</td>
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Public Transport Planning and Reform

Course Objectives

1. Describe Strategic Context For Public Transport
2. Learn Basic Public Transport Characteristics
3. Acquire Basic Service Planning and Analysis Skills
4. Understand Options for Public Transport Provision
I. Strategic Planning for Sustainable Metropolitan Transport

Strategic Planning for Metropolitan Transport: Why?

- Transport problems growing in magnitude and complexity
- Related to other strategic issues:
  - Land use
  - Energy and air quality
  - Safety, security, health
  - Economic competitiveness
- Transport too often implemented and operated in pieces with too little decision support information
Good Strategic Planning
The Key to Successfully Dealing with Growing Challenges

• Improves decision making by providing essential information
• Improves coordination of transport and related policies and investments
• Helps achieve consensus
  – Transparency
  – Involvement
• Helps make best use of scarce resources

Strategic Metropolitan Transport Planning (SMTP)

• Focuses on:
  – Major investment needs/priorities
  – Strategic (long-term, regional) operating and management policies
Examples of Strategic Operating and Management Issues

- Fare policies and integration
- Parking management policies
- Highway pricing policies
  - e.g., gasoline taxes, tolls, congestion pricing

Effective SMTP
“The 5-C Process”

- Comprehensive
- Continuous
- Cooperative
- Connected
- Championed
Comprehensive

- Covers *entire metropolitan area*
  - Does not match administrative and political boundaries
- Addresses transport *and related quality of life issues*
  - e.g., land use, local/global air quality, energy consumption, social/economic development.
- Performed *multi-modally*
  - All surface modes considered at same time
  - MTP done for integrated transport system
    - Not for each mode separately

Continuous

- Continuous monitoring of system travel demand, performance and condition
  - See what is working and what is not
- Updates on a regular basis
  - Plans
  - Planning data
  - Planning tools.
Cooperative

- Everyone with a stake in the transport system participates directly:
  - Public agencies at all levels of government (municipal, province/state, central government)
    - Transport (implementation, operations, regulation)
    - Land development
    - Environmental
    - Social
  - Civil society, e.g., NGO’s
  - Business community
  - Citizens

Process is Legally Connected to Decisions that Matter

- Implementing/operating authorities must follow formally adopted metropolitan, multi-modal plans, programs, policies

- Plans, programs impact spending:
  - Capital projects are consistent with adopted/approved long range plans
  - Annual programs reflect adopted priorities for implementing plan
Statutory Requirement: Decision-Making

Decisions on major investments and/or strategic operating/management policies must take place within the process!

Championed

• The person (people) ultimately governing the planning process
  – Must be a strong, public champion for it
    • Vision, goals and objective
    • Projects and finance
    • System operations and management
  – Should have legal authority to make decisions regarding funding and strategies impacting operations
Strategic Metropolitan Transport Planning Guidelines

1. Begin with a vision
2. Involve the right people
3. Structure process around DM needs
4. Understand causes of problems
5. Consider the right alternatives
6. Develop good decision-support information
7. Strive for transparent decision-making
8. Recognize multi-phase process preceding project implementation
Metropolitan Vision
What Should the Metropolitan Area Look Like in 20 Years?

• Vision includes covers transport and related quality of life issues
• Transport perspective goes beyond congestion:
  – Safety
  – Access as well as mobility
• Vision must be realistic and reasonably consistent with financial and other potential resources

Quality of Life
Important Part of Vision

• Social and economic development
• Land-use
  – Visual illustration of future quality of life
  – Macro scale (10,000 meter altitude view)
    • Balance among jobs, housing, other activities
  – Individual development/site-plan scale
  – Guide as well as “serve” land use
• All aspects of the environment
• Energy
Starting Point? A Vision

• A vision of the metropolis in the future (20+ years) including transport and related sectors

• Projects may be outputs, not inputs

• “Our vision is to have a two-line, 20 Km Metro, 25km of monorail and two ring roads by 2020”
2. Get the Right People to the Table

- Recognize different kinds of decisions and decision-makers
  - e.g., technical versus policy
- Make sure the right people are involved at each step in the process
- Do not forget citizens and the business community
- Prepare and follow a communications and public involvement plan


- Find out what decision-makers and other stakeholders want and need to know as early as possible
- Develop evaluation framework and criteria accordingly
- Structure planning/analysis to generate needed information.
Define and Understand the Problems Needing Solutions

• Analyze current and future (if current trends continue?) transport and related conditions, e.g.,
  – Congestion
  – Health
    • Safety
    • Local air quality
  – Climate change
  – Logistics costs
  – Economic, social development
  – Sustaining existing system

Identify Underlying Causes

• Causes, not symptoms
  – e.g., Land use, not congestion
• Focus on:
  – Demographic, social characteristics
  – Land use
  – Operations and management
  – Pricing
  – Network characteristics
    • e.g., structure, capacity, design, condition
Symptom: Traffic Congestion

Poor Land Use, Site Planning A Possible Cause of Congestion

- Widely dispersed, single-purpose developments (“bedroom” communities)
- Site planning not pedestrian or transit friendly
- Site planning forces dependency on private, motorized modes
Dispersal of Urban Activities

Figure 3. Change of Population Distribution in Beijing


Suburban Office Park
Pune, India
Pedestrian, Bicycle, Public Transport Friendly?

Manila

Beijing
Demand Side
A Possible Cause of Congestion

- Explosive population, income and motorization growth

- Declining household sizes
  - Grown children moving to own homes
  - More trips per capita

- Changing origin to destination patterns
  - Less core-focused, smaller O/D volumes

Changing Travel Patterns
Suburb-Suburb Growing Faster Than Travel to Urban Center

1996 Survey

Projected 2021 Trips

Non-Toronto CBD Trips Growing Fastest

Toronto CBD
Supply Side
A Possible Cause of Congestion

- Pedestrian/Bicycle
- Public transport
- Roads

Pedestrian/Bicycle Problems

- Missing connectivity and coverage
- Poor quality infrastructure
- Little or no street lighting
- Few protected crossings
- Encroachment by hawkers, parking
  - Poor enforcement
Poor Pedestrian Environment

Bangalore

Jakarta

Public Transport Problems

• Little or no regulation
  – Safety, service quality
• Buses stuck in traffic
• Route network
  – Redundant, confusing, unmatched to needs
• Insufficient and/or excess capacity
• Inefficient fare collection
• Poor quality infrastructure and equipment
Inefficient Traffic, PT Operations

Shijiazhuang

Right-of-Way Encroachment
Road Problems

- Insufficient arterial connectivity, capacity
- Poor/non-existent secondary road system
- Insufficient off-street parking
- Poor traffic engineering
- Poor design standards
- Poor enforcement of traffic, parking rules

Incomplete Arterial Grid

Manila
Complete Arterial Grids

New York City

Chicago

Poor/No Secondary Street Network

Fushun, China

Bangkok

Manila
Parking Management

Beijing

Xian

Urumqi

Poor Roadway Design

Ring Road 3 Beijing
Right-of-Way Encroachment

Important Concerns Beyond “Congestion”

- Health
  - Safety
  - Local air quality
- Climate Change
- Logistics
- Economic, Social Development
- Sustaining Existing system
Pedestrian and Bicycle Safety

Motor Vehicle Safety
Public Transport Safety

Emissions: Sources, Relative Impacts?
5 Sustaining the Existing System

Consider the Right Alternatives

• Begin with current and expected “no project” future issues

• Be multi-modal: In public transport studies, consider transit-supportive highway improvements, and vice-versa

• Include land use, systems management and operations policies in package
Be Multi-Modal

• Each alternative should be *judicious combinations* of:
  – Modes: Roadway, parking, and public transport
  – Actions: Investment, management, and operations improvements

• New *highway capacity projects* (e.g., road and expressway widening, new facilities) are excellent opportunities for *dedicated public transport facilities*

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**Road/PT Projects**

- **Barcelona LRT, Arterial**
- **Mexico City Metro, Expressway**
- **Paris, Expressway Median Transitway**
- **Beijing BRT, Expressway**
Land Use/Transport Relationship

Induce

Transport

Serve

Land Use

Strategic Metropolitan Transport and Land Use Alternatives

<table>
<thead>
<tr>
<th>Transport</th>
<th>Land Use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Continue current trend</td>
</tr>
<tr>
<td>Emphasis exclusively NMT, PT/RT</td>
<td>?</td>
</tr>
<tr>
<td>Mixed modes</td>
<td>?</td>
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<tr>
<td>Road emphasis</td>
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</table>

? Consistent LU/Transport Strategy
There Is No One, ”Always Best,” Type of Transport Improvement

• Cover a range of alternatives
  – Types of modes
  – Levels of investment
    • Not just high cost options!!!!!
• Consider more than just metros, ring roads and flyovers.
  – Street/roadway priority, other bus improvements
  – BRT
  – LRT
  – HOV lanes
  – Arterial/secondary road network improvements

Integration is Important in Project Development

• Public transport with roadway improvements
• Metro/BRT with local transit
• Investment with improved operations/management of roadways and public transport
Rapid Transit Options

Road Improvements
Develop Complete, **Objective, Reliable** Decision Information

- Quantitative and qualitative factors
- Focus on people rather than vehicles
  - Travel times
  - Accessibility
  - Reliability
- Economic, environment, land use, energy, and social benefits and impacts
- Life-cycle costs (initial Invst., ongoing Ops.)
- Financial sustainability
- Risk

Analysis Tools and Detail

- Models are planning tools, not magic wands
- Planning tools (e.g., travel forecasting, emissions, costing) should help decision makers distinguish among alternatives
- Sufficiently detailed to support the decision at hand
  - Too much detail is wasteful
  - Not enough detail and there is a risk of inaccuracy
Do Not Slant Analysis to Favor Pre-determined Solutions!!

- Biased assumptions
  - e.g., fares, capacity standards
- Non-competitive alternatives
  - “Straw-men”,
- Under-estimated costs
- Inflated benefits
- Ignored risk

Lima: What Happened?
Strive for Open Decision-Making

• Make decision information available to the general public in a timely fashion
• Hear from all stakeholders, including citizens - before decisions are made
• Inform decision makers of stakeholder concerns before they choose
• Reflect outstanding stakeholder concerns in next development phase

Lima Did Not!
Metropolitan Transport Planning
A Progression of Analyses and Studies

- Long-range, metropolitan strategic plans often do not include project details
  - (e.g., precise alignment, design concepts, mode)

- Subsequent, focused corridor or sub-area studies (e.g., alternatives analyses) provide the requisite detail
Each Successive Step Adds Detail

- Examine mode and/or alignment alternatives in more detail, e.g.,
  - BRT versus LRT versus Metro
  - New highway versus widening and management of existing highway
  - Elevated/subway versus surface
- Increase engineering, economic environmental, social evaluation rigor
- Produce increasingly accurate and reliable cost and financial information

Number of Alternatives and Level of Detail

- Metropolitan Priority Corridors, Alternatives
- Project Identification (Alternatives Analysis)
- Feasibility Study/ Preliminary Design
- Final Design
- Level of Engineering Definition, Analysis Detail
- 30% Design
- Minimal, Lowest
- Highest, Number of Alternatives

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PPIAF
WORLD BANK

I-69

I-70
Remember the Basics!

- Strategic Vision Goals
- Objectives
- Problem Identification
- Alternatives
- Analysis & Evaluation
- Decision on Strategic Plan
- Priority Setting, Implementation
- Operations
- Monitoring
Usual Developing City Situation

- Dysfunctional, disorganized transport governance
  - Many organizations with overlapping or conflicting authority
  - Some functions go unaddressed or poorly handled, e.g.,:
    - Independent planning/implementation/operating authorities
    - Independent highway and public transport organizations
    - Weak regulatory and enforcement bodies
    - National government too involved in purely local matters
    - Human resources limited or lacking
    - No dedicated funding for any PT function
  - Unresponsive to users and public
Metropolitan Urban Transport Functions

• Planning
  – Strategic
  – Investment, management/operations policy
  – System/corridor
  – Financial
  – PT Service

• Long and short-term priority setting, decision-making on investments and any operating subsidies

Metropolitan Urban Transport Functions (Contd.)

• Infrastructure project implementation
• Regulation of public transport (PT) service, operations
  • Strategic PT management
  • Enforcement of public transport regulations, traffic rules
  • Daily PT management, actual operation
A Good Institutional Framework is Critical for Effective Public Transport

- All functions addressed
- Clearly assigned responsibilities
- Responsive
  - Policy concerns of all levels of government
  - Needs of public transport users (e.g., fares, service levels and quality)
  - Concerns of all citizens (e.g., mobility needs, air quality, traffic safety)

Ideal Urban Transport Institution

1. Authority for all transport issues of metropolitan significance
2. Multi-modal planning/decision-making for all significant public investments in transport
3. Authority over strategic operations, management policies
   - Public transport (including taxis)
   - Highways, arterial roads
   - Parking
4. Formal linkages to land-use and environmental planning
Ideal Urban Transport Institution  
(Contd.)

5. Formal public/civil society/private sector participation and communications program

Ideal Urban Transport Institution  
(Contd.)

6. Sound quantitative and qualitative basis for decisions on strategies, policies, plans, programs, and projects
   – **Strong technical skills**
     • Travel forecasting
     • Transport network analysis
     • Policy, financial, and environmental planning
     • Program management
   – **Comprehensive, current data bases**
**Public Transport Regulation Is a Key Function**

- Strong, formal, legislated oversight and enforcement authority
  - Vehicle safety, emissions
  - Service parameters
    - Types and quality
    - Authorized corridors/areas/licenses/franchises
    - Fares
- Clear linkages:
  - Strategic operations/management policy setting
  - Investment planning
- Analytical skills in service planning, operations and monitoring

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**Case Studies**

- Paris
- London
- New York
- Vancouver
- Madrid
- Singapore
<table>
<thead>
<tr>
<th>City</th>
<th>Organization</th>
<th>Authority</th>
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<tbody>
<tr>
<td>Paris</td>
<td>Syndicat des Transports d’Ile-de-France (STIF)</td>
<td>All public transport; Entire conurbation</td>
</tr>
<tr>
<td>London</td>
<td>Transport for London (TFL)</td>
<td>All public transport, roads and highways, bridges and tunnels, NMT; Entire conurbation</td>
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<tr>
<td>New York</td>
<td>Metropolitan Transportation Authority (MTA)</td>
<td>All public transport, some bridges and tunnels; New York State portion of conurbation</td>
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<thead>
<tr>
<th>City</th>
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<th>Functions</th>
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<tr>
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<tr>
<td>New York</td>
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1. **Strategic Planning**  
2. **Investment, management, ops. policy planning**  
3. **System/corridor planning**  
4. **Financial planning**  
5. **Long and short-term priority setting, decision making for investment, operating subsidies**  
6. **Infrastructure project implementation**  
7. **Service, operations regulation enforcement**  
8. **Strategic service, operations management**  
9. **PT Service planning**  
10. **Daily PT operation, management**
<table>
<thead>
<tr>
<th>City</th>
<th>Organization</th>
<th>Sources of Funds (other than PT fares)</th>
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<tr>
<td>Paris</td>
<td>Syndicat des Transports d’Ile-de-France (STIF)</td>
<td>Dedicated employer tax; local, region, Department general revenue</td>
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<td>London</td>
<td>Transport for London (TFL)</td>
<td>Congestion charges, central &amp; local Govt. general revenue</td>
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<tr>
<td>New York</td>
<td>Metropolitan Transportation Authority (MTA)</td>
<td>Federal, State and local Govt. general revenue; dedicated taxes on petroleum businesses, mortgages and real estate; bridge/tunnel tolls</td>
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<tr>
<td>Vancouver</td>
<td>TransLink</td>
<td>All public transport, highways, roads, bridges, tunnels, NMT, parking; Entire conurbation</td>
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<tr>
<td>Madrid</td>
<td>Consorcio Regional Transporte (CRTM)</td>
<td>All metropolitan public transport; Entire conurbation</td>
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<tr>
<td>Singapore</td>
<td>Land Transport Authority (LTA)</td>
<td>All public transport, non-motorized modes, highways, roads, bridges, tunnels, parking; Entire conurbation</td>
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<tr>
<td>City</td>
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<td>Functions</td>
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2. Investment, management, operations policy planning
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5. Long and short-term priority setting, decision making for investment, operating subsidies
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<td>Vancouver</td>
<td>TransLink</td>
<td>Dedicated gasoline, property, power, parking taxes</td>
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<td>Madrid</td>
<td>Consorcio Regional Transporte (CRTM)</td>
<td>National, Regional and local Govt. subsidies (not dedicated)</td>
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<tr>
<td>Singapore</td>
<td>Land Transport Authority (LTA)</td>
<td>National (local) Govt. general revenue, much of which is derived from auto registration, gas taxes, parking, congestion fees</td>
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India: Unified Metropolitan Transportation Authorities

• National Urban Transport Policy, March, 2006

• Requires “Unified Metropolitan Transportation Authorities” in metropolitan areas of >1,000,000 pop.

• Encourages that “UMTA’s” receive specific statutory authority

UMTA Functions

• Facilitate coordinated planning and implementation of urban transport programs and projects
  – Development of integrated land use and transport master plans

• Provide integrated management of multi-modal urban transport systems

• Develop and adopt comprehensive, multi-modal metropolitan transport/land use plans
Progress to Date

- Indore: Indore City Transport Limited
  - Designated as UMTA
  - Currently limited to planning and procurement of public transport services
  - Intent to expand authority to highway and traffic matters
- Bangalore, Jaipur:
  - Have established informal policy committee
  - No statutory authority of staff
  - In process of clarifying responsibilities and resources

Transport Governance Case Study

Greater Vancouver Transportation Authority “TransLink” (GVTA)

From presentation by Glen Leicester, TransLink
Kuala Lumpur Master Class
September 13, 2004
Vancouver Urban Region

- 21 cities in regional federation (Greater Vancouver Regional District, GVRD)
- 2.2 million residents, 3.0 million by 2031
- Multi-cultural, diverse population
- Major gateway for sea and air
- Transport is a significant regional issue
- Prior to 1999 no regional transportation agency

TransLink Responsibilities

- Public Transport
- Roads
- Demand Management
- Air Quality
TransLink Legislative Mandate

- Regional corporation for planning, building, managing, operating *regional* transportation system

- Can raise revenue from dedicated, mostly transport sources

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TransLink Legislative Mandate

- Preparation and approval of a Strategic Transportation Plan (*STP*) outlining capital, service, and financial strategy
- Capital and program plans consistent with STP
- Extensive consultation process with the public, cities and other affected organizations
- Approval of STP by regional federation of governments
Current Sources of Funds

- Fares: 37%
- Fuel Tax: 33%
- Property Taxes: 26%
- Electric Bill: 2%
- Parking Taxes: 2%

Not currently used:
- Vehicle Registration
- Benefit Area Tax
- Tolls

TransLink Governance

- Board of Directors appointed by the GVRD on a sub-area basis and by the Provincial Government
- Board of Directors selects Chief Executive Officer
- Board may establish subsidiary companies and delegate responsibilities
- Board appoints Subsidiary Board members
GVTA Board: 15 Members

12 Local:
- Elected Mayors or GVRD Directors

3 Provincial:
- Elected MLA’s or Ministers

Internal Organization

Board of Directors

- Pat Jacobsen
  - Chief Executive Officer

- Ian Jarvis
  - Chief Operating Officer

- Sheri Pewes
  - Vice President
  - Capital Management

- Bob Paston
  - Vice President
  - Corporate & Public Affairs

- Glen Leesthor
  - Vice President
  - Planning

- Gig Chen-Kup
  - General Counsel

- Grant Close
  - Director
  - Human Resources

- Ken Haidle
  - Director
  - Communication

- Carol Lee
  - Corporate Secretary

- Clive Rock
  - Director
  - Strategic Planning

Vacant
- Director
- Finance
Lesson Learned

- Cities with the best PT have an *integrated metropolitan transport authority (MTA)* with:
  - *Strong statutory authority* over all modes and entire metropolitan area regarding planning, investment, and strategic management/operations
  - *Independent, dedicated* funding sources
  - Superior human, technical and data resources
  - *Positive, cooperative relationships* with all relevant public, private and citizen stakeholders
Minimum Responsibilities
Integrated MTA

- Strategic planning
- System, corridor major investment planning
- Metro management/operations policy planning
- Financial planning
- Long and short-term priority setting for investment and operating subsidies

Minimum Authority and Funding
Integrated MTA

• Minimum Authority
  - Entire metropolitan area
  - All PT modes

• Financing/funding
  - Some dedicated funding
    • Support MTA staff and functions
    • Recapitalization
Integrated MTA Governance

- “Policy,” voting entity that approves policies, plans, programs and projects
  - Representatives of senior governments (central/state/provincial); ministers/secretaries/directors
  - Representatives of local governments; elected/appointed officials, e.g. mayors, council chairs, bureau heads
- Dedicated staff (”secretariat) doing technical work to support decision making
- Citizen advisory process and structure

Institutions for Urban Transport
III. Measures and Standards

Public Transport Planning and Reform:
An Introduction

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?

• Helps assess adequacy and performance of current service
  – *How do we know if service is good and reform is needed?*

• Provides direction on how to use limited resources effectively and efficiently in the design and operation of services
  – *How do we best use our resources?*

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.

Service Availability

- Measures of how accessible public transport service are to the public
  - Stop Spacing
  - Service Span
  - Policy Headways
  - Geographic Coverage
  - Access to Jobs
  - Affordability Index
Stop Spacing

Measure: Distance between Designated Bus Stops
Application: Route
Standard: Maximum Distance

- Trunk: 500 meters
- Feeders: 300 meters

Stop Spacing 300 M

Span of Service

Total Clock Hours Over Which Public Transport Service is Operated

- Common spans of service
  - Work days
    - All day (covers both peak commuting periods)
    - AM, PM peak commuting hours only
    - “Owl” (early morning) service
  - Saturday service
  - Sunday (Friday) and holiday service
Service Span

Measure: Clock Hours During Which Service is Operated
Application: Route
Standard: Minimum Hours

<table>
<thead>
<tr>
<th>Day</th>
<th>Service Span</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work</td>
<td>Cover work travel (Longest span)</td>
</tr>
<tr>
<td>Non-Work (weekend)</td>
<td>Cover main shopping hours</td>
</tr>
</tbody>
</table>

Headway (Frequency)

*Time in Minutes Between Two Arrivals (or Departures) of Buses or Trains*

e.g., At a headway of 10 minutes, a bus or train departs every 10 minutes

• Headway is the inverse measure of service frequency
  \[(60/interval) = \text{Buses/Hour}\]
• Sometimes called interval
Policy Headways

Measure: Minutes between Bus Arrivals
Application: Route
Standard: Maximum Headway

<table>
<thead>
<tr>
<th>Route Type</th>
<th>Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trunk</td>
<td>8</td>
</tr>
<tr>
<td>Feeder</td>
<td>15</td>
</tr>
</tbody>
</table>

Cali, Colombia

Geographic Coverage

Measure: Percent of Population Within Walking Distance to Bus Routes
Maximum Walking Distance = 500 Meters
Bangalore Metropolitan Transport Corporation

Application: Network

Bangalore Casablanca
Access to Jobs

Measure: Population-Weighted Average Percent of Area Jobs Within 60 Minutes

Commuting Time by Public Transport

Application: Network

Data Needs: Population and Employment by Analysis Zone

Inventory of and Travel Times on Public Transport Routes

Similar measures can be used to assess access to health care and education

Affordability Index

Measure: Bus Fares as a Percent of Average Per Capita Income for the Poorest 20 Percent (Quintile) of Population

Application: Network/Company

Standard: Maximum of 10%
Quality of Service

• Attributes important to users
  – Some measures may be used in contracts as incentives or penalties

• Examples
  – Vehicle Reliability
  – On-Time Performance
  – Occupancy Factor

Vehicle Reliability

<table>
<thead>
<tr>
<th>Measure</th>
<th>Average Kilometers between Mechanical Breakdowns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Company/Type of Service</td>
</tr>
<tr>
<td>Standard</td>
<td>10,000 to 20,000 KM Value depends on local street conditions</td>
</tr>
</tbody>
</table>

Méjico DF
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 (generally headways greater than 12 minutes)

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
Capacity

Maximum number of passengers that can be carried on a vehicle = number of seats + the number of permitted standing passengers

e.g.,
Number of Seats on the Bus = 48
Number of Permitted Standing Passengers = 112
Capacity of the Bus = 48 + 112 = 160 Passengers

Reasons Vehicle Capacities Vary Among Public Transport Operators

- Number of doors
  - Affect loading/unloading times and seating space
- Low-floor buses
  - Less interior space, faster loading/unloading times
- Space allocation for seats and standing areas
  - Tradeoff between carrying capacity (operations efficiency) and quality of service provided to riders
  - More seats provided when standing times are long
- Policies regarding standing passengers/meter²
  - Tradeoff between carrying capacity (operations efficiency) and quality of service provided to riders
  - Reflect local norms regarding comfortable personal space
Passenger Volume at the Maximum Load Point

Maximum Number of Passengers On-Board Transit Vehicles as they Traverse a Route in the Peak Direction, in the Peak Hour

- Maximum load point typically on the edge of downtown for routes serving the center city
- Used for scheduling vehicles to meet load factor standards or maximum allowed passengers on one vehicle

Passenger Demand Profile for Radial Route

<table>
<thead>
<tr>
<th>Stop</th>
<th>Passengers Onboard Leaving Stop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic City</td>
<td>20</td>
</tr>
<tr>
<td>Kudlu Gate</td>
<td>50</td>
</tr>
<tr>
<td>Madiwala</td>
<td>80</td>
</tr>
<tr>
<td>Maharanis College</td>
<td>100</td>
</tr>
<tr>
<td>City Market</td>
<td>120</td>
</tr>
</tbody>
</table>
### Occupancy Factor

<table>
<thead>
<tr>
<th>Measure</th>
<th>Passengers at Maximum Load Point as a Percent of Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Route/Time-of-Day</td>
</tr>
<tr>
<td>Standard</td>
<td>Minimum 65%</td>
</tr>
<tr>
<td></td>
<td>Maximum 80%</td>
</tr>
</tbody>
</table>

*Manila Light Rail Transit Authority*

The value for the standard:
1. Reflects local conditions, social mores, seating configuration, standing areas, and route characteristics
2. Strikes a 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

<table>
<thead>
<tr>
<th>Measure</th>
<th>Daily Passengers per Operating Bus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Network/Company/Route</td>
</tr>
<tr>
<td>Standard</td>
<td>Minimum Daily Passengers/Bus</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of Bus</th>
<th>Crush Capacity</th>
<th>Daily Passengers per Bus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-deck</td>
<td>80</td>
<td>1,000-1,200</td>
</tr>
<tr>
<td>Single-deck</td>
<td>100</td>
<td>1,200-1,500</td>
</tr>
<tr>
<td>Single or Double-Deck</td>
<td>120</td>
<td>1,500-1,800</td>
</tr>
<tr>
<td>Articulated or Double-Deck</td>
<td>160</td>
<td>2,000-2,400</td>
</tr>
</tbody>
</table>

*Note: The standard is highly dependent on local experience*

---

## Daily Passengers per Bus

### Colombia and Morocco Examples

<table>
<thead>
<tr>
<th>Colombia</th>
<th>Morrocco</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armenia</td>
<td>Casablanca</td>
</tr>
<tr>
<td>Bogotá</td>
<td></td>
</tr>
<tr>
<td>Bucaramanga</td>
<td></td>
</tr>
<tr>
<td>Manizales</td>
<td></td>
</tr>
<tr>
<td>Medellín</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
</tbody>
</table>

*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 allow individual routes to be lower than 1.00 and are cross-subsidized by other profitable routes

Summary

Typical Service Measures

<table>
<thead>
<tr>
<th>Area</th>
<th>Measure</th>
</tr>
</thead>
</table>
| Service Availability| Stop Spacing  
Service Span  
Policy Headways  
Geographic Coverage  
Access to Jobs  
Affordability Index |
| Service Quality     | Vehicle Reliability  
On-Time Performance  
Occupancy Factor |
| Financial Performance| Bus Passenger Volumes  
Operating Ratio |
Summary

• Defined and provided examples of key measures and standards.

• *Remember*, many areas use the same or similar measures to access the condition of the public transport system.

• *However*, there is less commonality among standards since they depend on local conditions, available funding, and public policy.
IV. Public Transport Reform

Public Transport
Planning and Reform:
An Introduction

Why is Public Transport Reform Important?

• Prime Public Transport Goal
  Meet Community Access and Mobility Needs

• How do we best meet this goal?
  Effective institutional arrangements, planning, and management!
Objectives of Reform

Develop a public transport system that is:

– Effective
  • *Meets mobility needs* and is reliable, affordable, safe, and user friendly

– Efficient
  • *Minimizes costs* consistent with standards of effectiveness

– Financially Sustainable
  • *Consistent with short and long term community resources*

– Consistent with Broad Community Objectives
  • *Supports community development and minimizes impacts* e.g., pollution, congestion

Key Mechanisms

• Organizational Framework
  – Forms of competition
  – Detailed rules for operation

• Regulation
  – Protects users
  – Ensures fair competition
General Organizational Frameworks

- No competition
  - Government authority plans and operates services as public monopoly

- Competition on the street
  - Government authority grants operating rights to private companies

- Competition for the service
  - Government authority plans services and contracts for private operation

No Competition Public Monopoly

Government plans and operates services as a public monopoly

Advantages
- Direct government control over services and fares
- Easy service and fare integration
- Sensitivity to social objectives

Disadvantages
- Poor management incentives
- Political interference in day-to-day operations

Typical Results
- Low efficiency and service quality
- Financial sustainability problems

Examples
- United States, former Soviet Union
Making SOE, Public Monopoly Work Better

- Build-in incentives for management
- Maximize out-sourcing
- Establish clear roles for political leadership and management
- Set clear performance objectives, measures, required actions, and consequences

Bangalore, India Example

- One operator (BMTC) serves the metropolitan area
  - Provides different types of services based on BMTC planning
  - Operates large and small buses
  - Outsources some functions
- Broad policy direction provided by state
  - BMTC retains full management authority over services, fares, and labor
- No independent regulation other than safety
Competition on the Street

Government grants operating rights to private companies who may compete on the street for customers

Advantages
- Limited government operations management
- Management incentives for efficiency

Disadvantages
- Strong government technical oversight of services and fares needed
- More difficult service and fare integration
- Difficult to revise service network
- Difficult to provide unprofitable services

Typical Results
- Financially sustainable
- Oversupply of low-quality services
- Insensitivity to social objectives (e.g., congestion, affordability)

Examples
- Latin America, Africa, Asia

Making Competition on the Street Work Better

• Create strong planning and regulatory body
  – Manage the amount of service operated to insure profitability and quality
  – Set realistic fare levels based on sound economic principles and operating practices
  – Enforce safety and operating rules
  – Establish sound licensing policies (e.g., number, renewal period, ceilings on ownership)

• Provide publicly-funded infrastructure

• Provide strong traffic management and enforcement

• Provide joint services
  – Public information and marketing
  – Assistance in vehicle procurement
**Hong Kong Example**

- **Strong government planning and analysis**
  - Corridor/sub-area
    - Small number of companies operating large buses including double-deckers
    - Larger number of companies operating minibuses
    - Different types of services based on private market assessment within regulatory limits
- **Very tight regulation/enforcement**
  - Number of companies and buses
  - Quality of buses
  - Safety
  - Fares
- **No subsidies (huge captive market)**

**Competition for the Service**

*Government plans services, sets fares, Contracts for private operation*

**Advantages**
- Direct control over services and fares
- Management incentives for efficiency
- Control of service quality through contract provisions
- Sensitivity to social objectives

**Disadvantages**
- Strong government planning and oversight of services and fares needed
- More difficult service and fare integration
- Requires strong contract management

**Typical Results**
- Financially sustainable
- Relatively high efficiency and service quality

**Examples**
- Latin America BRT, United Kingdom, France
Contract Types

- **Gross-cost contracts**
  - Fare revenues go to public authority
  - Contractor risk limited to costs

- **Net-cost contracts**
  - Net-cost = Total costs — Fare revenues
  - Contractor risk includes costs and revenues (riders)

Making Competition for the Service Work Better

- **Maximize competition**
  - Multiple tenders (break up services)
  - Limits on awards to one company
  - Public provision of infrastructure and facilities
  - Assistance in procuring vehicles
  - Reduce contractor risk
    - Gross-cost contracts
    - Pass-through of volatile cost items (e.g. fuel)

- **Provide joint services**
  - Public information and marketing
  - Street supervision
  - Fare collection

- **Provide reasonable contract incentives**
UK Outside London Example

- Strong government planning and analysis
  - Corridor/sub-area
    - Small number of companies operating large and/or small buses
    - Different types of services based on public authority plan
- Results
  - Early problems in contract specification and management that were corrected
  - Higher quality services, lower subsidies

Summary of Key Features

<table>
<thead>
<tr>
<th>Competition Frameworks</th>
<th>Monopoly</th>
<th>On the Street</th>
<th>For the Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations Efficiency</td>
<td>—</td>
<td>+</td>
<td>+/—</td>
</tr>
<tr>
<td>Service/Fare Integration</td>
<td>+</td>
<td>—</td>
<td>+/—</td>
</tr>
<tr>
<td>Quality Control</td>
<td>+</td>
<td>—</td>
<td>+/—</td>
</tr>
<tr>
<td>Political Interference</td>
<td>—</td>
<td>—</td>
<td>+</td>
</tr>
<tr>
<td>Passenger Demand Response</td>
<td>—</td>
<td>+</td>
<td>—</td>
</tr>
<tr>
<td>Government Skills Required</td>
<td>—</td>
<td>+</td>
<td>+/—</td>
</tr>
<tr>
<td>Sustainability</td>
<td>—</td>
<td>—</td>
<td>+</td>
</tr>
</tbody>
</table>
Regulation

- All frameworks need regulation
  - Set rules of conduct and operation
  - Enforce rules
- Regulation can cover:
  - Fares
  - Service levels: frequency, hours, accessibility
  - Service quality: reliability, crowding
  - Vehicles: access, comfort, safety, emissions
- Effectiveness of regulations
  - Regulations are meaningless without enforcement
  - Incentives can assist compliance

Institutional Implications

The reform of urban bus transport requires:

- A regulatory framework
  - Legal basis to impose the appropriate obligations and incentives
- Competent regulatory institutions
  - Able to plan route networks, administer regulations, guide industry development, and monitor outcomes
- A responsive operating industry
  - Amenable to control, willing to enter into competition and to invest (e.g., buses, garages)
- A government entity to provide supporting infrastructure
  - e.g., Passenger facilities, traffic management, bus priority schemes
Reform Also Requires Consideration of Transition Issues

- **What service will be provided?**
  - Current, revised, or new route network
  - Frequencies and days of operation

- **How will current stakeholders be treated?**
  - Companies which “own” operating rights
  - Owners who provide the buses
  - Drivers and other labor
  - Combinations of the above

- **These issues are discussed in detail later in the workshop**

What is the Best Reform Option?

*The answer depends on the local setting*

- Desire of the government to control outcomes
- Legal authority for oversight and control
- Availability of funding to support government oversight and control
- Political willingness to exercise legal authority
- Ability to develop acceptable transition plan

The *Urban Bus Toolkit* can help
World Bank
Urban Bus Toolkit

• Targeted at improving urban bus systems in developing/transitional countries

• Sets out alternatives for providing services

• Provides tool for evaluating alternatives

Supporting Materials Provided

• Case studies
  – Developing countries (11 cities)
  – Developed countries (11 cities)

• Guidance documents for transport practitioners and city officials
  – Administrative procedures
  – Administrative structures
  – Contracts
  – Reform options
Where Can I Get the Toolkit?

• Run from the CD
  – Copies available here

• Go the web site
  http://www.ppiaf.org/UrbanBusToolkit/

Public Transport Planning and Analysis Is Important to Reform

• Public Needs Analysis
• Network/Route Design
• Alternatives Evaluation
  – Riders, revenues, costs
• Fare Setting
• Performance Standards
• Performance Evaluation
Good Planning and Analysis Improves the Chances of Success!
V. Public Transport Contracting

Public Transport
Planning and Reform:
An Introduction

Outline

• Why Contracting?
• Prerequisites For Contracting
• Alternative Contracting Schemes
• Single vs. Multiple Operators
• Choosing the Best Option
• Designing the Contract
• Managing the Bidding Process
• Monitoring the Contract
Why Contracting?

• Avoid/mitigate usual flaws of:
  – Inefficient, unresponsive public-owned operating companies

  Or

  – Poorly regulated public transport competition on the street

Reasons for Contracting

• Gaining efficiency, effectiveness

• Increase responsiveness

• Better organize and regulate the private sector (tool for industry reform)

• Lessen political interference
Potential *Bad* Reasons for Contracting:

- Necessarily cheaper for taxpayer and passengers
- Less demanding for the Public authority

Stakeholders and Relationships
**What Can Be Contracted?**

- Transit O/M on corridors, sub-areas, metropolitan area
- Transit O/M + rolling stock provision
- Transit M + rolling stock provision
- (Transit O/M + rolling stock + infrastructure provision)

**What Governments / Local Authorities Cannot Contract:**

- Public transport industry regulation
- Metropolitan transport strategic planning
- Strategic investment, service, operating and fare policies
- Decision-making on major public investment plans / programs / projects
Prerequisites For Contracting

• Appropriate and explicit legal and regulatory framework
  – Clear responsibilities between governments and jurisdictions

• Specific units in public authority:
  – To manage bid processes and monitor contract performance
  – Mix of technical, administrative/management and legal skills

• Will to enforce contracts (political, staff)

• Where appropriate, secure, reliable mechanism to transfer agreed-to payments to contractors

Alternative Contracting Schemes

• A broad range of contracting possibilities, based on the respective involvement of public and private parties
Cost-Plus Contracts
Definition

• Fare revenues are transferred to the public authority

• Operating costs are reimbursed + management fee

• Neither cost nor revenue risk for the operator

Cost-Plus Contracts
Advantages/Disadvantages

• Advantages
  – The service can be easily changed (no commitment from the operator on a specified service)
  – Few skills are needed from the public authority to manage this contract

• Disadvantages
  – Little incentive for the operator do decrease costs / improve efficiency/effectiveness/quality
  – Difficult for the public authority to track operator’s costs
  – Difficult revenue collection
Gross-Cost Contracts
Definition

• Fare revenues are transferred to the Public authority
• Operator commits itself on a cost for a fully-defined service in the bid. Contracted operator’s payment is contained in the bid
• May include penalties for failure to operate the required service
• Operator bears cost risk / Public authority bears revenue risk

Gross-Cost with Incentives
Definition

• Incentives to increase cost efficiency
• Fare revenues are still transferred to the Public authority
• Operator is remunerated on the basis of a contracted rate per passenger carried, the level of which is the level of competition
• In this case, the operator also bears the revenue risk
Gross-Cost Contracts
Advantages/Disadvantages

• Advantages:
  – Incentive to decrease operating costs
  – Sound risk allocation between public and private parties
  – Tends to be less costly for the public authority
  – Reinforces public authority over all factors related to revenue, i.e., fares, level of competition

• Disadvantages:
  – Difficult revenue collection
  – Requires strong oversight from the public authority
  – Extra monitoring costs
  – Could provide incentive for contractor to reduce quality

Net-Cost Contracts
Definition

• Also known as *Net subsidy contracts*
• Operator keeps the revenue and may receive an additional sum from the public authority.
• Competition is based on the minimum sum required
• Operator bears both cost and revenue risks, though with a guaranteed income
• “Commercial” services: Net-cost contract variation
  – Operator pays a fee to the public authority for the right to operate
Net-Cost Contracts
Advantages/Disadvantages

• **Advantages**
  – Strong incentive to reduce costs and increase revenue (not necessarily ridership)
  – Limited risk borne by the public authority
  – Low involvement of public authority

• **Disadvantages**
  – Tends to be more costly for the public authority than gross-cost contracts
  – May ultimately take important public policy decisions (e.g., fares) out of hands of public authority
  – Could provide incentives for operator to cut service quantity

Choosing the Best Option

• There is no “best” option — depends on:
  – Administrative, management and enforcement capacity of public authority
  – Financial, organizational and service capacity of private contractors
  – Legal and regulatory framework
  – Public financial resources
  – Current situation
  – Transport cost structure
  – Competition from unregulated, informal sector (e.g., motorcycle taxis)

• In developing cities, gross-cost contracts are usually more desirable
Single / Multiple Operator Options

<table>
<thead>
<tr>
<th>Area / sub-areas</th>
<th>Route or Corridor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single operator</td>
<td>![Single operator diagram]</td>
</tr>
<tr>
<td>(single may be consortium)</td>
<td>![Route or Corridor diagram]</td>
</tr>
<tr>
<td>Multiple operators in given area or corridor, on given route</td>
<td>![Multiple operators diagram]</td>
</tr>
</tbody>
</table>

Single / Multiple Operators Comparison

<table>
<thead>
<tr>
<th></th>
<th>Single operator metropolitan area</th>
<th>Single operator / Sub-area</th>
<th>Single operator / route</th>
<th>Multiple operators / route or sub-area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competition</td>
<td>☺</td>
<td>☺</td>
<td>☺</td>
<td>☺</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>☺</td>
<td>☺</td>
<td>☺</td>
<td>☺</td>
</tr>
<tr>
<td>Network integration</td>
<td>☺☺</td>
<td>☺</td>
<td>☺</td>
<td>☺</td>
</tr>
<tr>
<td>Fare integration</td>
<td>☻</td>
<td>☻</td>
<td>☻</td>
<td>☻</td>
</tr>
<tr>
<td>Easiness to monitor</td>
<td>☺</td>
<td>☺</td>
<td>☺</td>
<td>☺</td>
</tr>
<tr>
<td>Ability to renegotiate from position of strength</td>
<td>☻ ☻</td>
<td>☻</td>
<td>☻</td>
<td>☻</td>
</tr>
</tbody>
</table>

*Cost to public and quality assurance too highly dependent on situation to evaluate in general*
Single / Multiple Operators
Observations

- **Need certain level of competition for market to increase effectiveness and efficiency**
- Wrong kind of competition (net cost on the street) can lead to predatory behavior
- Make sure the public authority is in a position of strength to negotiate / withdraw contracts
- Take into account (i) the physical and fiscal situation of the city, (ii) the capabilities of the private sector, (iii) the ability of the public authority to manage the contracts
- Never lose sight of the service end-user (simplicity, convenient, integration)
- **Conclusion: Single operator per route or per sub-area may be best in most developing city cases**

Bidding Process Time Frame

- **From Contracting in Public Transport - DGTREN**
Managing the Bidding Process
Administrative Procedures

• Key issues
  – Closely dependent on national legal framework
  – Needs public authority and bidders legal framework knowledge
  – Aims at choosing the most cost-effective supplier (operator)
  – Needs transparency, equity, no vested interests

• Favor a two-staged tendering procedure
  – 1st envelope: technical / 2nd envelope: costs
  – Allowing alternative bids (service, standards) to make the most of operational capacity and creativity
  – Add certain degree of dialogue between bidders / contracting authority

• But: beware of not deterring small competitors with a much too elaborate process (transaction costs)

Criteria for Choosing the Best Contracting Partner

• Compliance with stated service requirements: quantity, quality
• Structure of proposed operating costs
• Demonstrated financial capacity
• Technical competency and references (national / international)
• Price charged to the public authority
• Preference may be given to national operators
• Scoring of contract bids against all evaluation criteria
Negotiating the Contract

• For the most elaborate contracts / services

• Requires advanced skills/knowledge from the contracting authority

• Could be time-consuming

Designing the Contract
Scope of Contract

• Define the service
  – Precise enough to allow bidders to compute properly costs
  – Flexible enough to:
    • Be adaptable, in anticipation of future service changes, and
    • Allow operators to propose the most efficient way to deliver the service

• Examples of scope items
  – Route description, stops spacing, max interval/ time of day, capacity to be provided
Designing the Contract
Quality of Service

- Measuring performance
  - Specify performance indicators as much as possible, not means of production,
    - e.g.: fleet average age, vehicles' standards, km between 2 breakdowns, % of trips on-time, etc.
- Too high standards will be met at the expenses of the public authority
- Standards could be negotiated during the bidding phase (alternative offers)

Designing the Contract
Allocating Risks

- Largely dependent on chosen contract scheme (Cost+, gross, net)
- Allocate the risk to the appropriate contractor, according to its ability to bear it
  - Example 1: deficient law enforcement (competitors…)
    - Private contractor cannot bear that risk
  - Example 2: major change in a competing infrastructure
    - Private contractor cannot bear that risk
  - Example 3: oil price increase
    - Private contractor: bears the increase, up to a determined threshold
    - Public authority: take the risk beyond the threshold on the basis of an indexation clause
  - Example 4: fare evolution
    - In a net-cost contract, the private contractor could not bear a unilaterally-decided by the Government fare slash
Designing the Contract
Contract Duration and Size

• Duration
  – Linked to the assets provided by the operator’s
    • Typically 5-8 years for bus systems where operator supplies buses
    • Contactors would prefer longer contracts (7-12 years)

• Contract Size:
  – Depends on the chosen strategy (single/multiple operators & local / international)
  – Contract areas linked determined by “logical route structures”, depot availability, operational efficiency considerations
  – Preferred size between 50-100 buses (1 depot)

Designing the Contract
Financial Mechanisms

• Fare setting (if net-cost): make the public authority involvement clear

• Special fare discounts (students, disabled): compensation mechanisms

• Fare collection mechanisms (gross-cost):
  – e.g. specific operator
Designing the Contract Incentives / Penalties

- Well-designed incentives work better and cost less than monitoring

- Best if implemented progressively
  - E.g.: ridership, quality of service

Designing the Contract Evolution Mechanisms

- Indispensable in a changing environment

- A sensitive matter: ability to foresee, way private operators will try to make more money
  - E.g.: service modification, cost-drivers change (oil)
Monitoring and Enforcing the Contract

• Monitoring and supervision
  – Alternative/complement to incentive instruments
  – Importance of data collection, on a regular basis. Cost could be shared public authority/ regulator
  – Clear, measurable and verifiable indicators
  – Skills and budget accordingly.

• Enforcement
  – The public authority must be credible (carrot and stick)
  – Fines, withhold part of subsidy, deny extension/renewal option
VI. Major Investments as Catalysts for Reform

Public Transport Planning and Reform: An Introduction

The Challenge

• Multiple, diverse players
  – Owner/operators
  – Users
  – Labor
  – Government

• Limited human resources
  – Staff for key functions, e.g., public regulation, planning

• Vested interests in current approach
Developing City Public Transport

- *Poorly regulated competition* on the street among numerous private providers using buses, minibuses, shared ride vans and taxis
  
or

- *Failing, subsidized SOE* losing ground to large and growing number of private providers

Typical Results

- Declining level and quality of service and/or
- Increasing congestion, accidents, and fares and
- Decline in mobility, access and safety
  - More people walking on roads to avoid costly, overcrowded and dangerous private public transport services
What is Needed?

- Changed legal and regulatory framework
- Improved enforcement
- More effective independent oversight
- More equitable distribution of public resources

Major Investments: Catalysts for Change

- Visible change for public
- Recognition of need for realignment of PT network to provide full investment benefit
  - Service design (e.g., feeder, trunk services)
- “Political cover” for change
  - Needed to justify investments
- Opportunity for “win-win” situation
  - Operators, users, government
Which Investments Can Be Used?

• Investments that:
  – Provide significant, visible user benefits
  – Help operators improve efficiency, finances

• Examples
  – Bus Rapid Transit (BRT)
  – Metro/Light Rail Transit (LRT)
  – Intermodal terminals

BRT: A Tool for Reform

• Flexible, permanently integrated, high performance system with a quality image and a strong identity

• Package of components appropriate to current and future:
  – Markets served
  – Physical, operating environment
## BRT System Elements

### Vehicles

### Running Ways

### Stations & Terminals

### Systems

### Service Plan

## Flexibility of BRT

<table>
<thead>
<tr>
<th></th>
<th>Stations</th>
<th>Running Ways</th>
<th>Service Plan</th>
<th>Vehicles</th>
<th>Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Simplest</strong></td>
<td>“Super” Stops, Shelter</td>
<td>Mixed Traffic + Queue Jumpers</td>
<td>Single All-Stops Line</td>
<td>Buses with Unique Livery, Layout</td>
<td>Digital Comm.’s Electronic Fare Boxes</td>
</tr>
<tr>
<td><strong>Most Complex</strong></td>
<td>High Platforms, Amenities, Services, Intermodal terminals, P/R</td>
<td>Fully Grade-Separated Transitway</td>
<td>All-Stops; On-Line Expresses; Feeder/Line-Haul</td>
<td>Hybrid, Guided Specialized Vehicles</td>
<td>Central Control Room, CAD, Smart Cards/Proof of Payment</td>
</tr>
</tbody>
</table>
BRT
Infinite Possibilities, But …

- Must have essential attributes
  - Measures to ensure high speed, reliability
  - Customer friendly:
    - High service levels at all times
    - Simple network structure
    - Unique identity, pervasive “branding”
  - Attractive: High over-all system quality

- Without these attributes, “BRT is only old wine in a new bottle”
BRT and Existing Operators

- Existing bus operators can be used in reformed, restructured public transport network to:
  - Operate BRT services
  - Extend “reach” of BRT
    - New “feeder” routes
    - Extensions beyond terminals
  - Provide new PT services in urbanizing parts of city

BRT Can Be Reform Without New Operators

- A totally new operating entity *may not* be needed
- Tightly regulated (numbers, quality, fares), parallel “minibus” or other services may continue
  - Serve different markets
  - Charge appropriate fares for all service types
  - “Keep peace”
- **Caution: Reform must result from deliberate planning process**
Latin BRT Business Model
(1-2)

1. New public institution created to plan and manage \textit{(not operate!)} PT system

2. Plan for BRT and \textit{reorganized} PT system prepared
   - Trunk and feeder services

Latin BRT Business Model
(Contd.)

3. Competitive tendering used for BRT, other (e.g., “feeder”) services
   - Guaranteed contracts for fixed amount of time
   - Special consideration for cooperatives/companies formed from existing operators
     - Award criteria
     - Public investment in infrastructure (e.g., garages)
     - Special financing for vehicles

4. Separate entity created/contracted for ticketing and revenue collection
   - May be public or private
Metro/LRT as a Catalyst

- Existing bus operators can be used to extend “reach” of system

- Tightly regulated (numbers, quality, fares), parallel “minibus” or other services may continue

- Caution: Reform must result from deliberate planning process

---

Do Not Ignore Competition!

- Poor financial performance for BRT or metro/LRT can be caused by *irrational* competition from:
  - Failing, subsidized state-owned enterprise
    - Bangkok
  - Private providers
    - Pusan, Manila, Jakarta
  - SOE and private providers
    - Cairo, New Delhi
Passenger Interchange Terminals

- Terminals can provide many benefits
  - Easy in/easy out passenger pick-up/drop-off
  - Safe/secure waiting environment
  - PPP for construction, operation
  - Net Revenue stream
    - commercial opportunities
  - Driver welfare facilities
  - Employment

Passenger Interchange Terminals

- Minimizing “in-and-out” time is important to success
  - Private sector can benefit from not losing time at congested, on-street rapid transit interface
Mexico City Indios Verdes Metro Station

Before Metro Bus

After Metro Bus

Major Investments
Keys to Success

• Plan transition

• Involve current operators

• Manage different time-frames
Treatment of Current Owner/Operators Is An Important Transition Issue

- Potential strategies
  - Guarantee operating authority or contracts for new services
    - e.g., BRT, “feeders” for a fixed period
  - “Buy-outs”
    - Operating authority
    - Capital assets
  - Provide jobs for all affected workers

Involve Existing Operators in Major Investment Planning

- It is never too early to involve the existing operators!
  - They know the physical, operational and market factors needed for planning
  - You may want to use them as operators of choice later (subject to competition)
  - They often have political clout
    - Money
    - Numbers of workers and effected families
Recognize Different Project and Reform Time-Frames

• Political agenda often involves a short time frame while institutional reform takes longer
  – Can work to advantage of reform

• Reform often works best when done incrementally, one corridor or sub-area at a time, with adjustments between phases
  – i.e., avoid Santiago and Mexico City

Major Investments Summary

• A major investment can be a powerful tool for significant public transport reform

• Consideration of existing owner/operators key to success
  – Involve them early in the planning process
    • Service and operations
    • Capital investment
  – Consider their financial situation
  – Develop transition plan to produce “win/win” result

• An incremental approach may work best
VII. Managing the Transition

Public Transport
Planning and Reform:
An Introduction

What Should Be Considered in Transition Planning?

- Assess *present demand and supply*
- Anticipate *projected urban dynamics*
  - Population growth
  - Urban poverty
  - Economic growth
  - Urban sprawl and shifts
- Identify and prioritize set of strategic objectives
What Are the Objectives of Transition Planning?

- Enhanced mobility
- Reduced operational inefficiencies and negative externalities
- Restored public transport financial sustainability

Guidelines for Transitioning to Successful Reform

- Do not deprive captive users from existing service provision
- Build on existing operational capacity of service providers
- Scale up and phase in changes
- Provide incentives for the formalization of informal operators
- Enforce law and order
Why Is Public Transport Reform Needed In Developing Cities?

- **Current service does not serve poor people well**
  - Problems: Access, affordability, safety/security
- **“Chaotic” competition-on-the-street hurts mobility, health, economic competitiveness of the cities**
- **Restore public transport sustainability**
  - Financial sustainability of failing state-owned enterprises (SOEs)
    - e.g., Dakar, Abidjan, Harare, Johannesburg, Tshwane
  - Shrinking franchised bus service despite high level of subsidizing
    - e.g., Golden Arrow in South Africa

Adapt Transition to Local Environment

- **Current and projected situation of transport supply and demand**
  - Accurate assessment requires surveys of household travel and public transport providers
- **Planned changes in service**
- **Capacity of public planning, management, enforcement institutions**
- **Contemplated change in industry organization**
- **Operational capacity of current service providers**
- **Implications for, treatment of stakeholders during and after transition**
- **Enforcement**
Prevailing Informality
A Major Constraint on Supply

<table>
<thead>
<tr>
<th>Modal Share of Micro-Operators</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>Abidjan</td>
<td>68%</td>
</tr>
<tr>
<td>Accra</td>
<td>87%</td>
</tr>
<tr>
<td>Conakry</td>
<td>97%</td>
</tr>
<tr>
<td>Cotonou</td>
<td>98%</td>
</tr>
<tr>
<td>Dakar</td>
<td>95%</td>
</tr>
<tr>
<td>Dar El Salam</td>
<td>97%</td>
</tr>
<tr>
<td>Douala</td>
<td>98%</td>
</tr>
<tr>
<td>Ouagadougou</td>
<td>75%</td>
</tr>
</tbody>
</table>

Source: Godard, 2006

Urban Sprawl and Population Growth
A Major Constraint on Demand

Accra, Ghana

Source: The Dynamics of Global Urban Expansion., World Bank, 2005
Urban Sprawl and Population Growth
A Major Constraint on Demand

Ouagadougou, Burkina Faso

Source: The Dynamics of Global Urban Expansion, World Bank, 2005

Must Address Rapidly Shifting Mobility Needs and O/D Travel Matrix

In Tshwane, bus service caters to commuters to/from the old CBD despite shifting of most job places to its south

Only minibus taxis cater to commuters to/from southern newly industrialized corridor

Source: City of Tshwane, Integrated Transport Plan, 2004
Future Travel Demand Expectations

• Fast urban population growth
  – Double by 2030 on average in developing countries

• Increased residential mobility and fast evolving O/D travel matrix
  – 1/4 to 1/3 of the population in Dakar in 5 years in the late 1990s

• Increased urban poverty and growing numbers of “stranded” population or “survival passengers”
  – Increase in absolute terms even if decrease in relative terms
  – Affordability is a major constraint for this population

• Increased private car ownership and growing number of “selective” or “stubborn” population
  – Correlated with personal income/economic growth (5.8% in 2007, 6.2% projected in 2008) — a very uneven social distribution

Targeted Objectives

Planned Service Changes

• Improve personal travel
  – Enhanced mobility for “stranded” population and “captive” passengers
  – Alternative for car users

• Measure performance using indicators pertaining to quality and level of service
  – A movement towards an integrated public transport system

• Ensure financial sustainability of contracted operators
Types of Changes
Planning Service Changes

**Improved existing service**
- e.g., Increased service spans, days of operation, frequencies, coverage

**Revised/totally new network**
- Integrated, hierarchical system
  - Trunk routes
  - Feeder and distribution services

**New system or types of service**
- e.g., BRT, Metro, shuttles, demand response

Options for Implementing Reforms and Changes

- Entire system in one shot
  - e.g., Santiago, Chile

- Piloting
  - By geography
    - e.g., corridor (trunk/feeder/distributor routes) sub-area (distributor routes in CBD)
  - By service type
    - e.g. First phase, formal network, routes and stop
      Second phase, introduce BRT
  - Around a catalytic event with a lasting legacy
    - e.g., (2010 FIFA World Cup in South Africa)
New BRT Lines in Johannesburg
An Example of Phasing Changes

- 325 kms - with flagship project to be implemented first
- Soweto - CBD - Sunninghill north-south corridor
- Alexandra - Sandton/Randburg - Roadpoort east-west corridor
- 2010 has resulted in prioritisation of the Ellis Park and NASREC links in place of the east-west link

Source: SABOA Conference 2007

Cape Town
Integrated Transport Corridor
An Example of Phasing Changes

Deliberate focus on the “survival” population group
Key Requirements
Planning, Management
and Enforcement Capacity

- Public sector capabilities
  - Policy analysis/development, planning, monitoring
  - Administration, contract management
  - Legal
  - Financial planning, audit
  - Enforcement

- Institutions
  - Independent of vested interests, political interference
  - Financially sustainable

- Human resources with skills and experience in relevant functions
  - Existing and/or must build

Promoting Changes in Industry Organization

- Most challenging is change from:
  - Competition on the street by highly fragmented informal sector
  - Integrated formalized system

- Why?
  - State regulation must be imposed on a self-regulated industry
  - Multiple, fragmented service providers have uneven capacities
  - Service providers must operate a brand new type of trade requiring different skills/capacities
Planning for Industry Organization Change

• Objective: Avoid hurting users, providers
  – High risk of service disruption
  – Incremental phase-in is least disruptive

• Most Significant Transition Needs
  – Organization
  – Communications
  – Financing
  – Capacity building

Guidelines for Implementing Effective Regulation

• Do not be complacent with illegal operations
  – Often not deliberate, incurs heavy costs for illegal operators (e.g. lack of access to finance)

• Do not over-regulate, increase formality costs
  – Promote formalization not forbidding existing operators access to the market (which is often impractical)

• Rely on existing self regulation
  – Provide incentives for joining associations ruled by voluntary codes of conducts (South Africa, Sri Lanka)
  – Support self-imposed discipline
    • e.g. Award exclusive rights to complying associations (South Africa)

• Adjust regulations to evolving state of the industry
  – Regulation is often an iterative and dynamic process; do not let operators outsmart regulations
Potential Implications for Existing Stakeholders

• Increased/decreased number of vehicles and workers
  – Approach: Avoid oversupply, preserve availability
• Changes in types and locations of work
  – Approach: Higher labor standards/required qualifications, retrenchments
• Different trade and business model
  – Approach: Assess how the costs and benefits of formality compare with those of informality
• Change from independent franchise holder/owner/operator to employee or shareholder

How to Treat Current Stakeholders?

• Will be different for different types of stakeholders
  – Companies who “own” operating rights
  – Owners who provide buses
  – Drivers and other labor
  – Users
  – Financial institutions
  – Combinations of the above
Options for Current Stakeholders

- **Government “compensates” stakeholders**
  - Examples
    - Mexico City: Purchased old minibuses for scrapping in Insurgentes Corridor where Metrobus implemented
    - South Africa: Scrapping allowance

- **Government uses franchising tool**
  - Requires stakeholder involvement in new system
  - Examples
    - Cali, Colombia: Competition on the Street for competition on the Street as part of BRT implementation
    - Planned Integrated Road-based public transport service franchising in South Africa
  - Franchises current operators to provide new service
    - e.g., “feeders to BRT” in Bogota

Other Options for Current Stakeholders

- **Government promotes integration of informal operators into corporations or cooperatives to provide new services**
  - e.g., attempted in Sri Lanka
- **Government subsidizes old vehicle scrapping or new vehicle purchases**
  - e.g., South Africa (recapitalization), Bogota (scraping), Uzbekistan (leasing)
- **Government provides guaranteed net revenue stream for a transition period**
- **Government provides technical assistance and capacity building for existing providers**
- **No effort made to address stakeholder concerns**
  - e.g., Indore, India
Packaging Treatment Options

- No reform can succeed without adequate treatment of existing stakeholders
- The “package” should reflect local situation and blend incentives and obligations
  - e.g., Government helps 1) form cooperative or incorporate, 2) finance vehicle purchases, and 3) build administrative and managerial capacity

Enforcement Issues

- Reform cannot work unless new arrangements are legally and consistently enforced
  - e.g. franchised operators should be protected against illegal operators
- Consistent enforcement requires close coordination of all implementing agencies
  - e.g., Police, licensing boards, transport authorities, tax administration
- Enforcement must be selective and focused on worst violations
Concluding Remarks

- Informality should be *corralled* but not *suppressed*
- A rationalized PT service can only succeed if it provides a *higher level/quality of service*
- Even a highly rationalized PT service *can only serve a part of mobility needs*
- Improved *financial sustainability* is an indispensable driving force of reform

References

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