

FINDING URBAN TRANSPORT SOLUTIONS: THE CHALLENGES OF FINANCING AND INTEGRATION OF NETWORKS



With the collaboration of :

ACKNOWLEDGEMENTS

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**The analysis and conclusions of this document are the responsibility of the authors.
They do not necessarily reflect the views of the AFD or its partner institutions.**

LIST OF ACRONYMS

AFD: French Agency for Development

BAPPENAS: Ministry of National Development Planning of Indonesia

BRT: Bus Rapid Transit

CEPACS: Certificates of Additional Construction Potential (Certificados de Potencial Adicional de Construção)

CEREMA: Centre for expertise and engineering on Risks, Environment, Mobility and Urban and regional planning

ITS: Intelligent Transport Systems

LRT: Light Rail Transit

LTA: Land Transport Authority (Singapore)

MP3EI: Master Plan for Acceleration and Expansion of Indonesia's Economic Development

PPP: Public-Private Partnership

PTA: Public Transport Authority

RPJMN: National Medium Term Development Plan 2015-2019

RUNK: Decade of Action for Road Safety

SPV: Special Purpose Vehicles

TOD: Transit Oriented Development

TDM: Transportation Demand Management

UMTA: Unified Metropolitan Transport Authority (Kochi)

VTRA: Veolia Transdev-RATP Asia

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FOREWORD

The seminar “Finding urban transport solutions: the challenges of financing and integration of networks” took place on June, 23rd of 2014 in Bandung. The scope of this seminar was to bring ideas to be further explored in Indonesia and especially in the metropolitan areas that are facing major urban transport issues.

This seminar on urban transportation was initiated by AFD (French Agency for Development), BUSINESS FRANCE (French Agency for the International Promotion of French Companies) and the French Embassy in collaboration with the Ministry of Transport and the Ministry of National Development Planning (BAPPENAS) of Indonesia. The West Java Provincial Government, the City Government of Bandung and the National Railway Company PT. Kereta Api Indonesia (Persero) supported the progress of the event to feed the reflection related to the development of the Bandung railway transport system.

The French Embassy and the Indonesian Ministry of Transport opened the seminar with a welcome speech. The BAPPENAS and the West Java Provincial Government exposed the different challenges for the Country regarding the transportation issues. To close the first session of presentation, the Mayor of Bandung, Mr. Ridwan Kamil, presented the characteristics of his city and its multiple projects.



Participants composed of elected officials, decision-makers, researchers and technicians from the transport sector have benefited from a presentation on how to finance urban transport projects by Mrs. Françoise METEYER-ZELDINE, Deputy Director of European and International Affairs of CEREMA (Centre for expertise and engineering on Risks, Environment, Mobility and Urban and regional planning) and Mr. David MEQUINION, Director of Infrastructure and Systems of ARTELIA. The institutional dimension and the importance of integration of networks were approached by Mr. Etienne LHOMET, Director of the Consultancy firm DVDH (Des Villes & Des Hommes). A session about innovation in the urban transport sector was led by Mr. Thierry MOCQUIAUX, Project Director for the joint-venture Veolia Transport RAPT Asia (VTRA). Mr. Alain RIES, Head of the Energy and Transport Division of AFD, presented the different projects and missions supported by AFD in Indonesia and in other countries, before concluding the seminar with Mr. LHOMET. Mr. Ipoeng POERNOMO, Development Director of Egis Indonesia, who was also the moderator of this one-day seminar, thanked all the participants and the organizer team after recalling the future challenges of Indonesia in the field of urban transportation.

The day ended with an open session for business opportunities organized by BUSINESS FRANCE gathering multiple French companies specialized in the transport sector.

INTRODUCTION - THE CHALLENGES OF URBAN TRANSPORT DEVELOPMENT

During the last decades, more and more urban areas from all over the world have started to face transportation issues. This is particularly true for fast growing agglomerations in emerging countries, which are sometimes welcoming hundreds of new inhabitants every day. But this consequent demographic growth, coupled with the increase of individual mobility, is no longer sustainable.

To maintain the target of improvements in living standards, mobility must not be hampered. Urban transportation is thus becoming a major challenge for most developing cities. Mobility is in fact a key element to foster economic and social development. Strategies and solutions to improve urban transports are various, and must be adapted to fit each particular urban context.

On Java Island, the most populated island of Indonesia, more than 140 million people live in an area of approximately 130,000 sq.km, with a density close to 1,100 inhabitants per sq.km. The high demographic and economic growth rates, coming along with a continuous rural exodus, generate a rapid urbanization process. The populations of the four main cities of Java now highly exceed millions inhabitants: Jakarta encompasses near 10 million people, Surabaya more than 3 million, Bandung around 2.5 million and Semarang comprises 1.5 million inhabitants. And this rapid urbanization will continue to grow as approximately 60% of the population of Indonesia will live in urban areas by 2025. The expansion of the urban areas and the rapid growth of the economy produce a significant increase of mobility needs and transportation demand.

As a matter of fact, urban transportation has a significant impact on the economy. The economic activity is compromised when a city faces severe congestion problems. The Government of Indonesia has thus decided to support the development and the reorganisation of the urban transport sector in order to preserve the economic development of the Country. This support must be undertaken at the different decision-making levels, from the city level to the national one. But, questions remain on how to improve and coordinate transport systems of different scales.

Mobility is a key element to foster economic and social development.

On the national level, the strategy of the BAPPENAS is to increase the use of public transport, extending the modal part from 23% currently observed to 32% by the end of 2019. Several actions have already been conducted, including the organisation of a national workshop on public transport in November 2013. Development of bus-based public transport (Bus Rapid Transit – BRT) in urban areas is one of the main actions of the National Medium Term Development Plan (RPJMN) 2015-2019 developed by the BAPPENAS. Until now, approximately 1,100 BRT buses have been operated across 17 cities covering Batam, Palembang, Pekanbaru, Riau, Jakarta, Tangerang, Bogor, Bandung, Yogyakarta, Semarang, Solo, Manado, Gorontalo, Denpasar, Ambon, Padang and Makassar. This transport system has already permitted to move 0.6 million people per day in the country. Six cities are currently building an urban railway network. And besides those multiple actions in the field of public transport, the importance of integrating transport infrastructures within the urban environment was also emphasized. Creation and optimisation of intermodal nodes are thus a priority in the strategy of the Government.

To accelerate the development of urban transportation, the Government of Indonesia gives special attention to five particular issues tackled by the following strategies:

1. Transportation and Land Use Strategic Interaction, which aims at enhancing the role of the transportation to support the development of land use through Park and Ride (P & R) facilities, Transit Oriented Development (TOD), Transportation Impact Control (TIC), as well as improving last mile connectivity in urban areas;
2. Urban Mobility Improvement Strategy, which aims at optimizing the role of public transport through the improvement of urban infrastructure (roads and multimodal infrastructures), improvement of urban public transport and freight services;
3. Urban Congestion Reduction Strategy, which is intended to reduce the burden of congestion in urban areas by strengthening Transportation Demand Management (TDM) with «push» (i.e. Electronic Road Pricing (ERP), parking systems, etc.) and «pull» (i.e. development of BRT systems, MRT) effects, and improving Traffic Supply Management (TSM) with the development of Intelligent Transport Systems (ITS) for capacity and priority management;
4. City Air Pollution Reduction Strategy, which is intended to reduce the urban pollution load by reducing greenhouse gas (GHG) emissions, air and noise pollution;
5. Safety Improvement Strategy, which is intended to improve the safety of road transport by increasing the level of consciousness of all citizens, and continuing to repair and construct facilities and infrastructures that support the safety of road transport, in accordance with the General Plan and the Decade of Action for Road Safety (RUNK).

On a local level, major cities have launched their own Master Plan, adapting the national strategies to meet local challenges.

For instance, the Bandung Metropolitan Area Urban Transport Master Plan, spread on the 2011 – 2025 period, includes various actions to face the challenges of transportation, such as the Bandung Urban Railway

project, for an expected budget of 175 MUS\$D, partially funded by AFD. This project aims at modernizing the railway section between Padalarang and Cicalengka (including Bandung) with the reinforcement of a 42 km section, a partial duplication of the railway track and the full electrification of tracks along the corridor. The construction of a 4.1 kilometer long viaduct located at the East of the Bandung Central Station is also part of the project and will lead to the suppression of multiple road crossings currently causing a strong congestion. In cooperation with local stakeholders, AFD suggests to study the reorganisation of the Bandung Central Station and its surroundings to promote intermodality and to favour a better urban integration.

The mayor of Bandung, Mr. Ridwan Kamil, has identified several urban mobility projects to make the city more friendly and livable. Only 20% of the inhabitants of Greater Bandung presently use public transport facilities, meaning that the major part of the population still contributes to the increase of congestion, pollution, and noise by using their private vehicles. The ideas are numerous: a monorail project, a cable car project in the hills above the city, the modernization of the current bus fleet, the promotion of cycling, the creation of a «skywalk» (an elevated structure dedicated to pedestrians above the Central Business District) or the introduction of free tourist buses. Yet, there are still questions on how to finance, implement, manage and develop such urban transport projects.

In order to feed the reflections, the seminar organised and moderated by Indonesian and French experts, as well as French specialized companies, facilitated experience and know-how sharing. The development of transport infrastructure in Indonesia has to face the following three main challenges:

- The choice of an adapted financial scheme;
- The integration of all stakeholders in a complementary framework and system and
- The diffusion of innovative methodologies and technologies, such as ITS.

I - URBAN TRANSPORT NETWORKS

DEVELOPMENT: THE FINANCING ISSUE

Financing urban transport is one of the most challenging tasks for decision-makers in emerging countries like Indonesia. The rapidly growing economy of those territories needs to rely on efficient infrastructures, which depends on solid funding. But “who can pay and who must pay for urban transport?” The funding framework of the urban transport sector generally belongs to three large categories of stakeholders: public authorities, direct beneficiaries and indirect beneficiaries. Furthermore, development of transport infrastructures affects land value, which might also be a source of funding.

Who pays what?

Public authorities are one of the main players involved in the funding of urban modes of transport whether in the area of infrastructure (most commonly) or – often, but not systematically – in the operation of networks through the payment of subsidies or through a direct management by municipal corporations. The sources of public funding for transport budgets may come from taxation, international financing agencies, or Public-Private Partnership schemes (PPP). Those financial sources can come from different levels of public institution playing a role in the transportation field, ranging from the Municipal level to the Regional or State level.

Direct beneficiaries correspond to users who benefit directly from the multimodal transport system. They can be public transport users who contribute to the system’s funding by purchasing a ticket, or users of individual motorised vehicles who may be subject to:

- Tolls for using specific infrastructures (highways, bridges);
- Congestion charging to access areas such as a city center, parking charges;
- Other charges related to automobile ownership, like taxes on petroleum products, etc.

Indirect beneficiaries refer to people who benefit from the presence of a transport system and the accessibility that it provides without necessarily being direct users. They can be residential or business land owners who see the value of their land increase with the arrival of a transport system. They can also be business activities which indirectly benefit from transport infrastructures in terms of transportation of customers or delivery of goods.

Creation of a transport authority ensures greater consistency since the contributions of all stakeholders can be coordinated.

In each city, these different categories of stakeholders may play a distinct role and bring different solutions to fund the transportation systems, depending on the institutions and the social and political conditions.

Each proposed solution must pay attention to the economic efficiency of the transport system, as well as to its social and environmental efficiency. The development of a successful transport system holds in the minimization of the costs while satisfying as far as possible the current and future needs of the population, as well as limiting the impact on the local and global environment. A lack of coordination between the actions of those various stakeholders may lead to inefficient organisations. The creation of a transport authority ensures greater consistency since the contributions of all stakeholders can be coordinated. Bandung might want to steer into that type of organisation.



*Contrasting operation funding arrangements (total costs): each city must find its own mix of funding.
Source: CODATU*

What are the financing solutions for transport development in Indonesia?

The development of transport infrastructures such as the Mass rapid transit system in the Jakarta metropolitan area (KA Commuter Jabodetabek project) or the current reorganisation of Bandung Central Station affects the value of land and buildings along the project. The assessment of the increase of land value is always a controversial issue depending on local property market. Different solutions can be set up to capture the generated value.

The “betterment tax”: a tax on the increase of existing property value projects

A “betterment tax” is different from a property tax as the increase in value of property is not due to the action of the owner (such as would be the case with renovations and improvements) but to an operation carried out by public authorities. However, the assessment of the land value gains is still based on the property market, often unpredictable, which causes a risk.

Betterment taxes are not popular and not easy to implement. As most of the areas where transport projects are implemented in Indonesia are densely populated or already built up, this solution might not be the most appropriated.

Land value capture: the experience of the Dublin tramway (Ireland)

The tramway in Dublin, opened in 2004, was partially financed by a Development Contribution Scheme. In Ireland, the law requires property developers to pay a standard financial contribution to help fund utilities in the area in which the project is being developed. They must also pay an additional contribution on top of the standard financial contribution based on the increase in land value in the vicinity of the new infrastructure.

Two recent articles in the “Irish Planning and Development Act, 2000” allowed planning authorities to issue authorisations to develop nearby stations on condition that the private developers contribute financially to the work necessary to complete new transport infrastructure. The tax is directly proportional to the land value increment generated by the public transport project.

In the Dublin tramway example:

- in residential areas: contributions totalled €250,000 per hectare
- in commercial areas: contributions totalled €570,000 per hectare.

This scheme helped to finance part of the capital invested and created new areas for urbanisation, thus offering new opportunities to developers willing to pay the supplementary contribution.

Moreover, urban development around stations has generated a new clientele and increased income from fares. This is therefore a win-win situation for both the transport authority and property developers.



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“Impact fees”: a tax on the value of urban development to be built

In the case of future urban projects, public authorities can apply “impact fees” to property developers to fund public transport infrastructures. Property developers will directly build at their own cost the public transport infrastructure or they will have to fund infrastructures supplied by public authorities.

A well-known example of impact fees is the Transit Impact Development Fee (TIDF) implemented by the city of San Francisco in April 1981. The tax was imposed on new office buildings in the city center in order to finance:

- Public transport investments;
- Additional operating costs generated by the project.

This concept is also common in Australia (known as “Value Increment Financing” or VIF) where the State lends property developers the equivalent of the estimated land value gain created by the new infrastructure, at a low interest rate and for over 10 years. The newly built areas will generate value for the property developer and more tax revenues which will fund the new public transport infrastructure. This mechanism optimizes urban space along public transport infrastructures. This model is socially acceptable because it is not considered as an additional tax.

Development of business and residential activities on land assets owned by public authorities

In many countries, it is usual that public authorities own significant land assets. Generally, they acquire land located nearby transport infrastructures, to foster urban development in surrounding areas.

The Public Authority can then sell the land to private developers by including the estimated added value (of the future urban project) in the sale price. Other anticipated purchases of land (land reserves) can be a financial solution to develop specific areas in the scope of an integrated urban project.

For instance, the Indonesian Railways Company PT. Kereta Api owns consequent land assets along the railways and the station of Bandung, which may favour the development of an integrated urban project.



Indicative perimeter of Bandung Central Station land assets.

In addition to using land reserves, public authorities may also seek to optimize land use near stations or along main transport lines. Sometimes, the value of the land occupied by the infrastructure itself can increase. Developing commercial activities along a metro line or in a railway or bus station is a way to generate cash flows and to finance part of the investment and operation costs of the transport system.

Focus 2

The new city of Aguas Claras (Brazil): urban development funds the metro

Aguas Claras, some 20 kilometres outside Brasilia's city centre, situated in the new city (satellite city) of Taguatinga, was largely unused until the beginning of the 1990s. The land belonged to Terracap, the land agency of the Federal District, also known as the "Federal District Development Agency". In December 1992, the decision was made to develop this area and build the Brasilia—Samambaia underground line, linking the Pilot Plan area to satellite cities that have developed around Brasilia. The land acquired was developed by Terracap and sold off as individual plots to property developers, in order to capture the significant land value gains generated by the investment.

This project - the first of its kind in Brazil - was a complete success, as demand for property in the region is very high. Out of the \$570 million cost to build the underground infrastructure, 85% was generated by selling off plots of land. The cost of developing the land in preparation for selling the plots was valued at €37 million. The same procedure was followed by Metrô DF for the construction of the last station of Aguas Claras, in service since late 2013. Today close to 135,000 residents live in this new city, meaning that the figure forecast for 2020 has already been reached.

As Terracap is already the administrator of the undeveloped land of the Federal District, Metrô DF is planning to use this new procedure to increase the population density of the so-called "Jockey Club" area, which is slated to accommodate the decentralisation of certain government agencies that are overly concentrated in the Pilot Plan, whereas the middle classes live in the satellite cities. Metrô DF plans for 39,000 square metres of commercial development around the Samambaia and Asa Norte stations.

Initial state of development



Current state of development



© source CEREMA

Sale of additional building rights to property developers

Public entities or local authorities have another financing solution through the sale of additional construction rights. This solution is also known as “Certificates of Additional Construction Potential” or CEPACs (Certificados de Potencial Adicional de Construção) in Brazilian. CEPACs can be considered as financial bonds as well as urban politic tools. They provide municipalities with the possibility of modifying land-use rules and selling construction rights greater than the land occupancy coefficients, in certain areas, in order to finance the physical and social infrastructures needed for urban development projects. The quantity of CEPACs issued is limited and they are assigned to specific areas in order to increase the population density in the targeted areas.

Public-Private Partnership

Public-Private Partnership (PPP) models become increasingly common to finance urban transport development. PPPs or “Kerjasama Pemerintah dan Swasta (KPS)” in Indonesia were initially introduced in the early 1990s for the development of infrastructure projects, especially for toll roads.

The aim of a PPP is to involve the private sector in the initial investment and/or operation of a project by assigning some of the tasks to the private partners and transferring them a share of the risk, while guaranteeing a sufficiently profitable set-up (by means of public sector subsidies if need be) to attract investors.

It is usually a long term contract, totally or partially financing the Design and Construction phase or the Operation and Maintenance phase. The two main kinds of PPP are the “concession contracts”, in which operation and commercial related risks are transferred to the private sector, and the “affermage contracts” (or service concession contracts) in which commercial risks remain under the responsibility of the public sector.

CEPACs in Rio de Janeiro (Brazil): 5 million square metres to be revitalised in Porto Maravilha

In Rio as in many cities, port operations have moved away from the vicinity of the centre of town, leaving behind thousands of square metres of hangars, silos and housing. The proximity of this area to the historic centre made it an exceptional land holding, but one which required a complete renovation programme. It was with this goal in mind that, through a supplementary law approved in December 2009 (LC 101/2009), the city council of Rio created the institutional and financial measures needed to set in motion a project called “Porto Maravilha”.

- creation of the Porto Maravilha Joint Urban Operation;
- creation of the Urban Development Company of the Port Area of Rio de Janeiro (CDURP), which managed the project for the city council;
- modification of Rio's urban master plan, in order to amend the construction and land-use rules.

For implementation of the project and financing of its public share, the municipality issued 6,436,722 CEPACs for 545 reais apiece, representing a financing potential of 3.5 billion reais (€1.05 billion) which were sold in a single instalment in June 2011 to the public bank, the Federal Savings Bank (CAIXA). This bank then put the CEPACs it had acquired on the secondary market, in successive instalments. By July 2013, nearly a quarter of the CEPACs had been resold on the secondary market to investors, at twice their initial price.

Using this approach, which differed from the one used in São Paulo, the city of Rio de Janeiro was thus able to have 3.5 billion reais at its disposal immediately to allocate to the project, and in particular to fund construction of the 44-km tramway system underway. The Federal Savings Bank recoups the value gains on the secondary market, which it can then allocate to the numerous housing and development projects that it funds throughout the country.

PPPs do not constitute a new financial resource. In fact, they mobilise the private sector to temporarily bear the financial burden, whether it be for investment or operation purposes.

The general principle is that the private partner gradually recoups his costs, either by being reimbursed for the public authority's share, or by being paid a fee by the user of the service and/or of the infrastructure. In any case, the contracting authority of the infrastructure or service pays a price for the PPP. Indeed, the burden of the investment or operation borne temporarily by the private partner represents an additional cost for the owner. Thus, PPPs are generally not used for purely financial reasons. However, this does not mean that PPPs are not useful. Indeed, the private sector has other advantages, which can be exploited with PPPs:

- Know-how in a complex industrial and commercial activity: Conducting an urban transport project requires skills and expertise which are most found in the specialized private sector;
- Flexibility: Regulations concerning public management may hinder management of an industrial and commercial project such as the construction and operation of transport infrastructures. A partnership with the private sector, under public control, can help accelerate and optimize project management;
- Better personnel management: Given that the operation of the transport infrastructure will be delegated to a private partner, it is not the transport authority but rather the private partner who is responsible for hiring and managing operational staff, which means lower administrative costs for the public partner and, above all, allows greater flexibility;

- Economies of scale: These may be achieved by bringing in financial partners, well established builders and operators, managers of multiple infrastructures;
- Encouraging efficiency: This must be organised during the competitive bidding stage, and then by rewarding the private operator based on balanced performance indicators.

Compared to traditional public management, PPPs appear to be sometimes better adapted to complex projects, with multiple interfaces and risks (especially on planning), even though PPPs require more anticipation.

Principle of success: do not overlook the user

The financial issue is currently one of the main concerns of Indonesian stakeholders. And PPP models might be a very adequate and efficient tool to be considered in Indonesia, when wisely managed by

public authorities. In France, this type of financial option is led by a Transport Authority, a politic organization who has a strong decision power.

Transport authorities can also directly benefit of “dedicated transport taxes” applied to all employers established in the area served by the public transport network,, which is a typical French scheme. Direct benefits to the users are thus rapidly visible, on the contrary of certain more sophisticated Anglo-Saxon mechanisms.

However Tax reorganization is not easy to implement: it is a long term process needing a politician consensus. This is the reason why Indonesia might orientate its financing strategy towards others tools more efficient in the short term, such as PPP models. As described above, implementing taxes on property gains can also be a very efficient financial solution, but not easily accepted and requiring a very specific legal framework. However, some promising examples showed that ingenious solutions can be found. Speculation on the property market can be a successful solution, even if the risk of the market is not to be neglected.

II - URBAN TRANSPORT NETWORKS DEVELOPMENT: INTERMODALITY, WHAT IS AT STAKE AND HOW TO IMPLEMENT?

Integration of transport networks aims at making public transports more attractive than individual modes. An integrated public transport network undeniably captures a larger number of users. The main explanation facts are that a good integration simplifies the understanding and the access to the transport system and reduces the intermodal journey time. The development of intermodality, which can be understood as the combination of diverse types of transport modes during the same journey, greatly depends on integrated systems.

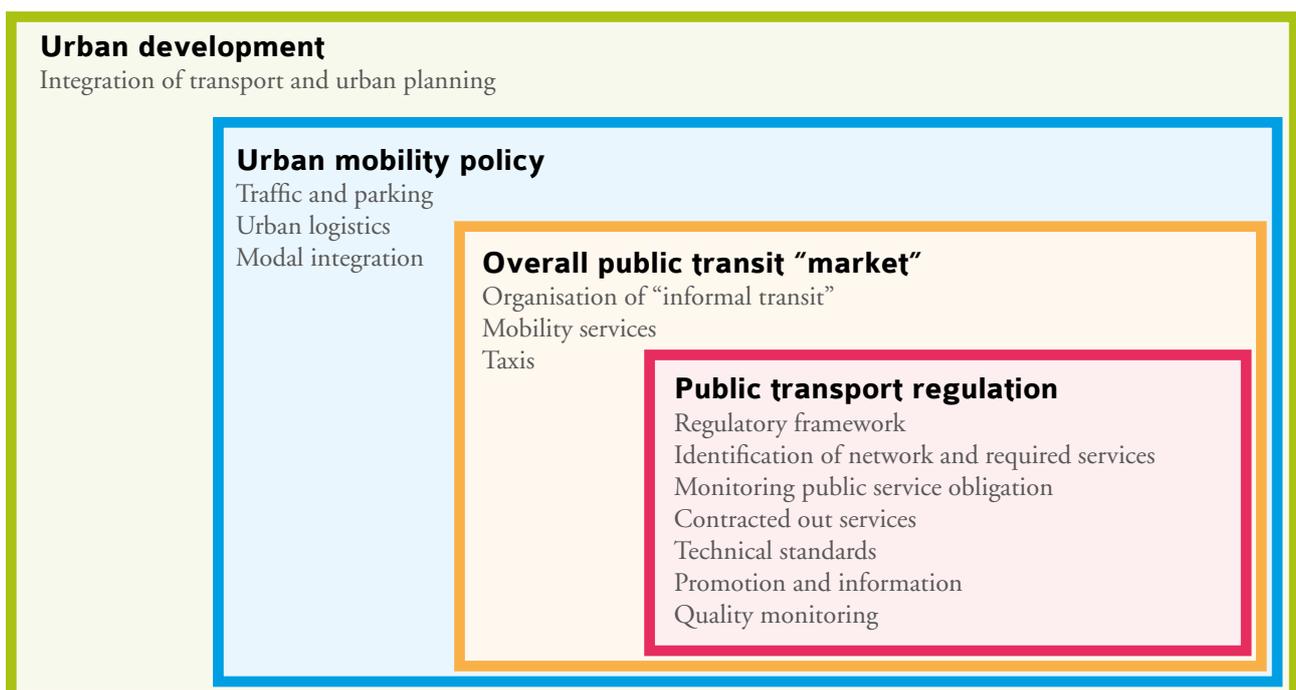
When there is no integration, on the «physical» aspect (interchange stations), on the «systems» aspect (ticketing system) or on the «financial» aspect (fare policy), transport modes can compete between them. In this case, the operating results of each company are directly threatened. Integration of transport networks is thus synonymous to economic efficiency.

Knowing that urban transport projects are expensive, the idea of letting their management to private organizations can be seen as a pragmatic solution. However, even if a private sector intervention favours a reduction of public expenditures, the implementation of a comprehensive and integrated strategy around the project definitely requires the establishment of a Public Transport Authority (PTA).

Intermodality: the institutional dimension

What are the roles and responsibilities of a PTA?

Different forms of PTA can be found through international examples. The types of assigned mission are criteria of differentiation. The identification of the various functions to be performed by a PTA is a complex process and is closely linked to the different levels of integration.



The focal areas of Public Transport Authorities

These functions may be limited to the mere regulation of public transport and the organisation of all passenger transport activities, or be expanded to on all

competencies related to mobility. The most integrated form of a transport Authority directly associates transport issues to urban planning issues.

Focus 4

The Land Transport Authority of Singapore

The Land Transport Authority of Singapore (LTA) in Singapore is probably one of the most integrated examples of a Public Transport Authority. LTA is tasked with formulating land transport policies and works very closely on this matter with the authority in charge of urban development. LTA plans and implements projects for high-capacity passenger transport, road infrastructure and pedestrian pathways. It also regulates vehicle ownership, traffic management and maintenance of road infrastructure. Whilst it does not directly define the fares for public transport, it assists the public transport board in doing so. It does however regulate service supply and the maintenance of public transport infrastructure.

LTA has thus complete control over all strategic functions, service planning, parts of regulation and common services. LTA has chosen to contract with private operating companies to deliver services which require a specific expertise.

LTA develops a strong Land use and Transport integration, as well as innovative funding mechanisms such as land value capture, Electronic Road Pricing, Vehicle Quota System, etc.



The various levels of action

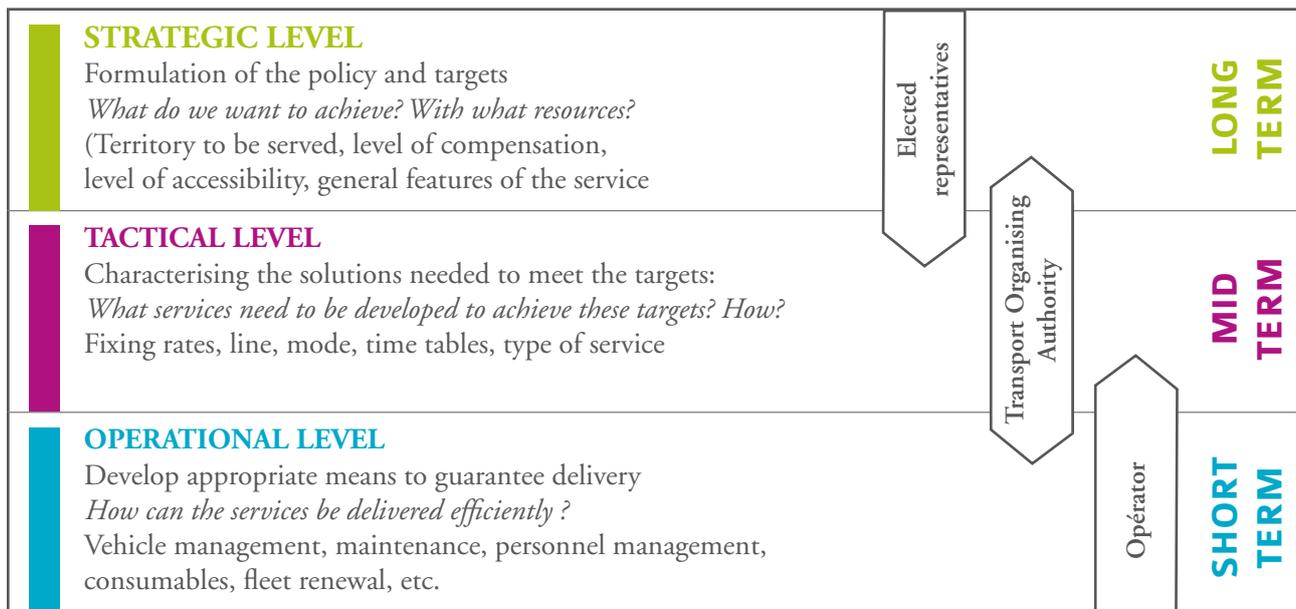
To feed the reflection of the Indonesian stakeholders, a methodology relying on a three-level analysis is proposed on the opposite page.

The Strategical level responds to a long-term approach (10 years and more). At this level, the political leaders define the transport policy and its objectives in terms of served territory, levels of modal split, targeted customers, levels of subsidies and available resources.

The Tactical level is oriented towards a medium-term vision (5 to 10 years) and defines the characteristics

of the transport supply that have to meet the above objectives. At this level, modes of transport, networks, fare grids, timetables, frequency and types of services offered are detailed. Major projects, either infrastructures or “systems and equipment”, are designed and implemented. This tactical level is rather under the responsibility of the administration.

Finally, the Operational level is intended to develop all appropriate means to meet the needs as they were specified at the tactical level, and to guarantee the delivery of appropriate services. The goal is to precisely implement the transport services as efficiently as possible. At this stage, a public or private operator is



The various levels of actions

in charge of all operating aspect including personnel management, vehicle management, maintenance, etc.

These three levels of actions, corresponding to three different time perspectives, are frequently carried out by distinct institutions. They can also be negotiated between the different stakeholders to optimise the implementation of transport policies. Elected representatives should clearly be in charge of the definition of transport policies, in connection with other metropolitan strategies, and be assisted in this task by Public Transport Authorities. PTA should hence be responsible for applying all strategies. The following sequence focuses on PTAs, how to implement them and their relations with other stakeholders.

Key issues to constitute a PTA

The following elements may be useful to the various Indonesian cities that are questioning the necessity of a Transport Authority.

How large should be the involved territory?

The definition of an adequate perimeter of jurisdiction is particularly important. Administrative boundaries that are smaller than the urbanised area limits will not favour an integrated metropolitan policy. On the contrary, too large limits may lead to give services to rural areas, which encounter specific issues.

What should be the Authority's legal form?

Transport Authorities can be a specialized public authority, a department of an existing public body or even a company founded by local authorities. A direct access to the elected representatives of the City is

recommended in order to ensure that transportation issues will be highly prioritised.

Which partners should be involved?

The Board composition and the task allocation define the governance scheme. Some directors' boards will associate different administrative levels (Municipalities, Regions, etc.) and others will include representatives of the economic sector, of customers, NGOs, etc.

What should be the functions of the Transport Authority?

This is probably one of the most decisive issues to delineate during the implementation process of a Transport Authority. The functions may be limited to the simple organisation public transport, or extended to the overall management of mobility within the territory, and they can even be connected to urban planning issues.

What can be the financial resources?

It is essential to clearly identify how fare revenues will be shared between the PTA and the system operators. In many cases, revenues can pass through the PTA to be later redistributed between certain stakeholders. The PTA usually receives grants from the Central Government or local authorities, on a long term vision to allow investments, as a complement to its own resources.

What should be human resources and expertise within the PTA?

The efficiency of the PTA will highly depend on the staff's origin and its capability to outsource specific tasks to external consultants. The incorporation of employees from other public bodies, or from operators will help the new structure to develop diverse skills.

The current and possible future Kochi's Matrix of functions

The City of Kochi, located in the south of India, intends to implement a Unified Metropolitan Transport Authority (UMTA) to improve the general management of transportation. AFD, which supports the action, organised a workshop in March 2014 gathering many stakeholders to discuss the roadmap of the future Authority. During one of the sessions, the functions of each stakeholder were discussed. This participative exercise enabled to produce a synthetic map of the current organisation of the transport sector. The issue of possible evolution processes and the future role of UMTA were tackled at the same time.

Each transport mode is currently managed by a dedicated authority. Owners of infrastructures or rolling stock, financial bodies, and operators are sometimes different for a same transport mode. With the implementation of UMTA, several functions would be gathered under the responsibility of one institution.

The future UMTA of Kochi should ideally focus on the strategic level, which encompasses the formulation of a multi-modal planning approach, in accordance with the review of the existing Comprehensive Mobility Plan, and the filling of certain gaps such as the parking policy.

MODES		Railways	Metro	Bus	Boat	Rick Shaws Taxis	Intercity	Walking Cycling	Parking	Road Cars Moto	Urban Freight	Land Use
STRATEGICAL LEVEL	Planning design	Ministry of Railways	KMLR						GOK*			GOK*
	Funding		GOJ* GOK*	GOJ*								
TACTICAL LEVEL	Infras Super		KMLR	KSRTC* Municipalité			Municipalité	SPV				
	Rolling stock Licences Fares		RTA*		GOK*			Police department				
OPERATIONAL LEVEL	Operation Maintenance		KSRTC* Private Operators	... WTC*	Private Operators	Operators						

The current matrix of functions

MODES		Railways	Metro	Bus	Boat	Rick Shaws Taxis	Intercity	Walking Cycling	Parking	Road Cars Moto	Urban Freight	Land Use	
STRATEGIC LEVEL	Planning design	GOK*											
	Funding	UMTA Kochi											
TACTICAL LEVEL	Infras Super	Ministry of Railways	KMLR	SPVs		Private Operators	Private Operators	SPV	Police department	SPV	Road Cars Moto	Urban Freight	Land Use
	Rolling stock Licences Fares												
OPERATIONAL LEVEL	Operation	Ministry of Railways	KMLR	KSRTC*	Private Operators	...	WTC*	Private Operators	Operators				
	Maintenance												

New matrix of functions including UMTA

- GOI:** Government of India
- GOK:** Government of Kerala
- GCDA:** Greater Cochin Development Authority
- KSRTC:** Kerala State Road Transport Company
- WTC:** Water Transport Company

Intermodality: the importance of networks' integration

Indonesia is experiencing a significant increase of mobility needs and transportation demand due to the expansion of urban areas. Railway infrastructures located along the structuring East-West axis on Java Island pass through numerous at-grade crossroads, especially in metropolitan areas, making traffic even more difficult. Road traffic management needs to be coordinated with railways' traffic to better meet mobility needs. Integration of public and private transportation is part of the national strategic plan of BAPPENAS, but improvement of urban mobility will not be possible without the promotion of public transports. Indeed, coordina-

tion between the various transportation modes is a key issue to reduce the use of private vehicles and to favour an efficiency mobility organisation.

Coordination of railways networks with other public transport modes, such as intercity or regional buses, Bus Rapid Transit (BRT), regular urban buses, cable-cars, taxis or even with para-transit systems is necessary to make mobility more efficient. A well organised public transport network should also enhance accessibility to the closest airport hub. Furthermore, pedestrian and cycling integration are not to be ignored. They should even be the main issue in many cities.

A PTA can be a mean to centralise all transport issues and to enable a better integration.

Intermodality and integration need to be developed through adequate institutional and financial frameworks. The establishment of a Transport Authority can be a mean to centralise all transport issues and to enable a better integration. And the design and the progressive construction of a hierarchized public transport network can be a long term target, which organises all actions of a PTA along a common road map.

Intermodality also refers to the integration of transportation and urban planning issues. BAPPENAS is concerned by this matter since RPJMN integrates a

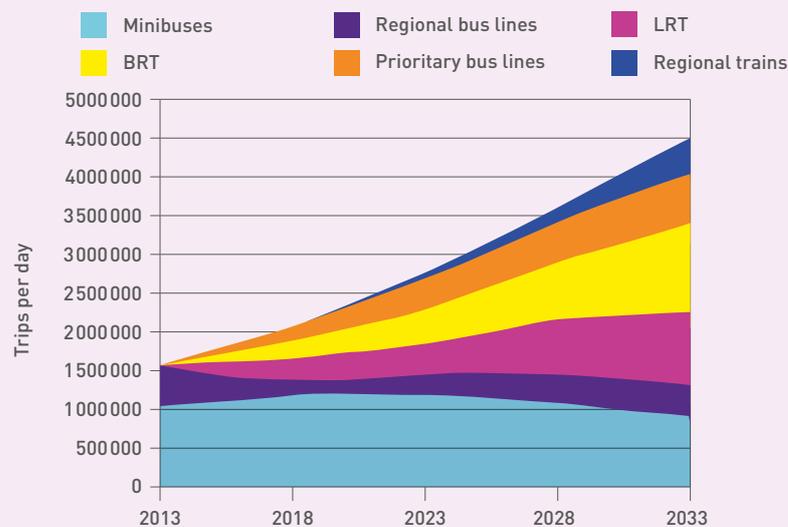
strategy aiming to implement transport systems that support land use development. This Transportation and Land Use Strategic Integration (“Strategi Interaksi Transportasi dan Guna Lahan”) suggests to extensively rely on Transit Oriented Development (TOD) and to improve transport systems’ access in urban areas.

Regarding the city of Bandung, which is mostly composed of residential areas, it can be noted that the city center might be revitalised. The RPJMN and the City’s Master Plan are important tools to advocate for an integrated development vision. The expansion of the city, especially eastward, can be an opportunity to develop a new form of urbanisation combining living, working and leisure places. However, the mix of urban functions is more efficient when served by a reliable and well integrated public transport network. The development of transport infrastructures is sometime the driving force of a well organised metropolitan development. It is the case of Bordeaux, a French city, which was metamorphosed with the implementation of a 44 kilometre long Light Rail Transit (LRT) network.

Focus 6

The modal split evolution forecast in Addis Ababa (Ethiopia)

A study of Addis Ababa mobility habits enabled a forecasting of a possible modal split evolution. Such study can constitute a base for a long term strategy for urban transportation.



Modal split between all Public Transport Modes

An holistic approach is consistent with the objectives of intermodality. Multimodal stations, which facilitate intermodality, have to be integrated within a larger urban project. Bandung Central Station which

has been identified as one of the multimodal sites of the agglomeration should support the articulation of a larger urban project, for the railway station and its surroundings.



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Urban redevelopment with public transport projects – the metamorphosis of Bordeaux

Intermodality: the central role of major intermodal stations

Multimodal hubs are essential to ensure the efficiency of a transport network. They enable customers to easily change their scale of mobility, from a local ride to an intercity or interstate journey, when the hub encompasses regional bus services or a railway station.

RPJMN integrates a strategy aiming to implement transport systems that support land use development.

The organisation of such intermodal nodes is quite complex, combining various transport modes, while they must remain very functional to the user. Parking facilities, pedestrian and cycling accesses, taxis stands are functions to be included within the intermodal hub. As suggested in the RPJMN, optimisations of terminals, development of Parks and Rides and real time information based on ITS are necessary actions to facilitate and promote the use of public transport system instead of private modes in Indonesia.

Inside the intermodal station, areas dedicated to travellers are designed to facilitate transition from one mode to another. Multiple services are included, such as information desks, seating, commercial activities, etc. Information relating to the different modes of transports is displayed in the station. But the most difficult task is the coordination of the timetables of the different transport modes.

An intermodal station needs to be articulated with all other urban facilities. Big intermodal hubs must be integrated in the city in the scope of a bigger urban planning project.

Case study of Bordeaux's railway station (France)

Bordeaux, a city in France of nearly a million inhabitants, can be considered as an important intersection at different scales, going from the regional level to the European level. At a European scale, the city is located at the crossway between Paris and northern cities of Europe, and Spain. The railway station will soon host a high-speed train network (TGV) to facilitate this European connection. But the railway station of Bordeaux is also highly connected to multiple networks.

Every year, 10 million travellers pass through Bordeaux Saint-Jean railway station. The train station has been successfully upgraded to a multimodal node, progressively integrating city bus stations, intercity bus station, airport shuttle service, a tramway station, city's self-service bike rental system, etc. Now, the site is equipped with a whole range of transport services, serving all kind of mobility need.

Accessibility is also facilitated for private transportation by providing parking facilities, taxis stands, and drop-off points. However, public transportation remains in the heart of the system. The intermodal station is equipped with information screens providing time schedules for the regional and national trains, and for city services as well. The railway station is actually designed to facilitate the journey of all travellers with multiple services and information points.

Bordeaux Saint-Jean train station falls within a larger and very ambitious urban project, integrating not only mobility, but also economic, social and environmental facilities. The whole project is designed to encompass all types of dwellings, offices, commercial and touristic facilities, public and natural spaces inside this CDB.



© source Bordeaux Euratlantique

III - URBAN TRANSPORT NETWORKS

DEVELOPMENT: CHALLENGES AND NECESSARY INNOVATION IN URBAN TRANSPORT

A multimodal approach is in fact extremely challenging in terms of innovation. To be more efficient, multimodal networks need to physically integrate the diverse modes of transport (inside a transport hub), but they also need to rely on more open system architectures.

For instance, time schedules can be adjusted regarding the typical journeys of a majority of inhabitants. This can affect commuters using every day and at the same time a suburban train and a connecting bus line to join the city center. Time schedules of trains and buses can be adjusted to minimise the total journey duration, even though this apparently simple problem always proves to be quite difficult to solve. Optimizations of the user's journey, of his comfort are new challenges for urban transport. This contributes to promote mass transit system instead of individual vehicles.

Optimizations of the user's journey, of his comfort are new challenges for urban transport.

Ticketing innovation and multimodal approach

Integrated ticketing systems (ITS) are rising innovations in the field of public transportation. This technology allows the user to purchase only one ticket compatible with several modes of transports. This is the case for the Paris region (France), where the public transport network is equipped with a smart card system that can be used for any mode (buses, metro,

suburban trains, etc.). Intermodality is thus favoured, unlike others networks where ticketing is not integrated. This is the case in Jakarta, where travellers have to purchase specific tickets to access the different modes even if the network includes multimodal platforms. The efficiency of the public network is here hindered. A Transport Authority can propose and implement solutions to palliate the lack of integration.

The coordination of transport services can be implemented at different geographical scales. The integrated ticketing system can combine transports modes from the city center to suburban or even rural areas. If several operators are implicated in this multimodal and multidimensional scheme, this is once again the role of the transport authority to ensure the coordination of the whole process. The PTA may have to ask its various operators to invest at a tactical level and to develop a strategy oriented towards the needs of the users.

Maximising capacities and implementing new infrastructures

In the field of transportation, many innovations are created to increase the system capacities. It is generally one of the main concerns of the stakeholders in charge of a transport infrastructure. It is even more justified when the city has to deal with a rapid urbanization process.

However, it is necessary to adapt the network's capacity to the current and future needs of mobility. The implementation of a new infrastructure must be consistent with the forecast demand of mobility. For instance, it may not be relevant to provide a mass transport service between two residential areas, as most trips generated in a city are from residential areas to workplaces or leisure areas. Under a certain amount of demand, other collective modes of transport can be sufficient, such as collective taxis or para-transit modes (mini-buses, angkots, etc.).

The BAPPENAS also plans to develop BRT systems in 29 metropolitan and large cities of Indonesia.

Sometimes, new infrastructures just replace old ones and upgrade the system instead of creating new public transport routes. This type of operation also permits to reach higher capacities and a higher commercial speed. A good illustration is the urban railway development in Indonesia, which will occur in six metropolitan and three large cities according to the RJPMN 2015-2019: Medan, Palembang, Jakarta, Bandung, Makassar, Surabaya, Semarang, Yogyakarta, and Denpasar.

In addition to the improvement of the railway infrastructures, the BAPPENAS also plans to develop and/or implement BRT systems in 29 metropolitan and large cities of Indonesia (including the completion of the BRT Transjakarta). The national strategy also encompasses the construction of rail-based mass transit (MRT and LRT) including Greater Jakarta MRT, LRT (Monorail and Tram) in Surabaya, Bandung, Makassar and an elevated railway loop line project in Jakarta.

Innovation in transport networks also consists in designing the rolling stock to respond to the demand, in terms of capacity, but also rapidity, comfort and safety. Improvement of headway regularity, improvement of safety, improvement of socio-economical balance, etc., are as much features searched to improve the overall efficiency of a transport network. All these im-

provements need of course to be considered along the financial roadmap established by the body in charge of the system (operator or transport authority).

From mass transportation to personal transport solutions

Multimodal networks are often complex, but to be performant, they need to be easily understood by the users. Passenger information is essential to the efficiency of a system. Real time information is now a low technology easily applicable to any type of transport system. The system has to include a performant Control center to collect and deliver in real time data coming from the whole network. Information desks or screens should be located in each station, whether it is a bus stop, a metro station or an intermodal node.

This kind of technology can also help to readjust traffic when the service is disrupted. Users can sometimes be informed instantaneously on smartphones via the Internet network. Each one is thus aware of the average waiting time before the traffic becomes regular again. Modal transfer should also be adjusted in case of significant disturbance. For instance, if a metro line is temporarily out of service, a bus line can take over.

Last but not least, innovation in public transportation consists in new personal services. They can be specific smartphone apps which indicate the best way to avoid too many changes during the journey, or the best transport option to go faster from point A to point B. They can be personal ticketing services, when tickets can be purchased outside the station, to avoid queuing and to save a few minutes.

There are lots of possible improvements for transportation systems that can be implemented more or less easily. The main objectives to keep in mind are to bring a solution to mobility challenges, especially by getting the customer more loyal to sustainable transportation, and to enrich the travel experience.

RATP Paris, a combination of solutions

The Ile-de-France region gathers 11.6 million inhabitants and 6 million jobs. The region represents 29% of the gross national product and concentrates 22.5% of the national workforce in an area of 12 000 sq.km. Every day, 41 million trips are made by the inhabitants of this region.

The transport services are organised by the STIF, the Ile-de-France Transport Authority. The Authority manages operators for different transport modes, including SNCF, the national railways operator, and RATP, the historical Parisian metro's operator.

RATP in Paris operates one of the world's largest multimodal networks:

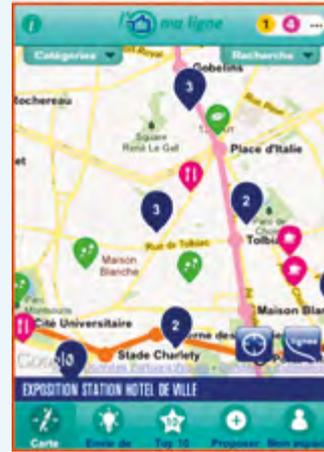
- 14 metro lines (2 driverless);
- 2 suburban lines (RER A & RER B);
- 3 tramway lines (T1, T2, T3);
- more than 300 bus lines...

Even though the Parisian network is very dense and offers a large possibility of mobility, the demand and the traffic are still growing. The current urban sprawl asks for more and more regional /orbital mass transport solutions. Furthermore, the recent rise of an ecofriendly culture combined to the problems of road congestion and economical restrictions are generating modal reports in favour of public transports.

To respond to these two challenges, RATP has planned to implement new infrastructures, such as an extension of the tramway network. But the project the most challenging is the Grand Paris Project. It consists of an automated metro of 130 km long with some 40 intermodal stations. This project aims at promoting suburb-to-suburb mobility and at relieving network saturation. Automation of the metro lines should allow higher commercial speed but also higher capacity (particularly because there is no driver's cab). It should be operated by 2025. The provisional cost of this new automated metro network is about €35 billion.



STIF also plans to provide a new design of stations for costumers to feel more comfortable. For instance, information desks with proactive staff, open space inside the intermodal stations, are to be implemented. The IT services are trying to be more and more smartphone oriented. The innovation projects for the Parisian network are currently oriented towards the personalised ticketing and information services, especially through apps development. The objectives of this implementation of new technologies for transportation are to get the current customers more loyal and to enrich the travel experience.



© source RATP

CONCLUSION

Indonesia is exploring the best options to solve the challenges of sustainable mobility. The current matter concerns the financial scheme to set up in order to improve transportation networks. The ambitious strategies of the country must be based on an integrated planning, including the financial aspects as well as the operational and the infrastructure's development aspects.

During the seminar, the exchanges with the audience raised various issues concerning the development of Indonesia and especially the development of Bandung, since many participants were local stakeholders. The participants were concerned by all the subjects broached during the presentations and many questions were discussed, such as: "How can the Government collaborate to accelerate infrastructures' implementation?", "How to involve the community?", "How to implement tools such as PPP in Indonesian cities?", "How to change from a private-own system to a public-own system?", "Is it the best solution to develop infrastructures first in order to change habits, or should people change their attitude first?", "How to cooperate with international cities?"...

The seminar allowed to discuss some international experiences, bringing some part of the answers to these questions. References to experiences of success or failure are important to learn, and to avoid repeating mistakes. Given the fast technological advances of Indonesia, the country expects to achieve a "frog leap" in the field of urban transportation, by skipping the conventional development phases that some other emerging countries are experiencing.

To feed the reflections related to Bandung's mobility development, four points may summarise the main issues tackled during the seminar:

1. Setting up a Transport Authority is a real asset to make transport projects more beneficial to the territory and to all users, through the management of the different transport services under one direction. The rationales and the actions of the different institutional levels can be synchronised under this Authority. A territory relying on an efficient Transport Authority is able to build a clearer vision of its mobility development. Traffic management, parking management, security and non-motorized vehicles can also be planned along public transport services ;
2. A pragmatic integration of the various modes of transport is also a good practice favouring sustainable mobility. Intermodal hubs are necessary to build an integrated network. Bandung Central Station is heading towards this kind of development;
3. Articulation between public transport systems and urban development is necessary to change the urban lifestyles towards more sustainable and comfortable options;
4. The challenges of urban transportation require knowledge and share of experiences in order not to reiterate the mistakes of others urban schemes. Since the French engineering is recognised in certain fields of transport, the seminar allowed to share successful experiences and know-hows on financial, operational and implementation aspects.

Some of those best practices might be usefully adapted to the Indonesian context, and be implemented in metropolises or urban areas that are facing transportation challenges.

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ORGANISERS AND PARTNERS



Agence Française de Développement (AFD)

AFD, the Agence Française de Développement, is a public development-finance institution that has worked for seventy years to alleviate poverty and foster sustainable development in the developing world and in the French Overseas Provinces. AFD executes the French government's development aid policies.

Working on four continents, with seventy-one field offices and bureaus, AFD provides financing and support for projects that improve living conditions, promote economic growth, and protect the planet. In 2013, AFD committed € 7.8 billion to projects in developing and emerging countries and in the French Overseas Provinces. These AFD-financed projects will provide schooling for children, improve maternal health, promote equality between men and women, support farmers and small businesses, and bolster access to drinking water, transportation and energy. These newly-funded projects will also help mitigate climate disruption by abating nearly 3.3 million metric tons of carbon dioxide-equivalent annually.

Since 2007, AFD has been active in Indonesia, by supporting projects aiming at fostering a green and inclusive growth. So far, AFD has granted loans in various fields (energy, agriculture, forestry, industry, sanitation, transportation) for a total amount of 1 550 MUSD.



BUSINESS FRANCE (formerly UBIFRANCE)

Business France is the national agency supporting the international development of the French economy, responsible for fostering export growth by French businesses, as well as promoting and facilitating international investment in France.

It promotes France's companies, business image and nationwide attractiveness as an investment location, and also runs the V.I.E international internship program.

Founded on January 1, 2015 through a merger between UBIFRANCE and the Invest in France Agency, Business France has 1,500 personnel, both in France and in 70 countries throughout the world, who work with a network of public -and private- sector partners.

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Ministry of Transport – Republic of Indonesia

The Ministry of Transport is the ministry responsible for transportation within the country. Its specific responsibilities may include overseeing road safety, civil aviation, maritime transport, rail transport, developing government transportation policy, organizing public transport, and the maintenance and construction of infrastructural projects.



Ministry of National Development Planning / BAPPENAS - Republic of Indonesia

Ministry of National Development Planning / BAPPENAS is responsible for assisting the President in formulating policy and coordination over the field of development planning. BAPPENAS is responsible for: Preparation of the long-term national development plan (RPJMN); Translation of the Vision, Mission, and President of the Work Program into the national medium-term development plan; Preparation of the government work plan (RKP); Coordination, formulation, and assessment of national development planning; Support the preparation of the National Budget.



West Java Provincial Government

West Java is a Province of Indonesia. It is located in the western part of the island of Java and its capital and largest urban center is Bandung. Total area of this province is 34,816.96 km². The province's population is 46.3 million (in 2014) and it is the most populous and most densely populated of Indonesia's provinces.



City Government of Bandung

Bandung is the capital of West Java province in Indonesia, the third largest city by population, and second largest metropolitan area in Indonesia with a sprawling urban population more than of 10 million with 167.67 km² of the total area.

FINDING URBAN TRANSPORT SOLUTIONS: THE CHALLENGES OF FINANCING AND INTEGRATION OF NETWORKS



Indonesia has known high demographic and economic growths for several years. Facing a persistent and significant rural exodus, the whole country is experiencing a rapid urbanisation process. But urban infrastructures have not followed the same pace of development, particularly in the fields of transportation, power and water supplies.

The Government of Indonesia recognises the essential role of mobility to meet the challenges of urban population growth and economic development. A Master Plan for Acceleration and Expansion of Indonesia's Economic Development (abbreviated MP3EI) was approved in 2011 for the period 2011-2025. In the context of this strategic plan, the Ministry of National Development Planning (BAPPENAS) has developed a National Medium Term Development Plan (RPJMN) in order to accelerate the development of urban transport.

To feed the reflections on the future Indonesian transportation networks, a seminar on "Finding urban transport solutions: the challenges of financing and integration of networks" was organised on June, 23rd of 2014 in Bandung. This seminar aimed at presenting French experiences and other international best practices and to share ideas to be explored and maybe further implemented in Indonesia. This document summarises the essential discussions and presents the main conclusions of the event.