

The Bus Rapid Transit Planning Guide, 4th Edition

Volume IV: Business Planning



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BRT Planning International



How should a BRT project be managed?

- BRT project office should have its own physical offices with the project identity
- Office needs to be properly equipped;
- Key staff needs to be dedicated *full-time* without other administrative responsibilities;
- A budget sufficient to hire the experts needed
- Make sure the experts have worked on successful projects

CH. 12: Institutional Planning



From where should the initial project be managed?

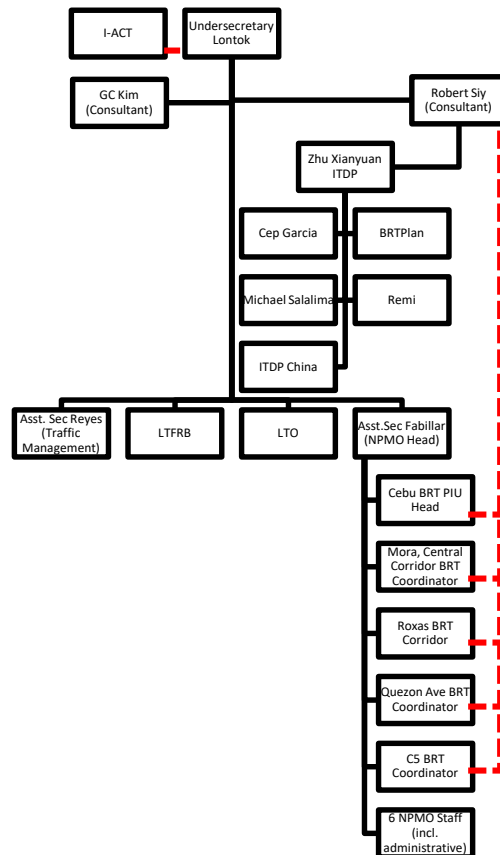
It doesn't seem to matter as much as...

Host of Initial BRT Project Office									
	Special project office directly under Mayor or Municipal Commissioner	Municipal Transport Dept Planning Staff	Pre-existing Transit Authority	Municipal Planning Office or Body	State or Provincial Transport Dept	Planning office of Regional Authority	Special project office under the National government	Development Bank Project Office	Special Project Office under Municipal Construction/Public Works
TransMilenio, Bogota	X								
GBRT, Guangzhou									X
BRT, Curitiba				X					
Guadalajara, Mexico					X				
Pereira, Colombia						X			
Jan Marg, Ahmedabad	X								
Rea Vaya, Johannesburg		X							
Leon, Mexico		X							
Guayaquil, Ecuador		X							
Quito, Ecuador				X					
Metrobus, Mexico City	X								
HealthLine, Cleveland			X						
Lanzhou, BRT								X	
Transantiago							X		
TransJakarta, Jakarta		X							
LA Metro Orange Line			X						
Cape Town MyCiti		X							
Pittsburgh MLK busway			X						
San Francisco (no BRT yet)						X			
Dar es Salaam DART (2016)	X								
Lagos busway								X	

Gold Standard BRT
 Silver Standard BRT
 Bronze Standard BRT
 Basic BRT or Below



Administrative Structure Central Corridor BRT Project Management

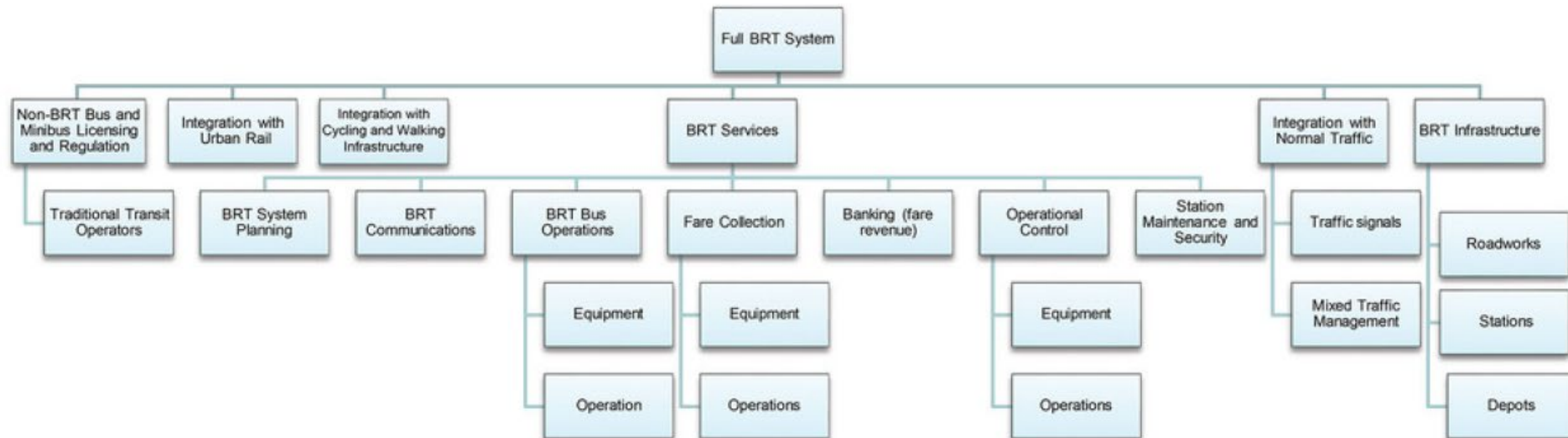


All the BRT projects in the Philippines were managed by one consultant and one Undersecretary of the National DOT

Naturally, they were quite busy...



Designing a great BRT is administratively complex...





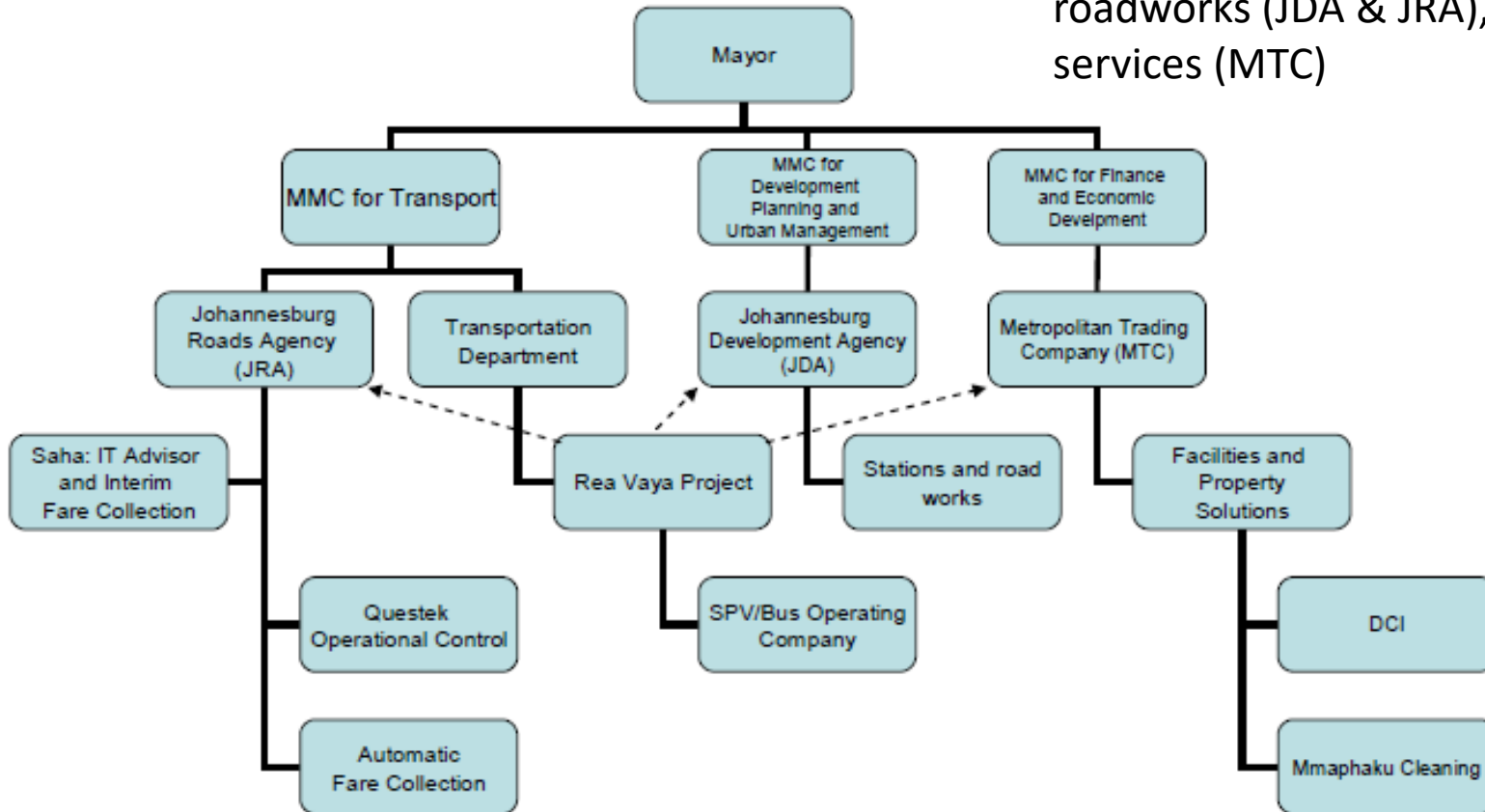
The BRT Authority Needs to have...

1. The administrative power (and political support) to compel coordinated action across a number of government departments
2. No conflicts of interest.
3. The ability to hire competent staff, or use outside consultants
4. The weaker the administrative capacity, the less sophisticated the project needs to be and the fewer the number of contracts the administration will be able to manage effectively.
5. Financial ring-fencing to protect technocratic decision-making. The authority should function from fare revenue and, if necessary, dedicated funding streams

CH. 12: Institutional Planning



Rea Vaya BRT Project Office Initially had no control over fare collection contract (JRA), operational control (JRA), roadworks (JDA & JRA), or station services (MTC)





Who should manage the BRT operations? Developed Countries

Institutions Managing Bus and BRT Systems, Select Cities										
	Bus Authority	BRT Authority	Transport Department Contracted BRT	Public Bus Company	Rail/Metro Company	Transport Authority (excluding Metro rail)	Transport Authority (All transport)	Transit Authority	Contracted Transit Service Provider	Transport Department In House
Developed Countries										
Rouen, France (TransDev)									X	
Paris Mobilien, Ile de France (RATP)									X	
Brisbane, Australia (TransitLink)								X		
Amsterdam R-Net (rating pending)									X	
Nagoya busway (rating pending)										X
Hartford, CT (CT Fastrak)								X	X	
HealthLine, Cleveland (RTC)								X		
Cambridgeshire, England									X	
Nantes, France (Semitans)									X	
LA Metro (Orange Line)								X		
Las Vegas (RTC/SV)								X	X	
Ottawa, Canada (OC Transpo)										X
Pittsburgh MLK (Port Authority)								X		
London (busways only)							X			
San Francisco (no BRT yet)							X			



Who should manage the BRT system? Developing

C

Institutions Managing Bus and BRT Systems, Select Cities										
	Bus Authority	BRT Authority	Transport Department Contracted BRT	Public Bus Company	Rail/Metro Company	Transport Authority (excluding Metro rail)	Transport Authority (All transport)	Transit Authority	Contracted Transit Service Provider	Transport Department In House
Developing Countries										
TransMilenio, Bogota	X	X								
Medellin, Colombia					X					
GBRT, Guangzhou			X							
Guadalajara, Mexico		X								
Lima (Protransporte)		X								
Rio de Janeiro (TransCarioca, TransOeste)			X							
Curitiba (URBS)	X									
Belo Horizonte (BHTrans)						X				
Dar es Salaam (2016)		X								
Pereira, Colombia (Megabus)		X								
Guayaquil, Ecuador (Metrovia)		X								
Cali, Colombia (Mio)		X								
Sao Paulo, Brazil (SP Trans)	X									
Ahmedabad (Jan Marg SPV)		X								
Johannesburg (Rea Vaya)			X							
Monterrey, MX			X							
Mexico City (Metrobus)		X								
Estado de Mexico (Mexibus)		X								
Jakarta, ID (TransJakarta)		X								
Leon, MX (rating pending)		X								
Caracas, VZ					X					
Lanzhou, BRT				X						
Beijing, China				X						
Jinan, China				X						
Santiago, Chile (Transantiago)								X		
Puebla, MX		X								
Cape Town BRT			X							
Lagos busway (Not BRT)							X			



Goals:

- Maximize the quality of the service over the long term;
- Minimize the cost of the service over the long term;
- Maximize the level of private sector investment over the long term;
- Maximize the public benefit from the public investment



Government needs to make fundamental decisions

Decision #1: Public or Private?

- Bus operations
- Bus procurement
- Fare collection equipment and operations
- Operational control system equipment and operations



Most countries going private, except the US...

Private Versus Public Operations

System	Bus procurement	Bus Operations	Fare Collection	Control Center
Rio	Private	Private	Private	Private*
Bogota	Private	Private	Private	Private
Mexico City	2/3 Private	2/3 Private	Private	Private
Pereira	Private	Private	Private	Public
Cali	Private	Private	Private	Public
Johannesburg	Private	Private	Public	Public
Santiago	Private	Private	Public	Private
Curitiba	Private	Private	Public	Public
Sao Paulo	Private	Private	Public	Public
Ahmedabad	Private	Private	Public	Public
Malmo/Kristianstad	Private	Private	Public	Public
Quito Lines 2 & 3	Private	Private	Public	Public
Guangzhou	Private	Private	Public	Public
Cape Town	Public	Private	Public	Public
Jakarta	Public	Private	Public	Public
Lanzhou	Public	Public	Public	Public
Cleveland	Public	Public	Public	Public
Quito Trolebus	Public	Public	Public	Public



Would transit be more competitive with FHV companies if there was more private sector involvement in the sector?

Developed Country		
BRT System	Bus Operations	Fare Collection
Rouen, France (TransDev)	Private	Private
Paris Mobilien, Ile de France (RATP)	Private	Private
Brisbane, Australia (TransitLink)	Public	Public
Amsterdam R-Net (rating pending)	Private	Private
HealthLine, Cleveland (RTC)	Public	Public
Cambridgeshire, England	Private	Private
Nantes, France (Semitans)	Public*	Public*
LA Metro (Orange Line)	Public	Public
Las Vegas (RTC/SV)	Private	Private
Ottawa, Canada (OC Transpo)	Public	Public
Pittsburgh MLK (Port Authority)	Public	Public
Nagoya busway (not yet rated)	Public	Public



Contract types:

- How is the operator paid
 - Profit sharing gross cost
 - Gross cost
 - Net cost
- How is the market defined
 - Route contract
 - Zone-based contract
 - Service contract (no specified route or zone)
- How is the market entry regulated
 - No regulation
 - Fleet quality regulation only
 - Zone or route exclusivity
 - System-level exclusivity



General principal

1. You need to attract investors willing to take a risk on your market.
2. Developing countries are riskier investment climates for foreign firms so investors are likely to be investors already comfortable with that country
3. The riskier the market, the more the contract has to mitigate the risk.
4. Market risk translates into higher operating costs



Net Cost:

- The bus company collects the revenue directly from passengers.
- Usually they use conductors
- Operator sets the frequency
- All revenue is paid per passenger

Impact

- Fully exposed to demand risk (insulates govt from demand risk)
- Can create dangerous competition for passengers curbside unless market is regulated.
- Companies profits vary a lot between routes and will change if govt adds competing services
- Increases risk of operators waiting until full of passengers to depart and picking up passengers at unregulated stops
- Can reduce the risk of **fare evasion leading to subsidies**



Gross Cost:

The government or their contractor collects the fare revenue, not the bus operator.

The operator is paid based based on a formula (per km, per bus hour, etc)

The formula may include some demand risk but it will be less than in Net Cost

- removes demand risk,
- Removes dangerous competition for passengers curb-side.
- Reduces unscheduled stops
- Reduces risk of shortage of services off peak and less popular areas
- increases risk of operators skipping passengers
- increases risk of driving more kilometers than needed
- Increases risk of **fare evasion and need for subsidies**

The more closely the fee resembles the operators cost structure, the less you are paying a risk premium.

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BRT Operator Payment Type	
Developing Country	
BRT System	Payment Method
TransMilenio, Bogota	Mixed Km and Passenger
GBRT, Guangzhou	Bus Kilometer
Lima (Protransporte)	Bus Kilometer
Curitiba (URBS)	Bus Kilometer
Belo Horizonte (BH Trans)	Passengers
Dar es Salaam	Mixed Km and Passenger
Rio de Janeiro (TransCarioca)	Passengers
Pereira, Colombia (Megabus)	Mixed Km and Passenger
Ahmedabad (Jan Marg SPV)	Bus Kilometer
Cali, Colombia (Mio)	Mixed Km and Passenger
Johannesburg (Rea Vaya)	Bus Kilometer
Mexico City (Metrobus)	Bus Kilometer, Fixed Cost
State of Mexico (Mexibus)	Passengers
Leon, MX (Optibus)	Passengers
Monterrey, MX	Passengers
Guayaquil, Ecuador	Bus Kilometer
Cape Town BRT	Km, Fleet, Labor, Fixed Cost
Sao Paulo, Brazil (SP Trans)	Bus Kilometer
Quito EcoVia	Passengers
Puebla, MX	Passengers
TranSantiago	Bus Kilometers
TransJakarta	Bus Kilometers
Delhi HCBS	Passengers
Developed Country	
Rouen, France (TransDev)	Passengers
Brisbane	Mixed Km and Passenger
Paris Mobilien, Ile de France	Bus Kilometers
Cambridgeshire , England	Passengers
Nantes, France (Semitans)	Bus Kilometers
Las Vegas (RTCSV)	Bus Kilometers
Amsterdam R-Net (not yet rated)	Passengers



Profit Sharing:

- 100% of the system's revenues are redistributed to all the system operators (bus operators, fare collector, BRT Authority)
- Operators are paid based on fee per kilometer or a more complex formula.
- The fee per kilometer is fixed and escalated with indexed price increases
- If demand increases, more kilometers are programmed and the system as a whole becomes more profitable.
- Operators are partially exposed to demand risk while the problems with fee per passenger are avoided.

Profit sharing with a mixed payment formula is best practice, but still requires fare enforcement from the



Geographically Defined Licenses:

Route licenses: One company, one route

- Very difficult to change the routing structure
- Big fight over any new inter-corridor route
- Unless the route licenses are auctioned off, there are almost always 'informal' mechanisms for awarding the best routes
- Hard to sustain with all door boarding

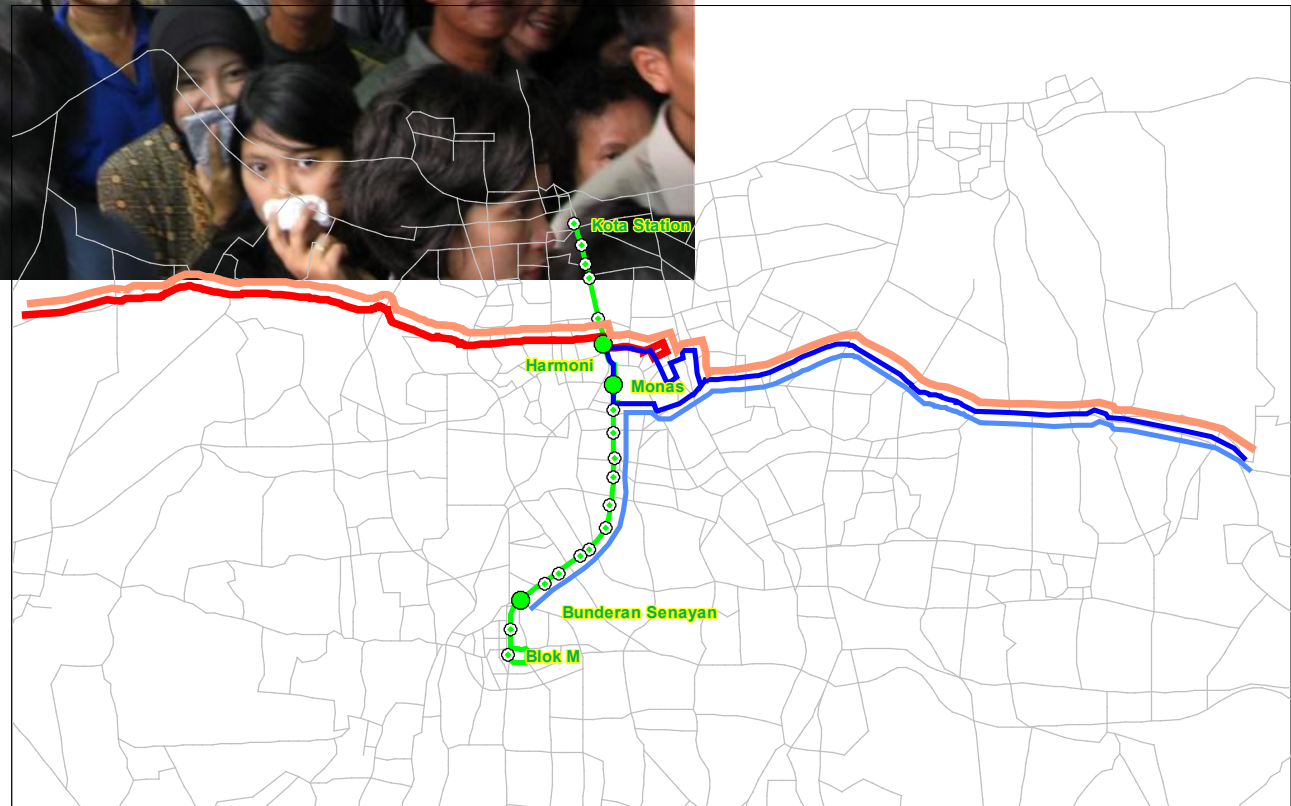
Zone-based licenses

- Service flexibility within the zone but not between zones. Routes end up not crossing the city center

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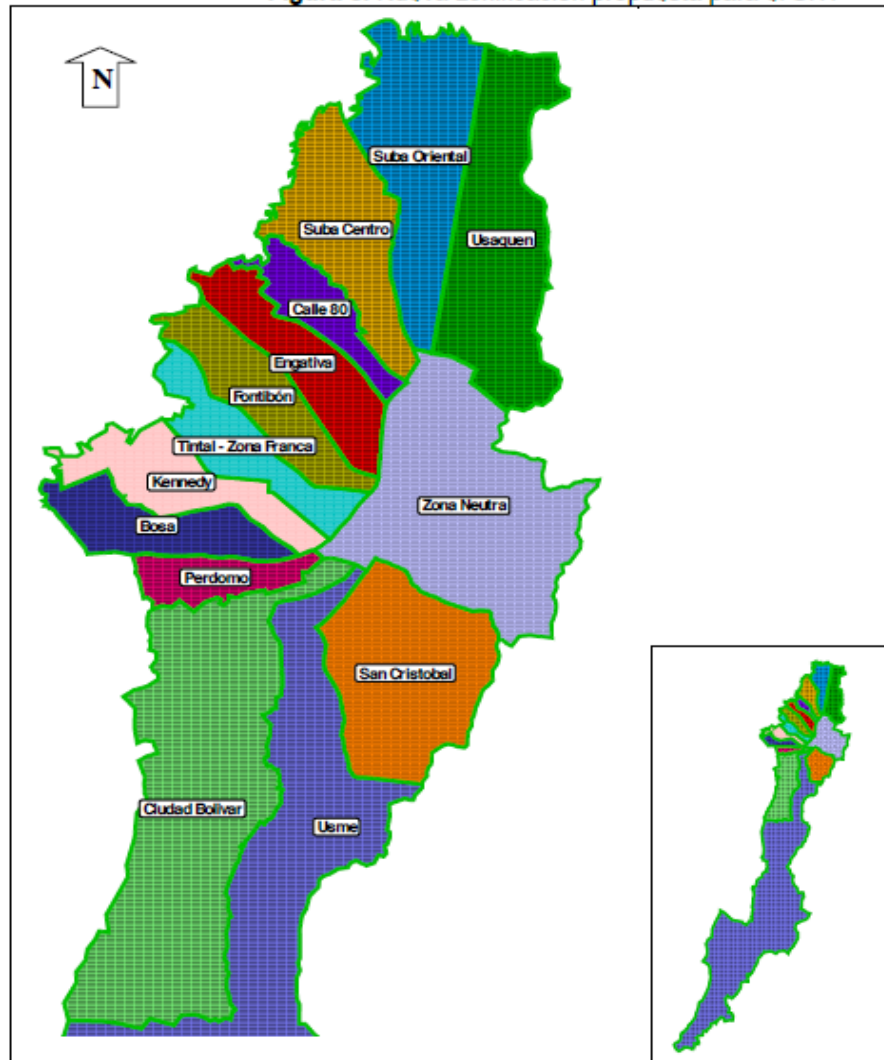


Problem with route licenses or route concessions:
Introducing inter-corridor routes is hard



Examples:
Jakarta
Mexico City
Transantiago Pre-2011

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Fuente. Imagen TransCAD

Problem with zone-based contracts:
Introducing interzonal BRT services is hard.

Zona	Nombre de la Zona
0	Neutra
1	Usaquén
2	Suba Oriental
3	Suba Centro
4	Calle 80
5	Engativá
6	Fontibón
7	Tintal - Zona Franca
8	Kennedy
9	Bosa
10	Perdomo
11	Ciudad Bolívar
12	Usme
13	San Cristóbal

Examples:
Transantiago Pre-201
TransMilenio SITP
2014
Sao Paulo,
Curitiba



Non-Geographically defined contracts

Service Contract:

- Operators are awarded a minimum number of kilometers
- These kilometers can be operated anywhere the transit authority asks.
- Very easy to make service changes and add new services without renegotiating the contract



How Regulated is Market Entry?

- BRT does not do well with old, poorly maintained buses. If one breaks down, the corridor backs up.
- Access to the BRT is best restricted to:
 - Quality vehicles
 - Quality companies
 - Companies under contract to a single authority
- More than one operator on a corridor makes possible competition within the market



How Regulated is Market Entry?

Poorly regulated buses using the Delhi High Capacity Bus Service contributed to negative public reaction and its eventual removal



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BRT Operating Contract Type			
BRT System	Contract Type	Subsidies	collection
Developing Country			
TransMilenio, Bogota	Profit sharing	No*	Yes
GBRT, Guangzhou	Profit sharing	No	Yes
Lima (Protransporte)	Profit sharing	No*	Yes
Curitiba (URBS)	Area contract (gross cost)	No*	Yes
Belo Horizonte (BH Trans)	Area contract (net cost)	No	No
Rio de Janeiro (TransCarioca)	Area contract (net cost)	No*	No
Pereira, Colombia (Megabus)	Profit sharing	No	Yes
Ahmedabad (Jan Marg SPV)	Service contract (gross cost)	Yes	Yes
Cali, Colombia (Mio)	Profit sharing	No	Yes
Johannesburg (Rea Vaya)	Service contract (gross cost)	Yes	Yes
Mexico City (Metrobus)	Route contract (gross cost)	No*	Yes
State of Mexico (Mexibus)	Design-Build-Operate forms	Yes	Yes
Leon, MX (Optibus)	Area contract (net cost)	No	No
Monterrey, MX	Design-Build-Operate forms	No*	Yes
Guayaquil, Ecuador	Profit sharing	No	Yes
Sao Paulo, Brazil (SP Trans)	Area contract (gross cost)	Yes	Yes
Quito EcoVia	Route contract (net cost)	Yes*	No
Puebla, MX	Design-Build-Operate forms	Yes	Yes
TranSantiago	Route contract (net cost)*	Yes	Yes
Cape Town BRT	Service contract (gross cost)	Yes	Yes
TransJakarta	Route contract (gross cost)	Yes	Yes
YRTA Yangon	Route License (net cost)	No	No
Developed Country			
Rouen, France (TransDev)	Design-Build-Operate forms	Yes	No
Paris Mobilien, Ile de France (RATP)	Service contract (gross cost)	Yes	No
Cambridgeshire, England	Route contract (net cost)	No	No
Nantes, France (Semitans)	Service contract (gross cost)	Yes	No
Las Vegas (RTCSV)	Route contract (gross cost)	Yes	No
Amsterdam R-Net (not yet rated)	Route contract (net cost)	Yes	No
* With Qualifications			

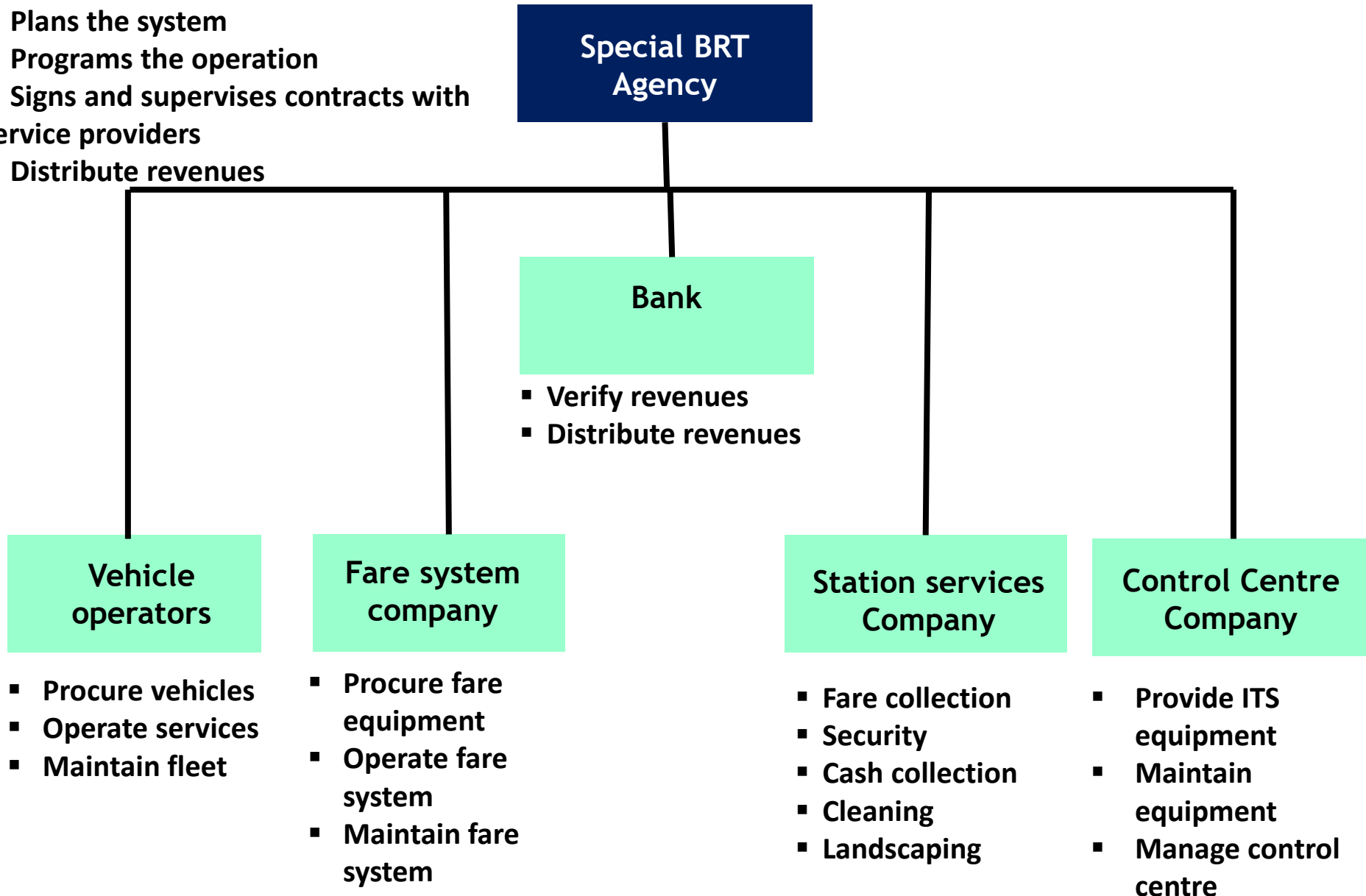


Decision #2: How many functions should be contracted out into how many separate bundles?

- Bus Operators do their own fare collection and operational control, or...
- Bus operators only operate and maintain buses, fare collector only collects fare, and operational control firm only manages operational controls

CH. 13: Business Planning

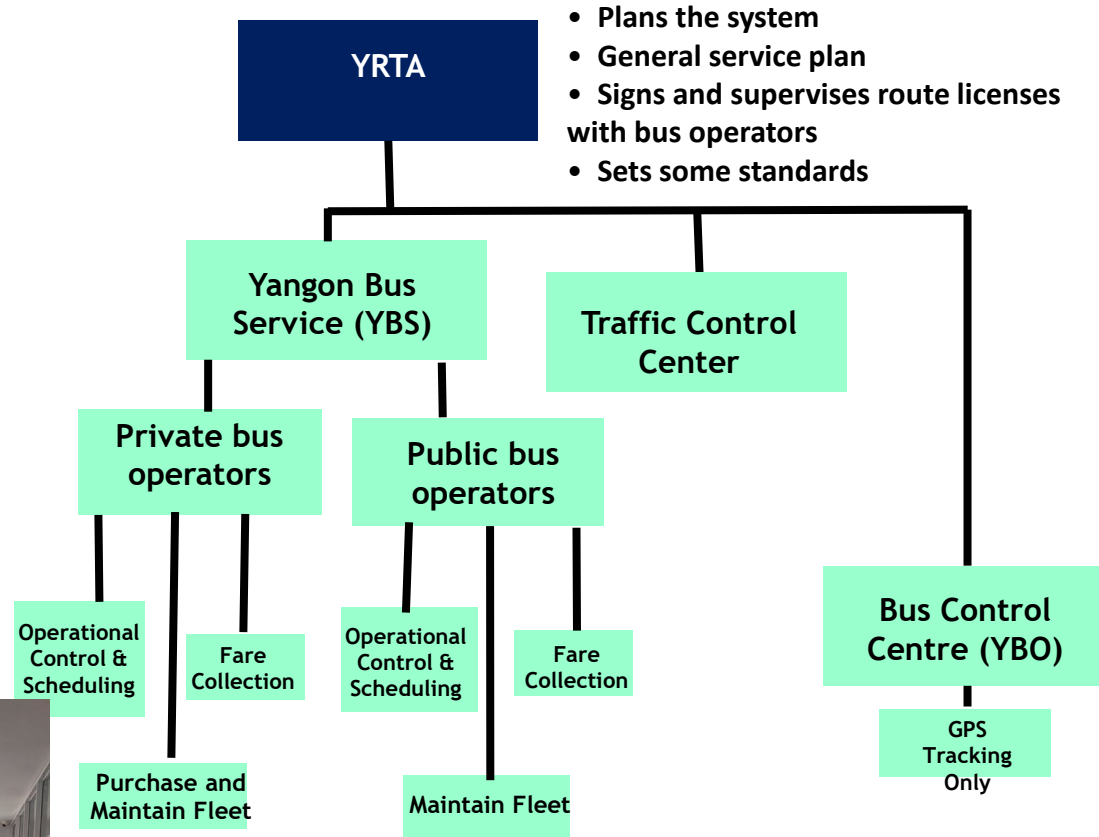
- Plans the system
- Programs the operation
- Signs and supervises contracts with service providers
- Distribute revenues



CH. 13: Business Planning

Yangon Bus Transit Business Structure

In this structure, each bus operator needs their own operational control staff and fare collection staff, adding to operating costs





Best Practice:

Fare revenue collected by a separate company that is not a bus operator

- Many operators can use the same BRT station
- Government knows how much money the system is making
- Government has more control over the operator
- More efficient



Best Practice:

Operational control system contracted out to a separate company that is not a bus operator

- More effective to have all bus operators on a corridor regulated by the same operational controller
- More efficient:
 - All companies use one system
 - Government approval for a change is faster
 - Police response is faster
- Easier to monitor quality of service compliance





Decision #3: How to select the operators?
Operate in-house, tender, or negotiate?

- In-House: The Authority decides to operate the buses, the fare collection system, and/or operational controls in-house (hires staff directly)
- Tender: The Authority decides to hire a private company through a competitive bid
- Negotiate: The Authority decides to negotiate a new arrangement with the current operators



“Managed” Competitive Tender Provides more leverage over...

- the operating cost
- the amount of private capital investment
- the project timetable
- corporate governance
- quality of service rewards and punishments

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Tendering of Private Operations		
BRT System	Degree of competition	Exclusive to BRT
Developing Country		
TransMilenio, Bogota	Competitive tender	Yes
Lima (Protransporte)	Competitive Tender	Yes
Rio de Janeiro (TransCarioca)	Nominal tender	No
Belo Horizonte	Nominal tender	No
Curitiba (URBS)	Nominal tender	No
GBRT, Guangzhou	Negotiated	Yes
Pereira, Colombia (Megabus)	Competitive tender	Yes
Ahmedabad (Jan Marg SPV)	Competitive tender	Yes
Cali, Colombia (Mio)	Competitive tender	No
Johannesburg (Rea Vaya)	Netotiated	Yes
Monterrey, MX	Negotiated	yes
State of Mexico, MX	Negotiated	yes
Mexico City (Metrobus)	Negotiated	Yes
Guayaquil, Ecuador	Stepped negotiations	Yes
Sao Paulo, Brazil (SP Trans)	Nominal tender	No
Quito EcoVia	Negotiated	Yes
TranSantiago	Competitive Tender	Yes
Puebla, MX	Negotiated	Yes
Cape Town BRT	Negotiated	Yes
TransJakarta Corridors I - III	Negotiated	Yes
TransJakarta, Corridors IV - X	Partial tender	Yes
Developed Country		
Rouen, France (TransDev)	Nominal tender	No
Paris Mobilien, Ile de France (RATP)	Nominal tender	No
Cambridgeshire , England	Competitive tender	No
Nantes, France (Semitans)	Nominal Tender	No
Las Vegas (RTC SV)	Competitive tender	No
Amsterdam R-Net (not yet rated)	Competitive tender	No



Competitive tendering in Columbia resulted in internationally competitive companies.

Private Bogota operators now operate in Santiago, Lima, Medellin, Cali,





What if a competitive tender is not possible for political reason?

- Provide a timetable for negotiations after which the government will tender
- Hire skilled negotiators.
- Know more than the companies you are negotiating with
- Intervene forcefully on corporate governance issues (Management changes have to be approved or the contract is invalid, etc)
- Retain more control over the fleet, shorten the contract length, gain leverage where you can



Quality of Service Contracts

- The rewards and penalties need to be agreed upon by the government and the operators
- They need to be easy to monitor and hard to dispute
- The money should go into an escrow and back out to the better performing companies to get buy-in and avoid litigation
- The dispute resolution mechanism has to involve a minimum of bureaucracy or else every fine will be disputed and the system wont work.



Best Practice: Multiple private bus operating companies on the same BRT corridors:

- Competition fosters stronger companies
- An operator providing bad service can easily be replaced by a competitor
- Penalties for bad service can go to an escrow account and given to companies providing best service rather than to the government



Each of Bogotá's BRT corridors are served by multiple operators



Length of contract = Life of vehicle
If the bus operator buys the bus...



Smaller vehicles

Large vehicles

600,000 kilometers
8 – 10 years

1.2 million kilometers
10 – 12 years



- Fares should be allowed to rise with cost inflation
- The BRT system needs to insulate itself from financial risk by a pact with the government that fares can rise with prices, and if not the government will provide the necessary subsidies.



How to get from the existing bus operators to the bus operators you want for your BRT system?

- Bring in outside operators and get rid of the existing operators or pay them off
- Use the existing operators as they are
- Transform the existing operators into modern bus companies



Objectives of Industry Transition:

- Avoid violence
- Companies able to provide a high quality of service
- Financially sustainable
- Well governed and accountable
- Become internationally competitive
- Create local employment
- Improve working conditions and staff welfare (shorter hours, better benefits, equal pay)



Best Practice: Involve affected former bus operators as *owners* of NEW companies operating under a new contract form:

- They have valuable experience driving and maintaining buses in that city
- They employ a lot of people locally
- A lot of powerful officials and even regular people have their savings tied up in the existing bus and minibus industry
- They are from the city, not foreigners
- They are likely to block the project and cause social unrest if they are excluded

CH. 16: Transition from Existing Operators to BRT



Eric Mavundla, Former Minibus Taxi Association Head, Johannesburg, now head of Personnel, Piotrans

CH. 16: Transition from Existing Operators to BRT

Bogota TransMilenio operating companies are all former Bogota bus enterprise owners



CH. 16: Transition from Existing Operators to BRT

Metrobus Corridor I

CISA General Manager explaining transformation from cooperative to modern company with Integrated Fleet Management



CH. 16: Transition from Existing Operators to BRT

BRT Operator Ownership Type						
	Former Minibus Operators Formed into Companies	Mixed Former Minibus and Private Investors	Former Private Bus Companies under new contract form	Outside Private Investor	Collective without Integrated fleet Management	Public bus operator
TransMilenio, Bogota	X	X				
GBRT, Guangzhou			X			
BRT, Curitiba			X			
Guadalajara, Mexico	X	X				
Lima BRT	X	X				
Perreira, Colombia	X	X				
Mio, Cali, Colombia	X	X				
Jan Marg, Ahmedabad				X		
Rea Vaya, Johannesburg	X					
Metrobus, Mexico City	X					X
TransJakarta, Jakarta	X			X		
HealthLine, Cleveland						X
Lanzhou, BRT						X
LAMTA (Orange Line)						X
MiCity, Cape Town	X		X			
LiteBRT, Lagos					X	
Porto Alegre Basic BRT					X	

CH. 16: Transition from Existing Operators to BRT

Ownership composition of new BRT Companies

City	Company	Former bus 'enterprise'	Former bus company	Former Individual owners	Domestic Non bus company	Foreign Transport Company	Government Company
Bogota	Si99	55%		44%			
Bogota	Connexion Movil	40%			40%	20%	
Mexico City	RTP						100%
Mexico City	CISA			100%			
Mexico City	Corridor 5 Operator		60%	40%			
Johannesburg	Piotrans			100%			
Cape Town	PTA	100%					
Cape Town	Golden Arrow		80%	20%			
Lagos				100%			
Guayaquil				100%			
Quito Phase I	UOST						100%
Quito Phase II & III	Central Norte			100%			
Leon, Mexico			100%				
Curitiba			100%				
Sao Paulo	Himalaya		100%				

CH. 16: Transition from Existing Operators to BRT



Metrics for Corporate Development: Example Yangon

Company	% of Fleet		%	Method of Driver Payment (1-6)	Payment Method Score	Operational		Rank
	Owned by the Company	% of Fleet in Depot	Government Owned			Control Center Functioning	OP Cont Score	
Bandula	100%	100%	0%	5	1	Yes	1	4.0
Omni Focus	100%	70%	0%	6	1	Yes	1	3.7
YUPT	58%	36%	86%	4	1	Yes	1	2.9
YBPC	100%	91%	85%	3	0.5	pending	0	2.4
Ludu (People's Partner)	100%	40%	0%	3	0.5	pending	0	1.9
GYCT	28%	0%	0%	1	0	Yes	1	1.3
Power Eleven	40%	11%	0%	2	0	No	0	0.5
Khit Tit Bayintnaung	2%	0%	0%	1	0	pending	0	0.0

1. Revenue share after flat bus rental fee
2. revenue share after operating, plus housing
3. Base salary plus revenue share
4. Base salary plus round trips
5. flat rate per round trip
6. Salary, varies based on performance, plus food



The Process...

- Define which routes and license holders are going to be cancelled and become BRT services
- Determine if the impacted owners of licenses and vehicles are legally due any compensation if their license is cancelled, and if so, what? (How long is the license valid?)
- If no legal compensation is required, is it advisable? How politically powerful is the incumbent industry?
- Determine how to positively identify ‘impacted’ owners and their legal representatives. How do we know they are legitimately impacted?
- Determine what options impacted owners will have:
 - Join a new consortium
 - Get compensation and exit the business
 - Get another equivalent route somewhere else
- Establish clear lines of communication with the impacted industry
- If a tender, involve the impacted industry in setting the rules of the tender
- If a negotiation, establish a clear negotiation process and hire a mediator