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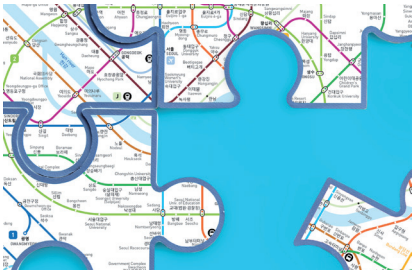
Policy Directions for Establishing a Metropolitan Transport Authority for Korea's Capital Region



Case-Specific Policy Analysis

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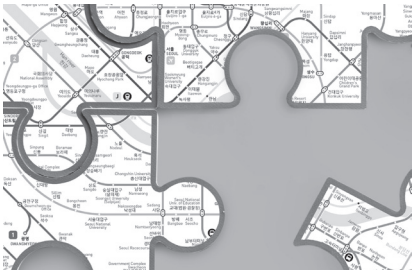
Policy Directions for Establishing a Metropolitan Transport Authority for Korea's Capital Region



Case-Specific Policy Analysis

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Acronyms and Abbreviations

ADIF	National Rail Infrastructure Management Agency (Spain) Administrador de Infraestructuras Ferroviarias
ALG	Association of London Governments
AMB	Metropolitan Area of Barcelona Àrea Metropolitana de Barcelona
AMTU	Municipal Association for Mobility and Urban Transport outside of AMB (Catalonia) Associació de Municipis per la Mobilitat i el Transport Urbà
ARAFER	Regulatory Authority for Road and Rail Activities (France) Autorité de régulation des activités ferroviaires et routières
ATM	Metropolitan Transport Authority for Barcelona Region Autoritat del Transport Metropolità Àrea de Barcelona
ATOS	Access to Opportunities and Services
AOM	Organising Mobility Authority (France) Autorité organisatrice de la mobilité
AOP	Organising authorities for “nearby transport” (France) Autorité Organisatrice de Proximité
API	Application Programming Interface (common data format)
AVL	Automatic Vehicle Location system
BR	British Rail
BRS	Business Rate Supplements
BRT	Bus Rapid Transit
BTC	British Transport Commission
CRCI	Regional Chamber of Commerce and Industry (France) Chambres de commerce et d'industrie
CIL	Community Infrastructure Levy (United Kingdom)
CMB	Metrpopolitan Corporation of Barcelona Corporació Metropolitana de Barcelona
CPER	Contract between the French State and Ile-de-France Region Contrat Plan État-Région
CPTP	Committee of Partners of Public Transport in Île-de-France Le comité des partenaires du transport public

CSS	Customer Satisfaction Survey
CTS	Catalan Transit Service
	Servei Català de Trànsit
DETR	Department of the Environment, Transport and the Regions (United Kingdom)
DGT	General Direction of Transit (Catalonia)
	Dirección General de Tráfico
DGTT	General Directorate for Land Transport of Catalonia
	La Direcció General de Transport Terrestre
DLR	Docklands Light Railway (United Kingdom)
DRIEA	Direction for Equipments and Planning (France)
	Direction régionale et interdépartementale de l'équipement et de l'aménagement
DfT	Department for Transport (United Kingdom)
DNM	Regional Moblity Guidelines (Catalonia)
	Les Directrius nacionals de mobilitat
EDS	Economic Development Strategy (United Kingdom)
EEMS	Spanish Strategy of Sustainable Mobility
EMA	Environmental Authority for Barcelona Metropolitan Area (1987 – 2010)
	Entitat del Medi Ambient
EMT	Transport Authority for Barcelona Metropolitan Area (1987 – 2010)
	Entitat Metropolitana del Transport
EPCI	Entities for Intercommunal Cooperation (France)
	Établissement public de coopération intercommunale
EPT	Public Territorial Establishments (Ile-de-France)
	Établissement public territorial
EWT	Excess Wait Time
FUA	Functional Urban Areas as defined by OECD
FMB	Metropolitan Railway Company of Barcelona
	Ferrocarril Metropolità de Barcelona
FGC	Catalonia Regional Railway Company
	Ferrocarrils de la Generalitat
Generalitat	Regional government of the Autonomous Community of Catalonia
GLA	Greater London Authority
GPE	Grand Paris Express
Grand Couronne	A zone constituting four departments of l'Île-de-France : la Seine-et-Marne, les Yvelines (78), l'Essonne (91) et le Val-d'Oise (95).

GOL	Government Office for London
GLC	Greater London Council
HOV	High Occupancy Vehicle
IFS	Integrated Fare System
IFER	Tax on network companies (France)
	Imposition forfaitaire sur les entreprises de réseaux
IPA	Infrastructure and Projects Authority
KOTI	The Korea Transport Institute
LAURE law	Law on Air Quality and the Rational Use of Energy (France)
	Loi sur l'Air et l'Utilisation Rationnelle de l'Energie
LB	London Buses
LBTC	London Boroughs Transport Committee
LC	London Council
LEZ	Low Emission Zone
LDA	London Development Agency
LIP	Local Implementation Plan (United Kingdom)
LLCS	London Lorry Control Scheme
LOTI Act	Law on the orientation of transport (France)
	Loi d'orientation des transports intérieurs
LPTB	London Passenger Transport Board
LT	London Transport
LTE	London Transport Execute
LVC	Land Value Capture
MAPTAM law	Law for Modernisation of Public Territorial Interventions and Establishment of Metropolitan Areas (France)
	Loi de modernisation de l'action publique territoriale et d'affirmation des métropoles
MC	Metropolitan Council within AMB
MCIL	Mayoral Community Infrastructure Levy (United Kingdom)
MMAMB	Planning Authority for Barcelona Metropolitan Area (1987 – 2010)
	Mancomunitat de Municipis de l'Àrea Metropolitana de Barcelona
MaaS	Mobility-as-a-Service
MIT	Massachusetts Institute of Technology
MPG	The Greater Paris
	Métropole du Grand Paris
MPS	Minimum Performance Standards
MTA	Metropolitan Transport Authority

MTS	The Mayor's Transport Strategy
MOLIT	Ministry of Land, Infrastructure and Transport (South Korea)
NIC	National Infrastructure Commission (United Kingdom)
NOTRe law	The Law on the New Territorial Organization of the Republic (France) Nouvelle organisation territoriale de la République
NPPF	National Planning Policy Framework (United Kingdom)
OMNIL	Mobility Observatory (France) L'Observatoire de la mobilité
OTRP	Office for Parisian transport (France) Office de la Région des Transports Parisiens
OPTILE	Professional Transport Organisation of Île-de-France Organisation Professionnelle des Transports d'Ile-de-France
ORR	Office of Rail and Road (United Kingdom)
Petite Couronne	Zone constituting city of Paris and departments: Hauts-de-Seine (92), la Seine-Saint-Denis (93) et le Val-de-Marne (94).
PCN	Penalty Charge Notice
PDI	Master Plan for Infrastructure (Metropolitan region of Barcelona) *Pla Director d'Infraestructures*
PDM	Mobility Master Plan (Metropolitan region of Barcelona) Pla Director de Mobilitat
PDU	Regional Mobility Master Plan (France) Plan de Déplacements Urbains
PDUIF	Mobility Master Plan for Ile-de-France Region Le Plan de Déplacements Urbains d'Île-de-France
PESVC	Road Safety Strategic Master Plan for Catalonia Plan Estratégico de Seguridad
PITVI	National Plan for Infrastructure, Transport and Housing (Spain) Plan de Infraestructuras, Transporte y Vivienda
PLD	Local Mobility Plan (France) *Le plan local de déplacements*
PLU	Local Urban Master Plan (France) Plan local d'urbanisme
PLUi	Intermunicipal Urban Master Plan (France) Plan local d'urbanisme intercommunal
PMMU	Metropolitan Urban Mobility Master Plan (AMB) Pla Metropolità de Mobilitat Urbana

PMU	Urban Mobility Plan
	Pla de mobilitat urbana
PNSNN	Policy National Statement on National Networks (United Kingdom)
PPP	Public Private Partnership
PTAL	Public Transport Accessibility Level
PVR	Peak Vehicle Requirements
RATP	Autonomous Operator of Parisian Transports (France)
	Regie Autonome des Transport Parisiens
RER	Regional Express Network (France)
	Réseau Express Régional
Renfe	Spanish National Rail
	Renfe Operadora
RMB	Metropolitan Region of Barcelona
	Regió Metropolitana de Barcelona
RN	Railway Network (United Kingdom)
RPT	Region of Parisian Transports (France)
	Région des Transports Parisiens
S106	Section 106 Planning Obligations (United Kingdom)
SCoT	Territorial coherence scheme (France)
	Schéma de cohérence territoriale
SDAURP	Master Urban Development Plan (France)
	Schéma directeur d'aménagement et d'urbanisme de la région de Paris
SDRIF	Urban Master Plan for the Région Île-de-France Region
	Schéma Directeur de la Région Île-de-France
SGP	Société du Grand Paris
SISBEN	Colombia's national targeting system
	Sistema Nacional de Selección de Beneficiarios
SNCF	National society of French railways
	Société Nationale des Chemins de fer Français
SRA	State-led society for the construction of the Grand Paris Express project (France)
	Strategic Rail Authority
SRQM	Sustainable Residential Quality Matrix
SRU law	Urban Renewal and Solidarity law (France)
	Loi relative à la solidarité et au renouvellement urbains

STIF	Syndicate of Transport for Île-de-France
	Syndicat des transports d'Île-de-France
STP	Syndicate of Parisian Transport
	Syndicat des transports parisiens
TDM	Transport Demand Management
TET	Territorial Equilibrium Trains (France)
	Les Trains d'Équilibre du Territoire
TAV	Spanish High Speed Trains
	Tren de Alta Velocidad
TGV	French High Speed Trains
	Train à Grande Vitesse
TICPE	Internal tax on internal energy products, applicable to gasoline and diesel (France)
	La taxe intérieure de consommation sur les produits énergétiques
TfL	Transport for London
TSBCS	Tax on business, commercial and parking dedicated surfaces (France)
	Taxe sur les bureaux en Île-de-France
TSE	Special tax on equipment (France)
	Taxes spéciales d'équipement
TMB	Main public transit operator in Barcelona
	Transports Metropolitans de Barcelona
TB	Bus Company of Barcelona
	Transports de Barcelona S.A.
UCL	University College of London
ULEZ	Ultra-low emission zone
VT	Transport Tax (France)
	Versement Transport
WebCAT	Web-based Connectivity Assessment Toolkit
WebTAG	Web-based Transport Analysis Framework

Executive summary

What we did

This report examines the functioning of the successful Metropolitan Transport Authorities (MTAs) that have been established for the large urban agglomerations of Paris, London and Barcelona. Its purpose is to support the Korean government in plans for the creation of an MTA for Korea's capital region, Sudogwon (which includes Seoul, Incheon and Gyeonggi Province). The study analyses the cases of Île-de-France Mobilités in France, Transport for London, TfL in the United Kingdom and both the Autoritat del Transport Metropolità, ATM, and the transport department of the Área Metropolitana de Barcelona, AMB in Spain. It provides insights that the Korean authorities can build on in creating an MTA for Sudogwon.

The report focuses on the initial stages of institutional transformation involved in establishing an MTA. It analyses how different institutional models respond to particular problems and identifies characteristics that have made the MTAs examined here success stories. It also identifies best practice applicable to the challenges that the MTA in Sudogwon will need to address immediately: delivering metropolitan-wide bus services, improving multi-modal transfer centres and strengthening transport data management.

What we found

MTAs can be established under different institutional models and can have diverse governing structures. Certain elements are nevertheless necessary for establishing a successful MTA. It needs legally backed authority over a specified territory and clearly defined responsibilities. Dedicated funding and decision-making authority over use of the transport budget, as well as dedicated and highly skilled staff are also essential. The report finds that authority over strategic-level planning, including responsibility for integrated planning of land use and transport, is important together with sufficient regulatory capacity in terms of expertise and manpower. Establishing an MTA entails transferring some of the responsibilities and funding assigned to lower levels of local government to the new metropolitan institution. These local entities need to be well represented in the decision-making body of the MTA. Creating these conditions in Sudogwon is important for the institution's success.

What we recommend

Address coordination between jurisdictions at all territorial levels

An MTA for Korea's capital region is essential from an integrated transport planning perspective. At the same time, planning at the level of the metropolitan region needs to take full account of the planning of local services at sub-metropolitan levels, reflecting the complexity and diversity of needs of the territories inside Sudogwon. The first step is to identify the differences in the roles of administrations in the area's larger commuting zone and in its urban core. The experience of Barcelona, with ATM as the MTA for the wider commuting zone and AMB's transport department as the MTA for the urban core, provides a useful potential model to incorporate in plans for Korea. A new framework could take advantage of already existing administrative structures, as the boundaries of Seoul, Incheon and the cities of the Gyeonggi province correspond to the urban core.

Make establishment of the Metropolitan Transport Authority an integral part of decentralisation

Establishing MTAs in countries where decentralisation has already started, such as Korea, should be seen as an opportunity to better coordinate the transfer of resources, decision-making powers and responsibilities from the national to the local scale. Establishing an MTA entails transferring some of the capacity, responsibilities and funding currently assigned to lower levels of local government to the new body. Nonetheless, as long as representation of entities that transfer such responsibilities and resources is ensured in the decision-making body of the MTA, its development can be a vehicle for unlocking the benefits of decentralisation. It is key to find a model that can bring benefits to the diverse stakeholders in return for the transfer of funding and decision-making power.

Leverage support of the national government to establish the Metropolitan Transport Authority

To make a new MTA for Sudogwon a success, the national government should establish a legal framework that gives the MTA clear responsibilities and decision-making powers. It should also create an adequate frame for the institution to develop solid financial capacity. The national government should develop a national planning framework that aligns policy goals at all levels. Such a framework should: a) align the MTA's strategy with those set by the national government; b) require co-ordination of transport planning with other key policy areas including land-use, housing, health and the environment; and c) require plans made at local level to comply with the strategy set by the MTA for the capital region. National governments can also create fiscal incentives for co-operation among MTA partners.

Engage with public opinion to create broad support for the creation of a Metropolitan Transport Authority

Fostering public awareness of the problems created by the lack of metropolitan coordination has proven to be important in developing a consensus on arrangements for metropolitan governance that is durable over the long term. It is also useful for bringing the issue of improving transport service delivery via an MTA onto the political agenda, facilitating the creation of an institution by generating public support.

Choose the right scope when defining responsibilities of the new Metropolitan Transport Authority

Planning mobility at the strategic level is the central responsibility of Metropolitan Transport Authorities. This involves more than planning infrastructure; it requires developing multi-modal strategies aligned with policy goals for mobility and coordinated with other urban strategies. Beyond planning, the capacity to implement actions in different transport policy areas varies widely among existing MTAs. The new authority for Korea's capital region will require power for implementing decisions that go beyond public transport management in order to achieve its objectives, as is clear from the short term objectives discussed in the next recommendation.

Focus on delivery of the government's priority objectives for transport provision

Analysis of the impact of existing MTAs suggests that establishment of an MTA for Korea's capital region is the right strategy for addressing the region's most pressing transport issues: a) more effective delivery of metropolitan bus services, with the MTA leading the transition to a bus system regulated under improved standards for quality and efficiency; b) improved multi-modal transfer centres; and c) better management of transport data for planning services and with a view to developing mobility-as-a-service solutions to complement conventional public transport.

Provide the Metropolitan Transport Authority with the necessary technical and financial capacity using fiscal instruments that bring mobility benefits as well as raising funds

An appropriate budget is crucial to delivering benefits and to ensuring the MTA is a durable institution. In both Paris and London central government devolved some limited tax raising powers to the MTAs to generate their own resources. In Paris, a transport-dedicated tax (Versement Transport) is levied on the larger employers in the region and in London the national government has levied a Business Rate Supplement for the same purpose. In Barcelona, a Metropolitan Tax is paid by all municipalities that are part of the MTA. Some funding mechanisms used in London and Paris contribute to wider sustainable development objectives and not just to the MTA's budget. For instance land-value capture mechanisms help to achieve transit-oriented development, and charges on vehicle ownership and use help to correct prices across different transport modes. Revenues from on-street parking charges and fines are pooled in Paris and allocated by formula to Ile de France Mobilitès, the Region and the local governments. A share of the fuel tax revenues is allocated to Ile de France Mobilitès, which has been granted the power to increase fuel taxes in the region up to a capped amount of additional revenue. The MTA for Seoul's capital region might be funded by some of the instruments employed in Paris London and Barcelona.

Chapter 1. Introduction and background

Decentralisation of public authority has been one of the main priorities for the reform of government in Korea since the 1980s. The 1994 amendment of the Local Autonomy Act created a new two-tier administrative system for the country's territories. This new institutional configuration gave the territories of Korea's capital region (Sudogwon) a new status: Seoul became a major city, Incheon was granted the status of metropolitan city (along with six other urban areas) and Gyeonggi that of a province. The first nationwide elections for local mayors and councils in 1995 marked the effective devolution of responsibilities to newly created local bodies.

Korea's capital region is today home to almost half the national population and contributes more than 50% of GDP. It is a dynamic urban unit, which is the heart of economic activity in the country. Nonetheless, as is the case in many major metropolitan regions, the large size of the capital area and the significant differences between the territories it includes make governance challenging. Governing transport has been particularly challenging and the lack of co-ordinated mobility planning, regulation and investment has hindered the potential to further improve social, environmental and economic outcomes.

In light of the limited success of the Metropolitan Transport Association, the body currently in charge of co-ordinating public transport policies across Seoul, Incheon and Gyeonggi province, Korean authorities have begun the process to establish a metropolitan transport authority (MTA). Formal MTAs have a proven international record of delivering sustainable long-term improvements in accessibility and quality of life in many urban areas. In addition, their creation has proved valuable for strengthening and widening local capacity to plan, manage and regulate transport. The process of establishing an MTA has differed in each case, and the institutional and governance model chosen has been determined by specific local circumstances. Authorities in Korea and Sudogwon, accordingly, will need to find their own model.

In the course of developing the MTA, looking at international experience, and particularly at agencies that show long-standing success, can bring valuable lessons and insights for Korean authorities to build on. To this end, the present report has been prepared by the International Transport Forum at the OECD. The document analyses the cases of Île-de-France Mobilités in France, Transport for London (TfL) in the United Kingdom and both the Autoritat del Transport Metropolità (ATM) and Àrea Metropolitana de Barcelona (AMB) in Spain's Barcelona metropolitan area.

The discussed metropolitan areas are important population centres with considerable economic and political weight in their particular countries. They also bring together a wide array of actors in the delivery of transport- services. The chosen authorities are the result of complex institutional evolutions, which in all cases allowed transition towards situations of improved governance and increased quality of services. Analysis of these institutions sheds light on possible solutions for facing current challenges in Korea's capital area and brings attention to factors of success that are important to consider; both for setting up the institution as for ensuring its effectiveness. In addition, the chosen MTAs provide distinct models in terms of the area of coverage and the scope of competence over different transport modes and policy areas. Analysing advantages and shortcomings of each model brings value to current discussions linked to the creation of an MTA for Korea's capital area. The three explored cases also provide valuable examples of effective mechanisms for ensuring alignment of the MTAs with the central State and national goals, as well as for promoting effective co-ordination with lower levels of government.

Chapter 2 focuses on the initial stages of institutional transformation involved in establishing the MTAs in each city area. It examines the rationale behind key decisions and compares how the different

models chosen responded to particular problems and context specific conditions. Chapter 3 analyses and compares the governance structure and decision-making mechanisms used by each of the agencies. It also discusses in detail the scope of competence and geographical coverage of the different agencies. Chapter 4 highlights the crucial role that an MTA can have in carrying out strategic level and integrated planning, and offers examples of planning instruments that Korea can take as a reference. It also provides a detailed description of the ways in which each agency has built technical and financial capacity. Chapters 5-7 look into best practices that would be applicable to some of the specific challenges that the MTA in Sudogwon will need to address in the short run: delivering area-wide bus services, developing and improving multi-modal transfer centres and strengthening transport data management. The last chapter compiles the main policy recommendations for Korean authorities that stem from the explored cases. While the three case studies are the main focus of this report, best practice in other cities and countries is included where relevant.

Limited metropolitan governance of transport in Sudogwon

The territories that make up Sudogwon are shaped by different factors. The special city of Seoul covers 605.2 km^2 and with 10 million people accounts for 19% of the national population. It has a high population density (17 013/km^2) and an average gross regional domestic product (GRDP) per capita of USD 31 955. The adjacent metropolitan city of Incheon, whose 1 046.8 km^2 hold almost 3 million people, is home to Korea's main international airport and a free economic zone that includes developing new towns such as Songdo (Incheon, 2018). Gyeonggi-do (province), which encompasses these two urban nodes, contains 28 cities on 10 172 km^2 and houses almost 10 million people in addition to the residents of Seoul and Incheon.

A series of innovative initiatives has been implemented with the aim of counteracting the fast growth of car ownership and use and resulting problems such as pollution and congestion. Among the most important strategies was the 2004 bus reform, which led to a significant increase in the modal share of public transport (to 66% in 2015, with bus accounting for 28% and subway for 37%). Sudogwon was the first area in Korea to adopt a single area-wide electronic payment system for bus and subway use. The Ministry of Land, Infrastructure and Transport (MOLIT) built on this system to introduce the One Card All Pass programme, integrating a wide range of transport modes across almost every region in Korea (including inter- and intra-city buses, subways, regional trains, taxis, the Nanum-Car electric car sharing system and road tolls) (OECD, 2017).

However, a lack of effective metropolitan governance has made it difficult to achieve important goals such as minimising journey times and delays in trips across the metropolitan area. It has also hindered co-ordination among service providers that could have enabled significant potential efficiency gains and safety improvements. Several measures remain pending: expansion of area-wide bus routes and a broader bus rapid transit (BRT) system; the improvement of multi-modal transfer centres; and construction of inter-regional metros and roads. In addition, conflicts have arisen regarding the revenue from integrated transit fares.

The Metropolitan Transport Association and the shift towards establishing the Metropolitan Transport Authority

The Metropolitan Transport Association was established in February 2005 as a public authority charged with co-ordinating public transport policies across Seoul, Incheon and Gyeonggi province (KOTI, 2014). Its legal basis is the Local Autonomy Act of 2008, which allows for an association to be created if a service requires co-operation by two or more local governments. It is in charge of developing metropolitan public transport plans, establishing BRT and transfer facilities, undertaking consultation

and adjustment on inter-regional projects, and the co-ordination of bus route planning and fare collection for all inter-municipal transport systems (MTA, 2017). The model adopted has several limitations that have kept it from attaining its objectives. Among the most relevant are the following:

- The voluntary nature of the three local governments' contributions limits the budget available for projects, as well as the institution's ability to predict its funding capacity.

- The staff is made up of former civil servants from the Seoul, Incheon or Gyeonggi province administrations on two-year postings to the association. Their short tenure means they have little incentive to work towards co-ordinated area-wide projects and often favour the interest of the authority that posted them to the association and for which they may work again after their posting ends. The short postings also make it difficult to develop long-term strategies: from 2005 to 2017, the institution had 17 heads, which does not provide the necessary stability for urban policy making (MTA, 2017).

- The association is the product of an agreement between local authorities with clear differences in terms of regional views and interests, and has no legal power to contravene the vision of a given territory (MOLIT, 2013). For example, Incheon wishes to guarantee its operational independence vis-à-vis Seoul and Gyeonggi-do, particularly through the development of new towns. This works against formation of a strategic vision for transport at the level of the metropolitan area.

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Chapter 2. Setting up a Metropolitan Transport Authority

Before establishing MTAs, London, Paris and Barcelona faced some common challenges. Among the most significant were the lack of an integrated transport network, overlapping responsibilities regarding the various transport modes and inefficient mechanisms to ensure stable financial support for public transport. Along with policies supporting car-oriented expansion and low-density urban sprawl, this situation led to rising rates of car ownership, air pollution, congestion and other negative externalities. In addition, public transport grew less competitive, which meant significantly higher subsidy costs.

Over time, these three metropolitan areas went through institutional changes, with metropolitan transport issues being approached in diverse institutional settings. However, the establishment of a formal MTA, with delegated responsibilities, planning and regulatory capacity and dedicated funding, was in all three cases the most important step towards effective co-ordination between the wide arrays of stakeholders in the transport sector.

This chapter describes the governance models in London, Paris and Barcelona before the establishment of an MTA, identifies the issues that motivated each city's decision to set up such an entity, outlines the process by which each MTA was set up, identifies mechanisms used to overcome institutional and political conflicts and facilitate consensus, and describes the institutional set-up chosen in each case.

Paris: Progressive evolution to a regional-scale authority

Île-de-France, France's capital region, has a long history of attempts at governing transport. Île-de-France Mobilités, previously the Syndicate of Transport for Île-de-France (STIF) evolved from multiple institutions over half a century. Administrative reforms, such as changes to the boundaries of the capital area, as well as alterations to the legal framework had an important impact on the transformation of Île-de-France Mobilités and its predecessors over time.

First efforts to co-ordinate operations, tariffs and infrastructure planning

Created by a decree-law issued on 30 July 1937, the Committee for Co-ordination of Transport in the Paris Region was the first attempt to improve transport co-ordination in the French capital (Neiertz, 1999). It held control solely over public transport within the Paris city limits (*intra-muros*). Rapid population and economic growth, particularly in the suburbs, soon made clear the need for transport co-ordination over a broader territory (Lecler, 2003).

Thus, after the Second World War, the law of 21 March 1948 created the Office for Parisian Transport (OTRP) under what was then the Ministry of Public Works and Transport. The OTRP controlled more territory than the previous body, and the legislation provided for the creation of its area of coverage, the Region of Parisian Transport (RPT).The OTRP General Assembly was made up of representatives of the national government, the City of Paris and the *départements* in the RPT (Oise, Seine, Seine-et-Oise and Seine-et-Marne), the Société Nationale des Chemins de fer Français (SNCF), the new Regie Autonome des Transport Parisiens (RATP, created by the same law) and road transport carriers. A Technical Consultative Committee, representing RATP, SNCF, the Professional Transport Association and the prefects (national government representatives) of the *départements*, was also part of the ORTP.

The ORTP, through the General Assembly, developed a two-year plan setting out transport needs in the RPT (approved by the transport ministry) and another plan on the organisation and distribution of public transport in the RPT. This allowed it to decide which lines (or extensions) and services to add to the network. It could also set tariffs for all RATP lines and for SNCF lines located in the *petite couronne*. The Technical Consultative Committee could submit opinions and recommendations to the General Assembly regarding any project.

The ORTP had no budget of its own, but the RATP had a budget consisting of revenue from fares and off-traffic products such as advertising, along with special grants from local authorities for line creation, extension or maintenance. Extraordinary provision was made for national and local government contribution but it was capped at 15% of the budget and allowed only as a means for the RATP to regain financial equilibrium.

Going beyond: An institution with increasing financial capacity and covering the whole region

In 1959 the national government set up the Syndicate of Parisian Transport (STP) with the aim of modernising and better organising transport. The STP absorbed the ORTP's prerogatives and became responsible for co-ordinating the public transport system in OTRP's former area of coverage. Unlike ORTP, STP was separate from the transport ministry. It now had a staff: a secretary-general, technical advisers and executive staff. Positions could be filled by national or local government employees or contractual staff. To cover staff costs, STP had a budget of special contributions by RATP and SNCF, channelled through the transport ministry.

STP was in charge of planning transport lines in the RPT, designating operators, defining general conditions for transport operations and setting tariffs. It also supervised the implementation of investment plans by the RATP, SNCF and other operators in the RPT. In 1964, the three *départements* under STP coverage were reorganised territorially into seven: three in the *petite couronne* and four in the *grande couronne*. In 1965, STP participated in the drafting of a master urban development plan envisioning construction of a regional express network (RER) (Sia Partners, 2011).

A May 1968 decree resulted in several changes to STP, including giving it certain budgetary autonomy. The budget was voted on by the STP's board and approved by the comptroller (the Director of Road Transport in the Ministry of Public Works). Only in the case in which no approval was given, did the Ministry have a say. The same decree also gave STP new prerogatives, such as the ability to build and operate parking facilities outside of Paris.

Moreover, the decree introduced specifications regarding the body's coverage area and the composition of its board. This institutional set-up provided for limited representation of local authorities. The board was composed of national and local government representatives (from the *départements* affected by the STP's actions: five members from Paris and one from each of the other *départements*). It was chaired by the *Préfet de Paris*, whose function was to carry out national government priorities in Paris (and, since 1977, the Île-de-France region). The number of national representatives equalled the total number of local representatives.

Local authorities have evolved over time in the capital area; the local representatives on the STP board came mostly from the *départements* and the city of Paris (Table 2.1). Decisions were taken on a two-thirds majority basis; in the event of a tie, the prefect had the last say, ensuring national government predominance. Both government levels contributed to the STP's budget, with the national administration having the larger share under national laws that set the amount of contributions.

A law of May 1976 created the Île-de-France region and gave it some authority over transport (Box 2.1). However, the national level maintained its majority role on the STP board and the new region had no representation on the board. In 1991, the STP's territory was expanded to the entire Île-de-France, with all departments in the region gaining full representation on the board (Paumier et al., 2007).

Box 2.1. **Reasoning behind the creation of the Île-de-France region**

The creation of the Île-de-France region in 1976 was the result of an institutional evolutionary process that started in the Paris area at the beginning of the 1960s. In 1961 the district of Paris was created through the law nº61-845 of 2 August 1961, with the organization of the Paris region as a new way of co-ordinating the action of the different actors in France's capital region in matters related to the economic and social development of the area. The district was initially led by the First Delegate, M. Paul Delouvrier, who responded directly to the First Minister and was responsible for proposing to the government and co-ordinating the planning policy of the territory of the district. In 1964, the figure of the First Delegate to that of the *Préfet de région de Paris*, a new position with extended powers created over the territory of the district. With this legislation, M. Delouvrier went from being the First Delegate to the Préfet of the Paris region, thus extending strengthening his responsibilities over the territory as a representative of the State.

The First Delegate, then *Préfet*, was helped in his duties by the administrative council. This body was formed by 28 Mayors or councillors of the district localities, half of which were chosen by the localities' councils and half of them were designated by the government. This body's main task was to request and evaluate studies as a source of opinion for the technical plans linked mainly to the district's territorial social and economic development. The last decisions over these matters were taken by the *Préfet*. The district didn't have the status of a territorial authority, as it was not directly elected. However, it was given a larger budget than any previous local administration, formed of voluntary contributions from the *départements* in its territories, subsidies from the national State and the revenue from taxes linked to the public services it dealt with. Although the district lacked clear responsibilities regarding transport, the *Préfet*, its head, was put at the head of the autonomous STP in 1968. The district was the first regional body in the country's recent history and served as inspiration for France's new regions.

The law nº72-619 of 5 July 1972 on the creation and organisation of regions, created new regions in the country, outside of the Paris district. The newly created regions had the status of public bodies (*établissement public*) and had certain capacities in terms of the delivery and co-ordination of public services assigned to them by the State, but the notion of regional public services was disregarded. Regional services, those specific to regions, were seen as ineffective and too costly for the public Treasury. Instead, regions had a main responsibility of helping co-ordinate the action of State services at more local levels, by promoting territorial, social and economic development. This involved, for instance, having a say in determining the repartition of national subsidies for public works in *départements* in certain fields, such as local roads, or land planning. They could also conduct and fund projects that participated in the social and economic development of the region. Furthermore, they could be the recipient of the responsibilities of lower tiers of government (*départements*, for instance) to manage them in their stead.

Regions according to the 1972 law were composed of a regional council, a body constituted partly by all the parliamentarians of the region and partly by an equivalent number of members chosen by each locality's inner councils. Additionally, a social and economic council formed by the main actors of the economic and civic life of the territory was created. Both bodies advised and gave opinions to the *Préfet* de region, who had the last say, as the representative of the State in the territory, over decisions that had to do with the proposal, execution and evaluation of major regional development plans.

Although the district of Paris was to a certain extent successful in the accomplishment of its duties, it lacked the democratic legitimacy given to it by the election of the general council. In 1976, it was decided that the district of Paris needed to realign to the national logic of common law for the regions. The law nº76-394 of 6 May 1976 on the creation and organisation of the region of Île-de-France transformed, as such, the Paris district into the Île-de-France region. The change in the name (from Paris to Île-de-France) sought to give an inclusive image to the capital area, by not limiting the identity of the territory to the city of Paris while forgetting to include localities in the first and second "*couronnes*". The Île-de-France region had, as initially constituted, a similar inner structure and framework of faculties than that of its provincial equivalents. In addition to the traditional capacities given to

the already-existing regions, Île-de-France was given a wider array of powers over key areas for the capital's dynamics, such as that of defining the regional policy for green spaces through a new, regional agency to this end. In terms of transport, the region was given the faculty of defining the regional policy of circulation and passenger transports, as well as insuring its compliance, without prejudice to the capacities of the Syndicate of Parisians Transports over this matter.

Source: ITF, based on Gouvernement Français, « Loi nº61-845 du 2 août 1961 relative à l'organisation de la région de Paris »; Gouvernement Français, « Loi nº72-619 du 5 juillet 1972 portant création et organisation des régions »; Gouvernement Français, "Loi nº76-394 du 6 mai 1976 portant création et organisation de la région d'Île-de-France,; Gouvernement Français (1976), « Seconde Session Ordinaire de 1975-1976, Compte rendu Intégral – 3e Séance, Séance du Jeudi 8 Avril 1976 »; Direction de l'Information Légale et Administrative (2018), « La Région : 50 ans d'évolution »; Cottour, C. (2008).

Table 2.1. **Public authorities represented in STP and STIF over time**

Years	1959-68 (STP)	1968-91 (STP)	1991-2001 (STP)	2001-04 (STIF)	2005-today (STIF/Île-de-France Mobilités)
Public authorities represented	- National government - City of Paris - Seine, Seine-et-Oise, Seine-et-Marne and Oise *départements*	-National government - City of Paris - Full representation by Hauts-de-Seine, Seine-Saint-Denis and Val-de-Marne *départements* - Partial representation by Essonne, Val-d'Oise, Seine-et-Marne and Yvelines *départements*	- National government - City of Paris - Hauts-de-Seine, Seine-Saint-Denis, Val-de-Marne, Essonne, Val-d'Oise, Seine-et-Marne and Yvelines *départements*	- National government - City of Paris - Île-de-France region - Hauts-de-Seine, Seine-Saint-Denis, Val-de-Marne, Essonne, Val-d'Oise, Seine-et-Marne and Yvelines *départements*	- Île-de-France region - City of Paris - Hauts-de-Seine, Seine-Saint-Denis, Val-de-Marne, Essonne, Val-d'Oise, Seine-et-Marne and Yvelines *départements* - Chamber of Commerce of the Île-de-France region - EPCIs

Source: ITF, based on Lecler (2003).

From its creation, the STP faced challenges, notably lack of investment capacity. Insufficient transport infrastructure investment was especially marked between 1910 and the 1960s, resulting in increasing congestion and an overall shortage of public transport services to cope with the demand generated (Chamant, 1971). The national government, deciding it had to expand the STP's funding capacity, launched law 71-559 of 12 July 1971 imposing a new tax, the Versement Transport, on enterprises with more than nine employees in Paris and the "*petite couronne*" of adjoining *départements* to fund public transport in the region. It gave the STP management control over the new revenue as part of the compensation fund for transport operators. The aim was to increase the quantity and quality of infrastructure and service delivery in the region while decreasing the strain on municipal and national budgets. From 1973, half of traffic fines in the region were also allocated to the STP (Paumier et al., 2007).

Further evolution: Gaining strategic planning capacity and a predominant local voice

A growing problem in the Paris area was urban sprawl, which spread fast especially between the 1960s and the 1990s. The phenomenon was to some extent increased by the government's attempt to reduce pressure on Paris by creating five new cities in the surroundings of the capital. Moreover, decentralisation in France, starting in 1982 with the Defferre laws, gave more power –including over transport – to the regions, *départements* and municipalities. Overall, decentralisation renewed institutions and helped them adapt to a growing democratic legitimacy and demand for citizen participation. However, in Île-de-France it had the effect of fragmenting wider transport governance, beyond that of public transport which remained under the responsibility of the STP.

Responsibilities related to city planning and transport in the 1980s and 1990s in the RPT region were shared among more than 120 *communes*, five *départments*, the Île-de-France region and the national government (Lefebvre and Offner, 1993). Each *commune* had a say over road management and parking policies, which led to inconsistencies in the wider management and planning of part of the road network.[1] At the same time, the national government was directly responsible for traffic management and indirectly responsible for public transport planning through its prominent role in the STP. The region had some responsibilities related to public transport but was hindered by a lack of capacity in transport planning and implementation. The Law 77-1410 of 23 December 1977 put the region in charge of transport and traffic planning on its territory as long as these responsibilities did not overlap with those of the STP, which maintained the upper hand on transport governance. The region was not represented on the STP board until 2001; in the meantime, competition between municipalities and the absence of a regional vision, as well as a general lack of co-ordination regarding spatial and transport planning, accelerated low-density urbanisation and urban sprawl, which contributed in turn to congestion and increased dependence on private vehicles (Halpern and Le Galès, 2016).

STP's ability to regulate the RATP, SNCF and other service providers was increased by the decree 2000-634 of 6 July 2000, which allowed it to shift from annual to multi-year agreements. This gave service providers more flexibility to invest and raise infrastructure and service quality, for which the STP now set minimum requirements.[2] At the same time, although de facto the service provider's expenditures was generally covered, this coverage was no longer guaranteed as it now depended on the provider's ability to meet contract objectives (Sia Partners, 2011).

Also in 2000, the Urban Renewal and Solidarity (SRU) law set up a new urban governance framework. As part of this, the STP became the Syndicat des Transports d'Île-de-France (STIF), integrating the Île-de-France region into its governance (Lecler, 2003). The region was granted five places on STIF's board, which nevertheless was still chaired by a *préfet* who had responsibility for both Paris and the region (Paumier et al., 2007).[3]

The law did, however, set the stage for the national level's gradual retreat from STIF governance. The Île-de-France region became head of STIF in July 2005 (under a 2004 law), in line with the decentralisation trend started in the 1980s. Since then the STIF board has been composed of 15 representatives from the region, seven from the *départements*, five from the city of Paris, one from the Regional Chamber of Commerce and Industry and one from the *établissements publics de coopération intercommunale* (ECPIs, entities formed by groups of municipalities to co-operate in certain areas) (Paumier et al., 2007; IAU, 2014).

The 2004 law also enlarged STIF's responsibilities. The body would now develop and revise the regional mobility master plan, the Plan de Déplacements Urbains Île-de-France.[4] It would also have authority over special school transport, on-demand transport and regular river transport. In addition, the law empowered STIF to borrow, fix the rate of the Versement Transport (up to a maximum set by the

law) and delegate responsibilities to *autorités organisatrices des transports* (AOPs, authorities organising neighbourhood transport). Some EPCIs around Paris (five of the 19 in the *petite couronne*, as well as two in the *grande couronne*) have AOP status and thus possess delegated responsibilities by STIF. Other EPCIs in the region have received an official delegation of certain, limited, local services (on demand transport, for instance) without receiving the AOP status.

In 2014, the law on modernisation of public territorial interventions and establishment of metropolitan areas, known as MAPTAM, created the Métropole du Grand Paris (MGP), to be established in January 2016 as an EPCI. It was later defined as incorporating the 19 EPCIs of the *petite couronne* as well as any EPCIs in the outer *grande couronne* that included at least one municipality in the *petite couronne*. With the 2015 law on the new territorial organisation of the Republic (NOTRe), the MGP was divided into 11 public territorial establishments (EPTs). By 2018 these will have harmonised responsibilities on city-related policy, local urban planning and an environmental plan regarding air, energy, sanitation, water and household waste management. EPCIs which, before becoming EPTs, enjoyed public transport-related responsibilities as part of a delegation of capacities from Île-de-France Mobilités, will continue to do so as new EPTs. Those that did not will be able to take on public transport responsibilities later, if they wish, as long as they meet the legislative requirements for this matter (French Government, 2010).

Challenges in consolidating STIF

The transfer of responsibilities to STIF brought challenges due to disagreements between government levels. The first was between the Île-de-France region and the national level. When the government turned over leadership of STIF to the region, it made no financial compensation to cover associated expenses,[5] particularly those related to RATP workers' pensions (Zentelin, 2013) and bus fleet safety enhancement (French Senate, 2006). Hence, the government's departure from STIF's board put financial pressure on the region, prompting the regional council president to apply an "empty chair policy" in 2004-06: regional authorities and their allies in certain *départements* on the board declined to participate in STIF activities until a new arrangement with the government was reached (Zentelin, 2013). This dispute affected the authority's stability and policy-delivery capacity in its early years.

Furthermore, the creation of a transport authority led by the Île-de-France region raised concern about the autonomy of other local authorities. In 2004 the Île-de-France region and city of Paris both leaned left, with the region dominated by the Socialist Party and the city by a coalition of the Socialist, Green and Communist Party. Yet the Paris administration had its own priorities for urban transport, the scope of which was mainly limited to the city itself instead of prioritising STIF's regional transport policies or a vision for Île-de-France (Halpern and Le Galès, 2016).

Similarly, the other local authorities on STIF's board were sceptical about having a very strong region at the helm. Hence members argued over the voting procedure for board decisions. A customary simple majority would largely favour the region, as it had the national government before it left the board. Minority *départements*, concerned about autonomy and their ability to counteract the region's decisions, called for requiring a two-thirds majority for approval. This debate further restricted STIF's decisions (French Senate, 2006).

The vacant chair tactic of the then president of the regional council, Jean-Paul Huchon, was successful in pressuring various levels of the administration, as public discontent with STIF's inaction grew. The resulting tension led to intervention by the Senate, and National Assembly through its Committee on Expenses (Commission Consultative sur l'Evaluation des Charges), which discussed the situation and found the government to be at fault, preparing the way for the region to receive the funding it required to keep STIF functioning (Zentelin, 2013).

The debates in both legislative chambers resulted in law 2006-438 of 14 April 2006 concerning the functioning of STIF and clarifying the voting procedure of its board (French Senate, 2006). The law included a clause on issues related to spending increases that had been approved by a simple majority and on which a local authority representative had the right to seek a second deliberation. For such a demand to be valid, the law stated, the request needed to be backed up by a two-thirds majority of the assembly of the authority concerned (*département* or the city of Paris) confirming that the issue at hand went against the interest of the citizens of the constituency in question. Similarly, for the second deliberation, a two-thirds majority was needed for approval of the point. This provision, valid only from 2006 to 2013, provided a counterbalance to the region's voice during its early years as head of STIF. On the one hand, it eased the decision-making process by affirming the region's authority. On the other, it provided a countermeasure that any other actor on the board (e.g. the less represented *départements*) could take to oppose a policy that went against its constituency's general interest (French Senate, 2006).

Finally, the city of Paris was allowed a pragmatic arrangement to ensure it could retain relative autonomy in transport system development: the *Versement Transport* was renegotiated in STIF to allow the rate applied in the city to be differentiated from that in the suburbs. Similarly, bespoke funding arrangements were developed for particular cases. For instance, the city agreed to develop new mobility services at its own cost, thus ensuring its autonomy as well as a reduction of costs to STIF for certain transport projects in the city. This arrangement, however, came at the price of a relative increase in inequality of public transport service provision between Paris and its periphery (Halpern and Le Galès, 2016).

London: Setting up a transport authority within a wider metropolitan government structure

Transport for London inherited a complex history of attempts to govern transport in the London Area, which were characterised by alternating periods of central government control and local rule. The early 20th Century was marked by rapid growth in population and housing construction, and general expansion beyond the administrative boundaries of the County of London. During this period the Underground network significantly expanded and the number of private bus operators was enlarged, considerably increasing congestion as well as competition for the London General Omnibus Company, then one of the world's largest bus companies. The competition was unrestricted, and had negative effects for operators' profitability, particularly as economic depression decreased all carriers' revenue. Meanwhile, the lack of co-ordination between transport actors meant transport service provision was less than efficient, contributing to a spurt of strikes in the mid-1920s (Wilson, 1939). These and other factors triggered the search for better transport governance models for the city.

Initial attempts: Centralised public transport management

The first official body charged with co-ordinating transport was the London Passenger Transport Board (LPTB), established in 1933 by the London Passenger Transport Act. Like all transport authorities in London until the creation of TfL in 1999, this body had the commercial name London Transport (LT). The LPTB was a public trust that absorbed urban and suburban transport companies in the London region, including those operating underground, railway, tram and bus services (TfL, 2017). LPTB provided centralised organisation and management of the assets while ownership remained in private hands in the form of securities.

LPTB received no direct government contributions or other funds except transport fare revenue. Fares were set at cost recovery level, so no subsidies were assigned. The LPTB governing board consisted of a chairman and six members appointed by local government bodies and organisations

representing bankers, lawyers and accountants (Wilson, 1939). The LPTB territory extended well beyond the metropolitan area, which was composed of the London Council and five other councils (Box 2.2). The model improved co-ordination between operators to some extent and enabled major expansions in the network. But it was far from solving the problem of financial sustainability for public transport (Busetti, 2015).

Box 2.2. **Historical evolution of London's metropolitan area**

London's metropolitan area, along with its administrative demarcation, has had a considerable evolution since the 19th Century. In 1851 the London area, as defined by the 1851 census, included London's centre, controlled by the Corporation of the City of London, as well as parts of the counties of Middlesex, Surrey and Kent. Inside of the London area, certain bodies sought to co-ordinate the actions of the different administrative authorities, particularly for housing and sewage service, but no single authority had control or responsibility for planning in the territory.

The Metropolis Management Act 1855 created the Metropolitan Board of Works (MBW), which was the first body set up to co-ordinate the actions of different public authorities in the London area. The MBW was later replaced by the London County Council (Local Government Act 1888). This was set as a metropolitan government for the recently created County of London (the area of coverage corresponded to the previous MBW's area). This body lacked proper capacities to carry transport actions. Due to this limitation, the London Passenger Transport Board was created in 1933. The Board's area of coverage, the London Passenger Transport Area, went well beyond the administrative territory of the County of London, reaching out to the, at the time, counties of Kent, Essex, Middlesex, Hertford, Surrey, Berks, Bucks and Bedford. This has been the largest perimeter for which any transport authority has been responsible in the history of transport authorities in the London area.

The County of London was eliminated in 1963 and in its place the London Government Act 1963 created the Greater London Council (GLC), which controlled the area of the Greater London. This new Greater London had a wider territory than its predecessor, by absorbing parts of the counties of Surrey, Essex, Hertford and Kent. The expanded boundaries allowed the new authority to better respond to the existing policy concerns of the capital, which had experienced a considerable enlargement of its urban shape since 1851. The Greater London area has remained mostly unchanged since 1963 and is today the political territory for which the Greater London Authority (GLA) is responsible.

In 1969, GLC became the authority responsible for transport in the Greater London. With this the perimeter establishing the territorial area for management of transport services, which dated back to the London Passenger Transport area of 1933, was reduced to the area of the Greater London.

Source: ITF based on Harris, S. (2011); British Government, Metropolis Management Act 1855,The National Archives, http://www.legislation.gov.uk/ukpga/Vict/18-19/120; British Government, Local Government Act 1888, The National Archives, http://www.legislation.gov.uk/ukpga/Vict/51-52/41/contents; British Government, London Government Act 1963, The National Archives, http://www.legislation.gov.uk/ukpga/1963/33/contents; The Online Historical Population Reports Website (2018), "Population tables I, Vol. I. England and Wales. Divisions I-VII, 1851, http://www.histpop.org/ohpr/servlet/PageBrowser?path=Browse/Census%20(by%20date)/1851/Great%20Britain&active=yes&mno=27&tocstate=expandnew&tocseq=19700&display=sections&display=tables&display=pagetitles&pageseq=first-nonblank

For reconstruction after the Second World War, central government funding and increased government participation were needed. LT was nationalised in 1948, with what was now the LT Executive (along with British Railways) becoming an operating subsidiary of a new British Transport Commission (BTC). The BTC was charged with efficient co-ordination and delivery of transport-related services in the United Kingdom through five executive bodies: LT, Docks & Inland Waterways, Hotels, British Railways and Road Transport.

As British Railways required a considerable debt load to operate, the BTC struggled to meet its statuary requirement of breaking even. Meanwhile, increased car use was significantly cutting into public transport revenue. There were also multiple co-ordination issues among the five executive bodies. In these circumstances, the BTC was unable to carry out its duties (Parker, 2012). It was dissolved in 1962 and London Transport became a board under the Ministry of Transport until 1969 (Harris, 2011).

The first version of a metropolitan transport authority

The London Government Act of 1963, which took effect in 1965, created the Greater London Council (GLC), a new metropolitan-area government. The act granted the GLC authority over 32 new London boroughs. Initially, the GLC's transport responsibilities extended only to traffic policies, metropolitan roads and parking management; for most other transport areas, the new London government was overseen by the Minister for Transport and had to comply with ministry policies (London Government Act, 1963). On 1 January 1970, however, under the Transport (London) Act of 1969, the LT Board, successor to the LT Executive, was transferred from the ministry to the GLC and became, once again, the LT Executive. The GLC sought to reconcile the interests of all stakeholders that had a say over transport in Greater London (Busetti, 2015). The 1969 act gave LT full control over fare setting, transport planning and operations, and was authorised to provide service even if costs exceeded fare revenue (Transport [London] Act, 1969).

Some GLC transport measures and their related cost led to controversy with other government levels. Major political conflicts arose because of overlapping responsibilities between politically opposed bodies. The Conservative government found itself at odds with Labour-led boroughs and the GLC, particularly over increased public expenditure when the Labour politician Ken Livingstone was leader of the GLC (Burnham, 2006). Mr Livingstone also put forward social measures through transport policies at a time when economic efficiency and structural reform were the norm. The Conservative government saw these locally led initiatives as a strain on its budget, as well as a political threat (Harris, 2011).

Back to managing operations

The conflicting relations between levels of government led to the dissolution of the GLC and the LT Executive (Harris, 2011). The 1984 London Transport Act eliminated the executive and split its metropolitan transport prerogatives between the London boroughs and central government bodies. The new London Regional Transport was merely a holding company for London Underground and London Buses and had a rather ill-defined planning role (Thornley, 1992). In parallel, British Rail (BR) ran half the railways running through London. The Department of Transport was in charge of supervising all public transport corporations.

The boroughs initially maintained control of traffic and parking for most of the 800 km road network previously controlled by the GLC. Only 70 km of GLC roads were deemed of "strategic importance" and given to LT (Busetti, 2015). Boroughs also obtained control over national transport grants, which were directly transferred to them by the government (Harris, 2011). Two new, sometimes conflicting bodies, the Association of London Authorities (representing 14 boroughs) and the London Boroughs Association (18 boroughs), attempted to co-ordinate road planning between local authorities

(Burnham, 2006). The boroughs were unable to agree on a common policy for traffic management that would continue the work of GLC's Traffic Control System Unit. Eventually, the transport secretary became responsible for the Unit, which was managed by the Corporation of the City of London (Burnham, 2006).

At the same time, the boroughs became planning authorities with responsibilities over local roads, pedestrian facilities and cycle routes, as well as land use and development. But without a metropolitan area-wide body, funding and planning inconsistencies resulted. For instance, many boroughs carried out road infrastructure projects regardless of objectives set by other boroughs to reduce traffic. Overall, the implementation of programmes that were popular with local voters took priority over co-operation to build regional bus and cycle lanes (Bunham, 2017). Traffic congestion had become a major concern but was difficult to tackle due to the lack of an integrated vision. Londoners made fewer journeys and travelled less distance than people elsewhere in the country, yet spent more time travelling due to the extent to which congestion slowed travel speeds in the urban area (House of Commons, 1997). Co-ordination between boroughs did improve through co-operation in some areas, however. For instance, all boroughs joined the London Committee on Accessible Transport, which developed policies concerning disabled residents. Even so, Conservative boroughs were reluctant to enlarge the scope of this joint body for fear that it could develop into a regional institution (Bunham, 2017).

The funding of the transport system was also challenging. The lack of a single "voice" for London increased the difficulty for negotiating additional public funds with the national government, which was particularly problematic in a system of highly centralised public expenditure and taxation control (Travers, 2009). The budget was decided by the national government and managed among LT, the Department of Transport and the Treasury. The capital was not represented in these negotiations. The instability of transport governance in the London area was detrimental to the general availability of funding for transport. In this framework, co-ordination of public transport was handicapped by the mismatch in interests and financial objectives of LT and BR. While they controlled different parts of the public transport system, LT was allowed to incur deficits in order to serve "local needs" whereas BR needed to generate profits (Burnham, 2006).

Strong criticisms against the ineffective transport governance in the capital were an important element bringing the issue to the attention of the Labour and Conservative parties (Travers, 2004). Both paid attention to the subject, but proposals diverged. The creation of an MTA was seen by Labour partisans as a way to regain previously lost responsibilities, and was thus threatening for supporters of the Conservative party. The Conservative administration of John Major sought instead to increase co-ordination of metropolitan transport policies through government-led agencies and thus created the Government Office for London in 1993 and the Ministries for London and for Transport in London in 1994 (Busetti, 2015).

The final struggle to establish TfL

Labour won the 1997 general election. The new Prime Minister, Tony Blair, called a referendum in 1998 on forming a new Greater London Authority (GLA), and within it an MTA for the metropolitan area (Chandler, 2007). The House of Commons produced a paper with a detailed justification for the transport component of the GLA (House of Commons, 1998b). The referendum, which took place on 7 May 1998, asked Londoners the following question: "Are you in favour of the government's proposals for a Greater London Authority, made up of an elected mayor and separately elected authority?" It ended with 72% of voters being in favour of the creation of a Greater London Authority, against 28% who rejected the motion (House of Commons, 1998a). Both the 1997 election and the 1998 referendum

helped legitimise the creation of a new metropolitan government and forced reluctant and opposing actors to negotiate with the national administration (Busetti, 2015).

Even so, government agencies held conflicting views on the best setup for the new MTA. A post of mayor of London was to be created, and the Government Office for London (GOL) proposed to give the mayor control over all public transport and roads through TfL, a new integrated agency that would be part of its bureaucracy (Chandler, 2007). This proposal went hand in hand with New Labour's vision of a co-ordinating body, and aimed to reduce the existing governance bottlenecks. For its part, the Department of the Environment, Transport and the Regions (DETR) proposed more constrained transport powers for TfL, which would remain part of the central administration under DETR, albeit with some mayor-appointed board members.

DETR's views were partly motivated by the worries some in government harboured about Mr Livingstone and the possibility of him becoming mayor. The concern was that the setup of TfL proposed by GOL would lead to major spending, as had been the case when Mr Livingstone was head of the GLC (Burnham, 2006). The design of the GLA and its transport responsibilities was developed in parallel with the negotiations for a public-private partnership (PPP) agreement for the London Underground that was intended to provide financial backing for the Underground system until the late 2020s (Busetti, 2015). As Mr Livingstone had opposed such a deal, the GOL proposal also raised concerns from those favouring the PPP agreement. If elected as head of the GLA and TfL, Mr Livingstone would legally be able to negate the PPP agreement. Ultimately, that is what ensued: Mr Livingstone became mayor and blocked the government attempt to sign the PPP agreement without his approval.

The creation of a strong TfL also faced reluctance by local municipalities to give up part of their transport-related powers. London boroughs, even those mostly led by Labour councils since 1994, favoured creating an institution to co-ordinate transport policies only insofar as it would not have a large say over roads or transport-related central grants. This position was reflected by inter-municipal groups such as the Association of London Authorities and the London Boroughs Association. These groups, irrespective of political allegiance, were against an institution that would take away any of their prerogatives (Busetti, 2015). This stance initially got in the way of co-operation between the newly constituted TfL and the associations, which at the time controlled inter-borough transport co-ordination.

The Greater London Authority Act of 1999 legitimised the final arrangement for the organisation. While the GOL's vision was predominant in the final configuration of TfL, some legal concessions were made for the views of other agencies. Thus the GLA Act reflected a middle ground, incorporating the divergent views of the GOL and DETR, as well as the disagreements with the boroughs. The mayor's power over transport and other matters was counterbalanced by the creation of a London Assembly of 25 elected deputies, which had the power to overturn the mayor's transport strategy and budget by a two-thirds majority vote (Busetti, 2015).

Some responsibilities for transport were not included in the mayor's extensive capacities. For instance, while the mayor was given the power to direct the Strategic Rail Authority, the GLA did not have control over rail operations. What is more, in 2005 the rail authority was put under the guidance of the Department of Transport and the mayor was left with only the power to negotiate with franchise operators on rail service in their area of coverage (Burnham, 2006). At the same time, the central government served as a balancing element to the legal prerogatives of TfL through its extensive direct and indirect control over the mayor's actions; the GLA Act contains more than 250 mentions of the secretary of state's role in overseeing the GLA (Busetti, 2015). The government also maintained strong indirect control over TfL's policies through the funding of transport-related projects (Burnham, 2006). Thus, DETR's concerns over TfL were assuaged, although the TfL still had wide powers.

TfL was given competence over major London roads ("red routes"), which represent 5% of the total GLA road network but 30% of traffic (TfL, 2018). The mayor was empowered to set a transport strategy that the boroughs had to abide by. The New Labour government based TfL's transport responsibilities GOL green and white papers on the constitution of the GLA (Travers, 2004). The papers argued against fragmentation of transport responsibilities in the Greater London Area. Accordingly, Mr Blair's government disregarded the borough's demands on transport prerogatives. More importantly, TfL was charged with redistributing transport-related national grants instead of allowing municipalities to control the funds directly, which further limited the boroughs' margin for manoeuvre (Busetti, 2015).

Nevertheless, although the GLA Act gives the mayor a wide array of transport responsibilities, he or she must work with the boroughs to effectively deliver on transport policies. Mr Livingston started a trend by looking for co-operative programmes that could incorporate borough-level projects. Some of these programmes were part of existing inter-borough transport policy arrangements, such as the Taxicard programme: the mayor, lacking the power to take it over, enhanced funding on the existing programme rather than creating his own. Thus, pragmatic partnerships between the mayor and boroughs ameliorated political friction between them, for the long-term sustainability of TfL (Burnham, 2006).

TfL started operating in 2000 but did not officially obtain control of London Underground Ltd until 2003. Mr Blair's government, which had sought to finalise the PPP agreement for funding the Underground without TfL, thus bypassed opponents of the agreement, including Mr Livingston, and the PPP was finalised in 2002-03 (Harris, 2011). TfL was to be funded mainly by government contributions on a limited-contract basis. The short duration of the contracts between the government and the GLA served as an incentive for TfL to develop alternative sources of income. For instance, in 2003 the government allowed TfL to borrow investment funds through bond issues as part of a five-year investment programme that increased TfL's financial capacity. Similarly, when the Central London congestion charge was introduced in 2003, the mayor was given the power to collect the revenue for TfL (Burnham, 2006). These new funding sources contributed to TfL's financial sustainability as an MTA, and helped reduce disagreement between the mayor of London and the central government.

Barcelona: Reaching a two-institution arrangement

The situation found in Barcelona diverges from that in Paris and London, where the administrative boundaries of the capital areas – the Greater London Area and the Île-de-France region - sought to respond to the expansion of the capital city. Although Barcelona is the core of the Catalan economic activity and has considerable powers, the current borders of the Catalan region correspond more to historical demarcations of the territory than to an attempt to encompass the – much smaller - Barcelona metropolitan area. The regional government has significant political, financial and economic influence on the Barcelona area (OECD, 2010), as a result of the political structure Spain adopted after the Franco regime ended, with regions established as autonomous communities.

These two institutionally strong levels of government often have different interests and objectives regarding spatial and transport policies, making transport governance complicated in the Barcelona area. This situation was a key factor in reaching an arrangement in which two institutions share a high degree of competence over transport planning and co-ordination: the Autoritat del Transport Metropolità (ATM) is in charge of co-ordinating transport at the level of the Metropolitan Region of Barcelona, while the transport department of the Àrea Metropolitana de Barcelona (AMB) is in charge of transport, land use and the environment in a smaller territory comprising the city of Barcelona and 35 surrounding municipalities.

A solid start establishing an authority within a metropolitan government

The first institution in charge of co-ordinating transport for the ring of municipalities surrounding the city of Barcelona was established by the Franco government. Transport co-ordination was part of a wider metropolitan body, the Corporació Metropolitana de Barcelona (CMB) which governed the city of Barcelona and 25 adjacent municipalities. The CMB had a wide array of responsibilities, including development of urban planning strategies and co-ordination of public service and transport infrastructure provision.

The CMB was made up of the Metropolitan Council, the Metropolitan Administrative Commission and the Metropolitan Management Board. The council was chosen by representatives of the municipalities and included six representatives of the government of the Province of Barcelona (*Diputación Provincial*). The commission included two representatives from the Barcelona City Hall, along with three representatives chosen by the remaining municipalities in the metropolitan area and one from Barcelona province.[6] The management board was designated by the minister for the Catalan government. Transport and water management were the CMB's top priorities according to decree-law 5/1974.

The CMB was established to ensure that national policy was followed locally. Initially it was seen as a way for the national government to keep municipal powers, especially those of the city of Barcelona, in check. With democratisation, the CMB gradually became an ally to the city of Barcelona (Busetti, 2015).

Shifting to an institution with limited capacity

Political tensions between the region of Catalonia and the city of Barcelona led to important institutional changes, which triggered the abolition of the CMB in 1987 (Busetti, 2015). It was replaced by three sectoral inter-municipal authorities, each covering a different area:

1. Mancomunitat de Municipis de l'Àrea Metropolitana de Barcelona (MMAMB), a planning authority covering 31 municipalities.

2. Entitat Metropolitana del Transport (EMT), a transport authority covering 18 municipalities.

3. Entitat del Medi Ambient (EMA), an environmental authority in charge of the water network and waste treatment, covering 33 municipalities (OECD, 2015).

At the metropolitan scale, from 1987 to 2010, the urban transport system in Barcelona and 17 surrounding municipalities was managed by EMT, established to co-ordinate local transport services. EMT directly ran the network through two publicly owned companies: Ferrocarril Metropolità de Barcelona S.A. (FMB), responsible for the metro service, and Transport de Barcelona S.A. for bus. However, EMT had limited capacities in terms of planning and funding. Any planning responsibilities were left to the municipalities, which were responsible for elaboration of their own infrastructure, mobility and service planning, ultimately leading to fragmented spatial planning (Busetti, 2015). EMT had little fiscal autonomy and was heavily dependent on contributions from the central and regional governments. In particular, reluctance of the regional government to provide funds for the metropolitan transport system (due to opposing political orientation) led to increasing deficits for Transports Metropolitans de Barcelona (TMB), the publicly owned holding company operating public transport in Barcelona. Furthermore, EMT's area of coverage was limited to the city of Barcelona and adjacent municipalities, while the urban agglomeration with its relevant transport networks extended across a wider territory.

The governance of transport systems within the urban agglomeration of Barcelona was hindered by the presence of two opposing levels of government: the Catalonia region and the city of Barcelona. The region had a significant influence over the capital's transport systems due to its legislative and executive powers, as well as through its rail network, which partly serves the metropolitan area. The metro system in Barcelona, despite being managed by FMB, a public-sector company belonging to EMT, fell under legal responsibility of the regional government. Overlapping responsibilities over different transport modes across the Barcelona metropolitan area went hand in hand with highly fragmented spatial planning practices in creating inconsistences in public transport delivery. Consequently, public transport became less competitive for travellers than cars, exacerbating congestion and pollution.

Institutional fragmentation resulted in a mixed picture for integration and harmonisation of fares. The metro and regional railways used integrated tickets, even though the services were operated by different providers: Ferrocarrils de la Generalitat (FGC), belonging to the region, and FMB, belonging to EMT. In contrast, the bus and metro services were both owned by EMT but did not use integrated tickets, since the metro services were the legal responsibility of the region, while bus services were the responsibility of EMT. As a result, commuters using the bus and switching to the metro could not use a single ticket (Busetti, 2015).

Lack of co-operation between the region and EMT also hampered effective and co-ordinated use of national funding for transport in the region. For instance, the regional government negotiated with the central government to obtain funds for its own railway system, FGC, which partly served the metropolitan area of Barcelona. Meanwhile, EMT negotiated funds for its own metropolitan metro and bus services. As a result, all funds were directed to the same metropolitan area yet there was no effective co-ordination of national investment (Busetti, 2015).

Creating an authority for the larger Metropolitan Region of Barcelona

Recognition of the need for co-ordination of transport links for a region extending beyond the urban core of Barcelona became a starting point for negotiations to set up an MTA at this scale. However, conflicting views of two major stakeholders, the region of Catalonia and EMT, hindered the process for creating the new co-ordinating authority. Both actors had a marked interest and related responsibilities regarding transport policies in the Barcelona commuting area. Yet their views regarding the future governing structure and types of investment that should be made differed because of their conflicting political orientation, as well as their individual control over different transport modes. As the region controlled the tram system in the metropolitan area, it showed particular interest in investment which targeted this mode, while the city of Barcelona favoured investment in the bus and metro systems, which were controlled by EMT (Busetti, 2015). Hence, it was quite difficult to align the interests of the region and the city of Barcelona in terms of how to fund a new MTA and what prerogatives to give it.

Furthermore, the creation of a new MTA had different and quite opposing political connotations for the two actors. The city of Barcelona, controlled at the time by the Socialist Party of Catalonia, saw in such an institution a way to enhance its responsibilities and autonomy vis-à-vis the region. In a way this was even envisaged as a possibility for regaining a structure similar to the CMB; rebuilding the CMB, dismantled in 1987 by the rightist Convergència i Unió party, was one of the Socialists' political demands. Contrarily, the Convergència-controlled region saw a new MTA as a potential threat to its responsibilities and opposed the possibility of creating a body similar to CMB (Busetti, 2015).

To a great extent, ATM as an institution owes its creation to an explicit effort of the national government to facilitate negotiations by introducing financial incentives. The national administration had a direct interest in the establishment of an MTA, as that would ease transport funding for the territory of

metropolitan Barcelona by allowing the government to negotiate with one actor instead of a wide array of stakeholders. Therefore, the government gave an initial symbolic financial contribution for setting up the organisation, and informally emphasised that the city of Barcelona had to belong to ATM in order to obtain grants for transport projects. It was this pressure, at a time when transport funding needs were particularly high due to the large deficits run by the municipal companies, that permitted the negotiations and resulting agreements between the Catalonia region and municipalities in the Metropolitan Area of Barcelona (Busetti, 2015).

At the same time, the 1995 municipal elections generated the right framework for reaching common understanding between opposing political parties to discuss the creation of an MTA. Indeed, transport-related negative externalities, such as congestion and ineffective service provision, were among the main issues discussed in the electoral campaign. When, in the context of the elections, all parties running agreed on a set of priority subjects for the city, a partisan agreement emerged in Catalonia on the need to have a consortium-based collaboration on the organisation of a public transport system for the Metropolitan Region of Barcelona (Busetti, 2015).

The agreed institutional setup was one that fitted both the region and city of Barcelona, as well as EMT. ATM was established as a platformme for voluntary collaboration, superimposed on existing institutional arrangements. In this way, the city of Barcelona, through EMT, kept its responsibilities over transport in Barcelona and adjacent municipalities vis-à-vis both the region and the new MTA (Busetti, 2015). While this situation created a less than ideal overlap of responsibilities between ATM and EMT, it was a necessary compromise that was required to set up the metropolitan-region institution. At the same time, the setup suited the interests of the region, which was now a major stakeholder in transport governance for the wider commuting area of Barcelona through its representation on the ATM board.

Moreover, the board was balanced through the indirect presence of the national government. Because of its crucial role in the negotiations that led to ATM, as well as its financial contributions to the institution, the government decided to have an observatory role on ATM's board, which enabled it to ensure the correct functioning of the MTA at a distance by knowing the inner workings of the institution and serving as a negotiating and middle-ground actor when needed (Busetti, 2015). Negotiations were formalised with the signature of a framework agreement in 1996 and a formal agreement to set up ATM in 1997.

Since then, ATM has considerably enlarged its responsibilities and widened its territory. Thus, in 2002, the ATM board approved the inclusion of the Associació de municipis per la Mobilitat i el Transport Urbà (AMTU), which added 54 municipalities under the ATM label. In terms of territory, since 2003 ATM has been defined as an authority covering the Metropolitan Region of Barcelona, a territory designated as a planning unit for urban development (164 municipalities in total). Furthermore, an integrated fare system (IFS) was established in 2001, and ATM became responsible for the organisation of fares for a territory which extends beyond the metropolitan region – the IFS now covers 346 municipalities. This is due to historical realities of transport networks, where regional railways reach municipalities that are outside of the metropolitan region. The IFS area is not under any specific planning instrument and is constantly expanding as more municipalities outside the region are willing to benefit from the IFS (Lloveras, forthcoming).

In 2003, ATM also widened its planning capacity after the government of Catalonia approved the Mobility Law of 2003, which entrusted ATM as a regional mobility authority with the new task of drawing up a Mobility Master Plan (PDM) for the Metropolitan Region.

Creating AMB that co-exists with ATM

Since the abolition of the CMB, the Barcelona urban area had sought to re-establish a single metropolitan institution with the capacity to command a full array of responsibilities and resources over the city of Barcelona and adjacent municipalities. Law 31/2010 of the Parliament of Catalonia brought together the three executive bodies responsible for environment (EMA), urban planning (MMAMB) and transport (EMT) to establish the Àrea Metropolitana de Barcelona (AMB). AMB is a territorial entity composed of the city of Barcelona and 35 surrounding municipalities, mostly immediately contiguous. It has responsibilities for the environment, economic development, transport and urban planning in its area of influence (Vallbé et al., 2015).

The current transport department of AMB evolved from EMT, but has a wider range of capacities. The AMB transport department, like EMT before it, performs direct and indirect management of public transport in the metropolitan area through direct management of the public operator, TMB. It also grants concessions for bus services operating within the metropolitan area. In addition, AMB is responsible for planning the bus services within the metropolitan area, and for the development of the Metropolitan Plan for Urban Mobility, which has to comply with the wider ATM Mobility Master Plan. Furthermore, following directives put forward in Mobility Law 9/2003 of Catalonia, AMB is in charge of implementing measures to encourage sustainable mobility. AMB's characteristics, among which are wide transport prerogatives, the capacity to carry out strategic level planning for mobility, and a technical staff, make it is possible to treat this organisation as a second-level MTA, one which is specifically tailored for AMB and which co-exists and co-ordinates with ATM (the MTA in charge of the wider metropolitan region).

Notes

[1] Only on part of the road network. *Départements* and the State also have competency over part of these networks.

[2] This increase of regulatory capacities took place not long before the transformation of STP into STIF, with the incorporation in the organisation of the Île-de-France region.

[3] In 1976, when the Île-de-France region was created, the Paris prefect became prefect of the region as well.

[4] Outside Île-de-France, such plans appeared in 1982 and became obligatory for metropolitan areas of more than 100 000 inhabitants in 1996.

[5] Interview with Île-de-France Mobilités.

[6] Barcelona province is one of the four provinces making up the Autonomous Community of Catalonia. Administratively speaking, under the Constitution of 1978, Spain is divided into municipalities, provinces and autonomous communities.

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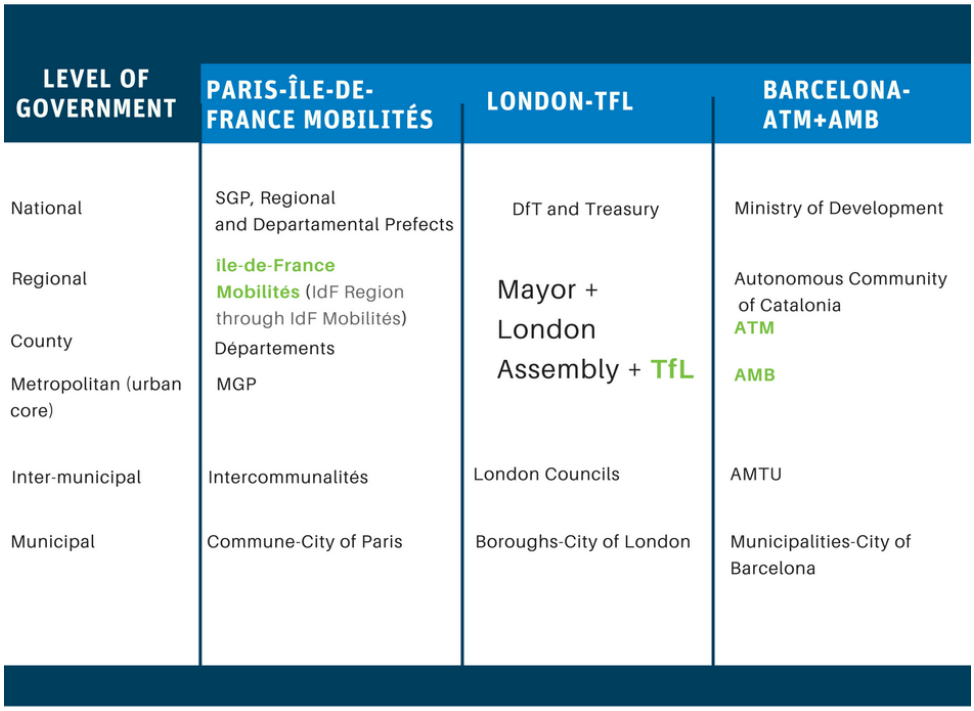
Chapter 3. The MTAs and the wider governance framework

Overall, the MTAs in Paris, London and Barcelona respond to a common goal, which is improving transport co-ordination across administrative boundaries in their city areas. Yet the specific function that each one of them has in the wider transport governance framework is significantly different. The objective of this chapter is to provide a better understanding of the role that each of these authorities plays by exploring a) their place in the wider institutional structure; b) the governance structure and decision-making process inside the MTAs; c) the way in which responsibilities over specific areas of transport policy are split between these MTA and other relevant institutions; and d) their geographical coverage and thus their function in co-ordinating transport at different territorial scales.

The MTAs in the broader institutional configuration

The role played by each of the MTAs is highly dependent on the overall institutional structure in which they are embedded and their position relative to other actors that are relevant to transport governance in each of the studied contexts. Figure 3.1 shows the place of Ile-de-France Mobilités, TfL, ATM and AMB in the overall administrative structure governing transport in the Paris, London and Barcelona areas.

Figure 3.1. **Position of the MTAs in the wider institutional structure in charge of transport governance**



Important differences in terms of the government level at which the MTAs exist, and the number of administrative layers involved in transport governance, can be highlighted. For instance, Île-de-France Mobilités in Paris is a body at the regional level, which interacts with five other levels of government that are involved, in one way or another, in transport governance in Île-de-France. At the same time, the

Île-de-France regional government participates in transport governance by having the leading role on the Île-de-France Mobilités' board.

In the case of London, TfL interacts with only three other governmental levels: institutions from the national government, an inter-borough association (London Councils) and the boroughs themselves. This simpler administrative arrangement is explained to a great extent by the fact that the GLA (the government body over TfL) is both a regional and a metropolitan-level authority. Both the mayor and the London Assembly hold an important role for transport along with TfL at this level.

Finally, in the case of Barcelona, ATM covers the Metropolitan Region of Barcelona, which is one of the planning units established by the Autonomous Community of Catalonia. Therefore, unlike Ile-de-France Mobilités and TfL, ATM is at a different administrative level than the Catalonia region. It interacts with five other levels, including the Catalonia region and AMB, which is the formal body at metropolitan level and which co-ordinates transport for Barcelona's urban area (the city of Barcelona and 35 adjacent municipalities).

The rest of this section provides an overview of all the actors involved in transport governance in each city area and explains the governance framework and decision-making process of the MTAs. The next section describes in more detail the division of responsibilities, regarding specific transport policy areas, between the MTAs and these different actors.

Île-de-France Mobilités and transport governance in the Île-de-France region

Six levels of government are directly or indirectly involved in transport governance in Île-de-France. Thus, even if Île-de-France Mobilités is the leading entity in charge of transport, final decisions and outcomes are also influenced by a multiplicity of other actors (Table 3.1).

Table 3.1. **Institutions and levels of government involved in transport in Île-de-France**

Level of administration	Institutions involved in transport
National	Société du Grand Paris (SGP): government-led society for the construction of the Grand Paris Express project Prefect of each *département*, supported by the Direction for Infrastructure and Planning (DRIEA)
Regional	Île-de-France Mobilités has a direct role; the executive of the Île-de-France region, who chairs Île-de-France Mobilités, carries out an indirect role
Départemental	*Départements*
Metropolitan	MGP has only indirect transport responsibilities
Inter-municipal	EPCIs hold different transport responsibilities depending on their status. Those in the MGP territory were arranged into 11 EPTs, each with the transport responsibilities the previous EPCI in the territory had before.
Municipal	*Commune* (and the city of Paris)

National level

The government stepped down from its major role in transport governance in the Île-de-France region in 2004, when the chair of STIF (now Île-de-France Mobilités) was transferred to the president of the region. Nonetheless, the French government is still present in the transport governance of the

country's capital region by detaining control over the two main transport operators in the area: SNCF and RATP.

Moreover, the government's presence in transport in the capital has increased considerably since 2007, when then-President Nicolas Sarkozy promoted the creation of the Great Paris Express, a project combining metro and rail lines to enhance transport in the capital. This project was not, however, given to Île-de-France Mobilités to manage, and the government decided to create the Greater Paris Society (SGP) as a state-led enterprise to manage the building of the project. SGP is led by an executive board, selected and overseen by a surveillance committee formed by representatives of local authorities and the government. At least half the members of the committee are assigned by the government (law 2010-597 of 3 June 2010 concerning Greater Paris).

Additionally, the national government has a role in transport governance through its local representatives: the Île-de-France *Préfet* and the *Préfets* of the seven *départements* in the region. The Île-de-France *Préfet* is assisted in his or her functions by the regional and inter-departmental Direction for Infrastructure and Planning (DRIEA), which gathers technical and legal transport-related expertise for transport projects in Île-de-France (DRIEA, 2018).

Regional level

Île-de-France Mobilités is the MTA for the whole Île-de-France region. In this sense, the body acts as the Organising Mobility Authority (AOM) for Île-de-France. The status of AOM was granted to Île-de-France Mobilités by the NOTRe law of 2015. The law gives Île-de-France Mobilités a wide-array of transport planning, strategic and managing functions (as will be explored later) but also allows it to delegate part or all of its responsibilities over most of its domains – barring tariff – to AOPs, the authorities organising neighbourhood transport. The region's role in transport governance is indirect, through participation in Île-de-France Mobilités, yet prominent, since its president chairs Île-de-France Mobilités' board and it holds a large number of seats (see next section).

Departmental level

The *département* is the administrative division between the region and the municipality. In the Île-de-France region there are seven *départements*: Seine-et-Marne, Yvelines, Essonne, Hauts-de-Seine, Seine-Saint-Denis, Val-de-Marne and Val-d'Oise; all are represented on the Île-de-France Mobilités' board, and so is Paris, which has the status of a *département* and a municipality. Departments have progressively lost their transport relevance in the region. Indeed, the NOTRe law transferred most of their transport-related responsibilities to regions.

Metropolitan (urban) level

The MAPTAM law of 2014 created the Métropole du Grand Paris as a special EPCI. The MGP belongs to a particular group of EPCIs that, as explained below (see Inter-municipal level), can raise their own taxes. The MAPTAM law also set up a commission that would decide upon the new administrative division of the MGP's area. The commission's report and related analysis resulted in the delimitation of the MGP territory as including the city of Paris, the three *départements* of the *petite couronne* and additional municipalities of the *grande couronne*. Thus, the MGP comprises Paris plus 131 other municipalities. At the same time, the MGP territory was divided into 11 EPTs.

The MGP's main responsibilities are related to economic, social and cultural development and planning; protection and promotion of the environment; and metropolitan planning and the approval of local urban plans and housing policies. The MGP was not assigned direct transport responsibilities.

However, it will have an indirect role in transport governance: for instance, local urban plans can include roads, parking and cycling specifications.

Inter-municipal level

EPCIs are groupings of municipalities that gather together and deliver a particular public service. In each *département*, a *département*-wide projection of inter-communal cooperation is created by the *Préfet* and approved after consultations with the *département* and municipal councils. This projection divides the territory into different EPCIs of at least 15 000 inhabitants each, regrouping the municipalities that conform it. EPCIs can be divided into six main types, grouped into two categories: those that hold direct control over taxation and those that do not. The capacity of EPCIs to raise taxes, as well as the specific areas and types of taxes that are transferred from the municipal level to EPCIs, is defined in the constitutive text of each individual EPCI as the result of the agreement between the municipalities that constitute this body. The same constitutive text limits EPCIs' capacities to fields, and under criteria, defined by the participating municipalities when the institutions are created. EPCIs have obligatory capacities which vary with the type of EPCI. These do not include direct transport-related actions. Therefore, all transport capacities of an EPCI are optional, and result from the will of the member communities to develop a particular transport policy along with its neighbouring authorities. Because of their limited responsibilities, EPCIs are not considered public authorities (*collectivités territoriales*).

In Île-de-France, three main types of EPCI exist: The Communautés Urbaines (CU), the Communautés d'Agglomération (CA) and the Communautés de Communes (CC) (APUR, 2017). CU are competent in matters related to the creation or planning and maintenance of roads, to signalling and to parking spaces. CA can opt to have control over the creation or planning and maintenance of roads and parking spaces. CC can optionally, following the agreement of their member municipalities, assume responsibilities over road creation, planning and/or maintenance (French Government, 2018b).

As previously mentioned, the MGP is also divided into 11 EPTs. EPTs, like the MGP as a whole, are aggregates of municipalities that organise public services at territorial level. EPTs take the form of EPCIs with tax-collecting responsibilities (as a later section will explore). They have five obligatory responsibilities, none of which concern directly transport: city policy (*politique de la ville*); the creation of a Local Urban Master Plan (PLUi) and a Climate, Air and Energy Plan; and water, wastewater and waste management (MGP, 2018). Thus, transport capacities of EPT's are the product of voluntary and optional transfers of prerogatives from the participating municipalities. What is more, member municipalities of an EPCI within the MGP can agree to transform it into an EPT. If such an EPCI had transport responsibilities, the new EPT can exercise the same capacities.

Municipal level

This is the lowest relevant level of administrative division. The region has 1 295 municipalities and districts.[1] The city of Paris is a special case, since it is both a municipality and a *département*. The mayor of Paris has the power of the head of a *département*, and thus more power than any other mayor in the country. Law 2017-257 of 28 February 2017 on the status of Paris and metropolitan planning changes the capital's legal status: from 1 January 2019, Ville de Paris will be a special status, replacing the municipality and *département* of Paris. This will have some repercussions for transport-related policies; e.g. the mayor will have direct power over road safety.

TfL and transport governance in Greater London

As part of the Greater London Authority, TfL is the central actor in transport in Greater London. Three other government levels, however, have a say in one way or another over transport matters in the area (Table 3.2).

Table 3.2. **Institutions and levels of government involved in transport in Greater London**

Level of administration	Institutions involved in transport
National	Department for Transport (with the help of bodies such as Network Rail and the Office of Rail and Road) and the Treasury (supported by institutions such as the National Infrastructure Commission and the Infrastructure and Project Authority).
Regional/Metropolitan	GLA, composed of the mayor of London and the London Assembly. TfL is at the heart of this institution, as the mayor's executive for transport.
Inter-municipal	London Councils
Municipal	32 boroughs and the City of London

National level

Although TfL, as the transport department of GLA, is the leading transport actor in Greater London, the UK government has an important role through its strategic influence, its funding participation and its presence as a transport manager and operator for part of the public transport system.

The Department for Transport (DfT) and the Treasury are the leading government institutions that participate in transport governance in London. DfT has a number of institutions that support its duties. In terms of railways planning and operations DfT is supported by Network Rail and the Office of Rail and Road. Similarly, the Treasury is assisted in its duties by two main bodies: the National Infrastructure Commission (NIC) and the Infrastructure and Projects Authority (IPA) (Box 3.1). The first is charged with developing a long-term vision for transport strategies in the country. The second collaborates in setting up a comprehensive plan for effective transport project delivery.

Box 3.1. **NIC at the heart of the government's transport infrastructure vision**

The National Infrastructure Commission is an executive agency public body responsible for articulating a long-term vision for infrastructure of national interest (IPA, 2017) by providing expert advice and recommendations on economic infrastructure (Treasury, 2017). To this end, the institution develops the National Infrastructure Assessment (NIA), to "analyse the UK's long-term economic infrastructure needs, outline a strategic vision over the next 30 years and set out recommendations for how identified needs should be met" (IfG, 2017), as well as specific subject reports, commissioned by the government. For both documents, the government issues responses to NIC's recommendations and sets a plan to comply with them. Furthermore, NIC produces annual monitoring reports to assess the government's progress in the accomplishment of its recommendations. The first two types of NIC-produced documents have had a particular influence on London's transport planning. Indeed, the last NIA insisted on the need for – and recommended the government fund participation in – new transport infrastructure in London, linked to projects such as Crosslink and the proposal of Crosslink 2. Similarly, NIC has dedicated several special reports to transport in London.

Source: ITF, based on Infrastructure and Projects Authority (IPA) (2017),; UK Treasury (2017).

Regional and metropolitan (urban) level

GLA has responsibility over strategic planning and transport as well as over investment, economic development, policing and overseeing of emergency services. TfL, the London Fire and Emergency Planning Authority, the London Legacy Development Corporation[2] and the Metropolitan Police Authority are functional bodies responsible for delivery of respective services in the capital area, Greater London (London, 2018).

GLA consists of the mayor's office and the London Assembly. Ultimately, the main political and executive power within GLA lies with the directly elected mayor. In turn, London Assembly provides democratic checks and balances on the way the mayor's office executes its functions. The mayor is responsible for elaborating a vision for London, which is translated through the London Plan, a strategic planning document setting out an economic, environmental, transport and social framework for the development of the capital. The Mayor's Transport Strategy (MTS) is at the heart of this framework (see more on the strategic planning framework in Chapter 4). Furthermore, the mayor chairs the TfL board, appoints its members and drafts the TfL budget.

The London Assembly acts as a counterbalance to the mayor. Its members (25, in general) are elected at the same time as the mayor for a four-year term. Eleven of them represent London as a whole, while the remaining 14 are constituency deputies. The latter represent the inhabitants of individual constituencies formed by aggregating the 32 boroughs and the City of London into 14 larger territories. The objective is to represent the interests of all territories in Greater London while keeping the number of deputies manageable. As a point of reference, for national elections Greater London is split into more than 70 electoral constituencies (LCA, 2014). The deputies hold the mayor accountable on transport by evaluating and commenting on the MTS and other policies promoted through his vision. Through a two-thirds majority voting procedure, the assembly can vote down the mayor's budget proposal.

As one of the four functional bodies of GLA, TfL acts as the MTA for the area. As the main executive body for the enactment of the MTS, the authority has three main areas of focus: surface transport, underground transport and Crossrail (TfL, 2018b). The GLA Act 1999 gives TfL a wide array of transport-related capacities. At the same time, its functions need to be implemented through subsidiaries. To this end, TfL has three main companies. The key one is Transport Trading Ltd, a holding corporation for 26 other subsidiaries. Every agency is controlled by a director, who responds directly to

the mayor but has considerable autonomy. TfL's day-to-day operations are followed and co-ordinated by the Commissioner of Transport for London, designated by the mayor.

Inter-municipal level

London Councils is an institution that represents the interests of the 32 London boroughs along with that of the City of London, as well as the London Fire and Emergency Planning Authority and the Mayor's Office of Policing and Crime[3] (LC, 2018b). Its main objective is to serve as a lobbying and advising organisation for urban policies (including transport). By way of illustration, London Councils is lobbying to ensure that the rate at which the mayoral Community Infrastructure Levy (CIL) is set, as one of Crossrail's funding sources (see more detail in Chapter 3), does not undermine the viability of developments or the ability of borough's own CILs to raise the necessary infrastructure funding. Furthermore, TfL can charge London Councils with the implementation of certain transport policies and programmes in Greater London.

Municipal level

The Greater London area is divided into 32 boroughs and the City of London, which, administratively speaking, is treated like the other boroughs. The territorial division within GLA has remained practically the same since the 1963 London Government Act, which established the boroughs as the main local authorities.

ATM, AMB and transport governance in the Metropolitan Region of Barcelona

Table. 3.3. **Institutions and levels of government involved in transport in the Metropolitan Region of Barcelona**

Level of administration	Institutions involved in transport
National	Ministry of Development, supported by the General Directorate for Land Transport. They are advised by the National Council for Land Transport and the Council for Public Works. Ministry of Interior, through the General Directorate of Transit.
Regional	Autonomous Community of Catalonia, let by the Generalitat and its Department of Land and Sustainability.
Departmental	*Diputació**
Planning unit	Regió Metropolitana de Barcelona, level of action of ATM
Metropolitan	AMB
Inter-municipal	Comarcas, AMTU
Municipal	Municipalities, including the special municipality of Barcelona

*The *Diputació* is the Spanish equivalent of the county level. Transport-wise, it mainly holds the ownership of part of the local (inter-municipal) road network in Catalonia.

In the case of the Metropolitan Region of Barcelona, both ATM and AMB have very relevant roles. Still, they share transport governance with entities from four other levels of government (Table 2.3).

National level

The Spanish Constitution (Art. 149, 1, xxi) grants the central government exclusive control over railways, land transport and motor vehicle traffic passing through the territory of more than one autonomous community. The transport prerogatives of the central government are assigned to the Ministry of Development, which delegates road transport-related functions to the General Directorate for Land Transport. In addition, the National Council for Land Transport and the Council for Public Works serve as advisory institutions for the Ministry of Development. The ministry is also responsible for Renfe, the main rail operator in Spain, as well as for the Rail Infrastructure Administrator (ADIF), the owner and main manager of rail infrastructure. Renfe is the owner of Rodalies de Catalunya, the main rail operator in the Metropolitan Region of Barcelona. The Ministry of Interior is partially responsible for the national road safety strategy through the General Directorate of Transit (DGT).

Regional level and Metropolitan Region of Barcelona

At the regional level, the Generalitat governs the Autonomous Community of Catalonia. It is the public authority responsible for all rail and road transport services with an itinerary entirely inside the territorial limits of Catalonia. The Department of Land and Sustainability is the main body in the Generalitat in charge of transport and mobility policies. The autonomous community owns the FGC, an important suburban rail operator in the region directly managed by a public operator. Furthermore, the Generalitat owns the Barcelona Metro infrastructure.

The Generalitat defines the transport planning demarcations in its territory. The Metropolitan Region of Barcelona is one such demarcation, bringing together 164 municipalities under a single planning unit. ATM, the MTA for the region, is a level below the Generalitat, rather than an entity situated at the same level as in the case of Île-de-France Mobilités and the Île-de-France regional government. Nonetheless, the Metropolitan Region is not a governing entity. ATM is a consortium owned by the Generalitat de Catalunya (51%) and local governments (49%), namely the Barcelona City Council, AMB and AMTU.

Metropolitan (urban) level

The metropolitan level corresponds to the Department of Transport of AMB, which acts as the MTA within the Metropolitan Area of Barcelona (the city of Barcelona and 35 surrounding municipalities). AMB was created as a public administration for the metropolitan area by law 31/2010, issued by the Parliament of Catalonia in July 2010. The institution was conceived with the aim of improving the co-ordination and delivery of water and waste-related services. It also incorporated transport-related prerogatives, inheriting those of EMT. Overall, AMB's activities are split in nine main areas: public space, environment, environmental education, housing, waste, transport and mobility, water, cartography and policy research laboratory. Every municipality that is in AMB's area of coverage has a department that corresponds to each of its areas of action. In this way, each thematic department in AMB is directly connected to, and acts in co-ordination with, a related department in every member municipality. This structure has facilitated the creation of planning instruments related to mobility, housing, territorial planning, the environment and sustainability that are aligned between the municipal and metropolitan levels. AMTU gathers the subsidies from ATM that are assigned to fund the urban public transport for AMTU member municipalities.

Inter-municipal level

The municipalities in Catalonia have the capacity to join, through mutual agreement, in groups of local authorities that help them solve a common need. The first form of such agreements is the *comarca*,

an inter-municipal body with its own legal personality, formed for the management of local prerogatives and services. Another form of agreement is the association, such as the AMTU, whose main objective is providing its members with technical support in matters related to mobility, infrastructure and public transport (AMTU, 2018). It brings together 91 municipalities and two *comarcas*, all part of the region but outside the 36 municipalities that are part of AMB. AMTU gathers subsidies from the ATM that correspond to funding the urban public transport for its members.

Municipal level

The municipality is the basic local authority in Catalonia's territorial organisation. The 164 municipalities in the region are each led by a mayor and a council. Only municipalities of more than 50 000 people are in charge of delivering municipal public transport services. The Barcelona municipality has its own status as a special municipality because of its historical and political weight in Catalonia. Transport-wise, this status allows the city to participate in the management of government infrastructure that has an impact on its territory, such as national railway infrastructure (law 1/2006 of 13 March 2006 regulating the special regime of the municipality of Barcelona, Art. 6.1).

Governance structure and decision making within the MTAs

While different in form, the MTAs have governing structure and rules for making decisions that have allowed the development of a co-ordinated and strategic vision for transport in the three city areas. The decision-making process is designed to bring multiple views together in a final strategy. This approach has allowed the MTAs to carry out an important role in striking a better balance between the decentralisation of transport powers and the creation of the unified vision that is needed to attain wider social, economic and environmental policy objectives for the urban areas. In addition, this configuration has helped improve co-ordination between the range of subnational actors and the national government.

Île-de-France Mobilités

Île-de-France Mobilités is institutionally led by a board of 29 members, who represent the most relevant actors in the Île-de-France region in terms of transport governance. The board is chaired by the president of the regional council. Île-de-France Mobilités's board members are:

- 14 representatives of the Île-de-France region (apart from its president)
- 1 representative of the chamber of commerce of the region
- 5 representatives of the city of Paris
- 1 representative for each of the 7 departments in the area
- 1 representative of the EPCIs in Île-de-France
- 1 or 2 consultative representatives from the Committee of Partners of Public Transport in Île-de-France (CPTP).

CPTP gathers representatives from various sectors of society in Île-de-France. For instance, it brings together labour and business associations, users and consumer associations and representatives from the public authorities and institutions participating in the funding of transport services in Île-de-France. The

committee has a consultative function on matters related to the offer and quality of transport services, as well as tariff setting and planning policies.

Furthermore, four political commissions respond to the Île-de-France Mobilités' board in matters related to investments, economic and fare policy, transport offer and quality of service, and accessibility and users relations respectively. These commissions examine the decisions to be taking by the board and emit their opinions on them. Any course of action they don't agree with has to be changed or suppressed. All decisions taken by the board have passed successfully the commission's stage. (Île-de-France Mobilités, 2018a).

Most decisions of Île-de-France Mobilités' board are taken by simple majority voting. This procedure ensures that the region has control over most decisions issued by institution. In 2006, after the board leadership passed from the national government to Île-de-France's president, a clause had to be agreed upon by all actors to assure local authorities on the board that the region would not impose its policies on the area. With this aim, a transition period was set, between 2006 and 2013, in which representatives from the *départements* had the right to ask for a second deliberation on issues that were related to an increase in spending, even when this had been approved by simple majority voting. The request of at least one representative from a local authority on the board was enough for the second deliberation on the subject to be necessary. For this demand to be valid, however, the request needed to be backed up by a two-thirds majority vote in the local assembly of the *département* concerned. This was taken as confirmation that the issue at hand went against the interest of the citizens in the affected local authority. A two-thirds majority was also needed for the approval of the point in the second deliberation (ordinance 59-151 of 7 January 1959 on the organisation of passenger transport in Île-de-France).

TfL

TfL's board, its main executive body, is composed of no fewer than eight and no more than 17 members. All of them are selected by the mayor, and one of them must be the chair. The mayor can (and currently does) chair the board and assigns the remaining members to their positions. The board members need to have particular expertise that allows them to contribute to the proper development of TfL's duties.

TfL's Standing Orders require the mayor to ensure that at least two board members can represent the interests of people who live outside Greater London and are served by rail. The transport commissioner, the general counsel and the chief financial officer of TfL, all appointed by the mayor, may attend board meetings in order to provide advice (TfL, 2018d).

The board is responsible for general strategic issues and policies, as well as for approving matters such as the TfL budget, annual report, business plan and statement of accounts. The board meets about every two months to decide on strategic matters and monitor TfL's performance. Any member may place items on the agenda, with agreement of the commissioner in consultation with the chair. When it comes to voting, matters are decided on a simple majority basis (TfL, 2018d). Nonetheless, should the board vote down certain proposals, the mayor can issue an executive order for TfL to implement it (Busetti, 2015).

The transport commissioner reports to the board and is in charge of TfL's day-to-day operational aspects. To this end, the commissioner leads a management team formed by chief officers with individual functional responsibilities (TfL, 2018d). Chief Officers are designated by the board, as permitted by the GLA Act 1999 (TfL, 2017c). Moreover, chief officers lead the 11 main operational areas that constitute the inner institutional framework of TfL. Four of these areas are dedicated to administrative activities, while the following seven are those dedicated to technical and strategic issues:

- Surface transport
- London Underground
- Customers, communication & technology
- Crossrail 2
- Commercial development
- Planning
- Walking & Cycling Commission

The chief officers have relevant autonomy, reporting only to the transport commissioner. The same applies to the subsidiaries' directors, who also respond to the commissioner and manage their respective companies.

ATM and AMB

ATM as a consortium has three main bodies: board of directors, executive committee and Mobility Council. The board is the governing body of ATM and has 18 members:

- Nine represent the Autonomous Community of Catalonia. One of these is the deputy for public works of the Generalitat, who chairs the board.
- Seven represent Barcelona city hall and AMB. Of these, the mayor of Barcelona or a person he or she designates serves as first vice president of ATM, while the president of AMB or a chosen representative acts as second vice president.
- Two representatives from the inter-municipal association AMTU.

In addition, two observers with the right to speak but no vote are appointed by the Spanish government.

The board is ruled by majority voting. However, for major interventions, such as the approval of new territorial planning, revision of fares and funding mechanisms, budget approval, appointment of the ATM general director, admission of new administrations into the authority and any intervention requiring expenditure over EUR 2 million, a two-thirds qualified majority is required.

The executive committee is responsible for examining and bringing proposals to the board. Proposals brought by the committee are linked, among other issues, to planning for the public transport system, to financial agreements and service contracts with operators and managers, to tariffs and to the organisation's annual budget (ATM, 2018a). The executive committee has six members: three from the Generalitat, two from local governments and one from AMTU (which groups municipalities outside the metropolitan core but within the region; see description below).

The ATM Mobility Council was established in 2005. Territorial mobility councils were created by the 13 June 2003 Mobility Act of the Catalonia region, which defined them as "entities of consultation and participation of the different actors representatives of the citizens and of the various institutions linked to mobility" (Spanish Government, 2003). The council membership represents various sectors of Barcelona civil society, such as enterprise organisations, unions, consumer associations and citizen-led associations.

AMB incorporates various bodies. First, the Metropolitan Council is the main body making decisions in AMB. It gathers 90 representatives from the 36 member municipalities, including all of their mayors and other chosen councillors (the number is determined proportionally, relative to the municipalities' total inhabitants). The president of AMB is the mayor of Barcelona.

The Metropolitan Council and presidency are aided in their duties by a governing board composed of councillors named by the presidency and proposed to it by the council. The current 13 councillors meet at least twice a month and facilitate decision making by exercising the responsibilities delegated to the board by the presidency and the council. Other bodies in the institution also participate in guaranteeing its operations. For instance, the Assembly of Mayors, made up of the 36 mayors of the represented municipalities, can issue opinions upon particular topics, as well as proposing to the council a new person for the presidency of AMB. Additional bodies of AMB aid, for example, in wider matters such as financial management and ensuring the legality of procedures (AMB, 2018).

Scope of competence over transport policy areas in relation to other actors

This section analyses the nature and scope of responsibilities assigned to MTAs over different policy areas. Responsibilities related to transport governance can be separated into two: operational responsibilities and strategic and planning responsibilities.[4] Operational responsibilities can integrate, as an example, the setting and collection of fares, the ticketing and the marketing of transport services. Strategic responsibilities include strategic and policy planning, planning and funding of major infrastructure, as well as spatial and land-use planning.

As shown by Figure 3.2, the studied agencies have a combination of operational and strategic planning prerogatives. A common feature is that all of them carry out strategic planning. Contrarily, the degree of responsibilities assigned to the MTAs for carrying out the operational responsibilities is very different. Regarding public transport, all of them have a high level of competence over planning of infrastructure and services. However, the degree of responsibility each has in terms of fare setting, concession granting and management, and investment in public transport infrastructure varies substantially. Moreover, TfL and AMB have an important role regarding road infrastructure and traffic management, as well as in the development of non-motorised transport strategies. Île-de-France Mobilités and ATM, by contrast, have low or no competence over these policy areas. In the case of TfL, the agency is also charged directly with road safety.

Differently from the cases studied, in some metropolitan areas an institutional arrangement has been created, where two agencies co-exist (one is in charge of strategic planning and the other handling operational responsibilities). This is the case of Stuttgart, Germany (see Box 3.2).

The rest of this section provides a detailed description of the role that the MTAs studied and other government actors play in planning and managing public transport, traffic, road safety and non-motorised modes. Chapter 4 will describe the strategic planning responsibilities in more detail.

Box 3.2. **Metropolitan transport arrangements in Stuttgart**

Responsibility over transport in the Stuttgart region, the metropolitan area which includes the city of Stuttgart and the surrounding five counties inside of the federal State of Baden-Württemberg, are split between two main bodies: the Assembly of the Region of Stuttgart (VRS) and the Stuttgart public transport association (VVS).

VRS is the main political entity of the Stuttgart Region and its members are directly elected by the Stuttgart constituency. Once chosen, regional MP's work in three main committees: transport, economic development and planning. The transport committee is responsible for strategic service and infrastructure planning for public transport in the whole region, through the elaboration of the regional transport plan. This document is developed in close consultation with the other two committees of VRS; thus ensuring the compatibility of transport policies with land-use planning for the accomplishment of the wider policy goals of the region. At the same time, the transport committee can participate in the funding of infrastructure projects of regional interest. These correspond mainly to works linked to the regional rail services (S-Bahn) and regional bus lines. VRS is also responsible for setting standards for contracts between public authorities and transport operators in the Stuttgart region. The transport committee further explores issues such as public transport fares, and emits recommendations and opinions to the VVS, which has the last word in this subject.

VVS is an association owned by a compendium of public and private actors that manages public transport in the space formed by the tariff union of the Stuttgart region; 50% of it belongs to the six counties in the region of Stuttgart, to the VRS itself and to the federal State of Baden-Wurttemberg. The remaining 50% is integrated by the transport operators in the area, who are privately as well as publically owned (public operators include Deutsche Bahn and Stuttgarter Strassenbahn). VVS serves as a technical, neutral and independent body that brings together all relevant actors to accomplish its duty: granting effective transport service delivery in the Stuttgart region. To this end, it manages the transport system by setting the public transport fares (upon consultation with the transport committee of VRS), designing the schedules, collecting revenues and handling the marketing operations of public transport in the region. It also participates and supports local authorities in the drafting of their individual transport masterplans.

The system of divided responsibilities between VRS and VVS reflects a governance tradition in Germany that tends to separate the political from the administrative arenas. It also reflects a tradition of giving a strong role to private actors in public service markets while allowing for co-operation with, as well as regulation from, public bodies. In post-second world war western Germany, such division and relationship between public and private actors was seen as a way to avoid the economic, social and political imbalances that affected the country during the 1920s and 1930s, and this type of configuration is still common. Giving responsibilities over planning to a publically-elected body is seen in this context as a way of ensuring the public nature of transport services. At the same time the public-private partnerships that is crystallised in VVS is seen as a good way of fostering that transport service delivery follows a technical and goal-oriented approach that takes into account both private and public interests.

Source: ITF, based on Basten (2011); Lönnroth (forthcoming); Ludwig (2008); Verband Region Stuttgart (2011); Verkehrs-und Tarifverbund Stuttgart (VVS); Walter-Rogg & Sojer (2006); VRS (2018).

Figure 3.2. **Level of competence over different areas of transport policy**

Île-de-France Mobilités: Robust competence over public transport

Infrastructure planning

Île-de-France Mobilités holds control over the construction of projects related to the expansion or improving of public transport infrastructure in Île-de-France. This prerogative extends to the planning of infrastructure related to the massive public transport network in the Paris area (metro, bus, tram, intra and inter-urban rails, as well as others such as cable car). This capacity doesn't extend to projects that fall into the scope of the Greater Paris Express, managed by the national government through the SGP.

Roads

Road design and management in France fall under three main jurisdictions, and roads in Île-de-France are no exception.

As national roads fall under the authority of the national government, the region's prefect (local representative of the national government) has a say over planning, management and improvement of national roads in Île-de-France. Under the Prefect's mandate, planning and studies for this infrastructure is done by the DRIEA Île-de-France. *Département*-level roads are the responsibility of the respective *départements* and municipal roads are designed and managed by municipalities. A municipality that belongs to an EPCI or EPT can delegate part or all of its road-related responsibilities to the inter-municipal entity. Hence, Île-de-France Mobilités has no responsibilities over road planning, management or maintenance.

Parking

Parking areas are planned, designed and managed by the local municipalities or by an EPCI or EPT with responsibilities delegated by municipalities. Île-de-France Mobilités has a role in providing planning guidance for certain parking areas, however. Indeed, as part of its responsibilities over public transport multi-modality, Île-de-France Mobilités is responsible for the main guidance on the planning of *parcs relais* – specially designed park-and-ride areas near major train stations in Île-de-France, mainly outside Paris proper.

The Île-de-France Mobilités issued the *Schéma Directeur des Parcs Relais*, which sets out the main guidelines for planning park-and-ride areas. Parking areas that respect certain criteria can receive an Île-de-France Mobilités' "label" implying that, if they follow pre-approved safety and quality measures determined by the authority, they may be eligible for subsidies. For labelled park-and-ride facilities, the guidance includes a fare scale for local authorities to follow. The document also recommends how to align park-and-ride facilities with nearby parking areas, indirectly giving Île-de-France Mobilités strategic responsibilities over these neighbouring spaces. Parking norms are also present in the PDUIF and are compulsory when it comes to the construction of parking spaces in new office buildings. These norms must be included in the PLUs and PLUis.

Railways and major metro lines

Île-de-France Mobilités is responsible for planning most railways that relate to intra-regional trips in Île-de-France. It does so in co-operation with the national government through jointly developed documents such as the *Schéma Directeur de la Région Île-de-France* and the *Contrat de Plan État-Région* (both explained in the next chapter). In the case of the Grand Paris Express project, the agreed strategy for the metro line is the result of a consensus between the initial vision promoted by the national government and put forward by Île-de-France Mobilités. Thus, even if Île-de-France Mobilités does not directly control the planning of this government-led project, it participates indirectly in the design.

The national government is responsible for planning and setting strategy for the infrastructure of rail lines belonging to territorial equilibrium trains (TET), which link cities not served by high-speed lines. Some TET lines go through Île-de-France, and the related infrastructure is planned by considering previous agreements between the government and the region.

Planning of public transport services

Île-de-France Mobilités is responsible for planning all motorised public transport services in the Île-de-France region: trains, metros, buses, trams, cable cars, public river services, reduced-mobility services, on-demand services and school buses. The law of 13 August 2004 allows Île-de-France Mobilités to delegate part or all of its responsibilities over everything except its tariff-related responsibilities to other authorities in Île-de-France. While legally it can delegate all services, in practice it will not delegate a function if doing so would jeopardise overall transport co-ordination in the region or threaten quality or safety. Thus, it delegates services on a case-by-case basis, following a technical study, and will not, for instance, consider delegating strategic transport modes such as subway or rail. Île-de-France Mobilités has been shown to delegate part of its responsibilities to municipalities, EPCIs and EPTs (acquired when converted from EPCIs). As mentioned previously, in the past only three EPCI have received the status of Local Organising Mobility Authority, out of 64 institutions in the region.

The national government is the organising authority for services and routes linked to TETs, some of which pass through the Île-de-France. The government's view is also present in Île-de-France through its prerogatives on inter-city routes of over 100 km, through the Regulatory Authority for Road and Rail Activities (DRIEA, 2018).

Fare setting and concessions

Île-de-France Mobilités sets public transport fares and leads the contracting process for the transport modes it oversees. In this sense, it has the capacity, through multi-year contracts, to co-ordinate, oversee and manage the operation of public transport services in Île-de-France by its main operators: RATP, SNCF and OPTILE (Organisation of Île-de-France Transport Professionals, a federation of private bus operators). These contracts allow it to survey the quality of transport services, e.g. by setting standards

for punctuality and service delivery. They also permit Île-de-France Mobilités to oversee the technical means of operations and the conditions of funding of transport services. While public transport delivery in Île-de-France is currently an oligopoly of RATP, SNCF and OPTILE, Île-de-France Mobilités is co-ordinating market opening by 2024 for regular road transport, by 2029 for tram, between 2023 and 2033 for existing inter-city railways, between 2033 and 2039 for RER C, D and E lines; by 2039 for RER A and B lines and by 2039 for the remaining transport modes in the region (see Chapter 5 for further detail on bus regulation). Tendering processes are being developed for new tram and metro services, as well as for certain new bus lines. School transport, in-demand and reduced-mobility services already need to follow tendering processes.

Investment

Île-de-France Mobilités has the ability to invest in public transport-related infrastructure in the Île-de-France region. Analysis later in this report will show that, this investment policy is helped by the receipt of funding sources such as the *Versement Transport* (see Chapter 4). Île-de-France Mobilités can also have a limited participation in the funding of infrastructure for modes that do not directly fall under its control. For instance, in Île-de-France it can partially subsidise the construction of Veligo (parking for bicycles near stations) and of some bicycle lanes in its efforts to enhance bus operation conditions. The new regional bicycle plan seeks to invest EUR 100 million in bike-related infrastructure, such as parking and charging stations for electric bikes, through subsidies given to communes, EPCI or departments. Subsidies linked to this particular plan do not pass through Île-de-France Mobilités (Île-de-France Region, 2017).

The national government also invests in major transport-related infrastructure and projects, as specified in the Contrat Plan État-Région (CPER). The CPER 2015-20 includes almost EUR 1.7 billion in government investment in transport infrastructure in the region, mostly for work related to the Grand Paris Express projects. In addition, the government helps monitor investment needs for the nine main train stations in Île-de-France. A regional discussion forum (IRC) exists for each of the six main stations in Paris plus Aéroport CDG 2 TGV, Marne-la-Vallée–Chessy TGV and Massy TGV. One of the IRCs' roles is to examine issues related to the services operated and existing in the station, particularly as concerns future investment programmes (DRIEA, 2018c).

Communes and EPCIs participate in investment on local municipal roads, parking and other local services that they have responsibilities over.

Traffic management, parking policies and road safety

Traffic management and road safety responsibilities in the Île-de-France region depend on the characteristics of the territories. Inside agglomerations,[5] road safety responsibilities for national, *département* and municipal roads fall upon the mayor. Thus, municipalities are in charge of road safety policies through mayors' control of municipal roads and parking and through enforcement of policies by municipal police (DISR, 2005).

Due to Paris' particular status, the *Préfet* of the Île-de-France region exercises safety prerogatives over Parisian roads and parking areas. The coming legal changes to the city's status, however, will give the mayor more control over roads and parking facilities, including on road safety (French Government, 2018a).

Outside of agglomerations, road safety and traffic management responsibilities are ensured by either the *Préfet* or the *département*, depending on the nature of the road in question. At the local level, setting and implementation of parking standards are left to the discretion of local authorities. For instance, the

Paris City Hall shifted from a minimum parking policy for new housing developments to establishing a maximum of one parking space for every 100 m² of construction, with availability of public transport also a factor (OECD, 2015).

Île-de-France Mobilités does not have competence over traffic management, but it recently acquired the power to set the rate of a tax on petrol and diesel consumption, which could be seen as widening the scope of its responsibilities on traffic demand management. The new tax will be further explored in the next chapter.

Non-motorised modes

Île-de-France Mobilités considers non-motorised modes in the Île-de-France Mobility Plan (PDUIF), in which it is legally required to include strategies that can deliver more environmentally sustainable transport and accessibility improvements (see Chapter 4 for the wider strategic planning framework).

Notwithstanding this strategic interest, Île-de-France Mobilités has a limited amount of responsibility regarding planning and management for non-motorised modes. In a way, it compensates for this lack of direct prerogatives through more indirect actions to promote cycling. Some of its strategies are in line with the funding of certain cycling infrastructure projects for local authorities that might develop them in the region. Île-de-France Mobilités' actions are illustrated by its new investment policy, which seeks to partially subsidise EPCIs, communes or *départements* for the development of certain cycling infrastructure, such as covered cycle parking areas, throughout Île-de-France (Île-de-France Mobilités, 2018b) (see the investment section above).

Communes are directly involved in the development of strategies for non-motorised modes and related infrastructure. Some EPCIs and EPTs with delegated transport capacities also lead this process. Infrastructure-related to non-motorised modes, such as parking for bicycles, is included in local urban plans (PLUs), while more precise strategies for non-motorised modes are included in local mobility plans (PLDs), though the latter are not obligatory (PDUIF, 2016). Municipalities are the main actor in implementing non-motorised strategies, such as putting in place cycling services (e.g. lanes, bicycle-shared programmes). They also decide on related traffic management and lead pedestrianisation projects.

TfL: Powers that go well beyond public transport

Infrastructure planning

Transport infrastructure planning in London involves a myriad of actors, with TfL having a major role. Generally speaking, GLA is responsible for conceiving and designing a comprehensive vision for infrastructure development in the London area. This is done by integrating different perspectives, such as economic, social, environmental and health concerns, into overall infrastructure planning. To this end, in 2014 GLA developed the London 2050 infrastructure plan. This document sought to foresee the main challenges the city needs to face, as well as ways to adapt to them. The plan is accompanied by supporting papers, including one on transport produced by TfL, as the MTA in GLA. This document served as further input for the London plan draft and MTS draft. Thus, TfL is at the heart of infrastructure planning in the London area. It is necessary, however, to analyse the types of infrastructure in London to understand the actors that influence their planning.

Road

Greater London contains a variety of road types. A few key roads of national interest, such as the M25, M1, M4 and M11, are planned by DfT and managed by Highways England. In additional, 5% of roads of the capital, the "red routes" which together account for about 30% of all transport traffic in the city, belong to the TfL road network. Planning and management of these roads is the responsibility of TfL. All remaining roads are under individual boroughs' control within their boundaries (TfL, 2018c).

In spite of the differing nature and ownership of roads, TfL seeks a co-ordinated approach to road planning in Greater London. Hence in 2012, by request of the mayor, it launched a taskforce on generating a common framework for road types in the capital. This effort resulted in a set of nine road types that is meant to help TfL, boroughs and developers alike. The framework is based on two main variables: the importance of the road for general movement, and place making (Figure 3.3).

Rail

The national government owns and is responsible for the funding and strategy of the country's railway network. Railway lines going through London are no exception, in spite of attempts by TfL to negotiate devolution of the city's rail network. The government acts through DfT, which shares its railway responsibilities with two main bodies that answer to DfT: Network Rail and the Office of Rail and Road. The former is a public company which operates and develops the country's railway 18 largest stations. The latter regulates the rail industry's health and safety performance, and it holds Network Rail accountable by developing the quality standards it must comply with.

Planning of services, fare setting and concessions

TfL plans and manages most public transport services in London through its subsidiary companies. It designs the services for London Buses, coaches, the Underground, Docklands Light Railway, the Overground, river services, taxi-private hire, dial-a-ride, Tramlink and London streets. TfL also sets fares of transport services in the London area and is responsible for reviewing and setting taxi fares.

Most of these services are run by private operators that have been awarded concessions by TfL. Contracts generally include clauses to provide incentives for operators to improve quality. Chapter 5 highlights the process of bus service delivery in London.

Figure 3.3. **Road categories developed by TfL**

Source: TfL (2015b).

Investment

While key transport infrastructure outside London is funded by the national government, TFL invests in key transport infrastructure in Greater London. Its investment programme is based on the key areas and priorities identified in the MTS. It has carried out a variety of investments, including in large infrastructure programmes such as Thameslink and Crossrail. TfL constantly invests in public transport improvements that can increase capacity and accessibility. It also invests in cycling infrastructure and initiatives to promote cycling, in particular to improve cycling safety, upgrading Cycle Superhighways and introducing new cycling routes. In 2018, TfL plans to spend GBP 2.1 billion on improving London streets, focusing on infrastructure for pedestrians and cyclists, road safety and enhanced public spaces.

The national government has had considerable importance in funding transport projects in London since the creation of GLA and TfL in 1999. The major actors in this process are DfT and the Treasury. After the creation of TfL and in its early years, DfT contributed a large part of its budget in the form of a yearly grant. For instance, in 2003/04, 48% of TfL's budget came from the government grant (Burnham, 2006). Over time, and as TfL has developed new sources of funding, DfT's direct contribution has significantly decreased. In 2016/17 period, the grant amounted to 6.7% of TfL's budget, and 2017/18 is the last period for which TfL will receive a direct grant from DfT (TfL, 2016).

The government, through DfT, still provides a considerable contribution to key development projects in the capital area, however. For instance, DfT provided GBP 5.1 billion of the GBP 15.9 billion for the construction of Crossrail (DfT, 2007). In 2015, moreover, a GBP 300 million Transport Development Fund was created for "transformative transport infrastructure projects" (UK Government, 2015). It has been indicated that this fund could, for instance, finance part of the Crossrail 2 project. For national-interest infrastructure projects developed in the London area, DfT helps develop the business case presented to the Treasury once the project has been approved by the Secretary of State. DfT essentially ensures the financial sustainability of the project, as well as its general viability. To develop the business case, DfT follows the five case framework, considered best practice in UK infrastructure

project design: the framework, based on evidence provided by TfL and DfT, requires a strategic case, an economic case, a financial case, a commercial case and a management case (DfT, 2013).

The Treasury examines DfT's contributions *a posteriori*, decides upon the availability of funds for the project and caps the amount of money available for a given venture, using long-term vision and expertise stemming from the NIC, as well as that of the Infrastructure and Projects Authority (IPA). IPA, and the Treasury by association, can further collaborate in the funding of transport-related projects in London through the UK Guarantees Scheme (UKGS). UKGS works by "offering a government-backed guarantee to help infrastructure projects access debt finance where they have been unable to raise finance in the financial markets" (UK Government, 2017).

Traffic management and parking policies

Traffic responsibilities in Greater London generally fall under the jurisdiction of the authority which has control of the road in question. Thus, TfL is responsible for traffic policies on GLA roads, the secretary of state is the traffic authority for roads of national interest, and the boroughs have responsibilities over the remaining roads (British Government, 1999). At the same time, when it comes to borough roads, TfL issues guidelines that local authorities may follow to conduct their traffic-related policies (GLA, 2010).

TfL is in charge of the traffic control systems for the whole Greater London area. It manages the area's more than 6 000 traffic lights and, under the Traffic Management Act 2004, facilitates co-operation among all London traffic authorities and utilities so as to improve conditions for road users (TfL, 2018e).

As mentioned earlier, TfL also oversees the congestion charging system, as well as the Low Emission Zone and T-Charge. Box 3.2 describes in detail these two programmes, as well as the Ultra Low Emission Zone to take effect by 2019.

TfL can also delegate to other actors the operation of traffic-related responsibilities. As an illustration, London Councils is tasked with the implementation of certain transport policies and programmes in the Greater London area such as the London Lorry Control Scheme (LLCS) (LC, 2018a) (Box 3.3).

Prerogatives over parking policies depend on road type. For red routes, managed by TfL, it is up to the authority to define the parking strategy by setting parking locations, conditions and eventual fines. For borough roads, responsibility lies in each borough, which determines parking location and general strategy for its territory. These parking strategies need to take into account and comply with general transport strategic documents such as MTS and the London Plan.

In particular, the London Plan sets maximum parking standards that boroughs should heed when developing their own. The standards are set for different classes of land use according to type of development (retail, commercial, residential, etc.) and proximity to public transport, on the principle that areas closer to the public transport network need fewer parking spaces (TfL, 2015a). More detail on the Public Transport Accessibility Level indicator is provided in Chapter 4.

Box 3.2. **The Low Emission Zone, T-Charge and Ultra Low Emission Zone**

The London Low Emission Zone (LEZ) is an area that covers most of Greater London (4 071 km2). It operates 24 hours per day, every day of the year, and is controlled with cameras that read number plates to tell automatically whether vehicles meet the LEZ emission standards, are exempt, are registered for a discount or must pay the daily charge.

Date	Type of vehicle	Vehicles that must pay a charge to enter
2008	Heavy vehicles	Euro III or lower for PM10 and vehicles registered as new before 2000. The daily charge is GBP 200.
2012	Heavy vehicles	Euro IV or lower and vehicles registered as new before 2005
	Delivery vans	Euro 3 or lower for PM10 and vehicles registered as new before 2001. The daily charge is GBP 100.

In June 2016, the Mayor of London announced new air quality measures including an emissions surcharge (known as the "T charge") on older vehicles entering or driving in Central London as an addition to the existing Congestion Charge.

The Ultra Low Emission Zone (ULEZ) was announced in 2015 and will replace T-charge in central London by 2019, include tighter standards London-wide for heavy vehicles in 2020 and cover all inner London by 2021. The content for ULEZ for inner London is still in its consultation phase. The confirmed ULEZ for 2019 will restrict the circulation of all vehicles with the following characteristics:

Cars and small delivery vans	Petrol, EUR 4 or lower + registered as new before 2006 or daily charge of GBP 12.50. Diesel, EUR 6 and registered as new before 2015 or daily charge of GBP 12.50.
Large delivery vans and minibuses	Petrol, EUR 4 or lower + registered as new before 2007 or daily charge of GBP 12.50. Diesel, EUR 6 and registered as new before 2016 or daily charge of GBP 12.50.
Heavy vehicles	Euro IV PM or lower and registered as new before 2005 or daily charge of GPB 200. Euro VI or lower and registered as new before 2014 or daily charge of GBP 100.
Motorcycles	EUR 3 or lower and registered as new before 2006 or daily charge of GBP 12.50.

Source: ITF (2017); GLA (2018).

Box 3.3. **The London Lorry Control Scheme**

LLCS is designed to manage the environmental impact of heavy goods vehicles (HGVs) on specific roads in the TfL road network. HGVs are defined as vehicles over 18 tonnes maximum gross weight. LLCS particularly works in reducing noise pollution by requiring operation at night and weekends on previously defined, mostly residential restricted roads. During the enforcement period, HGVs must circulate through an excluded route network, also previously defined, composed mostly of trunk roads and the like.

LLCS was initially begun in 1985 by the Greater London Council through the Greater London (Restriction of Goods Vehicles) Traffic Order 1985 Act. Upon the dissolution of GLC, the Lorry Ban continued to be enforced by the London Boroughs Transport Committee, later merged with London Councils, which became the manager of the scheme on behalf of the 32 London boroughs and the City of London.

Source: Own elaboration, based on London Councils (LC) (2018b); Burnham, J. (2006).

Road safety

In the London area, road safety is directly ensured by TfL if the road in question is part of the TfL road network and by the boroughs and the city of London for all remaining roads on their territories. TfL developed a global road safety strategy for the London area, "Vision Zero for road danger", giving guidance to local authorities on road safety best practice and specifying conditions and actions for an effective partnership between TfL, the boroughs and the City of London, and the national government for the accomplishment of policies related to this issue (GLA, 2018). Vision Zero emphasises preventive measures that promote safe speeds, street design, vehicles and behaviours on roads, as well as on those that reduce the severity of injuries post collision.

Work between TfL and the government for effective road safety measures in the London area involves two main points. First, TfL seeks to consider road safety policies released by government agencies such as DfT in the country's capital programmes. Second, TfL tries to ensure that the government policies take into account the nature and scale of road safety-related challenges in the London area (GLA, 2018).

Non-motorised modes

Strategically speaking, both TfL and the local authorities in the London area emphasise the development of non-motorised modes in the capital. TfL includes non-motorised modes in the MTS, and these clauses are later considered by each borough – and by the City of London – in local implementation plans (LIP). TfL also stresses mobility issues in the Accessibility Plan for London, which is later incorporated in the MTS (GLA, 2018). This strategic view on mobility and accessibility goes hand in hand with separate strategic analysis of pedestrian and cycling modes. The Strategic Cycling Analysis and Analysis of Walking Potential (TfL, 2017a; 2017b) are part of the strategic vision of the mayor for non-motorised mobility.

Operationally, TfL is responsible for the London area's cycle hire system, which offers bikes for rent in and around Central London. The system is currently sponsored by Santander and operated by Serco. TfL also develops the Cycle Superhighway routes for cycling into and across London, and leads the Bikeability cycle training sessions. Bikeability can also be developed at the initiative of individual boroughs, which can decide to offer separate training to residents of their areas. Finally, TfL provides

cycling grants, apart from the grants given to London boroughs, for organisations to conduct cycling-related projects in the Greater London area (TfL, 2018a).

ATM's competence over public transport and AMB's wider scope of responsibilities

Infrastructure planning

ATM is responsible for planning public transport infrastructure in the Metropolitan Region of Barcelona, and is therefore in charge of developing the Master Plan for Infrastructure (PDI). The PDI has a time frame of ten years and covers all public land transport infrastructure in the metropolitan region, without regard to the administration responsible for the infrastructure or its operating body (ATM, 2018b). It thus sets the pace for all infrastructure planning at lower administrative levels in the region (see Chapter 4 for more information on the strategic planning framework).

Roads

Road planning responsibilities in the metropolitan region depend on road type. The Spanish government owns, plans and manages the national road network, which consists of the main corridors for Spain's territorial connectivity, as well as those linking the country with the rest of Europe. The Generalitat is responsible for the main network of so-called basic roads in Catalonia, those other than national roads. *Comarcal* roads are the main inter-municipal roads, while local roads are secondary inter-municipal roads. Both *comarcal* and local roads fall under the administration of the Diputació of Barcelona. Urban roads, in the centre of municipalities, are owned, managed and planned by municipalities. Inside the Metropolitan Area of Barcelona, AMB is responsible for the definition of the basic metropolitan road network, while municipalities are charged with the design and management of their individual urban roads (Table 3.4).

Table 3.4. **Ownership and management of roads in the Metropolitan Region of Barcelona**

Type of road	Ownership of road	Design and management responsibility
National roads: of national interest	Spanish central government	Spanish central government
Basic roads: main roads other than national roads	Generalitat	Generalitat outside the Metropolitan Area of Barcelona; inside this area, delegated to AMB
***Comarcal* network: inter-municipal main roads**	Diputació of Barcelona	Diputació inside the Metropolitan Area of Barcelona; inside this area, delegated to AMB
Local network: inter-municipal secondary roads	Diputació of Barcelona	Diputació inside the Metropolitan Area of Barcelona; inside this area, delegated to AMB
Urban network	Municipalities	Municipalities

Parking

The design of parking infrastructure falls upon its owner. However, the design of parking areas needs to go hand in hand with the wider strategic and planning vision developed through ATM's mobility and infrastructure plan. This is particularly the case when it comes to inter-modal parking,

which has a dedicated place in the PDM. Adequately managing and designing inter-modal parking space is considered by ATM as important to deliver wider environmental sustainability, accessibility and safety policy goals. It thus generates studies and provides recommendations on new parking in the metropolitan region (Generalitat, 2018).

Railways

Railways in the Metropolitan Region of Barcelona are planned and managed by a number of actors. First, the national rail network is owned by the Spanish central government: it consists of the entire rail network except FGC, the Barcelona metro and tramways. It is managed by the national rail infrastructure management agency (ADIF), and its planning is the responsibility of the Ministry of Development. The Generalitat owns, plans and manages FGC, whose network is not connected to the ADIF-led network. The infrastructure linked to the Barcelona metro is owned by the Generalitat but operated by the public transport holding company, TMB, directly managed by AMB (Generalitat, 2018).

Planning of services, fare setting and concessions

TM is charged with the development and management of the integrated ticketing and fare policy, in the integrated fare system (IFS) area. For reasons linked to the historical development of the transport system in Catalonia, the IFS extends beyond the borders of the metropolitan region. In the IFS, ATM acts as a compensation platform for inter-modal, inter-urban and inter-municipal travels. Therefore, ATM receives both contributions from its members (the Generalitat, AMB and the city of Barcelona) and public transport fares, and makes the required compensation and subventions to transport operators. ATM also reviews fares annually along with other actors in the IFS.

ATM's concession-setting capacity extends only to the tendering process for the tram in the Metropolitan Area of Barcelona. The remaining concessions inside the Metropolitan Region of Barcelona are the responsibility of either AMB, inside the metropolitan area's boundaries, or the Generalitat for the rest of services in the region and the IFS area.

AMB owns and manages most public transport in its area of coverage. This is done mainly through Transports Metropolitans de Barcelona, the exclusive AMB-owned public operator for the metro and bus system in the area composed by Transports de Barcelona S.A. and Ferrocarril Metropolità de Barcelona S.A. TMB plans the metro routes, with AMB's approval. This gives the metropolitan authority a certain transport planning competence over the metro in its area of coverage. Through concession setting AMB also manages all bus and taxi services in the metropolitan area, and through TMB it operates part of the public bus service. Thus, AMB is tasked with the tendering process related to both bus and taxi systems. Overall, the transport services controlled by AMB amount to 46% of the total transport supply in the IFS.

Investment

The Spanish central government's Strategic Plan for Subsidies from the Ministry of Development responds to the main priorities in terms of government infrastructure funding (Ministerio de Fomento, 2014). The government extends a yearly grant to municipalities of more than 50 000 people (and some smaller ones that meet certain criteria) to partially subsidise public transport. To receive this grant, municipalities have to comply with certain requirements, one of which is to have a Sustainable Mobility Plan. The government's funds for public transport in municipalities in the region go directly to ATM (Spanish Government, 2015a). Since 2006, government grants have represented from 14% to 32% of public transport system subsidies in the Metropolitan Region of Barcelona (Lloveras Minguell, forthcoming).

While ATM does not have a main investment function in transport infrastructure, it can serve as a channel for grants from public authorities to fund transport infrastructure works in municipalities, given the proper conditions. For instance, the current agreement between ATM, AMTU and the Generalitat indicates that ATM will provide AMTU with funds for public infrastructure improvements, to be channelled to AMTU municipalities. Such funds are part of the contribution from the Generalitat for transport infrastructure works (AMTU, 2014).

Inside of the Metropolitan Area of Barcelona, transport investments for service improvements are managed by AMB. New transport infrastructure is managed by the owner of the infrastructure in question, be it a municipality, the Generalitat or the Spanish central government (Lloveras Minguell, forthcoming).

All municipalities of more than 50 000 people are obliged by law to stabilise urban transport services in their territory. For intra-municipal transport outside the Metropolitan Area of Barcelona, they are responsible for funding such projects. These municipalities receive a yearly grant from the Spanish central government. Municipalities can also impose complementary taxes to fund urban transport (Ruiz Montañez, 2017).

Traffic management and parking policies

In Spain, most traffic-related responsibilities are generally led by the central government, which defines the main traffic policies in the country and executes them through the Ministry of Interior and, more particularly, the Traffic General Directorate (DGT). These responsibilities extend to traffic management, surveillance and sanctioning on inter-urban roads, as well as harmonisation of traffic policies on the Spanish territory. The Generalitat expanded its traffic-related capacities through devolution of some government prerogatives under Royal Decree 391/1998 of 13 March 1998 on the transfer of services and functions from the central government to the Generalitat of Catalonia in matters related to traffic and circulation of motor vehicles.

Under this legislation, the national government kept its capacity to issue and revoke driving licences and to manage traffic on national roads, while the Catalan government became responsible for transit, circulation and traffic control and surveillance of public inter-municipal roads on its territory. The Generalitat is responsible for developing traffic and circulation strategies and policies for the region through the Servei Català de Trànsit (SCT) (Spanish Government, 1998). The national government and Generalitat co-operate regularly to align national and regional policies through the Sectorial Conference on Traffic, Road Safety and Sustainable Mobility. This body is responsible for "developing a co-ordinated action in [traffic and motor vehicles circulation], minding the principles of institutional loyalty and mutual respect in the execution of the attributed capacities of the related institutions" (Spanish Government, 2015b).

The Generalitat's action in the metropolitan area of Barcelona is supported by the traffic prerogatives of AMB, which participates in traffic management on the basic metropolitan road network along with the regional government (Lloveras Minguell, forthcoming). Municipal bodies are responsible for traffic management on their individual inter-urban road networks via a municipal circulation ordinance that defines circulation, parking and traffic practices on their territory (Spanish Government, 2015b).

Inside Barcelona's metropolitan area, AMB has a considerable role in planning parking. Its parking policies must comply with the mobility plan for the metropolitan area, which AMB develops. Park-and-ride facilities and secure biking parking are emphasised through AMB's mobility plan (Lloveras Minguell, forthcoming).

Road safety

The central government is responsible for developing the country's road safety strategy, taking into account the national transit guidelines. For this, DGT, the national body in charge of traffic and road safety, develops the required documentation for a ten-year period. The resulting guidelines serve as a general framework that is holistic by nature: it deals with road safety for all motorised and non-motorised transport modes and seeks to involve all concerned actors in the strategy's objectives (DGT, 2010). Apart from this more global guiding and regulatory role, the government is directly responsible for road safety on national roads.

The Generalitat develops the Road Safety Strategic Master Plan for Catalonia in consultation with the central government, the Diputació, *comarcas* and municipalities, as well as other stakeholders such as academics, associations and local bodies. Various departments of the Generalitat have a hand in elaborating, following up on and evaluating road safety strategies. SCT is the main body responsible for the region's road safety policy. It oversees the Directive Committee for Traffic, which is led by the director of SCT in co-ordination with the general police director. The committee is the executing body for the road safety plan. It is supported in its duties by the Catalan Traffic and Road Safety Commission, a consultative body for road safety policies. The committee also co-ordinates inter-departmental efforts in its field of action through the Inter-department Commission for the Improvement of Road Safety. More recently, a new Road Safety Observatory follows up and studies indicators of the adequate implementation of the master plan (Generalitat, 2014).

Municipalities are responsible for road safety policies for local roads, in line with the Generalitat's vision. They issue traffic, transit and road safety-related legislation, which is harmonised with the support of SCT. These actions are enforced, on urban roads at the municipal level, by the local police.

Non-motorised modes

The central government has an important role in the promotion of sustainable mobility, especially non-motorised modes. The Spanish Strategy of Sustainable Mobility, elaborated by the Ministry of Development, is the main national guideline for policies in this area. It prioritises cycling and walking, as well as inter-modal exchanges with motorised modes (Ministerio de Fomento, 2018).

The Generalitat includes non-motorised transport in the development of strategies for the Catalonia region. As an illustration, it produces Catalonia's Strategic Bicycle Plan, which in turn influences the PDM developed by ATM. ATM has a limited role in implementation of the strategy to promote non-motorised modes. It develops studies but has no power to implement actions in the territory.

In contrast, AMB has direct capacities over non-motorised modes at the level of the urban core, which compensates for ATM's lack of such. AMB is directly responsible for the promotion of sustainable transport modes, which will be included in the forthcoming Metropolitan Mobility Master Plan. Non-motorised transport infrastructure and programmes included will be eligible for direct transport investment from AMB.

Municipalities can promote their own non-motorised transport strategies, in accordance and co-ordination with higher-level planning strategies. For instance, the city of Barcelona, drawing on the actions developed in the framework of its Pact for Mobility (Box 3.4), has its own bicycle strategy as part of its Mobility Master Plan.

Box 3.4. **The Pact for Mobility developed by the city of Barcelona**

In 1998, Barcelona's city hall and more than 30 citizen-led organisations signed a Pact for Mobility, whose main objective was to provide a consultation and dialogue platform that would enhance interaction among the most relevant stakeholders in sustainable mobility. Five main principles underlie the pact's actions:

- Ensuring mobility that reduces harm to its surroundings and to the citizenry as a whole, and that respects the environment
- Defending the right to mobility for all
- Ensuring the quality of living of all citizens
- Promoting a change in attitudes in institutions and the citizenry through a system that ensures road safety and discipline
- Planning new urban actions according to the mobility needs they will entail.
- The pact set up groups involved in varied policy areas:
- Pedestrian groups
- Bicycle groups
- Public transport group
- Motorcycle group
- Car group
- Logistics and merchandise transport group
- Touristic mobility group
- Road safety group.

Source: Barcelona Town Hall (2018).

Geographical coverage and transport co-ordination for the urban core and commuting zone

When looking at the MTAs in the Paris, London and Barcelona areas, it is interesting to compare the role they have in co-ordinating transport across the urban core and the larger commuting zone.

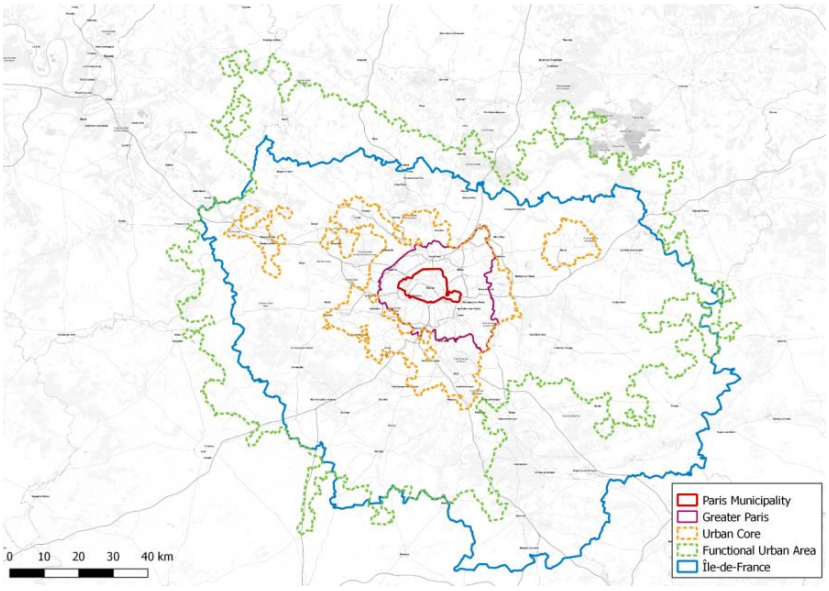
The urban core and commuting zone rarely share the same perimeter. Above all, they do not share the same mobility characteristics or transport needs. The urban core may include zones with different densities and incorporate suburban areas, but it is generally characterised by continuous urban development. Urban cores concentrate economic, social and commercial activities and are the areas with the highest densities of activity in the larger commuting area.

In contrast, the commuting zone, also referred to as the functional urban area (FUA), incorporates surrounding towns and cities that belong to the same economic unit as the agglomeration. Commuting zones are much larger territories and combine urbanised areas with the rural and semi-rural spaces between the main agglomeration and surrounding towns and cities. The economic activities and urban characteristics of the surrounding towns and cities tend, moreover, to be quite different from those in the main urban agglomeration (e.g. concentrating more industrial employment).[6]

Île-de-France Mobilités: An institution for the wider commuting area

Île-de-France Mobilités' area of coverage, i.e. the entire Île-de-France region, essentially corresponds to the commuting zone or FUA of the capital. Figure 3.4 shows the boundaries of the Île-de-France region compared to the area defined as the FUA according to the OECD methodology. Île-de-France accommodated 12.1 million people as of January 2017 (18.2% of the population of France) and covers 12 012 km^2. The area of coverage of Île-de-France Mobilités includes the city of Paris, with around 2.2 million inhabitants, and its urban and suburban peripheries, as well as secondary towns and cities and rural and semi-rural territories.

Figure 3.4. **Administrative boundaries, urban core and FUA of the Paris region**



Source: ITF based on OECD (2012), with the data for administrative boundaries from OpenStreetMap, Map tiles by Stamen Design, under CC BY 3.0.

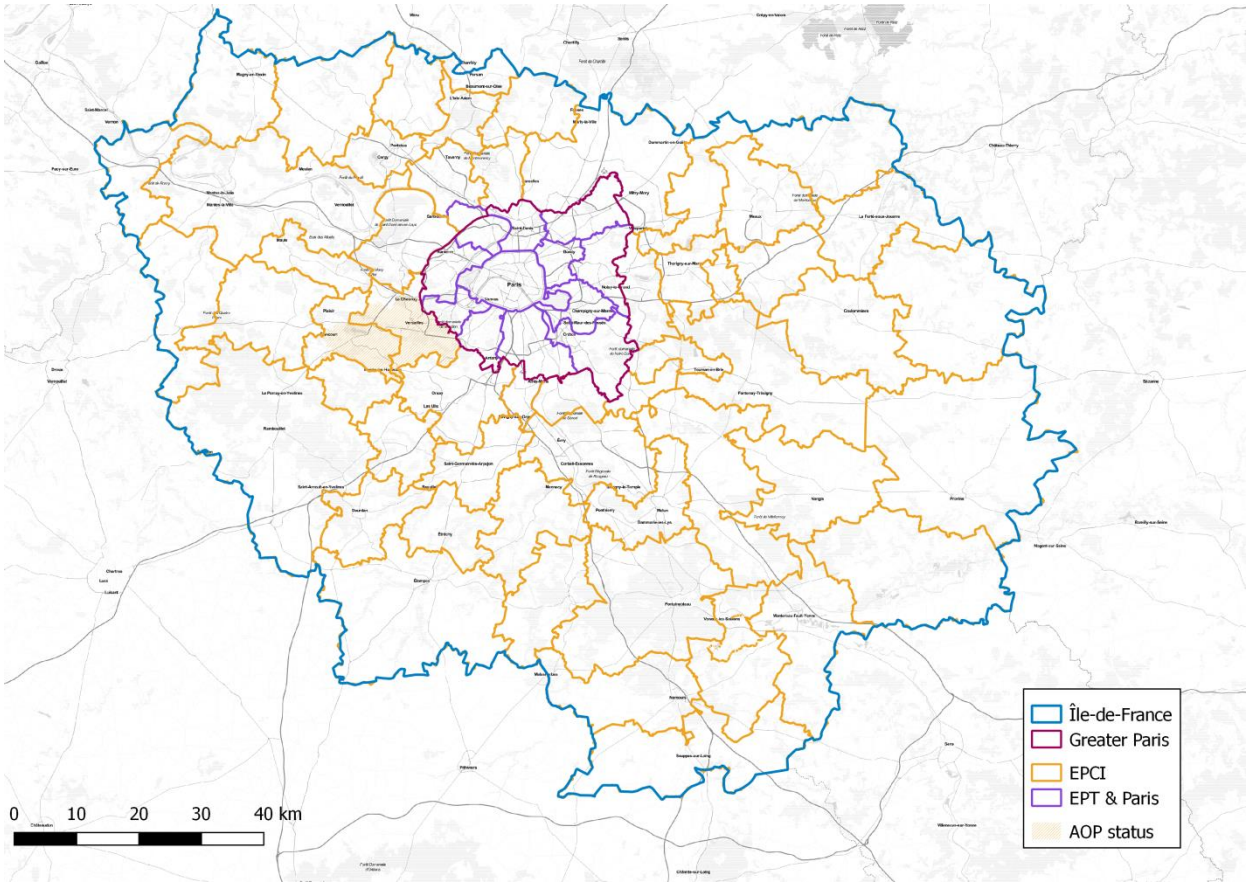
The establishment of an MTA at the wider commuting zone level has allowed for more effective planning and co-ordination of metro, commuter rail, tram and bus, and thus the development of public transport as a regional "structuring network" (Paumier et al., 2007). There can be certain limits, however, when it comes to linking the structuring network to planning services at the more local level, especially in the urban core.

The wider institutional setup in which Île-de-France Mobilités is embedded has created a significant territorial mismatch. Planning and regulation of the structural public transport services are carried out at the regional scale, while responsibilities for complementary policies and services that are needed to deliver the regional vision for mobility (e.g. road management and parking, bicycle and pedestrian infrastructure) are allocated to the region's 1 296 municipalities. And, the previous section noted, while the municipalities are in charge of local roads, both the national government and the *départements* are in charge of different types of "structuring" roads that cross the Paris region.

To some degree, the creation of EPCIs across the region was a recognition of the need for more co-ordinated strategies and an attempt to make some decisions at a larger scale than municipality by municipality. Before 2015, 19 EPCIs had been created in the area formed by Paris and its near periphery. Among other things, some of these inter-communal entities developed joint local transport plans and

strategies for facing climate, air and energy challenges. In some cases, EPCIs also became organising authorities for the neighbourhood-level AOPs. This has meant the delegation of certain responsibilities by Île-de-France Mobilités to EPCIs. Only three EPCIs were initially given the status of AOP in the *Grande couronne* of the Île-de-France territory. One of the EPCI lost AOP status upon agreement with Île-de-France Mobilités. For the remaining two, because of certain administrative changes in the borders of the EPCI, only a limited number of municipalities inside of them keep the AOP status. Other bodies have received a delegation of minor responsibilities related to on-demand transport or local services without receiving the status of AOP. Figure 3.5 reflects the current administrative division of Île-de-France, emphasising on the territories that have AOP status.

Figure 3.5. **Administrative boundaries of EPCI and EPT in Île-de-France**



Source: ITF with data for administrative boundaries from Île-de-France Mobilités. Map tiles by Stamen Design, under CC BY 3.0.

However, the transport responsibilities and planning capacity of these 19 EPCIs varied a great deal, resulting in fragmentation of mobility strategies across the urban core. For example, only Paris and five EPCIs prepared local urban mobility plans. The result is visible in infrastructure and service coverage gaps, as well as policy inconsistencies across the urban core, which are particularly evident between Paris and the rest of the agglomeration.

The creation of the Métropole de Grand Paris on 1 January 2016 led to harmonised responsibilities for policy areas other than transport across the city of Paris and adjacent municipalities. The MGP territory covered 814 km^2 and had a total population of around 7 million as of January 2017. While still

smaller than the entire urban core (Figure 3.4), the MGP territory includes all of the near-periphery of the city of Paris and parts of the far-periphery. Responsibilities for co-ordinated strategies for the environment, urban development and housing have been assigned to the MGP. Still, the question remains of how to create co-ordinated transport strategies that can better translate the PDUIDF to local scale, particularly in Paris' urban core. The EPTs in the MGP area have acquired the same transport responsibilities as the EPCIs that preceded them, so the responsibilities are still very unequal across the area.

As the rest of this section explains, the territorial setup in London and Barcelona has been more effective in making adequate links between commuting area and urban core transport strategies. TfL and AMB have not only created structures that specifically co-ordinate the entities inside the urban cores, but also their larger scope of responsibilities (which go beyond public transport) have helped improve the linkage between wider strategies and implementation in the urban cores.

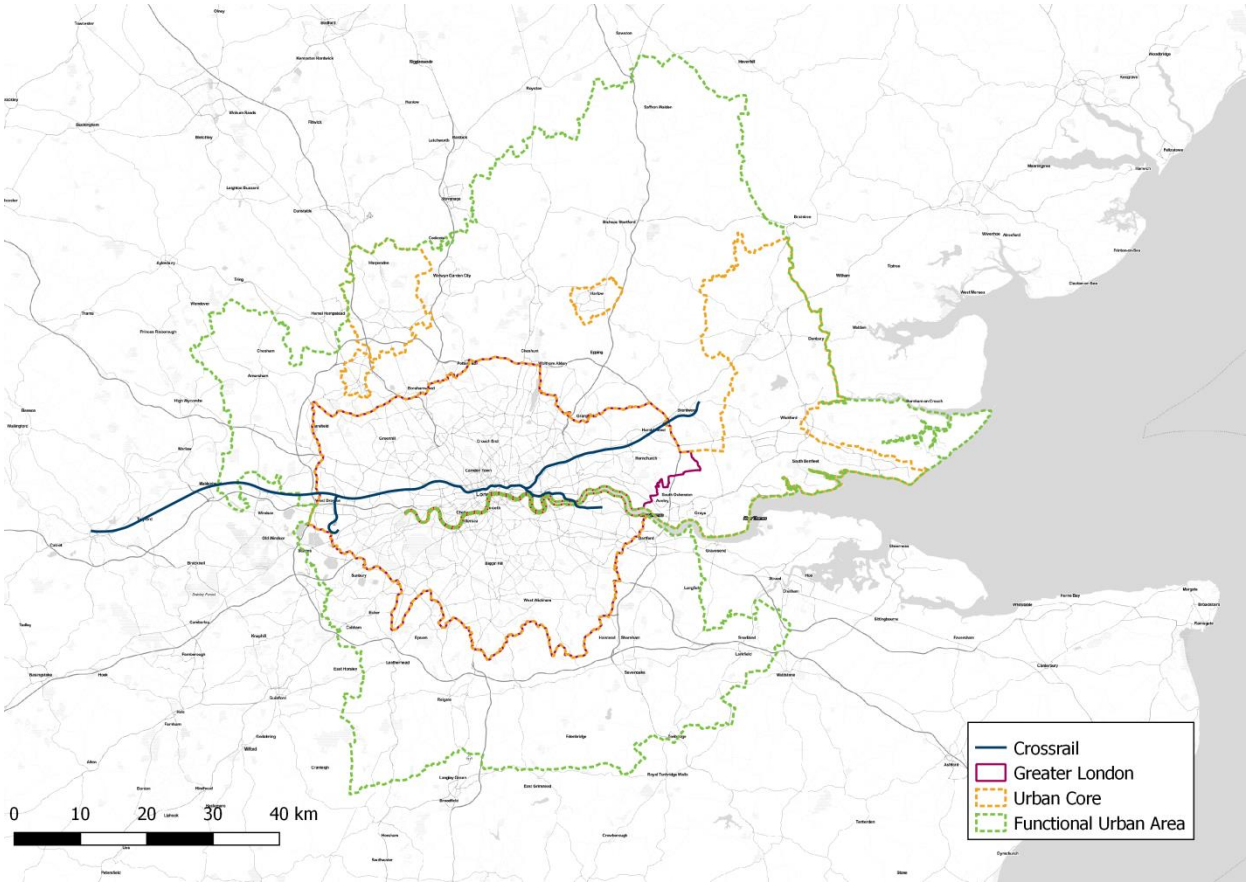
TfL: An authority for the urban core

TfL's territory, the Greater London area, covers 1 572 km^2 and had an estimated population of 8.7 million in 2016. The territory corresponds much more to the urban core than to the wider functional urban area of London (Figure 3.6). This is due in part to the historical administrative division of the capital area, including early unification of the London Council and adjacent boroughs, and the Greater London area being given the status of a region in England.

The UK commuting culture is strong and the commuting zone of London is very large. Many commuting needs are covered by national rail connections to other cities. As Figure 3.6 shows, the model also leaves aside many smaller towns that are near Greater London and are part of the urban core but fall outside TfL's territory. Once the Elizabeth line is opened, TfL will exceptionally become responsible for operating services that go beyond its usual boundaries within the GLA area, thus partially addressing the lack of coverage of territories that remain outside of the authority's area of influence.

In terms of responsibility over "structuring" public transport services, TfL has a similar role to that of Île-de-France Mobilités: planning and managing the Underground, Crossrail and surface public transport (including buses, the Overground, tram and light rail). In addition, TfL is in charge of cycling, walking, on-demand mobility services and taxis, which are all planned and managed along with public transport as part of a co-ordinated strategy for the territory of the GLA (TfL, 2018a).

Figure 3.6. **Administrative boundaries, urban core and Functional Urban Area of the London region**



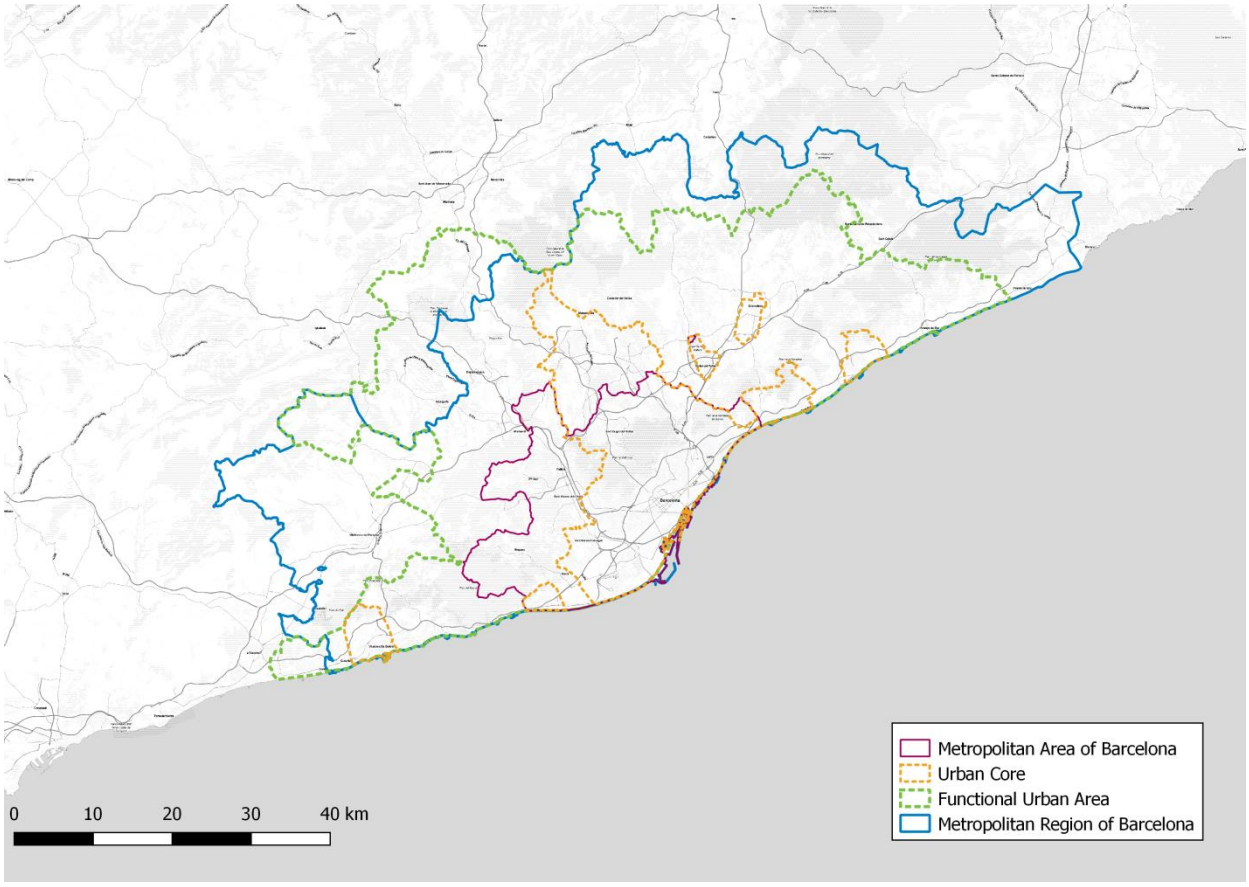
Source: ITF based on OECD (2012), with the data for administrative boundaries from OpenStreetMap, data for the Crossrail route based on the information appearing in the 2008 Crossrail Bill, from the Open Data Crossrail portal under Open Government License, http://data.crossrail.co.uk/datasets/b02e1f6aa7cf44dcbf13cae3dec62f69_0. Map tiles by Stamen Design, under CC BY 3.0.

ATM for the commuting area and AMB for the urban core

ATM plans transport in the Metropolitan Region of Barcelona, which is a territory that corresponds well the commuting zone (Figure 3.7). The region contains 164 municipalities over 3.235 km^2 and has 5 million inhabitants. ATM is also in charge of the integrated fare system for public transport (which, to include entire rail lines, extends beyond the metropolitan region territory).

In the smaller Metropolitan Area of Barcelona, the transport department of AMB plays a key role in developing comprehensive mobility strategies that complement region-wide investment and the broader regional transport strategy. The metropolitan area (the city of Barcelona and 36 municipalities) has an area of 636 km^2, around 3.2 million inhabitants and adds up to 70% of the total transport demand. As Figure 3.7 shows, with a few exceptions, the area covered by AMB corresponds quite well to the urban core. Table 3.5 summarises the territorial scale of the three MTAs.

Figure 3.7. **Administrative boundaries, urban core and FUA of the Metropolitan Region of Barcelona**



Source: ITF based on OECD (2012), Redefining "urban". A new way to measure metropolitan areas. OECD Publishing, Paris, http://www.oecd.org/cfe/regional-policy/redefining-urban-9789264174108-en.htm, with the data for administrative boundaries from OpenStreetMap, Map tiles by Stamen Design, under CC BY 3.0.

Table 3.5. **Territorial scale of MTAs in Paris, London and Barcelona**

City	Paris	London	Barcelona
Urban core	19 EPCIs had been created in Paris and its near periphery. Transport responsibilities among them were very heterogeneous. With the advent of the MGP, 11 EPTs have been created. Transport responsibility and capacity will still differ among them.	Transport for London (TfL)	AMB transport department
Commuting zone/FUA	Île-de-France Mobilités	London's commuting area is very large (nearly half the country). Greater London is also the territorial entity established as a region.	ATM

Notes

[1] 1 275 is the number of aggregated municipalities found in the départements of Hauts-de-Seine, Seine-Saint-Denis, Val-de-Marne, Seine-et-Marne, Yvelines, Essonne and Val-d'Oise. Paris is divided into 20 districts, rather than municipalities. Including the capital city's districts turns the overall number of the smallest local demarcations of Île-de-France into 1 295, municipalities and districts (IAU, 2018).

[2] The London Legacy Development Corporation oversees the London 2012 Olympic and Paralympic legacy work in east London and is under the control of the mayor and GLA.

[3] London Councils was created as the Association of London Government in 1995 through the merger of the London Boroughs Associations and the Association of London Authorities. In 2000, the association expanded by merging with the London Housing Unit, London Boroughs Grants, Transport Committee for London and Greater London Employers' Associations (LGC, 2006).

[4] The division of capacities of MTAs between strategic and operational ones is inspired by the work and shared experience of Mr. Måns Lönnroth (consultant for the Volvo Research and Education Foundations).

[5] "Agglomeration" refers in France to a place that has constructed buildings and whose entry and exit are signalled by panels put for this purpose on the route that goes through or around the place (French Government, 2018b).

[6] The OECD defines FUAs in terms of population density and commuting patterns. An FUA is an economic unit characterised by densely populated urban cores and hinterlands whose labour market is highly integrated with the cores. Ignoring administrative borders, the OECD methodology identifies high-density urban clusters (at least 1 500 people/km^2 in Europe, 1 000 people/km^2 in North America). As some urban cores are polycentric, the methodology connects non-contiguous cores belonging to the same FUA by using commuting data: if more than 15% of the population of one core commutes to work in another one, the two are considered integrated. The hinterlands, defined as "worker catchment areas", are areas with at least 15% of employed residents working in a certain urban core. The OECD has applied this definition to 28 OECD countries with 1 148 FUAs (OECD, 2013).

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Chapter 4. Key elements for effective action

The purpose of this chapter is to identify mechanisms through which each of the MTAs studied have been able to make solid progress in aspects that are crucial for this type of authority to be effective: first, securing the necessary financial and technical capacity to carry out assigned responsibilities; and, second, ensuring the development of a strategic plan for mobility that can also secure integration between transport planning and other key sectors, such as land use, housing, economic development and the environment. The chapter also highlights relative strengths and weaknesses in the three cases.

Securing financial and technical capacity

The magnitude and distribution of the budget managed by each institution reflect to a great extent the scope of capacities and responsibilities assigned to them (explored in the previous chapter).

In 2018, Île-de-France Mobilités' budget is EUR 8.074 billion. Expenses were divided between operating cost (81%) and investment (19%). Operating cost includes subsidies to RATP, SNCF and OPTILE; internal expenses of Île-de-France Mobilités; school transport and research. In terms of the investment share, 66% was allocated to funding rail and bus rolling stock, and the remaining 34% to improving quality of services and introducing new public transport services.

TfL's 2017/18 budget is GBP 10.2 billion, unchanged from 2016/17. In 2016, 68% was spent on the day-to-day running cost of the transport network and 32% on capital investment and infrastructure improvement, such as building the Elizabeth line (Crossrail), modernising tube services and stations, and transforming the road network.

Unlike Île-de-France Mobilités and TfL, ATM only redistributes revenue, while investment on transport infrastructure (except the tram[1]) is carried out directly by infrastructure owners, i.e. municipalities, the Generalitat or the Spanish government. Thus ATM's budget (EUR 1 346 billion in 2016) is mostly spent on running operations of existing services and internal costs of ATM. In parallel, AMB's mobility department manages the transport budget for the metropolitan area (EUR 274 million in 2018, around 40% of the total AMB budget).

AMB funds transport-related projects in the Metropolitan Area of Barcelona but these do not include major infrastructure improvements. Thus, transport-related investment for service improvement in the AMB area, such as fleet renewal, line extension and service infrastructure improvement (e.g. on bus stops), is managed by AMB and included in its budget.

While they differ in size, the MTAs in Paris, London and Barcelona have in common the presence of dedicated technical staff within the institution. Building up expertise for the institution has been central to carrying out responsibilities successfully in each case. It has also been important for the MTAs to attain recognition as specialised entities, both from the general public and from other institutions. In all cases, staff costs are calculated and budgeted as part of the MTA's operating costs.

TfL Group (including all subsidiaries) had a permanent staff of 27 131 in 2017. This included TfL Corporation's 5 810 permanent staff (TfL, 2017). Both are considerably higher than the total staff of the DfT, making TfL the agency with the country's foremost experts in the field (Busetti, 2015). Its staff size also means TfL's personnel expenses represent 1.9% of general expenditure (GBP 200 million in 2017).

Île-de-France Mobilités has a staff of more than 400 people, much smaller than TfL's. TfL has a much wider array of functions than Île-de-France Mobilités, which may partly explain the difference. In addition, the two MTAs have different strategies. TfL exercises most of its functions on its own, and employees in operating subsidiary entities (e.g. London Underground Ltd and Victoria Station) are counted as part of the TfL Group staff. In contrast, the French authority has the capacity to delegate part of its responsibilities to municipalities. In 2015 Île-de-France Mobilités had EUR 22 million of staff costs (about 0.3% of general expenditure).

ATM has the smallest staff, with 39 employees (ATM, 2017). This is partly explained by the large number of prerogatives kept by municipalities (Busetti, 2015). ATM co-exists in the region with AMB, which has more personnel (around 500 in all, including about 40 in the transport department). Externalisation of technical expertise by ATM also reduces the number of permanent staff.[2] Staff costs in 2016 amounted to EUR 1.8 million (1.3% of total expenditure).

The rest of this section describes in detail the funding sources and mechanisms that have been central to securing the budget for each institution.

Île-de-France Mobilités: Developing a range of MTA-specific revenue sources

Île-de-France Mobilités's general budget has three main sources: the *Versement Transport* (transport tax), which in 2016 accounted for around 50%; fares, at 30%; and contributions from regional, departmental and municipal authorities, at 20% (Île-de-France Mobilités, 2016). The share of contributions from each actor is set by Article 17 of decree 2005-664 of 10 June 2005.[3] Contributions are paid annually and can only be modified by majority vote of the board.

Versement Transport

Île-de-France Mobilités attains significant funds through the *Versement Transport* (VT), imposed in 1971 to raise funds for transport improvements in the Paris region. The tax is paid by companies with more than nine employees that are located in proximity to the transport network (within a specified "urban transport radius"). By design, the VT is paid as a percentage of the employer's total payroll cost.

Outside the Île-de-France region, the rate is decided by the municipal council or competent public authority on the basis of nationally dictated limits, defined in Article L2333-64 of law 2015-1785 of 29 December 2015.[4] Most authorities set the VT at its maximum allowed rate (Ubbels, 2004). In the special case of the Île-de-France region, the rate is set by Île-de-France Mobilités, within the limits in decree 2005-664 of 10 June 2005. The maximum rates in this case are 2.95% in Paris and Hauts-de-Seine; 2.12% for the municipalities in the *petite couronne* (Seine-Saint-Denis and Val-de-Marne); and 1.6% for other municipalities.[5] Like other local transport authorities (AOMs) in France, Île-de-France Mobilités decides how the revenue will be spent in its area of coverage, bearing in mind that budget raised by the VT must be spent on public transport improvement (Ubbels et al., 2004).

The tax was introduced as a result of growing acknowledgment among French politicians and authorities, in the 1960s, that steadily worsening traffic congestion had been putting a drag on urban transport systems, and that there was an urgent need for investment in public transport. The government had started seeking ways to encourage commuters to travel by public transport, improving infrastructure and discounting fares. However, budgetary constraints within communes were an important limitation. Reasoning that companies would benefit considerably from improved employee access to the workplace, the authorities decided to share some of the financial burden with private business. The tax was accompanied by a policy obliging employers to pay part of employees' monthly transport pass, thus incentivising use of public transport.

The VT was first levied in the Paris and the *petite couronne*, and later extended to other places in France. It is currently charged by local transport authorities in all urban areas with a population of more than 100 000. Interestingly, its implementation was not strongly opposed by business owners, who were aware of the positive economic externalities that improvements to public transport links could bring. For instance, La Defense business district, conceived in the late 1950s as a major business and transport node, was largely made possible by funds raised through the VT (Lecler, 2003).[6]

Despite the benefits the tax has provided to Paris and other urban areas, criticism of the VT has been raised. While supporters indicate that the tax has the potential to improve transport connections and encourage commuters to travel by public transport, critics counter that it could encourage car use. They argue that since companies in the "urban transport radius" pay higher taxes, they have an incentive to relocate farther away. This could lead to increased use of private vehicles by employees who have to commute to distant and poorly connected areas. In the Paris area, where local authorities sought to obtain relative autonomy from Île-de-France Mobilités, the VT rates were renegotiated, resulting in differentiated rates between the city of Paris and its suburbs (Halpern and Le Galès, 2016). As a consequence, some firms decided to relocate to the outer ring of the Paris urban core (Ubbels et al., 2004).

Other sources

Île-de-France Mobilités also receives revenue from driving and parking fines, which are collected by the finance ministry and redistributed as follows: 50% to Île-de-France Mobilités, 25% to the region and the rest to local authorities. Île-de-France Mobilités uses this money to improve connections between modes and accessibility to the network (Booth et al., 2007).

Another source of funding stems from an agreement in 2016 between Mrs Pécresse (president of the Île-de-France region) and the French government, by which the government grants Île-de-France a percentage of the revenue from the internal tax on energy products (petrol and diesel) sold in the Paris region. The aim is to direct this revenue towards public transport improvement. The measure implements the 2 June 2016 protocol adopted by Manuel Valls, then prime minister, and Mrs Pécresse on sustainable financing of public transport in the Paris region. Article 24 of the Law on Government Finance (*loi de finances initial*), which determines all government resources and expenses, authorises Île-de-France Mobilités to increase the internal tax rate on petrol and diesel sold in Île-de-France.[7] Up to EUR 100 million can be allocated to Île-de-France Mobilités; any revenue exceeding this amount is returned to the national budget. In 2017, the revenue from the tax increase contributed 1% of Île-de-France Mobilités' general budget.

In addition to investment made by Île-de-France Mobilités and included as part of its budget, the region and the national government makes significant transport investments. These include those allocated to the Grand Paris project, which is managed not by Île-de-France Mobilités but by the SGP, the public entity in charge of the Grand Paris Express project. Box 4.1 describes some of the mechanisms that ensure funding for the project.

Box 4.1. **Mechanisms through which the national government and the Île de France region directly contribute to transport investments**

The Contrat de Project État-Region is a five year contract between the national government and the Île-de-France region. It defines the strategic orientation, priorities and programme for capital investment in the region. Île-de-France Mobilités participates in negotiations on the CPER and thus in the identification of main priorities for infrastructure improvements across the region. Commitments made by the government and the region through the 2015-20 CPER (2017 revision), divided by expenditure component, are shown below.

Table 4.1. Annual Expenditure *Contrat Plan État Région* 2017 (French State/Île-de-France region)

Expenditure component (billion EUR)	National government	Île-de-France
Multi-modal mobility	1.811	3.436
Grand Paris	1,412	3.047
Multi-modal operations	.257	.230
Roads	.208	.159
Education, innovation and employment (digital economy, research, etc.)	.539	.511
Ecology and energy transition	.165	.157
Territorial	.319	.322

Among the main sources of revenue that contribute to funding the Grand Paris project are the following taxes:

- Special tax on equipment: Introduced in Île-de-France in 2010, it is paid with the property tax. Its sole aim is raising funds for the Grand Paris project.
- Tax on network companies: It was introduced in 2010 and imposed on businesses with activities directly linked to the use of infrastructure networks, including the transport network.
- Tax on business, commercial and parking dedicated surfaces (TSBCS): Yearly tax rate levied on offices, commercial premises, storage units and their associated parking areas. It is due by their owner (or occasionally the tenant of a commercial lease) when such property is located within the boundaries of the Ile-de-France Region.

Since 2014, the region also receives revenue stemming from annual taxes on parking spaces. This tax is collected within the territorial limits of Île-de-France. The proceeds of the tax are allocated to the investment section of the region's budget, with a view to financing investment expenditure for public transport. This tax is levied on private and public owners of parking spaces. According to law 2014-1654 of 29 December 2014, the tax is applied on the zonal basis, with differentiated rates for Paris and department of Hauts-de-Seine; communes within the urban unit and other communes in the region.

Source: ITF based on Île-de-France (2015).

TfL: Developing a wide range of funding sources that also promote transport and land use links

TfL's budget has four main sources. The largest share comes from fares, at 47% of the general budget. Grants and funding for Crossrail account for 23%, while borrowing and cash movement make up 17%. Other sources contribute 13%, including revenue from the congestion charge (about 5% of the budget) and commercial development of the TfL estate, including advertising and property rental.

Land value capture mechanisms, development fees and charges on businesses and property developments make up the bulk of funding for Crossrail, the new rail link that will connect Central London to Reading and Heathrow in the west and Shenfield and Abbey Wood in the east. The combination of revenue from the Mayoral Community Infrastructure Levy, planning obligations and Business Rate Supplements (along with grants from DfT and other contributions from some key beneficiaries of Crossrail, such as City of London Corporation, Canary Wharf Group and Berkley Homes) allowed the project to take off in 2009. In addition to raising funds for transport infrastructure and improvements, these mechanisms play an important role in linking transport, land use and housing planning. (For more on the MTAs' capacity to facilitate integrated planning, see the next section.)

Having a wide number of sources has helped TfL acquire strong financial capacity, although the cut in national grants (from the 2018/2019 financial year) and decision to freeze fares from 2016 to 2020 has put pressure on its budget.

Community Infrastructure Levy

The UK Planning Act introduced the Community Infrastructure Levy in 2008 as a planning charge that local authorities in England and Wales can impose on new development. An authority can decide to charge a CIL on all types of new development. The logic behind the charge is that developers need to contribute to the cost of the infrastructure that the new development will rely upon. In London there are two types of CIL: the Mayoral CIL and the Borough CIL.

The Mayoral CIL (MCIL) is a non-negotiable payment that is charged on all new developments across London which were granted permission after April 2012. The revenue is being used to fund Crossrail. As a charging authority, the mayor sets out the rates of the MCIL. The payment is applied on a zonal basis, with rates in boroughs depending on the benefits the project is expected to bring to each of them. Thus developments that are closer to the project and will benefit more from Crossrail have a CIL rate of GBP 50 per square metre, while those that are relatively distant from the future rail link are charged GBP 20 per square metre (TfL, 2017). This MCIL is remitted directly to TfL. Boroughs can also choose to levy a CIL on new developments as a condition for granting planning permission (Box 4.2).

Box 4.2. **Borough CIL**

A Borough CIL allows funds to be raised for the delivery of transport infrastructure within the boroughs. Unlike the Mayoral CIL, whose rates are set by the mayor, the rates for Borough CILs are decided by local authorities, which set up their own charging schedules and fix charge depending on land use.

In setting their CILs, boroughs must take account of the rates set for the Mayoral CIL, so that Borough CILs do not materially affect the mayor's ability to collect Crossrail funds. Local authorities on their spending priorities, setting out a list of projects or types of infrastructure that can be funded through the levy. These projects must comply with local development plans (in the case of London, the MTS), ensuring that revenue contributes to local infrastructure improvements that support strategies promoted by the mayor.

Source: ITF based on TfL, Community Infrastructure Levy, https://tfl.gov.uk/info-for/urban-planning-and-construction/planning-applications/community-infrastructure-levy

Planning obligations

Any new development in the United Kingdom has to be assessed in terms of its compliance with the local strategy or local development plan. When development proposals do not meet the requirements set out in local development frameworks, authorities can allow developers to commit to a planning obligation. In this way the developer can be granted a construction permit in exchange for the provision of amenities, which are required to make the development proposal acceptable. Commonly known as S106 agreements, these planning obligations, under Section 106 of the Town and Country Planning Act 1990, are legally enforceable obligations based on agreement between a developer and a local authority (TfL, 2016a). They can include the direct provision of amenities (e.g. building more affordable housing, providing necessary infrastructure) or can be set as financial payments.

Unlike a CIL, which is intended to provide infrastructure for the development of an area, planning obligations must be directly related to specific developments. Thus there should be a direct link between the development and the improvements being provided as part of the developer's contribution. Planning obligations for provision of necessary infrastructure that are imposed on the developer form an essential instrument allowing authorities to ensure that such infrastructure will be funded and that negative effects arising from a development proposal will be mitigated. In cases where a CIL and an S106 are in place, the CIL is treated as an "offset" to the planning obligation. If the CIL is higher than the S106, only the CIL must be paid. If the CIL is lower than the S106, the developer needs to pay the CIL plus an additional amount so that the total payment is the amount of the S106.

In cases where new development requires significant transport-related action, for instance the delivery of a new bus station or an entrance to the Underground, or where TfL is the beneficiary of the development, TfL also signs the agreement. Furthermore, TfL assists in the drafting of the agreements and helps ensure that the obligations are met.

As an additional source of funding for Crossrail, TfL levies contributions from planning obligations from developments that will increase the use of Crossrail. This applies to hotel, office and retail developments in Central London and the northern part of the Isle of Dogs, as well as developments within a radius of about 1 km around Crossrail stations. The contributions are proportionate to the calculated impact. The funds are collected for the Crossrail general budget. In 2016/17 they totalled GBP 25 million, and the cumulative total since 2013 is GBP 101 million.

Business Rate Supplements

In 2009, the Business Rate Supplements Act introduced a new opportunity for levying authorities to raise funds for projects that can promote economic development.[8] A BRS can be applied to existing commercial developments with rateable value above GBP 55 000, charged at 2 pence per pound of rateable value.[9]

In 2010, the GLA proposed to levy a BRS to raising GBP 4.1 billion of the GBP 14.5 billion cost of Crossrail. Introduced in 2013/14, it replaced a share of the funds previously paid with the DfT general grant (GLA, 2010). In the case of the Crossrail project, 70% of the BRS is paid by commercial developments located in boroughs that will directly benefit from the Crossrail route, i.e. boroughs where stations will be located. The remaining 30% is contributed by commercial developments in the City of London, Canary Wharf and Westminster, the areas where most of the jobs resulting from the improved connection will be located (PWC, 2014).

Charges on vehicles

The congestion charge programme, as well as penalty charge notice fees, which include driving offences and parking fines, also contribute to TfL's budget. TfL was one of the first institutions to implement a congestion charge programme, in 2003. The congestion charge is a fee charged to most[10] motor vehicles operating within the congestion charge zone in Central London. The flat rate zone is enforced through closed circuit TV and automatic number plate recognition. Aligned with best practice, the programme was introduced to reduce traffic in Central London by dissuading driving and encouraging the use of public transport, rather than to raise revenue.[11] Nevertheless, using the revenue to improve public transport has increased acceptability and encouraged alternatives to car use, helping to ensure that transport demand management policies are equitable and deliver their full potential (ITF, 2017).

In 2013, TfL reported that ten years after the introduction of the charge, gross revenue had reached about GBP 2.6 billion, of which around 45% was invested in public transport, walking and cycling, and GBP 960 million was directed towards improving the capital's bus network (TfL, 2013). The revenue accounted for some 5% of TfL's 2013 budget. TfL estimates that the programme resulted in a 10% reduction in traffic volume between 2000 and 2012. The congestion charge system is under review for possible improvements, and the possibility of introducing differentiated charge rates, i.e. an approach closer to road pricing, is being explored (ITF, 2017).

In an effort to improve air quality by making freight vehicles cleaner, TfL also implemented the Low Emission Zone. The Ultra-Low Emission Zone, setting much tighter standards for entrance into Central London and covering all vehicle types, is expected to be implemented by 2019. The LEZ, introducing an emission surcharge on the congestion charge, was proposed as a transition stage for the ULEZ. In 2017 the mayor of London launched a GBP 10 toxicity "T-Charge" aimed at older, more polluting vehicles on London roads. The charge applies mainly to diesel and petrol vehicles registered before 2006. The T-Charge (officially, the Emissions Surcharge) operates within the same zone as the congestion charge. As with the LEZ, the money raised (which is very small) also contributes to TfL's budget.

Land sales

The proceeds from the sale of land and property (for instance, 12 sites including Paddington Triangle, Liverpool Street station and Fisher Street worksite) that was purchased at the start of the project will also be used for funding Crossrail. Certain land in the area of construction was purchased (to obtain site access) through Crossrail Ltd, a wholly owned subsidiary of TfL. Some land being temporarily used for construction purposes will be resold once the project is completed. According to the TfL's 2013 business plan, a total of GBP 445 million from land sales will be directed towards funding for Crossrail 1 (TFL, 2013).

TfL's property developments

Being a major landowner, with some 2 307 hectares in Greater London, TfL plans to use its assets to bring in a new source of revenue to direct towards modernisation of the transport network. Development of TfL's landholdings could play an essential role in meeting mayoral priorities for constructing more affordable homes as well as generating revenue to reinvest in public transport.

By 2023 TfL plans to raise new funds from new property developments as part of its wider programme to generate GBP 3.4 billion in non-fare revenue. In 2016 the Lambeth Council granted TfL planning permission to develop new housing, office and public space above the future Nine Elms tube

station. This development will not only accelerate the delivery of vital infrastructure, such as new affordable homes, offices and retail, but will also generate revenue that TfL plans to devote to the funding of the Northern Line extension (TfL, 2016b).

ATM: Relying on government grants secured by formal agreements

Unlike the MTAs in London and Paris, which have a diversity of funding sources, ATM's budget comes from two main sources: government grants and fare revenue. In 2016, EUR 628.52 million (46.7% of the budget) came from fares and EUR 717.22 million (53.3%) from government grants. Most of the grants were from the Catalan government (about 49%), while the central government contributed 17%, AMB 18% and the city of Barcelona 16%. The relative shares of the central government and the region have been changing since 2010, with the central government significantly decreasing its contributions and funding from the region increasing to compensate (Lloveras Minguell, forthcoming). The central government provides additional funding for the state-owned railway system Renfe Rodalies.

Since 2014, the ATM board has elaborated a framework plan detailing how the operating cost of the transport system will be covered through fare revenue and public grants. The plan is a long-term formal agreement between the national government, the region, AMB and the city of Barcelona. It establishes the broader plan for funding the transport system through contributions from these administrations. The first long-term agreement of this type was signed in 2014 and covers 2014-31. The plan is developed both to cover operating cost and to finance existing debt.[12] Before 2014, the funding of the metropolitan transport system was based on short-term financial agreements between administrations.

The framework plan is implemented through three-year financial agreements signed by the same four parties, indicating the contributions to be made by each to ATM's budget. In the 2014-16 agreement, for instance, the Generalitat maintained its contributions to ATM at previous level of EUR 281.2 in 2014, increased it to EUR 286.7 million in 2015 and to EUR 289.1 million in 2016. For the same three years, the City Council of Barcelona increased its contribution by EUR 10 million, to EUR 110 million in 2016, while the AMB increase of EUR 7 million raised its contribution EUR 115.6 million in 2016.

AMB: A combination of government grants and metropolitan taxes

AMB's budget has four main sources. Municipalities across AMB pay a "metropolitan tax", a specific tax charged to all municipalities within AMB, which constitutes 15% of the budget. A further 25% is received through other surcharges (such as waste management municipal taxes) from municipalities, and 52% comes from regular transfers between administrations, including from city councils, the Catalan Water Supply Agency and the Port Authority of Barcelona, as well as redistribution of public transport ticket revenue collected by ATM. The final 5% is from concessions on private operators, including Aerobus and tourist buses (Lloveras Minguell, forthcoming).

Carrying out strategic level and integrated planning

An important characteristic of all the MTAs studied is that they have responsibility, and extensive capacity, for developing strategies that a) go beyond planning of infrastructure and cover a range of transport modes; b) are integrated with planning in other key sectors, such as land use, housing and the environment; and c) align mobility planning with higher policy goals, such as sustainability, enhanced access to opportunities, and economic growth. In addition to delivering important life-quality improvements, having a solid strategy provides certainty for private investment decisions.

Île-de-France Mobilités

Île-de-France Mobilités is the main actor in charge of strategic planning for mobility in the Île-de-France region, notably through the Mobility Master Plan for Ile-de-France Region (PDUIF) mobility plan. Various actors represented on the institution's board provide opinions and contribute to the elaboration of the PDUIF: region, *départements*, city of Paris and representatives from EPCIs and other local bodies.

Development of PDUs is part of a wider planning framework developed by the French government. PDUs were introduced through the LOTI law of 1982. Over the years, other legislation (in particular the SRU Grenelle laws) has contributed to the evolution of the planning framework and the progressive strengthening of PDUs. PDUs were not mandatory at first. In 1996 the Law on Air Quality and the Rational Use of Energy (LAURE law) made PDUs compulsory for urban areas over 100 000 inhabitants. In other urban areas across France the responsibility for developing a PDU lies with lower-level local transport authorities. For Île-de-France, until 2005 the national government was responsible for the PDU. Devolution of powers later made Île-de-France Mobilités responsible. The current PDUIF is for 2010-20.

PDUs establish detailed strategic orientations and the programme of action for ten years. By law they need to be evaluated every five years (Cerema, 2012). They include precise targets related to mitigation of CO_2 emissions, aligned to national objectives. The programme of action is subject to consultation from stakeholders – the national government, regional and municipal councils, inter-municipal and environmental associations, transport users and experts. The PDU has been an important tool in giving coherence to different sector plans as well as fostering stakeholder co-ordination. It enables alignment of projects, since only those that are in line with the plan are eligible for financing.

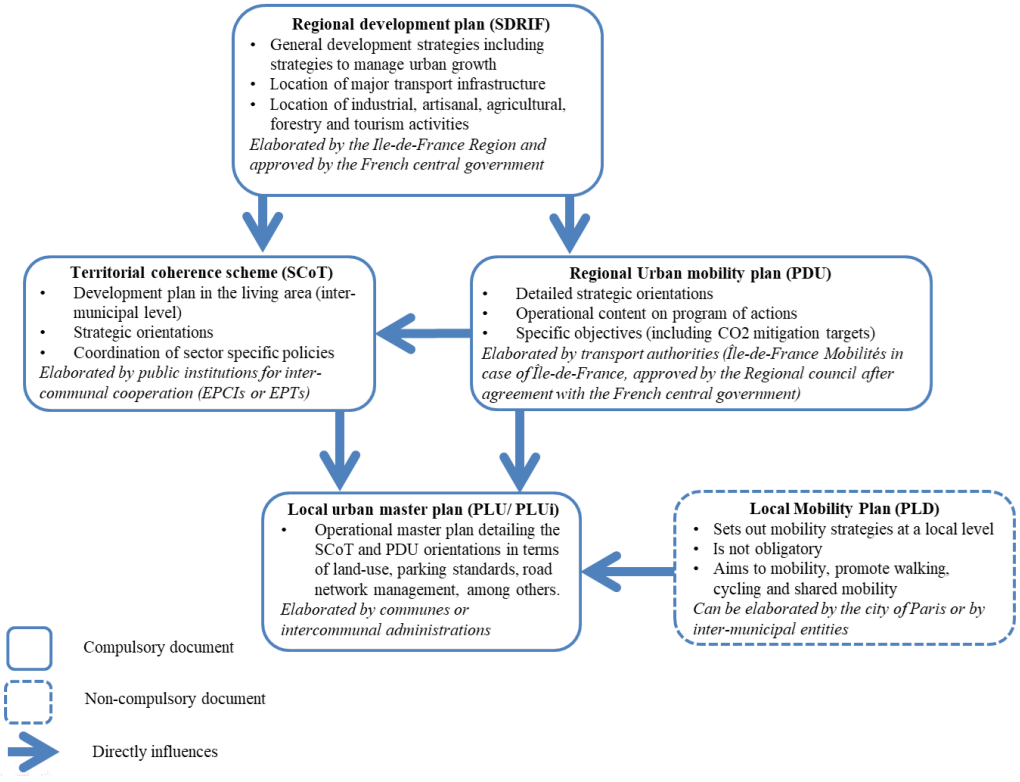
As a general planning tool for mobility across Île-de-France, the PDUIF defines the organisational principles for transport for people and goods and parking, and covers all modes of transport. For instance, it includes strategies aiming to discourage private car use through development and promotion of public transport and less polluting and energy-consuming modes, including car sharing, electric vehicles, cycling and walking. It also includes guidelines for the organisation of on-street parking and public car parks, and incorporates such matters as access to transport for all and road safety. The PDUIF is directly related, and contributes, to other regulatory documents developed for the capital region that set strategies in sectors closely related to transport (Figure 4.1). It must be compatible with the Schéma Directeur de la Région Île-de-France, which sets the general planning framework for the region and is jointly elaborated by the region and the *Préfet* of the Île-de-France region. The PDUIF also is aligned with the CPER, described in the previous chapter.

In addition, the PDUIF is linked to two other planning tools, which were introduced in 2000 by the SRU law: the territorial coherence scheme (SCoT) and local urban plans (PLU for municipalities, PLUi for inter-municipal entities) (Figure 3.1). The PDU determines the organisation of transport networks, traffic and parking. The SCoT sets out urban planning, housing and economic development strategies that are coherent with transport network and commercial developments. Unlike other territories in France, Île-de-France is a unique case where all actions defined in SCoT have to be coherent with PDU strategies.[13] The actions included in both documents are then translated to the local scale through PLUs and PLUis. The SRU law made these plans mandatory; they determine both development for the municipality (or group of municipalities) and the general rules that will apply to the locality and specific sites.

Transport planning in the region is also directly shaped by Local Mobility Plans (PLDs). The PLD determines mobility strategies at the local level, in line with stipulations in the PDUIF. The PLD is developed by municipalities or by EPCI or EPTs, if the latter have transport-related responsibilities

delegated to them. However, PLDs, unlike PLUs, are not compulsory, which is a weakness in the framework. In addition, there is no PLD that covers the urban core as a coherent territory.

Figure 4.1. **Planning framework in Île-de-France**



Source: ITF, based on "Plan de déplacements urbains Île-de-France", http://www.pduif.fr/.

TfL

The Mayor's Transport Strategy is the main policy tool guiding transport planning, management and development in London (GLA, 2018). The MTS is developed for a time frame of 25 years but, as part of the London Plan, is under constant revision. This is because the plan itself is subject to amendments, including on elements of the transport strategy, such as those made in 2012 to comply with the new National Planning Policy Framework (NPPF) and minor alterations in 2008 covering housing provision, waste and minerals.

The MTS, like the PDUIF in Île-de-France, is also embedded in a wider national planning structure. Hence, when developing the document, TfL must comply with the principles set out in the NPPF. Integrating transport and land-use planning, and promoting sustainable transport are at the core of the NPPF. Thus, one main objective of Planning Policy Guidance 13 is that transport is to "integrate planning and transport at the national, regional, strategic and local level and to promote more sustainable transport choices both for carrying people and for moving freight" (NPPF, 2012).

The MTS needs to take into account other statuary and non-statuary documents produced by the mayor, as well as the main transport policy directives of the secretary of state. Examples include statutory strategies for issues such as health and health inequality in Greater London, sustainable development in the United Kingdom and climate change prevention and mitigation defined in the UK

Government Sustainable Development Strategy and the Clean Growth Strategy. In some cases documents developed to address specific issues are drafted as plans that are later incorporated into the MTS: mobility issues that include concerns for mobility-impaired people, for instance, are part of the accessibility plan, which is in the current draft of the MTS. Thus, while transport strategy in London is guided by the mayor and developed by TfL, a range of actors have influence in shaping it (Box 4.3).

Box 4.3. **Roles of various actors in shaping the strategic view for transport in London**

Within the GLA, the London Assembly and the four functional bodies of the authority play roles in defining the MTS. A statement of intent delineating the main principles of a forthcoming MTS is approved by the mayor and sent for consultation to these bodies. The mayor integrates their comments and recommendations to produce a draft MTS. The GLA Act 1999 makes TfL responsible for helping mayors fulfil their duties, one of which is the drafting and implementation of the MTS. Thus, the mayor can delegate the development of the draft to TfL. Once developed, the draft is sent to consultation by the public and other concerned stakeholders, whose comments shape the final MTS. The current MTS is new, having been published on 13 March 2018 by Mayor Sadiq Khan.

The London Assembly can influence transport policy through committees as well; these are responsible for evaluating the mayor's strategies, including the MTS. By evaluating its main points, the assembly can conduct research into particular topics that can either go against or support the mayor's proposals. For instance, the assembly was a major backer of the proposal to further devolve rail services from the national government to GLA (London Assembly, 2015).

As the previous chapter noted, various government agencies work alongside TfL on developing a strategic vision for transport-related infrastructure of national interest in the London area, such as Crossrail and Thameslink. DfT is the main body charged with blocking or accepting infrastructure projects of national interest in the London area. The secretary of state evaluates projects in light of the guidelines in the Policy National Statement on National Networks, which was created under the Planning Act 2008 to speed planning for nationally significant infrastructure projects by clarifying the "policies against which the Secretary of State will make decisions on applications for development consent for such projects" (UK Parliament, 2014). The document, written by the government, pays particular attention to how a given project might mesh with the government's policies on adaptation to and mitigation of climate change (National Infrastructure Planning, 2018). In this process of approval or rejection of projects, DfT is supported by other national bodies, particularly by the National Infrastructure Commission, reporting to the Treasury.

Source: ITF, based on London Assembly (2015); UK Parliament (2014); National Infrastructure Planning (2018).

Overall, the MTS, supported by TfL's work, sets the pace and defines the main transport policy orientations for most concerned actors in London. When it comes to the boroughs, the GLA Act 1999 gives them the role of implementers of the MTS in their area of influence, which they do through the Local Implementation Plan (LIP). The GLA Act mandated LIPs to ensure that the transport system in a given territory abides by and promotes the MTS. To be implemented, LIPs require the mayor's approval. The mayor also determines the budget given to local authorities for transport policies after reviewing the LIPs. All this ensures that borough planning reflects that of TfL.

The MTS is developed in tandem with the spatial plan for London (London Plan) and the UK Economic Development Strategy. Such close co-ordination of strategies helps ensure consistency and build a decision-making framework that enables an overall integrated strategy for London. A number of tools developed by TfL are central to supporting such work and make the framework for integrated planning in London particularly strong (Box 4.4). Another important factor is that TfL as an institution

has developed very robust capacity to model long-term scenarios linking land use and transport, which inform the MTS (Box 4.5).

Also, just as LIPs need to comply with the MTS, boroughs' local urban plans need to be in strong conformity with the London Plan. The mayor, in turn, is bound by duty to consult with the boroughs on any alteration to or replacement of the London Plan or the MTS regarding strategic planning, changes to the transport network or major transport projects and developments. The mayor has a responsibility to align priorities and goals between the London Plan and municipal spatial plans outside Greater London. This "duty to co-operate"[14] entails conducting extensive consultation with counties adjoining London and informing local planning authorities of any alterations envisaged for the London Plan. The GLA Act 1999 says the mayor of London must "consult on any alteration to or replacement of the spatial development strategy (the London Plan) with counties and districts adjoining London" (Section 335) and "inform local planning authorities in the vicinity of London of his views concerning any matters of common interest relating to the planning or development of London or those areas" (Sections 339 and 348). For instance, following 2014 amendment to the plan, the mayor held two consultations for the wider southeast, which over 200 representatives attended.

Box 4.4. **Tools to link land use planning and transport strategies used by TfL**

The Public Transport Accessibility Level indicator (PTAL) is a highly influential metric used by TfL to link urban development and transport. It measures access to the public transport network across the Greater London area. The PTAL score provides information on how close a selected point in the city is to public transport and how frequent services are there. The methodology takes into account access time and service availability. Each location is given a score from 0 to 6, with 0 representing very low access and 6 the highest. To make a suite of its tools, data and analysis more easily available to boroughs, developers and planners, TfL introduced WebCAT, an open web portal for connectivity assessment. WebCAT is an interactive mapping tool which makes it possible to identify PTAL values and travel time plots for any location in London.

PTAL is are used in the London Plan as an essential tool for determining suitable density of development across Greater London, through the Sustainable Residential Quality Matrix (see below). The London Plan also uses PTAL for calculating recommended parking standards in both housing and commercial developments, on the principle that areas better connected to public transport need fewer parking spaces. PTAL can determine the share of business and commercial activities located in areas that have good connections to the public transport network (those with a PTAL of 5 or 6). This is used to monitor compliance with the London Plan goal of having a high share of workplaces that are well connected to public transport. The PTAL is also used as part of the transport assessment required for specific development projects. It allows officials to evaluate the impact of developments and their relation to public transport access and thus serves as an evidence base for a sufficient level of public transport infrastructure for developments and for negotiating contributions from developers.

TfL has also developed accessibility indicators such as the ATOS index, which measures accessibility in terms of travel time to jobs, educational establishments, etc. However, this new indicator has not yet been accommodated in the MTS.

The Sustainable Residential Quality Matrix was adopted in 2016 to strengthen land use and transport co-ordination. It is an operational tool enabling a link between citywide strategies of compact development and transport strategies. Its primary purpose is to provide clear guidance on appropriate ranges of density for future development based on location type (i.e. central, urban or suburban) and PTAL. On this basis, the London Plan sets ranges for housing density in its density matrix: the better public transport access is, the higher the density level at which the area can be developed.

Such measures have two main rationales: they make it possible to project potential housing capacity while identifying where it can be best provided, and they let local authorities know where to provide sustainable development with good transport access. The Sustainable Residential Quality Matrix is designed to make new developments compatible with sustainable residential policy principles set out in the London Plan.

Source: ITF, based on TfL (2016).

Box 4.5. **Strategic models used by TfL for modelling land use and transport interaction**

TfL has a rigorous approach to assessing urban development scenarios, in particular with regard to expected transport volumes and capacities. It has developed the following modelling tools to guide transport planning in relation to land-use strategies.

- London Transportation Studies Model (LTS): uses population and employment forecasts and other inputs to forecast the number of trips to be made in London in the future, where people travel to and from, when they travel and which transport mode they use.
- London Land-Use and Transport Interaction Model: predicts the use of land for human activities, depending on government policies and transport investment.
- Rail Plan Public Transport Assignment Model: predicts the public transport mode (e.g. rail, Underground, bus) and route passengers will choose to get to their destination, as well as the associated crowding impact.
- Highway assignment models (HAMs): covering the whole of London, five models that predict the routes drivers will choose and the impact of the associated congestion and delay on London's roads.
- London Regional Demand Model (under development): a demand-balancing model that is similar to LTS but uses the HAMs and Rail plan to model route choice.

Source: OECD (2015).

ATM and AMB

ATM acquired ample planning capacity in 2003 after the regional government of Catalonia approved the new mobility law giving ATM, as the regional mobility authority, the task of drawing up a Mobility Master Plan for the Metropolitan Region of Barcelona. The PDM is the tool that enables implementation of the Regional Mobility Directives (developed for the whole region of Catalonia) for the metropolitan region.

The Mobility Master Plan is a roadmap which aims to promote non-motorised transport modes and foster co-ordination with other planning documents. It is produced in the context of other plans and programmes that affect mobility and land use in the country and the region of Catalonia. Some examples are the Spanish Strategy for Climate Change and Clean Energy, the Spanish Strategy for Sustainable Mobility, and the National Plan for Infrastructure, Transport and Housing, all developed by the Ministry of Development. The PDM also complies with the Catalonia Strategy for Sustainable Development, and the Catalan Plan for Energy developed by the regional government. The Regional Infrastructure Master Plan, developed by ATM, is created in line with the PDM.

The plan is revised every six years. It includes strategies for monitoring and managing regional mobility, as well as for planning and operating the main road network. The document sets as central objectives the promotion of public transport, bicycle use and walking. The strategy also incorporates actions to organise parking as well as planning of inter-urban car traffic.

Within the framework of the PDM, ATM establishes quantitative mobility and environmental targets to be attained at the scale of the Metropolitan Region of Barcelona. It includes guidelines for urban mobility plans to be developed by lower levels of government (municipalities and AMB). This provides them with the flexibility to implement their own strategies but ensures alignment with the wider vision at the scale of the metropolitan region. Since 2003, the development of urban mobility plans has

been compulsory for municipalities in the metropolitan area. In 2010, when AMB was created, development of an urban mobility master plan at a metropolitan area level also became obligatory.

AMB is in charge of developing the Metropolitan Mobility Master Plan for the Metropolitan Area of Barcelona (PMMU) under Law 31/2010 of 3 August 2010. The strategy set out in the plan corresponds to the responsibility assigned to AMB to encourage sustainable mobility. PMMU is still in its first elaboration process. A participatory procedure that includes voices from academia, experts and citizens started in 2013 and it is expected to be presented in 2019. The drafting process gathers opinions and perspectives of all municipalities in the metropolitan area. It will take into account all transport modes, including public transport, pedestrians and bicycles, private vehicles, freight and logistics and smart mobility. Hierarchically speaking, PMMU will need to comply with the mobility strategies set by the Regional Mobility Guidelines and the PDM developed by ATM. Its elaboration will also be inspired by the drafting of the new Metropolitan Urban Master Plan of the metropolitan area, which seeks to provide an integrated view of mobility, urban planning, environmental policies and housing strategies for the urban core.

Notes

[1] Exceptionally, ATM is responsible for tram infrastructure within AMB area. In 1998 ATM issued a tender to design, build, finance and operate the tram service. The tram system was funded principally using European Investment Bank loans and project credits, supplied by Banco Sabadell and Société Générale, both shareholders in the concessionaires. The third and fourth most important funding sources were ATM itself and VAT credit.

[2] Interview with an ATM policy maker.

[3] Région d'Île-de-France 51%; Ville de Paris 30%; Département des Hauts-de-Seine 7.7%; Département de la Seine-Saint-Denis 3.7%; Département du Val-de-Marne 3%; Département des Yvelines 1.5%; Département de l'Essonne 0.9%; Département du Val-d'Oise 0.9%; Département de Seine-et-Marne 0.6%.

[4] The limit is 1% for cities with more than 100 000 people (increased to 1.5% if the organising authority for transport decides to invest in a large-scale project such as tramway or metro) and 0.5% for cities between 10 000 and 100 000 (or 0.85% in the case of planned investment in a large-scale project).

[5] An extra 0.05% can be raised if the organising authority for transport is an EPCI: a *communauté de communes* (grouping of municipalities), *communauté d'agglomération* (a type of metropolitan government structure) or *communauté urbaine* (urban community).

[6] The proceeds of the tax enabled modernisation of the Paris metro network, as well as construction of metros in Marseille, Lyon and other cities.

[7] Within the limit of EUR 1.02 per hectolitre for premium-grade unleaded petrol and EUR 1.89 per hectolitre for the conventional diesel.

[8] The levying authority can be the GLA, a county council in England, a district council of an area in England for which there is no county council, or a county council or county borough council in Wales.

[9] UK business premises have a rateable value set by the Valuation Office Agency. It is ascribed to a domestic or commercial building based on size and location, among other factors. The value represents the annual rent the property could have been let for on the open market as of a particular date.

[10] Several categories of users and vehicles are exempted from the congestion charge. These include two wheeled motorbikes and mopeds, emergency services, vehicles used by disabled people.

[11] Congestion charging is an expensive way of raising revenue, and therefore is not recommended if that is the intention. But it can be a good tool when the main purpose is to correct pricing by better reflecting the social cost of driving (ITF, 2010; 2017).

[12] Cumulative debt of Barcelona's transport system, acquired before ATM was established.

[13] In other cities across France it is the PDU that has to be in conformity with strategies defined in the SCoT.

[14] The process of preparing the plan is not subject to the duty to co-operate. However, it is subject to the duties to inform and consult.

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Chapter 5. Delivering bus services at metropolitan scale

Bus services are a central component of public transport networks. Effectively integrating buses and complementary modes across administrative boundaries has been one of the main issues the MTAs in London, Paris and Barcelona have had to deal with.

The model adopted by each MTA for delivering bus services differs. In Paris, a public, government-run system is in place, although preparations are being made to introduce competitive tendering by private operators by 2019. In London, the system is run by private operators under the regulation and overall planning of TfL. Barcelona has a mixed system with large shares of both publicly and privately run services.

While differently run, bus services in the three cities account for high shares of public transport trips:

- Paris: Buses make 33% of journeys in Île-de-France – some 3.5 million every day. These journeys are provided by a fleet of over 8 000 vehicles (4 500 operated by RATP and around 4 000 by private firms) operating on a network of about 1 450 km.

- London: Buses also account for the highest share of public transport journeys in Greater London (21% mode share). They make around 1.8 billion passenger journeys a year, which are provided by a fleet of over 5 500 vehicles operating 346 million scheduled bus kilometres annually.

- Barcelona: Bus services amount to 37.3% of the total public transport demand in the Metropolitan Region (including urban and interurban transport). The total fleet is composed of 2 330 buses, which represent 356 million passengers yearly on 138 million veh/km. In the metropolitan area of Barcelona, 69% of all bus trips are covered by the publicly owned operator TMB, which operates in the metropolitan area with 99 lines and 834 vehicles, serving a total distance of around 857 km; the remaining 31% is delivered by private operators though 107 lines and 614 vehicles (ATM, 2016).

This chapter describes in detail the model used in delivering metropolitan-wide services in each case. It highlights elements of the concession-granting process and the types of contract that have been valuable for ensuring delivery of high-quality services. It draws special attention to the role of the MTA in planning and regulating the system.

General model

Île-de-France Mobilités: Publicly run services in transition to open tendered contracts

Public transport in Île-de-France is mostly operated by the publicly owned RATP and SNCF. RATP runs most metro, tram and bus services in Paris and its suburbs. SNCF has a monopoly on national rail services, and shares with RATP the RER commuter rail network in the Paris region. In the Île-de-France region, some 8% of total public transport services, and almost half of total bus operations, are provided by private companies, which are grouped into a federation, OPTILE. Box 5.1 gives a full description of public transport operators in Île-de-France.

A very limited number of tendering contracts have been emitted by Île-de-France Mobilités for public transport operation. This is the case, for instance, of operations for bus lines on motorway A14 and for some new tram lines to be opened in the suburbs. This situation makes the public transport market in Île-de-France a monopoly or oligopoly, depending on the service and its localisation. This situation is unique in France. After the LOTI Act of 1982 put local authorities in the rest of the country in charge of the management of the public bus systems in their respective territories, the Sapin Act of 1993 imposed tendering for public transport operators. Indeed, France's transport competition practices served as inspiration for European Union standards in the liberalising of road and rail transport.

In particular, EU Regulation 1370/2007 of 23 October 2007 required the liberalisation of public passenger transport services by rail and road (EU, 2007). The regulation stipulated a transition process for the liberalisation. The law 2009-1503 of 8 December 2009 on the organisation and the regulation of rail transport set the pace for the gradual liberalisation of public transport services in Île-de-France. Under this law, tram services in the region will be liberalised on 1 January 2030, metro services by 1 January 2040 and bus services in Paris *intra-muros* from 1 January 2025 (French Government, 2009). The law did not cover OPTILE-related bus contracts. They expired at the end of 2016, after which, following a request by the State Council, they should have been put to tender. OPTILE operators were ultimately offered the possibility of an extension of their contracts until 2021, following negotiations between Île-de-France Mobilités and OPTILE on one hand, and government officials on the other. The conditions in which liberalisation of the various public transport modes will be implemented have not yet been released, as they are still undergoing debate and drafting. A new law project for a new pact for railways in France will set new dates for the liberalisation of rail services in the country's capital. The liberalisation of inter-city trains within Île-de-France (*transilien*) will take place between 2023 and 2033, lines RER C, D and E will do so between 2033 and 2039 and in 2039 RER A and B lines will follow suit.

Île-de-France Mobilités is in charge of the design and management of the public transport system in the capital region. It manages RATP, SNCF and OPTILE operations through multi-annual contracts, and monitors the quality of their performance. Île-de-France Mobilités surveys the collection and redirection of revenue to operators, done by Comutitres, through its agreements with Comutitres itself, as well as with SNCF and RATP. Île-de-France Mobilités also defines social fare subsidies for particular groups, such as students and the elderly, to ensure universal access to mobility and public transport.

Box 5.1. **Main public transport operators in Île-de-France**

RATP has been the main operator of public transport services in the French capital area since 1948. It has held an exclusive right to operate the routes assigned to it by Île-de-France Mobilités since 1949. It operates seven tram and 14 metro lines in the city, and with SNCF jointly operates lines A and B of the RER. It has operating rights on about 350 bus routes.

SNCF is France's foremost government-owned company, in charge of the country's railways. Its monopoly over the rail network extends to most suburban and regional railway services in the capital area. It operates most of the RER lines (A, B, C, D and E), though shared operation of the A and B lines with RATP. It is also expected to operate tram line 11 after its completion.

OPTILE is an association formed by 80 transport private enterprises, which together operate more than 1 000 bus lines in Île-de-France. The association is charged with representing the interest of its constituents vis-à-vis Île-de-France Mobilités and other public institutions related to transport. It collects and manages the revenue resulting from delivery of public transport services in Île-de-France. OPTILE's members assure 8% of the trips in all public transport modes and half of the bus and fleet circulating on regular lines in the capital region. They particularly participate in the provision of public transport on regular lines, school transport and other specialised services, such as on-demand and transport for reduced mobility users (OPTILE, 2018).

Source: TfL, based on Lecler, S. (2003); OPTILE (2018); French Government (1948), Loi nº 48-506; RATP (2018).

TfL: Privately run services, public regulation

Bus provision in London is a unique case within the UK. Unlike other cities, where bus services were fully deregulated, the bus market in the capital is privately run but publicly regulated. Thus, despite the common branding the city has created with red two-decker buses, the majority of bus services are run by different private operators. There are around 30 contractors in the Greater London area, but the majority of services (75.4%) are provided by six large operators (DfT, 2018).

Since its establishment in 1999, TfL has been responsible for securing bus services and ensuring the proper execution of bus contracts. It carries out this responsibility through a subsidiary, London Bus Services Ltd, better known as London Buses.

London Buses is in charge of planning and tendering routes, as well as awarding contracts. It provides bus stops and user information; monitors the quality of services, vehicle standards, and driver hours; and oversees research and development. Bus operators develop timetables (subject to approval of TfL), manage all aspects of day-to-day operations of routes, and control the use of tickets and smart cards. In addition to running services, they hold assets (such as buses and garages) and employ staff.

TfL collects all revenue from bus operations in the Greater London area. In its annual business plan, TfL fixes mileage of the contracted operators for the following year, which is subject to forecast levels of operating revenue and cost.

In 2017, TfL spent GBP 2.15 billion operating bus services, of which around 75% was funded by fares and the rest by grants and commercial income.

London buses are superior to the Underground in terms of affordability and fare subsidies. Around 40% of bus users travel for free, which is a substantial concession compared to, for instance, 11% of London Underground passengers (Transport Committee, 2013). TfL offers discounts on groups that are shown to rely more than others on buses, such as those aged 16 to 24 and the elderly.[1]

Barcelona: Mixed public and private delivery

In the Metropolitan Region of Barcelona, the bus transport network is organised as a mixed system in which one public operator, TMB, and several private ones coexist and provide service in different areas.

At the metropolitan level (the city of Barcelona and 35 surrounding municipalities), AMB is responsible for planning and managing bus services, including route planning and concession granting. The bus services for which AMB is responsible are divided between those that it manages directly through TMB and those that it manages indirectly, which are provided by private companies contracted by AMB. TMB operates urban routes in the city of Barcelona and adjacent municipalities in the daytime through direct management of a subsidiary, Transports de Barcelona. In areas of AMB not covered by TMB, operations are run by the private sector. These services connect mostly the suburbs and downtown area and also operate urban services at night.

TMB enjoys a high degree of autonomy and has considerable freedom to design and plan its services. It carries out its own planning programmes, subject to AMB approval; TMB is also subject to direct intervention of the Barcelona City Council at the time of planning, though the AMB board has the final word. Private operators have less management autonomy: AMB organises the tendering process, setting detailed specifications on how operations must be run. It also applies incentives to improve efficiency and quality (explained further in the next section).

Concessions that are not managed by AMB are the responsibility of the Department of Territory and Sustainability of the regional government. They include services that connect the metropolitan area with the rest of the metropolitan region. Outside the Metropolitan Area of Barcelona, the concessions under which bus service providers operate are very old and proceed from agreements that can be traced back to the 17th Century. The contracts did not include any public service obligations, so the region had to renegotiate them over time. The extension of concession periods was often negotiated in exchange for additional quality performance standards. While allowing for improvements in the shorter term, this continuous extension has delayed the shift towards an overall enhanced framework for contract design. The situation has also set back the realignment of regional routes, which could potentially be better co-ordinated with those that run in the Metropolitan Area of Barcelona.

As a remedy, all bus concessions supervised by the Generalitat de Catalunya expire in 2028 with no consideration of further extension. Thus the bus network and regulation of bus services outside the metropolitan area will be revised.

ATM is responsible for the integrated fare system and in charge of collecting the revenue generated by tickets sales for all public transport modes, which it redistributes among the operators. The redistribution depends on the zones crossed by the trip, the number of modes used and the type of ticket validated.

Revenue from operator-specific single trip tickets is passed on to the operator. Revenue from multi-modal trips (with at least one transfer between modes) is redistributed among the corresponding operators according to the fare zones passed over in each stage of journey (Lloveras Minguell, forthcoming).

ATM also participates by issuing financial contracts that are agreed between ATM and the public service providers. These contracts reflect agreements between the administrations represented on ATM's board on budget distribution between services and new investment. ATM's board agrees on the amount of contribution that will be dedicated to specific actions (e.g. service extensions) as well as the administration that will assume the cost.

Like TfL and Île-de-France Mobilités, ATM has established social transport pricing for assorted population groups, facilitated by the introduction of the IFS. ATM gives subsidies to children aged 4-14, quarterly season ticket for people aged up to 25, and a range of tickets for large or one-parent families, with discounts on personalised travel cards of 20% for the general category and 50% for special category large families. Municipalities and AMB can add their own subsidies. If they do so, supplementary subsidies are paid from the budget of the municipality concerned. AMB set an unemployment price of 79% off a general ticket and introduced a Metropolitan Pink Card and an Accompanying Metropolitan Pass to facilitate movement of elderly and disabled people with low income so as to improve their access to public transport services and increase their participation in civic life.

International experience suggests that targeted subsidies, as opposed to generalised support for particular groups, are a better way to ensure efficient resource allocation and strike the right balance between financial sustainability and service affordability. As in these three cases, it is very common for programmes to simply grant subsidies to easily identifiable groups (the elderly, students) considered vulnerable or poor. However, because there is often a mismatch between these categories and lower income groups, such programmes result in errors of both inclusion and exclusion, losing significant resources on subsidising travel by non-poor residents while leaving high shares of the poor without support. Therefore, at least in terms of equity, programmes designed in this way are badly focused. For

this reason, some cities, such as Bogotá, have designed programmes that target transport beneficiaries according to socio-economic data (Box 5.2).

Box 5.2. **Innovative subsidy programme for targeted population groups: The case of Bogotá, Colombia**

With the implementation of an integrated public transport system (Sistema Integrado de Transporte Publico, SITP), Bogotá has faced the challenge of providing public transport services for fares that are both affordable and financially sustainable. It addressed this challenge by setting fares at cost-recovery levels and then offering targeted demand-side subsidies for specific segments of the population. For this purpose, Bogotá adopted a "pro-poor" public transport subsidy in early 2014.

The national targeting system, SISBEN (Sistema Nacional de Selección de Beneficiarios), was used to identify potential beneficiaries. The SISBEN approach, introduced by Colombia's National Planning Department in 1994, has been used in Colombia's social safety net programmes as a way to channel social assistance to those in need and reduce inequality. To determine if an individual is eligible for assistance, SISBEN relies on several indicators, such as household composition, marital status, education, employment and income. The final subsidy plan was designed after assessment of its potential impact on the transport system, along with assessment of the financial sustainability of alternative plans.

Ex-post evaluation demonstrated that subsidy recipients increased their use of the public transport system. Monthly trips for beneficiaries rose by nearly 56% compared to normal fare card users. The subsidy had an impact on labour market outcomes as it led to a significant increase in the hourly earnings of informal workers. It appeared to increase productivity by allowing informal workers to have better mobility and access to economic opportunities, and thus higher earnings.

Source: ITF (2017).

Bus network planning

Île-de-France Mobilités

The bus network in France's capital area is chiefly a responsibility of Île-de-France Mobilités. Through the PDU, Île-de-France Mobilités defines and establishes the hierarchy of bus lines in its area of coverage. The design of the bus network is done in partnership with the relevant actors in the area, such as the government (for national roads), EPCIs and the municipalities. More particularly, local authorities are charged with indicating to Île-de-France Mobilités the main limitations in terms of the effectiveness, efficiency and quality of service delivery in their area. This can be done through their mobility plan (PLD), if they have one. EPCIs are in charge of the control of operators only when they are AOPs, which was limited to three initial cases, and currently to only two territories found near the project of the plateau de Saclay. In some occasions, such as the restructuring of the Paris network, it has been possible for citizens to participate in major changes to the bus system through consultations launched by Île-de-France (PDUIF, 2011a).

All these actors provide Île-de-France Mobilités with the information needed to define the bus lines, and can propose modifications to routes. Île-de-France Mobilités, however, has the last say in order to secure coherent service for the whole territory.

Île-de-France Mobilités defines five types of lines based on technical selection criteria including distance, population density and service effectiveness[2] (PDUIF, 2011b) (Box 5.3).

Box 5.3. **Routes as defined by Île-de-France Mobilités**

- Express lines: lines of regional interest that assure the connection of two main activity nodes (urban poles or stations) that are at least 20 km apart and can use express roads, i.e. dedicated roads for service delivery.
- Mobilien lines: lines of regional interest with the capacity to connect high-density urban territories and serve as essential components of the territorial bus grid. They can connect two main activity nodes (generally train stations) that are less than 20 km apart.
- Strong lines: these connect high-density urban territories but do not have to run regularly basis and depend on demand.
- Local lines: these have a complementary purpose at local scale, which ensures an accurate response to local bus demand. They can serve connections with one main activity node.
- Proximity lines: these have a short itinerary that covers one or two municipalities, delivering a particular local transport service. This category includes on-demand transport.

Source: Île-de-France Mobilités (2014).

Île-de-France Mobilités also participates in public bus infrastructure planning. It issues guidelines that help local authorities build the required infrastructure in accordance with safety and accessibility standards set for Île-de-France.

TfL

TfL is responsible for route planning in the Greater London area, which is done in accordance with its Guidelines for Planning Bus Services. Bus service planning is carried out continuously and on a network basis. TfL constantly monitors performance of the entire bus network and may make adjustments at any time to address emerging issues. Route planning is based on current and forecast demand on bus corridors, in particular changes related to new developments as well as changes in the local population. Bus network planning is a sophisticated modelling process, which uses algorithms allowing TfL to accurately assess passenger volumes and forecast demand.

The current policy adopted by TfL prioritises making the best use of existing capacity and redistributing resources to meet changing demand, rather than adding capacity. Accordingly, buses are being redistributed from central London to outer London, where the potential for modal shift to bus is greatest, as well as to growing areas where demand is expected to rise the most.

TfL consults on all significant changes to the bus network, including realignment or retendering of routes and changes in frequency. The consultees include boroughs and London Travel Watch. The latter is an independent watchdog organisation for transport users in Greater London. Funded by the London Assembly, it takes part in monitoring performance of bus services, assists with complaints and participates in the consultation process on a wide range of issues related to the services operated or licensed by TfL. Consultation with boroughs is also essential. For instance, in the process of development of Queen Elizabeth Olympic Park for the 2012 Olympics, TfL worked in consultation with the relevant borough to prepare bus service changes for the area.

ATM and AMB

ATM defines bus-related infrastructure improvements in its Infrastructure Master Plan in the metropolitan region of Barcelona. For instance, the PDI for 2011-20 includes a new public transport road infrastructure programme, with new bus stations in large hubs, reserved bus platforms and bus-HOV (high-occupancy vehicle) lanes. The bus route improvements are defined in the Mobility Master Plan (PDM).

AMB plans the basic metropolitan road network in line with projects defined in the PDI of ATM. AMB also decides upon bus service supply and network development for services carried out by private operators (in the case of TMB operations, it approves TMB proposals). However, private operators can propose some service modifications, within certain limits. For instance, changes in total mileage operated are limited to a maximum 10% change. And while operators might suggest some changes to existing routes (subject to negotiations), they cannot propose new routes.

Concession process and contract types

Île-de-France Mobilités

Île-de-France Mobilités is responsible for defining the supply of transport and the level of service quality in the context of contracts with operators. It sets particular and individual contracts with SNCF and RATP, the main public transport operators in the area, as well as with other private bus operators in the first and second *couronne* (the suburban areas around Paris), through OPTILE.

Contracts with RATP and SNCF

Île-de-France Mobilités negotiates multi-annual contracts with RATP and SNCF that control the quantity and quality of service by fixing bonuses and penalties for the operators based on the service quality provided (Heddebaut, 2017).

The contract with RATP contains several indicators for calculating bonuses to be paid to RATP. In terms of bus services, these include regularity, service provided by drivers and the quality of information and signage at bus stops.

Contracts with OPTILE

Private operators, under the OPTILE umbrella, provide bus services outside Paris and have individual agreements with Île-de-France Mobilités. No tendering is done. Before 2007, Île-de-France Mobilités had agreements with each individual enterprise and thus assigned individual financial compensation calculated on a scale harmonised for Île-de-France, based on number of passengers and average trip time. These conventions lacked the characteristics required by the decree of 6 July 2000, which set new standards for operators of public services in Île-de-France via Contracts of Public Service delivery (CSPs).

A transition period of ten years was negotiated between Île-de-France Mobilités and OPTILE in 2007 to incorporate the standards imposed by the 2000 decree. This period had two main time frames, each characterised by a different type of contract. The first stage, of up to four years, imposed individual contracts for all operators, with the same conditions. This type of contract had certain commonalities with the preceding conventions, such as the remuneration framework. At the same time, it included changes in relation to the previous situation that set up a progressive evolution towards the new CSP standards. For instance, the contract made it mandatory for enterprises to report their current and future

investment plans to Île-de-France Mobilités. This clause allowed Île-de-France Mobilités to constantly obtain accurate information on planned investment programmes related, for instance, to fleet renewal, thus increasing its capacity to co-ordinate its own potential contributions accordingly (RATP, 2006).

In a second stage contracts introduced new considerations for enhancing the quality of service. For instance, the new contracts included bonuses and penalties based on the operators' performance. But unlike the previous route-specific contracts, they were issued for groups of routes. The network-based element was used to better co-ordinate bus operations at the local level. The areas' perimeters were defined by Île-de-France Mobilités in close co-ordination with local authorities. In areas where Île-de-France Mobilités has delegated authority to issue contracts to AOPs (proximity transport authorities), these institutions must use the same contract type in order to ensure compliance with CSP standards (RATP, 2006).

TfL

Open tendering

The tendering process is supervised by TfL, which issues an invitation to tender every two or three weeks so that about 20% of the London bus network is tendered each year. Concessions are granted for five years with the possibility of a two-year extension if performance requirements are exceeded (see next section). Invitations to tender provide a detailed description of the service to be delivered, including service frequency, vehicle type and minimum performance standards. Routes are tendered individually, but often some routes that are located in the same area are grouped to facilitate transitions between operators.

Developing the call for tender:

Before putting a route (or group of routes) out for tender, London Buses analyses data from previous operations, such as route alignment, frequency of service, type of vehicles and minimum performance standards, and adjusts the description for the new services as needed.

Routes are differentiated according to frequency of service, which is expressed through peak vehicle requirements. Services are classified as high frequency, with five buses or more per hour, or low frequency, with four or fewer per hour. Within London's bus network some 82% of routes are classified as high frequency. Each route has a specific requirement for the types of vehicle to be used. Vehicles used on contracted services range from 40-capacity minibuses to 87-capacity double deckers. The operator can choose the vehicle manufacturer, but needs to comply with the criteria for vehicle specification defined in the tender documentation.

Pre-qualification system:

London Buses uses a pre-qualification system where operators are chosen from an approved list of suppliers. If a company is interested in providing a bus service but is not on the list, London Buses send out a pre-qualification questionnaire and undertakes a desktop evaluation. The pre-qualification procedure includes assessment of financial stability of the company, previous safety performance, and previous experience in the transport or service sector. If the initial assessment is acceptable, the potential service provider is added to the approved supplier list.

TfL selects a set of pre-qualified bidders that can submit sealed bids for individual routes or a combination of routes. This format serves two objectives at once: a) the single route tendering

encourages participation of smaller bus operators; and b) the possibility of bidding for a package of routes facilitates co-ordination and fosters economies of scale (Amaral, 2012).

Tender evaluation:

Operators entering the tender provide a plan for delivering at least the level of service defined in the specification set out by TfL. They also submit the estimated annual cost for the provision of the service. The evaluation process is led by TfL's senior contract evaluation manager and carried out by a technical team. Factors evaluated include price; ability to deliver quality of service; type of vehicle proposed; ability to recruit, train and retain staff; financial status; and health and safety policy and records. Contracts are awarded to the lowest-price bidder, with strong consideration of other qualitative factors. For instance, the promise of new vehicles or extra off-peak services might overweigh the best economic value parameter (Amaral, 2012).

Gross cost contracts with quality performance incentives

TfL's current process of competitive tendering and gross cost contracts with quality performance incentives has evolved into a very successful model. Bus services in London were formerly operated under net cost contracts (Table 5.1), in which operators provide a specified service and retain the fare revenue. If no subsidies are granted, the operators simply cover their cost with the revenue collected. The selection criteria for giving out concessions is usually in this case either the lowest price offered to users or the highest amount offered to the authority in exchange for running the line. If subsidies are granted, the authority pays these for any unprofitable operations. Under this type of contract the operator carries the cost risk, i.e. the risk that the level of operating and capital cost is underestimated. They also carry some of the revenue risk, i.e. the risk that patronage and revenue might fall due to a decrease in demand or changes in the passenger structure (Poliak et al., 2015). Operators have an incentive to mitigate some of these risks by cutting down on maintenance and other quality-related expenditure.

Table 5.1. **Evolution of contracts in the London capital area**

Period	1970-1984	1985-1996	1995-1998	1998-2000	2000-present
Type of contract	One contract with subsidiary	Gross cost contract	Net cost contract	Gross cost contract	Quality incentive contract
Ownership of bus companies	Public – 1 subsidiary company	Public – 13 subsidiaries and private operators	Private	Private	Private
London Transport	Under direct control of GLC (metropolitan government)	Under central government control	Under central government control	Under central government control	TfL
Revenue risk	Public	Operator	Operator	Operator	Operator
Demand risk	Public	Public	Operator	Public	Public

Source: Gómez-Lobo A. E. (2013).

In other periods, buses in London were operated using gross cost contracts, where an operator is paid an agreed fixed sum for running a service for a set period, regardless of patronage. All revenue resulting from the operations is retained by the authority issuing the contract. The government retains demand risk, which helps avoid creating incentives to cut down on quality of service (as in the case of net cost contracts). However, there is little incentive for operators to perform well if they do not receive benefits from increased patronage. To deal with this issue, TfL opted for introducing quality incentives to gross cost contracts in the form of bonuses and penalties, as well as the possibility of extending concessions, which are linked to reliability and general performance of services.

Quality incentives and the reliability performance payment:

Minimum performance standards (MPS) are a set of indicators used to measure operator performance in quality incentive contracts. Levels set for different contracts are based on route characteristics, such as average journey time, level of congestion and types of area served. A reliability performance payment is calculated by comparing the operator's actual annual reliability performance against that set in the MPS.

Reliability measurements and monitoring proceedings are different for high and low frequency routes. For high frequency routes reliability is based on regularity of services, expressed through waiting time. TfL measures the intervals between buses and converts them to an excess wait time (EWT) parameter. The EWT is defined as the additional time passengers waited compared to the waiting time that would be expected if the service were perfectly reliable. This aims to ensure that buses are evenly spaced on the routes and that passengers do not have to wait longer than 1.5 times the advertised frequency.

Payments are made on a progressive scale. For instance, operators receive an additional bonus of 1.5% of the contract price for each 0.1 minute of actual EWT under the minimum standard defined in the contract. However, if the actual EWT is higher than the minimum standard, the operator's payment is reduced by 1% of the contract price for each 0.1 minute increase.

For low frequency routes the main parameter is punctuality of services. TfL monitors actual departure time from the stop and compares it to the one advertised. It computes the percentage of departures made on time (i.e. between 2.5 minutes earlier than expected to 5 minutes later than expected). Bonuses are paid at a rate of 1.5% of the contract for each full 2% on-time performance that exceeds the minimum standard set in the contract. If the operator performs below the minimum standard, deductions are made at a rate of 1% per 2%. Bonuses are capped at 15% of the contract price and penalties at -10%.

Minimum performance standards for mileage operated:

Under quality incentive contracts, deductions from contract payments are also made for mileage that is not operated. The deductions are in proportion to annual contract price and scheduled mileage. This is an incentive for operators to deliver the mileage established in the contract. The deductions, however, are made only for lost mileage that is under the control of bus companies, such as staff absence or mechanical breakdown. Lost mileage that is beyond their control, e.g. due to congestion, is not deducted.

Contract extension:

The initial five year contract can be extended for two years if the operator meets or exceeds the reliability "extension threshold" criteria set in the tender specifications for each route. "Extension

threshold" criteria are based on EWT and On-Time scores but requirements are more stringent than those set in the MPS. If the operator meets or exceeds indicated requirements, the contract is prolonged with the same conditions. Operators can choose not to accept the prolongation. In this case, the route is tendered in the usual manner. Due to high cost of monitoring, some routes, such as night routes and school services, include some performance payments but are not subject to contract extensions.

Monitoring:

TfL uses a variety of measures and techniques to monitor the performance of operators and the quality of the service provided. These include monitoring surveys and mystery travel surveys. "Mystery shopping" survey techniques are used to monitor driver and vehicle quality. A separate independent survey by London Buses assesses operators´ driving skills and grades drivers according to measures such as speed, braking and road position. London Buses also employs independent contractors to make regular checks on the mechanical conditions of the vehicles used.

Since 1997 London Buses has done customer satisfaction surveys through face-to-face interviews with passengers. Questions relate to overall satisfaction, cleanliness, reliability and staff behaviour.

To ensure that operators comply with the conditions set out in the contract, London Buses also undertakes regular contract compliance audits meant to ensure that "on-bus" revenue is accurately accounted for and lost mileage reported correctly. And to monitor the safety of service, London Buses uses a range of data sources along with regular visits to operating premises to check on policies and procedures. Operators must also provide data to London Buses regarding any accidents which occur while the bus is in service.

Barcelona AMB

Tendering process

In the Metropolitan Area of Barcelona, AMB runs the tendering process and awards concessions. Bus service providers are chosen based on a competitive tendering procedure, without pre-selection or negotiation. AMB provides vehicles to operators, though installations such as depots, offices and bus-stop poles are owned by operators.

The 11 current tendered contracts were awarded for eight years. There are also two concession contracts: for airport connection and tourist buses. These concessions work on their own fare system and are not part of the integrated fare system. Operators subject to this contract type pay an annual fee to AMB based on declared revenue.

Operators bid for a concession by making a financial offer based on their estimated cost and the annual number of passengers they expect to serve. AMB assesses the technical and financial aspects of each bid and awards scores on a 100-point scale. Operators can score a maximum of 49 points for technical aspects (staff evaluation, experience in the sector, ability to exploit the services) and 51 for economic ones (financial proposal, expected demand from paying passengers). The concessionaire with the highest score wins the bid.

Net cost contracts with quality incentives for services in the Metropolitan Area of Barcelona

Private operators in the Metropolitan Area of Barcelona are subject to net cost contracts which are issued by AMB if the services are inside the metropolitan area and by the Generalitat of Catolonia if they operate also outside. Under this type of contract operators carry the revenue and cost risk. If operators underestimate their cost, they do not receive compensation, and if the number of passengers is under estimate, operators assume the revenue loss. While ATM collects the revenue, operators receive payment according to the number of tickets sold. For services inside the metropolitan area, ATM transfers the revenue to AMB, which redistributes it to operators. This allows AMB to calculate payments according to the incentive-based contracts it has in place. In cases where fare revenue does not cover operating cost, and/or a particular social programme is implemented, AMB allocates a fixed amount of subsidy (see below). For services outside the metropolitan area, ATM makes payments directly to each operator.

For contracts issued by AMB, if the number of passengers is above the estimate, the operator receives between 25% and 50% of the extra revenue. Yearly operating cost is constant through the contract and updated solely in respect to the evolution of fuel cost and drivers' local wage agreement. Passenger estimate, however, can be modified yearly to take into account perceived trends in passenger volume.

Initial contracts in the metropolitan area included a subsidy equal only to the difference between the firm's estimated operating cost and estimated revenue. Recently, however, several incentives have been included in the contracts to improve the quality of service. Thus, firms operate under net cost contracts with quality incentives. That is, AMB allocates a fixed amount of subsidy to supplement fare revenue to cover operating cost and pays bonuses for the quality of performance (quality incentives have not yet been introduced into contracts outside the Metropolitan Area of Barcelona).

The amount of subsidy granted by AMB is calculated according to the following formula:

$S = C - I +/- G$, where S is AMB's financial contribution; C is cost (operating cost + financial cost of equipment not supplied by AMB, such as driver wages, energy, other expenses); I is fare revenue; and G is the variety of quality incentives, including punctuality, bus quality, bus stop quality, dynamic information quality, perceived quality and passenger satisfaction. In total, payments for quality incentives can represent up to 5.5% of operating cost. Quality categories and specific penalties and bonuses are summarised in Table 5.2.

Table 5.2. **Categories of quality incentives**

Category	Penalties and bonuses
Punctuality	Penalties and bonuses based on punctuality are applied by calculating the difference between operator punctuality and the average punctuality of AMB services. They may add or deduct up to 1% of operating cost.
Vehicle quality	Vehicle quality is assessed through the "mystery shopping" technique twice a year. Different parameters are considered. These include quality of vehicle maintenance, information provided on board, cleanliness and driving quality. Quality incentives or penalties are designed in relation to the average results for the entire AMB service. The amount of quality incentives or penalties may total up to 1% of operating cost.
Bus stop quality	AMB monitors every bus stop twice a year. Some are maintained by operators (mainly bus-stop poles), others by local administrations. Deductions or bonuses can total up to 1% of operating cost.
Dynamic information quality	GPS systems are mandatory by contract and must be provided by operators. Operators need to provide accurate information on their position to the web services that process information on the time remaining before the bus arrives. To control for the quality and timeliness of this information, a quality index has been designed with an incentive and penalty ranging up to 0.5% of operating cost.
Passenger satisfaction	This incentive reflects the quality of service as perceived subjectively by users. A satisfaction index is based on annual surveys and interviews with users. The questions explored are related to timetable co-ordination, customer services, punctuality, driving quality and comfort of vehicles, among others. This index can add up or deduct up to 1% of operating cost.

Source: ITF, based on Lloveras Minguell F. (forthcoming).

Notes

[1] Others fare subsidies include the student pass, freedom pass and 60+ pass.

[2] The effectiveness ratio corresponds to the ratio OF yearly traffic and yearly distance on the line, according to the theoretical offer defined in the contracts between Île-de-France Mobilités and the bus operators (PDUIF, 2011).

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Chapter 6. Improving multi-modal transfer centres

Multi-modal transfer centres are key to achieving multi-modal mobility. Such facilities include space for activities other than transport, and thus play an important role in integrating mobility services with the urban environment. The MTAs studied have taken a leading role in providing guidance for the development of multi-modal centres and enhancement of existing ones. This chapter analyses the components and principles exemplified by the MTAs and identifies stages in related project development in which these authorities play a role.

Île-de-France Mobilités

Île-de-France Mobilités defines multi-modal transfer centres (*pôles d'échanges*) as places of interface between rail and other modes. In 2015, an estimated 4.2 million daily trips went through the 445 multi-modal transfer centres in the Île-de France region.

As part of its strategic planning responsibilities, Île-de-France Mobilités has been in charge of developing the regional policy for such centres. The policy aims to promote the idea that renewal and/or reorganisation of multi-modal transfer centres contributes to providing high quality transport services for all users, a central objective in the Île-de-France Mobility Master Plan (PDUIF). Having a regional policy helps ensure coherence across projects and promote adequate links between transfer centres, which are ultimately the nodes of the regional transport network.

The policy developed by Île-de-France Mobilités is explicitly set out in *Guide pour l'aménagement des pôles d'échanges d'Île-de-France*, a guidance document for local governments and developers. Its objectives are:

- describing a multi-modal transfer centre project from conceptualisation to implementation
- emphasising how to monitor projects
- proposing technical recommendations and reminding of key documents that should be used as reference when developing multi-modal transfer centres
- informing about possibilities to get funding from Île-de-France Mobilités to develop studies and project implementation
- sharing examples of good practice (Île-de-France Mobilités, 2015).

While the PDUIF sets out general guiding principles for organising this type of space in accordance with the regional policy, the guideline helps translate those principles when carrying out a specific project. The guidelines were developed through consultation with local governments, transport providers, transfer centre managers, RATP, SNCF, councils in the *départements* and consultancy groups. As will be seen, Île-de-France Mobilités in addition to formulating the general policy and guiding principles for multi-modal transfer centre projects, has an active and central role in various project stages, as the guidance document clearly shows.

The guidelines and the process for developing or renewing multi-modal centres

The guideline document is divided into four components: an introductory section, methodological guidance, technical guidance and good practice examples. The first section summarises the PDUIF's main objectives for all multi-modal centres, which are to provide clear, continuous and multi-modal information; organise multi-modality through access roads and optimised bus interconnections; provide pedestrian facilities that are secure, comfortable and accessible to people with impaired mobility; provide secure parking and bicycle access areas; make parking areas secure for pedestrians; and make connections and waiting as comfortable as possible.

The introduction also describes how the PDUIF categorises multi-modal centres based on the amount of traffic and the type of area in which the facility is located. Categories help to better identify challenges and objectives that are specific to the function and context of different types of multi-modal centres. Table 6.1 describes the categories used.

Table 6.1. **Multi-modal centre categories defined by Île-de-France Mobilités**

Category	Description
Major connecting hub/*Grand pôle de correspondence*	-High traffic (more than 15 000 daily entries) -Combining several "structuring services" (RER and train, metro, tram, and/or serve as bus station) -Serving major cities
Centres for connections in dense areas/*Pôles de desserte des secteurs denses*	-Relevant traffic (2 500 travellers per day minimum) -Located in dense urban areas -Access is mainly by modes other than car (high presence of pedestrian access) -Serving both housing and centres of employment
Centres for access to rail services from suburban areas/*Pôles d'access ferré depuis les bassins de vie*	-Moderate traffic (fewer than 2 500 daily travellers) -Located in peripheries of dense urban areas -Access is mainly by car or bus -Allow peri-urban and remote neighbourhoods to access rail services

Source: ITF, based on Île-de-France Mobilités (2014).

The second section, providing methodological guidance, describes project stages and the way Île-de-France Mobilités needs to be involved. The methodology described is applicable to all multi-modal centres except those that are part of the infrastructure agreement between the Île-de-France region and either the national government or a given *département*. The document outlines four stages all projects need to go through:

Project launch

In this stage, a local government identifies challenges that could potentially be solved by developing or remodelling a multi-modal transfer centre. The local government communicates the potential project to the Operations Branch of Île-de-France Mobilités's PDU Intermodality Division. In their first meeting, Île-de-France Mobilités's objectives are to see how well the proposed project aligns with the PDUIF,

identify the challenges the project could solve, determine which actors should be consulted and involved and discuss the overall objectives the project needs to follow.

For the process to continue, Île-de-France Mobilités needs to authorise a more detailed evaluation of the centre (*étude de pôle*). This evaluation may be fully funded by Île-de-France Mobilités. A special committee that will follow the project is established during this phase. Its members represent the local government, Île-de-France Mobilités, landowners, potential developers, transport providers involved and potential funders. The committee is in charge of validating the technical specifications (*cahier des techniques particulières* or CCTP) of the project, which are one of the outputs of the *étude de pôle*. It also approves and supervises other studies that complement the *étude de pôle*, and leads overall implementation of the project.

The local government is in charge of developing the technical specifications for the *étude de pôle*, following a specific format set out by Île-de-France Mobilités. The technical specifications receive comment by the committee and require final approval by Île-de-France Mobilités, and by the funder of the study if this is a different entity. The launch stage ends with a call for tender for the *étude de pôle*, signature of the funding agreement between Île-de-France Mobilités and the local government (and the funder of the study, if different from Île-de-France Mobilités) and the final decision on the entity that will carry out the *étude de pôle*.

Development of the étude de pôle

The *étude de pôle* starts with a diagnostic phase so as to fully understand the context, identify elements in the transfer centre that need to be improved and set priorities among them. Île-de-France Mobilités' data on public transport traffic are central to the development of the diagnostic. Staff from various Île-de-France Mobilités' divisions participate in surveys created for the study.

The *étude de pôle*, which incorporates a list of actions to be carried out in response to issues identified in the diagnostic, can put forward up to three project proposals. The project committee evaluates these proposals based on a multi-criteria analysis framework that includes several parameters (Box 6.1). After a proposal is chosen and approved by the committee, and opinions from the relevant actors are taken into account, the final project is developed and approved, and its cost is estimated. In some cases, public surveys are carried out in this stage.

Pre-project studies and financial planning

During this stage, participating developers carry out pre-project studies and ensure that funding is ready.

Two committees are created to follow up on the project. One is a committee of all actors participating in the development of the centre; its objective is ensuring good co-ordination among them. Project leaders for the various types of work involved meet every one to three months in this committee. The municipality in charge also puts in place a follow-up committee to inform key stakeholders, funding entities and Île-de-France Mobilités about progress on the project.

In some cases Île-de-France Mobilités supports the development of multi-modal transfer centres with grants. The guidelines describe the process for obtaining such a grant.

Box 6.1. **The multi-criteria analysis used to choose projects**

The following parameters are part of the multi-criteria analysis that the committee uses as a basis for choosing the most appropriate project:

- access improvements for each mode (bus, bicycle, walking, car, motorised two-wheelers, special vehicles); several elements are included, e.g. total transfer time, safety, comfort.
- improvement of pathways within the transfer centre
- quality of the information system in the transfer centre and its capacity to facilitate connections and allow users to calculate itineraries
- level of integration into the urban environment (urban and landscape quality)
- land availability constraints in terms of cost and schedule
- operating and maintenance facilities
- a summary of necessary investment estimates (by type of development and including project management costs)
- links with other multi-modal centre projects
- project management issues
- level of independence between actions to be taken for the project.

Source: ITF, based on Île-de-France Mobilités (2015).

End of studies and project development

In this final stage, developers carry out the project work and transfer ownership of the final project to the authority in charge. It is recommended that developers and authorities carry out a review about a year after the end of the work to evaluate a) the process for implementing the project, with a focus on identifying problems encountered and providing feedback to Île-de-France Mobilités for improving information and procedures (including the possibility of adding information to guideline document) and b) the functioning of the multi-modal centre, taking into account perceptions of travellers, authorities, developers, etc. Review procedures are described in the technical guidelines (see below).

Recommendations by mode

The technical guidelines offer recommendations for developing and evaluating multi-modal transfer centres that are specific to the treatment of every transport mode within the facility. Table 6.2 summarises the modes included and the main recommendation for each. For each mode and main recommendation, more detailed evaluation parameters and recommended actions are provided in the technical guidelines document.

Table 6.2. **Main recommendation by mode addressed in the technical guidelines**

Mode	Main recommendation
Access roads	Allocate space in access roads with the objective of allowing users to access the transfer facility securely, with comfort. Access for population with impaired mobility should be a main focus. Allocation of space in access roads should also prioritise access through modes that are an alternative to car.
Bus services	Organising bus services in a multi-modal centre under three main configurations. The offer can either be separated in different stop points in both sides of the rail tracks, it can be focused in one or various bus stations or it can take a mixed form. Mixed forms entail having a bus station as well as stop points directly linked to the different tracks. The configuration the organisation takes will depend on factors linked to the functioning of lines, road constraints and safety matters for pedestrians.
Pedestrians and population with impaired mobility	Improving comfort for pedestrians is a priority. Working towards this goal entails guaranteeing at least one access path for population with impaired mobility. Also, concerns about pedestrians and impaired mobility users need to guide the design for the access to the centre itself, as well as for the inner spaces of the centre.
Bicycles	Strongly enhancing access and parking conditions in multi-modal centres. For this, it is necessary to take into account the security and safety of parking facilities and to propose continuous cycling itineraries from access roads to the parking spaces themselves.
Motorised vehicles	Where cars are the dominant transport mode, parking policies should regulate and participate in the management of individual motorised cars. For this, planning multi-modal centres needs to interrogate the role and the regulation of parking and circulations of cars in the centre to give incentives that a) improve the general functioning of the centre and b) whenever possible, promote a modal transfer from the car to public transport modes.
User information, signage and screens	In multi-modal centres, information needs to be complete, readable, trustworthy, hierarchised and homogeneous. For this, information providers should, for instance, ensure the continuity of the information and make sure that information is accessible to all.

Source: ITF, based on Île-de-France Mobilités (2015).

TfL

London has some 600 multi-modal interchanges where commuters can transfer between modes or between two services of the same mode. This number includes interchanges between public transport and "feeder modes" that are used to get to or from stations, such as taxi, walking and cycling.

As the transport authority, TfL is responsible for improving integration across all transport modes by promoting strategies that improve the design of interchange facilities or zones.[1] The MTS, as the main policy tool guiding transport planning, management and development, includes guidelines for enhancing

multi-modal transfer centres across London. It identifies locations of interchanges (such as Clapham Junction, Lewisham, Stratford and Old Oak) that need to be prioritised to provide sufficient capacity and connectivity to destinations in Central London and beyond. An essential part of the new MTS is a particular focus on improving customer experience, physical accessibly and step-free connections at stations and busy bus interchanges. In line with these strategies, TfL has set ambitious goals to improve step-free access and make 40% of the Underground network step-free by 2022 (a significant increase from the current 26%). TfL's interchange team is in charge of monitoring and assessing any significant changes in the transport network or land use developments in order to identify interchanges that require particular improvement.

To promote a co-ordinated approach for the development and management of interchanges, TfL works closely with London boroughs and property developers, as well as with National Rail and operating companies. When developing or redeveloping interchanges, TfL establishes partnerships with relevant stakeholders and supports involved parties by providing interchange planning and design expertise. As TfL relies on information from a variety of stakeholders, it requests infrastructure and service providers to notify it of any changes in services or proposed infrastructure improvements that could affect the interchange. TfL also works closely with boroughs, which need to notify TfL on any new or changed transport and land use developments. And it channels developer contributions secured via Section 106 (see Chapter 4) to fund, at least in part, major interchange enhancements.

TfL also carries out its own Interchange Programme, designed to deliver integrated multi-modal transport improvements at interchanges across London. The programme is implemented and governed by the Interchange Programme Board, a group of sponsors comprising representatives from the mayoral team, GLA, the London Development Agency, Network Rail, and TfL departments responsible for surface transport, Underground and rail. TfL's interchange team identifies key strategic interchanges where the transport network may be jeopardised by new developments and recommends these interchanges to the Interchange Programme Board. The board then decides what programmes it will prioritise and sponsor.

To identify priorities and evaluate interchanges, TfL categorises multi-modal centres based on passenger flow, service level and location (Table 6.3). Categorisation helps identify challenges as well as set policies and standards according to type of interchange. For instance, the London Cycling Design Standards Guidelines, an MTS supporting document, consults on cycling parking standards for various types of interchanges based on the categories defined below.

Principles for promoting better transport integration and the creation of more accessible and efficient spaces for interchange are set out in TfL's 2009 Interchange Best Practice Guidelines.[2] The document provides a general framework to evaluate the quality of existing or proposed interchanges. Having a common evaluation framework makes it possible to maximise consistency and make the best use of shared resources. The guidelines were elaborated to deliver consistent advice and guidance to a variety of stakeholders in the process of development or redevelopment of multi-modal interchanges (see below).

The guidelines incorporate principles for allocation of zones within inter-modal centres (Table 64) and a checklist type of framework for the evaluation of project design. The document is not used to approve projects; rather, it is an assisting tool to be used in the preparation of broader planning policies and local implementation plans. The guidelines may also be used by developers when elaborating planning proposals, and by boroughs when granting planning permission as a checklist to determine how well best practice principles are met.

Table 6.3. **TfL interchange categories**

Interchange category	Definition
Major Central London termini	Strategic termini for heavy rail services in Central London (Zone 1), with strong links to other modes
Major Central London interchanges	Important interchanges in Zone 1 with high passenger flows and choice of modes
Major strategic interchanges	Locations playing an important role in the transport network, with high levels of interchange and choice of modes
District interchanges	Interchanges of more than local significance, playing some role in the transport network in the sub-region over and above serving the local area
Local interchanges	Interchanges of local significance only

Source: TfL (2002), Interchange Plan – Improving Interchange in London, London, TfL, http://content.tfl.gov.uk/interchange-improvement.pdf.

Ultimately, however, when it comes to the approval of transport-related development projects, including projects for the development of new interchanges or adjustments to existing ones, the Boroughs Planning team in TfL's Planning Directorate leads the planning process. Planned developments that are of strategic importance are referred to the London mayor's office. Other projects are reviewed by the Boroughs Planning team. Under the Town and Country Order 2010, TfL must be consulted on planning applications for development proposals likely to affect the transport network, including those that a) might result in increased traffic volumes, b) might impede improvement or construction of a classified road or proposed highway and c) consist of or include laying out or constructing a new street. In addition, under the Traffic Management Act 2004, TfL has to approve project proposals that affect surface transport, rail operations, services and infrastructure or require new transport provision. Thus, all project proposals that have to do with interchange facilities must be reviewed by TfL, as they are intrinsically linked to the effects the proposals might have on transport networks.

Spatial management principles as defined in Interchange Best Practice Guidelines

Interchange facilities often comprise spaces that fall within the jurisdiction of different stakeholders and where transport operators do not have direct control. This can result in increasing complexity of interchange environments, where commercial interests might overstep priorities for accessible and permeable transfers between modes. Thus, to optimise the quality of interchange facilities and functions, TfL identifies zones and spatial management principles that must be applied to all interchanges. The principles offer a simple framework to define which functions must have priority in different spaces within interchanges: a) decision spaces, b) movement spaces and c) opportunity spaces (Table 6.4).

As part of its strategic responsibilities, TfL is in charge of ensuring that these principles are taken into account and that commercial activities at interchange perimeters do not interfere with priority principles for efficient and seamless movement of passengers. Thus, by applying this framework, TfL gives developers a clear indicator of the parameters and areas within which particular functions can operate.

Table 6.4**. Interchange zones**

Function of spaces	Definition
Decision spaces	Areas where passenger decisions take priority, such as entrances, ticket offices and corridor junctions. No non-essential physical or visual elements, such as advertising, retail or other land uses that would serve to confuse or distract passengers should exist. Rather, clear signage, transport information and/or sight lines should be in place.
Movement spaces	These areas connect decision spaces. Movement spaces include corridors and paths that allow passengers to seamlessly transfer from one mode to another. These corridors/routes within the facility should be obstacle-free, with the eventual addition of adjacent elements, such as street furniture, plantings, advertising or information displays, that do not encumber the way.
Opportunity spaces	These areas are located outside of movement or decision spaces. Cafés, retail entrances, displays, street furniture and other elements can be located in these spaces. The spaces should be managed so that they do not conflict with the movement of passengers.

Source: TfL (2018).

Design and evaluation framework

To facilitate development and operations, and to better measure performance of existing or proposed interchanges, TfL established the Design and Evaluation Framework as part of the Interchange Best Practice Guidelines. The framework is based on four assets: efficiency, usability, understanding and quality (Table 6.5).

The design and evaluation framework complements the WebTAG Transport Analysis Framework developed by the Department for Transport, which is a multi-criteria decision framework used to appraise specific transport projects and proposals. It is based on five criteria: environment, economy, accessibility, safety and integration.

The Design and Evaluation Framework is applied specifically when evaluating interchanges and can be used at different project stages. It can capture perceptions from a range of viewpoints (passengers, developers, operators) and takes design quality into account. At the start of a project, developers can use the framework to make design decisions and allocate space according to the TfL guidelines (which are ultimately aligned with DfT goals). It can also ensure that problem areas are being addressed. The framework can be used as a basis of the interchange audit, an assessment of existing interchange facilities meant to identify necessary improvements, usually done by the TfL interchange team. Overall, the framework a) highlights key considerations during the design and planning stages of a new interchange or a project for improving interchange facilities or zones, and b) provides a set of criteria against which the quality of existing or planned interchange areas can be scored.

The framework uses a question-based approach with a “traffic light” scoring system: each principle is scored as green, amber or red. Green signifies that all criteria under a chosen asset (efficiency, usability, understanding or quality) have been considered and addressed; amber implies some criteria have been addressed; and red signifies that few if any have been considered. Table 6.5 describes the principles under each asset. For the evaluation, each principle is presented as a series of questions that should be considered and addressed by operators or planners when evaluating the quality of design at the interchange.

Table 6.5. **Design and evaluation framework principles**

Themes	Principles	Description
Efficiency	Operations	Operations include consideration of service co-ordination, operating costs, integrated ticketing, unimpeded passenger movement, maintenance, safety and servicing.
	Movement (within an interchange facility)	Concerned with some main characteristics of routes. These include proper accessibility, the quality of surfaces, the crowdedness, and the lack of directional conflict and of obstacles in routes.
	Movement (through the wider interchange zone)	Concerned with the movement of all users and all the modes linked to the interchange facilities, both within it and on its surroundings.
	Sustainability	Concerned with the social, economic and environmental elements linked to existing policies and targets. Some of these relate to the quality and nature of the used materials, as well as energy use considerations.
Usability	Accessibility	Refers to the capacity of a space to be used for all passengers, including those with reduced mobility. Looks particularly at elements such as the positioning of steps, level boarding, lifts and escalators and possible obstacles. Also considers the availability of helping staff and of the signage and wayfinding elements through braille, tactile or audible means.
	Safety and accident prevention	Refers to the consideration of all possible fire, safety and security requirements, by seeking to reduce any potential hazard as much as possible.
	Personal security	Concerns prevention of, and reactions against, crime and disorder.
	Protected environment	Takes into account passenger safety and comfort in all interchange zones, including protection from extremes of heat and cold.
Under-standing	Legibility	Seeks to provide easier identification of landmarks, nodes, pathways and operational thresholds, and minimise the need for additional infrastructure and signs to aid movement.
	Permeability	Looks at how to give people the maximum amount of choice in how to move around, by making clear connections to existing routes, facilities and destinations.
	Wayfinding	Includes legible, well-designed spaces; signing and information when and where passengers need it; effective use of surface treatments, materials and lighting; and environmental interventions such as public art, to create pathways, landmarks and destinations.
	Service information	Contemplates the availability of service information on public transport operations, opening hours and locating the interchange facility or zone in the local area, through different media.
Quality	Perception	Results from the combination of performance, accessibility and function, aiming at providing added value to passengers and to non-travelling users alike.
	Quality of built design	Looks at the functional effectiveness of the interchange facility's spaces, and the surfaces, appearance, arrangements and elements included in it.
	Urban realm	Includes spaces that are both integral to and related to, but not necessarily a part of, the interchange facility itself. Looks at the size, openness and design of the space.
	Sense of place	Providing spaces with their own distinctive identity, while maintaining and improving local character.

Source: ITF, based on TfL (2009).

Interchange management

In many cases, an interchange facility is owned or served by several organisations. To encourage co-operation between all stakeholders involved in managing different interchange facilities, it is recommended that the organisations involved agree on particular procedures. The procedures are defined in interchange facility management agreements that are promoted by the Interchange Best Practice Guidelines. The agreements establish clear responsibilities for each actor and provide accountability for tasks required for ensuring that the interchange operates efficiently. The agreements are not obligatory, but are a recommendation set out in the guidelines. Recommended agreements should include consideration of matters such as who will be responsible for cleaning and maintenance of particular zones, what uniform staff will wear, procedures in case of disruption, hours of operation and access rights. At interchange facilities where management is shared, the main operator should lead on co-ordinating such matters.

ATM and AMB

Multi-modal centres (*intercanviadors*) in the Metropolitan Region of Barcelona are defined as "nodes of the public transport network whose main purpose is to facilitate the continuous interchange of passengers between two or more transport modes and to minimise the time used in transfers" (Generalitat, 2008). There are more than 30 such centres in the metropolitan region, of which most are in the Metropolitan Area of Barcelona (ATM, 2013). As bicycles are a particular focus in the development of such facilities, many include bike-and-ride spaces. The main objective is to encourage cycling and non-motorised modes in the city. Park-and-ride facilities are numerous in the areas between Barcelona proper and its peripheral municipalities, to promote the use of public transport in these areas. More recently, this type of infrastructure is further being developed in the conurbation of the Metropolitan Area of Barcelona. For instance, AMB has launched a pilot to build park-and-ride stations in Sant Joan Despí on the border of Barcelona proper and Castelldefels on the border of the metropolitan area (La Vanguardia, 2018).

The owner of a multi-modal centre, generally the Generalitat, divides the spaces inside the facility and allocates them to operators through concessions. Each operator of lines or stations in the centre manages its corresponding sector on its own. Thus, multi-modal centres in the metropolitan region are not characterised by integrated management of infrastructure, as every space is managed by each operator individually (Lloveras Minguell, forthcoming). While the infrastructure owner is responsible for optimising the quality of interchange facilities and their functions as a whole, mainly by following guidelines from the Generalitat and other pertinent authorities, the efficiency of particular areas within the facility is under the control of the various operators.

Planning of multi-modal centres

The Generalitat and ATM have an important role in guiding the development and design of multi-modal transfer centres. General planning and design guidelines are developed by the Generalitat through its General Master Plan for Infrastructure and Mobility Services (Box 6.2). ATM takes these planning guidelines into account and develops more specific strategies, which are included in the master plans for mobility (PDM) and infrastructure (PDI) for the metropolitan region. The PDM offers a vision for multi-modal centres and their role in attaining mobility goals set by ATM. The PDI describes in detail the different multi-modal infrastructure projects themselves. The PDM, for example, identifies stations (between 200 and 1 000 metres apart) that have the potential to become multi-modal centres if joined together, and that could in this way bring benefits to the transport system and its passengers (e.g. by decreasing the number of routes needed for different transport modes or reducing transfer time).

Such stations are called "virtual" multi-modal centres. The PDM has identified 29 such centres in the region.

Box 6.2. **Guidelines for the creation and improvement of multi-modal centres in the Catalonia region**

The General Master Plan for Infrastructure and Mobility Services of the Catalonia region sets out the main co-ordination directives for multi-modality between bus and rail modes in the region. These directives set the main guidelines to ensure proper co-ordination between rail and bus services in the region. They also define the criteria for creation of new multi-modal centres and improvement of existing ones.

The main elements that need to be considered to ensure proper co-ordination between rail and bus services are:

- Train stations should be built as multi-modal centres, facilitating transfer between modes. If developing a multi-modal centre is not possible, the bus stop will be set at a recommended distance of 100 metres away – and no more than 300 metres away – from the train station.
- The waiting time for the transfer between modes should be considered. The optimal waiting time, including the time for acquisition of the ticket, is less than ten minutes.
- Multi-modal centres should integrate (at both bus and train stops) information regarding the location and operating times of the corresponding transfer stop, the geographical coverage and the frequency of service lines.

For the creation of multi-modal centres, as well as the improvement of existing ones, these elements are to be taken into account:

- Correct signalisation of the location of the multi-modal centre, as well as of the modes available in it.
- Adequacy of multi-modal spaces, including parking lots for private modes, so that the change of mode is eased to its maximum standard.
- Adaptation of the multi-modal centre to reduced mobility users.
- Inclusion of integrated, clear signage, which should be independent of the different operators or transport modes. There should be common homogenised signage at all multi-modal centres.
- Installation of visible and accessible information services and stands in all centres.
- Regular allocation of the same stops to the different services that operate in the centre.
- For centres with high passenger numbers, using different access points for exits and entrances whenever possible so as to direct user flows in such a way that they do not cross.

Source: ITF, based on ATM (2008).

The PDI, for its part, reflects the detailed work required to create or improve each individual multi-modal centre, the stages of the process, the technical and financial characteristics of the venture, and its social benefits. AMB lacks planning capacity in terms of multi-modal centres (Lloveras Minguell, forthcoming). Concerning the transformation of virtual multi-modal centres into proper ones, the PDI includes the context-specific measures needed. The case-specific transformations will depend on existing transport modes and infrastructure. As an illustration, the Martorell rail station was conceived as a virtual multi-modal centre because of its proximity to the Llobregat-Anoia metro station. The stations are in the process of being linked through a new connecting building, to allow the resulting infrastructure to serve as a multi-modal centre (ATM, 2011).

AMB lacks planning capacity in terms of multi-modal centres (Lloveras Minguell, forthcoming). It is, however, able to promote the development of park-and-ride facilities and to "ask the concerned authorities" to build the multi-modal infrastructure required to respond to the mobility needs in a given territory of the Metropolitan Area of Barcelona (AMB, 2016).

Box 6.3. **La Sagrera TAV as a major multi-modal centre for the Metropolitan Region of Barcelona**

The building of La Sagrera TAV as a new multi-modal centre is the most important construction project in the metropolitan region since the infrastructure work before the 1992 Barcelona Olympics. The initiative entails the expansion of transport in La Sagrera, one of Barcelona's historical neighbourhoods. A metro station, with connection for several lines and transfer to buses, already exists in La Sagrera. The TAV project seeks to expand the existing infrastructure and provide a high-speed rail connection between Madrid, Barcelona and Paris, as well as between Barcelona and other parts of Catalonia.

The project, initially proposed in the 1980s, was agreed in 2002 by the Ministry of Development, the Generalitat and the Barcelona city government. After the financial crisis, with its consequences for the housing and infrastructure market, a new agreement was reached in 2009 to adapt the project's funding and design to the available resources and Spain's new situation. Once finished, La Sagrera TAV will be the biggest building in Barcelona. The project is expected to bring wide economic and environmental benefits to the metropolitan region and increase overall transport access for people in the metropolitan region and Catalonia as a whole. La Sagrera TAV is expected to increase by 38% the number of people with access to a high-speed transport mode within a 30-minute commute. The potential passenger flow is estimated at 100 million per year, double that of El Prat, currently the multi-modal centre with the highest passenger flow in the metropolitan region. Thus the project positions La Sagrera TAV as the main multi-modal facility in Catalonia and one of the most important in Spain.

The project is managed by Barcelona Sagrera Alta Velocitat, a public enterprise formed on 27 June 2003 as part of an agreement between the ministry, the Generalitat and the city. The ministry (through public groups managed by ADIF) owns 50% of the shares in the enterprise, and the Generalitat and the city 25% each. The board of the enterprise has representatives from all three: the Generalitat and the city with 33% of the voting power each and the ministry with 34%. Decisions are taken on a qualified majority basis.

Barcelona Sagrera Alta Velocitat's main functions are to co-ordinate the efforts of all actors in the building of the multi-modal centre and to oversee and manage the associated urban development process at the local scale. In addition, Barcelona City Hall leads a participatory policy seeking to engage all citizens affected by and interested in the project. To this end, a commission meets every six months to follow up on the development of the project. Its efforts are supported by a working group which meets every two months and evaluates more precise topics linked to the project. Both the commission and the working group are made up of representatives of neighbourhood associations concerned by the project.

La Sagrera TAV requires considerable investment, undertaken by the central government through various institutions. The Ministry of Development includes EUR 255 million for the project in the sum that it allocates to ADIF for its contributions for the building of infrastructure in Catalonia. ADIF itself participates with EUR 161 million for the infrastructure and the rail services. An additional EUR 286.5 million from ADIF's budget represents part of the land value capture linked to the project and the leasing of associated commercial spaces. About 180 000 m^2 of complementary building are contemplated in the initiative for hotel, parking and tertiary use.

Source: ITF, based on Barcelona Sagrera alta velocitat (2018); Trullén, J. (2011); Ajuntament de Barcelona (2018); El País (2013).

While the strategic planning of multi-modal centres in the metropolitan region is a shared prerogative of the Generalitat and ATM, the construction and improvement of these centres is the duty of the infrastructure owner. For most multi-modal centres, this sharing of responsibilities entails diverse actors. The Generalitat participates in projects that involve FGC and the metro, and the Spanish government, through ADIF, plays a role in cases that deal with national railways and Renfe (Lloveras

Minguell, forthcoming). Other actors that may be involved in construction are the municipalities and neighbourhood or general citizen-led associations concerned with the development of the projects. More particularly, the participation of citizen actors in the design, follow-up and evaluation of multi-modal centre projects takes place through consultations and regular working groups created at the initiative of the municipalities. AMB does not have the capacity to generate these discussion spaces on behalf of municipalities.

Funding for multi-modal transfer centres generally comes from the central government, the Generalitat and municipalities. For major projects, a funding agreement is signed between the Ministry of Development and the Generalitat. Other sources can involve the commercialisation of part of the built infrastructure, as well as land value capture strategies from neighbouring areas. The establishment and specificities of these funding mechanisms vary from case to case. The articulation of different stakeholders for the creation of multi-modal centres, as well as the funding mechanisms to develop them, can be seen the case of La Sagrera high-speed train (TAV) project (Box 6.3). This facility, which will be the main multi-modal centre in Catalonia, is identified in the PDI and the PDM and exemplifies the planning criteria of the Generalitat.

Notes

[1] TfL distinguishes between an interchange facility – a purpose-built facility where interchange takes place (such as a railway station, bus station or bus/tram stop) – and an interchange zone, a wider area encompassing one or more interchange facilities that constitutes a multi-modal hub and public space.

[2] The guidelines comprise a website, https://tfl.gov.uk/info-for/urban-planning-and-construction/interchange, and a quick reference guide, http://wricitieshub.org/sites/default/files/pdf_7.pdf.

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Chapter 7. Transport data collection and management

Transport data, including private and public vehicle traffic, user itineraries and data on travel conditions, are essential to planning and assessing performance of urban transport systems. New technologies have opened the scope for generating better and more data that can even provide real-time information. Yet data collection and management can be challenging for authorities. This is especially so in a system where services are provided by the private sector, for which data ownership can be seen as a business opportunity, making data sharing rare. The development of new mobility services, many of which are not included in existing regulations, poses an additional challenge.

This chapter analyses how the selected MTAs, along with other relevant authorities, are enhancing data collection and management practice. It also explores how they are promoting open data initiatives and supporting the shift into a mobility-as-a-service (MaaS) approach.

Île-de-France Mobilités

Data collection

Various actors participate in data production and collection in France's capital region. The main stake-holders in this process are Île-de-France Mobilités, the public authorities and transport operators.

Île-de-France Mobilités serves as the main data collector on transport in Île-de-France, gathering information produced by operators and public bodies, as well as its own staff. Transport operators in Île-de-France generate and share real-time and non-real-time data as part of their contractual agreement with Île-de-France Mobilités. Decree 2000-634 of 6 July 2000 allowed Île-de-France Mobilités to include clauses on compulsory data provision in contracts with the three main operators (RATP, SNCF and OPTILE). Under these frameworks, operators provide Île-de-France Mobilités with theoretical or real-time information related to transport service execution, quality and delivery. Clauses include reporting frequency, data format and delivery means. Some of the data shared with Île-de-France Mobilités comes via Navigo, the smart-card pass used in Île-de-France since 1998 (Box 7.1).

Operators of public transport modes that are not controlled directly by Île-de-France Mobilités need to comply with data-sharing parameters set for them by the public authority they report to and have a contractual agreement with. Data on these alternative public transport modes are gathered by the public bodies concerned, and released by them as part of their open data policy (see below). For instance, the city of Paris has a contractual agreement with the bike-share (Vélib) system operator that includes clauses on data sharing. The data are published on the city's open data website.

Public authorities need to transfer data regarding the situation of the transport system in their territories to Île-de-France Mobilités. Île-de-France Mobilités defines the data to be provided by looking at the information it needs to be able to evaluate the mobility-related strategies and policies it develops. In evaluating progress on PDUIF, the regional mobility plan, Île-de-France Mobilités is aided by Omnil, the Île-de-France Mobility Observatory. Omnil was set up in 2007 to ensure the reliability and coherence of the data necessary to properly evaluate mobility policies in Île-de-France. It collects and analyses relevant data from the public authorities in the area to be able to evaluate the development of actions related to PDUIF. Its main members are Île-de-France Mobilités, the Île-de-France region, national

government agencies and representatives of the local governments in the area (the city of Paris and the seven *départements* in Île-de-France) (Omnil, 2018).

The external data generated by transport operators and public authorities is added to Île-de-France Mobilités's own data. Île-de-France Mobilités uses participatory approaches for data collection through its Viavigo Lab, where citizens are invited to serve as "lab testers" participating in data collection for evaluating the state of roads as well as the location and condition, for instance, of bike parking facilities. Data generated through this participatory approach are collected by Île-de-France Mobilités, made available on its open data platform and compared with data provided to Île-de-France Mobilités by local governments so as to identify gaps in the data sources (Viavigo Lab, 2018).

Box 7.1. **Navigo pass, smart-card data collection and transition to a new ticketing system**

Transport in Île-de-France is facilitated by the Navigo pass, a smart card introduced in 1998 for the *imagine R* programme of subsidised ticket for students. Twenty years later, Navigo has more than 4 million users. The Navigo pass is managed by Comutitres, an "economic interest group" created by OPTILE, SNCF and RATP. Comutitres contracts out the hosting and exploitation of the Navigo information and management system to an external group, ATOS Worldline. The group is responsible for providing the information to Île-de-France Mobilités (Comutitres, 2018).

The Navigo system is regulated by the Navigo Inter-operability and Security Committees, made up of representatives of Île-de-France Mobilités, RATP, SNCF and OPTILE. Île-de-France Mobilités presides over the committees and has the last say on decisions taken. The committees jointly generate two main guidance documents for the Navigo system: Common Smartcard Guidelines in Île-de-France (RCTIF) and Ticket Treatment Guidelines of Île-de-France (RTTIF). RCTIF includes the technical specifications required to ensure inter-operability between the Navigo smart card and the machine that reads, sells and validates the card. The specifications focus particularly on ensuring a secure exchange of data between card and equipment. RTTIF sets the rules for treating Navigo data, including the coding of data in the smart card and regulations on treatment of this information in validation, sales and policing operations. RTTIF also includes further specifications on the format of the data lists between different information systems (Île-de-France Mobilités, 2012).

Île-de-France Mobilités is promoting a transition to a new system using digital tickets on smartphones. For users without smartphones, contactless tickets will be available. The new ticketing system will also help shifting to a MaaS policy in Île-de-France. It will allow users to pay at the end of each month for the cheapest combination of the trips they did during the month, rather than paying either fixed weekly or monthly packages in advance as is now the case. The transition will be led by Comutitres and Île-de-France Mobilités, and is expected to be carried out between 2018 and 2021 (Île-de-France Mobilités, 2018).

Source: ITF, based on Comutitres (2018); Île-de-France Mobilités (2012); Île-de-France Mobilités (2018).

Open data

The main transport-related actors in Île-de-France have led open data-related actions in the region since 2011. That year, Île-de-France Mobilités created its open data portal, which has grown ever since. SNCF followed suit in 2012 and RATP in 2013. At first the open data initiatives were carried out mostly via operators' individual platforms, and the data provided went beyond the operators' contractual obligations to Île-de-France Mobilités. The opening up of data by these groups has been based on the principle of developing innovation and tools that enhance transport service delivery for the groups themselves. For instance, since 2012 SNCF has had a policy of opening its data with the aim of attracting and working alongside partner enterprises that provide services that increase SNCF's delivery capacity. These enterprises work, for instance, on technologies for improving sharing of real-time information on

trips for users, as well as for improving co-ordination of train arrivals with the availability of other motorised modes, such as taxis, at stations (SNCF, 2017).

Other European countries have developed regulations to frame open data policies. One innovative example is the new Act on Transport Services in Finland, which aims at removing regulatory barriers that impede transitioning to a MaaS approach and introducing open data requirements for all transport service operators (Box 7.2).

Box 7.2. **New Act on Transport Services, Finland**

The government of Finland passed the Act on Transport Services to enter into force on 1 July 2018. The act requires all essential data on mobility to be displayed in open interfaces. It is part of the more comprehensive Transport Code project, which aims at creating the necessary conditions to adopt MaaS, which, the Ministry of Transport and Communications explains as follows: "[T]hrough technology information and innovations, transport services become a customer-oriented service, in which the boundaries between transport modes disappear and transport chains will be smooth." The project covers all transport modes and aims to bring provision by all transport services under one act and thus to promote modal interoperability.

In line with Prime Minister Juha Sipila's strategic government programme of May 2015 to put the Finish economy on a path of sustainable growth and higher employment, the act aims to remove obstacles to the development of digital services, at making market access easier and at promoting interoperability of modes. The act requires all transport providers to provide access to essential data via open application programming interfaces (APIs), including information on timetables, routes and ticket prices.

The data that are regarded as essential are divided into categories of transport services as defined by the act:

- passenger transport services (including bus and taxi services and air- or waterborne passenger transport)
- stations, ports and other terminals
- transport mode rental and services for commercial ride sharing
- general commercial parking services
- brokering and dispatch services.

In the case of passenger transport services, the data opened to the public will have to include information on routes, stops, timetables, irregularly scheduled traffic, prices, availability and accessibility. In the future, the scope of these requirements may be extended to other data as well, such as real-time data on vehicle location.

The act incorporates specific considerations for the data to be opened to the public. They should be up to date, i.e. delivered as soon as the provider has the information. The act specifies that the data can be reused without limiting conditions. Essential data is to be stored in the National Access Point service, an open portal to which mobility service providers are required to provide data. Interfaces must be provided to all actors under fair, reasonable and non-discriminatory terms. The act specifies that the Finnish Transport Agency must provide small operators, which might not have technical capacity to share their data, with technical assistance so that all transport companies can provide essential information on their services.

The Finish Transport Agency, as the government agency responsible for the maintenance of Finland's road, rail, and waterway systems, has a key role in putting the requirements of the act in place. Among its responsibilities are providing an interface catalogue and a digitalisation tool for opening relevant data, monitoring supply and demand of mobility services and co-ordinating their development.

Source: ITF based on Government of Finland (2017a), Act on Transport Services, Finlex; Government of Finland (2017b), Government decree on essential data concerning mobility services.

The opening up of data in France has gone hand in hand with the issuing of related regulations. One of the main ones is the so-called Macron law of 2015 (Box 7.3). The law requires public transport operators and authorities to adopt an open data policy and release their data, generally with free access. In the case of Île-de-France, Île-de-France Mobilités is the lead agency in charge of putting this policy into place. Its policy builds on the actions it has taken since 2011 when it created its open data portal. To carry out its duties, Île-de-France Mobilités gathers transport data from other competent authorities in Île-de-France, such as nearby transport authorities and municipalities that have their own bicycle systems (among them the city of Paris). Île-de-France Mobilités encourages the three main transport operators to further open their data as well, beyond the elements that, by contract, they must provide to Île-de-France Mobilités. Ownership of the data shared with Île-de-France Mobilités, unless otherwise stated, remains the intellectual property of the operator that generates it.

Box 7.3. **The Macron Law**

Law 2015-990 of 6 August 2015 on growth, activity and equality for economic opportunities, known as the Macron law, made sharing of transport-related data compulsory for public transport services in France. Data sharing under this legislation is meant to be done "freely, immediately and on a principle of no charge" for the users requesting the data. The data that needs to be released is the following:

- Numeric data: data regarding information related to service stops, public tariffs, planned and real-time schedules, accessibility for impaired mobility people, service availability and any data linked to incidents that occurred in the network, as well as to malfunctioning mobility services-related furniture.
- Calculated data: data from calculators for multi-modal itineraries managed by, or on the behalf of, mobility organising authorities.
- Compliance with this regulation is the responsibility of operators of transport and mobility services, or the organising mobility authority when appropriate. Relevant actors are not immediately concerned by this clause. For an actor to be subject to the law, it needs to have established, and made publically available beforehand, their own main open data guidelines. The guidelines should include the following points, as defined by the law.
- The amount of data that will be opened for immediate reusing. This element also indicates the pace at which data is released and made available to the public.
- The timeframe of the release and the technical conditions linked to the diffusion of real-time data.
- The pertinent level of information the institution will provide with regards to variations on the offer of service. These variations, generally related to seasonal change, provide useful information for the organisation of inter-modality.
- The way in which the open data site connection between information systems, mainly through subscription or request, allows provision of the relevant data. This section also indicates, as well as the conditions on for the continuous provision of service of data providing in case of an eventual change on the modalities of data diffusion.
- Waivers on the principle of no charging with respect to mass users, as justified by the significant cost of making data available. The eventual contributions cannot, however, exceed the considered cost.
- Conditions to ensure complete and neutral reuse of data, so as to guarantee the quality of the information and of the services, as well as the user's safety (French Government, 2015).

Source: ITF, based on French Government (2015).

Despite the progress made, certain issues have arisen. First, the Macron law does not provide clear guidance on the format and way in which open data need to be released. While this has given operators flexibility to progressively adapt to open data requirements, it has impeded harmonisation of data formats, especially as regards data that go beyond contractual stipulations on format, frequency and delivery of information such as real-time data generated by the transport enterprises.

The open data policy has also faced resistance from the main operators – SNCF, RATP and OPTILE –which had released some of their theoretical data of their own accord before the Macron law, but opposed releasing real-time data freely. The reason given is that free release of their data could enable external data gatherers with wider technical capacity (e.g. Google, Amazon, CityMapper, Uber) to use the data for commercial purposes.

In some cases pressure by third-party data companies has helped in reaching middle-ground solutions. For instance, Citymapper applied public pressure in 2016 by launching a petition for RATP to open its data. RATP began to do so in January 2017, on the condition that it could price it for mass use (more than 30 million consultations per month). Using similar logic, SNCF opens up its data freely, but sets a fee for users leading more than 150 000 consultations per month (600 000 for real-time data of the SNCF regional rail services in Île-de-France). Data release by OPTILE members is on a case-by-case basis.

Main transport open data platforms and licences

Transport open data in Île-de-France is gathered via a range of platforms owned by the main transport-related actors in the region. Île-de-France Mobilités gathers all transport open data for the region on its platform, which includes a prototype API allowing exploration of the real-time data available to Île-de-France Mobilités. Île-de-France Mobilités' platform, at the regional level, works in parallel with the open data platform of the city of Paris and that of the French government. In particular, the government platform allows municipalities in Île-de-France and the rest of the country that lack technical capacity for their own open data spaces and policies to publish their data. Île-de-France Mobilités' open data platform also coexists with the individual platforms of RATP and SNCF.

Box 7.4. **Île-de-France Mobilités open data licences**

The Open Etalab licence is the product of the Etalab ministerial mission, which aimed to develop a licence compatible with international standards for open data sharing. The licence allows users to reproduce, copy, adapt, modify and exploit data with a commercial objective, all while indicating the source of the information and date of last update. The Open Etalab licence is compatible with international legislative frameworks such as the UK Open Government Licence, the Creative Commons Attribution from Creative Commons, and the Open Data Commons Attribution from the Open Knowledge Foundation (Etalab, 2017).

Mobility data jointly produced by Île-de-France Mobilités and transport operators can appear under the French ODBL licence, which is essentially the French version of the Open Knowledge Foundation licence and allows users to share, create and adapt data and products on the basis of the data as long as the source of the information is mentioned, the sharing is done under identical conditions to those in which the initial data was found and the data produced is itself open (Opendata STIF, 2018).

Finally, the Creative Commons licence allows for the copying, distribution and communication of material in any means and format as long as the source is declared, the data are not used for commercial purposes and they are not modified (Opendata STIF, 2018).

Source: ITF based on Etalab (2017), Opendata STIF (2018).

Data in Île-de-France Mobilités' open data platform can be found under three main types of licences, which determine how each piece of information can be used (Box 7.4). The type of licence depends on the nature and function of the data. For instance, data that could potentially serve to generate services or commercial applications is found under the Open Etalab licence or the ODbL licence, in which commercial use is allowed under certain conditions. More crucial data that should not be modified or commodified but could serve the public appears under the Creative Commons licence. This licence is, for instance, applied to maps and plans of the transport network in Île-de-France.

Data management

The use of the Navigo card and gradual digitalisation of tickets in Île-de-France have brought a huge increase in electronic data, which Île-de-France Mobilités has to process and analyse. In 2010 the authority contracted with a third party, Capgemini, for support in building a platform that would allow analysis of large amounts of public transport data to better inform decisions. The contractor helped build a decision-making information system the Systeme d'Information pour l'Exploitation des Données de Validation Telebilletiques (SIDV), now one of Île-de-France Mobilités' main data analysis tools. SIDV enables Île-de-France Mobilités to unify an enormous volume of public transport operators' data and quickly analyse it for a variety of purposes. Among other things, it allows analysis of journeys and commuter habits and bus efficiency, and gives an overview of transport logistics performance. The system is also used when setting pricing policies, identifying service gaps and planning urban transport. SIDV was designed to reduce costs and avoid the need for wide, time-consuming transport surveys.

Île-de-France Mobilités also created an Information and Digital Services unit in its Intermodality, Services and Marketing Department. The unit is in charge of defining and implementing digital strategies for the transport sector based on data processing and analysis. It is also responsible for the dissemination of the information to passengers. The unit is developing a Vivanavigo platform to combine multiple types of transport-related data, such as real-time information, passenger counts and traffic data, as well as previously unavailable data on bicycles, shared cars and location of parking areas. This allows Île-de-France Mobilités to have real-time information on network operations and identify gaps. Vivanavigo is also an information platform for transport users in France, who can access accurate, real-time information on availability of services or receive notifications about disruptions on the network.

With the aim of moving towards a MaaS framework, Île-de-France Mobilités uses data analysis and digital innovations to develop more convenient payment options. The flagship project currently being developed is Smart Navigo. It is being introduced in several stages. The first stage, in 2016-17, introduced the possibility of managing Navigo cards online. In the second stage (2018-20), the new system for recharging Navigo cards is being introduced: users with smartphones will be able to buy tickets and recharge their cards online instead of buying tickets at stations. The new system will introduce the post-payment method allowing users to pay at the end of the month for mobility services actually consumed. It will automatically calculate the cheapest price for the combined trips made under payment schemes that Île-de-France Mobilités is developing. Ultimately, the project will enable contactless validation with smartphone or bank card.

TfL

Data collection

To better plan services and provide information to passengers, TfL collects and analyses massive amounts of transport-related data. These data are collected from information provided by private operators, ticketing systems (e.g. Oyster smart card), sensors in vehicles, traffic signals, crowd-sourced data, surveys, interviews and focus groups, among other means.

Information provided by private operators

TfL as a public regulator in the Greater London area requires private companies operating public transport services to share several types of data so as to better plan the capital's transport network and provide accurate real-time information to passengers. This requirement is built into contracts between the operators and TfL. Thus, private operators cannot withhold any data required by TfL, including real-time data on vehicle location and data regarding the state of vehicles or accidents and incidents.

Especially in view of emerging app-based platforms offering instantaneous private hire bookings, a pending issue is that TfL has no regulation in place to oblige private-hire vehicles (PHVs)[1] to share data. TfL estimates that in the seven years between 2009 and 2016, which saw rapid growth of PHVs in London, the number of licensed drivers increased from 59 000 to more than 95 000 (TfL, 2016). TfL considers these services relevant to the future of London's transport system, with a potential to tackle congestion, pollution and accessibility gaps. Data stemming from the companies that provide on-demand ride-sharing services is essential to TfL for understanding how new services change the way people move, how to plan these services accordingly and in co-ordination with other services, and, ultimately, how to unlock their potential benefits.

Smart-card data collection

TfL collects all the data generated by the Oyster smart card, which is a personal electronic ticket card that can be used on all public transport modes in London. It can be used in pay-as-you-go mode or can hold daily or seasonal passes for particular modes.

The Oyster card was put in place by the TranSys consortium, which operated the card programme for TfL until 2008. TranSys was responsible for developing, installing, managing and maintaining the automated fare collecting system on behalf of TfL. It was required to send out all data collected to TfL. In 2008, TfL eliminated the contract with TranSys and bought the Oyster card brand (TfL, 2010). It thus now directly receives all information on movements of people from the Oyster card. By design the cards do not carry any personal information. The data include the amount of money the passenger adds to the card, the frequency of card use, travel routes the passenger uses, the mode of transport used, and data on entry to and exit from tube and rail stations (customers have to touch in and out for their journeys). All the data collected are anonymised and TfL analyses them to form an accurate picture of how and where people travel across Greater London.

Surveys, counts and other types of data collected

TfL departments collect additional data regarding their respective services. London Underground, responsible for the tube service, conducts a variety of surveys to understand where people travel to and from and how long their journey lasts. London Underground also collects data on the performance of the tube network, including percentage of scheduled kilometres operated, frequency, total journey time, station closures and availability of escalators and lifts. Underground Service Performance Reports that include these data are published monthly. Similarly, London Buses (see full description in Chapter 4) conducts a variety of surveys and counts to measure customer satisfaction, in addition to collecting data on all bus operations in the capital region.

Open data and data-sharing

All transport-related data collected by TfL is freely available for third parties to use with their own software and services. This includes real-time data sets on the operation of the transport network, such as real-time bus arrival times, accessibility in stations,[2] bicycle availability at shared-bicycle nodes, and bus

and train schedules. TfL has made available some 62 data sets that can be freely downloaded by users (Delotte, 2017). They provide a mix of real-time data (tube departure times, live traffic disruptions, live bus arrivals), fixed data (timetables, station locations, station facilities) and transparency-related data (operational performance, directors' remuneration). TfL's website specifies how regularly different types of data are updated, ranging from 30 seconds for real-time data on tube departures to annually for data such as passenger counts. TfL processes personal data in compliance with the Data Protection Act of 1998: all data sets published exclude data that might infringe privacy policies.

TfL's open data approach is aligned with the open data policy adopted by the UK government with the publication of the 2012 Open Data White Papers. In addition, GLA has made important efforts to prioritise the release of datasets across sectors, which have also strengthened TfL's capacity to implement its open data approach. In 2010, GLA started its London Datastore initiative, which aims to release as much of the data that it holds as possible. The only data sets not released are those that would infringe privacy legislation or contractual obligations, such as commercial confidentiality.

The London Datastore brings together data sets from sectors such as jobs and economy, transport, environment, community and safety, health, and housing. It is a free and open data-sharing portal acting as a "marketplace" for collaborative efforts. TfL, as part of GLA, also adds its data sets to the London Datastore. Some include information on connection levels, which allow businesses to choose locations that are accessible for citizens. The London Datastore also includes information released by boroughs with a detailed overview of all planning permissions granted across the capital. This includes up-to-date information on development and completion of transport projects, which among other things helps developers identify the best potential sites for projects.

Opening up data has brought significant cost savings to TfL by allowing the development of travel applications tools and services by third parties. The open data policy has also nurtured a culture of innovation and entrepreneurialism – up to date there are more than 460 apps powered by TfL data and 8 200 developers have registered to access the data. According to a Deloitte report, TfL was able to create annual cost savings of approximately between GBP 15 million to GBP 42 million from not having to produce apps in-house and allowing the market to develop innovative new transport apps and services (Deloitte, 2017).

Data sharing has allowed third parties to help TfL improve London's transport networks by identifying areas underserved by public transport. For instance, Citymapper, a company that has developed a free journey-planning app, analyses the data published by TfL in combination with its own data and identified gaps in public transport. The company found, for instance, that while the route between Aldgate East and Highbury and Islington stations (i.e. from the financial and tech start-up district to the inner northern suburbs) was being well served during the day, it was not well supported at night, despite a steady increase in ridership at night. Citymapper requested TfL to issue a PHV licence in order to launch the company's first commercial bus route (CM2 – Night Rider), which operates on weekends from 9 pm to 5 am via nightlife hotspots in East London (O'Kane, 2018).

TfL is working towards strategies and policies to further increase reciprocal data-sharing with the private sector. The mayor, meanwhile, is developing the Smart London plan, which will strongly emphasise sharing and using data to improve services. Among other actions, new citywide data partnerships will be developed.

Data management

TfL's dedicated analytics department has skilled staff with technical responsibilities over data analysis and data processing, computational and statistical analyses, and software and technology

development. Skilled technical talent capable of handling and analysing very large data sets compiled from multiple sources is an important asset.

Its data analysis allows TfL to manage service disruptions efficiently and inform users about changes in the transport network. For instance, by analysing data from Oyster cards, TfL can identify riders who regularly use certain routes and send them personalised travel updates, such as service changes or disruptions. It also sends targeted emails with information about alternative routes to minimise the impact of disruption. The data monitoring and analysis of the real-time data collected from the iBus system (Box 7.5) allows TfL to react promptly and to make temporary bus route changes in case of disruption in order to help passengers to get to major interchanges.

Box 7.5. **The iBus system**

The iBus system is an automatic vehicle location system that tracks the location of all buses operating in London and provides real-time audio and visual information to passengers on board. The system was implemented in 2006 as a response to the growth in the number of buses in service in London and the need for better co-ordination.

The iBus system uses satellite tracking and GPRS data transfer to keep track of where each bus is. The system also monitors the speed, movement and performance of buses on all contracted routes in London. Unlike traditional GPS, which has limitations in large cities due to signals being affected by surrounding buildings, iBus has an enhanced navigation algorithm that allows precise positions of buses to be identified.

The system also delivers better radio communications for drivers as well as accurate bus service monitoring for controllers, who know garages and the exact location of all buses at all times. The enhanced radio system lets service controllers speak to their entire garage fleet, individual drivers or a specific group of drivers in one area or on one route.

From a passenger's viewpoint, a key benefit of the system is clear and concise real-time journey information. On-board radio announcements and visual displays inform passengers of the route number, next stop and final destination. Additionally, the iBus system improved the quality of information displayed on Countdown signs at bus stops. The latest system takes into account a variety of factors to identify the location of the bus and approximate waiting time and provides more frequent updates.

Source: ITF, based on TfL (2009), All London's buses now fitted with iBus, https://tfl.gov.uk/info-for/media/press-releases/2009/april/all-londons-buses-now-fitted-with-ibus

Data analysis carried out in-house by TfL's staff allows the agency to create a comprehensive picture of travel patterns across London's rail and bus networks. This allows identifying major transport needs and making changes in order to enhance the efficiency and ease of use. For instance, TfL used the ODX Big Data Analysis tool to restructure the bus network in the New Addington area of London to provide better services for residents. The tool allows the matching of different sources of data. For instance, TfL fused Oyster card and iBus data to provide a multi-modal picture of customer travel patterns.

TfL has also leveraged research partnerships with academic institutions. It has worked with the Massachusetts Institute of Technology using data captured by the Oyster card for strategic research. Among the main objectives is to gain more accurate insights into the behaviour and movement of people. Specific projects include estimation of origin-destination matrices for the London Underground, analysis of bus-to-bus and bus-to-tube interchange behaviour, modelling and analysis of fare policy changes and

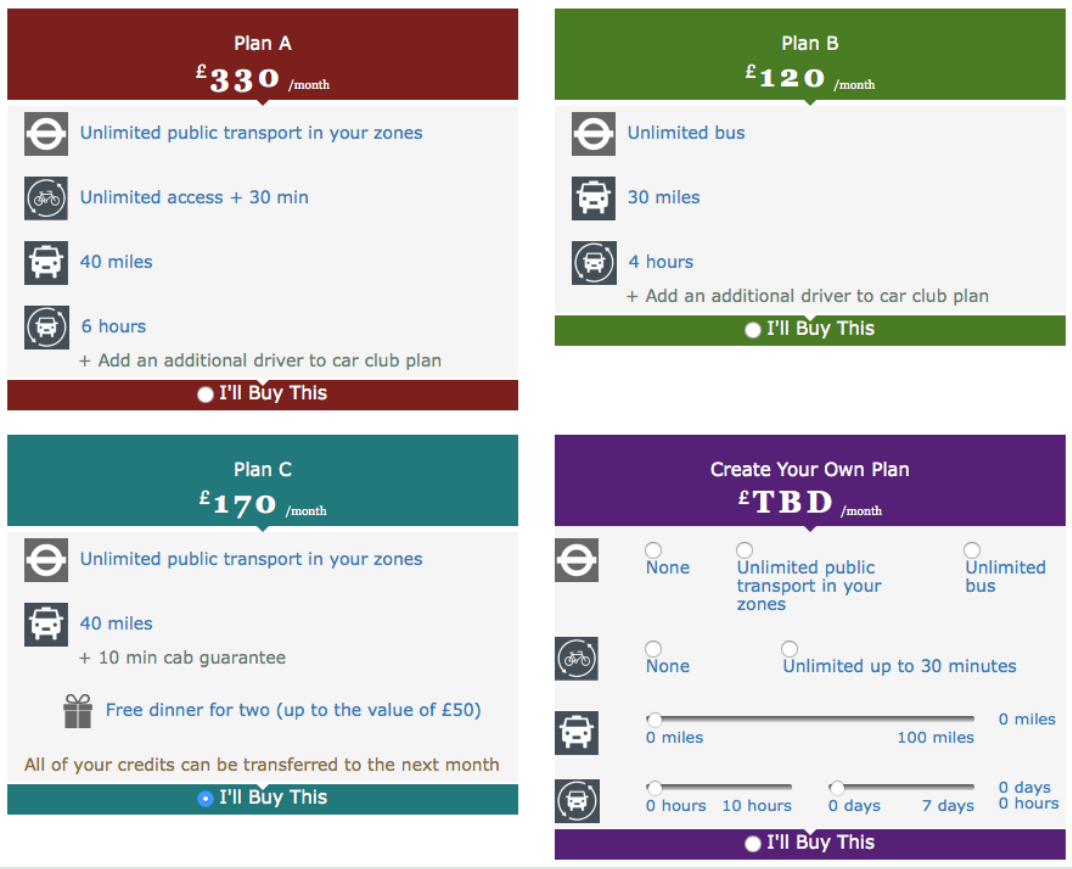
measurement of the quality of service (JTL, 2018). TfL also works closely with University College of London (UCL), which has supported TfL in analysing a variety of data sources in order to elaborate MaaS solutions. In collaboration with UCL, TfL is currently exploring potential MaaS solutions that would combine the ability to plan, personalise and manage transport services from a single user account (Box 7.6).

Box 7.6. **Potential MaaS solutions for London**

The Urban Transport and Energy Team of the Energy Institute, University College London, has collected new data through London Mobility Survey and activity tracking in order to study individual preferences for potential MaaS plans. The aim of the study was to analyse how to create personalised mobility plans that would fit users' needs.

Using data on travel habits, UCL has created potential monthly travel plans that could be applied to London. These include several monthly plans with different transport modes for users to choose from.

Figure 7.1. **Design of new products of TfL**



The study concluded that Maas-London was a potentially feasible product that could ameliorate the London transport market and contribute to Londoner's quality of life. However, for a project to become viable there is a need for co-operation with different stakeholders, including TfL, service providers and boroughs. The study concludes that if co-operation is established, the next step would be to design the actual platform and make it compatible with services that are already in place.

Source: ITF based on Kamargianni et al. (2015)

ATM and AMB

Data collection

Data collected by different administrations

In the Metropolitan Region of Barcelona, several actors collect transport-related data. The administrations that own the roads (local municipalities, Catalan regional government or Spanish central government) collect a wide range of information from traffic counters distributed along their respective road networks. These data is then published on each administration's websites. For instance, every year the Department of Territory and Sustainability publishes a document that summarises the main statistics regarding supply and demand of transport infrastructure (lines, network length, distance travelled, vehicles in service, share adapted to people with impaired mobility, average age of the fleet) for all public transport operators in Catalonia, differentiating between bus and railway. These data sets are combined and published on the website of the Department of Territory and Sustainability of Catalonia. The region also publishes data for the IFS area with data sets on population, number of municipalities, surface area, percentage of tickets used by type. ATM can in addition ask an administration to provide more detailed data, though there is no legal obligation for administrations to share the data they collect.

At the same time, AMB collects real-time data on the location of buses. AMB uses regulatory mechanisms that are embedded in contracts with private operators in order to collect this information. As such, all buses contracted by AMB must have a GPS and an intelligent transport management system, and all operators must provide reliable, accurate information to AMB. The intelligent transport management system provides real-time information on the location of vehicles and the expected time of arrivals for each bus stop. All information gathered is aggregated by AMB Informació, which is the agency established within AMB taking charge of data processing. If needed, ATM can request AMB to share the data from AMB Informació.

Ticketing data

ATM collects all the data stemming from tickets used on all transport modes managed by AMB, ATM or the Generalitat, including metro, urban or suburban bus, FGC, Renfe and tram. The information collected consists of ticket validations (including data on date, time, line, type of ticket). These data enable ATM to redistribute compensations to the operators or make transfers to administrations (e.g. AMB), which then redistributes compensations to the operators.

Surveys, counts and other types of data

ATM conducts transport surveys in order to have a more accurate picture of the modes used in the Barcelona Metropolitan Region. These surveys cover the entire IFS zone, and cover questions related to the number of trips per person, the time of the day, the origin-destination, and the transport modes used, among other things.

At the same time, administrations such as the Barcelona City Council, the Barcelona Metropolitan Area and AMTU conduct Working Day Mobility Surveys. The surveys are conducted by these administrations for their respective territories and the results are published on the ATM website as data sets. The purpose is to determine the basic characteristics of workday mobility (Monday to Friday, except public holidays) among people aged 16 and over living in the IFS area (ATM Mobility Observatory).

Open data and data-sharing

Within the Barcelona Metropolitan Region there are no mechanisms in place to promote open data sharing with third parties. Only the city of Barcelona has adopted an open data policy as part of its Digital City Strategy. The city hall of Barcelona has 463 data sets in the Open Data Barcelona Catalogue, including on mobility, education and employment (Open Data BCN, 2018). The goal is to promote reciprocal data sharing thereby fostering innovation and new collaborative projects that have a potential to improve urban environment. Furthermore, some public transport operators operating in the city of Barcelona and adjacent municipalities publish different data sets voluntarily. For instance, TMB, the holding company that operates metro and bus services mainly in the Metropolitan Area of Barcelona, publishes main public transport management data every year. The data sets include demand and occupation, number of lines and stops, fleet, etc. Information on the public transport network (lines, stops, stations, routes, etc.) is provided in GTFS[3] format and is updated weekly.

Data management

Data from tickets and data transferred from administrations is used by ATM mostly to inform its transport planning strategies, in particular when drawing up its Infrastructure Plan and Mobility Master Plan for the Barcelona Metropolitan Region. As was mentioned earlier, data collected from tickets are also the basis for redistribution to operators according to net cost contracts (see details in Chapter 5).

Within AMB, AMB Informació uses data gathered from the intelligent transport management system to analyse trends on travel times and plan network improvements within the metropolitan area. AMB Informació is also in charge of distributing information to citizens about public transport services.

Box 7.7. **T-Mobilitat**

The T-Mobilitat system is expected to come into service in 2018-19. The deployment will start in the Metropolitan Area of Barcelona and is to be expanded to the rest of Catalonia as a second phase.

ATM as the entity responsible for the implementation of T-Mobilitat contracted SOC MOBILITAT, which is a company that will be in charge of the acquisition, installation and maintenance of all the equipment required by the system. SOC MOBILITAT will also be in charge of the implementation and management of a new transport Information Management Centre, which will receive all the real-time information on the public transport network. The necessary software will be developed by the contractor and both the contractor and ATM will provide personnel to the centre.

The centre will build a database with all the information regarding the public transport system. The data stemming from all transport operations (TMB, FGC, tram, Renfe and bus operators) as well as from traffic cameras will be gathered at the centre. The data would to be shared with corresponding administrations via special agreements with ATM (agreement arrangements are yet to be defined) so that all administrations will be informed on the commuting patterns and movements of people in order to better plan transport services. Regulatory arrangements, specifying the format, regularity and proceedings of data sharing with the centre, are pending. AMB Informació will be also able to access the data through its agreement with ATM. The exact form of the agreement between AMB and ATM is still under development, but both administrations have recognised the importance of co-ordination for data sharing.

Source: ITF based on ATM, Sistema de transport, T-mobilitat, http://www.atm.cat/web/ca/t-mobilitat.php

ATM and AMB are working towards deployment of T-Mobilitat, a contactless card that will allow payments via personal smart card and will facilitate the use of public transport. According to the project the payment will be made at the end of the journey, depending on the distance travelled. This is a step towards MaaS for citizens in the metropolitan region, as with the new card riders will pay according to kilometres travelled and frequency of the use of public transport. Currently citizens pay for travel cards before they use them and have to buy them in specific places. The introduction of T-Mobilitat will enable pre-payment and post-payment systems, top-ups online and payment via mobile phones (Box 7.7).

Notes

[1] TfL requires any vehicle that seats up to eight passengers and is available for hire with a driver to apply for a PHV licence.

[2] TfL releases special guides with information about step-free access to platforms and trains. They are available at London Underground, London Overground and Docklands Light Railway stations.

[3] General Transit Feed Specification (GTFS) is a common open standard format for public transport schedules and associated geographic information. It allows public transit agencies to publish data in a format that can be utilised in applications (such as journey planners) in an interoperable way.

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Chapter 8. Conclusions and recommendations for establishing Seoul's Metropolitan Transport Authority

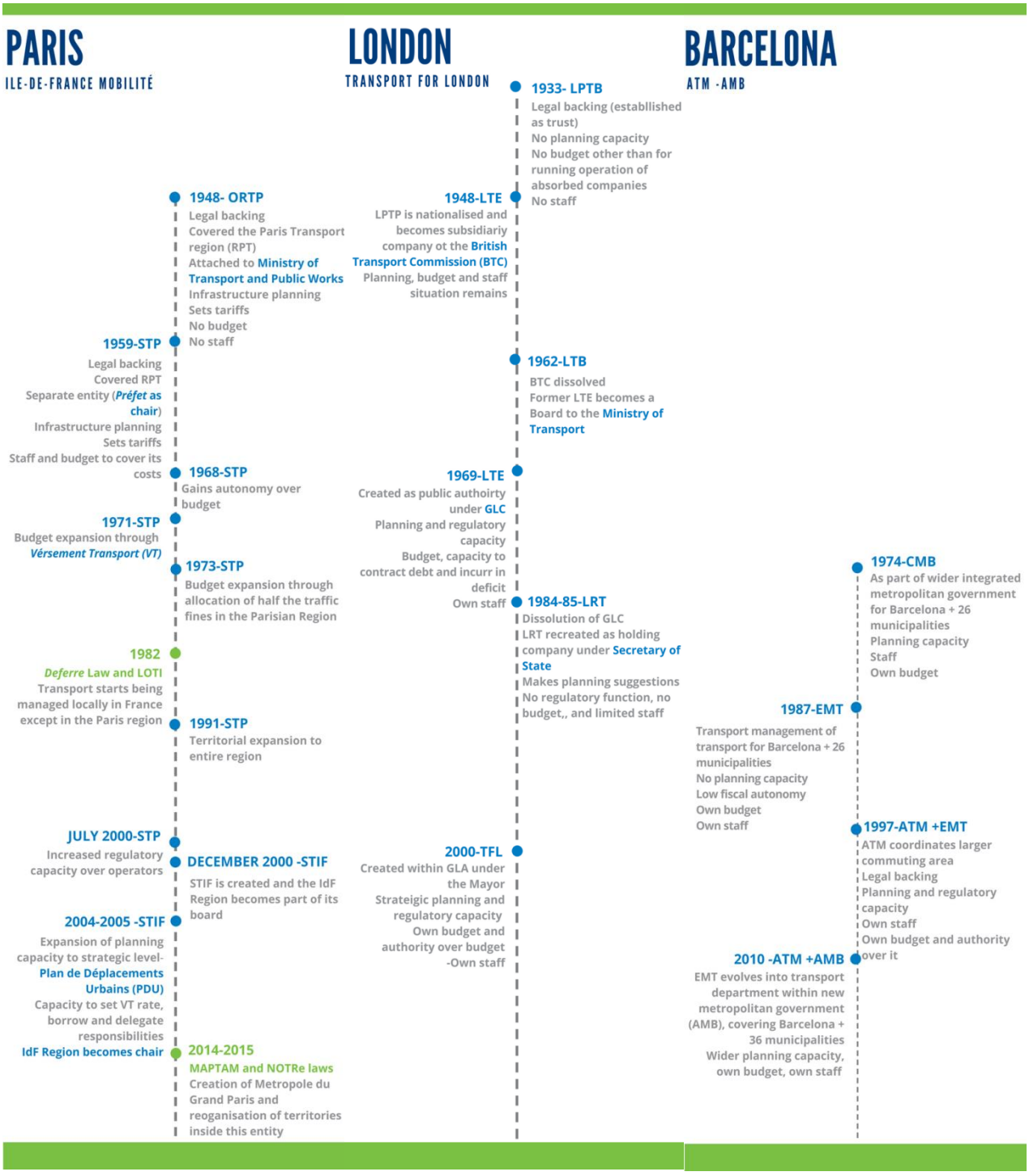
Barcelona, London and Paris have established some of the world's most effective metropolitan transport authorities, in urban areas that have expanded well beyond initial city boundaries. They have each seen a process of institutional reform that is instructive for other large cities seeking to improve the governance and co-ordination of transport services across the metropolitan area. Figure 7.1 summarises the historical evolution of the institutional framework governing transport in each of the three city regions, and highlights how each configuration incorporated or lacked the defining elements considered necessary for a fully functional MTA. These elements are the following:

- formal authority with legal backing over a specified territory, with clearly defined responsibilities
- dedicated funding and decision-making authority over use of the transport budget
- dedicated and highly skilled staff
- authority over strategic-level planning and responsibility integrated land-use and transport planning
- regulatory capacity
- predominant role of sub-national authorities in the decision-making process.

It will be important for the authorities in Korea and Sudogwon to ensure that the new institution created for the co-ordination of transport in Korea's capital region meets these conditions.

The analysis of transport governance and its evolution in the three cities reveals important insights for authorities considering the establishing of an MTA in other contexts, such as the capital area of Korea. These can be summarised as follows in Figure 8.1.

Figure 8.1. **Summary of key changes in transport governance in the Paris, London and Barcelona regions through time**



Setting up the MTA

Address co-ordination between jurisdictions at all territorial scales

Identifying differences between the roles of administrations in the urban core and the larger commuting zone is important when looking for the right institutional set up for co-ordinating transport beyond city boundaries.

The plan to establish an MTA for the Sudogwon area, i.e. for the larger commuting zone in the capital region, is essential from an integrated transport planning perspective. An institution at this scale will have the capacity to better understand commuting patterns and transport needs across the whole economic unit formed by Seoul, Incheon and Gyeonggi Province. As with Ile-de-France Mobilités in Paris and ATM in Barcelona, this should allow the new institution to develop the necessary regional-scale plans for mobility across the entire capital area.

The case of Ile-de-France Mobilités demonstrates the potential of such an authority to plan and supervise operations on the public transport lines that structure development across the commuting zone (covering commuting rail, metro and bus services). Ile-de-France Mobilités harmonises quality standards for services across the regional network and works to improve integration across different modes. Similarly the Sudogwon MTA will help to better prioritise investment and facilitate decision-making on regional linkages, particularly between Seoul and other cities in the region. The Paris and Barcelona case studies underline the advantages of having an MTA that covers the entire commuting zone and is in charge of tariff integration and revenue distribution.

The Sudogwon MTA will also be well placed to examine the linkages between regional mobility patterns and land-use and housing policy, including at the scale of the entire capital area. This will allow revision of urban development strategies, such as the creation of "new towns" for example. In the case of the Ile-de-France Region, new towns proved counterproductive to the policy of controlling sprawl.

At the same time it must be acknowledged that the very wide and diverse territory of Sudogwon is likely to make it difficult, as is the case of Ile-de-France Mobilités and ATM, for an MTA to plan the smaller scale services needed to complement the "structuring" infrastructure and services that are its first priority. Local buses, bicycle lanes, road management, parking policy and pedestrian facilities have location-specific qualities that need a strong input from local territorial authorities. An institutional set up that ensures strategies for these services are developed by local authorities in concert with regional policy will be necessary for the regional plan developed by the new MTA to be delivered effectively. The two-level arrangement in Barcelona, with ATM established as the MTA for the wider commuting zone and AMB's transport department serving as the MTA for the urban core, effectively addresses the local specificities in the area. In this respect, each department in AMB liaises, plans and executes policies in close co-ordination with related departments in every municipality of the metropolitan area of Barcelona. The necessary institutional framework for Sudogwon can be built by taking advantage of the administrative structure already in place, when Seoul, Incheon and the cities of the Gyeonggi province have administrative boundaries that correspond to their urban core.

Make establishment of the MTA an integral part of decentralisation

Analysis of the three cases highlights the potential of an MTA to effectively reconcile decentralisation with the development of the necessary vision for integration of the commuting area and the urban core. The process of decentralisation of responsibilities from national to local bodies is a common trend across OECD countries, with locally elected authorities seen to have a better

understanding of local needs and thus the capacity to be more responsive to local demands. Nonetheless, decentralisation has the downside of fragmenting responsibilities, such as those for transport, across an array of actors from different territories and levels of government. This is particularly risky in the case of large urban areas, which need to develop integrated transport networks and implement coherent policies across the entire urban core and commuting area to remain productive.

In this context, the development of MTAs has proven an effective way to organise and co-ordinate decentralisation. Setting up an MTA permits local authorities to have a prominent role in the decision-making process on transport policy and investment. At the same time MTAs maintain cohesion and coherence in plans for which a larger scale vision is key to ensuring efficient resource allocation and investment, delivering high quality and efficient services, and attaining wider environmental, social and economic policy objectives.

Establishing MTAs in countries where decentralisation has already started, such as Korea, should be seen as an opportunity to better co-ordinate the transfer of resources, decision-making powers and responsibilities from the national to the local scale. This will facilitate implementation of the decision to decentralise already made. During certain periods, entities with responsibilities over metropolitan transport in Paris (until 2004) and London (1948-69 and 1985-2000) were part of or led by the national government. In Paris this was because the first transport planning entities (ORTP and STP) were established before the decentralisation process began in France. In London, the establishment and abolition of local transport entities with decision-making powers was linked to the establishment and abolition of regional metropolitan governments.

It is true that establishing an MTA entails transferring some of the capacities, responsibilities and funding that are now assigned to lower levels of local government to a new body established for the entire capital region. Nonetheless, as long as representation of entities that transfer such responsibilities and resources is ensured in the decision-making body of the MTA, the development of an MTA can be a vehicle for unlocking the benefits of decentralisation.

Benefit from guidance and support from the national government

Paris, London and Barcelona are all good examples of the ways in which national level decisions can facilitate or hinder the development of MTAs. In the case of London and the UK, national decisions to establish or abolish metropolitan and regional governments with powers over transport were crucial to the existence of Transport for London (TfL) and its predecessor, the London Transport Executive under the Greater London Council. In the case of Paris, national level laws were behind the creation of the STIF (now Ile-de France Mobilités) and its predecessors, the ORTP and the STP. Various national government decrees enlarged the former STP's capacities through time, establishing a solid base for the transformation into the STIF. In contrast, the State's decision to exclude the Paris region from the scope of the national transport framework law (LOTI), slowed the pace at which local authorities were granted decision powers in the STIF, delaying consolidation of the institution into a fully-fledged MTA, a weakness addressed only in 2000 (by the SRU law).

National government decisions regarding the legal framework are also very relevant to the financial capacity of MTAs. In France, for instance, developing a framework that allowed local government to levy the *Versement Transport*, and later allowing Ile-de-France Mobilités to vary the rate of this tax on local business, has been important for developing a solid funding base for the institution. Similarly, the legal framework later allowed enlargement of funding for the MTA by channelling half of the revenues from traffic fines in the Paris region to the MTA. In the case of the UK, the establishment of the Greater London Authority by the State gave access for TfL to a wide set of funding mechanisms. The limited

duration of the initial contract with the national government for the bulk of funding for TfL provided the incentive for the institution to use its prerogative to raise its own funds and expand funding sources.

As shown by the case of the ATM in Barcelona, the national government can also play a central role in negotiations between parties for setting up an MTA. In particular, establishing economic incentives to align different interests can be crucial to these negotiations. This was the case of the initial symbolic financial contribution granted by the Spanish State for the development of the MTA and the informal though critical requirement for the City of Barcelona to belong to ATM in order to obtain State grants for transport projects.

Build consensus on the allocation of funding and decision-making powers between jurisdictions

The three case studies examined suggest the development of an MTA is highly dependent on political timing and taking advantage of periods of political allegiance between the different levels of government in supporting the development of an MTA. Political leadership from key actors was decisive in the case of London, from Prime Minister Blair and Mayor Livingston, but plans for an effective MTA had been developed that could be implemented when the political window opened. Even in the case of political alignment, and even more so when diverging political parties occupy different levels of government, it is important to understand how the development of the new entity affects different parties.

The key is always to find a model for the MTA that can bring benefits to the diverse stakeholders in return for the transfer of funding and decision-making power. Each of the three case studies shows that certain adjustments in this direction were made in the final set up of the MTA. In Paris for example, the first proposal for establishing the STIF did not contemplate the transfer of sufficient funds to the region, but this had to be modified. Similarly, voting rights in the STIF's administrative council were adjusted to increase the representation of certain *départments* (local governments) and the powers accorded the city of Paris were re-negotiated. In the case of London, major adjustments to the proposed model for TfL were also made. This included the creation of an Assembly of London with ultimate authority over the Mayor's powers over transport and other matters. The final Greater London Authority Act also emphasised the role of the Secretary of State for Transport (the national Minister) in overseeing the Authorities actions in relation to transport. In the case of Barcelona, the institutional model in which ATM was created was part of a compromise that met both the requirements of the Catalonia Region and the City. In particular, the City asked that EMT, the entity in charge of transport in Barcelona City and some of its surrounding municipalities at the time, was kept active in order to accept the development of ATM.

Leverage public awareness

Public awareness of the problems created by the lack of metropolitan co-ordination (e.g. congestion and pollution) can be important for bringing the subject into the political agenda and pushing forward development of an MTA with public support. This was the case of the development of ATM, where the subject became central to Barcelona's municipal elections. In the case of the UK and London, public criticism of institutional arrangements for transport also brought both the Conservative and Labour parties to address the issue. In the case of Paris, general discontent generated by the lack of effectiveness of the STIF was central to obtaining the intervention of the Senate in 2004, which resulted in the final agreement of the State to transfer sufficient funds to the Region to accompany its new leadership role in the STIF.

Ensuring effective co-ordination with other actors and within the authority

Clearly define responsibilities for the MTA in relation to other actors

The selected case studies highlight that a clear and coherent division of responsibilities between different actors is central to unlocking the benefits of an MTA. Developing the right split of prerogatives requires careful analysis of existing institutional layers and relevant actors, as well as of their particular transport-related capacities.

Allocation of responsibilities should avoid overlap between the MTA and other actors, and rather create synergies between them. There is no universal model and the case of Barcelona demonstrates the potential advantages of establishing two transport authorities (ATM and the transport department of AMB), at different institutional and territorial levels. Having found complementary roles for these institutions and avoiding duplication of duties between them has been key to the model's success. A clear transfer of responsibilities from other actors to each of the institutions has also played a crucial role. The creation of all MTAs analysed in this report has been accompanied by dedicated legislation, which clearly defines the responsibilities of the entity.

Developing an MTA for Sudogwon should go in hand with a general appraisal of the transport responsibilities at all government levels, including the National Governement, Special and Metropolitan cities, Gyeonggi Province and other local level authorities within each of these territories. Based on this analysis, a clearly defined role for the MTA needs to be developed. Particular attention should be given to ensuring that the new MTA is able to solve current conflicts caused by overlapping responsibilities between adjacent administrations. This is mostly the case of decisions made by Seoul, Incheon and Gyeonggi province regarding transport services that cross administrative boundaries. Developing dedicated legislation for the creation of the MTA is an important step that is already taking place. It will be vital for responsibilities assigned to the MTA to be clearly defined by this legislation.

Develop communication and co-ordination mechanisms between the MTA and other actors

The new MTA will need to work closely with the national government and the local administrations in Korea's capital region. Co-operation with the national government will be of particular importance for the creation of major transport projects such as the GTX commuting railway project planned for the region. At the same time, every-day service operation and implementation of the regional strategy will be highly dependent on effective co-ordination with city and municipal authorities.

Mechanisms to facilitate interactions between TfL and both higher and lower levels of government can be taken as an example to follow by Korean authorities. In the case of major transport infrastructure projects, such as Crossrail, a set of formal procedures tie TfL's actions to the DfT and the UK Treasury (Finance Ministry), as well as to the Treasury's new strategic infrastructure planning body, the National Infrastructure Comission (NIC). Firstly, TfL elaborates the case for the project with the support of DfT. Subsequent consultation with the NIC is required and allows this body to make recommendations on how to better adapt the project to long-term national objectives and needs for transport infrastructure. The resulting project proposal is then evaluated by the Treasury for financial sustainability.

The lowest level of government in London is the Borough. A Borough Planning team has been established inside TfL in order to ease communication and co-ordination. The team is the main contact point with boroughs for all matters. These include the granting of planning permissions by boroughs for TfL's investments and initial discussion of Borough's Local Implementation Plans. Additionally the

team has the capacity for dealing with financial issues, handling, for instance, monetary arrangements linked to the Community Infrastructure Levy with the Borroughs.

Generate a governing structure with effective representation of all relevant voices

The new MTA for Sudogwon should integrate all relevant stakeholders in its governing structure and develop mechanisms that ensure their effective participation in the decision-making process. The three cases show the critical role of the central government to create a MTA at the initial stage. For example, the French national government created the Syndicate of Parisian Transport (SLP) with the aim of co-ordinating public transport services in the Region of Parisian Transport (RPT) in 1959. With support from local governments, it successfully developed into the metropolitan transport authority in 2004.

Experience in London, Paris and Barcelona illustrates the importance of setting up the MTA as an institution whose power effectively stems from the sub-national level of government. This was done in all three cases by positioning at its head a local or regional actor who leads the institution while working alongside all relevant transport stakeholders in the region (including governmental and non-governmental actors). Inevitably, the power granted to the MTA to make decisions needs to be based on the reconciliation of the multiple interests and needs of parties represented. Effective representation and participation of all relevant actors in the decision-making process provides legitimacy to the leading entity inside the authority, as well as to the MTA as a whole in relation to other actors. The selected cases below show different forms of representation of stakeholders in the MTA's governing structure.

Sub-national authorities

Representatives of local institutions can be part of the organisation's decision-making body. This is the case of *départements* and the City of Paris in the Board of Île-de-France Mobilités. It is also the case of AMB, AMTU (the inter-municipal body representing municipalities that are not part of AMB), and the City of Barcelona in ATM's Board of Directors. In parallel, the Metropolitan Council of AMB is constituted of the Mayors and chosen councillors of the 36 municipalities in the Metropolitan Area of Barcelona. In contrast, no direct borough representation is found in TfL's Board. However, their voice is ensured through representation in the London Assembly, which includes Members that represent the interests of local territories.

Non-governmental actors

These are part of the Boards of Ile-de-France Mobilité and TfL. In the case of Barcelona, a Mobility Council integrating these stakeholders was created as part of ATM's governing structure, in addition to the main decision-making body (i.e. the Board of Directors).

National government

The Spanish Ministry of Development has an observer role in ATM Board, having no vote but a voice to point out its stance on particular actions of the MTA. In the cases of Paris and London, the national government does not have a direct role in the MTA's governing body. Nonetheless, indirect forms of national government participation can allow the national government to intervene when transport policies are not in accordance with the national interest. According to the GLA Act, for instance, the UK's Secretary of State has the capacity, under certain conditions, to review and ask for modifications to the Mayor's Transport Strategy. Moreover, a solid national planning framework can play a crucial role in aligning the actions of the MTA and other local authorities with national goals and principles (see below).

Choosing the scope of action for the MTA

Strategic-level and integrated planning should be a key function of the MTA

Giving the new MTA responsibility over the development of the long-term transport strategy for Sudogwon will be vital. The creation of a long-term and multi-modal transport strategy for their area of coverage is a common responsibility shared by the MTAs examined. It has also been a key factor for their success in contributing to social, economic and environmental goals and in strengthening local capacity. Ile-de-France Mobilités develops the Mobility Master Plan for the region (PDUIF), TfL develops the Mayor's Transport Strategy for Greater London, and in the case of Barcelona, ATM develops the Mobility Master Plan for the metropolitan region (PDM), while AMB develops the Urban Mobility Plan for the metropolitan area (PMMU). Regardless of the degree of responsibility that the MTA's have in terms of implementing actions related to different modes of transport, these strategic documents set objectives and priorities, comprehensive of all modes of transport with a metropolitan vision. They serve as a road-map to guide and co-ordinate policies and investment. They also provide certainty and information on future transport schemes and their location to the private sector and the wider public.

Strategic planning by the new MTA can effectively contribute to attaining national policy goals (e.g. health, environment, inclusiveness) if embedded in a solid national planning framework. This framework should: a) align the strategy developed by the MTA with strategies set by the national government; b) promote and require co-ordination of transport planning with other key sectors; and c) introduce requirements for plans made at the lower local scale of government to comply with the strategy set for the capital region.

Creating adequate planning capacity inside the new MTA as well as inside the transport departments of Seoul, Incheon and other cities in the Gyeonggi Province will be important. In Barcelona, AMB's urban mobility plan is developed to comply with ATM's wider mobility plan. In a similar way metropolitan areas inside Sudogwon should have the capacity and responsibility to develop the urban mobility plans that will translate the new MTA's plan into their particular urban mobility strategies. This should be done in co-ordination with economic, environmental, housing and spatial plans. With the same logic, decisions made by municipalities within every city should be aligned with these urban strategies. A framework similar to that created in London, where boroughs are obliged to create Local Implementation Plans to deliver the Mayor's Transport Strategy over their area of influence can be created. Guidance and support from the national government can be important for developing the right planning capacity at each level of government and will be especially relevant to close gaps between planning capacity in Seoul and other cities in the capital region.

Finally, developing tools and mechanisms for promoting comprehensive development strategies through everyday practice and decision making will be important for effective implementation of the strategic plan developed by the MTA. The Public Transport Accessibility Level (PTAL) and the Sustainable Residential Quality Matrix (SRQM), used by TfL and directly linked to the Mayor's Transport Strategy, are a good example of how this is done in London (see Chapter 3).

Capacity to implement a full range of transport policy, beyond public transport, is as an advantage

Choosing the scope of competence over different transport areas (public transport, non-motorised modes, traffic management, etc.) will be important. While strategic planning including all modes of transport is a common feature among the studied MTAs, significant differences are found when comparing their capacity to implement actions related to different transport policy areas. A relevant

outcome to consider is that the broader the scope of transport areas covered by the MTA, the wider the set of tools that it can use to influence mobility outcomes.

The case of TfL highlights the advantages of setting an MTA with responsibilities that go beyond public transport. TfL has achieved significant increases in public transport use through the combination of public transport improvements and stringent transport demand management schemes (e.g. congestion charges). Moreover, having power over both elements has been relevant to create an equilibrium between the delivery of public transport improvements and the implementation of transport demand management. To a great extent public acceptance for the congestion charging scheme was due to TfL's demonstrated ability to improve public transport (OECD, 2015). In addition regulation of modes such as taxis, and private-hire services, as well as competence over road safety has also contributed to TfL's success in setting one of the most solid and comprehensive mobility policies worldwide.

An evolution towards implementation of more comprehensive mobility strategies can be seen in the case of Ile-de-France Mobilités. While created to have a direct role in public transport co-ordination and management only, the MTA has progressively evolved towards carrying out actions in other areas. For instance it is now funding and implementing bicycle schemes outside the City of Paris and it has recently been given the power to set a surcharge on fuels; and thus the power to change the price of driving. In Barcelona ATM is only focused on public transport at the scale of the metropolitan region but this is compensated to an important extent by AMB, which has the capacity to implement comprehensive mobility strategies for the urban core and a solid framework for integrating them with environmental and urban development plans.

In the case of Korea's capital area, finding the right allocation of competence over different modes for the new MTA will be key. Decisions in this respect should make sure that the MTA set for Sudogwon, in co-ordination with authorities inside this area, can effectively deliver mobility strategies that are comprehensive of the different transport modes and services. Allocation of responsibilities to the new MTA will need to consider the extent to which it will need to have the power to implement actions that go beyond public transport in order to achieve its objectives. This could for instance include designing and managing road pricing schemes (e.g. toll roads) or road safety programmes for the entire region. In parallel transport departments within each of the cities will need to have technical capacity to implement comprehensive strategies in each of their areas.

Even in policy areas where the final decision is that the MTA has low degree or no direct competence, its role in developing frameworks to guide and harmonise policies in the territory can be very useful. A good example of this is TfL's framework for roads in Greater London. Many actors are involved in planning and managing the different types of roads (DfT, TfL and the boroughs). Nonetheless, the TfL's framework has developed categories of roads according to their importance for general movement and place-making, providing a common frame for decision making. In the case of Sudogwon the MTA could create a similar framework for roads. In addition the MTA could also play a role in guiding and harmonising policies and schemes that are left to other authorities to implement. Common guidelines could allow for actions in the many territories of Sudogwon to more easily align with the strategic plan that the MTA will produce, as well as to ensure harmonisation of actions across the territory. This type of guidelines and common frameworks could be developed, for instance, for non-motorised transport programmes and projects, congestion charging, low emission zones and other vehicle restriction schemes that are left for implementation at the urban level, and parking policy standards (for which, in turn, cities inside Sudogwon will need to serve as guiding entities for municipalities).

Securing financial and technical capacity

Establish a technical staff and budget that corresponds to the range and nature of responsibilities of the MTA

Identifying the size and characteristics of the staff needed for the new MTA will be of extreme importance. Human capital has been a crucial asset for the selected MTAs and hiring specialised personnel that allow the institutions to perform their many duties has been a top priority. Ensuring technical capacity within their teams to encounter new challenges, such as management of more and more precise data and new technologies, or developing of necessary legal frameworks to regulate new services, has also been an important part of the evolution of the MTAs. As such, once the scope of responsibilities is clearly defined, a careful analysis of the required staff will be necessary.

A relevant feature that is common to the selected MTAs is the inclusion of staff costs in its budget. Having dedicated staff, in contrast to rotating personnel transferred from or shared with the different administrations, allows MTAs to build expertise through time. Having its own staff also provides the entity with the necessary autonomy and freedom to act in the common interest of the different parties represented, rather than being biased towards the interests of the institution(s) to whom the personnel belongs to.

Create solid financial capacity through diversified and secured streams of funding

Securing the overall budget has been crucial for the selected MTAs to deliver benefits as well as for the mere survival of the authorities through time. Different mechanisms have been used by each of the entities to secure their budget. On the one hand, ATM's funds are secured through a strong framework of periodic agreements with the different entities that contribute to its budget. While the framework has proven effective, securing funds in this case is highly dependent on each of the entities being able to set these funds aside, while no mechanism to channel specific sources of funding directly to the entity have been created. To a relevant extent, the fact that ATM acts as a financial pillar for redistribution of revenues and is not directly in charge of investing in the transport system, explains why such a framework has been enough to pull together the necessary funding from different actors. Nonetheless, especially if the MTA in Seoul's capital area is meant to go beyond being a financial pillar, it will be important to develop a framework that allows the entity to have a wide range of funding streams.

Ile-de-France Mobilités, TfL and AMB offer interesting tools for doing this. It is important to highlight that having an adequate national legal framework to put into place these mechanisms has been necessary for their development.

- The development of a transport dedicated tax (*Versement Transport*) levied from the private sector has been an important contribution to Ile-de-France Mobilités' budget. The logic behind this tax is that companies paying it also receive important benefits from improving employee's access to the workplace. Gaining buy-in from the private sector for the tax was an important condition to its implementation and perdurance. As highlighted by some of the critiques it has raised over time however, it is important to keep track and analyse changes in location decisions of entreprises that result from implementation of the tax. This is necessary to ensure that the tax effectively serves to raise funds for public transport schemes and at the same time incentivises the use of public transport by employees. In contrast, it could in some cases generate relocation of firms to more distant places that remain poorly connected (to avoid the tax), and thus generate more and longer trips by car.

- In London, TfL levies funds from businesses through Business Rate Supplements (BRS), under a very similar logic to that behind the *Versement Transport*. BRS are charged to existing commercial developments that are considered to benefit directly from a certain transport scheme.

- AMB, in the metropolitan area of Barcelona, gets part of its funding from a "metropolitan tax" paid by all municipalities that are part of this institution. In addition, taxes paid for some services which are now under AMB's responsibilities (e.g. waste management municipal taxes) are also channelled to AMB.

- In London, land-value capture mechanisms (LVC), namely the Community Infrastructure Levy (CIL), and planning obligations constitute an important source of funding for TfL. A Mayoral CIL,applicable across Greater London to new developments, was implemented in 2012 and has served to raise funds for the Crossrail project. Planning obligations is a framework developed to make sure that all developments in the city are built with the necessary amenities to make the proposal acceptable. These obligations can include transport infrastructure delivery by the developer and/or funding contributions for TfL to do so.

- As a major landowner, TfL has the ability to raise funds through land sales and property development.

- Charges on private vehicles are also important to raise funds for both Ile-de-France Mobilités and TfL; 50% of driving offences and fines in the Ile-de-France Region are channelled to Ile-de-France Mobilités. In the case of TfL, while the main objective of penalty charges such as parking fines, congestion charging and the low emission zone and new toxicity T-Charge was not to raise revenues, funding collected by these schemes are part of TfL's budget. In addition to exploring other sources of funding, in the case of Korea the existing energy tax in Sudogwon could be channelled to the new MTA in a similar way.

It is important to highlight that in all cases, contributions by the national government to the MTAs budget were very important during first stages. While in all cases direct contributions by the national government have been reduced, or even disappeared, the State still makes important direct investment for major transport schemes considered of national importance.

Finally, transport systems in the three cities continue to be subsidised. Social inclusion and equity considerations are often behind this decision, which is common not only to these cities but also to many others in OECD countries (ITF, 2017). Nonetheless, farebox revenues are an essential source of revenue for the MTAs and it is important to implement business models that strike a good balance between affordability and financial sustainability. Making it a requirement for employers to pay half of the monthly Navigo pass for employees, for example, has helped to raise public transport demand and farebox revenues in Ile-de-France.

Setting prices at cost-recovery rates or as near as possible to this level, and applying targeted subsidies for selected population is also an important action to reach a good equilibrium between affordability and financial sustainability. Targeted subsidies are used in the three cities studied, setting as beneficiaries population groups such as students and the elderly. However, experience in other world cities, such as Bogotá can be taken as an example for the new MTA in Sudogwon to explore targeted subsidy schemes that are better aligned with equity and affordability objectives (see Chapter 4).

Develop funding arrangements that bring benefits on top of raising funds for the MTA

The MTAs in London and Paris have developed some mechanisms that not only allow to raise funds for transport investment and improvement but that at the same time contribute to wider sustainable development objectives. Developing this type of mechanisms would be an asset for the new MTA.

TfL has been particularly successful in employing land-value capture (LVC) mechanisms. Planning obligations and the Community Infrastructure Levy facilitate integrated housing, land-use and transport planning and at the same time raise funds for the delivery of infrastructure that contributes to transport-oriented development. In the case of planning obligations these can come in the form of financial contributions or through direct delivery of the infrastructure by developers. At the same time, the Mayor of London and TfL made a commitment to exploit publicly-owned land for housebuilding in the capital, and in particular land that is owned by the TfL. This has allowed unlocking the benefits of developments located above or adjacent to public transport stations, generating adequate density around public transport and at the same time raising funds for investing in the transport network.

Charges on vehicle use can also contribute to MTA budgets and at the same time can serve to correct prices across different modes; better reflecting, in particular, the social cost of driving. Congestion charges can be useful demand management tools, while low emission zones can effectively contribute to speed up the introduction of cleaner technologies into the vehicle fleet. While none of these tools should be implemented with the objective of raising revenue, revenues raised can contribute to the MTAs budget, in addition to bringing the above mentioned benefits, as in the case of TfL. Fuel taxes and other vehicle ownership and use related charges can also have this two-fold function. An example is the internal tax on energy products in the case of Ile-de-France Mobilités. A percentage of the revenue from the internal tax on energy products sold in the Paris region is channelled to the authority. Since 2016 the authority also has the power to set the tax rate.

Improving multi-modal transfer centres

Give the MTA the lead for developing policy for multi-modal centres

Multi-modal centres, as the nodes for transport systems, should be strategically thought and planned with a metropolitan vision. Île-de-France Mobilités, TfL and ATM have shown to be the best institution to develop the wider policy for this infrastructure in their respective areas of coverage. Policies developed by these MTAs promote solid frameworks for co-ordinating stakeholders involved in these projects. They also set principles to ensure that multi-modal transfer projects promote accessibility, transport-oriented development and sustainability, and help safeguard that these principles are prioritised over private and commercial interests. Having an explicit policy guiding these projects has also contributed to attaining more homogenous and widespread improvements in multi-modal transfer centres across each region.

Including multi-modal transfer centres in the respective Mobility Master Plan has been central to ensuring their contribution to the wider strategy for the Paris, London and Barcelona areas. In a similar way, it will be important for planning of these projects to be part of the Mobility Master Plan developed by the MTA in Korea's capital area. General specifications that can be found in master plans for the selected cases with regards to multi-modal centres comprise, for instance, prospective locations of projects, as well as a hierarchical classification of centres in terms of their importance in the transport system of the metropolitan area. Common criteria used for creating multi-modal centre categories encompass elements such as, traffic and passenger volumes, the types of modes that they connect, and

the degree of integration into the urban environment and eventual existing land availability constraints (see Chapter 5).

Developing explicit guiding documents for planning these spaces has proven particularly useful in helping the MTAs ensure implementation of the policy. As such, MTAs publish policy guidelines for the design of multi-modal centres, which take into account national best-practice and objectives set by the central government. Guidelines for multi-modal centres generally include standards to ensure the economic, environmental and social sustainability of these infrastructures. Emphasis is made in promoting the use of public transport modes; the improvement of accessibility for users with impaired mobility and the priorisation of passenger needs. TfL also designates three main types of spaces inside of multi-modal centres: decision spaces, movement spaces and opportunity spaces. Commercial activity allowed depends on the type of space, always under conditions that prioritise the use of space as a transit and connection area.

The MTA could also have an active role in securing funding and leading implementation for multi-modal projects, as well as in guiding management of the infrastructure

Beyond having a strategic and planning role, MTAs can participate in the funding, definition and implementation of projects for developing or renewing multimodal centres. They can also take an active role in the management of these centres. This wider participation has proven beneficial to ensure that centres serve as effective nodes in the wider transport systems and become user-oriented transfer platforms.

Île-de-France Mobilités provides grants to local municipalities for selected multi-modal centre projects. The framework for granting these funds specifies criteria for their allocation, allowing Île-de-France Mobilités to have a wider decision-making power over the building process of the infrastructure. Apart from grants, MTAs can participate in the funding of main projects through other means. As an illustration, TfL channels the contributions stemming from developers secured via Section 106 of the Town and Country Planning Act to fund at least in part major interchange enhancements (see Chapter 4).

MTAs can also have an essential role in the definition and implementation of the specific multi-modal transfer projects. Various degrees of intervention can be found among the studied MTAs. In the Barcelona area, AMB limits its action to asking relevant authorities to build multi-modal centres when it deems them necessary. Île-de-France Mobilités has further capacities in the definition of projects during early stages. It has the leading role in the initial feasibility evaluation for the project and in the follow-up and evaluation committees for the works. TfL goes beyond this, having a wider role throughout the entire implementation of the project: it co-ordinates the Interchange Program Board (IPB), which is tasked with the selection, definition and follow-up of specific multi-modal centre projects that it believes should be prioritised. In general, the wider the capacity granted to the MTA in order to define and evaluate initiatives for these centres, the larger its ability to influence the project's impact at a metropolitan level, as well as the standards guiding its design.

Finally, MTAs can have a leading role for managing multi-modal centres. In all cases explored, multi-modal centres are divided into operating areas by the transport authority, and later assigned to the corresponding transport operators. Transport operators have the ultimate duty of overseeing issues such as cleanliness, adequate signage and the provision of obstacle-free space for travel in their respective operating areas. Nonetheless, issuing guidelines, as in the case of TfL, helps to ensure minimum quality standards regarding these elements and to better co-ordinate actions from all operators. Setting compulsory directives can be even more effective. In the Paris area, for instance, compulsory directives related to signage and travel space in the station are defined by Ile-de-France Mobilités.

Delivering metropolitan-wide bus services and improving data management

Planning the bus network should be part of the MTA's strategic planning responsibilities

Allocating responsibility over planning of the "structuring" bus network in the capital area to the new MTA will be central to improving co-ordination between authorities (in particular between Seoul and other major cities) and to delivering efficient and coherent bus services. The development of a "structuring" bus network is a common responsibility shared by the MTAs examined. London's core bus network is embedded in the Mayor's Transport Strategy for Greater London. In the case of Ile-de-France Mobilités, the Mobility Master Plan (PDUIF) includes major bus corridors. In Barcelona, ATM's Infrastructure Master Plan defines the alignment of routes for the Metropolitan Region and AMB defines them in the metropolitan area of Barcelona (Barcelona plus 35 municipalities).

Planning the bus network in advance and in the frame of the overall mobility strategy has overcome the disadvantages of case-by-case decision making. This has resulted in a more efficient allocation of routes, avoiding duplication of services in some areas and leaving others poorly served. In addition the development of a mobility master plan is a consultative process involving all the different authorities and stakeholders. Designing the bus network as part of this process helps avoid disputes between actors in later stages of infrastructure construction and service implementation.

While sharing responsibility over planning of the bus network, the degree of responsibility over other elements that are important for organising the network vary between the MTAs studied. In the cases of Ile-de-France Mobilités and TfL, the obligation to plan the bus network is accompanied by responsibilities over granting concessions and supervising operations. This has proven particularly effective and has allowed authorities to harmonise operations across the whole bus system and unify quality standards, as well as to improve integration across different modes.

In the case of ATM, the authority is solely in charge of planning the bus network for the commuting area (outside the metropolitan area), while concession granting and supervision of operations is left to the regional government. Within the Metropolitan area of Barcelona the concessions are granted by AMB, whereas outside of this territory concessions are granted by the municipality for urban buses and by the Generalitat (regional government) for interurban buses. Concessions regulated by AMB include quality incentives for operators. The transition to this type of contract has been relatively simple due to the fact that most of the operations are carried out by TMB, a public operator in charge of the urban public transport in Barcelona city. In contrast, the introduction of minimum quality performance standards into contracts managed by the Generalitat has required the renegotiation of conditions with private operators. The process has been more difficult. As a result, two bus systems with different quality standards co-exist in the Barcelona region.

Thus while a model where the MTA plans the network but has no role in granting or supervising concessions is also viable, ensuring consistency across bus services in the entire area is more challenging under this configuration. In addition, in the case of Sudogwon, there is no administrative level equivalent to the Generalitat of Catalonia. Therefore, this model would face limitations for managing and supervising inter-city bus lines.

Engage in regular assessments and liaison with stakeholders for building a functional bus network

The case studies selected show that the plan for the bus network should be reviewed and adjusted on a continuous basis in order to adapt it to the changing demands of citizens, as well as to modifications in

the built environment. TfL, for instance, regularly reviews how bus services are used in order to ensure that the bus network is providing the best service possible.

Realignment of the bus network should be done based on accurate analysis of the current and forecast demand, and in close co-ordination with local administrations and all parties involved. As shown by the examples of London, Paris and Barcelona, consultation with local authorities who can provide information that is needed to define the bus lines has proven important to build consensus when designing and adjusting the bus network. In the case of Ile-de-France Mobilités, local authorities can indicate to the MTA the main limitations in terms of service effectiveness, efficiency and quality of the delivery of bus services in their area. Similarly, TfL works in close collaboration with the Boroughs and conducts regular consultations with citizens in order to identify existing or potential gaps in the bus network.

Use the MTA to lead transition to an improved bus system

Concessions to run bus services, awarded on a competitive basis for relatively short (five years) have been used very successfully in London and Barcelona to organise the bus market and should be considered as a model for the Sudogwon MTA. Regular re-concessioning allows for the bus system to be adapted to growth and development of the city and to changes in transport policy. An open tendering process for granting bus concessions is important to allow competition to drive efficiency and potentially innovation. The most important factor, however, is the value of concessioning in enabling the MTA to determine the evolution of the bus system as part of its strategic planning process (see Chapter 6). As noted above, this should involve close consultation with the bus operators along with other stakeholders to ensure consensus changes to the bus network. Shifting to a model with fixed contracts, rather than open-ended ones, as it is the case for a large share of services in Sudgowon, will be necessary. AMB and TfL grant contracts with duration of no longer than five years (with a possibility of two years extension). This allows realigning bus routes, and making the necessary adjustments in contract conditions for the system to have continuous improvements.

Whilst it could be difficult to use open competitive tendering for bus concessions and implementing radically new contract terms immediately, setting clear rules and schedules for shifting into this type of model in the medium term is highly recommended.

The MTA could play an important role in this transition and in the management of the new and improved system for buses. This could be done by either taking direct responsibility for supervising and in a later stage granting concessions, or by setting the common framework for concession granting and supervision should this responsibility remain within other authorities. A number of actions can be implemented to facilitate this transition by encouraging incumbent operators to progressively conform with the rules and conditions that they would face under competitive tendering. This will give time and increase certainty for incumbent operators to consolidate into more competitive companies in the gradual preparation for competition. These actions would also help the new MTA and other authorities to have a better idea of the level of efficiency of the current system. The key steps are described below.

The existing system where revenue management and settlement is done by the Bus Business Association should be replaced by one where the MTA carries out this function. This entails that data collected through smart card companies on bus revenues, card validation and "on bus" collected revenues, is provided to the MTA. This will allow the authority to review the amount of subsidies granted and make sure these are provided to cover the gap between the cost of efficient operations and the affordable price for the population, rather than to cover operational inefficiencies. Additional information provided by private operators would also be needed (see point below).

Data sharing should also be embedded in new contracts with private operators (bus and others) and phased into existing ones. This will facilitate monitoring service delivery and ensure that services comply with the standards set out.

Gradual introduction of tendering process in segments of the network where this is feasible could also provide authorities with benchmarking information on operation costs.

Quality incentive contracts with bonus and penalty payments, similar to those used by TfL and AMB, could be phased into contracts in order to increase the quality of operational performance. As shown by the case of Ile-de-France Mobilités, the transition period can be composed of various stages, each of those characterised by different type of contracts. As such, in case of OPTILE, at the first stage STIF required incumbent operators to provide accurate information on operators' current and future investment plans through four-year contracts. This allowed the authority to assess operational costs and the companies' ability to meet quality and safety standards. In the second stage, contracts introduced new considerations for enhancing the quality of service in the form of bonuses and penalties based on the operator's performance. This prompted the operators to increase their competitiveness in the preparation for the transition towards competitive tendering that will be introduced in coming years.

Hire staff with data management skills

Having in-house capacity for collecting, managing and analysing the increasing amount of data sets available with new technologies will be of relevance for the MTA. TfL, for example has a dedicated Analytics department with staff that has technical responsibilities over data analysis and data processing, computational and statistical analyses as well as software and technology development. This has provided the MTA with an increasing capacity to react promptly to disruptions in the system and inform citizens in a real-time basis.

The iBus system implemented by TfL, for instance, allows to make temporary bus route changes in case of disruption in order to help passengers get to major interchanges. The ODX Big Data Analysis tool, also developed in-house by TfL, allows matching different sources of data. The MTA made use of this tool to restructure the bus network in the New Addington area of London to provide better services for local residents.

Establish public-private partnerships to exploit new transport data and technologies

Under existing data ownership arrangements in the Sudogwon area, a significant amount of transport data is held by the private sector. As mentioned above, shifting towards a model where data-sharing requirements are incorporated into contracts with private operators will provide an important source of data.

In addition the development of partnerships with the private sector and academia can also enable public authorities (including the new MTA) to access essential datasets for planning purposes and/or to enlarge its capacity to carry out data analysis. TfL has been working, for example, with the Massachusetts Institute of Technology (MIT) using data captured by the Oyster smartcard for strategic research purposes. The authority has also worked in co-operation with the University College of London (UCL) in analysing a variety of data sources in order to elaborate different forms of Mobility-as-a-Service (MaaS) solutions. The MTA also might consider contracting a third party to get support for specific activities. In the case of Ile-de-France, this was done for building a platform that allows analysing large amounts of public transport data "in house" to better inform decisions and carry out evidence-based policy making.

Explore the development of regulations that set incentives for open-data practice and Mobility-as-a-Service solutions

The new MTA and Korean authorities as a whole could also look at other international examples that are developing new regulations for transport services. The New Act on Transport Services was issued by the Finish national government and entered into force on July 2018. On the one hand, the new legislation seeks to shift away from a regulatory framework that lacks flexibility for transport service providers to perform different types of services. With the removal of these regulatory barriers the government aims to incentivise the wider development of mobility-as-a-service solutions. Nonetheless, in exchange for the additional flexibility in the market, the act also introduces high data-sharing requirements to all transport operators. Having access to this data is seen as a central condition to ensure that authorities maintain the capacity to supervise performance of the system (especially with the expected increase of services and providers) and to make sure that new services developed contribute to delivering social, economic and environmental goals.

International Transport Forum

Policy Directions for Establishing a Metropolitan Transport Authority for Korea's Capital Region

This report identifies the characteristics of the metropolitan transport authorities (MTAs) in the Barcelona, London and Paris areas that make them effective, and makes recommendations for the establishment of a new MTA in Korea's capital region. It reviews governance arrangements and responsibilities for strategic planning, investment, data management, public transport services and the management of multi-modal transfer centres. Successfully managing mobility services in metropolitan areas is central to improving accessibility and to the well-being of their populations. The challenges faced include coordinating multiple government and non-government stakeholders, finding an institutional structure that meets the needs of both the urban-core and the larger commuting area, and striking a good balance between the powers of central government and local authorities. These challenges are particularly present in countries in the process of decentralisation. Successful MTAs give local authorities a prominent role in decision-making while maintaining a coherent larger scale vision in planning, policy-making and investment. Strong financial and technical capacity have proved critical.

This report is part of the International Transport Forum's Case-Specific Policy Analysis series. These are topical studies on specific issues carried out by the ITF in agreement with local institutions.

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