

URBAN MOBILITY AND SUSTAINABLE DEVELOPMENT IN THE MEDITERRANEAN: REGIONAL DIAGNOSTIC OUTLOOK

Sylvain Houpin





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Preamble

Featuring rapid urbanisation in the states on the Southern and Eastern shores and dominated by urban sprawl to the North, the issue of urban mobility in the Mediterranean raises major questions in terms of sustainable development.

The Blue Plan addressed these issues in the Urban Areas and Transport chapters of its environment and development outlook, published in 2005, before subsequently initiating more detailed monitoring of mobility trends in several conurbations (Sfax, Batna, Barcelona, Aix-Marseilles).

In 2005, the 21 states around the Mediterranean and the European Community, Parties to the Barcelona Convention, adopted the « Mediterranean Strategy on Sustainable Development » (MSSD), which was endorsed by the Barcelona Euro-Mediterranean Summit in November, 2005. Promoting sustainable urban development is one of the MSSD's seven priority action areas.

Within this context and under its 2007-2015 intervention framework as validated by the 21 riparian states, the Blue Plan has committed itself to paying particular attention to transport and urban mobility issues in the Mediterranean, particularly in view of their links with climate change. This will be achieved through a programme to run from 2007-2010 intended to further knowledge about travel. It is reflected in a working programme with three thrusts:

- The coordination of six case studies on the cities of Istanbul, Cairo, Tunis, Algiers, Tangier, and Aleppo. The studies were conducted with the support of the World Bank, the French Development Agency and Veolia, with local hand-over workshops being organised.

- The holding of a technical hand-over seminar in Sophia Antipolis on 23 and 24 November 2009, which provided the opportunity for the handover of all the work conducted (case studies, regional study, specific studies) and for regional level debate between experts, local practitioners and partners and stakeholders in the study programme.
- The drawing up of a regional diagnostic outlook on urban mobility in the Mediterranean. Drawing on the six case studies and topped up by the work of the technical seminar, this approach should lead to the establishment of an inventory whilst helping to identify the regional stakes and specify suitable intervention strategies.

The diagnosis, which aims to be prospective, is thus the fruit of a partnership-based work process dating back to 2005, the main teachings of which it strives to evidence.

Given the recurrent difficulties with the availability of information observed in most of the cases, the point was not to establish an exhaustive inventory of the state of play of urban mobility in the Mediterranean, but rather to pave the way for the implementation of sustainable urban development in keeping with the specific features of the region.

Caution

The case studies behind these analyses were based exclusively on the use of existing data. The gaps in information noted in most cases or differences in the manner in which the data was produced in terms both of periodicity and scale of analysis meant that it was not always possible to refine the comparative analysis of the various situations observed as far as might have been wished.

Multimodality in Istanbul



Context and issues at stake

The shared fate of Mediterranean cities

Whilst it is not really possible to speak of the existence of a specific model of « Mediterranean city », the cities in the Mediterranean riparian states nonetheless share many common traits and similarities.

As the cradle of civilisation, Mediterranean cities are marked by a common geographic framework around this remarkable coastal area and by a long history which they all share.

Despite each of them having their own specific features, the traces of thousands of years of economic and cultural exchange, interdependence and successive domination can still be seen today within the various Mediterranean urban structures, in their physical and social organisation as well as in their most everyday operations.

Thirty or so political or economic capitals in the Mediterranean along with various metropolises with several million inhabitants amass the activities, financial resources and most well-off people, whilst housing only a third of the states' urban population.

Apart from the global-scale megapolises of Cairo and Istanbul (almost 16 and 11 million inhabitants respectively and 13th and 28th biggest cities in the world), around 18% of city dwellers live in 85 medium-sized cities of between 300,000 and one million inhabitants. Virtually half of all urban

residents live in more than 3,000 towns of less than 300,000 inhabitants.

Marked urban dynamics...

Whilst more than half the world's population now lives in towns, two in every three inhabitants in the countries bordering the Mediterranean already live in urban areas.

In 2050 or thereabouts, the urban population in the states on the European shore could well stabilise at almost 170 million (140 million in 2005), whereas in the states to the East and South it could double to reach more than 300 million.

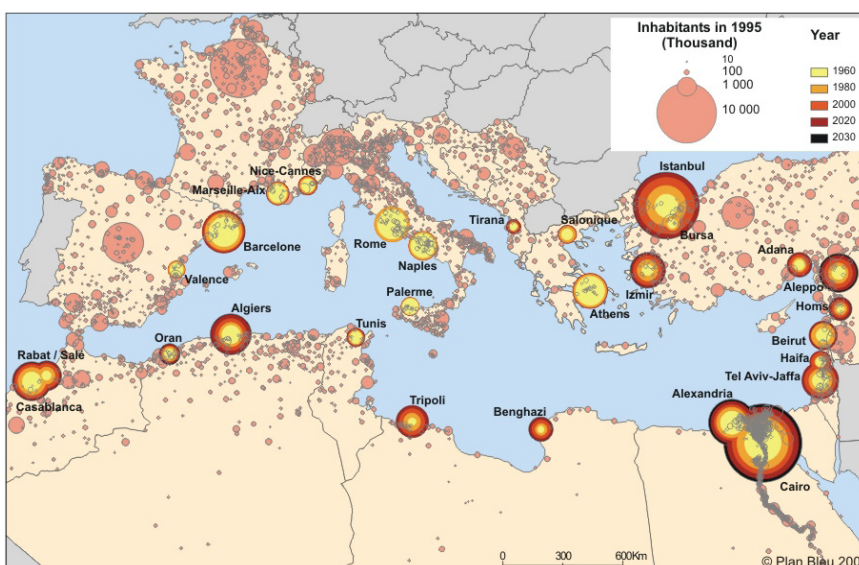
The driver of this urban growth is becoming increasingly endogenous, fed by internal redistribution, inter-urban migration and a rural exodus which is either drying up (Egypt, Tunisia...) or holding up (Turkey, Syria, Morocco).

Over a third of this growth will take place in the coastal regions, more specifically in the coastal cities.

Despite the progress which has been made over the past twenty years plus in terms of provision of services, major imbalances continue to exist between large and small cities, central urban and outlying areas and well-off and run-down districts.

...within a hot spot for climate change

Population distribution



Source: Plan Bleu

The Mediterranean region is exposed to many uncertainties. It is particularly sensitive to meteorological mishaps and earthquakes.

The historic vulnerability of the Mediterranean cities is being further exacerbated by the effects of climate change.

The Mediterranean is one of the regions of the world in which the impact of global warming is likely to mark the environment and human activity most strongly.

The effects of a whole series of meteo-physical unknowns, which

are already affecting the Mediterranean, are being further aggravated by accelerated coastal urbanisation and climate change: landslides, floods or even forest fires. The coastal areas to the north and south of the basin as well as those with strong population growth (southern and eastern banks) where the dense cities and suburbs are located, are amongst the most vulnerable.

Whilst emitting fewer greenhouse gases (GHGs), the Mediterranean cities are being more affected than other regions of the world, which puts them in the front line as far as drafting strategies for adapting to climate change is concerned.

Urban sprawl and mass motorisation

Once compact, the cities are now spreading, often along the coasts. They are invading the outskirts, swallowing up hitherto independent villages and outlying farming land.

Although walking still predominates as a way of getting from A to B in the cities to the south and east, increasing use of the private car encouraged by public policy aimed at mass motorisation as well as the deterioration in the quality of service provided by public transport has triggered uncontrolled urban sprawl and increased car dependency in most cities.

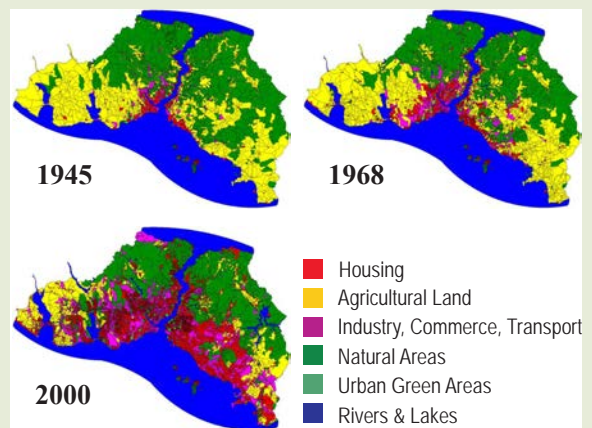
For the conurbations on the northern shore, recent trends have been marked by the dispersal of the population and of jobs as well as by a dual movement of peri-urbanisation and metropolisation over ever-increasing areas, where access to housing for the most destitute is a challenge still needing to be addressed.

To the south and east of the Mediterranean, urban sprawl is being driven in particular by the strength of so-called « informal » housing. Depending on the country and the conurbation, between 30 and 70% of town dwellers are only able to construct their own homes by working through informal channels. In Aleppo, the suburbs of informal housing cover 3,500 hectares and account for virtually 40% of the population, in other words some 900,000 inhabitants.

Istanbul is experiencing uncontrolled informal spread...

Istanbul has faced a major influx of immigrants within a relatively short period of time. Generally speaking, urban development has not been covered by any real land planning or checks on land use. The only measures which it has been possible to take have been «emergency » ones on a more local level, marked by a lack of coordination and consultation on the part of the players involved.

Almost 50% of the population is housed in sprawling districts of unplanned, informal housing. Water reserves and forest areas are under threat, the Bosphorus is deemed to be one of the potentially most dangerous waterways in the world, and the capacity of the recent public transport systems (trams, light railways and metros) is still not enough to relieve metropolitan congestion. These uncontrolled centrifugal forces which are making it difficult to keep a hold on urban spread and the provision of the urban services essential to the inhabitants, are threatening Istanbul's sustainability within her natural environment and in terms of her social cohesion.



Source: Kemper, G, et al. (2000), Monitoring Land Use Dynamics for the City of Istanbul, Rapport final.

...coupled with almost permanent congestion, which is jeopardising the metropolis's accessibility

Whatever the reasons for travel, average motorised trip distance has dropped over the past ten years. With the gradual decentralisation of various activities and services to secondary centres, an increase in trip duration, the relative growth of walking but most particularly quasi permanent round-the-clock congestion on most of the main thoroughfares have all been noted.

Istanbul has a relatively low mobility rate. Marked car dependency, the dearth of alternative provision (rail and river-maritime) and congestion levels on the urban road network with the attendant consequences in terms of longer journey times are impacting quite considerably on demand for motorised trips. According to the demand forecasts established by the JICA using a «no roads and no transport project» scenario (do nothing), the proportion of cars could rise and increase three-fold by 2023 (JICA, IMM 2007).

Overview

A worrying situation across the board

In most of the situations observed to the south and east (*see above : Comparative Profiles of six Mediterranean Cities*) but also in certain towns on the northern rim, the trends are uneven but converging:

- **A constant increase in demand for travel**, linked to urban sprawl and the decoupling of home from work,
- **Generalised congestion** along the main thoroughfares and, consequently, a drop in travel speed, particularly marked in Cairo and Istanbul,
- **A mass motorisation movement** encouraged by the opening up of the markets and the introduction of consumer credit, dominant in the south and east.
- **Recurrent shortcomings in public transport provision** in terms of servicing, level of service, run-down fleets as well as inter-modality.
- **A constant rise in GHG emissions linked to the transport sector**, mainly road transport which is heavily dependent on fossil energy.

Gradual awakening to the stakes relating to urban mobility

All of the situations studied demonstrate the implementation or planning of infrastructure and urban transport projects aimed at developing public transport provision : the Algiers metro, the extension of the Cairo metro network, Istanbul's exclusive lanes with high levels of service, and tram projects in Morocco and Tunisia.

These examples, the fruit of public policy towards developing collective public transport, illustrate the gradual awakening of the public authorities to the importance of urban mobility issues and their associated stakes- economic attractiveness, urban accessibility, local pollution or reducing the carbon footprint.

Cairo, prethe first city on the continen to have its own metro...

With a first regional line opened in 1987, which carries over a million passengers every day and an urban line which opened in 2000 and carries 500,000 passengers, the metro now accounts for a significant share of urban travel in the city (17 % in 2001). With some 80 km for the 2 lines in operation, the metro is far and away the most effective mode of public transport in Cairo.

This network, which is run by the Egyptian Company for Metro Operations and Maintenance (ECM) under the direct supervision of the Ministry of Transport, is currently being developed. Phases I and II of line 3 are now under construction, and are expected to be brought into service in 2010 and 2013 respectively.

Metro in Cairo



... but generally under-proportioned public transport provision

Urban public road transport is provided by one single major public company, the Cairo Transport Authority (CTA). Nevertheless, a large number of more or less informal minibuses along with a multitude of collective and individual taxi owners are also involved in providing public road transport. The CTA is a public company with 42,000 employees. It has a fleet of 4,500 vehicles, in other words a ratio of 8-9 employees per vehicle. Moreover, there are some 80,000 minibuses and almost 60,000 taxis in operation.

Finally, the suburban train and tram system, a throw-back to the colonial age, has been in constant decline since the 1950s. Operated by the CTA, the two tram systems, i.e. the Heliopolis tram route, which mainly serves the residential districts of Heliopolis and Madinat Nasr to the north east of Greater Cairo and the trams on certain lines to the north of Cairo and 15 May City to the south, play only a minor role in urban travel. Compared with other formal modes of transport this network is now little used.

However, awareness is still limited as regards town planning and integrated transport/town planning approaches are few and far between : highly « functionalist » urban development practices can be seen virtually everywhere, particularly through the importation of generic urban products, which are inspired by international standards and car-dependent to the detriment of the creation of public space: housing estates, shopping centres, new towns...

These practices are marked on the part of public and private players alike by the clear predominance of operational over territorial reasoning, which can also act as an integrator.

Poor levels of service in Urban Public Transport Systems

In most Mediterranean cities, urban public transport does not provide satisfactory transport conditions in terms of comfort, regularity of service and safety: routes tend to be over-loaded, the vehicles often run-down and rarely air-conditioned. In the absence of priority traffic conditions, journey times are too long, fares do not always take account of connection possibilities and inter-modality link-ups between the various systems are poorly developed.

Thus, public transport still has a negative image and would appear to be aimed at captive populations still without access to a car.

Soft modes largely ignored by public policies and projects

With the notable exception of Cairo, walking is the main means of transport for urban populations in most of the Mediterranean cities on the southern and eastern shores.

However, most of the time soft modes do not feature among the concerns of the public authorities as they are designing or implementing urban transport projects.

In Istanbul, diversified and efficient public transport provision...

Istanbul is served by a relatively efficient and well-managed public transport system, which is constantly improving. A variety of rail transport systems are used (light railway, tram, suburban railway, metro), notably including a particularly efficient bus line with its own exclusive lane, which is currently being extended. An electronic ticketing system (Akbil) allows for connections within the public transport network (buses, ferries and trans-European rail transport system).

Buses and minibuses (including the «dolmuş» which operate along certain routes) comprise the bulk of the public transport network: 591 bus routes and 123 minibus routes provide a service for over 4.5 million passengers on a network of 6,100 kilometres. The vast public bus network numbers almost 4,222 buses, 2,858 of which are operated by the IETT public company and 1,347 by private operators.

Bus in an exclusive lane in Istanbul



...which cannot keep pace with the explosion in demand

Istanbul's public transport system is struggling to keep pace with the rapid rate of growth of the urban structure. The local authorities have been caught up by the pressure of urbanisation without managing to free up sufficient resources to respond to this expansive type of growth. Over the past decade, the proportion of private cars in everyday travel has risen from 19.3% to 26.3%, whilst taxis and « Dolmus » (collective taxis) fell from 9.4% to 4.8% over the same period, illustrating the loss of attractiveness on the part of public transport.

With the extension of the metropolitan area and with the IETT national bus company not in a position to make the necessary investment, services for people who are often on low incomes have developed according to the entrepreneurial mode. Cooperatives of minibuses and other small capacity vehicles such as « Dolmus », or collective taxis, have been set up to serve the new urban suburbs. Likewise, employers and academic establishments contact service companies directly to organise pick-ups for their employees and students.

In Tunis, public transport provision structured around public operators...

Tunis is an exception in the Mediterranean, enjoying plentiful and varied transport provision organised around a single public company responsible for managing passenger transport on the conurbation's bus and light railway networks. The Tunis Transport Company (STT) was born in 2003 of the merger between the National Transport Company (SNT) and the Tunis Light Railway Company (SMLT). It carries an annual total of 460 million passengers. With 4 operators for 35 routes and the stated aim of capturing 5% of the market, the role of the private sector is limited. Informal transport using minibuses (rental vehicles) only comes into play for suburban and inter-urban provision.

This classical but increasingly unusual set-up has meant that public transport has thus far managed to retain a significant share in travel and has led to a degree of consistency in transport provision. This diverse and complementary network (tram, light railway, bus, etc...) is just waiting to develop into a fully integrated Urban Transport System.

Light Railway in Tunis



...but struggling to maintain an adequate level of service

Constrained by wide geographic coverage and poorly focused on the main urban centres, like the rail networks (metro and Tunis suburban railway lines) the public land transport companies' urban and suburban routes are fully loaded at peak hours (90 % to 100 %) whereas at off-peak times traffic on certain routes drops off considerably, to the extent that the average fillage rate for buses is very low (an average of 12 passengers for the TUT).

The fact that the public modes of transport are saturated in this way is not without consequence for the private operators who, in turn, are required to carry excess users. At the same time, the tough general traffic conditions and the lack of amenities to facilitate bus travel are the main causes behind a drop in service speeds in virtually all the major cities, falling in certain cases (the city of Tunis in particular) to less than 10 km/hr.

As in Barcelona or Lyon, which are exemplary cities in this respect, walking nonetheless has to play a central role in feeding into the major public networks.

As such, how public areas are addressed in terms of inter-modality, pedestrian access as well as urban regeneration should be the focal point of integrated town planning/transport approaches.

In Cairo, extreme density...

With almost 39,000 inhab/km² the city of Cairo is one of the most dense in the world. It ranks fourth amongst the cities with the greatest density in developing countries. However, walking as a means of travel still lags behind the other cities in the region, local traffic, safety and comfort conditions being notoriously inadequate. The virtually total lack of pavement continuity on the streets of Cairo, compounded by major congestion, make any form of non-motorised travel very difficult.

Central district of Cairo



...which does not allow satisfactory accessibility to the urban areas

As in most Mediterranean cities, walking is a dominant means of transport, accounting for almost a third of all daily trips. However, pedestrians face extremely challenging travel conditions. Walking through the streets of Cairo is a veritable assault course and may even prove genuinely dangerous when it comes to crossing the main thoroughfares. Pedestrians are not a priority either for drivers or the traffic police, which can only push users onto individual and motorised modes of travel wherever they are in a position so to do.

Informal transport, a feature shared by the cities to the south and east of the Mediterranean

Whatever name they go by (collective taxis, big taxis, shared taxis or « Dolmus » in Istanbul), the range of informal transport mechanisms in the cities to the south and east of the Mediterranean is vast. With the exception of Tunis, the informal sector represents a highly significant sector of the market for urban transport provision. In Tunis it is now pivotal following several years where institutional provision was totally lacking.

This feature is not specific to the Mediterranean cities, with this type of transport being widespread in Africa and South America. Their constant development is coming about in conjunction with the extensive, rapid and spontaneous urbanisation dynamics to be seen in these cities, where institutional public transport provision is unable to keep pace with growing demand.

Lack of genuine urban governance

The modes of governance in the vast urbanised areas on the southern and eastern rims but also sometimes to the north, appears unable to respond to the demands of sustainable urban management.

At territorial level : with the exception of Aleppo and Istanbul, where far-reaching institutional adjustment has been carried out through the merging of urban communes into a metropolitan body, urban sprawl is spilling over official administrative boundaries and constantly disconnecting territorial administrative organisation just that little bit further from its real purpose.

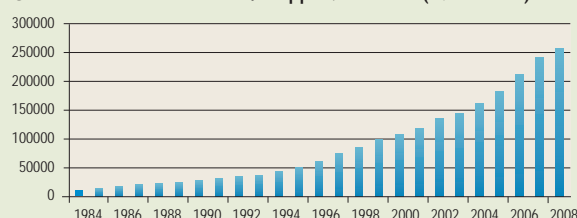
At institutional level : with the relative exception of Istanbul, the cities studied are marked by the predominant role of the State, major administrative centralisation and a lack of autonomy at the intermediate levels.

In Aleppo, informal urban development...

Since the 70s, many of the city of Aleppo's urban extensions have been the result of informal urbanisation. The city's geographic location has encouraged urban sprawl and expansion along the main thoroughfares. Unprepared for the arrival of ever-increasing numbers of inhabitants, the conurbation has witnessed the construction of areas of illegal housing. Thousands of homes have been built without permission and not in compliance with town planning rules.

In 1980, the areas of informal housing covered an overall total of 945 hectares, home to some 285,000 people, in other words almost 30% of Aleppo's population. In 2000, some 2,400 hectares had been taken over by this type of district. Non-regulatory housing districts currently cover around 3,500 hectares or 21% of the city's total area (16,250 hectares), amassing virtually 40% of Aleppo's population.

Growth of the vehicle fleet. Aleppo Mohafazat (1984-2008)



Source: Plan Bleu Plan Bleu study case: Urban mobility in Aleppo. Sakkal Salwa, Al Mohamad Riad (2009).

...along with a constant rise in individual motorisation and informal transport

Most of Aleppo's inhabitants do not have their own car. However, the car pool has grown considerably over the last few years as a result of Syria opening up economically : with 253,960 vehicles in 2008 for 4,045,166 inhabitants, the motorisation rate in the Aleppo mohafazat stands at 62 vehicles for 1,000 inhabitants and it has been estimated at 88 per 1, 000 inhabitants for the conurbation of Aleppo.

As in all Syrian cities, Aleppo's public bus transport services have been deteriorating since the 80s, which has driven the opening up of the sector to private operators: about 2,300 omnibus vehicles. Added to the 15,000 taxis, this large number of omnibuses has led to traffic jams, long waiting times and a decline in service speeds.

In Cairo, public transport services unable to maintain an adequate level

Over the last ten years, passenger numbers on regular bus routes have dropped off steeply, falling from almost 40% of modal split to barely above 20% today. Although the opening of the metro helped feed this decline in numbers, the inability to maintain a satisfactory level of service on the buses both in terms of quality and regularity has led to this major decline in their market share of urban travel. In parallel to the undoubted efficiency of the metro, the trams have been partially dismantled, thus what remains is now only marginal in terms of modal split.

Specialised and informal public transport system in Greater Cairo's new towns



The on-going development of irregular and informal urban transport

The shortcomings in public bus and tram transport has allowed informal public transport systems to develop on a considerable scale, to the extent that « shared taxis» and minibuses alone now account for almost half of all public transport. Although the share of buses and minibuses in daily travel across all modes is in constant decline (70% in 1971, 41% in 1987 compared with a mere 22% in 2001), the proportion of daily travel carried out by taxi or collective taxi has risen on a regular basis, from 6% in 1987 to 37% in 2001. Faster and more adapted to market needs (services/frequency), collective taxis have attracted a large number of bus users. They have thus provided a better feeder system for the metro stations than regular buses.

The current number of taxis can thus be estimated at about 60,000, despite a four year moratorium on the issuing of new licences, in other words virtually twice the number of officially granted licences. The same applies for the minibuses, of which over 80,000 would appear to be in operation for a mere 20,000 licences issued.

At technical level: the limited attractiveness of the public service and the fact that urban expertise is widely scattered between many institutions both public and private, is undermining expert capacity, resulting in the predominance of operational reasoning and poor regulation of the informal or industrial private sector.

Sectoral partitioning and institutional competition

When decisions are taken to the highest level, institutional rivalry can be exacerbated.

More often than not this rivalry is intensified by professional culture clashes (transport/town planning) and can also trigger competition between institutions in the area.

Roles are often attributed in confused fashion, which can undermine the coherence of public action.

The relatively systematic creation of autonomous public agencies devoted to rolling out a territorial project does not back up the conventional administrative structure, nor does it facilitate optimisation of the human resources available.

Although coordination bodies exist, more often than not they have not been attributed sufficient powers to be able to act as arbitrators.

A lack of continuity and coherence in public action

The lack of any genuine local governance able to coordinate the local and central institutional players is reflected in the field in major contradictions between the public policies implemented.

The multiple project opportunities generated by the recent economic context (property bubble and massive foreign investment) have only served to render the action of the public authorities even more inconsistent in most of the situations observed.

In Istanbul, an institutional expansion process is tending to track urban expansion dynamics...

Between 1950 and 2007 the number of districts doubled, rising from 16 to 32. Istanbul now comprises 32 districts, 73 municipalities, 151 villages and 805 quarters... Since July 2004 the administrative limits have been changed and expanded from 1830.92 km² to 5343.01 km² to cover the entire province. This new area, which takes account of the territorial level of operations, particularly from the economic point of view, allows for more relevant and efficient strategic approaches.

The Istanbul metropolitan municipality (IMM) shares the administration of this extended area with 73 lower-level authorities: 32 provincial sub-municipalities and 41 first-level municipalities. The Istanbul Metropolitan Municipal Council is the IMM's decision-taking body. It comprises the mayor of the metropolis, 73 elected representatives from the 32 district municipalities and the 41 provincial ones, plus a further 274 members from these same authorities. This institutional adjustment process is still underway, as witness the fact that since April 2008, the Istanbul metropolis has grown from 32 to 38 districts....

...but with a deficit of governance despite the existence of dedicated urban transport coordination bodies

The Istanbul Metropolitan Municipality or IMM is the authority responsible for organising urban transport. It is in charge of or supervises a range of bodies dedicated to land use planning, regional local planning, real estate management, transport and traffic regulation in the conurbation. Two specific bodies (UKOME and AYKOME) are devoted to coordinating the transport sector with all the authorities and bodies involved with infrastructure planning, programmes and projects. Overall, urban transport planning and management involves a total of some 50,000 employees.

In part, the differences which exist in terms of intervention strategy and the lack of coordination between the numerous State departments and municipality agencies constitute one of the main reasons for the transport system's lack of efficiency. Thus, the fragmentation of decision taking within the state institutions hampers the genuine efficiency of strategic planning approaches.

The fruit of the world's oldest urban civilisations, many of the Mediterranean cities studied are paradoxically marked by a memory block on the part of city practitioners and professionals in terms of area development and operation and previous urban planning exercises.

Finally, the technical institutions are not particularly concerned about capitalising on knowledge, which does not allow local practitioners to fully grasp the dynamics at play.

In Tunis, well-structured regional local planning...

City management is governed by the Land and Town Planning Code (CATU), which determines the environmental planning and management instruments according to a model inherited from French tools and methods. Since 1990, town and transport planning exercises for the Tunis conurbation have multiplied : the Greater Tunis Urban Development Plan (SDA) to run until 2021 was initiated in 1995 in parallel with the drafting of the national land planning programme and the Regional Transport Master Plan (PDRT), which was tailored according to the Greater Tunis SDA. Planning of the urban transport systems is based on the periodic collection of data such as domestic surveys and Urban Travel Plan-type methodological approaches copied from the French model (PDU). However, the most recent «domestic survey» dates back to 1994. Since the necessary funding for the update initially planned for 2004 was not found, this information will have to be updated in the light of recent developments in the conurbation and its operations.

... but inadequate coordination of local players to be able to control urban development

The many planning exercises conducted in Tunis were not able to take full account of the new metropolitan scale or, more recently, the major real estate projects around the main Tunis lakes. The various ministries or governorate services involved in urban management do not appear to have their own expertise. They confine themselves to a strict contracting authority role, with strategic studies being commissioned from local consultancies following calls for tender launched by the various ministerial departments, administrations and public bodies.

The mushrooming of players (Ministries, Governorates, Communes, agencies and public operators) inevitably gives rise to coordination difficulties and has public players vying against one another. The increasing complexity of the system of players is intensified by the continuing highly marked sectoral partitioning within Tunisian institutional organisation :

The transport sector in Greater Tunis involves some five different ministries. The forms of coordination between these ministries are still unclear, and it appears likely that only arbitration at the highest level will manage to establish a common line. Thus three real estate agencies: the Agence Foncière d'Habitation (AFH), the Agence Foncière Industrielle (AFI) and the Agence Foncière Touristique (AFT) were set up in 1973 with a view to conducting housing, industrial and tourist zone projects. Enjoying the prerogatives of a public authority in terms of pre-emption and expropriation, they are behind the roll-out of various major housing, industrial and tourist zone operations. With a sectoral rather than a territorial structure, their work on occasion contradicts strategic ministerial plans head-on.

Little account taken of poorly identified impact

Besides the fact that global warming is likely to have a marked effect in the Mediterranean, the region also presents a set of specific natural aggravating factors, which encourage the production of ozone: relief and hot, dry climate, particle concentration, proximity of the desert...

In these cities, the climate, the relief and the winds play a particularly important role in photo-chemical pollution, which is likely to create or aggravate respiratory problems (allergies, asthma...). The calm, anti-cyclonic conditions often seen in the summer encourage temperature inversion phenomena in the city centres, which may lead to virtually permanent pollution peaks in many of them, as is the case in Athens, Cairo, Genova, Barcelona and Marseilles-Aix. Such phenomena lead to a concentration of the main chemical (CO, NO_x, SO₂) and physical (particle) pollutants linked to transport, housing and industry.

Where air quality measuring stations exist, their networks, monitoring and the circulation of the results still appear inadequate.

Moreover, the lack of monitoring indicators and assessment of the impact on public health can only be deplored, particularly as regards respiratory disease linked to the concentration of air pollutants in urban areas.

A recurrent lack of data

Access to data is clearly very difficult in most of the cities studied: lack of reliable information, patchy if not totally non-existent data. Where data does exist, it tends to have been produced for some specific project. Consequently, it does not cover the entire area relevant to the understanding of how conurbations function overall, nor is it regularly produced.

Under these conditions, local practitioners usually lack the fundamental elements of knowledge as they design or assess sectoral plans and programmes.

In Algiers, a major increase in motorisation...

Outlying urbanisation, higher standards of living and longer travel distances as a result of urban sprawl have been instrumental in households acquiring private cars. This trend has been intensified by the arrival of car dealers, car loan access facilities, the deterioration in public transport provision and the attraction of the private car.

In 2004, 58 % of Algerian households did not own a vehicle, 36 % owned one and 6 % owned at least two: although multi-motorisation is still rare, it will increase unless public transport provision becomes efficient, effective and legible for the user. The rate of household motorisation is higher in the outskirts than in the central districts, particularly for the well-off social groups.

Besides the harmful effects it produces- air pollution, traffic congestion and saturation of the road network- the increase in private car trips in Algiers is driving a constant increase in the consumption of fossil fuels, which are not particularly expensive in this oil-producing state.

...accompanied by the marked "dieselisation" of the car fleet

The increased consumption of fuel is particularly marked in the case of diesel, which doubled between 2000 and 2008. Measures were taken by the public authorities in order to reverse this dieselisation trend by encouraging the use of gaseous fuels and other so-called clean fuels: lead-free petrol, gaseous fuels such as LPG/C and CNG.

Various measures were adopted in support of LPG: the conversion of 1,000 taxis in Algiers to LPG/C, the installation of LPG kits at preferential, subsidised prices for clients and car dealers, very attractive LPG/C prices at the pump, the introduction of a funding mechanism to allow individuals wishing to convert their vehicles to LPG/C to have access to interest-free credit.

Moreover, the Ministry for Energy and Mines has launched a programme of action aimed at the use of compressed natural gas (CNG) in particular for public transport in the urban environment. The introduction of this gas onto the national market and the installation of converter kits on vehicles has led to the opening of two CNG stations, the conversion of 120 light vehicles belonging to Sonelgaz and five Sonelgaz buses running on natural gas as well as a five to ten bus programme for ETUSA.

Current dynamics

Relatively unsustainable prospects...

Little account taken of specific local features

The strong desire of the people and their decision-takers to achieve « globalised » consumption patterns is leading to the transposition of exogenous products, methods and practices in both urban planning and transport. Pyramids, shopping centres, golf courses and housing developments are nowadays just as likely to be found in Cairo as in Las Vegas...

The origin of the investors behind the major urban projects but also the constant influence of international expertise on the local level is making it more difficult to take the local context into account.

Questioning the role of the car in the city

In virtually all the situations studied, and whatever their level of development, mass motorisation dynamics and public policy towards kitting out households or developing the road infrastructure were observed.

Future urban public policy in the Mediterranean will need to tread the line between, on the one hand, the need to reduce dependency on the car and bring mass motorisation dynamics under control and, on the other, policies aimed at opening up the local markets to imported goods and access to car loans.

In certain cities on the northern shores, a shift in modal split is starting to be observed in favour of public transport, along with an un-coupling between the level of motorisation and car use, but greater consistency in public action in the urban areas on the southern and eastern banks still remains to be sought.

In Tunis, dynamism and urban sprawl...

Despite moderate growth when compared with other cities to the south, since the 70s Tunis has been experiencing major urban sprawl. In the early 60s, the city extended over some 10kms, whereas it now measures almost 40km from north to south. It is this sprawl which has produced the significant drop in density which, from an average of 101 inhabitants/ha in 1975, reached 92 inhabitants/ha in 1996. Until the 80s, almost 60% of jobs were still concentrated between the Kasbah adjoining the medina- a major administrative centre where most of the ministries were located- and the European town- the conurbation's commercial and administrative centre- in other words in a part of the town which represented over 45% of Tunis's population.

Simultaneous movements involving the extension and the specialisation of urban areas have led to the gradual uncoupling of economic and residential functions, which in turn has meant that both the number and length of home-work trips have increased sharply.

Tunis skyline from the lakeside



...driven by a collection of urban projects which, it is hoped, will produce a « system»

Since 2007 some new forms of urban mega-projects designed by promoters from the Persian Gulf have been established around the main lakes of Tunis. Moreover, these major projects would appear to evade the urban planning process which has been developed. The projects rolled out on the northern coast or to the west should lead to the freeing-up of the Tunis hyper-centre and encourage the development of a multi-centre set-up by the concentration of medium and high quality residential pockets. This is having a major impact on the centre of Tunis, which kept its back firmly turned on the lagoon as long as it was no more than a polluted lake. However, by providing a home for a highly motorised population, these projects will play their part in the congestion of part of the road network. Indeed, these districts will be occupied by households whose home-work trips will use routes already saturated at peak times.

In Cairo, mass motorisation dynamics...

Whilst two-wheelers represent a mere 10% of all vehicles registered in the governorate of Cairo, with almost 4.25 million vehicles (private and other) almost a third of all private vehicles registered in the three governorates of Greater Cairo and almost half of all vehicles registered in Egypt are to be found on the roads of the Greater Cairo Region. Since 1973 and particularly since the country opened up economically, allowing the mass importation of foreign vehicles, registrations in the governorate of Cairo have been shooting up in exponential fashion. From 1976 to 2001, the number of cars rose from about 86,000 to about 625,000 i.e. a remarkable 727% growth rate in 25 years (in other words, pushing 30% per year!) However, whilst motorisation rates are still rather low compared with other cities around the world with 84 vehicles/1000 inhabs (including taxis), the 2002 Greater Cairo Region transport plan forecast that the total number of vehicles would continue to rise to reach over 2.5 million vehicles in 2022.

Density and congestion in Cairo



... which are aggravating already widespread congestion

Greater Cairo generates almost 20 million motorised and almost 7 million non-motorised trips per day. Two thirds of the motorised trips use public transport. The 2002 regional transport plan forecast for 2022 that the number of motorised trips would grow by about 3% each year. The traffic management provisions, which are rather odd to say the least (scarcity if not complete absence of signs, 3 lines in two lanes), can only exacerbate what is already a difficult situation and one which cannot be evaluated due to the lack of qualitative data on travel speeds or the frequency of congestion on the roads. As the rate of motorisation rises, the current poor traffic conditions are likely to get even worse, particularly along the main corridors of development. This can only exacerbate the serious traffic problems in the conurbation, where the situation is one of the worst in the entire world.

Network congestion, pushing up GHG emissions

The prospect of breaking out of the vicious circle which has been observed of motorisation dynamics/ network congestion/ decrease in travel speeds/ deterioration of public transport/ motorisation is still not to hand in most of the situations studied.

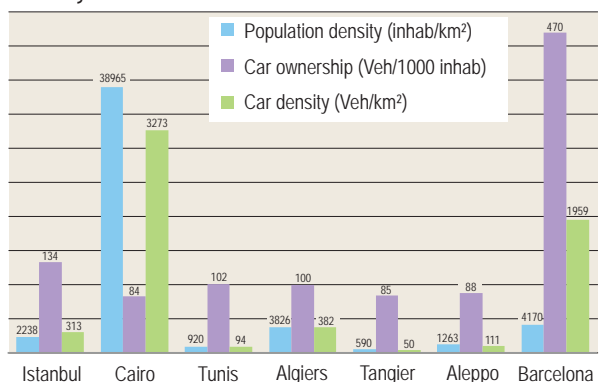
In Cairo and Istanbul, as in the other cities studied, the dilapidated car, bus and collective taxi fleet as well as the drop in travel speeds caused by major congestion of the road network are factors which clearly aggravate GHG emissions.

Poor cold yield and lack of performance on the part of old, low speed engines are just one of the causes. Although the gradual renewal of the vehicle fleets is bringing improvements, particularly through the adoption of European standards in Istanbul, they are still not enough.

There are several examples of pro-active public policies towards renewing the car fleet and thus reducing GHG emissions: Bonus-malus and scrappage premium systems in Europe, replacement of the taxi fleet by Natural Gas Vehicles in Cairo, the conversion of buses/vehicles to liquefied natural gas in Turkey and Algeria. The fact remains that the trends observed in the Mediterranean will without the shadow of a doubt have major consequences in terms of final energy consumption, GHG emissions and local pollution.

It emerges from the situations encountered and described that technological progress cannot be the only public policy lever for reducing GHG emissions in the urban transport sector.

Density of vehicle fleet in seven Mediterranean cities



Informal transport, an inevitable player in urban transport

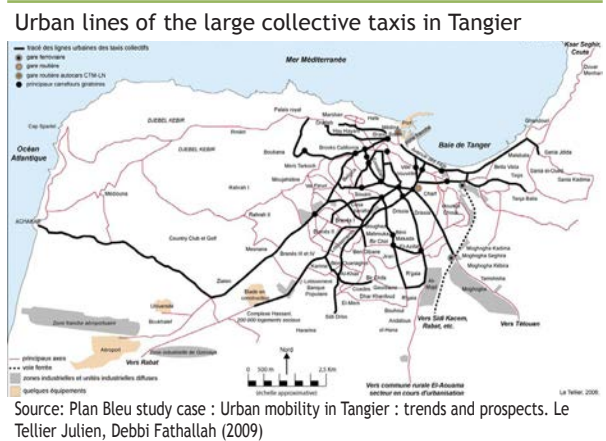
The economic models underpinning the informal systems present in the Mediterranean are relatively similar in all of the cities studied. Based as a general rule on private investment (operating licences and vehicle purchase), informal transport is an important provider of jobs in the cities, both in terms of running and maintaining the fleets of vehicles. It thus comprises a crucially important socio-economic sector in the cities.

Within this context, any initiative aimed at regulating the so-called informal sector raises particularly important economic and political stakes for the people directly concerned as well as for the competent authorities.

These informal transport systems contribute to congestion by increasing road traffic and aggravating local pollution as a result of the dilapidated state of the vehicle pool.

However, although this needs to be specified in greater detail by a case by case approach, the various informal public transport systems nonetheless present a rather positive « carbon balance » compared with traditional public bus systems when their effective passenger numbers are thrown into the balance.

The shared operational mode (up to 5 or 7 passengers per car), the routes and request stops result in the optimisation of load factors for these systems compared with « institutional » transport, whose levels of service and passenger numbers are in constant decline virtually across the board.



In Tangier, informal transport plays a dominant role in urban transport...

After several years of inadequate if not non-existent public collective transport provision, the number of collective taxis has shown a steep rise in Tangier. During the 80s, these micro-operators were granted the public transport routes within the municipal boundaries and were able to enjoy forms of exclusivity in some sectors. In the Tangier wilaya, the number of taxis has risen sharply since 1984: it has risen 6.6-fold in 20 years, with 433 vehicles in 1984, over 700 in 1994 and 2,861 in 2004. Between 2000 and 2003, whilst the number of large taxis rose by a quarter, the number of small taxis doubled.

In 2001, operation of the Tangier public transport network (Autasa) was granted to the Spanish Ruiz group, which has introduced the same management, sales and operational methods as it applies in Europe. Although bus provision has been improved over the past ten years by the creation of new routes, it still lags behind the demand for travel. Autasa currently has 76 buses on the road in Tangier, i.e. an average of 3.3 buses per route, one bus per 13,000 inhabitants, compared with 600 buses planned for Rabat-Salé by Veolia Transport, i.e. one bus per 3,300 inhabitants.

Although the company enjoys a monopoly on bus services, it faces stiff competition from the taxis, which offer greater flexibility in their routes and timetables, without being limited by the constraints of a public service. The faster bigger taxis, which are better adapted to the width of the roads and to hilly areas, are often more practical, whilst not costing the user any more. In Tangier, taxis account for about 5% of the vehicle fleet, but between a quarter and a half of all traffic.

...which does not prevent the use of specialised operators to offset immediate shortages

Given the low level of public provision, a large proportion of all urban trips use other collective types of transport- either informal (large taxis, mini-buses, combined transport) or specialised (company workforce, school buses).

Workforce transport services on behalf of others were institutionalised in 2003 in response to the concerns of industry. The vehicle fleet for this type of operator grew from 294 minibuses in 2003 to 883 in 2009, in other words a three-fold increase in the number of places offered in six years, and now has the same transport capacity as the taxis.

These specialised forms of transport meet rapidly and constantly growing needs against a backdrop of major economic expansion with its corollary of industrial and tertiary sites. Whilst this allows a more efficient service to be envisaged in the short term for the industrial areas and connections with the Tangier-Mediterranean Port, the mushrooming of operators will in the longer term render more complex the introduction of integrated, coordinated public transport provision in the city.

Specialised transport, leading to counter-productive effects

Given the inadequacy of public collective transport provision, the growth of specialised school, university, administrative or private transport would appear to be gaining ground to the detriment of the creation of global, coordinated transport provision.

In Tangier, in order to respond to the major and immediate needs linked to surging economic development and the construction of some major industrial units, but also in Algiers with its large student population, which enjoys fare benefits, this would seem to be the preferred sort of response within a context of inadequate regular provision.

Whilst providing for an immediate response to the daily mobility needs of a dependant population, such mechanisms also represent direct competition for institutional forms of transport. By rendering operator coordination issues more complex, this once again further compromises the emergence of a global public transport provision.

Public health, one of the major urban mobility stakes

In virtually all the situations observed, the decentralisation of polluting activities and industry has already come about and urban transport is now one of the main causes of GHG emissions and local pollution.

More than public transport passengers, passengers in private vehicles are the first to be affected by the inhalation of particles inside their cars, particularly when they are stuck in traffic jams. In Europe, it is estimated that measures aimed at reducing particle concentration have allowed 348,000 deaths per year to be avoided, 40,000 of them in France. The cost of decreased life expectancy due to air pollution has been estimated at almost 16.3 billion €/yr in France, where a « Particle Plan » was got underway following the Grenelle environment forum.

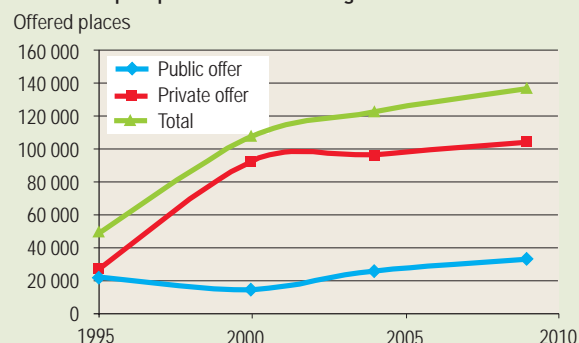
However, it is still very difficult to establish this type of estimate for the cities to the south and east, and specific research still needs to be conducted in order to take this type of analysis further.

In Algiers, « constant » progression in public transport provision... to the benefit of specialised private operators...

Since 1963, public transport in Algiers has been provided by a single public company, supervised by the Ministry of Transport—the Régie Syndicale des Transports Algérois (RSTA). Since 1988, transport markets have been opened up to a whole range of private operators as a way of combating youth unemployment. The creation of micro transport companies has been encouraged by the State through low interest bank loans for the purchase of vehicles and a five-year tax exemption.

Following the abolition of the subsidies it had received since its creation, the former RSTA (which became the ETUSA), ran into major financial difficulties and was never able to provide a complete and fair service to the various parts of the conurbation. Consequently, the shortcomings of the public operators are compensated for by the services of the 2,787 private operators who provide a more finely tuned service to the outlying areas, thus meeting travel needs not satisfied by institutional transport. Since 2001, the ETUSA has been taken over by the public authorities. But the excessively slow improvement in its service provision has had a knock-on effect on the increase in motorised trips using private cars. Urban transport by taxi, with 11, 000 individual and collective taxis, has virtually replaced public transport in the hyper-centre.

Public transport provision trends in Algiers



Source: Plan Bleu computation, Plan Bleu case study: Urban mobility in Algiers: trends and prospects. Safar Zitoun Madani, Tabti-Talamali Amina (2009).

...driven by the virtually total subsidisation of student transport services

The Algiers situation is a case unto itself in the Mediterranean—university transport is subsidised by the State to the tune of 95%, making it virtually free for students. Student transport is operated by « Takhout Mahieddine Transport », which since 2004 has held a monopoly on university transport in the wilaya of Algiers. This company has become the biggest private transport operator in Algiers, exceeding the provision of the public bus companies and private operators alike.

Moreover, the Takhout buses are new and in excellent condition. The company accounts for about 10% of total trips in the Algiers conurbation and has a fleet of 1,387 buses, whereas in 2009 ETUSA was operating a mere 302 buses.

Trends towards sustainable urban mobility

Towards public policies tailored to the specific local features...

Priority must be given to controlling demand

The urbanisation processes observed in the cities to the south and east of the Mediterranean are marked by the predominance of extensive reasoning, which trigger informal and unregulated development dynamics (Istanbul, Tangier...) Although it is notoriously difficult to measure, the economic, social and environmental impact of this generalised urban sprawl is immense: uncoupling of home and work, land consumption, loss of economic attractiveness, increased dependency on fossil fuels.

Although it was not possible to fully address all of these aspects in the studies presented, it nevertheless emerges that across the board public transport provision and even the major urban networks are unable to keep pace with the growth in demand for mobility in cities witnessing such rates of growth. The case of Cairo with its extreme density provides a good illustration of the fact that promoting increased urban density is not enough to hope to tackle the interactions between travel and urbanisation. Public policies towards controlling urban sprawl and promoting urban renewal should be seen as a priority for public action, ahead of offer-based approaches.

An integrated town planning/ travel approach, a « reticular metropolisation » approach or the provision of public transport should be preferred to extensive development processes, where urbanisation should be structured through densification confined to the main travel routes.

Towards a multi-modal approach for the public transport networks

In most of the cities studied there is a clear lack of coordination between the various urban transport networks, whether this be in terms of the mode of transport, fares, timetables or transit areas (location of stops, kitting out of stations or transfer hubs).

With the exception of the informal systems, which are particularly reactive to user demand with, for example, the emergence of informal and spontaneous transfer hubs in Cairo, the institutional operators' own operational reasoning would appear to be clearly favoured to the detriment of user mobility. When projects are rolled out or sectoral policies drafted, all too often the public authorities still give priority to a specific mode of mass transport (metro, tram or road...) without paying adequate attention to the issue of integrating the various modes of transport which already exist.

The setting up of a multi-modal network at conurbation level, single or multiple but coordinated by a sole authority, where each mode would be fully integrated on the strength of its own comparative advantages, should be one of the leading objectives for public urban transport policy.

Reducing car dependency

Rather than promoting the « car-free city », the point is to develop a pragmatic approach aimed at the selective regulation of car use. According to the situations observed, incentives such as developing public transport provision, renewing the car fleet, adjusting the road network and coercive measures such as implementing public transport routes with their own exclusive lanes, dissuasive parking policies or even the introduction of traffic restriction policies in the densest areas (pedestrianisation, ecological urban tolls...) can all be combined.

Financing the compact city

Despite its long and ancient architectural and urban culture, the desire to invest in shaping the city, its urban services and collective amenities is still limited in modern-day Mediterranean cities.

Against a backdrop of limited local authority means, new resources dedicated to collective transport can be factored in during the design phase of projects—turning land linked to new transport networks to financial use, for example, or advertising resources linked to urban amenities...

However, it is difficult to mobilise these new resources to finance collective urban amenities which are not related to any major infrastructure.

Such is the case for most of the urban neighbourhood public amenities (public toilets, lighting and street furniture), more generally for public area amenities (green areas, public gardens for children...) and more specifically for integrating constructed elements into public areas to encourage more sustainable urban mobility, such as bus stops, pedestrian walkways, parking, cycle paths, exclusive lanes...

Placing the user at the heart of project design and public policy

With the exception of Istanbul, in the virtually ubiquitous absence of fare integration mechanisms, the administrative limits of the local institutions or the operating perimeters of operators in the field all too often hamper peoples' daily travel.

A supply policy which focuses too exclusively on the operational constraints of the various networks cannot satisfactorily meet the public's requirements. Good public policy practices towards the development of public transport (Lyon, Barcelona) are marked by a clear concern on the part of the authorities and transport operators for the user.

In the cities to the south and east, these so-called «client-oriented» approaches should apply to road safety issues, pedestrian access but also services to employment centres

In Istanbul, the gradual integration of the various urban transport modes and networks...

The various modes of urban transport operating in the metropolis are still not adequately integrated, both in terms of fares and of spatial interfaces. Whilst some effective link-up points do exist between different modes of transport, these would appear to have sprung up spontaneously rather than through the will or action of the public authorities. But these informal transfer hubs do not have suitable mechanisms for parking, pedestrian areas or even sign-posting. Moreover, the type of service provided as well as the operating perimeters of the public and private operators are still all very separate and poorly connected between themselves—the institutional modes are deployed in the centre, whereas the private ones tend to operate on the outskirts. However, with the roll-out of some recent railway projects, it would appear that the metropolitan municipality is attempting to set up the first inter-modal platforms as the first step towards a viable alternative to the private car. As far as fares are concerned, a single fare was recently established with a monthly subscription price of 85YTL (about 50 €) which allows unlimited travel on boats, buses and the metro—the « Mavikart ».

Informal transfer hub in Istanbul



...with the introduction of pro-active traffic management measures

The Istanbul Metropolitan Municipality (IMM) is starting to implement a certain number of measures towards policies aimed at intelligent traffic management, such as the introduction of urban tolls and the electronic monitoring of traffic flows. Since early 2006, the city has been working on the introduction of an integrated traffic management charging system designed according to the congestion charging models in Singapore and London. Thus, as of 2013, Istanbul will be split up into three main traffic zones with different tariffs. However, although these efforts should be viewed in a positive light, in the short term the introduction of these binding measures on car traffic in the city centre where there are currently very few viable public transport alternatives could well lead to an increase in transport costs for the poorest households and thus cause genuine urban discrimination...

Towards the full integration of informal systems

Generally affordable for a simple trip but expensive when connections with other networks are involved (lack of integrated fares) and not particularly comfortable (dilapidated fleets) informal provision nonetheless provides a good level of user service due to its ability to adapt dynamically to demand.

Taking up little space in local authority network planning and project design deliberations, informal transport nonetheless plays a key role as a feeder for the mass institutional forms of transport and should be seen as an integral part of global provision in the Mediterranean cities.

If the modern supply management tools which exist to the north were taken on board it would be possible to optimise this mode of public transport without losing its benefits.

In the cities on the northern bank, the recent development of public transport systems on request (car pooling and small peri-urban collectives) reflects the diversification of demand linked to urban sprawl and lifestyle changes (size of families and ageing population). They operate in a very similar way to the informal forms of transport in the cities to the south and east of the Mediterranean.

Moreover, with the development of new technologies relating to non-fossil fuels, electric and hybrid cars, the automobile sector has started to undergo far-reaching technological change. This should prompt a re-examination of the relevance of the various modes of urban transport used.

As might be suggested by the examples of Cairo with the replacement of the taxi fleet by vehicles running on Towngas, or Israel with the experimental development of a fleet of electric cars, the informal sector, confined to a given area, could provide a real opportunity for circulating these new green technologies.

These now unavoidable changes will most probably drive a change in the classical form of modal split and speak in favour of the rehabilitation of informal systems in the eyes of the local authorities in the cities to the south and east of the Mediterranean.

Local decision-taker awareness still needing to be raised

Whilst combating global warming has already drawn the attention of public decision makers to the importance of curbing GHG emissions, there is still only limited awareness to the south and east of the public health stakes relating to air quality and more specifically to fine particle concentrations.

Besides the systemic approaches which need to be adopted, the resulting economic impact must be better assessed to ensure that greater account is taken of issues relating to urban mobility in public policy and project design.

A precise estimate of the economic impact of imported fossil fuels for cars or the cost of non-action in the face of non-sustainable dynamics (urban sprawl, mass motorisation and the deterioration of air quality) can play a determining role in public decision taking.

New tools for new challenges

Certain innovatory monitoring and observation mechanisms have already been introduced in some cities on the northern shores, such as Marseilles and Nice for air quality, but a far-reaching overhaul of the methodological approaches needs to be carried out in order to assess the socio-environmental impact of urban transport on the public and to fully integrate these concerns into urban planning exercises.

Certain less common data elements should be available for the assessment of specific impacts, as is the case for data on average travel speeds, which is essential to the assessment of GHG emissions.

Consolidating the capacity of local urban expertise

The development of specifically Mediterranean expertise in research, higher education or continuous training is a pre-condition for the implementation of effective local initiatives and solutions adapted to the local context. This could lead, for example, to the creation of technical institutions dedicated to the Mediterranean city, and more specifically for urban transport, along the lines of what already exists in certain states to the north. Furthering cooperation in the Mediterranean should help provide an active contribution thereto.

In Marseilles and Nice, the monitoring and assessment of local pollution is tending towards operational mechanisms to assist in decision taking...

France has an air quality monitoring mechanism based on a network of 35 French associations approved by the Ministry for the environment. In the Provence Alpes Côte d'Azur region, ATMO PACA is a partnership-based structure (State, municipalities, industry, consumer and environmental protection associations and qualified individuals) which monitors, provides information and aids decision taking. Since 2006, the work which it has conducted in several cities in the region has led to the shaping of a new innovatory approach aimed at ensuring better adapted monitoring in the field, linked to the needs of local players.

Air pollution mapping in Marseilles

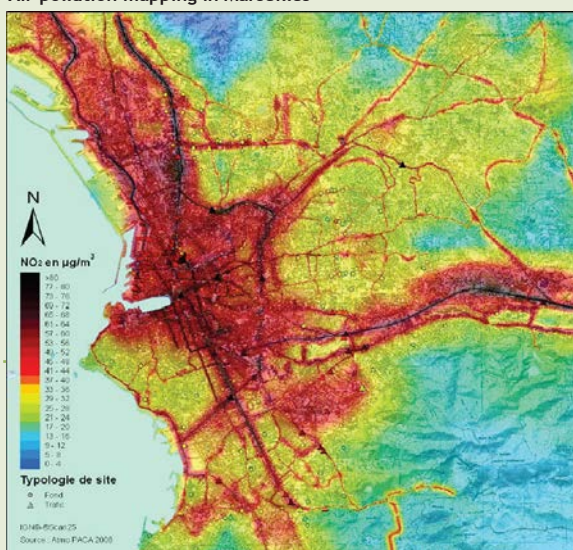


Illustration ATMO PACA

Following a first stage of enhanced exchange with the various technical and decision-taking players for the different issues involved (environment, health, planning, travel, energy, academic life...) in order to share recognition of the need for concerted action, a more specific diagnosis of the area must now be established. This will be done on the basis of a precise inventory of air pollutant emissions (including the main greenhouse gases), an intensive measuring campaign and the introduction of an urban model.

Finally, through emission mapping, a sectoral analysis of the respective contributions and high resolution concentration mapping should lead to the construction of a prospective tool (digital model) based on the implementation of air quality change scenarios based on the hypotheses of the local partners: pedestrianisation of certain areas, changes to the private vehicle/public transport split either locally or at city level, reduction of speed and access in certain sectors.

Besides its technical aspects, the de-partitioning of jobs and the grass-roots inclusion of ideas about area development has meant greater account being taken of air quality in these cities.

Conclusions et recommendations

Knowledge, Concept and Coordination for the Mediterranean cities

Given the major challenges which the Mediterranean cities will be called upon to face, on demographic issues as well as adapting to climate change, priority must now be given to an integrated and systemic approach to urban development:

- Thought out according to usage rather than systems;
- Linking the diversification of transport provision to controlling demand for mobility;
- Determined to genuinely establish control over growth and development dynamics.

To this end, three key ideas relating to urban travel must be given priority by public Mediterranean decision-takers.

Enhancing knowledge and instruments for monitoring urban dynamics...

In order to take account of the new scale of Mediterranean cities, which feature vast heterogenic, inter-dependent urban areas run by a whole range of administrative bodies.

By developing monitoring and assessment tools dedicated to the basic indicators of urban mobility (travel, reasons, distance, time, cost...) but also to other economic, social and environmental factors in order to assess the sustainability of urban development (network congestion, urban attractiveness, local accessibility, impact on public health, energy dependency...)

By consolidating local technical expertise, particularly by boosting human and financial means, developing research programmes, rendering professional careers more attractive, blending professional cultures and developing regional cooperation.

Renewing urban models and concepts ...

Towards pragmatic approaches adapted to specific local features, a far cry from the straightforward transposition of standardised urban products.

Towards urban models less dependent on roads and cars in which town planning and public transport networks are intimately linked within a reticular metropolisation-based approach.

Towards urban amenities structured around rehabilitated public areas, likely to be instrumental in improving the quality of life in dense urban areas, allowing better road sharing in favour of soft modes and integrating essential inter-modal centres.

Towards the full integration of informal transport within global public transport provision, in order to optimise existing resources.

Towards usage rather than supply-based approaches, and taking account of the inhabitant and user.

Improving coordination between local players in urban development...

Through the “territorialisation” of public policy, aimed at encouraging approaches which are systematic and integrated rather than sectoral.

Towards effective strategic planning, based on anticipatory real estate policies and by limiting dispensatory mechanisms.

Finally and more generally speaking, the emergence of urban contracting authorities with the competence, own resources and capacity to arbitrate over local players is one of the conditions for the successful implementation of more sustainable urban policies.

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Case studies

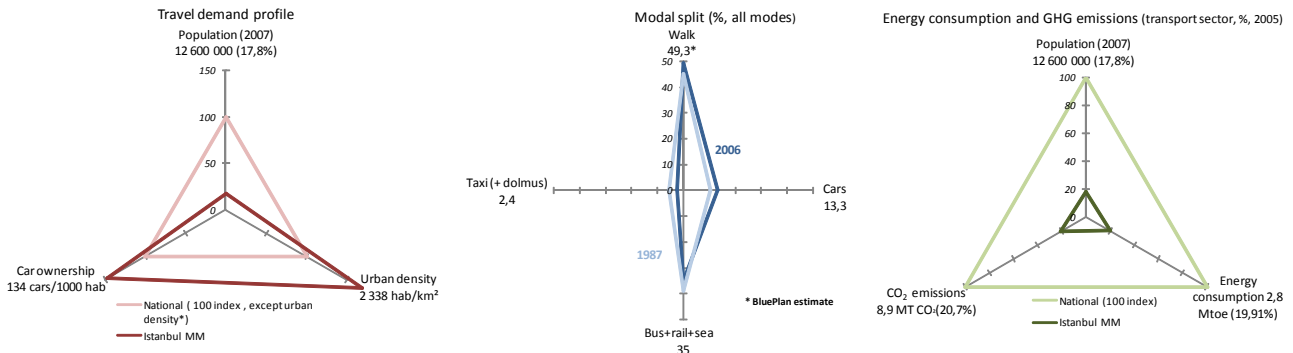
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Compared profiles of six Mediterranean cities

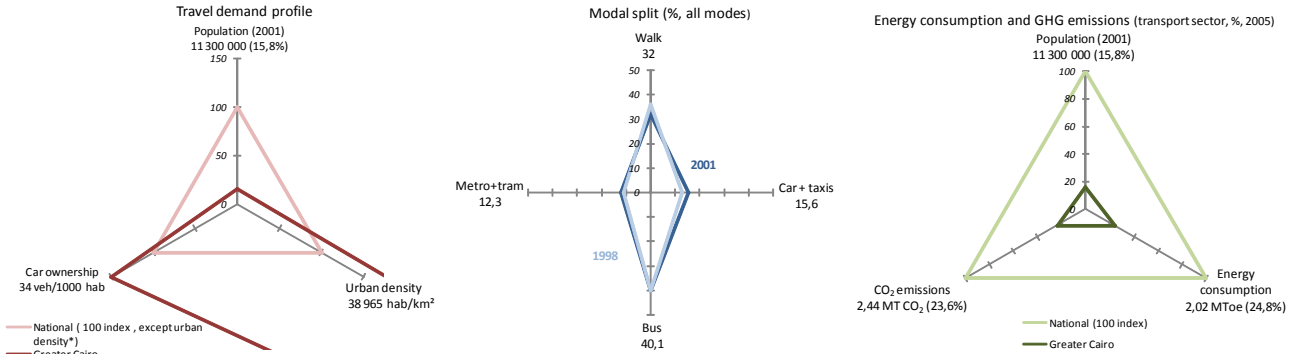
Caution

The plans shown below gather the essential and comparable datas that have been collected within the six case studies. Despite these datas' heterogeneity, in their analysis scales (time and space) as much as their constituent methodology, this system of graphic restitution allows putting in parallel the main characteristics of these cities and illustrate in a relative way the situations that have been observed.

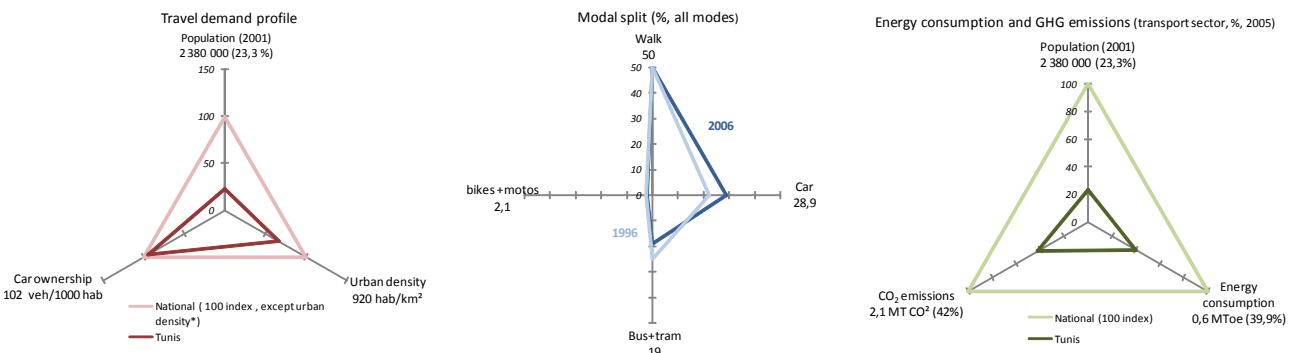
Istanbul presents a considerable density and rate of equipment superior to the other cities of the region. The craft transport offer, traditionally dominant, is constantly decreasing to the advantage of the car.



Cairo is one of the densest cities in the world. In a paradoxical way, walking remains set back when it comes to daily movement compared to some of the region's other cities. Important levels of energy consumption and GHG emissions from transport are recorded, in spite of the dominating place of the collective transports, the rates being most probably linked to the dilapidation of the vehicle fleets and the extensive level of road network congestion.

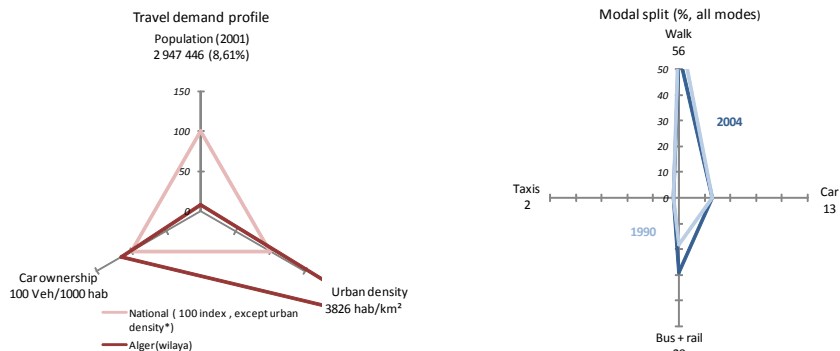


Tunis The urban sprawl dynamic is characterized by a low density as well as constant increase of car use in the daily transports, although there is a most developed offer of collective transports. This translates by very high levels of energy consumption and GHG emission compared to those of the region's other cities.

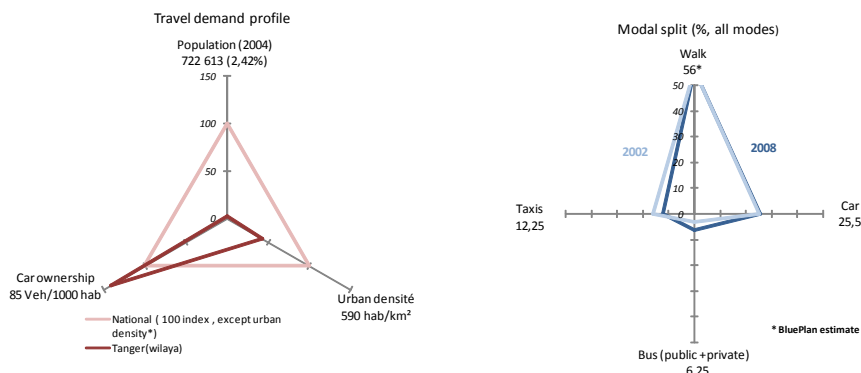


*density: in reference to the global medium of urban density in developed countries, where it reaches 1392 inhab/km². Source : [http://www.goodplanet.info/goodplanet/index.php/fre/Societe/Urbanisation/Urbanisation/\(theme\)/295](http://www.goodplanet.info/goodplanet/index.php/fre/Societe/Urbanisation/Urbanisation/(theme)/295)

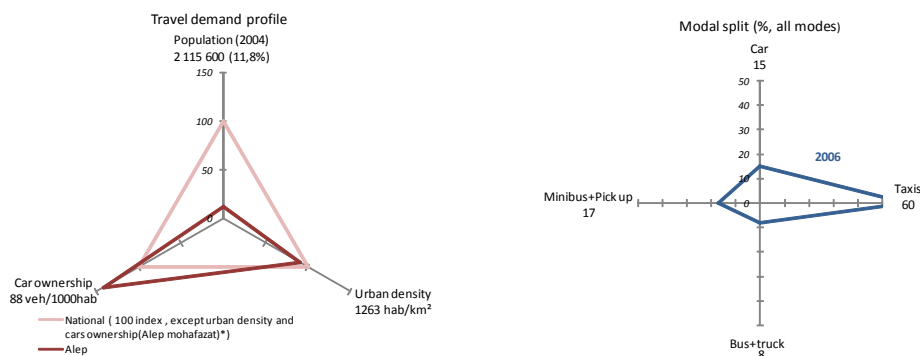
Algiers While not being comparable to Cairo, Algiers is still one of the densest cities in the region. Walking, favored by a restricting geography and the congestion of road networks, keeps a dominant place in the daily transports.



Tangier Though there are some strong recent development dynamics, Tangier is still a city of less density. A motorization level set back from the cities of the region and a great weakness from the collective transports offer (public and private) make difficult the urban transports. Walking remain the most common means of transport.



Aleppo presents a density and motorization level comparable to Tunis and Tangier. There is an existing offer, which is not insignificant, from the collective transports, but the main part of the daily transports is ensured by taxis and other craft transports (minibus, pick-up).



*density: in reference to the global medium of urban density in developed countries, where it reaches 1392 inhab/km². Source : [http://www.goodplanet.info/goodplanet/index.php/fre/Societe/Urbanisation/Urbanisation/\(theme\)/295](http://www.goodplanet.info/goodplanet/index.php/fre/Societe/Urbanisation/Urbanisation/(theme)/295)

Urban mobility in Tangier: Trends and prospects

This document was drawn up by Julie Enjalbert, on the basis of:

- the report drafted by Julien le Tellier and Fathallah Debbi, in collaboration with Lahoucine Amzil
- the summary drafted by Julien le Tellier and Fathallah Debbi, in collaboration with Lahoucine Amzil
- studies by Cecilia Rubiolo, Sciences Po Paris MAster I studen, Blue Plan intern
- the survey on the urban transport situation in the Middle East and North Africa conducted by Sylvain Houpin



Introduction

At the gates of Africa and Europe the city of Tangier, surrounded by the Atlantic Ocean and the Mediterranean Sea, occupies a unique place within Morocco's urban structure. Squeezed in between the Cape of Spartel and Cape Malabata, facing the Strait of Gibraltar, it has a population of almost 670 000 and comprises Morocco's second industrial centre after the Casablanca region.

Despite its strategic geographical location, Tangier was long marginalised within the Moroccan urban network. It was only in the early 2000s after Mohammed VI came to the throne that the city of Tangier took on new impetus, marked by the inauguration of massive construction sites such as the Tangier Mediterranean Port (PTM).

Just as is happening elsewhere in the Mediterranean, the city of Tangier is currently in the grip of sustained urbanisation and unprecedented urban sprawl. In the face of this major shake-up in urban morphology, transport provision is struggling to keep pace with the major increase in travel demand. The sustainability of this model of urban development in light of the issues relating to urban mobility is emerging as a crucial question.

Travel demand

Available indicators

Basic travel demand data

Population (1): Municipality of Tangier: **669,685 inhab.** en 2004 (3% growth rate between 1994 and 2004)
Tangier¹ Conurbation: **722,613 inhab. in 2004** (2.4% of the national population, established in 2004 at 29,891,708 habitants)

Density (2): Municipality of Tangier:
of which Béni Makada district: 159 inhab/ha
of which Charf-Moghogha district: 52 inhab/ha
of which Charf-Souani district: 290 inhab/ha
of which Tanger-Médina district: 25 inhab/ha

Employment (3): 261,625 active persons in 2004 in the city of Tangier
Unemployment rate nearing 10% (compared with 20% over the 90s)

(1) Source: RGPH, 1994

(2) Source: IRHUA, 2007

(3) Source: RGPH, 1994

¹ The Tangier conurbation comprises: - Tangier municipality, divided in 4 districts (Tangier Medina, Charf Souani, Charf Moghogha, Béni Makada), - 3 outlying municipalities: Al Aouama, El Bahraouiye, Boukhalef-Gueznaya

State of play and current dynamics

Tangier, a Mediterranean hub city

Located to the extreme North-west of the Tangier peninsula at the interface between Africa and Europe, from which it is only separated by the 14 km of the Strait of Gibraltar, the Tangier conurbation occupies a strategic site. Open to two seafronts since it is bordered by the Atlantic as well as the Mediterranean coastlines, the city of Tangier is a point of passage and transit both for the transport of passengers and Moroccans living abroad and in terms of international goods transport.

Every year the summer attracts a flood of motorised tourists and Moroccans living abroad, producing a relatively marked impact on the city and its traffic.

The historic port of Tangier also features predominantly in the transshipment of « International Road Transport » (TIR) trucks, further aggravating congestion on roads to the north of the city. Between 1995 and 2001, TIR grew at an annual rate of 16%.

Given its strategic location on the Strait, Tangier stands as a hub city at the gates of the Mediterranean. Yet it is becoming increasingly difficult for the existing infrastructure to absorb the growing flows of goods and people. The creation of the new Tangier Mediterranean Port which the authorities have been rolling out since 2002 should, however, go a very long way towards relieving congestion around the current port.

A medium-sized city in an area undergoing revival and on a metropolisation roll

Despite its many geographical assets the city of Tangier has been marginalised historically, lying on the fringes of Morocco's urban structure. Indeed, from Morocco's independence in 1956 until the start of Mohammed VI's reign in 1999, the Moroccan coastal urban axis developed between the towns of Al-Jédida and Kénitra, leaving Tangier on the sidelines.

After several decades of isolation the major projects which emerged in the early 2000s (Tangier Mediterranean Port complex, motorways and railways, industrial and commercial free zones ...) reflected the will to breathe new life into the development of the Tangier peninsula. The areas around the city of Tangier and the Tangier-Tetouan region are currently being completely overhauled. Not only is the city of Tangier no longer on the sidelines,

it seems even to have become the driving force set to secure Morocco's place in the globalised economy.

A city of booming industry ...

Nowadays Tangier's economy depends mainly on its industrial fabric, which has expanded widely over the last decade thanks to the development of new industrial sites. The Tangier-Tetouan region has become Morocco's second industrial centre after Casablanca, housing almost 800 industrial establishments providing around 70,000 jobs, i.e. about 14% of all industrial jobs in Morocco. The city of Tangier alone accounts for 61% of the region's industrial establishments and 81% of its permanent jobs. Symptomatic of this industrial boom, mainly in the textile and clothing sectors, between 2002 and 2004 industrial investment in the region rose by 13.2% per annum compared with 3.9% for Morocco as a whole. Renault's planned factory should also boost industrial employment by opening up 4000 jobs. In the long term, 24,000 jobs should be created. Finally, the project for a major industrial platform aims at multiplying ten-fold the area set aside for industrial zones in the Tangier-Tetouan region. This project should help spread the industrial zones at the gates of Tangier more widely, particularly along the Tetouan highway which is developing into something of an industrial and urban corridor.

a disrupted touristic vocation

The region has become industrialised somewhat to the detriment of Tangier's tourist vocation, despite a recent upturn of interest in the sector. From being Morocco's leading tourist destination in the 60s, Tangier was gradually abandoned for other Moroccan cities deemed to be more attractive, such as Marrakech or Agadir. Pollution in the bay of Tangier, the deteriorating quality of services offered to tourists and difficulties with sanitation and water supply helped tarnish the city's tourist image.

In an attempt to restore that image, the authorities are now plugging the city's seaside nature, with the hinterland consequently being gradually abandoned to the benefit of the seafront.

The creation of new employment pools and the development of the seafront are thus helping the city strike out in new directions

The complementary nature of the Tangier-Tetouan duopolis: towards the emergence of a dual urban metropolis?

At 60 km from each other, the cities of Tangier and Tetouan constitute the Tangier peninsula's main urban structure. Tangier, however, exercises a highly polarising effect on the region as a result of the massive concentration of economic, social and cultural activities in the city.

Urban mobility in Tangier should thus be addressed on a broader basis, encompassing the entire Tangier-Tetouan region.

Lay-out reshaped by the implementation of the Tangier Mediterranean Port project

At 35 km to the east of Tangier, the aim of the Tangier Mediterranean Port project is to offer integrated logistical provision. Apart from the construction of a deep-water port with four terminals (international road transport, goods import-export, cereals and oil), the project foresees the creation of new free and commercial zones and the construction and renovation of motorway and rail infrastructure. This massive project, extending over more than 500 km², should generate no less than 60,000 jobs (200 000 according to the most optimistic estimates). Housing and transporting all these new workers is likely in the long term to change the city's spatial lay-out. Two new towns are already in the pipeline: Chrafate in Meloussa-Jouama and Ksar Seghir, although it is in no way certain that they will manage to contain the flood of new workers.

Major urban sprawl, marked by the emergence of new urbanisation fronts

The various projects being implemented as a boost for the city of Tangier are having a major impact on the city's spatial lay-out and encouraging the emergence of new urbanisation fronts, thus driving unprecedented urban sprawl.

Initially contained within the limits of the catchment basin, the Tangiers conurbation has gradually spread beyond the boundaries set by successive urban development plans.

New urbanisation fronts are currently emerging along the northern coast as well as in the heart of the Tangier peninsula. Urban sprawl is most obvious along the Rabat highway (towards the site initially planned for the transshipment port) and the Tetouan national road (because of the emergence of the industrial corridor and the proximity of the Tangier Mediterranean Port).

Despite the major infrastructure constructed in conjunction with the Tangier Mediterranean project, basic services are still sorely lacking in the rural areas and problems of inadequate provision persist in the region. By way of example, road links between the cities and rural municipalities are still few and far between and the Tangier hinterland remains isolated.

Unchecked urban sprawl in Tangier therefore runs the risk of exacerbating existing imbalances, and distributing the effects of the development linked to the major projects throughout the entire Tangier-Tetouan area thus remains an issue.

Sustained urban growth, strongly driven by the rural exodus

During the last intercensal period (1994-2004) the Tangier conurbation showed a sustained rate of growth of some 3% per annum. This growth is more the result of the rural exodus and migration from the various regions of Morocco than of endogenous population dynamics.

This urban growth has been unequally distributed over the four urban districts and three rural municipalities comprising the Tangier conurbation.

Béni Makada district and the neighbouring rural municipality (Al Aouama) have experienced relatively high levels of urban growth (5.2% and 7.2% respectively). These areas, comprising the high density southern and south-eastern sectors of the conurbation, have also seen the strongest wave of informal housing. They are currently affected by lower levels of amenity provision than the centre of the conurbation.

Conversely, the population of Charf-Saouani district and the rural municipalities of El Bahraouiye and Boukhalef- Gueznaya have experienced only moderate growth (about 1%).

Varied urban morphology, imbalanced macroform

Because of its hilliness, rampant development and the lack of control over urbanisation, Tangier currently appears to be an imbalanced city with a varied urban morphology.

Basically, Tangier's urban structure is made up of two major contrasting blocks :

- The relatively well structured and equipped central part, in which most public administrative and collective amenities are concentrated. The medina with its vernacular lay-out and its extension, the

new town, enjoy a regular lay-out and extend eastwards towards the bay on an orthogonal plan.

- Conversely, the outlying area presents a mixed bag. It comprises a collection of varied urban structures including informal housing districts, the contours of which were shaped by topographical constraints and the fragmented land ownership of rural origin.

The urban lay-out thus follows two main lines: an East-West axis covering the integrated urban fabric as a whole; a meridian axis from the medina towards the under-equipped suburbs, covering all the informal housing districts.

The disjointedness which is such a feature of Tangier's spatial expansion along with the failure to make optimal use of land also tends to exacerbate the difficulties of linking the city's various urban entities and to highlight the dichotomy which exists between the well-equipped city centre on the one hand and the urban fringes on the other, which are lacking in terms of the provision of amenities.

Strengths and Weaknesses

Uncontrolled urban growth , in absence of real estate regulation

Les The new urban dynamics currently reshaping Tangier's morphology and lay-out do not always seem to have been fully taken on board by the land policy currently in force. Urbanisation has still not been brought under control as a result of real estate constraints.

Indeed, despite the remarkable improvements of recent years, land registration is still patchy (particularly in the Béni Makada area) and subject to the vagaries of real estate speculation. Difficulties with conflict resolution are reflected in the large numbers of plots having been frozen and prevent urbanisation from being brought under control.

Moreover, the new constructions built within the framework of private real estate development (which is tending to become organised and more professional, despite the predominance of self-build housing) are mainly to be found in the new urban suburbs. This trend tends to exacerbate problems relating to the lack of amenities and access to basic services, including public transport.

The rise in real estate prices along with the roll-out of the Tangier Mediterranean and major industrial platform projects have prompted the State to hand over part of its property to national and international private investors developing major tourist and real estate projects. This price hike is making it even more

difficult for low and medium income households to access housing.

In the long run, massive production of housing paradoxically does not help meet housing demand and is not tailored to people's real needs in terms of access to transport and basic services. There is a risk of squalid and precarious housing being developed despite the efforts being made by the municipality to abolish it (including the slum-free city programme and programmes targeting « housing threatened to ruin »). Thus informal housing, accounting for between 30 and 45% of the housing pool, still has a decisive influence on the city's lay-out and operations

Nevertheless,

Partial answers to global issues

Despite the shortcomings of real estate regulation in the city of Tangier, it would appear that a specific, structured approach is now being taken to the constraints relating to the new types of travel demand linked to the major projects (including the Tangier Mediterranean Port). The chosen option involves developing sites in the outskirts.

The creation of Chrafate new town at some twenty kilometres from the centre of Tangier and at the crossroads of several major roads, is intended to meet the new demands for housing which will be generated by the Tangier Mediterranean Port and major industrial platform employment area. The success of this new town will depend on account being taken of increased commuting between Chrafate, the city of Tangier and the Tangier Mediterranean Port area. Two new urbanisation zones (ZUN) are also being developed by the Al Omrane al Boughaz company-Ibn Batouta and Al Irfane.

Nevertheless, since it requires major funding and with the city's carrying capacity still largely under-utilised, the relevance of an « outskirts » type response should be questioned.

Stresses and Opportunities

The Tangier conurbation is located in an area with major potential for economic development

The Tangier conurbation is located in an area with major potential for economic development which offers many advantages. Integrating the logistical provision attached to the development of the Tangier

Mediterranean Port, enhancing the touristic potential of the city and its industrial boom are all likely to boost the development of the Tangier conurbation and give it greater clout within the urban structure both regionally and nationally. Today's Tangiers is booming in terms of both its economy and its population.

However, for the conurbation of Tangiers to expand and to develop economically, the types of growth will have to be brought under control on a broader scale. Residential areas and new pools of employment are likely to become further uncoupled. Fresh construction resulting from the development of the Tangier Mediterranean Port will need to be harnessed in order to ensure better service to the hinterland and to open up the rural municipalities.

Nevertheless,

An economic development on shaky bases...

Given its strategic position at the interface between Africa and the old continent, Tangier's three main activities (industry, tourism and the port) are highly dependent on economic conditions elsewhere.

In addition, Tangier's industrial boom is largely the result of its favourable tax system. The demise of tax exemptions foreseen for Tangier by 2015 could well curb the growth in industrial activity.

Finally, despite its economic growth, Tangier is badly affected by a shortage of qualified human resources.

... which implies real efforts to foresee changes to come, particularly in travel needs

Controlling urban sprawl, reorganising the city layout and handling the population flows generated by the drive for renewal in Tangier will require the various players in charge of urban mobility to look well ahead. The speed at which change is coming about demands the efficient and responsive governance of urban mobility in Tangier.

Construction of the Tangier Mediterranean Port and the industrial drive of the Tangier-Tetouan region could create between 60 000 and 200 000 jobs in the region. The ensuing housing and transport needs have not, however, always been clearly assessed.

The two new towns in the pipeline are intended to provide a response to these fresh travel issues. However, until these two satellite towns are built the Tangier Mediterranean Port will have to depend on the city of Tangier's carrying capacity in terms of housing, amenities and services. Construction of the Tangier Mediterranean Port implies, for example, changes to the public transport system for the new employment pool.

Transportation supply

Background

Available indicators

Vehicle fleet (1)	79,399 PCs on the road in 2003
Motorisation rate (2)	85 veh/1000 inhab in 2003 almost 4.5% increase in vehicle fleet per year
Modal split (estimate) all modes (2)	Walking: 56% Bus: 6.25% Taxi: 12.25% PC: 25%
GHG emissions	60.6% growth rate in GHG emissions in Morocco between 1990 and 2006

(1) Source : 2007 Statistical directory

(2) Source : Plan Bleu, Urban mobility and sustainable development in the Mediterranean: Regional diagnostic forecast, 2010

Caution : Because of the limited data available for the Tangier conurbation, many of the figures mentioned in this document, particularly for transport provision and travel, have been estimated by the Blue Plan using a range of sources.

Current situation and ongoing dynamics

Inadequate road infrastructure in the suburbs

Tangier's road network comprises a relatively well laid-out and reasonably sized radial grid. The main roads (Rabat highway, Tetouan highway, El Aouama highway and the western coastal highway) converge on the city centre and the Place de la Ligue arabe, close to the main railway and collective interurban taxi stations.

Public funds invested over recent years have brought about a marked improvement in the quality of road infrastructure: filled potholes, repaired and lighted main streets, new roads.

Nevertheless, there is a lack of structural cross connections within this radial network, particularly in the suburbs to the south of the conurbation. Thus, the dense and structured network in the city centre gradually relaxes as far as one move away from it. The shortcomings of the secondary road network are particularly obvious in Béni-Makada district where, in the absence of transversal links, people are forced to use inter-district roads unsuitable for traffic (too steep and narrow).

Under-sized urban bus network

Since 2001, collective urban bus transport has been provided in Tangier by the private operator Autusa, a subsidiary of the Spanish Grupo Ruiz company. In 2009 the company was operating 76 buses (60 of them new), providing transport capacity of some 7,600 seats. Service is provided on 23 routes (6 of them newly created) with an average length of 15 km. Tangier basically has one bus per 13,000 inhabitants on average, which is somewhat inadequate given the size of the city and its urban growth. By way of comparison, Veolia Transport has foreseen a fleet of 600 buses for Rabat-Salé, equating to one bus for every 3,300 inhabitants.

Increased household motorisation

As is the case in many Mediterranean cities, Tangier appears to be moving towards mass motorisation. The car fleet is estimated to be growing at almost 4.5% per annum, slightly above the national average. There are, however, major disparities between the various districts of Tangier: whilst it would appear that only 4% of households in the medina own at least one private car, over 43% of households in the new town are said to be motorised.

As a consequence of this increase in household motorisation, the threat of increased traffic congestion exists along the main thoroughfares in Tangier, given the hilly topography which limits the road network in the city centre. One of the main difficulties lies in tackling unruly parking, which contributes to congestion in the city.

Varied public transportation supply but low coordinated

Inter-urban travel is provided by train (operated by the National Railways Office or ONCF) and the coach network. Every year Tangier's ONCF station handles 740,000 passengers, 255,791 leaving and 470,188 arriving. The bus network provides a service to the urban area and inner suburbs, as do specialised forms of transport (company staff transport). Taxis (tourist, individual and collective) operate over a broader area, including both the urban and inter-urban spheres. Finally, private mixed transport operators serve the rural areas and districts.

Nevertheless, in the absence of inter-modal coordination (no integrated fares, connections not possible between modes, duplication on certain routes), public transport in Tangier tends to compete rather than to provide complementarity.

Deficiencies in urban public busses transportation supply

The provision of urban bus transport has followed an erratic line of development since 1984. In 2000, the Tingis Bus Company even had to suspend its services a year before the date set by the concession agreement, leaving Tangier without urban bus transport for several months.

Public-private partnerships continue to constitute the prevalent mode for managing urban bus services in Tangier. The public service delegation was attributed to the Autusa company through a 10 year concession agreement which could be tacitly extended for a further 5 years.

The Spanish company's subsidiary focused on a policy of efficiency and visibility. It also strove to optimise its human resources, using one single « conductor-driver » per bus. It also managed to reduce operating costs by renewing its bus fleet.

Its profitability has been greatly improved by increasing passenger numbers and higher load factors. That said, profitability gains have not necessarily been reflected

in a proportionate increase in the number of buses, kilometres travelled and routes. The network continues to provide an imbalanced service to the conurbation, with most routes being concentrated along the main thoroughfares, particularly Ben Abdallah boulevard, a sort of by-pass around the hyper-centre. Conversely, bus services remain poor to some of the outlying informal housing districts as a result of the hilliness of these areas and their difficult access.

A predominance of informal modes in urban transport

At the turn of the 2000s, shortcomings in urban bus transport provision were largely compensated for by informal transport provision, particularly collective or so-called « large » taxis. They grew in number from 1073 to 1304 between 2000 and 2004. As for individual taxis, they doubled in number between 2000 (762 taxis) and 2004 (1 557 taxis), a trend tacitly supported by the authorities.

Consequently, « large taxis » now compete fiercely with the urban bus network. Indeed, even though under the AUTUSA concession agreement « *the contracting authority shall ensure that no operator shall harm the correct functioning of the service granted for the afore-mentioned routes (large taxis, others...)* », informal transport provision continues to be widely tolerated by the authorities, who implicitly accept it within the urban area. The large taxi system in Tangier reflects a convergence of interests: it effectively compensates for the shortcomings of the urban buses, directly and indirectly creates jobs and feeds into local community coffers.

When all is said and done, even though the urban transport provided by large taxis overlaps with the urban bus network, it nonetheless makes for a better tailored service to the outlying districts, adapting more easily to the narrow secondary roads. Large taxis are consequently more practical and at the same time no more expensive for the user. Nevertheless, the dilapidated state of this car pool (largely comprising Mercedes Diesel 240 vehicles) is contributing to the deterioration of air quality in Tangier.

An institutionalization of the “specialized transportation supply”

The « staff transport on behalf of others » sector has grown sharply over recent years. The number of private operators in charge of this type of specialised transport grew by 105% between 2003 and 2009. More significantly still, the car fleet used for this type of transport experienced exponential growth of over

200% over the same period. In terms of seats offered, this type of transport is now on a par with taxis.

The industrial boom in Tangier and the roll-out of the Tangier Mediterranean Port and major industrial platform projects suggest that this type of transport could develop strongly.

Inadequate account taken of un-motorized modes by the decisions makers

Despite the limited account taken of it during the various phases of urban planning, walking is still the main mode of travel for the people of Tangier (56% of people transported according to the 2003 Traffic and Transport Plan). It is particularly widespread amongst schoolchildren.

The areas of highest pedestrian density are mainly to be found in the city centre, around the main amenities and in shopping areas.

Although walking is particularly widespread as a mode of travel, pedestrian thoroughfares remain strewn with numerous obstacles: poor state of pavements, random clutter, unsafe pedestrian crossings, with pedestrians consequently facing a higher risk of accident.

Limited access to transport provision for the poorest households

Urban transport fares (particularly AUTUSA's) continue to be set very much under public authority control. Fares are set according to a financial approach (profitability for the operator) as well as economic reasoning (profitability for the community, in other words socially acceptable to the people of Tangier).

Transport actually represents a major outlay for households in Tangier. According to a World Bank study published in 2008, « *The potential cost of transport for the poorest households if they were to use the bus would account for about 18.5% of their income in the Rabat and Casablanca conurbations and 20% in Fès and Tangier* »².

Likely increasing environmental impacts

Generally speaking, Morocco has still not become a major emitter of greenhouse gases. Nevertheless, various factors are serving to undermine air quality in the main conurbations in Morocco, including

2 Source: World Bank, Regional Office for the Middle East and North Africa, Finance Group, Private sector and infrastructure, transport and town planning sector, October 2006, Kingdom of Morocco. Analysis of the urban transport sector and strategic options. Report 1 – Institutional organisation and urban travel capacity, 69p.

Tangier. The growth and dieselisation of the car fleet, the delapidated state of rolling stock (in 2008, none of the large taxis were less than 20 years old), road traffic congestion in the cities, inefficient technical checks on vehicles and the inadequate planning of urban development are increasingly affecting the environment within the urban areas.

Moreover, air quality legislation in Morocco is still in embryonic state. Indeed, despite the promulgation in May 2003 of a law on combating air pollution, the implementing decrees establishing the standards to be respected have still not been published.

However, the Phénixa consultancy has been entrusted with drawing up atmospheric emissions registries for Tangier and Tetouan. The aim of this initiative is to establish an inventory of air pollution and its origins and to model medium term trends in this type of pollution. The idea is to produce a decision-taking tool which can be used by the whole range of players involved in the environmental impact of urban mobility: central administration, local authorities and industry.

Strengths and Weaknesses

The city's urban morphology and topographical lay-out force the introduction of public transport in exclusive lanes

Unlike other cities in Morocco such as Rabat or Casablanca, Tangier has not inherited a city centre criss-crossed by wide streets from the colonial age. By way of illustration, boulevard Pasteur, one of the city centre's main thoroughfares, has only two lanes, ruling out the possibility of creating bus lanes or stops.

In the suburbs, hills and narrow roads further complicate any project to develop urban transport in exclusive lanes.

Road size and the topographical and geographical lay-out in more general terms are thus two major constraints on the introduction of public transport.

Nevertheless,

Strong urban growth that still too partially benefits to the fostering of public transportation supply

Given the current state of transportation supply, the outlying urban districts (Béni Makada in particular) and rural municipalities are overall less well served than the rest of the conurbation. This further

accentuates the imbalance in city morphology, which is already significant in real estate terms.

The major infrastructure (motorways, expressways, railways) currently being developed under the Tangier Med project should be supplemented by more local service roads.

As for urban transport itself, the creation of 6 new routes and the purchase of 5 buses have partially consolidated bus transport provision. The busiest bus routes are those running along the Rabat highway to the informal housing areas and industrial zones.

Stresses and opportunities

Global, coordinated provision threatened by the systematic use of specialised operators

The dearth of public transportation supply has given free rein to the development of informal forms of transport, both collective (large taxis, mini-buses, mixed transport) and specialised (company staff, school buses). The fleet of vehicles belonging to operators providing employee transport on behalf of others consequently grew exponentially between 2003 and 2009.

Although in the short term the systematic use of specialised operators helps meet increased travel demand, the mushrooming of operators necessarily makes global and coordinated transport provision more complex.

Nevertheless,

Informal transport provision appears relatively well adapted to the Tangier context

The informal transport provision which has developed in Tangier against the backdrop of a breakdown of public services nonetheless provides certain advantages which should be explored in order to make up for the city's topographical and morphological constraints.

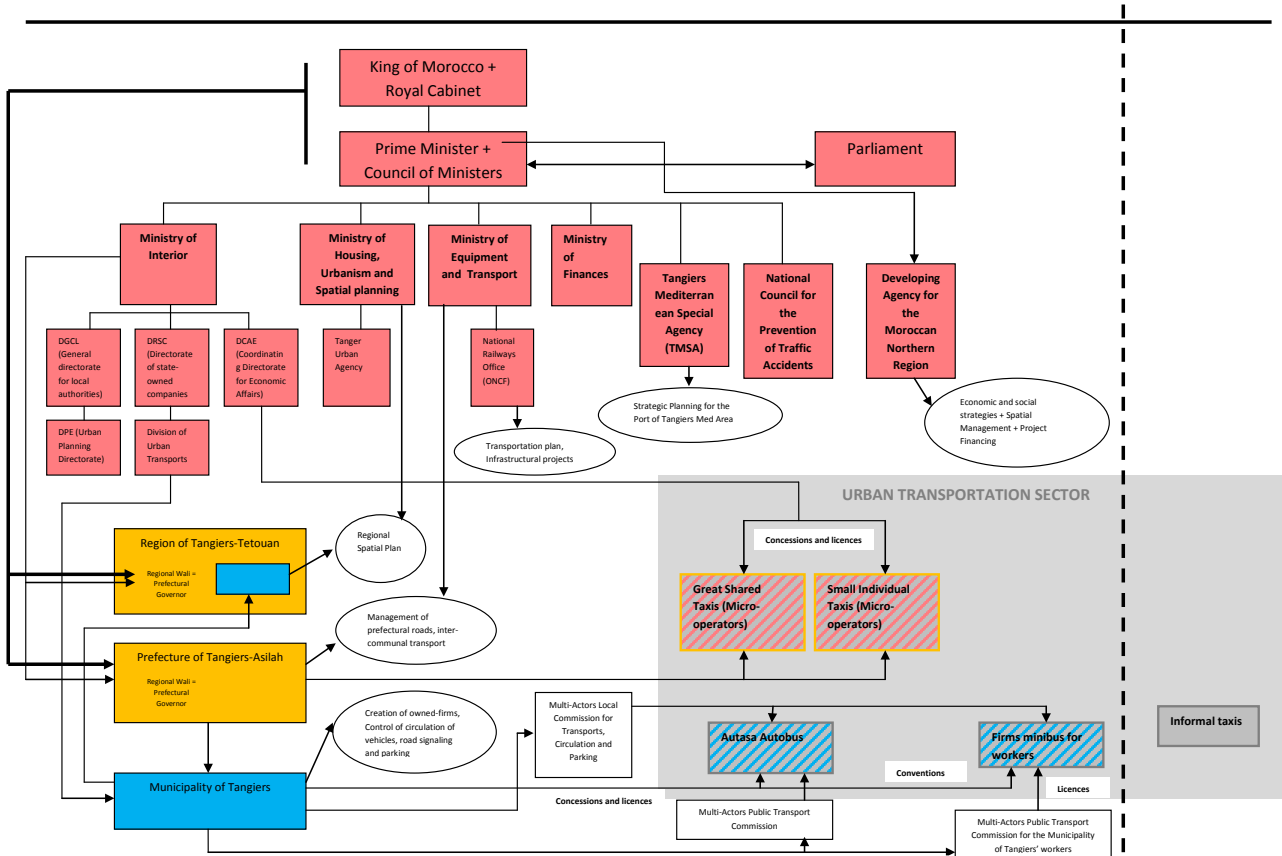
Informal transport provision, be it taxis or specialised transport, largely comprises small, light vehicles, allowing the area to be provided with a better tailored service able to adapt to the size of the road network.

Improving transport provision will depend on the setting up of a global, coordinated network which fully takes on board the main players in urban transport as represented by the mass of micro taxi operators currently present in Tangier.

Urban mobility governance

Background

Institutional diagram of the governance system in the urban transport sector



Current situation and ongoing dynamics

A variety of players but inadequate coordination

Urban planning competence in Tangier is shared between many players involved in different areas. In the absence of any clearly identified coordinating body, measures undertaken as part of regional planning sometimes emerge as an inefficient hotchpotch.

Basically, the **municipality's** urban planning powers were consolidated by the adoption of the municipal charter in 2002. But in actual fact, Tangier municipality has no competence over the neighbouring rural municipalities and the lack of a coordinating body for the conurbation undermines

the effective development of any urban development strategy.

Tangiers urban agency, whose competence extends over the wilaya of Tangier as a whole (Tangier-Asilah prefecture + Fahs Anjra rural province), is establishing itself as the pivotal player in the technical management of town planning. It is principally responsible for urban planning and monitoring the drafting of town planning documents. It is often reproached for failing to take adequate account of the urban travel issue.

The **Tangier-Tetouan Regional Inspectorate for Housing, Urban and Land Use Planning (IRHUAE)** is one of the decentralised services of the Ministry of Housing, Town and Land Use Planning (MIHUAE). It is mainly responsible nowadays for assessing and providing administrative follow-up to projects implemented in the housing and regional development field.

Due to a shortage of human, financial and logistical resources the **Wilaya urban planning division** simply provides administrative follow-up to these dossiers.

Whilst not having any direct town planning competence, the **Tangier Mediterranean Special Agency** (TMSA), a public limited company created by the State in 2003 to oversee the main Tangier Mediterranean Port construction sites is a player of stature. It enjoys public authority prerogatives over an area of more than 500 km², including the power to expropriate in the public interest as well as to mobilise State resources.

Finally, the **Al Omrane Al Boughaz** company, a subsidiary of the Al Omrane development Holding and the MHUAE's executor, enjoys enough financial and operational autonomy to be able to influence decisions relating to town planning.

Urban planning documents of limited scope

One urban planning document has succeeded another over several decades with no real effectiveness. The 1981 Town Development Plan (SDAU) proved unable to prevent urban expansion and intensive building on many agricultural or environmentally valuable areas. Nor did the second SDAU, which was approved in 1998, manage to adequately foresee the urban developments which were to affect the city.

In addition, town planning documents have been sapped of content by, amongst others, the numerous derogations thereto. They mainly address the height of buildings in the city centre and nature reserve constraints in mountainous areas.

Central authorities ascendancy over urban transport

The complexity of the institutional and organisational provisions covering urban transport governance in Tangier is proof of the difficulties attached to the implementation of consistent, well-structured urban travel plans.

Moreover, State control of this sector remains strong. In fact, even though the 2002 municipal charter entrusted the municipalities with responsibility for organising urban public transport, vehicle traffic and public road signing and marking, the State's external services (and more specifically the Ministry of Public Works and Transport) have frequently intervened to act as contracting authority for the major highways.

A body exists in Tangier which is supposed to encourage partnership between the various players responsible for urban transport- the local transport, traffic and parking committee. In practice, however, the municipal authorities often delegate their powers to the wilaya's representatives within this committee.

An approach based on transport provision to the detriment of management by travel demand

Urban transport planning in Tangier continues to be largely dominated by a supply-based approach to the detriment of demand management. The lack of a multi-modal approach and the shunning of soft modes are an illustration thereof. This is all the more harmful given that, because of the rise in motorised travel, Tangier's urban growth model is increasingly gravitating towards non sustainable prospects.

Strengths and Weaknesses

A shortage of knowledge and monitoring tools

Little data is available on transport provision and travel demand. It is only produced for projects or one-off events and is not regularly updated. Consequently, it does not cover all of the area which would be needed in order to understand how the conurbation operates as a whole.

This lack of knowledge and monitoring tools affects local practitioners in both the design and the assessment of sectoral plans and programmes.

Sectoral compartmentalization and lack of anticipation of urban mobility stakeholders

The bodies involved in planning and managing urban mobility in Tangier tend to apply a sectoral, compartmentalised approach to their work. The lack of coordination and consultation between the various players, particularly as far as **transport, town and land use planning** are concerned does not allow the creation of synergy for coordinated action. The « project approach » continues to dominate, hampering the emergence of an integrated and forward-looking policy.

Nevertheless,

A recent awakening to the need to de-compartmentalise the approach to urban planning

Despite its many shortcomings, the design of the 2009-2013 urban development plan drawn up with a view to the city's bid to organise the Tangier international expo 2012 demonstrates that local players have awoken to the importance of de-compartmentalising urban and transport policies.

This document is intended to list the various urban projects proposed. It also includes the main projects to have emerged from the 2003 traffic and transport plan.

That said, the scope of the document is limited by the lack of overall vision concerning the urban development of the conurbation as a whole.

Stresses and opportunities

Faster urban development in Tangier demands responsiveness from the authorities

Since taking on the role of spearheading Morocco's entry into the globalised economy, the city of Tangier has been changing at breakneck speed, as demonstrated by the record time within which the Tangier Mediterranean Port infrastructure has been constructed. Although when all is said and done the urban growth rate is actually quite moderate, Tangier's rampant urban sprawl is accelerating changes to the city morphology.

The confusion which currently reigns amongst those involved in urban governance as a result of their great diversity could well undermine their ability to tackle the new travel issues in Tangier.

Nevertheless,

An opportunity for new approaches at a regional level

The structural changes currently coming about within the Tangier peninsula are an opportunity for local players to start reviewing the means for urban governance.

New players (developers and public and private developer-contractors) with substantial means and engineering capacity are already present in the field. Within this exceptional context of booming

development it is inevitable that thought will have to be given in the Tangier Tetouan region to designing and managing more efficient public urban mobility policies, including at a more detailed level.

Lessons and prospects

Although the patchy nature of transport data in Tangier means that it is not always possible to identify the full range of dynamics at play, the speed at which change is coming about in the Tangier conurbation acts as a reminder of how crucial it is to rapidly address urban mobility issues before the scale of uncontrolled urbanisation causes lasting damage to the environment.

However, some conclusions can already be drawn

The relevance of the regional scale for grasping urban mobility issues

In the long term, several tens of thousands of jobs should be created once the main Tangier Mediterranean Port infrastructures come on stream. The emergence of these new job pools throughout the Tangier-Tetouan region should go hand in hand with the emergence of new housing pockets through the creation of new towns at Meloussa and Ksar Seghir. Within this context, the Tangier conurbation's administrative boundaries will be too narrow to comprehend new home-work types of travel. Transport provision and travel demand should therefore be considered against a broader spatial backdrop encompassing the Tangier-Tetouan region.

Imbalances further aggravated within the Tangier conurbation

In many respects Tangier is a two-tier and imbalanced city. The relatively well-equipped central area is being affected by residential decongestion whilst new population flows are settling in the outskirts, where infrastructure is lacking. The mismatch between transport supply and demand is reflected in the increased call for informal modes of transport in response to the shortcomings of urban public transport. Traffic congestion is heavier in the city centre than in the outlying districts, despite the denser road network.

And key messages relayed

Promoting complementarity between the various modes of transport and shaping coordinated multi-modal provision

The promotion of more environmentally friendly public transport using exclusive lanes in Tangier should be backed up by the inclusion of the transport supply already on offer from informal micro-operators (collective and individual taxis), given their efficiency in terms of providing a service to neglected outlying areas. The development of multi-modal travel platforms (with hubs and feeder lines) constitutes an effective solution towards curbing individual mass motorisation, a source of increasing greenhouse gas emissions. In addition, the promotion of soft modes of travel is crucial for the conurbation.

Enhancing the monitoring, follow-up and observation of air quality

Even though air quality is less of an issue in Tangier given its geographical location (coastal city and prevailing winds), its system for monitoring the environmental impact of transport provision is still inadequate. In the absence of quantified data it is difficult to roll out projects for combating air pollution. Completion of the second phase of the atmospheric emissions registry relating to the emissions inventory for the city of Tangier should lay the necessary foundations for drawing up an air quality improvement plan.

Clarifying urban governance by setting up an organising authority for regional local planning and transport

In the absence of a specific coordinating body, the overlap of competence between the various players responsible for urban mobility governance is likely to persist, particularly since the areas covered by their work have different boundaries. Ad hoc structures exist, however, which could open the way to the setting up of a local transport organising authority along the lines of the local traffic and transport committee.

Urban mobility in Algiers: Trends and prospects

This document was drawn up by Julie Enjalbert on the basis of:

- the report drafted by Madani Safar Zitoun and Amina Tabti-Talamali
- the summary drafted by Julien le Tellier
- studies by Cecilia Rubiolo, Sciences Po Paris Masters I student, Plan Bleu intern
- the survey on the urban transport situation in the Middle East and North Africa conducted by Sylvain Houpin



Introduction

Historically limited by the restrictive topography of a remarkable bay...

As a result of its outstanding port site which shelters it from the prevailing westerly winds, but also because of its hilly hinterland, the city of Algiers developed seawards throughout history. Backing up against the Bouzaréah Massif, the original heart of the city of Algiers lay between the two ravines hollowed out by the Kniss and Mkessel oueds. Until recently successive layers of urbanisation and the transport network thus overlaid one another, respecting these geographical and topographical constraints.

From capital of the Regency of Algiers under Ottoman rule from 1516, capital of the new French colony as of 1830 and the political capital of Algeria since independence, the Algiers conurbation has now become a regional metropolis, home to almost 3 million inhabitants.

... for some twenty years the city of Algiers has been experiencing major urban sprawl ...

Since the early 1990s and just as has happened in many cities throughout the Mediterranean, the city of Algiers has been undergoing unprecedented urban sprawl. Influenced by new forms of residential mobility, urban decongestion and de-densification of its central areas, the Algiers conurbation has spread to new, outlying districts. This urban sprawl is triggering new dynamics in demand for travel and the need to adapt transport provision. The boom in motorised mobility and difficulties with improving public transport (PT) provision are currently fuelling traffic congestion, with a consequent marked deterioration in quality of life and of the environment.

... demanding an appropriate response from the authorities involved in urban mobility issues.

Two key issues seem to be left open, and should be more closely addressed by those responsible for regional local planning and in the transport sector: On the one hand, enhanced inter-modality between public transport systems could partly address the problems created by the boom in motorised mobility and shortcomings in public transport provision; on the other, the lack of any real coordinating authority for urban transport continues to undermine the effectiveness and coordination of public policies implemented.

Travel demand

Available indicators

Basic travel demand data

Population	2,947,446 inhab. in 2008, i.e. 8.6% of the national population (34,229,446)		
Annual growth Algiers (population)	1.3% from 1998 to 2008, compared with 1.7% from 1987 to 1998		
Annual growth Algeria (population)	1.6 % from 1998 to 2008, compared with 2.7% from 1987 to 1998		
Area of Wilaya of Algiers	809 km² , i.e. 0.03% of national area		
Urbanised area	313 km² in 2008, 229 km ² in 2000, 140 km ² in 1987		
Density	3826 inhab/km ² in 2008, 3 326 inhab/km ² in 1998, 2892 inhab/km ² in 1987 (Algeria: about 15 inhab/km ²)		
Employment	1,018,500 (2004 estimate) compared with 760,000 in 1998 (ONS)		
Reasons for travel (EMD)	Work: 27 %	Studies: 43 %	Other: 30 %
Mobility indexes	AM : 1.69 /day/capita AMM : 0.75 /day/capita Walking : 0.94 /day/capita		

Current situation and ongoing dynamics

Urban sprawl gets under way in the late 1980s

During the 1990s liberalisation of the land and property market as part of the liberal global reforms undertaken by the Algerian State clearly accelerated urban sprawl around the Algiers conurbation. Within the space of 20 years, from 1987 to 2008, the city's built-up area tripled. The «center of gravity» of Algiers conurbation would have moved gradually towards the interior, at odds with the dynamics of urbanization that had prevailed until then. The city grew over history in a dense and compact way, primarily occupying the central parts of the conurbation and the less hilly districts.

Urban sprawl is now pulling in two main directions:

- Eastwards, along the coast and in the plain, with on-going urbanisation as far as the neighbouring wilaya of Bourmedès.
- South-westwards, beyond the southern ring road and the rows of peaks, where urbanisation is more recent.

A heterogeneous urban morphology

Generalized sprawl of the city of Algiers is highly heterogeneous as a result of the generalised sprawl affecting the city. Thus in the 90s, the urban front which emerged to the east of the conurbation largely comprised popular housing (informal and social dwellings). The urban front which developed more recently to the west and south-west of the conurbation, however, primarily includes some residential neighbourhoods.

Broadly speaking, the past thirty years have seen three successive waves of urbanisation:

- Informal housing in the late 80s and early 90s;
- Collective and social housing in the 90s;
- Low-rise housing, core amenities and development projects since the late 90s (new administrative and business districts, universities and recreational areas). From 1992 to 1998, the « land predation » which emerged on public plots also proved instrumental in driving urban sprawl in the shape of informal housing.

Residential looseness and decreased density of the central areas

The population in the wilaya of Algiers virtually tripled in the space of 30 years- whereas in 1987 the population was estimated at about 979 916, the 2008 census recorded 2 947 446 inhabitants. Urban growth slowed markedly, however, between 1998 and 2008, settling at an annual rate of 1.3% (compared with growth of over 3 % per year between 1966 and 1987).

However, this urban growth has been unequally distributed throughout the wilaya of Algiers, with growth rate differentials bearing witness to the residential decongestion underway. The central district of the Algiers wilaya (hyper-centre and city centre) has experienced negative growth. Still remaining the most densely populated areas of the wilaya, the central areas of the Algiers conurbation have decreased in population terms, as a consequence of this decongestion trend.

The relative de-population of the centre of Algiers has benefited the two suburban belts¹ and the Algiers hinterland². Initially, people flooded towards the inner suburbs, the density of which virtually doubled within the space of 10 years (from 1987 to 1998). Since 1998, density in this area has increased less significantly. The outer suburban belt, however, is witnessing a constant increase in density. Finally, residential decongestion towards the Algiers hinterland has led to the emergence of new urban conurbations even beyond the administrative boundaries of the wilaya of Algiers.

There are many factors behind this centrifugal form of urbanisation. To the east, the construction of

¹ The main outlying districts affected by such densification are:

- To the east of the conurbation: Mohammadia, Bordj El Bahri, Bordj El Kiffan

- To the west of the conurbation: Aïn Benian, the municipalities from Hammamet as far as Zeralda

² Construction of the southern ring-road, programmed under the 1975 general orientation plan, was instrumental in opening up the Algiers hinterland

major highways has encouraged urbanisation. To the west, the 1990 land reforms opened up new areas to construction. Finally, some public programmes such as the lease with purchase option programmes offered by the Housing Improvement and Development Agency (AADL) have further accentuated residential migration phenomena. Targeting the Algiers middle class, such programmes encourage people to settle in the outskirts (inner and outer suburbs).

Basically, the most affluent and most motorized have settled in the surrounding municipalities without changing jobs. There have been thus, an increase in the number of home-work trips.

« Decoupling » between living basin and employment areas: towards increased commuting

Residential decongestion in the Algiers conurbation has not been shadowed by a redistribution of jobs throughout the area.

Because of its status as the economic, political and administrative capital of Algeria, a major pole of tertiary and industrial jobs is concentrated in the city of Algiers. In terms of infrastructure, Algiers' port and airport are the largest in the country, with the airport handling almost 12 million passengers each year. It is also estimated that the port of Algiers attracts almost half of all port activity each year. Regarding industrial activity as such, almost 1 404 hectares are occupied by areas of industrial and economic activity. Finally, despite a decentralization of political office initiated after 2005, most central administrations are still located in Algiers, particularly in the core area of the city. The city of Algiers would count for 23% of the administration's total manpower.

Most of these jobs are still located in the hyper-centre and city centre of the Algiers conurbation. With the exception of Bab el Oued municipality which exports manpower, the central municipalities (the Kasbah, Sidi M'Hamed, Bachdjarrach, Algiers-centre...) are magnets for workers from outside.

Conversely, the East of the conurbation, where the population has grown over recent years, accounts for only a small proportion of jobs.

Urban sprawl in Algiers has thus encouraged home job's decoupling. The ensuing increase in commuting is also feeding congestion within the city, mainly at peak times.

Finally, accounting for 43.37% of total trips in 2004, students travelling between home and studies would appear to generate most daily trips.

Towards a reasoned polycentrism?

In 2008, the services of the Ministry for Land Planning, the Environment and Tourism or MATET, published a forward-looking diagnostic document on urban development in the Algiers metropolitan area. Amongst the various proposals put forward, the Master Plan for the Development of the Algiers Metropolitan Area (SDAAM) picks up on the idea of creating a belt of new towns as a way of rebalancing urban growth in the Algiers region.

The idea is not a new one. Indeed, as early as 1997, the thinking behind the Sidi Abdellah new town project was to help relieve congestion in the Algiers conurbation and to regulate its unruly urban growth. A series of legal complications was, however, to delay implementation. On 29 October 2003, a decree on the creation of the new town of Bouinan was also adopted.

Thus, despite the earlier difficulties, the new town option as part of a polycentric approach would once again appear to be attracting attention.

Strengths and weaknesses

A high quality port site within a remarkable bay

The geographical and natural site on which the original centre of the city of Algiers was founded and developed plays a role in its influence and attraction. Indeed, although the port of Algiers is starting to face serious problems as storage capacity becomes congested, the fact that the city is so open to the Mediterranean seafront along with the excellent port facilities which have been built there are helping the city become the main trade and development centre in the country.

Nevertheless;

A topography which constrains urban development

Geography of Algiers is one of the main factors limiting its daily operations. Bordered to the west by the Bouzaréah massif, to the south by ranges of medium altitude peaks and steep-sided oued valleys, urban growth was initially contained within a small area, resulting in high population density in the hyper-centre and city centre.

Stresses and opportunities

The rapid and as yet unregulated spread of the conurbation

The dense, compact city rapidly spread beyond its traditional boundaries. It began to encroach upon new outlying areas in centrifugal motion. Within the space of a mere twenty years or so the area covered by the Algiers conurbation thus increased significantly.

At the same time, the various bodies responsible for urban planning did not always manage to adopt a consistent, overall vision and to adapt to the new situation of urban sprawl.

Lack of continuity in urban public policies

Thus every urban plan have been followed by another, in absence of any continuity of public policies. From 1968 to 1975, the COMEDOR (Standing Committee for studies, development, planning and organisation of the Algiers conurbation) advocated the development of the eastern part of the conurbation. From 1975 to 1986, the general orientation plan maintained the « Eastern option » but as of 1986 the town plan refocused urban development on the south-western part of the conurbation. In 1998, the « Grand Urban Project » promoted by the governorate of Greater Algiers was declared unconstitutional. The return to power of the wilaya authorities marked the return of the Western option.

The institutional instability which prevailed throughout the 90s did not always facilitate matters.

A large number of the capital's core projects were thus the result of « one offs » in the absence of any urban planning logic.

Nevertheless,

A will to implement proactive policies to provide better answers to the new trends in travel demands

Recent developments in urban planning reveal a degree of pro-activism on the part of the planning authorities towards clarifying urban practices and fitting them into a more consistent framework. Two studies were thus launched by the Town Planning Directorate in 2006.

The first addressed the « Drawing up of a development and town planning blueprint for the wilaya of

Algiers ». The second focused more on the « Drawing up of a development plan for the Bay of Algiers ».

The aim of these two studies is to « *give in-depth consideration to development and planning in Algiers in order to learn from the failures and sticking points encountered, to fine-tune the content of the PDAU (Urban Development Plan) and try out within the pilot field of a POS (land use plan) such instruments*

still to be determined as will render town planning more efficient on a daily basis »³.

The successful consultancies are expected to submit their projects in 2010 and 2011 respectively.

³ Source: Specifications for the revision of the Algiers PDAU. Section1 : terms of reference. Wilaya of Algiers, 15th May 2006, p. 14.

Transportation supply

Background

Available indicators

Modal split:	Taxis : 2 % Walking : 56 % PC : 13% PT : 29 %
Vehicle fleet:	126,885 PC in 1990, 294,813 P C in 2008 the vehicle fleet is growing at a faster annual rate than the population
Motorisation rate:	69 veh/1000 inhab in 1990, 100 veh/1000 inhab in 2008
PT provision:	3459 bus, i.e. 137,042 seats
PT network:	313 bus routes, 24 collective taxi routes, 2 suburban train lines, 4 cable cars, 2 mechanical lifts
Service speed of buses:	7 to 10 km/h on average
Share of PT and Taxis in household budgets:	9.5% in 2004, 2000 DA per month, 20% of minimum guaranteed salary
Road accidents victims:	2,441 of which 168 killed in 2208, i.e. 6.03% of the national total

Current situation and ongoing dynamics

Whilst in decline, walking remains the main means of household travel

Walking is the main means of travel for the people of Algiers.

Particularly well suited to the traditional lay-out of the medina, walking is the most widespread form of travel in the Algiers hyper-centre. It is also a preferred mode amongst the young people of Algiers, including students and schoolchildren.

Walking as a means of travel has nonetheless declined sharply over recent years. In 1990, 1.23 trips were made on foot per person and per day. Fifteen years on, this indicator has dropped to 0.85 trips per person per day.

The decline in walking as a means of travel amongst the people of Algiers has come about hand in hand with the increase in household motorisation.

A strong growth in car ownership

Urbanisation in the suburbs, increased commuting, lifestyle changes, increased purchasing power and the liberalisation of the car market have all encouraged households in Algiers to acquire their own cars, a trend which has been further consolidated by the ease of access to bank loans and the decline in public transport provision.

In 2004, 58% of households did not own a vehicle, 36% had one vehicle and 6% had at least two. Thus whilst multi-motorisation remains relatively uncommon, increasing distances between home and work would suggest that the rate is set to rise sharply.

Private car use is more widespread amongst households living in the outskirts, in the inner and outer suburbs. For example, 70% of households in the inner suburbs own at least one private vehicle.

Increased motorised mobility has a considerable impact both as far as the environment is concerned and in terms of road infrastructure carrying capacity. The growing use of diesel cars is having a negative effect on air quality in the Algiers conurbation. As for the road infrastructure network, it is looking increasingly challenged in view of the number of vehicles using the roads each day.

An under-sized road network and major congestion in the city

The geographical constraints governing the site of Algiers have long shaped its main thoroughfares. Over recent years, however, major efforts have been made in an attempt to compensate for Algiers' hilly relief through the construction of new road infrastructure.

Briefly, the road network can be summed up as follows:

- A few rare thoroughfares of modest size in Algiers city centre.
- The east of the conurbation is served by two motorways running parallel to the coast: the eastern motorway, an urban motorway into the city centre and the southern ring-road, a by-pass.
- A handful of major highways scattered across the area: the Oued Ouchaïch and Annassers urban motorways and the national highways (like the RN5 linking Algiers to the wilayas in eastern Algeria).

But the 2,500 km or thereabouts of road network no longer appear able to absorb the increase in motorised traffic. Major congestion of the road infrastructure is also seriously undermining traffic conditions, user comfort and the quality of the environment.

A lack of regulation facing a wide range of public transport operators

Over recent decades, public transport supply in Algiers has evolved with the political and economic changes which have affected the country. During the 60s, the main concessionary were nationalised, with the Régie Syndicale des Transports Algérois (RTSA)- later to become the ETUSA- holding a monopoly. In 1988 the monopoly was broken when the market was opened up to private operators, thus allowing micro informal transport companies to emerge. This was a move supported by the State in an attempt to combat youth unemployment. The granting of low-interest loans for the purchase of vehicles and the introduction of 5-year tax exemptions provided a huge boost to the setting up of micro companies in the transport field. The crisis in the 90s was subsequently to accelerate the deterioration of public services, ETUSA in particular. Recently, the refloating of State coffers thanks to the oil « boon » has opened the way to investment in mass transport projects, such as the construction of metro and tram lines.

The development of public transport supply in Algiers, mainly driven by specialised private operators

Given the financial difficulties faced by the public transport operator, ETUSA, the number of private operators exploded as of the 90s in response to the liberalisation of transport provision. In terms of number of vehicles, 90% of the public transport fleet is currently in the hands of private operators. The services provided by the 2,787 private operators partly make up for the shortcomings of institutional transport and provide for a more targeted service to outlying areas. The increase in private provision has, however, led to the introduction of small and medium sized vehicles, a source of congestion which further aggravates the effect on the environment.

Again in the hyper-centre, Algiers' fleet of some 11 000 individual and collective taxis also provide a substitute for the ETUSA buses which are no longer able to meet travel demand.

Urban rail transport remains a minor mode of transport in the Algiers conurbation, representing a mere 1 to 2 % of trips across all modes (2004 EMD).

Preponderance of specialised private operators in student transport

Because of the sheer size of the student body, student transport is a crucial issue in terms of urban mobility in Algiers.

Since 2004, the « Tahkout Mahieddine Transport » company has held a monopoly on university transport in the wilaya of Algiers, taking over from the main public operators in this niche. This company is now the leading private transport operator in Algiers, owning a fleet of 1 387 large buses and thereby providing over 138 500 seats.

This mode of transport is currently subsidised to the tune of 95% by the State, with the result that students in Algiers travel practically for free.

Transport: a major item of expenditure for households in Algiers

On average, households in Algiers spend almost 2000 DA each month (about 9.5% of their monthly income) on taxis and public transport, with transport thus representing a significant outlay for the people of Algiers.

To a great extent The expense of this item can be attributed to the absence of integrated guaranteed fares, with users having to pay for every trip they make, connections included.

Also, although urban and rail transport is usually included on the list of State regulated goods and services⁴, implementation of executive decree n°98-144 de facto liberalised the ETUSA's fares.

Notable environmental consequences linked to the increase in motorised mobility

The rise in motorised travel linked to the fact that increasing numbers of households in Algiers own private cars and to the growing number of vehicles involved in urban public transport is increasingly affecting the environment in the Algerian capital.

It is leading to increased fuel consumption, diesel in particular. The significant difference in price between petrol and diesel is actually driving "dieselisation" of the car pool.

Moreover, motorised traffic congestion (largely caused by the predominance of small vehicles) is slowing travel speeds and consequently leading to an increase in greenhouse gas emissions. Finally, the dilapidated state of many of the vehicles on the roads of Algiers is impairing air quality because of the many pollutants being emitted.

The ensuing pollution is also a threat in public health terms, with a not insignificant economic cost attached. According to estimates produced by the World Bank in 2004, the annual cost of the environmental impact relating to air pollution and greenhouse gas emissions equates to 2% of GDP.

Strengths and weaknesses

Initiatives towards better air quality assessment

In 2002 the minister responsible for the environment wished to set up a system to monitor air quality and measure pollution. Four stations are supposed to provide for the monitoring of nitrogen dioxide (NO₂), carbon monoxide (CO) and airborne particle (PM10) levels in the air in Algiers on a daily basis. However, despite the city's rather favourable geographical situation (a coastal city with sea breezes), this so-called SAMA SAFIA network has still not achieved a level of coverage and reliability which would allow the real situation in the conurbation to be comprehensively assessed.

⁴ Since order 37-130 of 22nd July 1967 on land transport guidance was promulgated

Algeria, with its wealth of natural gas reserves, has the resources to combat the environmental impact of urban transport

The LPG option constitutes a logical energy policy choice given Algeria's large oil reserves.

The Algerian authorities have consequently adopted a series of measures aimed at promoting the use of « cleaner » fuels⁵ and curbing the growing dieselisation of the car fleet. These include:

- Converting 100 Algiers taxis to LPG/C
- Installing LPG/C kits at preferential rates for private individuals and car dealers
- Introducing attractive financing mechanisms for private individuals interested in converting their vehicles to LPG/C.

The ministry of Energy and Mines has also launched a far-ranging programme of action aimed at encouraging the use of compressed natural gas (CNG) in urban public transport: the setting up of two CNG stations in Gué de Constantine and Caroubier (wilaya of Algiers), the conversion of 120 light vehicles belonging to Sonelgaz and 5 Sonelgaz buses running on natural gas.

Finally, an Algerian regulation from 9th October 2003 requires the maximum lead content of petrol to be reduced from 0.65 to 0.4 grams per litre. These provisions would appear to have borne fruit, since consumption of lead-free petrol has been on a steady upward curve since it was introduced in 1998 and now accounts for 20% of total fuel consumption.

Nevertheless,

Efforts that need to be pursued at the wilaya of Algiers scale

The urban development plans and action implemented to date have not always managed to use regulatory provisions intended to effectively combat air quality deterioration and reduce greenhouse gas emissions. Thus, apart from general measures such as converting cars to less polluting sources of energy, greater account should be taken of the specific features of urban mobility in Algiers (topography of the city, tertiary hyper-centrality, increased commuting, traffic congestion...).

⁵ Lead-free petrol, gaseous fuels such as LPG/C and CNG (LPG is a cleaner fuel containing neither sulphur, lead nor water).

Moreover, with a view to improving air pollution monitoring, the SAMA SAFIA air quality measuring mechanism, the reliability of which should previously be ensured, should be extended to the outlying municipalities in the Algiers conurbation. For the time being, all four stations in the network (in Ben Aknoun, Bab el Oued, El Hamma and 1st May square) are located within Algiers hyper-centre and city centre.

Stresses and opportunities

A wide transportation supply, albeit over-segmented and inadequately coordinated

In the transport field the difficulty of coordinating between the various players involved, saturated carrying capacity on the network and difficulties in meeting travel demand are giving rise to a range of adverse effects. The lack of a multimodal approach and fare integration neither make for transparency regarding urban transport provision in Algiers nor do they best address user concerns.

Nevertheless,

Towards a multimodal approach including new means of mass transport

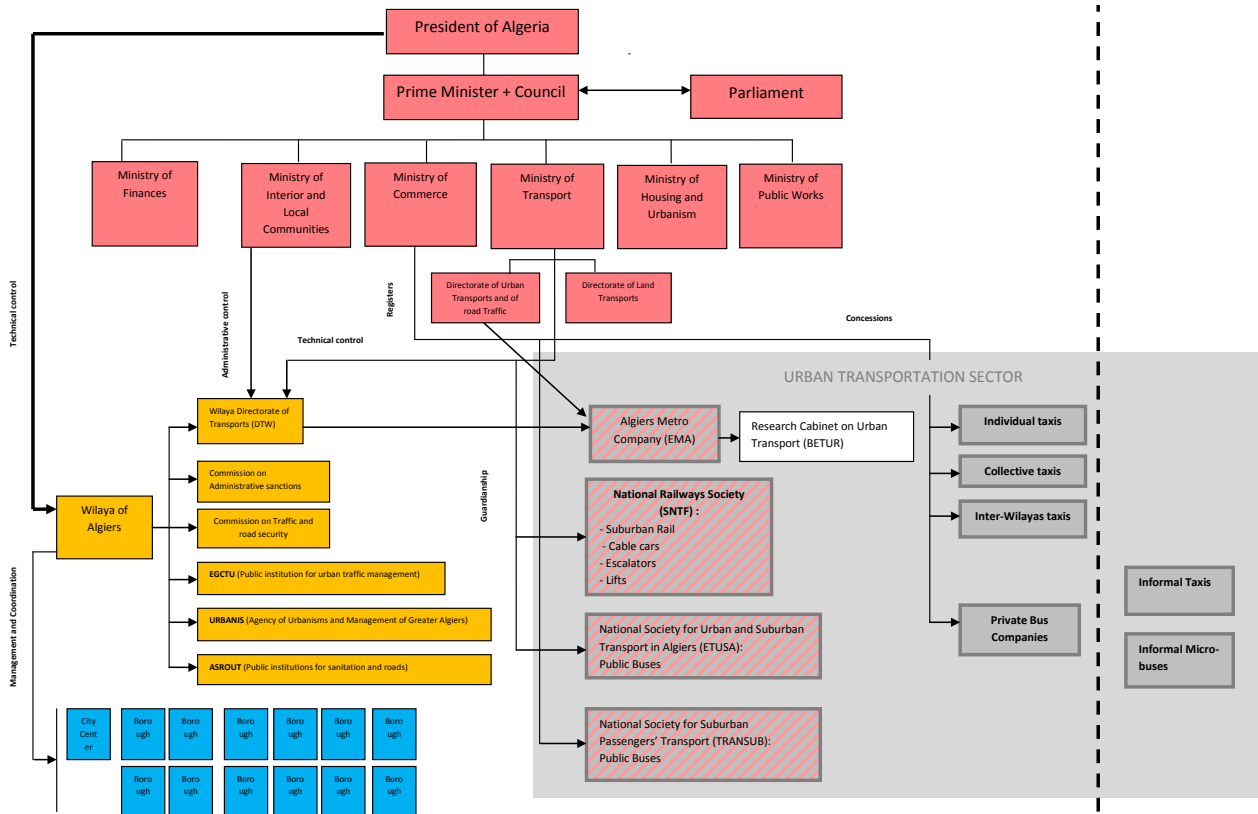
Steps taken under the adoption of the 2005-2009 five year plan would appear to suggest that greater account is being taken of user expectations and the restructuring of the transport system in Algiers. Thus more than 20 years after the first shovels were wielded the Algiers metro project has been de-mothballed. It is eventually intended to serve 54 stations along 3 lines with a total of 56 km of tunnels. As for the project to electrify the Algiers railway network, it could help the share of this mode of travel to rise and lift it out of the marginal situation it finds itself in today. Finally, one of the major projects planned for the capital is the construction of the first tram line.

Moreover, law 01-13 of 7 August 2001 on the organisation of land transport introduced certain innovations by encouraging the restructuring of urban public transport on the basis of networks integrated both physically and in fare terms..

Urban mobility governance

Background

The urban mobility governance system



Current situation and ongoing dynamics

A highly centralised urban mobility governance

In theory, several bodies are responsible for urban governance: the ministry of transport, the wilaya and the municipality.

The ministry of transport enjoys wide-ranging prerogatives on urban and land transport matters, including: drafting the general rules governing road passenger transport; issuing operating licences for public and private transport operators; drawing up master plans for road, rail and urban transport infrastructure; supervising the public urban transport companies (including ETUSA and the SNTF).

The Wilaya Transport Department (DTW) is a decentralised body of the ministry of transport and answers to the wali.

The wilaya of Algiers, covering 13 administrative districts subdivided into 57 municipalities, is responsible for the development, maintenance and upkeep of wilaya roads. The provisions of law 90-09 of 7th April 1990 require it to set up public transport services in order to meet travel needs on routes within its area.

The wilaya of Algiers has also set up a *Road safety and traffic committee* as a forum for consultation and action on road safety issues.

The municipality is theoretically a central player in urban transport organisation within its area, to the extent that it affects the population's daily life. In accordance with regulatory and legislative provisions, the municipality is thereby expected to conduct and implement studies for transport plans, create transport

services in the form of state-owned companies, industrial and commercial public undertakings or concessions, etc ...

In practice, the concentration of decision-taking powers at central level denies the municipalities their genuine prerogatives and it is the decentralised body of the ministry of transport (the Wilaya Transport Department) which implicitly acts as urban transport organising authority.

Lack of a coordinating body, with an overlaps of competences

The multiplicity of players comprising the institutional urban transport framework in Algiers and the lack of a genuine coordinating body means that competences regularly overlap, with the ensuing inefficiency and inconsistency.

Thus, in practice, the primacy granted to the Wilaya Transport Department partly neutralises the competence of other players responsible for urban transport.

The wilaya of Algiers has also been behind the setting up of three public undertakings of an industrial and commercial nature (EPIC): The traffic and public transport management company (EGCU), the Greater Algiers town planning and development agency (URBANIS) and the Public road cleaning company. Not infrequently these EPICs encroach upon the competences of the external services of ministries, wilayas or municipalities and sometimes there is even an overlap of competence between the undertakings themselves.

Limited scope for common urban planning exercises

The main urban planning documents have thus far not effectively managed to bring unruly urban growth in the wilaya of Algiers under control. Having often already lapsed when they are validated, and sapped of substance by numerous derogations, for example, to pre-empt or regulate the spread of informal housing.

Strengths and weaknesses

Revised legislative and regulatory provisions in the transport sector

The adoption in 2001 of a new law on the guidance and organisation of land transport is indicative of the

will to make up for the shortcomings and deficiencies of the previous guidance law⁶.

Taking note of the overlaps in competence hampering public action on urban transport matters, the LOOT provides for an urban transport area to be delimited when several municipalities in the wilaya are affected by the same project.

It also explicitly recognises the difficulties caused by the lack of organisation between the various competent players and advocates the setting up of a coordinating body. Thus, in accordance with article 30 of the LOOT, « *Urban transport organisation and development missions shall be entrusted to a coordinating authority. The setting up, attributions and operating modes of this authority shall be stipulated by regulation* ».

Nevertheless,

A uncompleted legislative framework ...

Although the 2001 LOOT foresees the setting up of an authority responsible for organising urban transport, it does not specify which one. As yet, no organising authority has really taken root in the institutional transport landscape.

...with human and financial resources which sometimes appear inadequate

By way of illustration, the question arises as to whether, given the scale of its prerogatives, the human and material resources made available by the ministry of transport allow it to successfully conduct all of its work.

Stresses and opportunities

Major institutional instability, far from facilitating strategic thinking

Urban governance in the city of Algiers has thus far tended to be shaped as a matter of urgency.

Forced to act at top speed in the face of galloping urbanisation, the public authorities have dealt with the most pressing issues, backing isolated projects without including them in a process of long term, consistent and coordinated strategic thinking. Players

⁶ The promulgation of law 88-17 of 10 May 1988 prompted the opening up of the road transport market to the private sector.

involved, were more spectators rather than actors of the new urbanisation dynamics underway in the Algiers conurbation, did not allowed the implementation of a clear and comprehensive strategy to regain control regarding urban sprawl.

The « remarkable institutional instability » which has been a feature of governance in the city of Algiers over recent years has considerably hampered the creation of a town planning reference framework for the conurbation as a whole. In fact, between 1967 and 2000, the city of Algiers witnessed no less than 6 changes in legal status, resulting in inevitable ambiguity in the share-out of competence, particularly between the wilaya and the capital's popular municipal assemblies

Nevertheless,

Marked political resolve towards correcting shortcomings in governance and strategic planning provisions

The legislative headway of recent years is a reflection of the efforts made by all the players involved in urban issues. It expresses the authorities' marked political resolve to establish effective urban management and planning bodies.

Besides the innovations brought in by the LOOT in 2001, the 2008 Master Plan for the development of the Algiers metropolitan area (SDAAM) also advocates the setting up of a coordinating body for regional planning at urban level.

Efforts made towards encouraging a multi-modal, integrated approach are also helping to make up for the shortcomings of urban planning in the past.

Lessons and prospects

Algiers' sphere of influence extends well beyond the city's administrative boundaries. The diversity of geographies of planning documents have make difficult to conduct a cross-cutting analysis.

Certain conclusions can, however, already be drawn

Congestion driven by a all range of factors

The rise in traffic congestion in the city cannot be attributed to the hilliness of the site of Algiers and its under-sized road network alone. Increased household motorisation, encouraged by deficient urban public transport and the low cost of fuel, is a major factor in the overloading of the city's main thoroughfares. Moreover, urban sprawl, residential decongestion and the growing home work uncoupling are also contributing to network saturation by making commuter trips longer.

A governance mechanism unable to control the expansive drive of urban development

Hesitation in urban planning partly linked to the many legal changes which have affected the capital has hampered the development of a consistent medium and long term approach to town planning. The multiplicity of « one offs » has served to consolidate the heterogeneous nature of the urban lay-out and and led to a lack of spatial organisation throughout the conurbation.

A wide transportation supply, albeit inadequately structured and coordinated

Projects for public transport using exclusive lanes (metro, tram) should improve transport conditions for the people of Algiers. Their efficiency, however, will depend on the degree to which they are integrated within global, coordinated multi-modal provision. This will only be possible once the sector's institutional capacity has been consolidated: shaping of a strategy for the transport field, regulation of public transport provision and connections between modes.

Negative returns from cheap, accessible fossil fuel

Household motorisation is further encouraged in the face of the shortcomings in public transport provision by the fact that fuel is cheap in this oil-producing and exporting land: the headlong rush towards a «all private vehicle» model is not hindered yet.

And key messages relayed

Priority should be given to shaping and coordinating diversified multi-modal supply

The restructuring of transportation supply will doubtless involve reorganising the provision which comes from the thousands of small private operators by promoting inter-modality and pushing ahead with public transport projects using exclusive lanes, including metro and tram. Such steps can already build on the principles established by the legal provisions of Law 01-13 of 7 August 2001 on the organisation of land transport.

Clarifying the institutional framework in order to adapt it new needs of mobility amongst the people of Algiers

Urban mobility governance in Algiers suffers from a lack of coordination, particularly in the transport field. The setting up of an Urban Transport Organising Authority (AOTU) could prove instrumental in clarifying the institutional framework.

Pursuing efforts to assess and monitor air pollution

Poor public urban transport provision, the predominance of small vehicles amongst private operators, the growth of the private car fleet, road saturation and the ensuing drop in travel speeds are leading to the on-going deterioration of air quality. Nevertheless, the creation of the SAMA SAFIA monitoring network is indicative of the emergence of environmental concerns within the wilaya of Algiers. As part of the drive to combat the effects of global warming such efforts deserve to be continued.

Urban mobility in Tunis: trends and prospects

This document was drawn up by Sylvain Houpin, Blue Plan Programme Officer for Urban Areas, based on:

- The report produced by Morched Chabbi and Hassen Abib
- The summary of the handover workshop as drafted by Xavier Godard and Philippe Vallouis
- The work of Cecilia Rubiolo, Masters student at Science Po, Paris, on a Blue Plan placement
- Further bibliographical research using previous Blue Plan material



Introduction

Founded back in 698 Tunis, the capital of Tunisia, was the first city in Africa to have some form of public transport. Thus, in 1872, Tunis saw the inauguration of a steam train, followed in 1887 by the first animal-drawn tram, and subsequently the electrification of the tram in 1900.

Despite having shown only moderate growth when compared with other southern cities, as of the 70s Tunis began to experience considerable urban sprawl.

This centrifugal form of development affects everyday urban mobility in many ways.

Travel demand

Available indicators

Essential data on travel demand for travel

Population	2,380,000 inhab. (2007) (23,3% national pop), growth rate: 2 %.		
Surface area	23,458 ha (2002) (national surface area: 163,610km ²)		
Density	92 inhab/ha (2002) (national density: 62,5 inhab/ha)		
Employment	702,908 (2004 Greater Tunis) (22% « nationally employed » active pop 2007)		
of which	43.6 % administration, health, education and other services 20.1 % manufacturing industriy 13.7 % in trade 9.6 %, public works 1.5 %, mines and energy 3.8 % agriculture and fishing 7.7 % transport.		
Reasons for travel (Geater Tunis 1994)			
All modes (including on foot)	work 32%	school: 44%	other: 24%
Motorised	work: 51%	school: 22%	other: 27%

Current situation and ongoing dynamics

Dynamic population growth and urban spread

In the wake of independence in 1956, Tunis was a city with 560,000 inhabitants. It has since witnessed an annual average growth rate of 2.9%, which slowed to around 2% as of 1994 and is set to stabilise at 1.8% over the next few years. It currently numbers almost 2.4 million inhabitants.

Despite moderate levels of growth when compared with other southern cities, since the 70s Tunis has witnessed major urban sprawl. Indeed, in the early 60s the city extended over some 10 kms, a figure which now stands at 40 km from North to South. This urban sprawl is responsible for the marked drop in density, which from an average of 101 inhabitants/hectare in 1975 had fallen to 92 inhabitants per hectare by 1996.

Highly varied urban morphology as a result of successive stratification

Backing up against a hill to the North-West and bordered by the Mediterranean coast to the East, Greater Tunis occupies a site hemmed in by a shallow lagoon and a fault that extends to a "sebkha" to the South-West of the city. Six major urban typologies can be identified, laid out along a centrifugal line of development:

- **The medina**, a pedestrian town which until the 60s soaked up the rural exodus, at one time had almost 170,000 inhabitants, in other words 30% of the city's population. That figure has now dropped to 90,000 and the medina accounts for a mere 3.8% of the capital's population, i.e ten times less than in 1960.
- **The Kasbah**, adjoining the medina, is still a major specialised administrative centre, housing most of the ministries and public administrations.
- **The European town** with its « Haussmannian » morphology inherited from the colonial age continues to act as a trade and administrative centre for the city.
- **The « shantytowns »** and/or outlying squatter areas. With no building or plot permits, this type of peri-urban development tends to occur illegally on farming land.
- **The residential areas**, comprising a variety of legal forms of housing, constructed by public and private operators along the existing road network.
- **Major Projects**, imported urban models constructed at one fell swoop on large swathes

of land, amongst which the major social housing operations, speculative urban projects and industrial ones should be flagged up.

Gradual decentralisation of the city's core elements towards greater multi-polarity

Since 1977 the core operations- businesses and offices in particular- have been gravitating towards the new districts which sprang up between 1976 and 2000.

Given these trends, the new elements comprising Central Tunis are structured around an extended hyper-centre (medina + European town), which now opens up to Tunis's northern and southern lakes, several secondary centres on the coast to the North (La Marsa, la Goulette) and South (Hammam Lif, Radès) and in the western part of Tunis (Ettadhamen), and finally two more recent centres, one created to the North in 1990 (Northern Urban Centre) and the second planned for the El Mourouj district to the south of the city.

Thus these neighbourhoods in lakeside El Menzah as well as the shanty areas, which are largely concentrated to the west of Tunis, have witnessed a fresh concentration of informal businesses. The spread of new areas to the north and west of Greater Tunis has also driven the redistribution of tertiary activity (offices and businesses).

Moreover, concentrated within southern Tunis since the 70s, the spread of the industrial areas over several hundred hectares during the 80s was further driven by growing urbanisation to the north and west of the city

Ever-increasing travel needs for the people

Up until the 80s, almost 60% of all jobs were concentrated within **the Kasbah** adjoining the medina- a major administrative centre housing most of the ministries- and the **European town**- the city's business and administrative centre- in other words, in a part of the city representing almost 45% of the population of Tunis.

The simultaneous thrusts of urban area expansion and specialisation have led to a gradual uncoupling of industrial and economic activity from residential functions, triggering a sharp rise in the number of home/work trips and the distances covered.

The employment hubs are focused on the city centre (medina + European town), to the south and in the centre-east district of Tunis, which houses some major industrial areas, whereas western Tunis accounts for a little less than half the population of Greater Tunis

and a mere 10% of all jobs in the city. This means that the people who live in the western district have to travel huge distances on a daily basis in order to reach the various employment centres.

Finally, located mainly in the agricultural areas, the new outlying districts are largely inhabited by the lower and middle classes (civil servants, teachers, nurses, etc.), more often than not tied to public transport.

Strengths and weaknesses

Breakneck growth dynamics with no transitional stage

Centrifugal-style urban growth, housing supply which is lagging behind population growth, importation of new means of production (tertiary and industrial zones) and consumption (mass retailing) which are heavily dependent on car use have contributed to a rapid switch (noted as far back as 1977 but only really gaining impetus during the 80s) from a somewhat radial-concentric classical set-up to a contemporary polycentric lay-out.

Despite various initiatives and projects, major transport infrastructure has not managed to keep up with the pace of this radical shake-up in the way the city operates, nor to shore up the recent developments on the urban front.

Nevertheless,

The city remains relatively compact

The urban sprawl around the Tunisian agglomeration is still relatively modest bearing in mind the dynamics affecting Mediterranean cities, partly due to geographic constraints (relief, coastline and wetlands) but also probably as a result of the effects of a particularly pro-active policy to eradicate the slums.

Initially devoid of any form of infrastructure these areas- known in Tunis as peri-urban slums (HSPU)- were targeted before the 70s by policies to demolish them and drive their inhabitants out and back towards their regions of origin, then subsequently between 1985 and 1990 by rehabilitation activity and infrastructure provision.

Stresses and opportunities

Oil stain shape urban extension, with many shots gone

Tunis has long been at the receiving end of a plethora of land planning exercises, first and foremost the Greater Tunis Urban Development Plan for 2021 (SDA), which was got underway in 1995 at the same time as the National Land Planning Scheme was being drawn up. The Regional Transport Master Plan (PDRT) was also established in parallel.

However, since 2007, some new-style mega urban projects designed by golf promoters have taken shape around the main lakes in Tunis (northern and southern lakes and the Ariana sebkha), albeit without giving the impression of fully dovetailing with existing planning documents. It is as if the urban planning process established elsewhere had no bearing whatsoever on these major works.

Nevertheless,

Major works ploughing back into the inner suburbs (between the hyper-centre and the outskirts) not far from the main roads

The projects which have been rolled out on the northern coast or to the West, such as at the El Menzah gardens, results in the concentration of medium and high quality residential pockets to the north, west and north-east of the city. They have had a major impact on the centre of Tunis, which kept its back firmly turned to the lagoon as long as it was no more than a polluted lake.

They can loosen Tunis downtown and encouraging the growth of a multi-polar lay-out. All the same, by accommodating highly car dependant people, they will be contributing to the congestion of part of the City of Tunis road network. These areas will indeed house highly car dependant families, whose trips from home to work will use roads which at peak times are already saturated.

These housing, service and activity projects will therefore have a major impact on traffic congestion and indirectly are likely to challenge public means of transport, which service speed is already facing a sharp slowdown.

Transportation supply

Background

Available indicators

Vehicle fleet (Greater Tunis 2006)¹: 237,900 private cars , (1,100,000 national)

Motorisation rate (Greater Tunis 2006)¹: 102/1000 inhab, annual growth rate: +4.3%

Modal split (Greater Tunis 2006)¹:

All modes:	PC: 28.9%	PT: 19%	2wheels: 2.1%	Foot: 50%
Motorised:	PC: 57.8%	PT: 38%	2wheels: 4.2%	
Change 1996-2006	+29.02%	-24.3%	-16%	+/- 0%

Share of « transport » in household Budget (Gtr Tunis 2005)²: **11.9%** (national: 10,7%)

Of which 8.5% for private transport and 3.4% for public,

Change (Gtr Tunis 1995-2005)³ **+8,5 %**

Greenhouse gas emissions (Tunis 2006)³: 2,1 MT eqCO₂ (**41.2% of national total**)

Fuel consumption (Tunis, 2005)³ : 0.6 MToe (**40% of national total**)

Sources:

(1) Estimate established by modelling using the 1994 domestic survey

(2) INS domestic consumption survey

(3) Plan Bleu estimates

Current situation and ongoing dynamics

As in most Mediterranean cities on the sea's southern and eastern shores, Walking remains the dominant mode of travel. It would appear, however, that the switch to more motorised trips is already underway.

Mass individual motorisation underway

Car's modal share is constantly growing. It now accounts for more than 60% of all motorised trips in Tunis (including taxi trips), to the detriment of public transport. Despite an ambitious policy objective to achieve parity between public transport and the private car, this shift is being bolstered by measures encouraging the opening up of the domestic market to consumption, of cars in particular (imports and credit).

A constantly expanding road infrastructure network

The new multi-functional nodal points at the North (El Manazeh, El Manar, Ennasr, Ariana) and East (La Marsa, Sidi Daoud, Berges du lac, Montplaisir-Bourjel) have helped drive the growth of inter-sector exchange, sometimes obviating the need to transit through the city centre, facilitated by the emergence of road infrastructures which directly link these new districts amongst themselves and with the rest of the city.

Regular, varied and plentiful transport provision

Unlike in other parts of the country, urban public transport in the Greater Tunis region involves a plethora of operators and a wide range of services:

- A **railway** line 23km in length, serving the southern suburbs of Tunis with 70 diesel-electric engines.

- **An electrified railway line** of about 20 km in length, serving the northern suburbs of Tunis (TGM line) with a fleet of 18 trains.
- **A light metro system** serving the inner suburbs (Ben Arous, Ariana, Ibn Khaldoun, Intilaka and Denden) with a fleet of 134 trains on 5 lines of about 118 km in length.
- **A public bus network** (STT) with 207 urban and suburban routes over about 6845 km, on which a fleet of 1114 vehicles operates.
- **35 bus routes run by 4 private operators** (TCV, TUT, TUS, STC).

A public transport network which is struggling to meet the growth in demand

« Specialised » services which compete with regular routes: the long suburban routes have the lowest average traffic densities and coverage rates of costs through income on the STT bus network. Moreover, the low rate of cost coverage through income can be attributed to the low passenger rate and amount of school transport.

Ever-increasing informal urban transportation supply

In parallel to the public networks, taxis, rental and rural transportation vehicles also provide an urban transport service in the four governorates comprising Greater Tunis. Over the last ten years, this unofficial fleet of public transportation vehicles in the Tunis region has grown at an average rate of 4.6% per year, from 7657 vehicles in 1996 to 11954 in 2006. This can be attributed to the steadily increasing demand for travel between rural areas not served by official bus routes and the urban areas.

Under-funded public transport systems

Public transport is financed to the tune of 70 % by the users (tickets) and 30% by the State (top up for school services and equipment grants). Despite the high level of user participation (70% compared with about 30% in developed countries), the sum total of resources (users + State) is not enough to fund public transport and the public transport companies are shouldering chronic deficits, mainly as a result of:

- Inadequate compensation from the State for school services (which does not fully cover the loss of earnings for these companies) ;
- Non-compensation for free transport;
- Inadequate State financial participation in investment.

Everyday mobility, a major household expense

The Tunis region has the highest level of total per capita spending for urban transport, amounting in 2005 to almost 12% of the *household budget*. However, between 1995 and 2005 the increase in total consumption (also in transport) was slower for the Tunis region than at national level.

Environmental impact

Despite the acknowledged lack of data and knowledge, it is none-the-less estimated that the relative share of each pollutant (CO₂, CH₄, Nox, CO, COVNM et SO₂) tends to be in excess of 40% (which is the estimated share of fuel consumption for the Tunis region compared with the national total). This points to the effect of congestion, which is much more pronounced in the Tunis region than in the country's other cities.

It is essential that greater account be taken of issues relating to the emission of greenhouse gases and air pollutants (particles) in the design, implementation and evaluation of public policies towards sustainable urban mobility.

Strengths and weaknesses

An well provided area

The constant growth of the public transport networks in Greater Tunis has meant that over 80% of the area is provided for. Indeed, the domestic survey conducted by the District of Tunis in 1994 revealed that the public transport networks covered around 83% of the geographical area of Tunis and its suburbs.

Compared with other cities in the region, Tunis stands out because of its full multi-modal provision, with the exception of the Tunis light railway, which runs well, using relatively modern and well maintained rolling stock in spite of heavy usage.

Nevertheless,

A lay-out which radiates from the centre, which no longer fully meets the city's needs

Travel to or from the centre has often been given priority to the detriment of peripheral travel:

- Most of the 207 urban and suburban routes connecting the city centre with the outskirts are radial ones,

- The 5 light metro lines serve the inner suburbs (Ben Arous, Ariana, Ibn Khaldoun, Intilaka and Denden).

Moreover, the bottleneck created by the two wetlands/lakes at the heart of Tunis has caused the public transport network to develop on a north-south axis to the detriment of more tangential routes.

Inadequately coordinated provision

Connections between the metro and the STT buses are the only ones for which no additional fare has to be paid. (The two networks are run by the same operator).

Organised connection transport (bus-metro) represents a mere 2% of the STT's total passengers and is on a constant downward trend despite the growth of the light metro and bus networks.

This can be attributed to the poor connection conditions (ill-matched bus and light metro timetables, lack of passenger information...) as well as to the absence of single ticketing for the urban area.

A quality of service which is struggling to hold up

Stretched by a broad geographic coverage and not particularly focused on the main urban centres, the urban and suburban lines run by the public land transport companies, such as the railway networks (metro and Tunis suburban railways) are fully loaded at peak times (90 % to 100 %) whereas off-peak traffic on certain routes drops off considerably, with the result that average occupancy rates for buses are very low (12 passengers on average for the TUT).

The saturation of public transport also affects the private operators, who are in turn required to carry an excess of passengers.

At the same time, the challenging general traffic conditions and the lack of facilities to ease bus travel are the main reasons for a slow-down of service speeds in almost all the major cities, in some cases (the city of Tunis in particular) slowing to less than 10 km/hr.

Stresses and opportunities

Plentiful provision of public transport structured around public operators

Tunis is an exception in the Mediterranean, enjoying a plentiful and varied supply of transport, built around specialised companies and one single public company in particular (the STT, which emerged from

the merger in 2003 of the SNT bus company and the SMLT light metro company). The transport system is mainly rooted in public companies, with tentative openings towards private operators and a level of taxi use which is still acceptable compared with other cities in the region. The openness towards the private sector is limited to 4 operators for 35 routes in Tunis, with the stated target of reaching 5% of all customers.

Unofficial-type transport using minibuses ("louages") only comes into play for suburban and interurban routes.

A varied and complementary network (tram, light metro, bus etc...), which is just asking to evolve into a fully integrated UT system.

To date, this classical albeit increasingly rare set-up has meant that public transport still accounts for a large share of travel and that transport provision continues to be quite consistent

Nevertheless,

Public action often contradictory on transportation issues

The pro-active 1987 traffic plan, which limited car access to the city centre, was intended to turn away vehicles wishing to transit through. But updating this plan is proving an uphill struggle and over the last few years the policy has looked less pro-active, with car parks being built in the city centre, threatening to draw in car traffic.

The development of the Tunis light metro coincided in the 90s with a national programme to promote the people's car. This programme is seen as the result of the lowering of the GATT-imposed customs barriers. It is aimed at the middle classes with an income of around 600 Tunisian Dinars per month (i.e. around 500 Euros).

Finally, despite the existence of a Master Plan and an investment programme through until 2016, which foresee in particular tram line extensions, the creation of a high speed railway network (RFR) and exclusive bus lanes, several expressway-style road infrastructure projects are underway around the town centre in apparent contradiction to the strategic approach aimed at encouraging collective forms of transport rather than the car.

Pedestrian access left by the wayside

Walking is still the main transportation mode, ahead of cars.

Suited to the traditional medina set-up, walking is poorly esteemed and underestimated during mobility surveys, although it is still relatively widespread in Mediterranean cities.

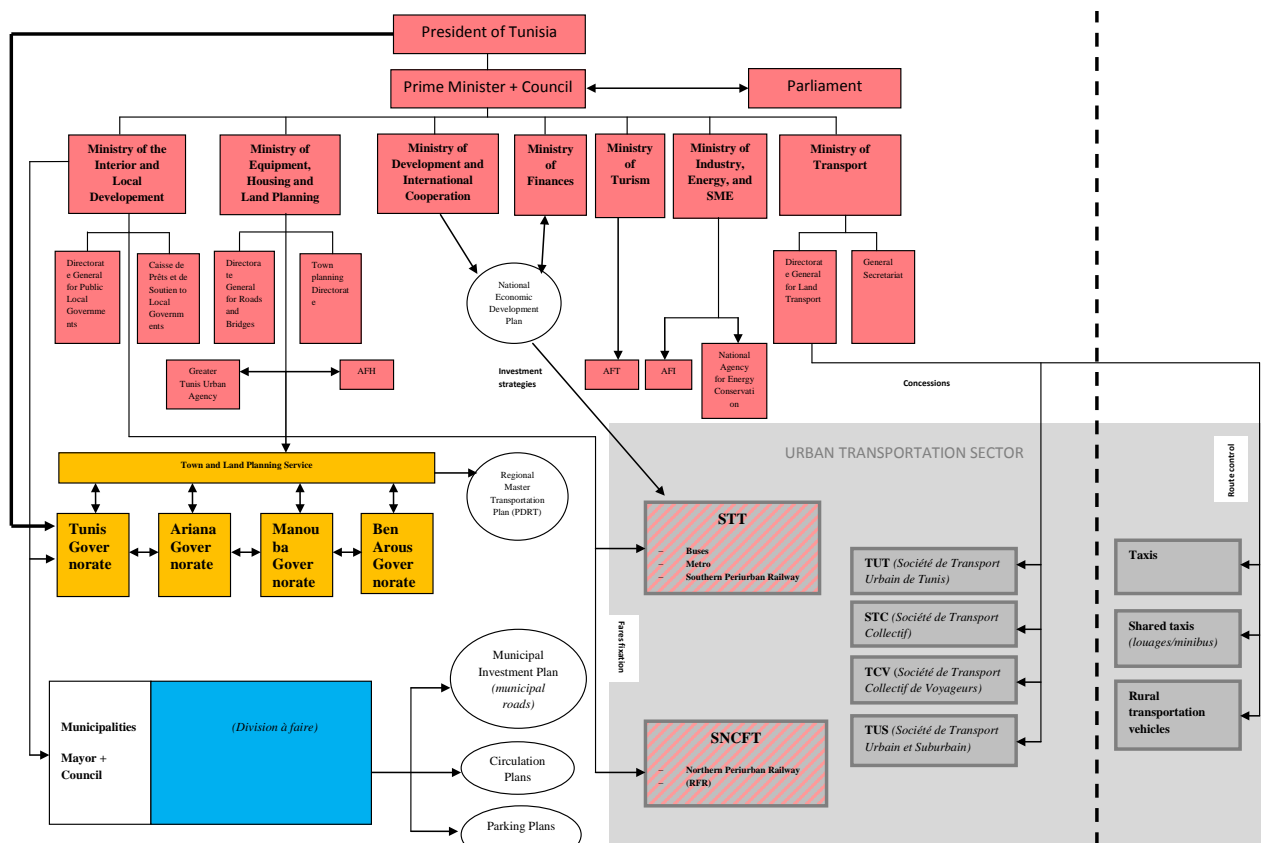
Walking would still appear to be the main form of transport in Tunis, even though urban development is tending to come about according to other mobility patterns, where the car plays an important role.

The high rates in Tunis (1.2 mechanised trips per day in 2003) are nonetheless still well below the levels usually observed in the developed world or in some developing Asian cities (between 2 and 2.5 mechanised trips per day for the French cities).

Urban mobility governance

Background

The urban mobility governance system



Current situation and ongoing dynamics

The preponderant role of the central authorities

Land planning, town planning and urban transport essentially fall to the central or decentralised State. The role of the municipalities is limited to managing the roads within their area, largely through traffic and parking plans. As far as public transport as such is concerned, it stops at simply transmitting public needs on the one hand and, on the other, a certain degree of involvement regarding the conditions which govern the use of public transport vehicles on the road network.

Within Greater Tunis, some five ministries and several sectoral departments within them are involved in the planning, management and running of these networks.

- **The Ministry of Equipment, Housing and Land Planning (MEHAT)**, through the Directorate General for Roads and Bridges (DGPC) and the Land Planning Directorate (DGAT) is essentially involved in land planning, which notably includes the planning of foundation transport networks (roads or other modes). The Town Planning Department is involved through its supervision of town planning projects and major integrated ones (habitat, socio-collective amenities, etc.).
- **The Ministry of Transport** is involved in the planning and programming of heavy infrastructure (with funding being provided by the State), in regulating the sector and tariff policy as well as in organising the TCUs (coordination between operators) and relations with the private sector.
- **The Ministry of Development and International Cooperation (MDCI)** is particularly responsible for the coordination, planning and follow-up of the National Economic Development Plans and is also involved in the consultation between the various ministerial departments concerned by the drawing up of Regional Master Transportation Plans (PIDRTs). It oversees the public transport operators (STT, SCNFT) particularly in approving investment plans under the National Economic Development Plan (MDCI), setting tariffs and financial compensation of running costs relating to free or reduced fare transport.
- **The Ministry of the Interior and Local Development (M.I.D.L)** oversees the thirty or so municipalities in the District of Tunis, responsible for programming, investment, implementation and the maintenance of the municipal road network. The Directorate General for Public Local

Governments (DGCPL) « examines, amends and approves » the Council Investment Plans (which include road-related programmes) and the CPSCL (Local Community Loans and Support Fund under the aegis of the MIDL), which is responsible for providing the necessary funding in the form of subsidies and loans.

Eventually it is expected an improvement in taking into account the local level by decentralising towards the governorates, in particular by granting them the competences ascribed to the regional authorities which organise land transport. These authorities would remain as the contracting authority as regards the drawing up of the regional transport master plans, which currently fall to the services of the MEHAT. For Greater Tunis this would mean 4 regional organising authorities coordinated by an inter-regional commission under the aegis of the Prime Minister. These institutional shifts are taking their time, however. (*voir Stresses and opportunities*)

The laborious emergence of local urban engineering

The various ministries or governorate services involved with urban management do not appear to have their own internal expertise. They limit themselves to the strict role of contracting authority, strategic studies being commissioned from local consultancies following calls for tender issued by the various ministerial departments or administrations and public bodies.

Strengths and weaknesses

Well structured land planning

City management is regulated by the Land and Town Planning Code (CATU), which determines the environmental management and planning instruments according to a model inherited from French tools and methods.

- **City development master plans (SDAs)** drawn up by the MEHAT establish land use rights within the municipality.
- **Regional transport master plans (PDRT)** drawn up by the Ministry of Transport in conjunction with the main departments involved (MEHAT, MICL, MDE...) establish the planning for road infrastructure and public transport.
- **Urban Travel Plans (PDU)** stipulate the general rules of transport organisation, traffic and parking within the urban transport area, with the Governor

being responsible for drawing them up (when the urban transport zone exceeds the area of a commune but does not exceed the limits of the Governorate, otherwise the minister responsible for the local communities...)

Finally, urban transport system planning is based on periodic data collection such as domestic surveys and PDU-style methodological approaches, lifted from the French model. However, the last « domestic survey » dates back to 1994. No funding was found for the up-date initially planned for 2004, and as such the information needs to be brought up-to-date by factoring in recent developments in the city and the way it operates.

Nevertheless,

Low efficiency of actions taken to control urban development

Since 1990, more and more urban and transport planning exercises have come into being for the city of Tunis and its suburbs: the Greater Tunis Master Plan for Urban Development (SDA) for 2021 was initiated in 1995 at the same time as the National Land Planning Scheme and the Regional Transport Master Plan (PDRT) were established, the thrust of which followed that of the Greater Tunis SDA.

It would however appear that, despite the large number of such planning exercises (which have not all been completed within a reasonable timeframe), they have not managed to take full account of the new metropolitan scale nor such phenomena as the informal but on-going spread of shanty dwellings or, more recently, the major real estate projects being driven by golf region promoters around the main lakes in Tunis (northern and southern lakes and the Ariana sebkha).

Heightened industrial competition and contradictions

As one of the consequences of the increased scale on which the Tunisian metropolis now operates, the burgeoning number of players (Ministries, Governorates, Municipalities, agencies and public operators) is inevitably giving rise to problems of coordination and competition with public action. The increased complexity of the stakeholder system is further exacerbated by the sectoral compartmentalisation which remains strong within the Tunisian institutional set-up.

- **Between ministries**

The transport sector in Greater Tunis involves some five different ministries in such fundamental issues as strategic planning, funding and management. The methods of coordination between these various ministries are unclear and it looks as though only arbitration at the very highest level is likely to be able to give a common thrust to State action.

- **Between Governorates**

Since the district was abolished, establishing genuine coordination between governorates appears tricky enough in itself for Greater Tunis, to the extent that moving to the level of the Region as is sometimes mooted in reference to metropolisation appears totally unrealistic for the near future.

- **Between real estate operators and the ministries in charge**

In 1973 the State set up 3 real estate agencies- AFH, AFI and AFT- with a view to conducting projects on habitat zones, industrial zones and tourist zones. They enjoy the prerogatives of a public authority as far as seizure and expropriation are concerned, and have been behind the roll-out of some major habitat, industrial and tourist zone operations. Structured in sectoral rather than territorial fashion, their work which sometimes clashes head-on with strategic ministerial plans would appear to point to a coordination flaw in the State's supervisory role.

Stresses and opportunities

Public action rather well channelled

The stances adopted publicly by the President regarding urban transport for Greater Tunis have fully taken on board some of the fundamental directions needed in order to move towards sustainable urban mobility: curbing car use in the urban environment and promoting public transport (target of 50/50 modal split), securing sources of funding on a permanent basis, one single authority for organising transport....

This was confirmed by the very recent law on the organisation of domestic transport, which was passed and promulgated in April 2004, and which plans in particular for the decentralisation of urban transport organisation to governor level (designated as regional organising authorities) :

« The regional land transport organising authority (AROTT) is responsible for coordinating contributors, organising urban and regional transport, drawing up and monitoring regional land transport master plans, shaping transport services and proposing how they be run. »

« The Governor shall carry out the tasks attributed to the Organising Authority. »

« The authorities shall coordinate amongst themselves according to the mechanisms laid down by decree. »

In the case of Greater Tunis, an inter-regional Commission chaired by the Prime Minister shall assist the coordination between the regional authorities concerned.

Nevertheless,

An incomplete legislative framework

Although the 2004 law portended considerable advances, the implementing decrees were never passed.

Since the dissolution in 1994 of the district of Tunis, which was responsible for conducting studies

and carrying out urban development planning and management for Greater Tunis (under the aegis of a Higher District Council chaired by the Prime Minister) an urban agency has been set up. However, this agency is only required to provide technical assistance to the Greater Tunis municipalities, whose competences as regards the running of the city are highly limited. This new mechanism can but lead to a dissipation of urban engineering at metropolitan level.

Moreover, in 2008 it was the President's will that the coordination of transport and town planning be granted to and provided by the Town Planning Agency. This announcement, which to some extent contradicts the 2004 law, led to consultations which would seem to have laid down a somewhat disappointing line, since the Agency would only be responsible for coordinating the work of the municipalities and would have no say as regards the coordination of the Governorates...

Against this backdrop, the announcement blurs yet further the effective emergence of a genuine urban transport coordinating body for Greater Tunis.

Lessons and prospects

Tunis is one of the Mediterranean cities with the most highly developed and diversified urban transport networks amongst other cities of comparable size in the region. However, like all cities in the region, It is also witnessing non-sustainable spatial spread and motorisation trends. Although understanding of the recent situation in the Tunisian metropolis still needs to be taken much further,

certain conclusions can already be drawn

Provision outstripping the regional plan

Tunis is an exception with its diversified urban transport system (light metro, tram, bus), which largely depends on a public company, and with unofficial transport playing only a minor role for suburban services

Although this has meant that public transport still accounts for a large share of travel, the model is now being called upon to evolve in order to adapt to the newly emerging context of motorisation and metropolisation, against a backdrop of limited public finances.

A Master Plan and programme of investments foresee the extension of tram lines, the creation of a high speed rail network (RFR) and exclusive bus lanes by 2016.

Unsustainable urban dynamics

Yet transport provision cannot match the demand generated by recent urban growth. The evident saturation of the various modes of public transport is not without consequences for the private operators, who are in turn called upon to transport a surplus of passengers.

At the same time, the challenging general traffic conditions and the lack of facilities to ease bus travel are the main causes behind a drop in service speeds, in some cases falling to below 10 km/hr.

Although this is still all relative in comparison with other cities in the region, the very accessibility of the city of Tunis is thereby being eroded.

And key messages

A collection of urban projects in need of channelling to render them a « system»

Most of the latest urban development operations have featured the importation of standardised urban products prized by foreign investors.

Nevertheless, these highly car-dependant new areas will somehow have to be slotted into the existing urban system, particularly as regards urban transport. The urban models introduced need to be revisited in order to:

- Dovetail supply and demand towards a city accessible to all,
- Revise urban development models in favour of reticulate metropolisation...
- Rehabilitate soft modes, the treatment of public areas, the community town ...

Successfully coordinate public policy in the area

As in most Mediterranean cities, the increased operating scale within the Tunis metropolis has led to an increase in the number of players involved in urban development at both central and local level. The increased complexity of the stakeholder system is further exacerbated by the sectoral compartmentalisation which remains strong within the Tunisian institutional set-up.

Coordinating all the public policies which affect urban mobility demands more effective urban governance, to be achieved in particular by:

- Developing engineering capacity within each of the institutions involved, to ensure that projects can be overseen and/or that the institutions involved can be supervised,
- "Territorialising" public action rather than following a sectoral approach (e.g. differing real estate strategies).

Taking better account of environmental issues in public action

Finally, the lack of available data and knowledge about the environmental impact of urban transport points to inadequate account being taken of environmental issues in urban development.

It is essential to the design, implementation and evaluation of public policies towards sustainable urban mobility that more account be taken of issues relating to greenhouse gas emissions and other significant air pollutants (particles).

Urban mobility in Cairo: trends and prospects

This document was drawn up by Sylvain Houpin, on the basis of:

- The report drawn up by Dr Ali Huzayyin, Hindawy Salem and Emad El Sherbini (DRTPC, Cairo University)
- The summary of the handover workshop drawn up by Xavier Godard and Sylvain Houpin
- The work of Cecilia Rubiolo, Masters student at Science Po, Paris, on a Blue Plan placement
- An additional bibliographical search from the following publications :
 - Le Caire, l’Égypte, la mer Rouge et la Méditerranée Boulevard périphérique et sectorisation en chaine dans La ville franchisée, formes et structures de la ville contemporaine, David Mangin, édition de la Villette/Certu, 2004
 - Dimensions nouvelles de la métropolisation dans le monde arabe : Le cas du Caire, Eric Denis et Leïla Vignal, Cahiers de la Méditerranée Vol 64-2002 les enjeux de la métropolisation en Méditerranée
 - Previous Plan Bleu work



Introduction

One of the world's most ancient cities...

Having been called Memphis for almost five thousand years Cairo, the capital of Egypt, grew up on the shores of the Nile, close to the pyramid plateau at Giza, some 15km west of Al Fustat. Over one thousand years the population multiplied by 100, rising from 100 000 inhabitants in 980 to almost 11.3 million in 2001 (about 16 million today).

...long involved in a process of «megapolisation»...

In the 1960s, the Greater Cairo agglomeration comprised the governorate of Cairo, the urban section of the governorate of Giza and the urban part in the south of the governorate of Qalubia. Today's Greater Cairo is structured around a classical central urban area, comprising a hyper centre, the closer outlying suburbs and those further away which are just as dense, surrounded by a ring road and an "outer" belt of 8 new satellite towns. The Cairo metropolis now comprises 5 governorates.

...with the vocation of being the capital of the Arab world

Greater Cairo is the largest urban area in Africa and the Middle East and one of the most heavily populated metropolises in the world. It ranked 11th amongst the world's largest cities between 2000 and 2015. Although Cairo is the first Northern African city to have a metro, the extreme density of the urban fabric, the widespread congestion on the road network and the dramatic air pollution levels make it a veritable « urban nightmare ».

Travel demand

Available indicators

Essential data on travel demand for travel

Population:	11,300,000 inhab. (GC 2001) (15.8% national pop), (+ 1,752,000 inhab. in the 8 new outlying towns)			
Annual growth rate:	1.3% (2000-2015) compared with 1.8 % national)			
Surface area:	290 km²/29 ha (GC 2001) (national surface area: 995,450/1,001,449 km ²)			
Density:	38,965 inhab/km² / 390,000 inhab/ha (GC 2001) (national density: 75.1 inhab/km ²) (Paris (Agglo) 2006: 37,250 inhab/ha)			
Employment:	4,000,000 (2001 GC) (about 20% « nationally occupied » active pop)			
Students:	3,700,000 (1998 GC)			
Reasons for motorised travel (GC 2001)	work: 20%	school: 24%	domestic: 49%	other: 7%
Average number of trips/ inhab/day:	1,64 (GC 2001)			
	21,6 M trips/day of which 14,4 M motorised			
	25 M expected by 2020, (JICA, 2002)			

Current situation and ongoing dynamics

A very contrasted urban morphology as a result of successive stratification processes

Apart from the signs of a past going back thousands of years, like most Mediterranean cities Cairo's urban area is marked by successive influences of: proactive urban planning more or less inherited from the colonial periods, building processes linked to rural exodus and informal economy and more recently, to importation of and major infrastructure and generic urban products funded by international donors.

A megalopolis which would appear to be reaching a threshold of attractiveness

For several decades already, the capital has no longer been attracting migrants from the provinces. Thus since the 70s, the rate of growth in the Cairo agglomeration has trailed behind the national average. (*Annual growth rate (2000-2015): 1.3% as opposed to 1.8% at national level*). The decentralisation of jobs and activities but also the deterioration in living conditions (unhealthy housing/widespread pollution and congestion) are contributing to the loss of attractiveness of the central metropolis, which is witnessing a slackening of demographic growth.

Extreme density, which is not enough to ensure good accessibility to the urban areas

With almost 39,000 inhab/km² the city of Cairo is one of the densest cities in the world. It ranks fourth amongst the densest cities in developing countries. (More than 10 times more than the Parisian agglomeration (3,725 inhab/km² in 2006)). However, walking as a means of travel still trails behind the levels seen in other cities in the region, with local conditions being notoriously inadequate as far as traffic, safety and comfort are concerned. The almost total lack of pedestrian walkways in the streets of Cairo, compounded by high levels of congestion, makes motorised travel highly inconvenient or difficult.

Public spaces and urban morphology constrained by sectoral production process

The urban projects currently underway or recently conducted in and around Greater Cairo have almost

always been the result of functional approaches of the « zoning and sectorisation » type. This illustrates in particular the low levels of investment and capacity devoted to urban design. The operational rationale of the town planners and promoters has obviously taken precedence to the detriment of the design of public areas and collective facilities and infrastructure. This utilitarian approach to the urban area, determined according to plots to be built upon rather than prospects, thus favours « urban generic products » (housing estates, shopping centres etc..) to the detriment of an integrated approach structured around public space. It is thus even more difficult to factor in the key elements of an « accessible city », such as pedestrian walkways, bus stops and parking places.

A change of the scale at which the urban area operates

For many years now, the development plan for new settlements has included a territorial approach extended to some thirty kilometres around the city beyond the boundaries of Greater Cairo. However, most of the central part of the Cairo agglomeration continues to be affected by centrifugal forces which are reflected in the major development coming about in the gap between the central agglomeration and the belt of new settlements. It therefore provides examples of unregulated housing as well as mixed or specialised urban spread, mainly made of standard, non-sustainable imported urban products (housing estates, shopping and leisure centres, etc...)

There is now some doubt about how to qualify this vast area under urban influence, between a regional megalopolis and a world-ranking metropolis!?

Active corridors at the very heart of the issue

The growth of the new settlements has emerged hand in hand with the identification of what have been called active corridors. The most marked development thrust, relating to urban development and housing projects as well as industrial and agricultural ones, can be seen in six of the 13 main regional corridors leading to Greater Cairo, which are: the Cairo/Alexandria Desert Road, the Cairo/Alexandria Agricultural Road, the Cairo/Suez Road, the Cairo/Ein El Sokhna Road, the Cairo/Assiout Road and the Cairo/Ismaïlia Road.

The most attractive corridor is clearly the Cairo-Alexandria Desert Road. Through the heart of the desert it connects Egypt's two biggest urban centres.

The link towards the port of Alexandria and the availability of land (large areas at low cost) along the road are major points of attraction for many investors.

Decentralization of housing, services and facilities: towards commuting trips explosion

The central part of Cairo has long been the focal point of administration, activities, services and facilities. Until the late 70s, congestion in the central areas was virtually permanent. Businesses in the centre employed some 140,000 people there. As of the 80s, the urban decentralization drive began, with the creation of major centres of activity in outlying governorates. Later, during the 90s and in the early 2000s, the new settlements started to develop, providing new outlying urban poles including activities, services and facilities but more specifically some universities. More recently, the Ministry for Information Technology and Communications was shifted close to the Alexandria Desert Road toll station, within a new quarter, the «Smart Village», which houses many private new technology operators. These trends have been instrumental in the gradual transformation of Cairo into a veritable polycentric metropolis. However, the emergence of these highly/overly specialised urban extension operations (industry and/or housing and/or services) is driving a veritable « uncoupling » of home and work, and people's daily travel needs are constantly growing in both numbers and distance. Thus in 2001 there were almost 8 million active workers for 12 million inhabitants (GC) and it is estimated that there are over 5 million daily migrants.

Strengths and weaknesses

Virtuous, highly pro-active public policies

In order to curb the consequences of surging demographic growth, the public authorities have committed to some highly ambitious public policies, particularly towards the creation of new ex nihilo settlements, the large scale decentralisation of activities and the urban redevelopment of informal settlements.

Thus the new settlement experience in Egypt, which was begun in the 70s by President Sadat, is unique in terms of its scale and its ambition. Cairo's current urban spread could therefore be deemed to be one of the world's biggest urban building sites.

Although not all of these initiatives are devoid of ensuing negative effects, it nonetheless demonstrates the ability of governments to engage in large-scale actions to meet the challenges of a multimillionaire metropolis...

Nevertheless

Surging development dynamics with no transition stage...

The rate of urban development in Cairo has recently witnessed an unprecedented acceleration. These rapid, sometimes brutal developments bring many negative consequences in their wake : housing provision which cannot keep pace with the rate of population growth, centrifugal urban development which is now affecting all of the towns in the Nile delta, the importation of business strategies based on car use and finally a social corpus whose originally peasant system of values (gregarious rationale, social practices inherited from a rural past) is no longer adapted to the mechanisms and practices within this multi-million metropolis. The difficulties these new settlements are encountering in getting off the ground and in particular the large numbers of vacant private residential properties are no doubt related to the deeply rooted wish of households to remain close to the family circle, which in the past was confined to a given quarter, a street, or even the same building... It seems clear that imported urban models are not (yet) quite tuned with the local lifestyles.

Stresses and opportunities

A «metropolitan explosion» which it is difficult to contain

The size of this world-ranking metropolis, the scale of demographic pressure and the oil stain dynamics of urban expansion with many shots already gone (new settlements and new quarters) are all factors which compromise the living environment of Cairo's residents. The fact that the middle and upper classes have spurned the dense city along with the country's openness towards new modes of consumption has led to the importation of notoriously non-sustainable « anglo-saxon » urban models based on widespread individual motorised mobility.

Whilst the central metropolis would appear to have achieved a « threshold of attraction », the Egyptian

capital's « megapolisation » process is bringing with it a spread of demographic growth throughout all the cities in the Nile delta, which seems to have spiralled out of control.

Nevertheless

Benefiting from the paroxysm of urban density

4 million students and virtually the same number of jobs are concentrated in Cairo, resulting in daily mobility needs crying out to be met. However,

accessibility for all to urban essential services is still relatively limited and the benefits which could be expected of compact urban organisation are absent.

However, the extreme population concentration and the proximity of urban facilities and services nonetheless represent a real opportunity to implement sustainable urban facilities and infrastructure.

It will be a matter of putting this to advantage in the design of future public policies or urban development projects.

Transportation supply

Background

Available indicators

Vehicle fleet (GC 2007)	1,328,712 private cars /4,250,000 national/ 53%			
Motorisation rate (GC 2007) ²	84 veh/1000 inhab , 56/inhab national.			
Daily trips (GC 2001)	21,6 million			
Modal split (GC 2001) ² :				
All modes	PC+taxis: 15,6%	PT: 4,1%	metro+tram: 12,3%	Foot: 32 %
Motorised	PC+taxis : 23%	PT: 59%	metro+tram: 18%	
Change 1998-2001	+21,9%	+0,5%	+12,8 %	-11 %*
Fuel consumption in the transport sector	2001: 2,45 MToe (24,8% of the national total), 1998: 2,02 MToe (23,6% of the national total),			
GHG emissions	2001: 7189 TeqCO ₂ (26 % of the national total), 1998: 5972 TeqCO ₂ (22% of the national total)			

(*)variation due to change in scope of the study.

(2) Central Agency for Population Mobilization and statistics, CAPMAS

Current situation and ongoing dynamics

Walking strongly thwarted

As in most Mediterranean cities, walking is a dominant mode of transport, accounting for almost a third of all daily travel. However, pedestrians face extremely difficult travel conditions. Pedestrian walkways (pavements, pass-ways) are non-existent and not really respected (unregulated parking). As far as driver behaviour but also traffic regulators are concerned, there is no such thing as pedestrian priority. Walking in Cairo's streets is a veritable assault course and may even be genuinely hazardous when major roads need to be crossed. This can but push users to opt for individual and motorised forms of travel when they are in a position so to do.

A mass motorisation underway

Whilst motorised two-wheelers account for only 10% of all vehicles registered in the governorate of Cairo, with almost 4.25 million vehicles (private cars and other vehicles all included), virtually a third of the private vehicles registered in the three governorates of Greater Cairo and almost half of all motorised vehicles in Egypt are on the streets of the Greater Cairo Region.

Since 1973 and the economic opening up of the country in particular, which opened the way for the massive importation of foreign vehicles, registration in the governorate of Cairo has been increasing exponentially. Between 1976 and 2001, the number of vehicles rose in spectacular fashion from about 86,000 cars to some 625,000, in other words a remarkable 727% growth rate over 25 years (i.e. almost 30% per year)!

However, although motorisation rates of 84 veh/1000 inhab.(including taxis), are still rather low compared with other cities around the world, the 2002 Greater Cairo region transport plan foresees that the total number of vehicles is still rising and will reach a total of over 2.5 million vehicles in 2022. Such a concentration can only further aggravate the serious traffic problems in the agglomeration, which is one of the world's worst as far as congestion goes.

A widespread congestion

The Greater Cairo Region generates almost 20 million motorised trips per day and almost 7 million non-motorised ones. Two thirds of all motorised trips are

made by public transport. Indeed, the 2002 Greater Cairo Region transport plan has forecast that by 2022 the number of motorised trips is likely to rise by some 3% every year.

Thus, although there is still a lack of qualitative data on the speed of travel or the frequency of congestion on the roads, it is likely that the current poor urban traffic conditions will deteriorate further, particularly in the main active corridors as the rate of motorisation progressively rises.

The terms of traffic management for the less original (few if any lights and road sign, three lines on two tracks) can exacerbate a situation already difficult.

A road infrastructure network undergoing constant development

In parallel to the growth of the car fleet, 1971-2001 saw the roll-out of some major road infrastructure projects within GC, notably some new bridges over the Nile, numerous viaducts/subways, car tunnels, motorway flyovers, the Ring Road, some garages, large and multi-storey car parks, the extension and relocation of the main bus terminals and Terminal 2 of Cairo international airport in 1985 and the opening of Terminal 3 in early 2009.

The first city in Africa to have a metro...

With the first regional line opened in 1987, which carries over a million passengers every day, and an urban line opened in 2000, which carries 500 000 passengers for a total of 65km, into which considerable public investment has been pumped.

Thus the metro's share in travel within the agglomeration has become significant (17% in 2001) and the some 80 km provided by the 2 metro lines are far-and-away the most efficient form of public transport in Cairo.

The network is run and developed by the Egyptian metro and maintenance company (ECM) under the direct aegis of the Ministry of Transport.

The network is currently being developed. Phases I and II of line 3 are under construction and expected to start operating in 2010 and 2013 respectively. Finally, the launch of feasibility and design studies and the preparation of the documents for the call for tender for Phase III of the same line were recently confirmed.

Globally under-proportioned collective transport supply

Collective urban road transport is provided by one single major public company- the Cairo transport Authority (CTA), a large number of more-or-less informal minibuses companies and a whole host of collective and private taxi owners.

The CTA is a public company with 42,000 employees. It has a fleet of 4,500 vehicles, in other words a ratio of 8-9 employees per vehicle. Moreover, almost 80,000 minibuses and around 60,000 taxis have been registered as operating.

Finally, the suburban train system and tramway, a vestige of the colonial period, has been on a constant downward trend since the 1950s. Run by the CTA, the two tramway systems i.e. the Heliopolis tramway, which mainly serves the residential areas of Heliopolis and Madinat Nasr to the north-east of GC and the tramways on certain lines to the north of Cairo and 15 May City to the south, play only a minor role in urban travel. This network is put to little use compared with other formal modes of transport.

A level of public transport service which is struggling to hold its ground

Over the last ten years passenger numbers on regular bus lines have shown a big drop, falling from almost 40% of modal share to barely over 20% today.

Whilst the opening of the metro may have been instrumental in feeding this decline in use, the inability to maintain a satisfactory level of bus service in terms of both quality and frequency has led to this sizeable decrease in their market share in urban travel.

In parallel to the clear efficiency of the metro, the existing tramways have been partially dismantled, to the extent that what provision still remains now only plays a minor role within the modal split.

The constant growth of unauthorised urban transport supply

The weakness of public bus and tramway transport has allowed informal collective transport systems to develop on a considerable scale, to the extent that « shared taxis» and minibuses alone now represent almost half of all collective transport.

Although the share of buses and minibuses in daily travel all modes included is in constant decline (70% in 1971, 41% in 1987 compared with a mere 22% in 2001) the proportion of daily travel effected by taxi

and collective taxi has been following a steep and regular growth curve, rising from 6% in 1987 to 37% in 2001. Faster and better adapted to market needs (lines/frequencies), the collective taxis have captured a large number of bus users. They also provide better connections with the metro at the stations than do the regular buses.

Thus the current number of taxis can be set at about 60,000, despite a four year moratorium on the issuing of new licences, in other words almost double the number of licences officially granted. The same goes for the minibuses, of which over 80,000 would appear to be operating for a mere 20,000 licences issued.

A public transport network which is struggling to satisfy increased demand

Independent from demographic growth in the central metropolis, the new operating scale of the Cairo metropolis, linked to the processes of urban spread involving the new settlements and active corridors have stretched the capacity of transport networks to meet residents' daily mobility requirements.

The level of provision for the new settlements both internally and externally or between the new settlements themselves appears to be inadequate, as is shown by the scale of specialised transport in the industrial and business zones, or even the emergence of unprecedented informal modes of collective transport (« rickshaw » or « shared taxi » style).

Moreover, the lack of coordination mechanisms (common pricing/organised connections (bus-metro link-ups), integration of formal/informal provision) between the various modes and operators stands in the way of a genuinely attractive global collective transport provision at the level of the Greater Cairo Region.

Mobility, a significant expense for households

There is not enough data to assess what households really pay out for urban mobility. However, the success of the Cairo metro in terms of passenger numbers can be ascribed to particularly favourable prices for several social groups, pupils, students and civil servants.

Yet it is clear that the poorest households can barely access these measures, which presume regular and daily use of collective transport and particularly because they require an advance subscription payment, which is ruled out for the very poorest. The

occasional use of collective transport with individually bought tickets thus becomes very expensive and leads to reverse equalization.

Environmental impact very much present but still difficult to assess

Cairo suffers from a particularly unfavourable geographic configuration (in a basin near the desert) as regards the factors which aggravate air quality (temperature inversion, ozone concentration and particle pollution).

Whilst fuel consumption and greenhouse gas emissions rose 11-fold between 1971 and 2001, efforts to renew the car fleet (taxis) and the opening of the metro over the last 20 years have meant that the increase in gases affecting air quality (NO_x and CO) could be limited to a mere 8 and 6.5 fold over the same period.

However, although per capita greenhouse gas emissions from the transport sector in Cairo are still moderate compared with other global metropolises (220 kg / inhabitant as opposed to 7500 kg / inhabitant for Atlanta, 1400 kg / inhabitant for London, 1100 kg / inhabitant for Paris, 950 kg / inhabitant for Tokyo and 500 kg / inhabitant for Tunis) the question remains as to whether there is any correlation between fuel consumption in the transport sector and greenhouse gas emissions in Cairo.

Thus, the relative share (GC/ national average) of greenhouse gas emissions (26% in 2001 as opposed to 22 % in 1998) would appear to be increasing more rapidly than the relative share of fuel consumption (24.8% in 2001 as compared with 23.6 % in 1998).

It is likely that GC's widespread congestion (and the extremely slow progress of urban organisation and the road network), which is causing a gradual but constant drop in the average speed of motorised travel, is the reason behind this. The logical outcome would be increased specific fuel consumption, hence more greenhouse gas and pollutant emissions.

Strengths and weaknesses

Urban concentration which is encouraging all new modes of mass transport...

Despite the constraints of Cairo's extreme density and particularly the limited slots still available for new infrastructure, the benefits of urban compactness and first and foremost the benefit of proximity of

work and services and home have been recognised for favouring the development of sustainable urban models based on shared infrastructure, starting with collective transport. In principle, the necessary conditions for population concentration are thus already present for a mass urban transport network to be developed.

Nevertheless,

Poorly coordinated, sometimes contradictory public policies

The number of road and motorway infrastructure projects underway as well as the public policies towards consumption and in particular households purchasing and/or being equipped with cars seems to indicate that urban development is gravitating towards models which largely depend on individual motorised mobility, which are notoriously non-sustainable.

However, an ambitious policy for improving the fleet of motorised vehicles both by renewing the taxi fleet and by maintaining private vehicles or buying LPG-powered buses would appear to indicate a dawning awareness of more sustainable development options.

Stresses and opportunities

Two metro lines...

In 2001, almost 2 million trips were recorded each day. In 2008, an average of 2.35 million trips per day was recorded, with a peak of 3 million trips in February 2009.

A third metro line is currently on the drawing-board, attracting funding and attention.

Nevertheless,

...victims of their success

The downside of this significant success will have been the relative abandonment of other collective modes of surface transport.

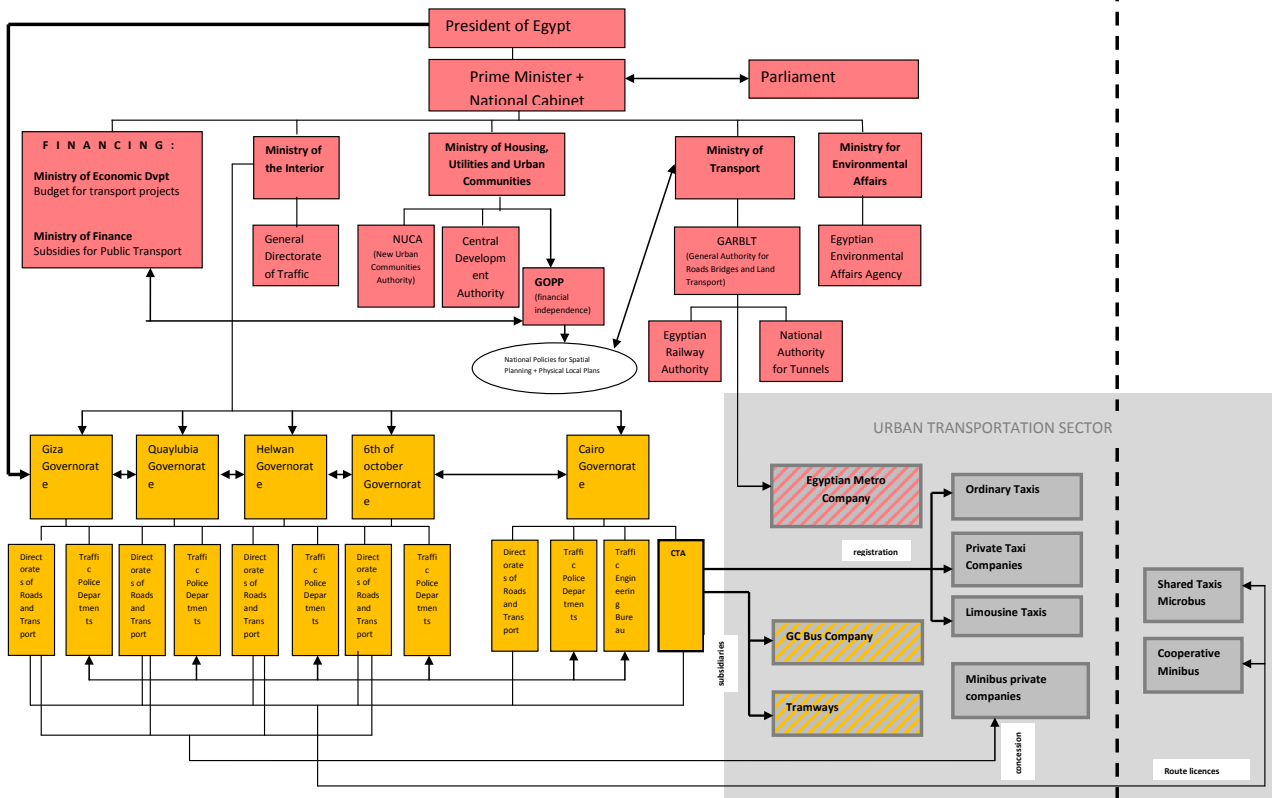
A double paradox has also been observed amongst local players as far as the development of the metro network is concerned:

- It means that the roads can remain dedicated to car traffic, with no change in intermodal options.
- It is feeding a relative lack of interest in other formal and informal collective modes of transport.

Urban mobility governance

Background

The urban mobility governance system



Current situation and ongoing dynamics

« Hyper-centralised » urban governance

Over the last century, the GC system of governance has undergone major change. Initially attached to the Ministry of Public Works, the local level has gradually climbed up the administrative ranks of institutional organisation in Egypt.

The metropolis included five governorates (muhafazat) subdivided into districts (marakaz) and villages (Qura). Each level has a structure of governance which brings together representative councils and representatives of the State. Governors are appointed by the head of State and in turn appoint the members of the executive bodies, district officers and mayors. In addition, almost 90% of local authority income is the result of a State transfer.

Consequently, the Egyptian central government continues to hold predominant local sway over GC's system of governance.

As far as planning and land planning are concerned:

The **General Organization for Physical Planning** (GOPP), set up in 1973 under the aegis of the Ministry for housing, public services and urban communities, controls and coordinates land planning at national and local (urban) level on the basis of a new participatory approach on the part of the competent institutions. In 1982, the government granted it a certain degree of financial autonomy and decided to appoint it as the authority in charge of spatial and programme planning at national and local level. The GOPP is thus responsible for conducting GC's spatial planning studies, although it is not in charge of monitoring and implementation, which remains in the hands of the institutional bodies at national and local level.

The GOPP is also responsible for fostering international cooperation towards GC's urban development. On this front, since 1981 it has notably been acting as the liaison body with the French AIURIF in drawing up the « Strategic urban development plan for the Greater Cairo Region » for 2050, under the UNDP's aegis.

The GOPP recently undertook a participatory planning operation, which should be further consolidated by the forthcoming passing of a law currently being examined by the Egyptian Parliament, which stipulates that the preparation of strategic planning documents at all levels (national, regional, Governorate, town and village) should henceforth involve the active participation of all the institutions concerned.

In order to encourage the decentralisation of the planning process and to build local government capacity, the GOPP recently evolved from its role as project manager of spatial planning exercises to one of contracting authority vis-a-vis private designers. As far as the GC Region is concerned, the GOPP should also act as coordinator, ensuring the participation of the five governorates and key non-institutional players in all the crucial decisions which affect the Region's future spatial development.

The dominant role of the State in urban transport governance

Cairo's transport system depends on both the Ministry of Transport, which is responsible for collective transport, the metro in particular, and the agglomeration's three governorates. Various State bodies are thus involved with urban travel issues:

The High Committee for Greater Cairo Transportation Planning, HC. Established by a Prime Ministerial decree in 2000, the committee is chaired by the minister for transport. This committee is responsible for all transport-related issues in the agglomeration. It supervises the drafting of urban travel planning documents and is presumed to be in charge of updating and monitoring them.

The Transport Planning Authority, TPA has been involved in numerous studies and brain storming sessions regarding urban travel in Cairo and its suburbs, despite the fact that this body is in charge of transport issues at national level.

The Egypt National Institute of Transport, ENIT provides continuous and post-graduate training in transport planning, engineering and economics. The Institute has conducted various studies on the Cairo

metro and has a resource centre for transport in Egypt. Finally, it participates in the High Committee for Greater Cairo Transportation Planning.

The National Authority for Tunnels, NAT is in charge of the planning and design of metros and underground works. As such, it played an active role in the drawing up of the 2000 Cairo travel plan.

The Cairo Metro Organisation, CMO is a spin-off from the Egyptian National Railways and was established in 2001. This body is in charge of the planning, implementation and running of the city's metro network.

The Cairo Transport Authority (CTA) is a major public company, which has a monopoly on collective urban road transport.

Finally, the **Egyptian National Railways, ENR** are involved with the planning, implementation and management of the railway lines within the Cairo agglomeration.

Strengths and weaknesses

A large number of local bodies involved

Since 1960, Greater Cairo comprised three governorates: the governorate of Cairo, the urban northern part of the governorate of Guizeh and the urban part in the south of the governorate of Qalubia. In 2008 these boundaries were extended by taking in the governorates of Helwan and 6th October in order to take account of the reality of urban sprawl. However, the major increase in the number of local authorities directly involved in policy shaping has not been reflected in any corresponding legislative developments.

Because of the responsibility it holds over the Traffic Engineering Bureau (CTEB) and the (CTA), the governorate of Cairo has de facto assumed the leadership of urban transport management for the metropolis. However, the metropolis's new scale of operations makes it particularly difficult to grasp current dynamics, particularly since the data and statistics currently available take no account of the area encircled by the Ring Road.

Finally, the very large number of private operators involved in GC's urban transport (minibuses, collective and yellow taxis and shared service informal minibuses) further complicates any attempt at coordination.

Confusion in competences distribution

The large number of national, regional and local authorities involved in urban transport planning and management in the metropolis of Cairo means that competence is to a certain extent juxtaposed between the various bodies and that there is thus real overlapping between the local and national bodies.

By way of example, five traffic police services from each governorate and the Directorate general for traffic, which comes under the ministry of the interior, are responsible for traffic management and the traffic police on intermingled networks (sections of national roads crossing GC territory).

In the case of the Ring Road, the Ministry for housing, public services and the urban communities is in charge of raised motorway construction, whilst management is provided under the direct aegis of the General Authority for Roads, Bridges and Land Transport (GARBLT), a body which answers to the Ministry for Transport..

Stresses and opportunities

Exacerbated institutional competition

The effects of competition between the ministerial players in charge of the design and supervision of major transport projects can be clearly seen in the fact that the Ministry for Economic Development alone allocates funds for transport, whilst the Ministry of Finance is responsible for subsidies to public transport. This is manifestly the case between the Ministry for housing, public services and the urban communities and the Ministry of Transport.

A lack of resources allocated compare to the needs of a megalopolis of this size

A recent World Bank study showed that over the last ten years the Cairo metropolis had devoted only 100 M\$ per year on average to the financing of transport infrastructure, a tiny fraction in other words of the investment needed by an agglomeration of this size.

An increased awareness about improving the system of governance

Since 1987, many projects have been initiated towards shaping a public transport coordination body for Greater Cairo. Although it is still highly unlikely that any such body will be set up, fresh efforts were recently made with the creation of a committee mandated to propose the means for coordinating GC transport. This would seem to indicate the great importance being attached to the key issue of improving the urban transport governance system.

Nevertheless,

Lessons and prospects

Cairo is one of the biggest cities in the world. Despite the large amount of work which has been put into collating the data, the size and complexity of this metropolitan system requires more in-depth analysis on many counts, drawing in particular on more complete and up-to-date statistical data on a larger scale.

However, certain lessons can still be established

Saturation of the Cairo metropolis

Density is not enough to encourage urban mobility and sustainable urban development! The levels of congestion and air pollution observed in Cairo have a particular impact on the attractiveness of the centre of the metropolis. This would appear to be a not-insignificant factor driving the urban unravelling currently underway.

The megalopolis is spreading on the basis of non-sustainable modes of consumption

The urban models which have been favoured, notably in the most recent urban extension operations have consumed large swathes of fragile, limited land (farming areas in the Nile delta) as well as large amounts of energy and natural resources (water and air).

Precious little account taken of the environmental and social impact of transport

Although a network of 14 automatic stations, which has been in operation since 1999, allows a daily report to be published on air quality in GC, the information collected does not appear to be taken account of in the major public policy choices on urban development in the Cairo metropolis. There is manifestly a lack of knowledge or cross-analysis of data on accidents (pedestrians)/public health (respiratory disease)/climate (greenhouse gas emissions). Similarly, travel speeds and the frequency of congestion still need to be assessed in order to fill in the knowledge gaps and further understanding of the metropolitan urban system.

and key messages

Accepting the new metropolitan scale

Including some new settlements within the boundaries of daily mobility is crucial to the understanding of current dynamics, both for establishing knowledge (essential for the drawing up of ad hoc public policy) and for introducing governance mechanisms for the planning and management of metropolitan systems.

Revising the urban models whose implementation is being sought

In the light of unavoidable climate change and the need to review our modes of consumption and production, Las Vegas is no longer an example to be followed....

It is essential to factor the environmental and social impact (and particularly its financial and social consequences) into decision-taking if sustainable urban development is to be achieved.

Providing global and integrated collective transport supply for the metropolis

Paying too much attention to one or other mode of transport will not allow the demand for mobility of the captive residents of this gigantic metropolis to be met. Providing integrated and coordinated transport is still a challenge given the delays which have been built up in comparison with other metropolises of an equivalent size. Taking account of foot transport and the creation of connection hubs (with the associated mechanisms to encourage genuine inter-modality) when public areas are developed, or integrating non-professional and informal modes of transport into global provision should all be encouraged.

Faced with this state of affairs, the need to encourage the pragmatic approach

Doing what works!

Urban mobility in Istanbul: trends and prospects

This document was drawn up by Sylvain Houpin, on the basis of:

- The report drawn up by Haluk Gerçek from Istanbul Technical University and Orhan Demir from Plan Ofis
- The summary report from the handover workshop held on 27th June 2008 at Istanbul Technical University, drawn up by Philippe Vallouis
- Research conducted by Cecilia Rubiolo, Masters student at Science Po, Paris, on a Blue Plan placement
- An additional bibliographic search emerging from previous Plan Bleu work.



Introduction

The Istanbul metropolis is a vast urban-influenced area which spreads along both sides of the Bosphorus, the Black Sea coasts to the north and those of the Sea of Marmara to the south.

Its symbolic situation is particularly remarkable due to:

- Its strategic dimension as a gate to Europe between East and West.
- The range of influences to which the city has been submitted in the course of history.
- The geographic constraints stemming from the fact that it straddles two shores.

With more than 12 million inhabitants straddling Europe and Asia, the metropolis is Turkey's economic driving force. As far as urban transport is concerned, road and individual modes of transport predominate.

As a result, Istanbul suffers near-permanent congestion on its urban road network, which has a considerable impact on the demand for motorised travel.

As such, the general level of accessibility in the metropolis is clearly at risk, with major consequences expected in terms of economic competitiveness and socio-spatial fragmentation...

Travel demand

Available indicators

Basic travel demand data

Population	12,600,000 inhab. (2007) (17.8 % national pop)		
Annual growth rate	3.3% (2000-2007) compared with 1.26 % national ¹⁾		
Surface area	5390 km² (32 districts 2007) (national surface area: 815,000 km ²)		
Density	2338 inhab/km² , 234 inhab/ha (2007) (with densities of 4,420 inhab/ha in the most urban areas)		
Employment	3,862,821 (2006) (some 16.5% « national employed» active pop ⁴⁾)		
Reasons for motorised travel (2006, 38 districts) ²⁾	Work : 43.5%	School: 15%	Domestic: 29.5% Other: 11.9%
Average number of trips/inhab/day	1.79 trips/person/day (2006, 32 districts) (21 M trips/day of which 10.6 M motorised trips ²⁾),		
Average distance covered (2006) ³⁾	total: 7.2 km	motorised: 11.2 km	walking on foot: 3.6 km
Temps de parcours (2006) ³⁾	total: 32.2 mn	motorised: 49 mn	walking on foot: 16 mn
Change in duration of trip 1996-2006 ³⁾	total: -2,1 mn	motorised: +8,2 mn	walking on foot: -6 mn

(1) source: OECD

(2) The share of districts in addition to the area under study is negligible (2% of the population and 2.3% of total motorised trips).

(3) source: Household travel Survey, Istanbul Metropolitan Planning and urban design center (IMP) 2006.

(4) source: www.cia.gov/library/publications/the-world-factbook/geos/tu.html

Current situation and ongoing dynamics

A strong demographic growth

Between the 50s and the 90s, Turkey experienced an instable political climate, which encouraged the uncontrolled growth of Istanbul: in thirty years, the city's population tripled. Over the 80s, flows hit record levels of more than 200,000 people per annum.

The high levels of migration which marked urban growth made Istanbul the country's population capital. Since 2000, population growth is estimated at 3.3% (compared with a record annual rate of 14% in the 80s). This is still the highest level in Turkey and the metropolitan regions of the OECD states.

In 2000, Istanbul represented 14.8% of the Turkish population. By 2015, it is likely to reach 16,077,864 inhabitants and 22,037,990 in 2025. (IMM, 2006).

A spontaneous and uncontrolled urban development

Istanbul was faced with a rapid influx of immigrants over a relatively short period of time. Generally speaking, urban development did not benefit from any real land planning or checks on land use. Only some « emergency » measures marked by a lack of coordination and consultation with the players were taken here and there on a more local level.

Almost 50% of the population lives in sprawling areas of unplanned shanty housing. Water reserves and forest areas are at risk, the Bosphorus is deemed to be one of the world's potentially most dangerous rivers, and the recent public transport systems (tramways, light metros and metros) still do not have sufficient capacity to relieve the serious metropolitan congestion.

These uncontrolled centrifugal dynamics, which make it difficult to contain urban sprawl and to provide the inhabitants with essential urban services, are threatening Istanbul's sustainability, in terms of both her natural environment and her social cohesion.

An on-going decentralisation of industrial activities

The decentralisation of industrial activities was first envisaged back in 1937 in an initial land planning document for Istanbul, which was drawn up by Henri Prost, a French town planner and architect.

This document proposed that industry should be moved away from the historic peninsula to outside the walls of the old city. Initially located on the banks of the Golden Horn because of the possibilities of access to maritime transport, industrial activity gradually started to be transferred as of the 1950s, gaining momentum as of 1960.

On its new site, industry was more readily able to find the manpower needed for its development, particularly by absorbing the newcomers brought in by the major migratory flows from the countryside to the cities which began during the same period.

The new immigrants set up in the gaps between the city walls and the industrial areas, in the absence of any sort of planning. These « squatter » developments, known as « gecekondu » were particularly evident in Zeytinburnu and Taşlıtarla. Industry continued to expand towards the outskirts of the city until 1970, inexorably followed by its corollary of neighbouring areas of shanty housing.

Given the constant nature and extremely rapid nature of these dynamics, the Istanbul Metropolitan Municipality (IMM) proved unable to pre-empt or control these processes.

A concentration of commercial activity

The coastal area both along the Sea of Marmara and along the Bosphorus is nowadays mainly taken up by residential zones. The historic peninsula and the inland hinterland areas are a mix of residential and commercial functions, even within one single building. Istanbul's central business district (CBD), which was originally located around Eminönü, now runs along the Sisli - Zincirlikuyu axis and Maslak Büyükdere Street.

Although there is still plenty of traditional craft production along this street, the property left behind by the manufacturing industry has now been taken over by high-rise business centres, which generate considerable daily demand for transport at certain times of the day.

A gradual convergence of urbanisation on the two banks

Under strict constraints as a result of its geography and topography (very hilly, split by the Bosphorus Strait linked to the Sea of Marmara), the city has a unique urban structure, which is shared between the

two banks of Europe and Anatolia and combines both historic quarters and new urban areas.

Until the late 60s, Istanbul retained the features of a seaside city. She then developed on a more linear pattern from the southern part and around the Sea of Marmara over more than 65km from Silivri to Gebze.

With the construction of the first bridge over the Bosphorus in 1974 and the decentralisation of industrial and commercial services, the Istanbul peninsula, the historic heart of the city, lost its role as an urban hyper-centre, particularly as of the 80s. The new settlements formed at the periphery have moved the boundaries of the city, westwards, eastwards and northwards.

The bridge over the Bosphorus had a determining impact on the population distribution between the two parts of the city. In 1965, almost 80% of the population was living on Istanbul's European shore. In five years this dropped to 76% and in 10 years to 73%.

The emergence of a polycentric metropolis

Much investment was pumped into the organised industrial zones (OIZ) which have sprung up throughout the country but particularly in the region of Marmara. Within this context, provinces such as Kocaeli, Bursa and others in the Marmara region adjoining Istanbul attracted a considerable number of factories, which rapidly increased their production.

Thus over the last thirty years, the Macro-form of the city has changed considerably, evolving from an agglomeration which was highly centralised around its historic peninsula into a world ranking multi-polar metropolis spread over the two shores of the Bosphorus and with a certain number of secondary centres such as Bakırköy, Bağcılar and Büyükçekmece in the European part and Kadıköy, Üsküdar and Kozyatağı in the Anatolian part. This has only served to drive demand for daily travel.

However these new poles as well as the more residential areas nearby are still heavily car-dependant and are thus contributing to a considerable increase in the virtually constant congestion on the Metropolis's road network

Strengths and weaknesses

Considerable urban sprawl, bringing major pressure to bear on the natural environment

Istanbul's strategic position, its specific geographic features and the predominance of extensive urban development which is heavily dependent on fossil energy clearly accentuates environmental pressures: Controlling airborne particles and carbon gas emissions but also protecting the forests to the north of the city and water reserves which are being challenged by urban sprawl and the development of road infrastructure in shaping the transport network.

Such current trends along with a gradual dawning of awareness amongst the population about these issues are focusing the various points of opposition raised by the possibility of a third bridge being constructed to the north of the city, calling for environmental constraints to be better factored into transport-related decisions.

Nevertheless,

Uncoupled Job/home, increasing daily travel

More expensive property, traffic congestion and increasing social pressure against industrial pollution (air, water, noise pollution and others) are driving the decentralisation of factories away from the heavy density of urban agglomerations.

However, the consequences of these job dispersal dynamics and their impact on daily home-work mobility are difficult to objectify. Job data is particularly difficult to collect given its sectoral structure and the fact that responsibility for its collection is shared between various bodies- consular chambers, governorates, etc... Moreover, in certain sectors of activity it is estimated that about a third of the current population is employed in so-called informal activities and are therefore not covered by any real headcount.

Total employment within the Istanbul metropolis was estimated at 3.862.821 in 2006. Mean job density in 2006 was estimated at 717 employees per km², with densities rising to almost 33.797 employees per km² in the European part of the city.

However, although job distribution estimates are usually established using travel data relating to the sites where economic activity is concentrated, the double process of urban sprawl and the manifest dispersal of activity can but generate a multiplication and extension of daily home-work travel throughout the metropolis.

Stresses and opportunities

Urban accessibility under threat

Istanbul has a relatively low mobility rate. The marked car dependency, limited alternative options (train and river-maritime) as well as the level of congestion on the urban road network with the ensuing consequences in terms of longer journey times, considerably affects the demand for motorised travel. According to the demand forecast conducted by the JICA on the basis of a “no roads and no transport project” scenario (do nothing), the percentage of cars could well have tripled by 2023 (JICA, IMM 2007).

From this point of view, it is the metropolis’s general level of accessibility which is clearly threatened, with major consequences expected in terms of economic competitiveness and socio-spatial fragmentation...

Nevertheless,

A rapidly expanding metropolis turned to economic globalization

Over the years Istanbul has become an industrial and business city in marked contrast to its image as a historic, cultural and tourist centre. However, although the manufacturing industry is still a leading sector as far as Istanbul’s economic development is concerned, over recent years industry’s contribution to Istanbul’s GDP has been in constant decline to the benefit of services, financial and business activity, altering the economic structure within Istanbul’s urban environment.

Istanbul has now become Turkey’s leading city, providing more financial, business, industrial, cultural and educational services than the other cities in the land. Between 1990 and 2004, Istanbul produced 21% to 22.7% of Turkey’s annual GDP.

The metropolis is fully caught up in the globalisation of economic trade, and shows all the characteristics of a world-class metropolis. The demands of its population but also the companies which set up and/or develop there in terms of urban services (essential services and urban transport) match the city’s level of development.

It is no longer possible to be satisfied with an urban transportation supply inherited from the past without compromising the metropolis’s future development, and it is clear that an enabling environment for the introduction of innovative mechanisms (curbing

car’s use within the city, coordinating the public transportation supply, introducing urban tolls) towards more sustainable mobility is now in place.

Transportation supply

Available indicators

Transportation supply in few figures

Vehicle fleet (2007):	1,700,000 private cars / 26.4% of the national fleet				
Motorisation rate (2007):	134 veh/1000 inhab , 91 veh/1000 national.				
Daily trips (2001):	21 millions				
Modal split (2006, 38 districts) :					
Motorised:	PC: 26.3%	Taxis ¹ : 4.8%	PT ² : 62.3%	Rail : 4.6 %	River-maritime: 2%
Change 1987-2006:	+36.3%	-53%	-3,5%	+21,5%	-4,8%
GHG emissions:	2007: 8.9 MT eqCO ₂ (21% of the national total) ³ , 1990: 6.5 MT eqCO ₂ (23.4 % of the national total) ³				
Fuel consumption :	2007: 2.86 MToe (20.8 % of the national total) ³ , 1990: 2.06 MToe (22% of the national total) ³				

(1) including Dolmus

(2) Public bus and specialised transport

(3) Plan Bleu estimates

Current situation and ongoing dynamics

A road network involved in almost all daily trips

As a result of public policies clearly in favour of road based mobility, the road network nowadays hosts almost 90% of daily trips (cars and public transport).

Increasing road capacity has mostly tended to be the chosen to response to the growing number of motorised vehicles. The ensuing road infrastructure (multi-lane highways, flyovers, complex junctions) was built in an attempt to solve the growing congestion problem.

Consequently, the additional capacity provided by this road investment at the same time also facilitated the rapid growth in the use of private cars according to the vicious circle rationale so familiar in developed countries.

An extremely fast development of the car fleet

Over the last few years, Istanbul has witnessed a major and rapid increase in the number of car owners as a result of population growth and economic development. Rising from 200,000 in 1980 to 1.7 million in 2007, the number of cars has increased the number of cars increased dramatically.

Private cars, which represent 26.3% of the total number of daily trips, create serious traffic congestion and environmental pollution problems in the urban centre. However, compared with the metropolises in developed countries, Istanbul's motorisation rate is still low.

Varied and relatively efficient public transport supply

Istanbul is served by a relatively efficient public transport system, which is generally well managed

and is constantly being upgraded. A variety of rail transport systems (light metro, tram, suburban train, metro) is used with an electronic ticketing system (Akbil), which permits connections within the public transport network (bus, ferries and trans-European rail transport system).

Buses and mini-buses (including the «dolmuş» which operate on certain routes) make up the main body of the public transport network: 591 bus routes and 123 minibus routes provide a service for over 4.5 million passengers on a network of 6,100 kilometres. The vast public bus network numbers almost 4,222 buses, 2,858 of which are run by the IETT public company and 1,347 by private operators

A clearly inadequate rail network

Istanbul has a metro (8.5km), a light metro (19.3 km), three tramways (32km), two funiculars (1.2km), two “historic” tramways (4.2 km), suburban railways (72 km), and two funiculars (0.9 km) with a total rail network of 138 km.

This is reflected in rail’s low share in trips, which has remained stable over the last two decades (4%) and well below the levels noted in other metropolises of comparable size.

Contrary to what was recently the case (1983-2000), a series of major investments are now planned to extend the urban rail network to 265 km by 2013. However, given in particular the investment costs and the difficulties of insertion, most future investment is targeting the development of regional rail provision beyond the limits of the metropolitan area.

The proliferation of specialized and artisanal transportation modes

With the spread of the metropolitan area and whilst the national IETT bus company cannot make the necessary investment, service to the often poorly-off people has grown up around the entrepreneurial model. Cooperatives of minibuses and other small capacity vehicles such as « Dolmus », or collective taxis, have emerged to serve the new urban suburbs.

Moreover, employers and educational establishments contact servis companies directly regarding the transport of their employees and students.

Maritime transport poorly integrated within the global transportation supply

Straddling the two banks of the Bosphorus, maritime transport is an integral factor of urban mobility in Istanbul. Two public shipping companies provide a service in this sector- IDO under the aegis of the IMM and TDI, the national company.

Even if they represent only a small share of daily trip, « informal dynamics » do not spare maritime modes of transport: the « motor » or « sea dolmus » are concentrated on the most profitable Bosphorus crossings to supplement the fleet of « vapur », the TDI national company’s boats, which do not offer the same frequency despite their greater service capacity.

It is clear that there is a lack of public intervention regarding the terminals- transport modes seem to spontaneously link up one with another, in order to optimise passenger pick ups. Even now, the terminals often tend to be poorly equipped, devoid of information or even unsuitable for user transfers or waiting.

Poor integration of the various modes and urban transport networks

The integration to the global transportation supply of the various modes operating within in the city is very low both in terms of pricing as spatial interfaces.

As far as the inter-connection between the various networks and transportation modes is concerned, although there are some efficient points of connection between the different modes, they would appear to emerge spontaneously rather than through the will or action of the public authorities. Thus where they do actually exist, these informal transfer hubs do not have suitable provision for parking, pedestrian zones or even sign-posting.

Moreover, the type of services offered as well as the scope for the intervention of both public and private operators are clearly separate and poorly connected with each other- most of the institutional modes are in the centre, whilst the private ones tend to operate more in the outskirts. Finally, there is no real global approach to the planning of an “intermodal network” or “masterplan” for urban transport in Istanbul, rather a network by network based approach.

It would appear, however, that with the development of recent rail system projects, the metropolitan municipality is striving to set up initial, indispensable intermodal platforms as a first step towards viable alternative provision as opposed to private cars.

As far as pricing is concerned, it should be noted that, thanks to market concentration encouraged by the merger between TDI and the IDO companies, a single pricing system has recently been established with a subscription price of 85YTL/month (about €50) which allows unlimited use of boats, buses and the metro- the « Mavikart » .

Some major environmental impact probably expected

Despite the lack of precise, reliable data as regards the monitoring of air quality and greenhouse gas emissions, it is estimated that the volume of CO₂ emissions from road transport in Istanbul grew by 37% between 1990 and 2007, rising from 6.5 million tonnes to 8.9 million tonnes per year.

Moreover, car use can be seen as the main cause of air pollution, particularly due to the obsolescence of a large part of the car fleet and its disproportionate contribution as far as particle and also greenhouse gas emissions are concerned.

Over the last decade, the extension of the urban rail transit network, the rise in the number of vehicles using lead-free petrol equipped with catalytic converters and taxis running on LPG (liquid petroleum gas) have led to a drop in the emissions caused by road use.

Despite this gradual improvement in the most recent part of the car fleet, however, particularly through the adoption of European standards (lead-free petrol and catalytic converters) and the spread of LPG, the growth of the fleet has stood in the way of any clear, noticeable improvement in air quality (SO₂ and particles) and the curbing of greenhouse gas emissions.

Strengths and weaknesses

An almost constant congestion ...

Whatever the reasons for travel, the average motorised travel distance has dropped over the last ten years. At the same time there has been a relative increase in trip duration and a relative rise in walking.

There are two main reasons for this- the city's polycentric development along with the gradual decentralisation of a certain number of activities and services to secondary centres, but particularly the virtually permanent round-the-clock congestion on most of the major roads.

Public transport supply, unable to keep up with the rapid increase of travel demand

Istanbul's public transport system has not been able to keep up with the rapid rate of growth of the urban structure. The local authorities have been trapped by the pressure of urbanisation whilst being unable to free up sufficient funding to respond to this effusive growth.

Over the last decade, the proportion of private cars involved in daily trip rose from 19.3% to 26.3%, with the proportion of taxis and « Dolmus » (collective taxis) falling from 9.4% to 4.8% over the same period, clearly illustrating a decline in the attractiveness of public transport.

However, the Istanbul metropolitan metropolis would appear to be moving towards an improvement of its public transport system and has kicked off with some rail transport projects.

Neglected soft modes

Dedicated facilities for non motorised modes of transport (cycle lanes and pedestrian walkways) are practically non-existent along the road network. These soft modes have been largely ignored by Istanbul's central and local level political decision-makers.

Nevertheless,

The introduction of pro-active traffic management measures

The IMM is starting to roll-out a certain number of measures towards policies aimed at intelligent traffic management, such as urban tolls, road charging and the electronic monitoring of traffic flows.

Since early 2006, the city has been working on the introduction of an integrated traffic management charging system along the lines of congestion charging, such as exists in Singapore and London. Istanbul is thus set to be divided into three main traffic zones, to which different tariffs will apply as of 2013.

These efforts should be viewed in a positive light. It should, however, be stressed that the introduction of these specific and binding car traffic measures in the city centre, where there are currently very few viable public transport alternatives, could in the short term trigger a not insignificant rise in the cost of transport for the poorest households and thus constitute genuine urban discrimination...

Stresses and opportunities

Major geographical constraints

Istanbul's particular geographic situation straddling the two banks of the Bosphorus, -already very hilly in themselves- brings with it some very real constraints for planners, particularly in terms of the ensuing cost for transport infrastructure. It has thus been estimated that every metre of road there costs around 25 to 30,000\$ (Surasi, 2002))

Istanbul's European side is currently linked to the rest of the country by two bridges and their motorway ring roads, as well as a set of maritime links. In 2009, the Marmaray project- the rail tunnel currently under construction- should be completed in order to connect the two existing suburban railway lines. For the time being, this rail link is targeting Istanbul's everyday mobility as a priority.

Moreover, the steep slopes produced by Istanbul's hilly contours act as major natural constraints on railway construction, which requires inclines of less than 5% and a radius of curvature of at least 300 m. Consequently, many types of systems such as cable-cars and funiculars have been constructed and contribute to the general provision of urban transport.

Nevertheless,

A positive influence from the prospect of joining the European Union

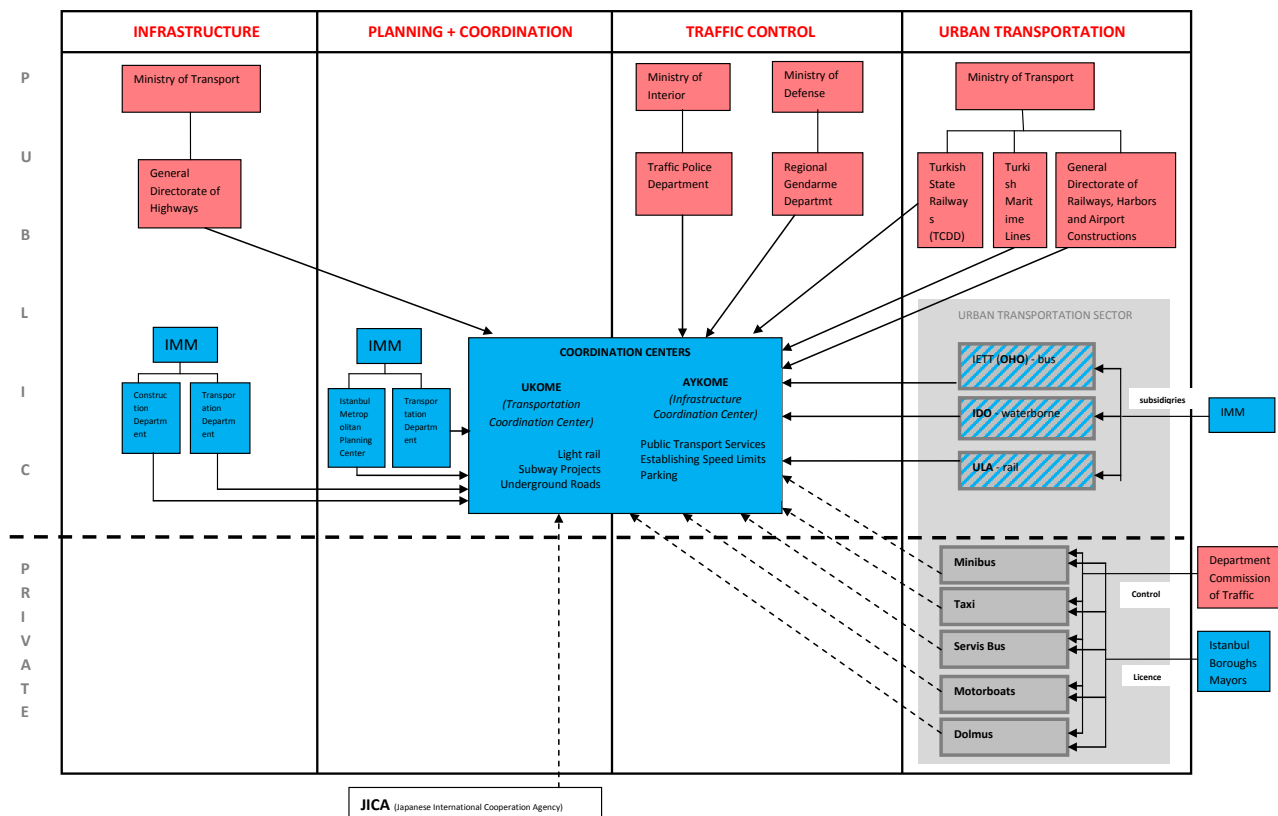
The car industry in Turkey has to a great extent adopted the EU's technical regulations regarding vehicles. The measures taken over the past decade to decrease pollution caused by industry and heating have had a significant effect, particularly in the major agglomerations. The spread in the use of natural gas has made a significant contribution towards reducing air pollution caused by residential heating. From 100 ug/m³ in 1995, SO₂ levels in Istanbul had fallen to 18 ug/m³ by 2006.

This has in all likelihood been instrumental in raising public awareness about the issue of air quality. These changes have had a largely positive effect on reducing emissions from transport.

Urban mobility governance

Available indicators

Institutional diagram of the urban mobility governance system



Current situation and ongoing dynamics

An institutional extension process... which is tending to track urban spread dynamics

Between 1950 and 2007 the number of districts doubled, rising from 16 to 32. Istanbul now comprises 32 districts, 73 municipalities, 151 villages and 805 neighbourhoods... Since July 2004 its administrative boundaries have been changed and increased by 1 830,92 km² to 5 343.01km², thus covering virtually the entire province. This new area, which takes account of the operational level of the territory, particularly from an economic point of view, opens the way for more relevant and effective approaches.

The Istanbul metropolitan municipality (IMM) shares the administration of this extended area with 73 lower-ranking authorities- 32 provincial sub-municipalities and 41 first level ones. Istanbul

metropolitan municipal council is the decision-taking body within the IMM. It comprises the mayor of the metropolis, 73 elected councillors from the 32 district municipalities and the 41 provincial ones, along with a further 274 members from the same authorities.

This institutional adjustment process is still on-going, as since April 2008 the Istanbul metropolis has grown from 32 to 38 district...

A real metropolitan entity organising urban transport

The IMM, the Istanbul Metropolitan Municipality, is the body responsible for organising urban transport. It has within itself or is responsible for a range of other bodies involved with land planning, real estate management, transport and traffic regulation within the agglomeration.

With a workforce of almost 50 000, planning and urban transport employ a large number of workers. Some of the main bodies are:

The Department of Transportation (DOT), which is the official IMM unit responsible for transport at metropolitan level. It comprises six directorates in charge of Transport Planning, Transport coordination, Public Transport Services, Rail Systems, Traffic Management and Road Maintenance.

Its responsibilities include taking decisions on strategic transport-related issues, developing plans and projects, and integrating projects and programmes which are implemented by units or companies attached to the municipality.

Transport related issues are the job of the Ministry of Transport, which is headed by the deputy secretary general for transport.

The Istanbul Directorate General for Electricity, Tramway and Tunnel (IETT) is one of the oldest IMM companies in the transport sector. Whilst its role has evolved considerably over the years, it is now in charge of wheeled transport, mainly comprising a fleet of 2,500 buses. In 2005, this fleet allowed some 476 million passengers to be transported, in other words almost 5 % of the market share for all urban transport in Istanbul, which represents about 65% of Istanbul's public transport.

The Istanbul Transport Corporation (Ulaşım A.Ş.) Ulaşım A.Ş. was set up in 1988 in order to manage and run the rail transport system, under the guidance of the IMM which retained ownership of the network.

The Istanbul Metropolitan Planning and Urban Design Centre (IMP) was set up in 2005 to support the IMM in drawing up urban strategies and with its operational planning. This body, which assists in decision-taking, comprises over 400 urban planning professionals and university professors from the key urban development fields, including in particular real estate management, transport planning and town planning.

The city's geographical features mean that the IMM is in charge of coordinating a wide variety of modes of transport- metro, light railway, tram, funicular, cable car, bus and river-maritime transport. It has a coordination centre (UKOME and AYKOME), the aim of which is to ensure consistency between its various services and private operators.

It controls the lion's share of public transport provision through its own companies (IETT - bus, IDO, Ulaşım AS – urban railway), which are responsible for all the stages of production of their services.

The State is still a key actor in urban transport governance

Road transport and traffic regulation involve more than 10 ministries and central authorities. The various ministries and central administrations concerned with urban transport also include the TDI (Turkish shipping lines), the TCDD (Turkish State Railways) and the «Directorate General for railway, port and airport construction» (DLH) linked to the ministry of transport. As such, the Marmaray project and the project to build the third bridge over the Bosphorus are managed by these central bodies amongst others.

However, since 2004, competence is gradually being transferred in Turkey from the central bodies towards the local authorities. As far as urban transport is concerned, the result of this has been the transfer of the TCDD's rail infrastructure (Railways of the Turkish Republic) to the Istanbul metropolitan municipality. Similarly, the TDI (Turkish shipping line) has transferred part of its fleet to the IDO (Mixed economy municipal maritime transport company)

A body dedicated to coordinating urban transport

In the wake of a 2004 law, an urban transport coordination body was set up, and placed under the IMM's aegis.

The Transport Coordination Centre (UKOME) is the authority within the IMM which aims to coordinate the transport sector with all the authorities and bodies involved with issues of infrastructure planning, programmes and projects, mainly the public services such as water supply, sewage and electricity systems and telecommunications.

The UKOME is a technical decision-taking body, which brings together public operators and those responsible for traffic control and infrastructure. The private operators, in other words the taxis, dolmus, servis and minibuses only enjoy observer status and are only represented there by their respective consular chambers.

However, the UKOME's decisions are nonetheless instrumental in regulating the activities of the private operators, particularly as far as pricing and itineraries are concerned, as for all modes of transport.

This coordination structure is supplemented by the **Infrastructure Coordination Centre (AYKOME)**, which was also set up in 2004 and is responsible for coordinating the rail and underground networks (light railway, the metro and underground road projects). Its role and responsibilities are similar to those of the UKOME.

Strengths and weaknesses

A competences distribution sometimes still confused

Whilst the IMM is the authority responsible for organising urban transport, virtually all the institutional levels (national, regional and local) are to a greater or lesser extent involved in the urban development of the Istanbul metropolitan region.

Its competences overlap with the Departmental Commission for Traffic, giving rise to conflict between these two institutions and a lack of coordination.

Thus through the Departmental Commission for Traffic, the department is also competent for road transport (servis, minibuses, dolmus). It issues licences for operators transporting people. It is responsible for dolmus and minibus itineraries, organised within the chambers for the self-employed

The programming and management of the road and rail infrastructure involve public State organisations:

- TCDD, the national rail company, attached to the ministry of transport's port and railways division (DLH), owns and operates Istanbul's suburban rail links
- The regional directorate for road operation and maintenance (TCK), including the two Bosphorus bridges, which also comes under the ministry of transport.

Finally, as previously mentioned, the Ministry of Transport (MT) plays a key role in the urban transport sector (road and river-sea transport infrastructure).

Nevertheless,

A coordination deficit despite the existence of dedicated bodies

In the study conducted by the first urban transport Council in 2002, almost 17 bodies (local and national authorities) were identified as being totally or partly responsible for transport planning, investment, operation and management in Istanbul.

The large number of stakeholders involved in urban transport planning and operations makes for exceedingly difficult coordination of all of their activities.

Despite the existence of dedicated bodies (UKOME and AYKOME), it is clear that there is a divergence of intervention strategy and a lack of coordination between the governmental departments and the municipal agencies in particular, which could partly be one of the main reasons why Istanbul's transport system is still not efficient enough.

Stresses and opportunities

Some bases for an efficient urban governance

Unusually for a Mediterranean city, urban transport planning and management is provided by a single authority, and at metropolitan level, to boot. However, the fragmentation of decision-making within the institutions means that strategic planning processes are not really efficient, due to a clear coordination deficit between the players. Mechanisms for establishing more effective coordination between ministries and more rationalised decision taking remain to be developed.

Nevertheless,

Virtuous public policy despite still quite fragmented territorial planning

Although there is not really one single authority for preparing planning exercises on a wide scale, for some time now the metropolis has been overhauling its planning and public policy integration exercises:

- In 2006 the drawing up of zoning plans on a 1/100.000 scale, which initially fell within the remit of the Ministry of the Environment, was transferred to the IMM.
- The zoning plans on a 1/50.000 scale remain under the aegis of the Ministry for Public Works
- Zoning plans on a 1/25.000, 1/5000 and 1/1000 scale are the responsibility of the Metropolitan Municipality itself or as a coordinator of the lower echelons.

Thus in July 2006, the « Land Management Plan» (1 / 100 000 scale) was finalised and approved by Istanbul municipal council. At the same time, an Istanbul Transport Master Plan 2023 is being drawn up in conjunction with the Japanese cooperation agency, JICA. These two plans would appear to confirm the current trend towards sustainable investment in the urban railway system.

Thus, although new concepts are starting to appear in the planning processes towards sustainable urban development, such as urban regeneration, taking account of the earthquake hazard, environmental impact or even curbing road traffic and reducing car dependency, efforts still need to be made towards the full integration of land and transport planning.

Lessons and prospects

Along with Cairo, Istanbul is far and away one of the two largest cities in the Mediterranean. Although the scale and complexity of this metropolitan system would no doubt require more in-depth analysis, certain lessons can already be drawn from it :

Bases of a real urban governance exist, but still appears to be inefficient enough

Unlike most Mediterranean cities, Istanbul has one single body for organising transport. Through institutional adaptation (constant extension of the IMM's boundaries), the new metropolitan scale has clearly been taken into account.

Urban infrastructure which do not follow the explosion in demand for mobility

The Istanbul Metropolitan Municipality has taken many steps in response to current and future demand for urban mobility. Apart from a few measures towards improving the management of the transport networks, since 2004 almost 103 infrastructure projects have been implemented to an investment tune of some 1.1 billion YTL. The prospect of a third road bridge over the Bosphorus is currently being discussed with the backing of the Japanese International Cooperation Agency (JICA) and the proposal for a second tunnel under the Bosphorus was accepted by the Turkish Grand National Assembly in 2006.

However, all these measures would not appear able to address the immediate issues, particularly expected demographic trends and the ensuing on-going urban sprawl, but also growth dynamics and the ensuing rise in income, which is likely to stimulate demand for private cars.

A very progressive inclusion of environmental issues

Recent steps have been taken, which take environmental concerns fully on board, particularly regarding air quality and more specifically curbing air pollution from transport.

Initiatives have been adopted towards improving traffic management and reducing traffic jams, regulating the circulation of heavy vehicles in transit, reducing car traffic on the second bridge through dissuasive pricing, encouraging collective public transport through preferential price policies, banning collective private transport in the historic peninsula and even the introduction of green buses which run on gas.

However, noteworthy as they may be, these measures are still not up to the issues at stake in the metropolis. Better coordination between sectoral initiatives and more cross-cutting and integrated approaches still need to be pushed to the fore if a genuine global and effective environmental policy is to be rolled out.

And also of the key messages

Clarifying urban mobility governance

The main obstacle to more effectively combating traffic congestion lies in the great number and diversity of players involved. The hugely fragmentary nature of the ensuing decision-taking process does not always allow « programme-based » approaches to be superseded in favour of a more shared and strategic vision

It is essential that clarification of the urban governance system should allow the setting up of a global and integrated provision from the various urban transport networks, as well as better account being taken of urban issues, particularly full dovetailing with land management and urban planning activities.

Renewing urban models that are sought to be implement

Given the major congestion in the Istanbul metropolis, increased travel time and more generally the clear degradation of individual mobility, one fundamental issue in drawing up and implementing public urban development policies must be the restoration and maintenance of a good level of accessibility to urban spaces.

To this end, it is absolutely essential that less car-dependent development models be promoted, including in particular the full integration of soft modes within the city's public areas, as well as the genuine diversification of transport provision (development of the rail network and dove-tailing between the various networks and modes of transport).

Finally, it is essential that better account be taken of environmental and social impacts (and particularly their financial and social consequences) in decision-taking in order to improve the sustainability of the urban systems rolled out.

Curbing demand for travel, in particular related to informal and unregulated urban sprawl

ince the 1960s, informal settlements have mushroomed in the outlying areas, often in protected zones. They represent a series of major threats in terms of pollution, health and environmental risks. Fed in part by the thrust of the transport planning exercises chosen for Istanbul, these dynamics have resulted in a non-sustainable extensive model of urban development.

Housing the expected population growth will hinge on seriously curbing this on-going urban sprawl. To this end, priority must be given to the setting up of a genuinely polycentric metropolis including housing, services and activities based on a multi-modal transport system if more sustainable urban growth is to be achieved.

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