THAÏLAND

SETTING UP A NEW MINDSET FOR URBAN ECONOMY AND PUBLIC TRANSPORT
### ACRONYMES

<table>
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<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>AFD</td>
<td>French Agency for Development</td>
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<tr>
<td>AREP</td>
<td>French consultancy owned by SNCF <em>(Amenagement, Recherche, Pole d'Echanges)</em></td>
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<tr>
<td>ARL</td>
<td>Airport Rail Link</td>
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<td>BMA</td>
<td>Bangkok Metropolitan Administration</td>
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<td>BMR</td>
<td>Bangkok Metropolitan Region</td>
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<td>BMCL</td>
<td>Bangkok Metro Public Company Limited</td>
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<td>BMTA</td>
<td>Bangkok Mass Transit Authority</td>
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<td>BRT</td>
<td>Bus Rapid Transit</td>
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<td>BTS</td>
<td>Bangkok Transit System</td>
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<td>BTSC</td>
<td>Bangkok Mass Transit System Public Company Limited</td>
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<td>CODATU</td>
<td>Cooperation for urban mobility in the developing world</td>
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<td>DVDH</td>
<td>French consultants for sustainable mobility <em>(Des Villes &amp; Des Hommes)</em></td>
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<td>FAR</td>
<td>Floor Area Ratio</td>
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<td>ITS</td>
<td>Intelligent Transport System</td>
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<td>KT</td>
<td>Krungthep Thanakom</td>
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<td>LRT</td>
<td>Light Rail Transit</td>
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<td>MoF</td>
<td>Ministry of Finance</td>
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<td>MoT</td>
<td>Ministry of Transport</td>
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<td>MRTA</td>
<td>Mass Rapid Transit Authority</td>
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<td>MRT</td>
<td>Metropolitan Rapid Transit</td>
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<td>NESDB</td>
<td>National Economic and Social Development Board</td>
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<td>NMT</td>
<td>Non-Motorized Transport</td>
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<td>OBM</td>
<td>Operation and Maintenance</td>
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<td>OTP</td>
<td>Office of Transport and Traffic Policy and Planning</td>
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<td>PDO</td>
<td>Public Debt Management Office</td>
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<td>PPP</td>
<td>Public Private Partnership</td>
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<td>PTA</td>
<td>Public Transport Authority</td>
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<td>SNCF</td>
<td>French Railways Company</td>
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<td>SEPO</td>
<td>State Enterprise Policy Office</td>
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<td>SRT</td>
<td>State Railway of Thailand</td>
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<td>SYTRAL</td>
<td>Transport Authority of Lyon, France <em>(Syndicat mixte des transports pour le Rhône et l’agglomération lyonnaise)</em></td>
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<td>TOD</td>
<td>Transit Oriented Development</td>
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<td>UDDC</td>
<td>Urban Design and Development Center</td>
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The two-day workshop “Setting up a new mindset for urban economy and public transport” took place on the 16th and 17th of November 2016 in Bangkok. This Thai-French event was co-organized by the Public Debt Management Office (PDMO) of the Ministry of Finance of Thailand and the French Agency for Development (AFD).

Designed by CODATU, a France-based NGO promoting sustainable urban mobility in the developing world, the workshop addressed technical and financial issues related to urban transport, through a sharing of experiences and expertise between key stakeholders from Thailand and France.

The framework of the event emerged in 2015 when AFD engaged a dialogue with the Thai authorities to identify and develop actions in the transport sector. As both central and local governments are looking for developing mass transport systems in major Thai cities, PDMO was keen on the organisation of a workshop, focusing on technical solutions and associated financing schemes to bring ideas to better support the ongoing and future transport projects.

In August 2016, a preparatory mission led by CODATU on behalf of AFD helped to identify the main areas of interest and to define the framework of the workshop. Topics looking at urban integration, Transit Oriented Development (TOD), transport technologies, integrated public transport networks, and of course financial schemes were identified. For each topic of interest, Thai and French experts were invited to share their vision with the audience.

Thai and French presentations, case studies, comparative approaches, round tables and interactive brainstorming sessions conducted the reflections during the two-day workshop. Focuses on Bangkok’s development were put in parallel with Paris transport projects’ development, as the two capital cities are comparable in size. As representatives from municipalities of the Provinces of Thailand like Phuket, Khon-Kaen, Chiang Mai, Songkla (Hat Yai district) and Nakorn Ratchasrima (known as Korat by locals) attended the workshop, some of the experts coming from second sized cities in France like Bordeaux and Lyon shared their experience, as urban and mobility issues can be similar.
Thailand can be considered as a major hub of the Asian region: it is the crossroad between a North/South corridor (China-Singapore) and a West/East corridor (India-China). And the capital city Bangkok, which is served by one of the busiest airport of the region and of the world, would be the focal point of this regional crossroad.

With over 14 million inhabitants, Bangkok represents around 22% of the total population of Thailand. Considering the fact that the major part of the country is still rural, the metropolitan area of Bangkok continues to grow, due to migration.

The concentration of the economy and the population in Bangkok metropolitan area inevitably led the region to face some important issues, such as providing adequate infrastructure, especially regarding transportation infrastructure and services. Indeed, the development of the city resulted in sharp increases in vehicle ownership and traffic demand. About 20 million passenger trips are made each day in the capital, of which 46% are made by private vehicles (two or four wheelers), 40% by public transport (rail and bus), and 14% by foot.

Road transport is the main mode of transport and the capital is known for its heavy traffic congestion (the city is ranked as the second city the most congested in the world after Mexico), which significantly reduces the efficiency of the city’s urban transport network, then the overall economic potential of Bangkok by creating widespread journey time delays, excessive fuel consumption, and polluting emissions.

Nevertheless, Bangkok is equipped with a quite diversified mass transit system:

- **Two lines of skytrain or BTS**, owned by the Bangkok Metropolitan Administration (BMA) - the local government of the Bangkok region in charge of defining all the policies related to the city’s management: transport, urban planning, waste management, housing, roads and highways, environment and security services. BMA is supported by Krungthep Thanakom (KT), a BMA’s enterprise specializing in the implementation of public service projects for the Bangkok region. In operation since 1999, the two BTS lines (Light Green/Sukhumvit Line and Dark Green/Silom Line) are operated by BTSC whom BMA grants a concession lasting until December 2029;

- **Two MRT (Metropolitan Rapid Transit) lines**, the underground metro owned by the Mass Rapid Transit Authority of Thailand (MRTA), a public company under the Ministry of Transport (MoT), in charge of overseeing rapid transit operations in the Bangkok area. The Blue line is in operation since 2004 and the Purple line was commissioned in August 2016;

- **The Airport Rail Link (ARL)**, an elevated commuter train linking the city center to the Suvarnabhumi international airport. It is owned by the State Railway of Thailand (SRT) and operational since 2010;

- **One BRT (Bus Rapid Transit) line**, owned by Krungthep Thanakom and operated by BTSC, the same operator as for the BTS;

- **Numerous bus routes**, mainly operated by BMTA (Bangkok Mass Transit Authority), the State enterprise under the MoT;

- **A water transport system** using the Chao Praya river and the many canals.
The development of public transport has become one of the priorities of the government, which in 2013 adopted the “2 trillion THB” infrastructure program for the country, of which 80% (1.6 trillion) was to be allocated to the rail sector for the modernization of the existing network (doubling of tracks), the development of urban transport networks (metros, airport link) and the creation of a high-speed network between Bangkok and Korat.

A dozen of projects are currently being planned to extend Bangkok public transport network. The Office of Transport and Traffic Policy and Planning (OTP) is the body of the MoT responsible for the national policy unit in the transport sector. OTP oversees the development of the policies and elaborates the Master Plans and feasibility for the transport projects, which are then implemented by the stakeholders in charge (SRT, MRTA, BMA). Any new project must be approved by the National Economic and Social Development Board (NESDB) and the Council of Ministers. The financial scheme is then determined by the Ministry of Finance, usually combining local and international financing: PDMO (in charge of overseeing public debt management operations) is the public entity under MoF when it comes to international borrowing. Most of the projects are being studied under Public Private Partnerships schemes (PPP), where the State Enterprise Policy Office (SEPO) is in charge.

Urban transport projects are also flourishing in other municipalities: the workshop particularly paid attention to the municipalities of Phuket, Khon-kaen, Chiang Mai, Songkla (Hat Yai district) and Nakorn Ratchasrima, where systems based on rail, like monorail or Light Rail Transit (LRT) are being considered, along with an integrated urban planning approach. This link between transport projects and urban planning will be develop in the following section.
1.1 The necessity of a master plan linking urban planning and mobility infrastructures

Regarding the present and future challenges to come, and considering the inevitable growth of urban areas, cities will necessarily have to tackle lots of challenges, starting with economic challenges: how to reinforce the attractiveness, how to acquire and maintain assets, etc. But there are of course concerns on housing (how to accommodate the newcomers? how to maintain or reinstate a quality of life?), on climate change (especially regarding heatwaves or floods anticipation) and on the new economy (how to support the ecological conversion and social economy?).

With its 12 million inhabitants and its international appeal, Paris, the French capital, must face these challenges to preserve its economic strengths, its quality of life and its worldwide influence. To tackle those challenges, the Greater Paris region has come up with a Master Plan including very high goals:

- Build 70,000 dwellings a year and improve the existing stock to solve the housing crisis;
- Create 28,000 new jobs per year and improve the mixed-used development of housing and employment;
- Ensure accessibility to amenities and quality public services;
- Design transportation for a less car-dependent way of life;
- Improve the urban space and its natural environment and resource management.

All those ambitions can only be fulfilled if they are supported by efficient infrastructures and services. The spatial project depicted in the Greater Paris Master Plan is fully relying on a wide transport project: the “Grand Paris Express”. This programme consists of the implementation of 200 kilometers of new automatic metro lines around Paris by the year 2030. Modernization and extension of existing transport networks, such as the RER high-speed metro and the light rail are also planned. In total, the investment cost for the Grand Paris Express is equivalent to €25 billion.

This regional transport project will contribute to create a multipolar region where the different objectives of development of the Master Plan will be realized. One of the main highlights is the link between major clusters like business districts, research institutes, innovation clusters, university centers, (...) contributing to the economy but also to social and environmental aspects.

Bangkok will eventually have to tackle the same challenges. Since the beginning of the century, Bangkok urban area has experienced an annual population growth 2.5 times of the growth rate from 1980-2000. However, these are the suburbs that attract newcomers and not the center, resulting in large urban sprawl. The rapid expansion of the city did not allow the proper implementation of mitigation measures to regulate commuting distance, and Bangkok now experiences heavy traffic congestion.

Congestion is made difficult by the current distribution of road space and an unbalanced spatial pattern of arterial roads. Indeed only 8% of the land is dedicated to the road pattern, which
contributes to create a “super block system” on the outer areas, unnecessarily forcing the mixing of both long- and short-distance trips.

BMA, which encompasses most of the urbanized area, has drawn a land use master plan reflecting ambitious strategies for the city. The plan proposes more urban and land use mix, a compact development, a flood protection system, the revitalization of the core center, and development of subcenters and Transit Oriented Development (TOD). Those concepts might generate more trips, but they will necessarily be shorter. The challenge here is to change the mindset to high density living conditions.

Regarding mobility and transport planning, a unique regional master plan at the scale of the greater Bangkok does not exist yet. There are six comprehensive mobility plans according to the six local governments of the Bangkok Metropolitan Region\(^1\), but not connected to each other. Hence, there is a crucial need for coordination, which implies a dialogue between state entities like OTP and the local level.

Mobility planning is indeed an essential tool to support a whole urban planning program. The development of transport infrastructures and services is commonly the driving force of a well-organized metropolitan development. It is the case of Bordeaux, a French city, was metamorphosed with the implementation of a 44-kilometre-long Light Rail Transit (LRT) network.

It is essential to formulate an integrated Master Plan linking land use planning and transport development, instead of letting the city grow under unplanned development, with a growth dependant on property developers. Integrated planning can coordinate the development sectors of the city in parallel with an appropriate access to all facilities thanks to a good transport system, which is fundamental. The major objective is to change and adapt the urban shapes to allow easy movements of the population.

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1 Bangkok, Nakhon Pathom, Nonthaburi, Pathum Thani, Samut Prakan, and Samut Sakhon.
Special Focus Box: Using mobility project to renew the city of Bordeaux, France

Bordeaux, with 740,000 inhabitants is one of the top ten largest cities of France in terms of demography, and is expected to reach 1 million inhabitants before 2030. The city has become extremely attractive in the 2000s when the local government decided to implement a LRT system and to completely revamp the city center in parallel.

The project was massive and consisted in the combination of simultaneous various actions, such as historical building façades cleaning, iconic renewal of open public space of which the 4 kilometers of the Garonne river bank, pedestrianization projects, diversion of the traffic to avoid the city center and development of parking areas at the limits of the city core. And those projects were implemented along the LRT alignment, making the construction period an opportunity to reshape the entire urban concept.

The LRT network is 66 km long and composed of three lines in operation since 2003. An additional line is currently under construction. The ridership is about 300,000 daily passengers. Continuous efforts are made to reduce the use of private vehicles in the city and to promote the shift towards alternative modes of transport.

Thanks to the significant efforts on urban renewal, Bordeaux is now one of most attractive cities of France, and one of the best touristic destination of the world¹.

¹ European Best Destination° in 2015, and nominated at the «World Travel Awards» in 2016, two internationally recognized prices in the tourism economy.
When land use strategy considers urban transport networks, we talk about **Transit Oriented Development** (TOD). TOD is a tool to organize urban development in connection with public transport infrastructures and services. In the case of Paris for instance, the suburban clusters and sub-centers are being developed with the arrival of the Grand Paris Express project. A “**Charter for urban transport integration**” has been developed, shared and implemented for each developing area, as each neighbourhood is considered as singular.

The concept of TOD favours **densification along the mass transit corridors**, where it is still possible. The city of Bordeaux was facing a significant problem of urban sprawl, especially the decades before the arrival of the LRT network. When the municipality decided to implement a strong public transport system, the decision to boost the construction of housing was also made. Densification along the main transport corridors provided an **answer to the urban sprawl issue** and to the need of housing.

Those developments along transport infrastructures tempt to include a **mixed land use** with not only housing and working places, but also cultural places, leisure places, public spaces, green spaces.

In Thailand, the concept of TOD is also under consideration and some municipalities have already identified dedicated areas to be densified. The following drawings show an application of the concept in different municipalities (here Chang Mai, Khon Kaen and Phuket). TOD is proposed along future public transport projects, especially nearby the main stations, and where diverse facilities can be easily accessible to the people.

**Phuket**, which is a world class touristic destination welcoming 30 million tourists each year, is facing more and more urban planning and mobility issues. Landlocked on an island, its disproportionate attractiveness compared to its hosting capacity makes it a very congested area. The island is structured with one major North-South road, on which a LRT project is being planned. However, the local government is aware that a need is required for a collective and expert reflection on the future of Phuket, and for the development in parallel of a wider transport network with multimodal options and connections to the various areas of interest. Indeed, there is willingness to create a strong digital cluster and to develop Phuket as a smart-city, to develop the Thalang area (in connection to the main land), to develop an Education cluster and a Health cluster as many tourists come for plastic surgery.
Chiang Mai and Khon Kaen, two major provincial cities of Thailand, are considering LRT system as the future backbone of their public transport system. As shown in the case study of Bordeaux, the LRT is a smart tool to link the multiple facilities of the city, and can be used to reveal historical and touristic places trough a smooth access. The development of clusters is proposed along some identified main public transport lines.

Hat Yai District, located in the South of the country, has strong links with a nearby district, Songkhla District, considered as its twin city. As offices are mainly located in the district of Songkhla but commercial activities are in Hat Yai, there is a lot of daily commuting. The average time to commute is one hour even though the distance is less than 20 kilometres. The current idea is to implement a monorail project between the two cities, which would be attractive for the Malaysian tourists and would help to revitalize the area along the underutilised railway line.

Bangkok, with its existing and to be developed mass transit lines (see figure below), can apply TOD in various areas. Regarding the potential development of the areas around the future BTS and MRT lines and stations, it can be suggested to promote mixed-used areas with recreational areas, open and public spaces (maybe covered to protect from rain season). Accessibility to the future stations should also encourage the use of non-motorized modes, by providing bicycle facilities (parking, bike-lanes) and large and secured walkways. These types of soft mobility should also be developed in the historical area, along with green areas and more public places. Areas along the canals may also be revitalised to highlight the water transport system and propose better connectivity with the other modes of transport. Specific crossings in Bangkok might also be improved by taking in account multiple accesses, specific transport and urban needs, commercial and social activities, mixing public and private activities and investments under public initiative and monitoring (see 1.2).
1.2 The art of dreaming the city

Cities are no more monocentric but have to be analysed and understood as a chess board where each piece plays a crucial role and has to be connected. A city can also be compared to a sick body which can be cured thanks to localized interventions of acupuncture to stimulate nerve centres. Creating a park, a museum, setting-up a new building, a square, a bridge, a walkway… These interventions are quick to implement and provide a wind of change in the city.

AFD is particularly interested in this type of reflection and supports several initiatives worldwide where transport infrastructures projects are fully integrated along an urban planning vision. It is the case in Kochi, India for instance where AFD provided a technical assistance for two years, along the financial support for the implementation of a 25 kilometres long metro line. The technical assistance helped giving a broader vision on mobility aspects in the city, promoting integration of modes, development of a secondary network complementary to the metro alignment, etc.

Applied to Bangkok, the identification of the main places of the metropole allowed new ideas and concepts to emerge, especially regarding connectivity between the various elements of the city. Here are some of the key concepts proposed for an ideal future city:

- **Improve connectivity** of each areas, particularly to the airport, using public transport networks and feeder systems to the metro and build a strong network like a spider net, favouring multimodal connectivity (increase transport options, Park&Ride facilities, common ticketing system, passenger information). There is a strong willingness to eliminate congestion between suburbs and centre;
- Improve living areas and enhance neighbourhood life by providing sustainable transport options, with low carbon impact, more greenery, easy access to facilities, and promote affordability for all; favour the concept of a condensed city, increase the density (using TOD for instance) and stop urban sprawl;
- **Revive the green belt around Bangkok**, but also touristic attractions like floating markets, where people would enjoy being outdoors.

Some ideas are already identified for specific areas:

- Restructure the core center (including the old city, Asoke and Silom neighbourhoods) by privileging non-motorized transports. The idea is to have a walkable city, with safe pedestrianised areas, shaded walkways (protecting also from the monsoon) where motorcycles are forbidden, with more green areas and low carbon emissions in the center;
- Another concept is to identify and develop hubs (i.e. train station areas: Bang Sue, Hua Lamphong, Khlong Tan) with access to diverse facilities, to lower the travel demand and have people with shorter commuting time;
- **Create connectivity between the two riversides.**

As a matter of fact, much of these ideas and concepts to develop an ideal Bangkok are universal aspirations: green city, walkable city, affordability, easy access to facilities, etc. Most of those concepts are linked and interconnected to the mobility pattern of the city. Having a mass rapid transit system is an essential asset in a millionaire city. But having an integrated transport system, connecting in a simple way the various areas of interest, planned according to the ongoing and future urban development of the city, is a key element to make the city a liveable place.

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2 Concept developed by Pedro Ortiz, senior urban planner at the World Bank, Washington DC.
INTERMODALITY AS THE KEY TO MAKE A PUBLIC TRANSPORT NETWORK SUCCESSFUL

2.1 An insight into the present development of Bangkok’s network

As described earlier, Bangkok public transport network is composed of numerous modes of transports, of which the MRT, BTS, ARL, BRT, a huge network of buses and water transport system.

However, the workshop has shown that intermodal integration could be significantly improved, as none of these modes are directly connected to each other. The commuter needs to exit the system, and walk to the other system, using a different ticket (except for the BRT and the BTS). Some stations themselves have been given a different name, despite their proximity, as it is the case for Asoke (BTS) and Sukhumvit (MRT) stations. The reason behind lies in the lack of coordination between the various transport providers.

As far as buses are concerned, Bangkok enjoys a large bus network which carries more than 1 million passengers a day, and which is currently being extended with additional 400 kilometres in the coming years. However, the buses still act more as a competitor to the Mass Transit Systems (MRT and BTS) than as an additional / complementary transport solution. BMTA is well aware that the solution lies in the creation of an integrated network where stations are interconnected, fares are integrated, Park&Ride facilities are provided, and where the bus network is rationalized to better serve the existing Mass Transit Systems. One of the challenge is also to maintain the same ridership, through an upgrade of the quality of service and an improvement of the last mile connectivity.

2.2 A need to adopt a shared and comprehensive vision

Public transport providers across the world have been using various tools to make their network more attractive and convenient for the users, to make it a real alternative to private modes of transport and considerably reduce the congestion and the GHG emissions.

In Lyon, a city located in the south-east of France, the Public Transport Authority SYTRAL is the owner of the transport infrastructure and has implemented a single ticket which can be used across modes. SYTRAL oversees the development of the network, defines the transport offer, controls the service quality (standards, regularity, cleanliness, safety…) and defines an inclusive fare policy. The presence of a single Authority overseeing all public transport related developments is crucial to enable a comprehensive vision. One of the other strength of Lyon network is the diversity of modes available, defined according to the demand, the urban area and the mobility pattern of the citizens. Lyon network is the second largest in France (after Paris), with five different modes of transport - four underground metro lines, five at-grade tram lines, two cable car lines, nine trolley bus lines, 118 bus lines – and park&rides at the terminal stations as well as along the ring road.
In Saint-Médard-en-Jalles, a secondary city of Bordeaux Metropolis (France) hosting a major defence industry, accessibility and integration has been a major concern. The city has been very active in promoting the concept of “suburban light rail”, considering that public transport should not be restricted to the city center but shall be extended to the suburbs to connect the remote areas of interest (sub-centers, airport, industrial areas…), adopting a holistic approach of the territory. Saint-Médard-en-Jalles is currently studying the possibility of extending an existing Light Rail Line

3 to connect the center of Bordeaux, in a very cost-effective way, as the fare revenues will cover the operation and maintenance (O&M) costs.

In Rabat, the capital city of Morocco, the public transport network relies on buses and Light Rail Transit (LRT). However, the 17km-long LRT infrastructure has a comparatively low ridership of 100,000 passengers/day because of the lack of integration with the existing bus system. Hence, the Moroccan Ministry of Internal Affairs is currently conducting a study to reorganise the bus routes and design an integrated network. This network shall be implemented in 2017.

Intelligent Transport Systems (ITS) plays a major role in making public transport networks more efficient and more transparent for the users. The digital revolution has considerably helped in optimizing the operation in real time (ex: rerouting of buses in case of accident, alternative itineraries for taxi in case on congestion), in providing detailed passenger information through journey planners (possibility to pre-book a seat in Manila, Philippines, for example), and in involving citizens in the development of innovative mobility solutions through Open Data (cab applications, car-pooling, car-sharing, application to book a rickshaw in India, application mapping the paratransit routes of Matatus in Kenya…), making public transport fully demand-oriented and collaborative. A significant fact is the share of the population having a mobile phone in developing countries which has gone from 5% to 80% between 2000 and 2012, creating a mobility revolution.

This revolution is inducing a shift from a binary choice between public transport and private vehicles, to a multifold choice comprising all the new mobility options; the limit between public and private services becoming thinner and thinner. It is today a real challenge for traditional public transport operators to collaborate with the new mobility solutions, keeping in mind the fact that these new services shall fit to the legal framework and pay taxes.

2.3 Application of the comprehensive vision to Bangkok city

As mentioned earlier, the physical and soft integration of all modes of public transport are key to the success of the network and the transport services to people. Along these lines, BMTA is planning to introduce an integrated ticketing system in the buses by the end of 2017, which will replace the conductor and reduce the cost of operation. Ultimately, the aim is to expand the system to all modes of public transport (express boats, MRT, Skytrain, Airport Rail Link). BMTA is also planning to reallocate the government subsidies which, at present, are used to provide free service in several bus lines, in order to provide subsidised fares for low-income household in all buses.

Below are the 3 priority areas to be developed for a successful intermodal integration in Bangkok:

Work on the physical integration of all existing and future modes of public transport

In Bangkok, the priority shall be to work on the complementarity of the Mass Rapid Transit Systems (BTS, MRT, Airport Link), the water transport and the bus network to avoid any overlapping which creates a competition between modes. The intermodal approach shall also encourage the integration of stations located in the same area (using a single name) such as Chatuchak and Mo Chit, Makkasan and Petchaburi, Sukhumvit and Asok, Chong Nansi and Sathorn. Finally, the development of a journey planner with real-time information is key to the readability of the network for the users.

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3 The Light Rail or Tramway is an at-grade rail system, with a capacity per vehicle of 450 persons in the case of Bordeaux (it can carry up to 650 persons for an articulated vehicle of 2x33 metres). Such system requires a high level of urban integration (see “Special Focus Box: Using mobility project to renew the city of Bordeaux, France” p.7).
**Work on accessibility and last-mile connectivity**

The attractiveness of the network could be improved thanks to a reflection on the accessibility of all users, regardless of their age or physical health. Major improvements could be made in the design of the buses, to make the boarding and alighting safer and the journey more comfortable, as well as in the design of the station access for wheelchairs and luggage. Last-mile connectivity is also a major drawback which makes people shift to private vehicles. This could be improved through the development of Mobility hubs equipped with Park and Ride facilities on the outskirts of the city, at the following stations: Bearing (BTS), Bang Sue (MRT), Bang Wa (BTS), Mo Chit (BTS), Ban Thap Chang (ARL), and through the use of the existing canals as feeders to the Public Transport network. This would for instance improve the connectivity with the northern suburbs of Bangkok where the availability of public transport is very poor.

**Promote non-motorized transport**

Bangkok already has a good network of footpath but the city would gain from developing an overall strategy to pacify the city centre with safe cycle lanes, safe at-grade pedestrian crossings, pedestrian-only streets and bicycle parking. Basically, Bangkok could take advantage of the fast development of the Mass Transit network to take actions to rethink the place of cars in the city. One interesting case is the accessibility of the Ministry of Finance (MoF), which employs around 10,000 people and which is located 950m from Sam Sen Station (SRT) and 1.7kms from Ari Station (BTS). However, most of the employees come by their own mean of transport as there is no safe walkway or shuttle bus to reach the Ministry.

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**Diagram:**

- **Accessibility of the Ministry of Finance**
- **MOF RD**
- **Limited Parking Space**
- **BTS Station**
- **Walkway: 8 mins (800m)**
- **Shuttle bus**

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3.1 Public-Private Partnership models in Thailand

Public Private Partnership (PPP) refers to projects where the government and the private sector collaborate to invest in an infrastructure and (transport) service project. Under Thai law, a PPP may include build-operate-transfer (BOT), build-own-operate-transfer (BOOT), build-transfer-operate (BTO), lease of assets or operations and maintenance agreements. According to the type of PPP, the ownership and the level of risk of the project vary. In Thailand, PPPs are increasing in popularity as witnessed by 2013’s legislative support in passing the new PPP bill and a total of twenty nine transportation projects are being undertaken using this model. In Bangkok, the recent and well-known PPP projects are the BTS, resulting from a cooperation between BTSC and BMA, and the MRT Blue and Purple Lines which are net cost PPPs involving MRTA and BMCL.

While the MRT system was financed with a concessional loan from the Japanese Bank for International Co-operation (JBIC) and operated by BMCL under a 25-year concession granted by MRTA, the BTS was financed and is operated by the private partner BTSC under a 30-year concession granted by the BMA. Nowadays, there is a tendency of the government to invest in the infrastructure as well as in the land acquisition, which will be the case for the extension of the MRT system.

HOW TO MAKE A PUBLIC TRANSPORT NETWORK FINANCIALLY VIABLE?

**CONCESSION CONTRACTS**
- Investment into new or existing infrastructure by private sector; full system operation by private sector.
- Ownership with private sector for duration of contract.
- Risk profile: Budget-based revenue with government.
- Revenue-based revenue risk with private sector; technical, financial, operational risks with private sector.
- Duration: 15-50 years approx.

**LEASE CONTRACTS**
- Private sector fully responsible for providing services and operational investments.
- Ownership remains with public sector.
- Risk profile: revenue risk with private sector; major investments by public sector, some by private sector.
- Duration: 15-30 years approx.

**MANAGEMENT CONTRACTS**
- Facility and/or operational management.
- Ownership remains with public sector.
- Risk profile: private sector receives fee, linked to performance; limited capital investment by private sector.
- Duration: 5-15 years approx.

**SERVICE CONTRACTS**
- Maintenance of assets and/or equipment.
- Ownership remains with public sector.
- Risk profile: private sector receives fee for services.
- Duration: 1-5 years approx.

Source: Asian Development Bank
SPECIAL FOCUS: PPP models in the world

- In France, in a great majority of cases, the Public Transport Authority (PTA) invests in the infrastructure and borrow on the financial markets at a low rate of interest. Private partners come in for the operation and maintenance of the system, with a variable degree of delegation. Most PTAs opt for net cost management contracts, which leave the commercial and industrial risk with the private partner. The only exceptions are the cities of Caen and Reims which have opted for a concession, where the private party builds and operates the system.

- In Hong-Kong, the government does not grant any subsidies to the Mass Transit Railway Company (MTRC) to manage the network but it grants land without auctioning it off. It is a PPP net cost with full risk for the operating company. MTR get funds through property development and advertising in the depot and in the stations, selling or renting out residential and commercial properties. Today, the company’s revenues mainly come from the management of thirteen shopping complex, about 90,000 housing units and five office buildings. In 2012, commercial and advertising revenues from the stations represented 16% of MTR’s total revenues, and this percentage is increasing every year.

- In Seoul (South Korea), until 2009, the underground system of Seoul comprised eight lines, operated by two public companies. These operators had chronic operating deficits. Hence, the city decided to grant the development and operation of the Line 9 to a private partner for 30 years, to encourage the public company to improve its performance levels. The key innovation provided by the operator on this line is the implementation of regular trains, stopping at each stations, and express trains, stopping only at the main stations. Moreover, the operator got involved at an early stage, thereby optimizing the construction phase (three years) and providing innovation in terms of operation and maintenance.

- In Sao Paulo (Brazil), the Line 4 of the metro is being implemented under a concession contract which is new for Latin America: the owner is Metró, the public company operating the 4 other metro lines, and the operator is a consortium of private companies. The transport authority finances the infrastructure through public funds and foreign loans and the concession holder finances the components related to operations. The advantage for the owner Metró is a guarantee of competency and coherence for the entire transit system.

- In Dhaka (Bangladesh), the Bangladesh Communications Ministry is considering funding a multimodal hub through PPP, as a pilot project. The multilevel facility would house the stations of the two upcoming BRT lines, the terminal station of the light rail train, a shopping mall, a hotel and a car parking. Private investors would make the initial investment and would be paid back through collection of rent. At the end of the management contract, the ownership of the infrastructure would come back to Bangladesh Railways.
3.2 “Who Pays What in Urban Transport?”

Presentation of the handbook from AFD and MEDDE

In 2009 with an update in 2014, the French Agency for Development (AFD) and the Ministry of Ecology, Sustainable Development and Energy (MEDDE), with the contribution of CODATU and CEREMA (Centre for studies on Risks, Environment, Mobility and Land Planning) jointly produced a Handbook of Good Practices in Funding Urban Transport. This document highlights key examples of funding solutions from all over the world, with the intention of providing a framework of reference for decision-makers, to analyse the best option available to fund urban transport projects.

This handbook explores the challenges of funding urban transport, through the analysis of the major contributors (the State, the direct and indirect beneficiaries) and the available tools. Funding frameworks largely differs from one country to another, according to the local context (see figure below): no public subsidies in Hong Kong, very heavy involvement of direct beneficiaries in London (84% of the budget), and a strong participation by indirect beneficiaries in Paris (Transport tax).

Each city must find its own mix of funding, according to its institutional context, to cut cost, optimise and supplement ticket revenues. Cutting cost can be achieved through a well-integrated network, with transport modes adapted to the demand, and a public transport separated from traffic congestion to ensure a good commercial speed, a lesser number of buses and a higher energy efficiency. Modern operating systems such as real-time information and integrated ticketing are also solutions to make the system more cost effective. Optimisation of the revenues implies to make the system as attractive as possible, through well-designed fare policies, high-quality information and strict regulation of the use of private vehicles. Finally, additional revenues can be found, such as congestion charging and parking tolls (example of San Francisco, London, Singapore), employer aid to the employee (implemented in Brazil and France), land value capture (good practice from Copenhagen and Brasilia), rent from retail and office built in the station surroundings (example from Hong-Kong and Tokyo).

Source: “Different funding arrangements for operations in 2012”, Who Pays What for Urban Transport
Case study from Lyon (France): How to reach a financial equilibrium?

In Lyon, the public transport network is owned by SYTRAL, the Public Transport Authority, and operated by the private company KEOLIS. In 2016, SYTRAL had an annual revenue of 788,308 M€, coming mainly from the Transport Tax (40%), the fare revenue (30%) and the participation of local authorities (27%). The Transport Tax was introduced in 1971 in Paris for both private and public companies employing more than 9 people. Its purpose was to provide the necessary funding to extend and improve public transport services in the Paris area, which at the time was experiencing rapid economic growth. It was then gradually extended to all metropolitan areas with a transport authority, then including Lyon. The sum is calculated based on the company’s pay roll, with a maximum of 2%. In total, it represents €276 million, among which 80% are coming from private companies and 20% from public companies. Among all French taxes, the Transport Tax is one of the least criticized as it significantly contributes in improving the public transport system and hence the quality of life of the employees. As far as the fare revenues are concerned, 30% is quite a good number for France, considering that the French railways (SNCF) get only 17% of their revenues through fare collection.

If we look at the expenses, it is well balanced with the revenues: 61% come from the network operations, 21% from the equipment (SYTRAL assets have doubled over the past 10 years), 17% from the debt annuity, and 1% from the administrative structure.
Every six years, a **road-map** is decided, which represents an investment of more than 1 billion euros and describes all the project to be undertaken within those six years. Broadly, 12% of the total investment is given to the ongoing projects, 39% to new projects, 38% to the purchase of equipment and the improvement of the infrastructures, 11% for the maintenance of SYTRAL property, and the rest is used to continue studies and to make forecasts on the network development. Below is the Development plan for 2015-2020:

*Figure: Development plan for 2015-2020 (Lyon, France)*
SPECIAL FOCUS BOX – Financing transit systems and TOD through Land Value capture

Land value capture is a tool which helps in creating a win-win situation between transport and town-planning: the development of a transport infrastructure leads to new urban developments which, in return, brings more customers to the system and more revenues. In the 19th century in New York and Paris, public institutions have tried to take advantage of this added value generated by a public investment and have implemented land value capture policies to fund transport infrastructures.

One of the well-known methods is to anticipate the purchase of the land and sell it at profit once the value has gone up, or develop business activities on it. One great illustration is the new city of Aguas Claras (Brazil) where the land agency of the Federal District “Terracap” acquired land around the Brasilia-Samambaia underground metro line and sold it off as individual plots to property developers. Terracap could recover 85% of the total cost invested in the metro project. A similar process was followed in Copenhagen (Denmark), Tokyo (Japan) and Mumbai (India), as part of the Mumbai Urban Transport Project (MUTP).

Another method is to introduce a betterment tax, which is different from a property tax as the increase in value of property is directly linked with a community action (new transport infrastructure). But the difficulty here is to assess the land value gains. A successful example is the Dublin Tramway (Ireland) where property developers had to pay a standard financial contribution to fund the development of utilities in this area. The tax is directly proportional to the land value increment generated by the public transport project. This scheme was a win-win situation as it helped to finance part of the capital invested, created new areas of urbanisation and generated a new clientele for the Tramway.

The factors for success of the above mentioned projects are (i) the provision of high-quality accessibility in an area with low value where there was a lack of mobility, (ii) the public authorities being in a position to buy the land or already owned the land, discouraging speculation, and (iii) a prosperous property market.

Other methods exist, such as:

- the Impact fees implemented particularly in the United States (San Francisco) under the name of Transportation Sustainability Fee (TSF) and imposed on all types of development in the city, with partial exemptions for projects with a social dimension;

- the sale of additional construction rights, introduced in Brazil (Sao Paulo and Rio de Janeiro), which provides municipalities with the possibility of modifying land-use rules and selling construction rights greater than the Floor Area Ratio (FAR) in order to finance the physical and social infrastructures needed for urban development projects. It is implemented in specific areas only, in order to increase the population density.
CONCLUSION

As discussed in the previous sections, Thailand has many opportunities to develop urban projects, either in Bangkok or in municipalities from other provinces. The interesting thing is that transport is usually key to think urban planning on different scales, from a very special area to a wide metropolitan project.

The country needs to face different urban transport challenges, howsoever related to the financial scheme, the physical integration or the shift to more sustainability. And Thai cities already seek for appropriate answers, in line with the universal aspirations of a city, like giving more place to the pedestrian, reducing the place given to cars, favouring Non-Motorized Transports, create public space and green areas in the city, reducing the need for mobility, creating mixed areas, encouraging accessibility and affordability for all (elderly, children, disabled, low income...), working on the last-mile connectivity.

One of the main messages shared during the two-day workshop was to coordinate urban development and transport projects. Examples of the French cities where urban renewal have been launched reinforce the idea that it can happen quickly enough in Thailand. The Bangkok 250 Project is a nice example of urban regeneration planning. The project, in collaboration with BMA and UDDC, try to implement a new vision on the urban development of Bangkok.

The Kadeejeen-Klong area was selected as a pilot project where the challenge of preserving historical landmarks is added to the urban renewal challenges.

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4 http://bangkok250.org
5 Urban Design and Development Center
It should be reminded that Bangkok was historically built on water, and has evolved towards the expansion of roads and big infrastructures as rail-based systems. The Government invested 250 billions THB in those infrastructures, but the urban environment does not seem fully consistent with those infrastructures. As described in Section 2, accessibility could be further improved, especially in the areas between the stations that are mostly private lands, which means difficulty to develop public spaces or apply the concept of TOD with affordable housings for instance.

Bangkok 250 proposes a strategic Master Plan for 17 districts in the historical center of Bangkok. The project is built on a participatory process. Many propositions from the people emerged like using old industrial buildings for new urban industries (with 3D printing or urban farming for instance), using warehouses for co-working spaces, develop areas for foreigners (as Bangkok is a cosmopolitan city), etc.

To ensure a consistency between mobility projects and urban planning, it is important to have a good coordination among the different stakeholders. Urban planning agencies, like in France, can have a crucial role in the coordination of the city’s development projects. It is also strategic to have a common road map shared by all the authorities (if not a single authority) to oversee all transport activities, and making the link with urban planning and housing development strategy. Such tool could also encourage collaboration between the various agencies in charge of mobility in a Thai city and thus favour more physical integration and fare integration among the transport systems. Coordination between the public entities is also important regarding the financial issue, where financial options can be optimised to fit the needs of the project.

With its booming economy, the country had been committed to the implementation of great public transportation projects and other heavy infrastructures. The real next step for Thailand is now to focus on the quality of life of its inhabitants based on these projects and the quality of the services allowed by these projects. Already located on an exceptional natural site and with a major historical heritage, the capital city has all the assets to shift towards a World Class Reference in the field of urban ecology. Mobility projects and public transport projects can be used to achieve this mutation.

This positive trend is also scalable to the situations of the other touristic hubs of Thailand, as Phuket or Chiang Mai, and to the other economical hubs like Khon Kaen or Hat Yai.

All the conditions are there to accelerate the process of urban transportation project in Thailand, as PDMO raised at the end of the two-day workshop.

AFD is prepared to work with the local authorities in that purpose and to stand beside in the implementation of such projects.

A second workshop will occur in May 2017 (date to be confirmed), focusing more on Phuket and its LRT project.