

Sustainable Urban Mobility in the Middle East and North Africa

**Ahmed El-Geneidy, Ehab Diab,
Cynthia Jacques and Anais Mathez**

Thematic study prepared for

Global Report on Human Settlements 2013

Available from <http://www.unhabitat.org/grhs/2013>

Dr. Ahmed El-Geneidy is a professor at the School of Urban Planning at McGill University, in Montreal, Canada. For the past four years, he has led a multidisciplinary research team, Transportation Research at McGill (TRAM), whose main goal is to generate valuable research and to educate students through projects related to land use and transportation planning. Ehab Diab is a PhD student at the School of Urban Planning, McGill University. Cynthia Jacques is a Master of Urban Planning Candidate, McGill University, and Anais Mathez, B.A. Urban Systems (Geography) and Environment Candidate, McGill University.

Disclaimer: This case study is published as submitted by the consultant, and it has not been edited by the United Nations.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area, or of its authorities, or concerning delimitation of its frontiers or boundaries, or regarding its economic system or degree of development.

The analysis, conclusions and recommendations of the report do not necessarily reflect the views of the United Nations Human Settlements Programme, the Governing Council of the United Nations Human Settlements Programme or its Member States.

Nairobi, 2011

Acknowledgements:

Other contributors from the Transportation Research at McGill (TRAM) research group (listed in alphabetical order): Julie Bachand-Marleau, Taleen Der Haroutiounian, Ehab Diab, Jacob Larsen, Kevin Manaugh, Jeffery Robson, Nithya Vijayakumar and Rania Wasfi.

Contents

1. The Crisis of Sustainability in Urban Transport	1
2. Non-Motorized Transport	3
2.1. Overview and description.....	3
2.2. Trends and conditions.....	3
2.3. Impacts and challenges	4
3. Public Transport	7
3.1. Overview and description.....	7
3.2. Trends and conditions.....	7
3.3. Impacts and challenges	10
4. Informal Motorized Transport	11
4.1. Overview and description.....	11
4.2. Trends and conditions.....	11
4.3. Impacts and challenges	13
5. Private Motorized Transport	14
5.1. Overview and importance.....	14
5.2. Trends and conditions.....	14
5.3. Impacts and challenges	18
6. Commercial Goods Transport	21
6.1. Overview and description.....	21
6.2. Trends and challenges	21
6.3. Impacts and challenges	23
7. Integrated Land Use and Transportation Planning.....	24
7.1. Conditions and trends	24
7.2. Impacts and challenges	26
8. Social Sustainability of Urban Transport	28
8.1. Evidence of impact	28
8.2. Challenges	28
9. Urban Transport and the Environment.....	32
9.1. Overview and importance.....	32
9.2. Trends and conditions.....	33
9.3. Impacts and challenges	35
10. The Economics of Sustainable Urban Transport.....	37
10.1. Evidence of impact	37
10.2. Existing policies in face of challenges	37
11. Urban Transport Institutions and Governance.....	40
11.1. Evidence of impact	40
11.2. Existing policy.....	41
11.3. Challenges	43
12. Towards Sustainable Urban Transport	44
List of References	48

List of figures

Figure 1. Comparison of modal split across MENA cities (excluding walking trips)	2
Figure 2. Growth in population and registered vehicles in Kuwait	15
Figure 3. Retail fuel price and subsidies in Africa as of November 2008 (in US cents/litre)..	16
Figure 4. Retail fuel price and subsidies in Asia as of November 2008 (in US cents/litre)....	17
Figure 5. Average fuel prices in selected countries (in November 2006, US cents/litre)	18
Figure 6. Distribution of fuel consumption in road transport in the Arab countries (2005) ...	32
Figure 7. Current maximum gasoline sulphur limit in the Middle East.....	33
Figure 8. National and regional priority areas and recommendations	47

List of tables

Table 1. Proportion of road deaths per user category in the MENA region	5
Table 2. Promotion of alternative transport in the MENA region	6
Table 3. Modal split of motorized trips in some countries within the study region.....	7
Table 4. Cairo modal share percentages of motorized trip	8
Table 5. Mean traits of the sample auto cost variables in Kuwait	15
Table 6. Car fleet and registration dates in Algeria, 2009.....	19
Table 7. Road freight operators in Egypt (2002–2003)	22
Table 8. Percentage of urban population living in urban slums, selected MENA countries ...	25
Table 9. Proportion of road deaths by income level across MENA.....	31
Table 10. CO ₂ emissions by sector in the MENA region in 2005	34
Table 11. Territorial organization of countries within the MENA region	40
Table 12. Ranking of sustainable transport barriers in some Arab countries	44

List of acronyms and abbreviations

BOT	build-operate-transfer
CNG	compressed natural gas
CO ₂	Carbon dioxide
CTMS	comprehensive traffic management studies
ESCWA	Economic and Social Commission for Western Asia
EU	European Union
GNI	gross national income
KD	Kuwaiti dinar
LE	Egyptian pound

LPG	liquefied propane gas
LRT	light-rail transit
MENA	Middle East and North Africa
UAE	United Arab Emirates
UK	United Kingdom of Great Britain and Northern Ireland
UNDP	United Nations Development Programme
US	United States of America
US\$	United States dollars

1. The Crisis of Sustainability in Urban Transport

This report provides a review of the status of urban transport in the Middle East and North Africa (MENA) region.¹ As will be revealed through the discussion in this report, the urban transport crisis in the MENA region is driven by rapid rates of urbanization throughout much of the region, the consequent proliferation of informal settlements leading to urban sprawl, the failure of the formal public transport sector to meet the growing demand for urban transport, high fatality rates for sustainable modes of transport, as well as increasing incomes and rates of car ownership in some parts of the region.

The status of urban transport in the MENA region cannot be summarized into a single broad trend for all of the countries in the region. Rather, the countries face different degrees of challenges, which in turn have shaped their response to the growing demand for urban transport. For instance, some of the wealthier countries in the region have seen increased use of private motorized transport, whereas other countries are still highly dependent on public transport modes. Even within the sphere of public transport, there are variations between the countries as to the relative importance of informal versus formal public transport services. The discussion in the paragraphs below will provide a more detailed, empirical summary of the status of urban transport and the use of the various modes throughout the region.

The respective share of different modes of transport in urban trips across the MENA region varies significantly by country. Generally, comprehensive traffic management studies (CTMS) have confirmed that collective modes of transport have dominant weight in the estimation of modal split among cities. In 2008, very high shares of trips by collective mode have been recorded in Algiers (70 per cent), Cairo (74 per cent), Casablanca (61 per cent), Istanbul (64 per cent), Tunis (50 per cent) and Teheran (59 per cent) (see Figure 1).

Over the last several decades, informal public transport has developed amid the broader urban public transit modes. This small-scale informal public transport varies by city, and includes shared-taxis and minibuses in Morocco, Cairo and Damascus, vans in Algeria, as well as other such services in Beirut and Amman. These modes of transportation play a key role in the supply of public transport, accounting for several thousands of vehicles in each city, and explain a significant number of motorized trips.

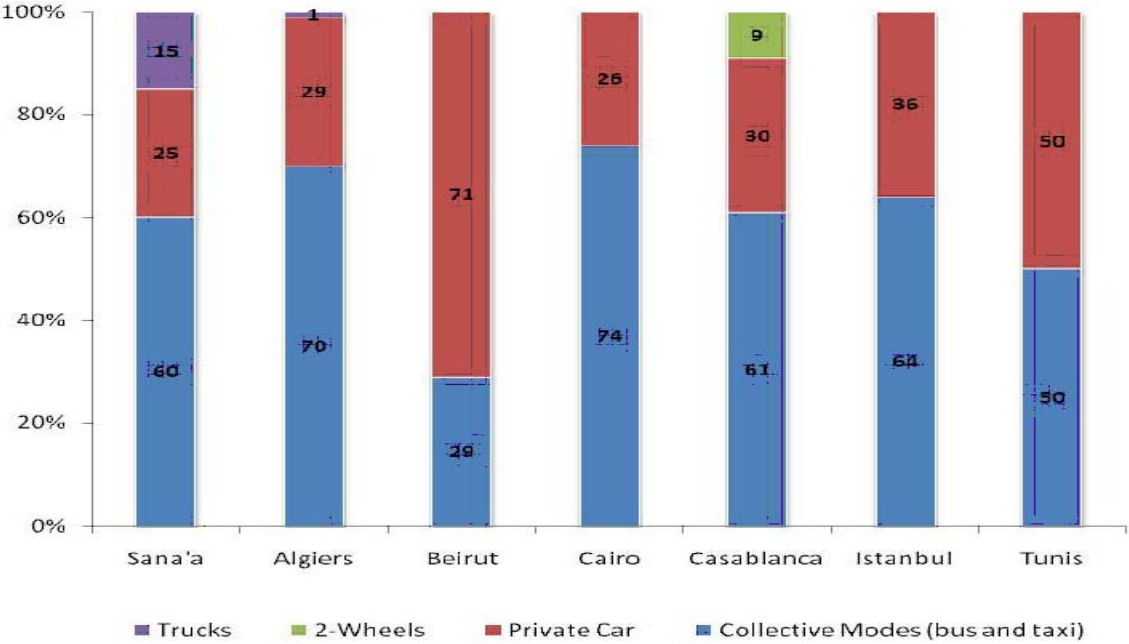
However, levels of private motorization (private vehicles per 1,000) have risen over the course of the last few decades, and are threatening the dominance of public transit, if not already surpassing this mode share in certain urban areas in the region. Although these private motorization rates are generally low compared to other regions in the world, private vehicles have increased to account for over 50 per cent of all modes of transport in cities such as Beirut and Tunis. Whereas Cairo and Algiers report low rates of private vehicle ownership (68 and 69 in 2004, respectively), intermediate rates are present in Tunis (100 in 2002), Casablanca (110 in 2004), and Istanbul (134 in 2006). Countries with exceptionally high rates of private vehicle ownership include the atypical example of Beirut (350 in 1994, and 500 in 2006), where private transport accounts for over two thirds of all transport, as well as other oil-rich countries such as Kuwait, Qatar and Saudi Arabia.²

Notwithstanding this shift in modal share, walking remains a common means of transportation, accounting for 30 to 50 per cent of the trips surveyed by comprehensive traffic management studies. Besides being a natural mode of transportation for short trips, pedestrian

1. The countries covered are the following: Algeria, Bahrain, Egypt, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya (Libya Arab Jamahiriya), Morocco, Occupied Palestinian Territory, Oman, Qatar, Saudi Arabia, Sudan, Syrian Arab Republic, Tunisia, Turkey, United Arab Emirates (UAE), Western Sahara, and Yemen.

2. World Bank, 2010.

Figure 1. Comparison of modal split across MENA cities (excluding walking trips)



Source: CODATU, 2008, *Urban Transport in the Mediterranean Region: Guidance and Recommendations*, data based on household surveys and traffic counts. Adapted from World Bank, 2010.

transport is sometimes used for longer distances in replacement of deficient public transport, or by certain underprivileged groups whose purchasing power is too low to pay public transport fares or own private vehicles.

Urban mobility is strongly influenced by a spectrum of economic, social and political factors. The dramatic differences in some countries and the slight nuances among others demand for critical analyses of the conditions, trends and implications of modal splits within intra-urban areas.

Further to the brief overview of the use of the various transportation modes in the MENA region, the chapters below contain a more detailed examination of the trends, conditions, policies and challenges associated with the various modes (non-motorized transport, formal and informal public transport, private-motorized transport and commercial goods transport), and their integration with land use planning in the region. Subsequently, the policy responses to urban transport in the region, as they relate to the four pillars of sustainability (social, environmental, economic and institutional sustainability) will be discussed. The report concludes with a reflection on the movement toward more sustainable urban transport in the MENA region, examining the barriers to this process and highlighting some recommendations that have been made to help the region realize the goal of sustainable urban transport.

Given that the MENA region comprises both developed and developing countries, and several areas suffer from ongoing or recent conflicts, there is uneven data collection throughout the region. This, therefore, limits the empirical data and examples that could be provided for some areas in the region. Nevertheless, the data obtained provides a good indication of the status of urban transport throughout the MENA region, and reveals opportunities for moving toward sustainable urban transport.

2. Non-Motorized Transport

Non-motorized transport accounts for a large share of all urban trips made across the MENA region. The trends and conditions of walking and cycling as modes of transport are discussed below, followed by an examination of the barriers present that render these modes difficult to promote.

2.1. Overview and description

Walking – the most basic urban transport mode for all short-to-medium length travel – and bicycling play a fundamental role in urban transport, especially in most low- and middle income countries throughout the MENA region. Despite the prevalence of this mode share, interests of non-motorized travellers tend to be thoroughly neglected in investment, network management and infrastructure maintenance. Without secure, continuous, and quality infrastructure, people will often refrain from walking and bicycle travel.

Non-motorized transport across the region, which generally refers to walking, bicycling and pushcarts, is often overlooked, and thus not included in many national statistics. However, comprehensive traffic management studies can estimate that trips by foot play a very important role in the transport system. In Casablanca, for example, walking represents 54 per cent of urban trips³ compared to Dakar (Senegal) and Conakry (Guinea), where walking represents 73 per cent and 65 per cent of trips, respectively.⁴ Considering these elements, it is realistic to estimate that walking can represent 50–75 per cent of trips.⁵

2.2. Trends and conditions

While walking is used to access virtually every mode of transport, this elemental form of moving about is often neglected from both a planning perspective and at the infrastructural level. Particularly where motorization is occurring rapidly, infrastructure that separates different categories of road users is often non-existent, and road expansions often come at the expense of space formerly dedicated to pedestrians, putting these individuals increasingly into harm's way.

Typically, two different groups use the bicycle. For those who cannot afford a private motorized vehicle, the bicycle is regularly used for transportation, while for those with time and money for leisure activities, cycling is primarily a recreational activity. Recreational cycling, however, remains a fringe activity across the region, possibly due to the hot climate. Given the stigma of poverty attached to the bicycle as a mode of transportation, its use in this area remains associated with the poor. Where incomes rise, many discard their bicycle in favour of other motorized transport modes.

Egypt has the largest amount of information on the modal share of non-motorized transport. Walking and bicycling in Cairo was estimated at 32 per cent of all trips in 2001. Current surveys show a 52 per cent share for non-motorized transport modes in Shebin El-Kom and 31 per cent in Fayoum, and field visits in different cities have shown a higher share of non-motorized transport, especially in middle size and smaller cities. Reasons behind this high share can be estimated to be relatively short distances travelled to schools, universities, and factories, as well as the costs associated to owning a vehicle.⁶

3. World Bank, 2008a.

4. CERTU, 2008.

5. World Bank, 2010.

6. UNDP, 2008.

Whereas Tunis and Algiers report the share of walking as 50 per cent in 2006, and 56 per cent in 2004, respectively, countries like Israel is much more auto dependent. Urban rates of bicycling and walking have remained fairly stagnant, accounting for only 1 to 2 per cent of passenger kilometres.⁷

While the situation for pedestrians and cyclists in many countries in the region is overlooked, popular trends in Europe and North America, as well as recognition of the costs of motorization, are feeding a growing interest in non-motorized transport. As in many other cities, the high levels of congestion in Beirut (Lebanon) makes walking the most efficient way to get around downtown; encouraging walking in the city's central areas is one of the priorities of Solidere, one of the agencies responsible for development and transportation planning in downtown Beirut.⁸ In Turkey, interest in the bicycle as a transportation mode appears to be increasing. Although no specific figures are available yet, bicycle shops are being built next to a bicycle path in the Anatolian side of Istanbul. This can be understood as a flourishing urban cycling movement.⁹ Moreover, in Konya, in south central Turkey, the country's first public bicycle sharing system was unveiled in 2010.¹⁰

Recently, several cycling groups have emerged in various cities in the region through social networking websites. One example is Cycle Egypt group which includes more than 6,000 members. These groups advocate for cycling as a form of transport for regular commuting. They also organize weekly recreational cycling trips to promote the use of the bicycle as a mode of transport.¹¹

In Israel, the bicycle once played a significant transportation role in the country's kibbutz movement, though the land devoted to collective living is now being sold for private development, typically built for private automobile usage.¹² However a route spanning the entire length of the country, the Trans-Israel Cycling Route, was planned in 2008, although there is no evidence of construction or completion to date.¹³ While officially promoted as a recreational route, opportunities nonetheless exist to maximize the transportation potential of this new infrastructure. Recently, however, Tel Aviv has experienced a surge in interest for urban cycling. This renewed interest has coincided with the availability of the municipality's budget to introduce a five-year plan that would pave more than 40 kilometres of new bicycle lanes throughout downtown. This plan is not without opposition: an increasing number of car owners in Tel Aviv have created a backlash against these new steps, in fear that already scarce parking will become altogether eliminated. Urban movements that involve various multi-level stakeholders are gaining momentum in these more developed cities, though the democratic process involved in the advancement of infrastructure for non-motorized transport is still lacking.¹⁴

2.3. Impacts and challenges

Many challenges face non-motorized transport in the MENA region. The main barriers to maintaining or increasing this mode of transport are primarily safety and poor infrastructure, followed by education, culture, financing of facilities and cycle purchases.

-
7. Fletcher, 1999.
 8. Nabti, 2004.
 9. Gallo, 2010.
 10. Today's Zaman, 2009.
 11. Moussa, 2010.
 12. Fletcher et al, 1999.
 13. Kaveh, 2007.
 14. Fox, 2011.

Safety is the predominant issue for users of non-motorized transportation in this region. Users of non-motorized transportation are known as ‘vulnerable road users’ (along with motorized two-wheelers), since they lack the protective shell provided by a vehicle’s frame. Studies indicate that pedestrian safety may represent a large problem in the Middle East, with over 30 per cent of road fatalities claiming the life of a pedestrian in some countries, such as Israel and Tunisia.¹⁵ Cycling is also seen as unsafe, as a lack of road safety education and a lack of facilities forces cyclists to mix with fast-moving motorized vehicles, causing high traffic fatalities. While cyclist deaths are generally underreported, they seem to account for a much smaller proportion of traffic fatalities compared to pedestrian accidents. Table 1 summarizes the proportion of pedestrian and cyclist deaths in the region.

Table 1. Proportion of road deaths per user category in the MENA region

Country	Estimated road traffic death rate per 100,000 population	Percentage of road deaths	
		Cyclists	Pedestrians
Bahrain	12.1	6.6	28.6
Egypt	41.6	1.9	20.1
Israel	5.7	1.5	31.6
Jordan	34.2	—	24.7
Libya	40.5	5	15
Morocco	28.3	7.1	27.9
Qatar	23.7	27	—
Tunisia	34.5	2.6	32
Turkey	13.4	1.8	18.9
UAE	37.1		28.5

Source: WHO, 2009.

Infrastructure and the maintenance of existing facilities for pedestrians and cyclists remain poor in MENA region. Often, sidewalks begin and end, with no continuous connection to create a walk-able network around urban centres. Poorly maintained sidewalks and uneven surfaces cause pedestrians to favour the sides of the road, causing safety issues, especially in high-traffic urban areas. Similarly, cycle routes, already sparse, are isolated and rarely connected, partly because cycle lanes are often difficult and costly to implement if they were not part of initial planning and traffic management.¹⁶

As indicated in Table 2, there are very few policies promoting the use of active transportation modes in the MENA region. It has also been noted that national policies regarding the promotion of walking and cycling are nonexistent, except in Syria, UAE and the Occupied Palestinian Territory. Policies promoting public transport are more frequent, though levels of education and available financing are generally low for the urban centres across MENA region. Moreover, bicycles may present an expensive purchase for low-income individuals, as imported bicycles and their parts can be subject to high import duties and taxes.¹⁷ Few subsidies exist to help finance the purchase and maintenance of these non-motorized modes of transport, and thus promote incentives to use these alternative modes of

15. WHO, 2009; Otero et al, 1997; Downing, 1991.

16. Fox, 2011.

17. Fox, 2011.

transport. Furthermore, municipal budgets do not readily account for these costs, and are often unavailable to finance pedestrian and cycle networks while motorized vehicle congestion continues to be the primary concern.¹⁸

Table 2. Promotion of alternative transport in the MENA region

Country/Area	National policies to promote:	
	Walking or cycling	Public transportation
Bahrain	No	No
Egypt	No	Yes
Israel	No	Yes
Jordan	No	Yes
Kuwait	No	No
Libya	No	No
Morocco	No	Yes
Oman	No	No
Qatar	No	Yes
Saudi Arabia	No	Yes
Syria	No	Yes
Tunisia	No	Yes
Turkey	No	Yes
UAE	Yes	Yes
Yemen	No	No

Source: WHO, 2009.

18. Fox, 2011.

3. Public Transport

This chapter reviews the state of public transport in the MENA region. Although private motorized transport has established great popularity in some parts of the study region (as will be discussed further in Chapter 5 of this report), public transport remains an important form of urban transport in many countries within the region.

3.1. Overview and description

Public transport in the MENA region varies by country in accordance with the level of economic, social, and technological development. There are both formal (metros, buses, rail and minibuses) and informal (discussed further in Chapter 4) forms of public transport, the prevalence of which differs throughout various parts of the region. Implementation of public transport in the study region generally follows a more cost-efficient and adaptable development path, with light-rail transit (LRT) and bus rapid transit (BRT) preferred over more cost-intensive, underground rapid transit systems such as metro systems. Recently, however, in countries experiencing higher levels of economic development, capital-intensive rapid transit projects, such as the Dubai metro, have been introduced or are planned for the future.

3.2. Trends and conditions

Table 3 presents the modal split between public transport and other motorized modes in some MENA cities. Private vehicle usage has increased to the point of accounting for 50 per cent or more of all motorized transport in some MENA cities; for example, in Beirut private vehicles account for almost two thirds of urban trips. Although, public transport is still in the leading position in most cities, including Cairo, Algiers and Istanbul, its predominance is gradually being threatened, particularly in Algiers, Casablanca, and Tunis.¹⁹ For instance, in Tunis the bus and tram transit modal share across all modes (including non-motorized modes) declined from approximately 35 per cent in 1996 to 19 per cent in 2006, meanwhile the use of private vehicles was increasing. In Israel, bus usage for urban transport declined from approximately 52 per cent in 1984, to 47 per cent in 1990 and to 32 per cent of passenger kilometres in 2000, as the private automobile increasingly dominates the modal share (discussed further in

Table 3. Modal split of motorized trips in some countries within the study region

	Algiers (2004)	Beirut 1994	Cairo 1998	Casablanca 2004	Istanbul 2005	Tunis 2002
Public transport*	65%	29%	74%	50%	58%	40%
Private vehicles	29%	71%	26%	30%	36%	50%
Taxis	5%	—	—	11%	6%	10%
Two-wheelers	1%	—	—	9%	—	—
Total individual mobility	35%	71%	26%	50%	42%	60%
Total	100%	100%	100%	100%	100%	100%

* Public transport includes metros, buses, minibuses, shared taxis, etc.

Source: *Regional Seminar on Urban Transport in the Mediterranean Region, 2008.*

19. Regional Seminar on Urban Transport in the Mediterranean Region, 2008.

Chapter 5 of this report).²⁰ Istanbul, Turkey, has seen a similar trend toward a declining share of public transit trips for urban transport between 2000 and 2010, as the proportion of private vehicle trips increased from 19.3 per cent to 26.3 per cent, while taxis and minibuses (collective taxis) dropped from 9.4 per cent to 4.8 per cent during the same period.²¹ In Greater Tunis, the number of people using private cars in 2006 has been estimated at 64 per cent of the total number of passengers, while the rest of passengers (only 36 per cent) have used the public transit.²² In contrast, in Tangier, Morocco, bus usage slightly increased from approximately 4 per cent in 2002 to 6.25 per cent in 2008.²³

In many countries within the region, public transit is underdeveloped relative to the demand for such services.²⁴ For instance, Bahrain has a very small bus fleet (only 100 buses), characterized by unreliable service and degraded infrastructure, therefore lacking competitiveness with the private vehicle.²⁵ In addition, Egypt has a government-operated public bus service in the major metropolitan regions, however, this service is perceived as unreliable, thus catalyzing the development of informal transit services (the topic of the next Chapter of this report). To illustrate this trend, Table 4 presents the evolution of modal share of motorized trips in Cairo. The daily usage of bus and minibus services has dropped off sharply, falling from 70 per cent to 41 per cent and then to 22 per cent of total daily trips in 1971, 1987 and 2001, respectively. This decrease has allowed informal public transport systems (shared taxis) to develop on a larger scale, which now account for almost half of all public transport services.

Table 4. Cairo modal share percentages of motorized trip

Transport mode	1971	1978	1987	1998	2001
Car and taxi	14%	31%	38%	20%	23%
Bus and minibus	70%	56%	41%	28%	22%
Light rail tram	16%	13%	12%	1%	1%
Metro*	0%	0%	3%	16%	17%
Shared taxi**	0%	0%	6%	35%	37%

* Service started 1987.

** Service started in 1985.

Source: Huzayyin and Salem, 2010.

Most countries in the region have some form of publicly- or privately-owned bus service with varying degrees of operation. For instance, the West Bank city of Ramallah has six times as many taxis as buses,²⁶ whereas Libya lacks an intra-city bus system altogether.²⁷ In contrast, Qatari bus services grew impressively adding 2,100 buses during the five year period between 2005 and 2010, as the government-owned transport company, Mowasalat, launched a public bus service in October 2005 after a year of operation using only taxicabs.²⁸

20. Fletcher, 1999.

21. Houpin, 2010.

22. UITP, 2007.

23. Houpin, 2010.

24. UITP, 2007.

25. Trade Arabia, 2010.

26. Maoh and Isaac, 1999.

27. World Travel Guide, undated.

28. The Peninsula, 2010.

Underground transit services are selectively deployed throughout the region due to their high cost and extensive infrastructure requirements. Only four examples of underground transit exist within the region: in Egypt (Cairo), Israel, Turkey, and the UAE. Both Istanbul and Israel have rather limited metro service. Introduced in 1987, the Cairo Metro is the only underground rapid transit service of its kind in Africa. As the proportion of daily metro trips increased from 3 per cent in 1987 to 17 per cent in 2001, car and taxi trips declined from 38 per cent in 1987 to 23 per cent in 2001 (Table 4). Metro usage continued to rise from 2 million trips per day in 2001 to an average of 2.35 million trips per day in 2008, an increase of almost 15 per cent. The proportion of daily trips made by (informal) shared taxis also saw a drastic increase during this same period (Table 4), indicating that formal transit services in Egypt remain unsatisfactory.²⁹ Line 3 of Cairo's metro system is expected to be in operation by 2013. In Dubai, construction on the US\$7.6 billion Dubai Metro system started in 2006 and piecemeal operation began in 2009.³⁰ Once construction is completed, the Dubai system will feature 87 driverless trains running on two lines comprising more than 75 kilometres of track.³¹ With Dubai as an example, the respective transit authorities of Abu Dhabi (UAE), Saudi Arabia, Qatar, and Kuwait have planned additional underground services.³² A metro system for Algiers has also been started, with the first line set to open by the end of 2011.³³

In some countries, taxi services are surpassing bus services in popularity amongst passengers. Taxicabs represent a half-measure between public and private forms of motorized transport. In Palestine the number of taxis is growing exponentially in comparison to bus service. In Oman, much of the intra-city travel is done using the country's fleet of 30,000 taxis or group taxis referred to as 'microbuses'.³⁴ In Syria, privately run group taxis have been more successful in intra-city travel than their publicly operated counterparts, providing a more flexible service for both inner city and suburban residents.³⁵ In Yemen, taxis and microbuses are less costly than intra-city buses, and provide more efficient and convenient service.³⁶ In Algeria, taxis are tasked with serving outlying areas; however, the routes served are chosen based on potential profits.³⁷ Recently a new government-run programme, the Egyptian New Taxi Programme was established in Egypt through support from various local and international funding agencies to replace all old taxi vehicles with newer models (discussed further in Chapter 10).³⁸ In 2006, taxis comprised 60 per cent of mode share for daily trips in the city of Aleppo.³⁹ Mode share for taxis in Algiers, Istanbul, Casablanca and Tunis are presented in Table 1.

In North Africa, several examples of light-rail transit (LRT) and tramways services exist. Cities in Algeria (Algiers, Oran), Egypt (Cairo, Alexandria), Morocco (Rabat), and Tunisia (Tunis) have LRT service implemented or planned. The Egyptian services are legacy trams from the late 19th and early 20th centuries, and currently capture less than 1 per cent of public transit motorized trips. The Métro léger de Tunis began service in 1985, and accounted for an estimated 23.6 per cent of the total trips by public transport in Tunis in 1998.⁴⁰ For Algeria

29. Huzayyin, 2004, as cited in Huzayyin and Salem, 2010.

30. Corder, 2007.

31. Ahmed, 2006.

32. Kuwait Times, 2008; Railway Gazette, 2007; Barry, 2009; Ahmed, 2006.

33. Huber, 2009.

34. Lonely Planet, 2007.

35. Hopfinger and Khadour, 1999.

36. Yemen Times, 2008.

37. Yesguer, 2008.

38. African Development Bank, 2009.

39. Houpin, 2010.

40. Godard, 2007.

and Morocco, LRT service was introduced quite recently in 2011, and little information has been released regarding the service levels.⁴¹

3.3. Impacts and challenges

Collective modes, including public transit and taxis, is the dominant mode of transportation for motorized trips in many cities within the study region, with a high share of trips recorded in many cities, including Cairo (74 per cent), Algiers (70 per cent), Istanbul (64 per cent), Casablanca (61 per cent), Tunis (50 per cent) (see public transit and taxi data in Figure 1).⁴² Despite relatively high usage of public transit in some cities, inefficiencies in service reinforce the development of informal transit services. For instance, in Algiers, two-thirds of the bus stops are served less than twice per hour during the evening peak period and many buses leave the central stations over capacity therefore resulting in overcrowding and uncomfortable conditions as drivers allow more passengers to board along the route.⁴³ In Morocco, buses operate on only 60 percent of the total designated bus routes.⁴⁴ Bus service in both Kuwait and Egypt is subject to a lack of funding, resulting in aging bus fleets, overcrowding, and declining service frequencies.⁴⁵ This poor quality of service is no match for advantages of the informal transportation sector, such as personalized stops and flexible service.⁴⁶ As has been seen, public transport in the region is threatened by the pre-eminence of private motorized transport. This is largely due to years of neglect of the public transport sector by transportation authorities, planners, and policymakers throughout the region.

There are, however, positive examples of changing attitudes towards public transport, reflected in the burgeoning number of projects being planned and implemented. Nevertheless, Yemen, Sudan, Oman, Lebanon, the Occupied Palestinian Territory, and Kuwait do not have policies that support public transportation development. The most common way of supporting public transportation in the region is through subsidizing its pricing, and improving access and frequency of public transport service, as seen in Egypt, Bahrain, Iraq, Morocco, Syrian Arab Republic, and Tunisia.⁴⁷ Interestingly, many of the major public transportation projects planned in the region are disproportionately concentrated in the wealthier states of Dubai, Abu Dhabi, Saudi Arabia, Qatar, and Kuwait, where public transport is seen as an economic driver.

41. Kaltheier, 2002.

42. World Bank, 2010; Regional Seminar on Urban Transport in the Mediterranean Region, 2008.

43. Maatouk, 1992.

44. Oualalou, 2002.

45. Koushkiet al, 1999; US Bureau of Consular Affairs, undated a.

46. Alterkawi, 2006.

47. WHO, 2010.

4. Informal Motorized Transport

This chapter will focus on a variety of forms of informal transport employed in the countries within the MENA region, exploring the role that informal services play in the region, as well as the trends and challenges associated with this form of transport.

4.1. Overview and description

Informal motorized transport comprises private regulated and non-regulated taxis, collective taxis and minibuses, as well as other forms of motorized transport such as three wheelers. Depending on the regulations that govern their operation in various countries, private taxis may or may not be considered as informal transportation. Informal transport options play an important role in urban transportation within the MENA region by filling the gaps of formal public transit services, as discussed in greater detail in the previous chapter.⁴⁸ These informal services are highly competitive with formal transit services as they are faster than buses, they provide high accessibility, and they are demand responsive as the services can change almost instantaneously to respond to change in market needs. In addition, these informal services are sometimes cheaper than formal services, as in the case with some illegal taxis, since the drivers do not pay for plates or for legal fees and can therefore offer the same service at a lower cost.⁴⁹ Thus, informal motorized transport typically thrives where public transport services and formal taxi services are limited or non-existent. There are situations, however, where private informal transport is complementary to public transport, or where the distinction between these services is minor.

4.2. Trends and conditions

Taxicab services may be operated by the government, operated privately and regulated by the government, or completely unregulated, existing entirely beyond the scope of the government. The latter of these is most commonly considered informal transport. Due to the non-regulated nature of these services, accurate or up-to-date information on informal motorized transport is often difficult to obtain.

In Turkey, taxis are regulated at the municipal level, and national figures for unofficial taxicabs are nonexistent. In 1991, an entry restriction was placed on the formal taxi market in Istanbul, limiting the number of taxis to 17,416 despite increasing demands for mobility. Such entry restrictions in the formal taxi market are assumed to play an important role in the proliferation of informal taxi services, as it creates an ‘artificial shortage’ of taxis. This shortage of legal taxis in Istanbul is evident in the modal share of taxi trips in Istanbul in 2005, representing only 6 per cent of all motorized trips (see Table 3 in the previous chapter). It is estimated that around 5,000 (22 per cent) of the taxis operating in Istanbul in 2001 were illegally operated, informal taxis.⁵⁰ Similarly, in Cairo a comparable entry restriction was placed on the issuance of new taxi licences; despite this, however, the number of taxis operating in the country is estimated to be double the number of licences issued.⁵¹

A larger, shared type of taxicab service exists in nearly all the countries in this region; however, the vehicle type and service characteristics vary from one country to the next and can include shared taxis and minibuses. Like with passenger car taxicabs, these minibuses can be categorized both as public and informal transport, depending on the regulations concerning their operation. In Kuwait City, informal transport is provided by vehicles known as ‘one-

48. United Nations Development Programme Global Environment Facility, undated.

49. Çetin and Oğuz, 2010.

50. Çetin and Oğuz, 2010.

51. Houpin, 2010.

eights', which are white pickup trucks where individuals ride in the open air. Security on this mode of transport is low and they are not recommended for travel by women.

In Egypt, informal transport services provided by individuals, which are not planned and sometimes not regulated by the Egyptian Ministry of Transport, represent almost 83 per cent of all motorized trips per year. These services include inter-urban and intra-urban minibuses and shared taxis with 7–17 seats, regular taxis, pickups and light vehicles (such as three wheelers), as well as school, tourist and factory buses.⁵² The Cairo region is served by 163,300 taxis and minibuses (shared taxis) which cover 2.7 million passenger trips daily.⁵³ The modal share of informal shared taxis in Cairo has risen steadily from 6 per cent in 1987 to 36 per cent and 35 per cent in 1998 and 2001, respectively.⁵⁴ However, these informal transport options are characterised by low quality service as they are not organised or monitored, and do not coordinate with other modes.

In Sana'a, Yemen, the majority of trips are made by public transport modes, with an approximate share of 60 per cent of trips made by informal minibuses and taxis. Informal collective transport modes, on average, represent 40 per cent of vehicles in traffic in Sana'a, including minibuses (6 per cent), minibuses (12 per cent), standard and tourist buses (2 per cent) and taxis (19 per cent), while private cars and trucks represent 33 per cent and 25 per cent of vehicles in traffic, respectively.⁵⁵ In the Occupied Palestinian Territory, there was a shift away from public transport services, such as buses, in favour of shared taxi services, which became a more favourable option due to their ability to move more easily on secondary roads. Taxis formed 11.4 per cent of the total vehicles in the West Bank, while in the Gaza Strip the percentage of taxis did not exceed 2.1 per cent.⁵⁶ In Algiers, the share of minibuses and shared taxis has been estimated represent 56 per cent of motorized transport in 2004, while in Damascus the share of minibuses has been estimated by 46 per cent of motorized transport in 1998. In Casablanca the proportion of shared taxis has been estimated by 24 per cent of all motorized transport trips.⁵⁷

In other countries, including Saudi Arabia, Kuwait and the UAE, private taxi services are regulated nationally, and in Qatar the Qatari government is actually responsible for delivering these services through its public transportation agency. In these countries, the use of informal motorized transport is lower than in other parts of the region as there is more stringent enforcement against illegally-run taxis. For example, in more recent years there have been many new articles demonstrating this law enforcement to eradicate illegal taxis by the Roads and Transport Authority in Dubai. Penalties imposed on illegal taxi operators in Dubai include higher fines and even deportation.⁵⁸

There are several examples where governments have begun to recognize that these privately run collective taxis provide important services, and therefore they have attempted to impose some regulation or codification to improve safety and performance of these informal services. In the Occupied Palestinian Territory, for example, 'shared taxis', which can carry 5–12 passengers at a time, have become more organized and codified in recent years, being painted a bright yellow and given easily identifiable license plates.⁵⁹ In Israel, '*Monit Sheruts*', or service taxis, operate on fixed routes on all days of the week, including Shabbat.

52. UITP, 2007.

53. Houpin, 2010.

54. Huzayyin, 2004 as cited in Huzayyin and Salem, 2010.

55. World Bank, 2010.

56. Applied Research Institute Jerusalem, 2007.

57. Regional Seminar on Urban Transport in the Mediterranean Region, 2008.

58. Gulf News, 2009; Al Theeb, 2007; Sengupta, 2009.

59. Maoh and Isaac, 1999.

Over the past decade, three wheelers, small public transport vehicles that can accommodate up to two passengers, have been introduced in most small cities and some neighbourhoods in Cairo and Alexandria, in Egypt. Some regulation exists to force the owners to use four-stroke engines, instead of the more polluting two-stroke engines, but they are still illegally used in some occasions. Also no registration or licensing rules are available to track them. However, their use is spreading in an extremely uncontrolled way. For example, in Senbelaween City, the number of three wheelers expanded from zero to 3,000 between 1999 and 2005 alone. In Borg Al Arab City, Alexandria, three wheelers are the only urban transportation mode available for residents. Nevertheless, they indeed provide an easy, fast and cheap transport mode, even if they are not always comfortable or safe.⁶⁰

4.3. Impacts and challenges

Informal motorized transport plays a role in most countries throughout the region, regardless of the country's level of development. Nevertheless, in countries that have seen increasing economic growth in recent years, such as parts of the UAE, the use of informal transport modes is highly discouraged. Where no or poor public transit services exist, these informal systems are particularly crucial; however, their operation – including routes, fares, frequency, and emission profiles – is often not decided on the basis of maximizing benefits to the society as a whole, but on the basis of profit for the operator. Recognizing that privately run informal transport services will remain an important element in the region, governments should explore regulatory options to make these services safer and more reliable, especially for women.

Safety is an additional concern for users of informal transport services such as shared taxicab services. This type of service offers passengers a more affordable alternative to private taxi usage; however, these forms of transport generally only run where the service is profitable for proprietors, while safety and reliability of the service is typically below that of publicly-provided mass transit. In addition, in many cases across the region, private taxis – both licensed and non-licensed – have been associated with harassment of female travellers. The issue of equality for women is a major challenge in male-dominated societies where women presently occupy a marginal presence in the public sphere. To address this issue, a unique brand of taxi service is emerging in some countries in the MENA region. Aimed at balancing the constraints placed on women's public activities and their need for mobility, the 'pink taxi' service started in the Kuwaiti capital in 2010. This service permits women to ride in cabs driven by other women, thus increasing their personal safety and mobility, while opening new avenues for employment for women.⁶¹ Given the recent implementation of this service, it is premature to assess its success; however, options such as the 'pink taxi' may represent a promising development for improving the conditions of women's transportation in the region.

60. United Nations Development Programme Global Environment Facility, undated.

61. Meehan, 2010.

5. Private Motorized Transport

This chapter focuses on the role of private motorized transport as a share of the modal split in urban centres across the MENA region. It reviews the general status, trends, and conditions, as well as the challenges and implications of private motorized transport.

5.1. Overview and importance

Private motorized transport varies significantly in urban areas across the MENA region, sometimes accounting for as much as two thirds of all trips, or as little as a quarter of all trips. These uneven rates can be demonstrated with the following reported numbers of private motorized vehicles per 1,000 inhabitants:

- Low (from 70 to 100): Cairo (68 in 2004) and Algiers (69 in 1990, 83 in 2004).
- Intermediate (from 100 to 200): Tunis (64 in 1994, but 100 in 2002), Casablanca (110 in 2004), and Istanbul (134 in 2006).
- High (over 300): Beirut (350 in 1994, and over 500 in 2006).⁶²

Although levels of private motorization in countries south and east of the Mediterranean are, in general, relatively lower compared to other regions in the world, a rapidly growing urban population has created certain pressures that have altered travel behaviour. The inability to adequately satisfy the ever-increasing demand for public transport services has encouraged users to seek alternative modes, particularly private vehicles for those who can afford them.⁶³ While this mode offers advantages in the way of efficiency, privacy, and speed, its disadvantages include congestion, pollution, isolation, higher rates of traffic fatalities and associated costs.

5.2. Trends and conditions

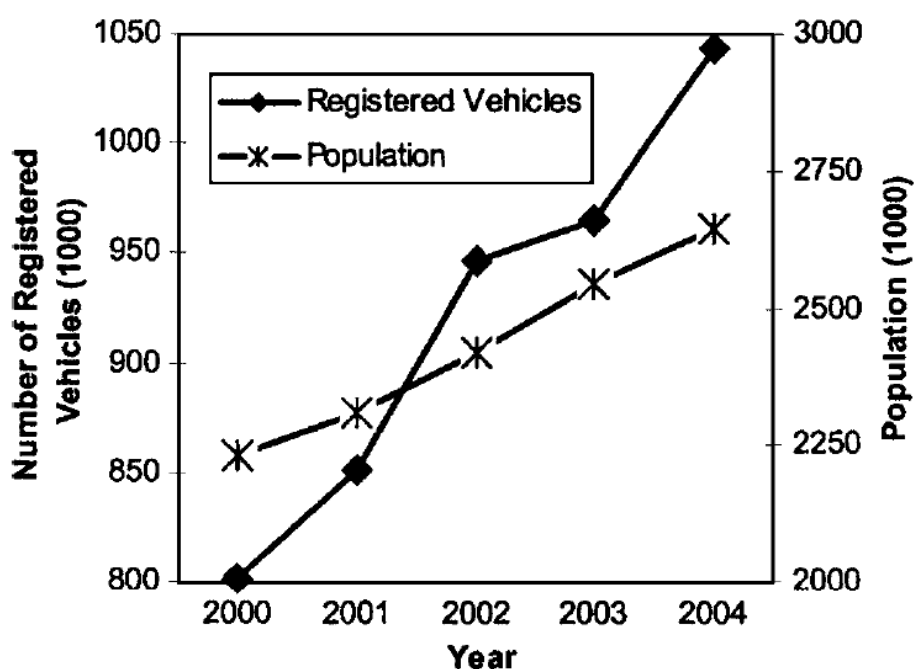
Across the MENA region, a trend towards policies endorsing the liberalization of imports, coupled with rising incomes and a subsequently growing middle class, has led to an increased preference for private motorized. Several related factors also include the region's generally low cost of car ownership, insurance, and maintenance relative to other areas in the world. For example, in the oil-rich State of Kuwait – where individuals meet 97 percent of their daily travel needs using private motor vehicles, and the annual increase in the number of autos is twice that of the growth of the total population (see Figure 2) – the annual cost of owning and operating a car is KD 1248 (US\$4,125).⁶⁴ Koushki (2007) collected data on auto costs from a systematic-random sample of 2,000 auto owners/operators in the State of Kuwait. These included the cost of insurance and registration, capital, book salvage value, fuel, oil change and service, repair and maintenance, and tire change. Table 5 gives summary statistics on these auto cost variables.

62. Regional Seminar on Urban Transport in the Mediterranean Region, 2008.

63. Regional Seminar on Urban Transport in the Mediterranean Region, 2008.

64. Koushki, 2007. Citing Runzheimer International (2001), Koushki (2007) provides estimates for the costs of owning an average midsize vehicle across a number of US major cities. Los Angeles topped the list at US\$9,254, whereas New York City, ninth on the list, reported an annual auto ownership cost of US\$8,066.

Figure 2. Growth in population and registered vehicles in Kuwait



Source: Koushki, 2007.

Table 5. Mean traits of the sample auto cost variables in Kuwait

Variable	Sample size	Mean	Standard deviation
Auto capital cost (KD)	1,654	7,386	5,672
Auto salvage value (KD)	1,581	4,187	4,004
Fuel cost (KD/week)	1,564	5.9	3.1
Oil and service cost (KD/month)	1,662	6.5	3.5
Maintenance cost (KD/year)	1,662	107	84
Tire-change cost (KD)	1,662	70	47
Tire change period (year)	1,564	2.1	1.9
Auto-change period (year)	1,564	4.5	4.1
Basic insurance and licensing fees (KD/year)	1,662	25	—
Additional insurance cost (KD/year)	184	241	264
Daily kilometres of operation	1,570	64	53

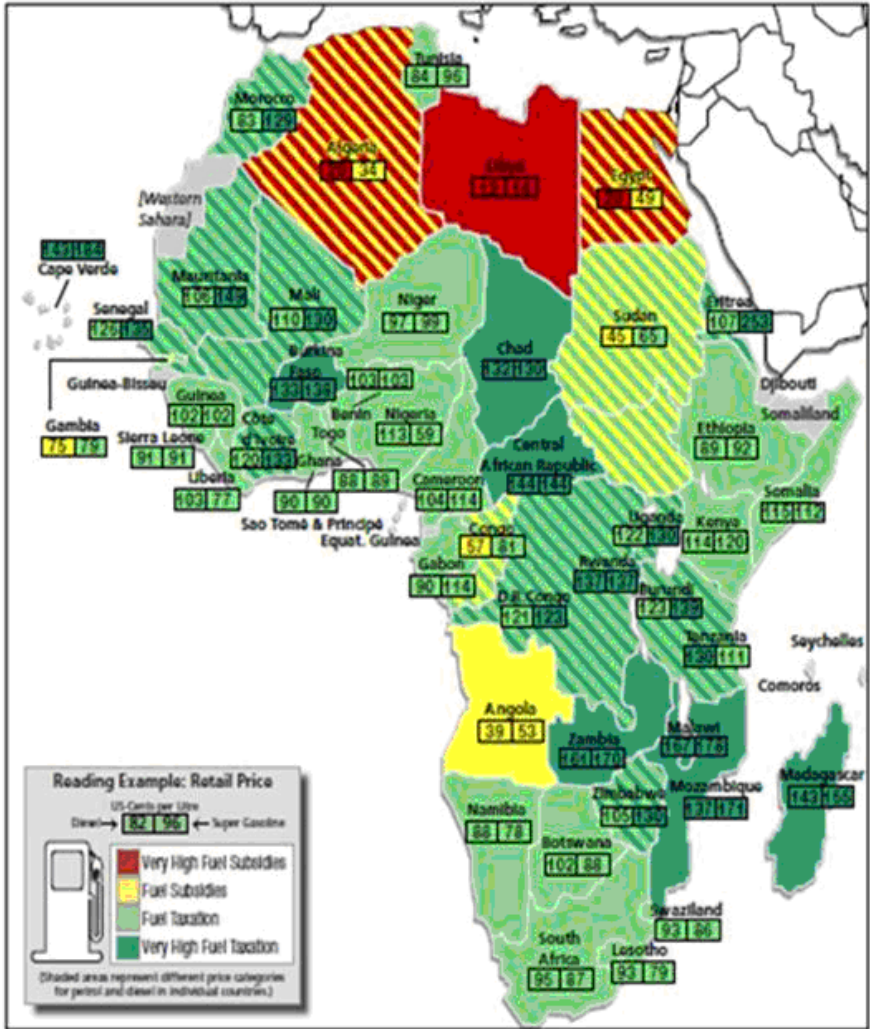
KD 1.0 = US\$3.3 (2004)

(Source: Koushki, 2007.)

High rates of private automobile use in the MENA region are strongly associated with the low price of fuel, due to government subsidies. Motorization in Egypt is especially driven by a heavy subsidy of fuel prices, effectively providing those Egyptians that have a choice of modes with an incentive to drive. In the 2010/2011 fiscal year, where 80 per cent of the budget for subsidies is for energy, 52 per cent represents diesel (US\$3 billion), and 23 per

cent (US\$1 billion) represents gasoline.⁶⁵ Other countries with significant fuel subsidies include Libya, Saudi Arabia, Kuwait and Iran.⁶⁶ Figures 3 and 4 maps these differences in retail fuel price across Africa and Asia, and categorizes countries based on the prevalence of fuel subsidies or fuel taxation.

Figure 3. Retail fuel price and subsidies in Africa as of November 2008 (in US cents/litre)



Fuel Taxation Category 1: Very High Fuel Subsidies – The retail price of fuel (average of Diesel and Super Gasoline) is below the price for crude oil on world market.

Fuel Taxation Category 2: Fuel Subsidies – The retail price of fuel is above the price for crude oil on world market and below the price level of the US.

Note: The fuel prices of the US are average cost-covering retail prices incl. industry margin, VAT and incl. approx. US 10 cents for the 2 road funds (federal and state). The fuel price may be considered as the international minimum benchmark for a non-subsidized road transport policy.

Fuel Taxation Category 3: Fuel Taxation – The retail price of fuel is above the price level of the US and below the price level of Spain.

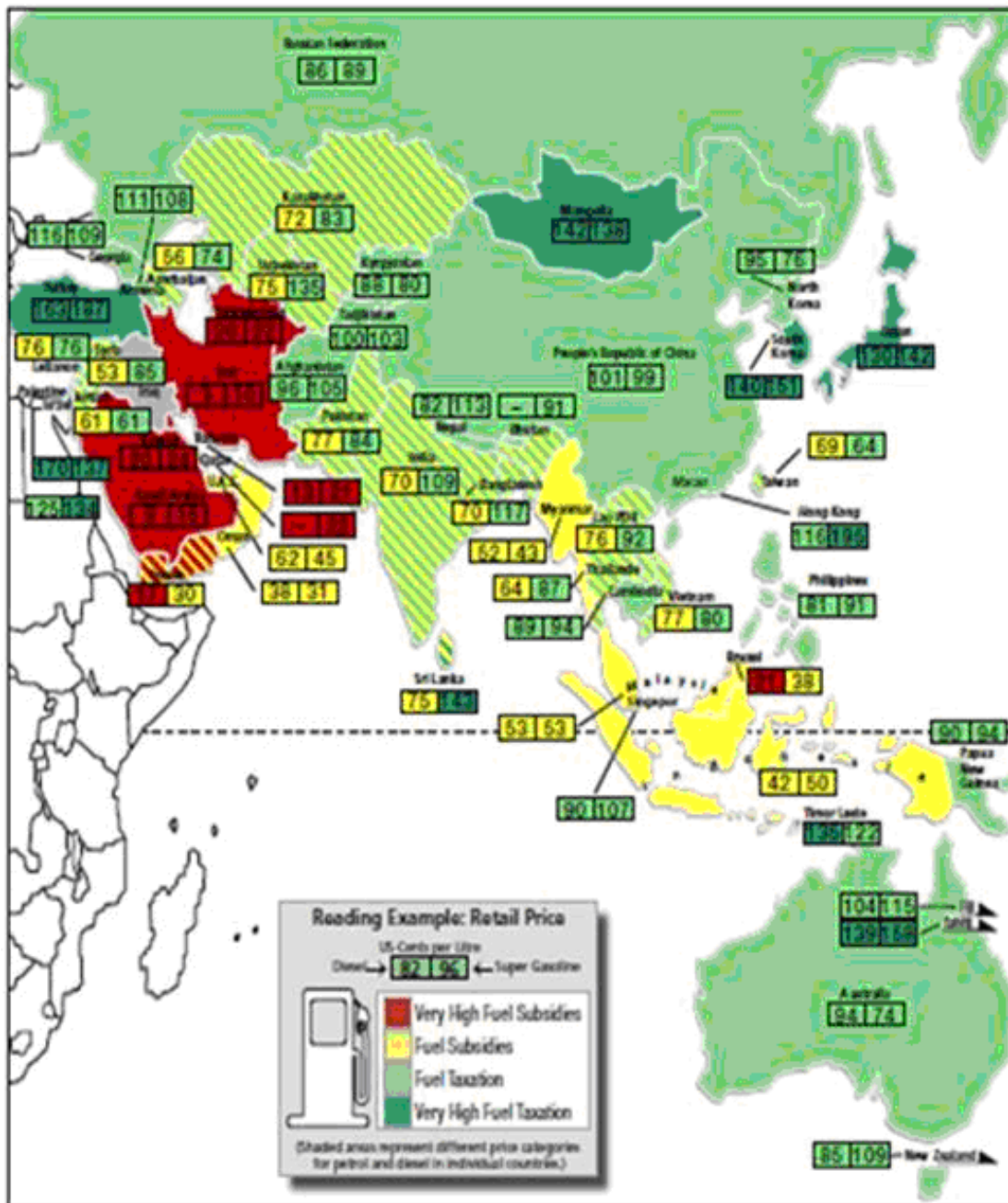
Note: In November 2008, fuel prices in Spain were the lowest in the EU-15. Prices in EU countries are subject to VAT, fuel taxes as well as other country-specific duties and taxes.

Source: GTZ, 2009.

65. Arab Information Network, 2010.

66. GTZ, 2009.

Figure 4. Retail fuel price and subsidies in Asia as of November 2008 (in US cents/litre)

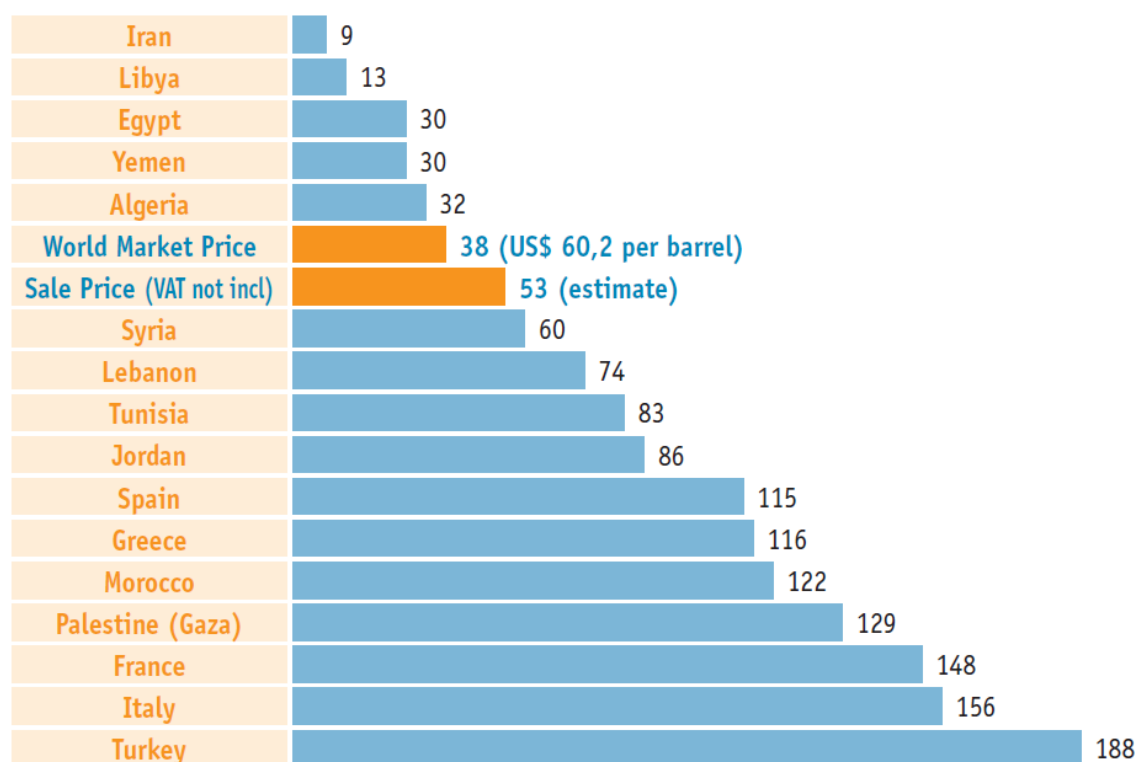


For Legend, see Figure 4.

Source: GTZ, 2009.

With these government subsidies, the MENA region includes the largest number of countries with the lowest average fuel price (see Figure 5). The average fuel prices for Libya, Egypt, Yemen and Algeria are much below the world market price and sale price for petroleum.

Figure 5. Average fuel prices in selected countries (in November 2006, US cents/litre)



Source: Regional seminar on urban transport in the Mediterranean region, 2008.

5.3. Impacts and challenges

The effects of the increased dependency on private motorized transport in the region are many. Congestion in many of the countries is reaching precarious levels, and is furthered by the rising presence of private vehicles. In the city of Sana'a, Yemen, CTMS traffic counts report that private cars account for 33 per cent of vehicles in traffic.⁶⁷ In Dubai, high congestion is costly: 541 cars per 1,000 people costs the local economy an estimated US\$1.2 billion in lost work-hours annually.⁶⁸ In Lebanon, high levels of congestion are made worse by inadequate road signage, a failure to manage a limited supply of parking and a lack of discipline among Lebanese drivers.⁶⁹ In Egypt – especially in the regions of Cairo and Alexandria – traffic congestion is a well known problem.⁷⁰ Accompanying the congestion found on road networks throughout the region is a significant degradation of environmental quality. In Israel, transport emissions are regarded as a major contributor to atmospheric pollution in the country. They account for roughly 90 percent of carbon monoxide emissions and 32 to 43 percent of nitrogen oxide emissions present in the atmosphere.⁷¹ In Lebanon, an estimated 80 deaths, 3,000 hospital admissions, and 14,160 restricted activity days are attributed to air pollution associated with prevalent private automobile use.⁷² Similar air

67. World Bank, 2010.

68. Shariff, 2007.

69. Hayek, 1996.

70. El Araby, 2002.

71. Fletcher, 1999.

72. Chaaban et al, 2001.

quality issues have also been reported in the Gulf countries of Kuwait, Qatar, and Saudi Arabia (discussed further in Chapter 9 of this report).⁷³

The types of private automobiles driven in the region vary greatly, in accordance with the level of economic development in each country. In the Maghreb countries of Algeria, Libya, Morocco, and Tunisia, the majority of cars on the road are used European cars (second hand) that have been shipped across the Mediterranean Sea to the African continent. Algeria has reported a high number of private cars registered before 1997 (refer to Table 6), with the bulk of the fleet representing Renault, Peugeot and Volkswagen.⁷⁴ As many of these are older vehicles, they are often in poor condition with high emissions profiles.⁷⁵

Table 6. Car fleet and registration dates in Algeria, 2009

Make	Year of Circulation														Total	%
	Before 1997	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		
RENAULT	55 320	4 600	5 229	5 565	5 958	7 733	6 533	3 137	3 747	2 310	2 813	1 689	4 719	20 065	129 418	25.1
PEUGEOT	46 299	1 614	2 244	3 125	3 242	3 848	3 781	2 884	2 493	1 406	1 198	935	3 245	10 093	86 407	16.76
TOYOTA	3 836	174	188	649	394	319	410	780	1 643	1 706	1 476	2 370	5 608	11 908	31 481	6.1
HYUNDAI	170	36	195	597	443	330	379	942	1 253	2 538	1 607	1 398	5 793	6 125	21 806	4.23
VOLKSWAGEN	6 067	356	506	462	708	920	1 131	696	608	609	695	340	1 109	6 533	20 740	4.02
DACIA	2 116	21	31	11	26	1	3	9	411	703	874	415	1 388	8 405	14 414	2.8
CITROËN	1 415	285	726	854	1 187	1 768	1 515	560	638	383	223	366	1 248	2 742	13 910	2.7
FIAT	6 402	184	179	211	174	242	162	63	318	201	142	137	663	728	9 806	1.9
DAEWOO	622	242	823	3 084	1 213	542	289	46	6	3	8	21	115	633	7 647	1.48
SNVI (SONACOME)	300	300	200	175	150	500	360	450	280	402	962	1 062	912	1 012	7 065	1.37
MAZDA	5 899	29	26	23	17	10	11	9	14	68	83	238	317	101	6 845	1.33
MERCEDES	2 492	237	262	265	305	276	251	179	165	123	62	127	203	908	5 855	1.14
MITSUBICHI	1 547	237	206	264	286	258	203	145	158	120	98	123	473	1 315	5 433	1.05
KIA	33	24	41	179	168	72	52	101	172	190	140	269	361	2 872	4 674	0.91
NISSAN	189	11	19	35	33	17	30	42	66	138	157	345	847	2 027	3 956	0.77
CIRTA PMA	2 002	50	196	198	106	76	74	73	60	47	35	63	138	734	3 852	0.75
FORD	460	56	95	91	84	95	69	84	70	137	102	138	710	1 343	3 534	0.69
HONDA	2 194	25	42	42	23	17	28	83	95	116	96	72	179	155	3 167	0.61
ISUZU	83	0	13	101	64	34	45	85	78	53	44	97	553	1 152	2 402	0.47
BERLIET	1 653	1	0	0	0	0	0	0	0	0	1	1	2	3	1 661	0.32
EN PMA UMA	158	125	211	228	57	55	77	46	64	88	100	99	216	120	1 644	0.32
AUDI	614	5	4	10	25	33	62	18	16	22	36	26	94	612	1 577	0.31
OPEL	229	55	61	76	136	152	189	86	18	12	10	23	82	270	1 399	0.27
SEAT	332	53	83	88	128	86	36	12	11	19	11	17	85	406	1 367	0.27
ZASTAVA	1 067	0	18	5	3	3	0	21	10	0	0	0	10	0	1 137	0.22
DEUTZ	962	7	6	4	4	8	1	0	2	5	5	8	6	38	1 056	0.2
BMW	450	12	16	15	24	12	20	20	21	28	19	16	86	254	993	0.19
VOLVO	285	5	2	6	5	6	3	3	15	11	19	25	47	381	813	0.16
LAND ROVER	513	3	6	8	5	12	8	1	0	2	4	2	26	119	709	0.14
DATSUN	12	2	2	4	9	12	10	43	99	100	120	89	67	109	678	0.13
SAVIEM	504	1	1	1	0	0	0	0	0	0	0	0	0	0	507	0.1
BENBADIS	312	4	2	4	4	1	4	10	2	10	5	8	23	99	488	0.09
FRUEHAUF	428	0	0	0	0	0	0	0	0	12	2	9	1	1	453	0.09
HINO	287	1	2	0	0	2	0	0	0	0	0	15	32	75	414	0.08
AUTRES	22 161	150	1 328	1 001	1 546	727	961	2 126	4 087	5 522	4 078	6 554	22 451	45 669	118 361	22.95
TOTAL	167 433	8 905	12 963	17 381	16 527	18 167	16 697	12 754	16 620	17 084	15 225	17 097	51 809	127 007	515 669	100

Source: Algeria National Statistics Office, 2009.

Additionally, the Occupied Palestinian Territory also reports an overall aging vehicle fleet. Approximately one-third of the private cars on the roads today were manufactured in the 1970s. About 60 percent of the fleet is composed of cars manufactured between 1980 and

73. See for example: Albassam et al, 2009; Bener et al, 2008.

74. Algeria National Statistics Office, 2009.

75. Godard, 2009.

1989 and only 10 percent are relatively new cars that were manufactured between 1990 and 1996.⁷⁶ Due to older automotive technology, these vehicles not only consume more fuel but also produce more emissions than newer comparable vehicles.

High rates of motorization are made worse by lax controls on fuel quality, and as a result, air quality. The use of fuel that does not conform to environmental regulations found in North America and Europe exists across many areas in the MENA region. While leaded gasoline has been banned for use in much of the region, Afghanistan, Iraq and Yemen still have leaded gasoline in their markets. Moreover, diesel fuel on the market has many times more sulphur particles, particularly in Yemen, where maximum sulphur limits for gasoline are much higher than global standards. Chapter 9 of this report expands on the issue of fuel quality and regulation.

Though congestion and environmental degradation pose threats to local sustainability, a relatively high traffic mortality rate among drivers, pedestrians and other vulnerable road users is the most acute observed trend in the MENA region. A high rate of private motorized transport usage throughout the region has brought with it a correspondingly high level of traffic accidents. At 42 deaths per 100,000 inhabitants, and where 47.5 per cent of those deaths are drivers or passengers of private vehicles, Egypt has one of the highest road fatality rates in the world.⁷⁷ Libya, Iraq and the UAE follow closely behind, with 40.5, 38.1, and 37.1 deaths per 100,000, respectively. In the UAE, 70 per cent of road fatalities involve four-wheeled private motor vehicles (refer to Chapter 8 of this report). The highest road fatality rates are correspondingly found in the areas with the greatest extent of motorization. In the Gulf States of Kuwait, Qatar, Saudi Arabia, and the UAE, road fatality rates outstrip those of both Europe and the US by a wide margin.⁷⁸

In an attempt to counteract the high road fatality rates in the region, many national transport authorities have launched road safety campaigns. In Morocco, such a campaign launched at the turn of the 21st century resulted in a 4 percent decrease in traffic accidents in 2004, while the UAE has set road safety initiatives as a keystone in its transportation plans.⁷⁹

The most significant issues resultant of this auto-dependent lifestyle are high levels of congestion, road fatalities, and pollution, coupled with the development of urban form designed exclusively for mobility by private automobile. Any effective policy responses to these issues must address the concepts of road safety, environmental regulation, public transit provision and the integration between transportation infrastructure and land-use planning.

76. Maoh and Isaac, 1999.

77. US Bureau of Consular Affairs, undated a.

78. Bener et al, 2008; Al-Saleh and. Koushki, 2007; Abdalla, 2002.

79. MENA Infrastructure, undated; Portail national du Maroc, 2006.

6. Commercial Goods Transport

This chapter attempts to characterize intra-urban commercial goods transport in the MENA region. While data are limited, information at the scale of intra-urban is scarcer. Rather, commercial goods transport statistics are drawn from a combination of regional sources, and, where applicable, more specific examples. An attempt has been made to draw connections between these broader trends and the patterns that may be present for intra-urban conditions.

6.1. Overview and description

The delivery and collection of goods is a necessary component of urban living, and thus the economic and social sustainability of an area is dependent on the effective, efficient, affordable and safe transport of goods to the population within a given urban area. As a major driver of local economic growth, commercial goods movement receives significant government attention in many MENA countries. Commercial goods movement occurs primarily by road at the intra-urban scale, accounting for close to 75 per cent of goods carried across urban centres.⁸⁰ In Egypt, the modal split for intercity freight movement is more than 94 per cent for trucks and only 5 per cent for rail and less than 1 per cent for inland waterways. Motorized vehicles dominate the market for intra-urban freight transport mostly due to their flexibility and low initial cost. However, rail and river transport have higher carrying capacity and lower energy costs, reflected in prices. Recent statistics show that the cost of freight transport by road is 0.14 LE/tonne-kilometre compared to 0.07 LE/tonne-kilometre and 0.05 LE/tonne-kilometre for railway and waterways, respectively.⁸¹

Common goods in road transport are crops (wheat, cotton, sugar and beet) and clothes, food and industrial machinery and household tools. In the Occupied Palestinian Territory, the bulk of transported commercial goods are fuel, chemicals, animals, grain, vegetables and fruits. The majority of freight service operators are privately owned, especially in Tunis and Marrakesh, where there are no public sector services. While few state companies do exist, primarily in Egypt, almost 90 per cent of commercial goods moves through the private sector.⁸²

6.2. Trends and challenges

The reliance on road transport for the movement of commercial goods has prompted several governments to enact reforms in this sector, in order to ensure safety and support the development of this industry. In Tunisia, this began with the liberalization of road transport sector of goods in 1990, after a 30 year long state monopoly. To date, Tunisia has 578 goods transportation companies serving third parties, and 1070 private operators also active in this business, all of which are in the private sector.⁸³ The total amount of goods transported in 2008 amounted to 28 billion tonne-kilometres. Because of a free pricing system, competition is fierce among operators, especially in major urban areas, where most operators conduct business.

The road freight in the Occupied Palestinian Territory is around 3.7 million tonne-kilometres. In total there are 46 road haulage companies, most of which are very small. There are about 5,904 registered trucks and commercial vehicles with payload greater than 8 tonnes.

80. Euro-Med, 2010.

81. UNDP, 2008.

82. Euro-Med, 2010.

83. Euro-Med, 2010.

The operating ones are 2,751 trucks and commercial vehicles. In Morocco, the regions of the Great Casablanca and Rabat-Zammour Zaer hold 46 per cent of all commercial cars and trucks in the country. Until recent reforms, freight service was monopolized by the National Transport Office. Now, the National Transport Office has been transformed to play the role of goods transport commissioner, opening the market to the private sector, which has surged in these urban areas due to new regulations and incentives.

In Egypt, truck operators are also mainly privately owned, with the exception of five specialized truck operators belonging to the Ministry of Investment. The rest of operators are either private (companies or individual) operators or belong to the 24 cooperative freight transport co-operatives located in most of the governorates. Types of 'own account' trucks, belonging either to the public or private sector, are carrying their own products. Table 7 illustrates road truck operators, who supply road freight service in Egypt. The average truck fleet age of the main five companies is 15 years, illustrating the potential benefits from reforms that enforce vehicle inspection and tuning programmes.

Table 7. Road freight operators in Egypt (2002–2003)

Operator name	Affiliation	Fleet size (trucks)	Freight carried	
			Millions tonnes per year	% of total
Nile company for direct transport	State	291	1.10	—
Nile company for inland transport	companies	229	0.90	—
Nile company for transport works	(working under the law #159 adopted in 1981)	229	1.00	—
Nile company for heavy transport		138	0.90	—
Nile company for freight transport		232	1.09	—
Total		1,119	5	1.2
24 freight transport cooperatives (one in each governorate)	Private sector	18,241	24.43	5.8
Companies that work under the investment law	Private sector			
Individual operators	Private sector	117,300	392	93
Own account fleet companies	Gov, PES, PS*			
Total		136,660	421.4	100

* Gov = government companies, PES = public enterprise sector companies, PS = private sector companies.

Sources: UNDP et al, 2008, citing: (1) Transport Planning Authority (2003), *Study of Road Freight Transport and the reasons behind Inactivation of law no. 70 for year*, Egyptian National Institute for Transport. (2) Central Authority for Statistics and Public Mobilization (2003) *Annual Year Book*.

Trends towards safety, reorganization and reform, as well as improved vehicle efficiency are being noted across urban areas in the MENA region. Egypt, for example, in a recent report on its National Transport Strategy, aims to increase road safety by twining selected routes and implementing international design standards.⁸⁴ Infrastructural improvements will almost

84. Ministry of Transport, Egypt, 2009.

certainly improve the safety and efficiency of road-based commercial goods transport; however, while improved road networks may improve the safety performance of road-based commercial goods movement, it may also induce increased use of private motorized transport.

The average age of freight transport vehicles in Morocco operating for third-party accounts is higher than for own accounts. Up to 29 per cent of the transport vehicles for third-party accounts are less than 5 years old, versus the 39 per cent for own account transport. Meanwhile, 19 per cent of transport vehicles for third party accounts are 20 years old or more, versus 16 per cent for own account purposes.⁸⁵

The reform codes of the 1990s in countries such as Algeria, Morocco, Tunisia and Egypt have incited the arrival of new companies that have attempted to boost competition, promote equity in the payment of transport services, and create logistically sound operations.⁸⁶ Unfortunately, the situation has improved only relatively: implicit and explicit costs have risen due to denser urban networks. Meanwhile, urban density creates pressure that is mounting for intra-urban freight services.

6.3. Impacts and challenges

Commercial goods transport faces the effects of political instability, and constraints in terms of organization and infrastructure to serve within primary urban centres. In the attempt to push reforms, concerns are present with the existence of operators holding only one or two vehicles and working without regulation. In addition, non qualification (associated with a lack of knowledge of legislation) exists within cities, coupled with the absence of resources and skills that could enable urban areas to properly fulfil requirements regarding traffic planning, management of urban networks and the construction of infrastructure. Furthermore, in cities like Algiers, where profits give way to empty returns that represent 60 per cent for small trucks, and 46 per cent for other types of commercial transport vehicles, efficiency and public service deteriorate. In spite of considerable efforts to reduce management costs, many companies experience chronic deficits due to transport fees and the implicit costs of traffic delay. Commonly, companies have little resources left to upgrade or maintain their fleet. In many cities, this has namely resulted in the dislocation of urban transport networks.

Political instability remains an obstacle to commercial goods movement – and thus socioeconomic development – in several countries in the region. In cities where roadblocks have been employed, especially in Iraq and the Occupied Palestinian Territory, the high associated costs of urban traffic delays and irregular access cause major problems for consumers and employers alike.⁸⁷ Likewise, other countries that have been plagued by conflict in recent times have seen an underinvestment in facilities necessary to remain competitive in moving commercial goods. For example, civil war and political unrest in Lebanon from the 1970s to the 1990s has been identified as a leading cause of politically and economically decentralized urban centres. Commercial goods transport suffers from inadequate networks and poor financial and organizational management.⁸⁸

85. Euro-Med, 2010.

86. Euro-Med, 2010.

87. Maoh and Isaac, 1999.

88. Held, 2006.

7. Integrated Land Use and Transportation Planning

The principle of integrated land use and transport is based on a cyclical relationship: new transportation infrastructure improves access and increases development. This leads to more intense uses of the surrounding land, which creates new travel demands on the network. While understanding this basic relationship is fairly straightforward, developing public policy which harnesses this dynamic relationship between land use and transportation demand for positive social, economic and environmental ends requires concerted effort. The chapter explores the trends, influencing conditions, as well as challenges related to land use and transportation planning in the MENA region.

7.1. Conditions and trends

The MENA region has experienced unprecedented, rapid population growth over the past few decades. The majority of this new growth is being taken up by the urban areas, where much of the economic growth is centred. According to the United Nations, the proportion of the population in this region that lives in urban areas has increased from 45 per cent in 1980 to 59 per cent in 2010. It is expected that 61 per cent of the region's population will be located within urban areas by 2015, compared to an average level of urbanization (in 2015) of 47 per cent for all developing countries.⁸⁹ This rapid urbanization is not only the result of natural growth, as it is also fed by the rural population which is increasingly migrating to urban areas to follow employment opportunities. As a result, the population in the cities within the region is growing at a faster rate than the population of the countries overall.⁹⁰

These high urbanization rates throughout the region result in a large strain on already inadequate infrastructure, including housing and urban transportation networks, which struggle to keep pace with the growing urban population.⁹¹ In addition, throughout much of the region there is a real lack of effective land management and urban planning.⁹² Consequently, in many areas throughout the region this extreme urban growth is being accommodated by unplanned, informal settlements, as seen in Morocco, Algeria, Jordan, and Egypt among other countries. Informal housing represents a large proportion of the housing stock in some parts of the region; as much as 20–40 per cent in some areas.⁹³

With swelling populations in these cities, much of this informal settlement is occurring near the periphery of the city in a sprawling fashion, resulting in increased land area of cities, as is currently occurring in Sudan.⁹⁴ Sprawling development has also been seen in Sana'a, Yemen, resulting in a relatively low residential gross density of 130 people per hectare, and thus higher costs for infrastructure and service delivery, particularly transportation services such as public transit.⁹⁵ Another example of urban sprawl is in the Greater Cairo area, in Egypt, where existing towns and villages are expanding due to increased informal development, and taking up adjacent agricultural lands to accommodate this growth. In an attempt to limit the propagation of uncontrolled and unplanned informal development in the Greater Cairo region, while still accommodating increased urban population growth, an initiative was set out in 2007 by the General Organization for Physical Planning to permit some urban expansion onto surrounding agricultural land, which was previously prohibited.⁹⁶

89. United Nations, 2010.

90. Madbouly, 2009.

91. Madbouly, 2009; Cities Alliance, 2009.

92. Cities Alliance, 2009.

93. World Bank, 2008b.

94. Madbouly, 2009.

95. Cities Alliance, 2009.

96. Madbouly, 2009.

In some parts of the region, inhabitants in these informal settlements are living in such dire conditions that the areas are characterized as slums. Table 8 provides some data on the proportion of urban populations that live in slums. For some of these countries, there are other external factors besides simply high urban population growth that are attributed to the high slum population, such as the recent or ongoing conflicts. Policies related to the improvement of slum areas are a high priority in certain parts of the region, particularly, in Yemen, Morocco, and Egypt.⁹⁷

Table 8. Percentage of urban population living in urban slums, selected MENA countries

Country	Year	Percentage of urban population living in slums
Egypt	2007	17.1
Iraq	2007	52.8
Jordan	2005	15.8
Lebanon	2005	53.1
Morocco	2007	13.1
Saudi Arabia	2005	18.0
Sudan	2005	94.2

Source: UN-Habitat, 2010.

From the discussion above, it is clear that the impacts of urban growth in the region today are much more challenging than even just a decade or so ago, as the region struggles to accommodate urban growth at ever increasing rates, thus placing extreme pressure on and demand for urban transport infrastructure and services.⁹⁸ This emphasizes the increasing importance of integrated land use and transportation planning in the region, but also makes the task much more challenging as urban areas will have to address the issues of current inadequate infrastructure and services (as discussed in Chapter 3 with regard to the provision of formal public transit services), as well as provide additional services to accommodate growth.

Several major cities in the region have plans and policies aimed at linking land use and transportation in order to achieve various sustainability objectives. For instance, the Amman, Jordan Master Plan of 2008 promotes high-density, mixed-use development through the identification of growth centres, intensification along select corridors across the city and the provision of safe and efficient public transportation.⁹⁹ In Syria, integrated land-use and transportation planning is covered under the Programme for Sustainable Urban Development, the result of collaboration between various departments of the local and national governments and international partners. One project covered under this programme is the Project for the Rehabilitation of the Old City in Aleppo. Among the objectives of the project is the goal of combating traffic by relocating land uses and adopting complementary traffic regulations to

97. Madbouly, 2009.

98. World Bank, 2008b.

99. Greater Amman Municipality, undated.

increase accessibility while protecting and preserving the Old City.¹⁰⁰ In Sana'a, Yemen, a Comprehensive Traffic Management Study was conducted in 2006, in an attempt to better prepare for the impacts that projected growth will have on the urban transportation system.¹⁰¹

In other contexts, integrated land use and transportation planning has been officially embraced, although the policies enacted may not be aligned with recognized best practices. For example, in Kuwait, the national Ministry of Planning is responsible for the development of nationwide land-use plans and has authored the 2006 Integrated Master Plan, the third in the country's history. The document establishes new integrated policies concerning land use, natural resources, environment, transportation, population, housing, recreation, infrastructure and utilities. However, the document anticipates a 78 per cent increase in auto traffic by 2030 and calls for the addition of new highways to the existing road network in order to accommodate future demand. Similarly, in Israel, where a Comprehensive National Outline Plan for Construction, Development and Conservation (called NOP 35) has been approved, concerns have been raised that the traditional transportation paradigm of 'predict and provide' remains largely unchanged.¹⁰²

7.2. Impacts and challenges

Several countries in the region have suffered from recent or ongoing conflicts, which have made planning long-term, integrated transportation strategies nearly impossible. This is seen in the case of Lebanon, where the civil war prevented coherent transportation and land use plans; the last master plan produced for Beirut dates back to the 1960s.¹⁰³ With no planning, there is a heavy inflow of cars daily into the centre of the city, in part because growth in travel demand has not been matched by increased public transit.¹⁰⁴ In addition, the lack of planning has led to the development of urban slums that make the provision transport services more challenging. The consequences of political instability and occupation in the Palestinian Territory have similarly precluded the development of any land-use and transportation planning. This is partly because Israel and the Palestinian Authority often have opposing transportation and mobility goals: while Palestinians desire free movement within the region for people and goods, Israel restricts and controls movement both within the occupied territories and within Israel due to claimed security concerns. In Iraq, the dual issues of ongoing ethnic violence and US occupation have rendered the state unable to engage in any long-term transportation planning.

With much of the new urban population growth being accommodated by informal settlements, presents its own set of issues. For instance, since the government does not officially acknowledge informal settlements, these areas often do not receive the proper infrastructure and services that the inhabitants require, including urban transportation infrastructure and services.¹⁰⁵ In addition, even when a city decides to develop and implement an official plan which would allow better integration of land use and infrastructure development, it is not always possible to fully carry out these plans, as landowners are not willing to surrender their land for the provision of infrastructure, and enforcement to do so is very weak.¹⁰⁶

100. Integrated Urban Development in the City of Aleppo, undated.

101. Cities Alliance, 2009.

102. Garb, 2004.

103. El Zarif, 2005.

104. Hayek, 1996.

105. Madbouly, 2009.

106. Cities Alliance, 2009.

On the whole, integrated land use and transportation planning is gradually becoming an accepted planning paradigm in several countries in the region; however, more widespread adoption is some ways off. Whether due to political instability, lack of professional expertise, or the use of transportation projects as a source of political patronage, transportation policies in several countries remain focused on infrastructure without heed to its affect on land use.

8. Social Sustainability of Urban Transport

Questions of social sustainability are of fundamental importance, yet they represent a relatively recent concern. It has traditionally been assumed that investments in transportation benefit society at large, yet work in the social sciences has revealed that such monolithic descriptors tend to overlook variations between different subgroups. While discrepancies in the provision of social benefits throughout subgroups is an issue worldwide, certain aspects of the political and cultural landscape of the region make issues of social equity paramount. This chapter will explore the challenges of social sustainability in urban transport within the MENA region.

8.1. Evidence of impact

Three major issues of social sustainability are of concern in the region: political rights of migrant workers and those displaced by war and conflict, the effects of deeply-rooted cultural and religious attitudes towards women, and poor road safety—particularly for the most vulnerable users. Like many regions of the world, since only those with sufficient financial means can purchase a private vehicle, motorists benefit most from investments in road infrastructure through increased access to destinations, creating an impediment to upward mobility for the poor. Those who do not possess a vehicle are usually at greater risk for traffic-related road injuries due to increased time walking, cycling or accessing public transportation. Countries with insufficient public transport systems are particularly vulnerable to this phenomenon.¹⁰⁷

8.2. Challenges

In countries characterized by a hierarchical organization of social groups, geographic inequalities may be exacerbated by transportation infrastructure aimed at keeping groups separate, either through physical barriers or unequal service provision. The oil-rich countries of Qatar, Saudi Arabia, the UAE and Oman rely on unskilled expatriate workers for many services yet enact policies to ensure that this workforce remains largely separate from the local population. For example, in Qatar, spatial segregation is reinforced through the reduction of accessibility by public transit to suburban areas – a policy that particularly affects migrants often working in or on projects in these areas.¹⁰⁸ In Oman, similar government action is in effect. With the majority of public transport users in the state being expatriates involved in unskilled labour, the Omani government does not believe it is in their interest to subsidize public transportation initiatives.¹⁰⁹ As mentioned previously, the existence of parallel road networks through the Occupied Palestinian Territory allows Israeli citizens easy access, yet subjects Palestinians to major delays and long detours.

A major equity issue confronting the region involves the marginalization of lower-income groups and migrant groups throughout contemporary transportation planning. The combination of factors causes a reduction in both accessibility and mobility levels for many and is the most significant threat to any measure of social sustainability in the region. Despite their importance, equity issues are not the focus in many transportation plans. In some countries, transportation policy is used as a tool to reinforce existing spatial segregation, as noted in Qatar and Oman. In Saudi Arabia and Yemen, transportation policy is used to reinforce the secondary position of women in society.

107. Lu et al, 2005.

108. Lockerbie, 2005–2011.

109. Al-Ismaily and Probert, 1998.

As a region characterized by restrictions on the involvement of women in public life, gender-based inequality in access to transportation is also endemic. In Saudi Arabia, a growing economy has seen an increasing number of Saudi women owning cars, yet they nevertheless remain banned from driving in the Kingdom.¹¹⁰ While a recent revision made to the Saudi traffic law omits gender as a point of contention amongst enforcement officials, the Saudi Traffic Department has absolved itself of responsibility for the issue by leaving it to the higher legislative authorities.¹¹¹ In Kuwait, despite the clear mobility issues for low-income, female, disabled, and other marginalized groups, there has been no attempt at the policy level to address these shortcomings.

Studies in Yemen and the West Bank conclude that, in the absence of specific policy, transport systems often do not adequately serve women's needs. The researchers in this study also note important issues of gender equality in general in the region. Particularly in the Occupied Palestinian Territory, the combination of social, political, and economic constraints mean that even well-educated women often give up on a career. While many of the political barriers to safe, efficient travel present in Occupied Palestinian Territory (such as the barrier wall, checkpoints, and access roads), are not an issue in other parts of MENA, many other constraints make travel difficult for women. For example, in Yemen, a 2009 study conducted by the Yemeni Center for Social Studies and Labor Research under World Bank financing collected interviews with over 500 women throughout nine neighbourhoods in the city of Sana'a. The results of the study found that women choose walking and public transport for the majority of daily trips made in the city. The data collected showed a direct correlation between working women and the provision of better urban infrastructure, such as lighting, sidewalks, and access to public transit terminals. The highest rate of working women (15 per cent) was found in the older neighbourhoods of Sana'a, where such urban infrastructure is present and maintained. In peripheral areas, these rates are much lower (8 per cent). Road infrastructure, such as pedestrian crossings, sidewalks and access to bus terminals, is inaccessible or nonexistent. Female interviews highlighted the importance for such infrastructure for making trips in the city possible.¹¹²

Gender-based transportation exclusion is less pronounced in Tunisia and Egypt, and almost non-existent in Turkey and Israel.¹¹³ It should be noted that these issues are more problematic in rural areas than in urban areas. Apart from issues of convenience, the spill-over effects of the lack of transportation options include: lack of education, and inability to find or secure employment. In some cases, gender also plays a role in the affordability of public transit and informal taxis. Women interviewed in three West Bank communities mentioned cultural restrictions on haggling with male drivers means that they often pay higher fares than men. The same study found that the combination of routes designed to access work destinations and a pricing scheme requiring separate payment for mode changes means that women also pay more than men on average.¹¹⁴ The report recommends the implementation of an integrated fare structure to address this issue. Interestingly, Saudi Arabia has a stated policy goal to '*Minimize the level of transport using private cars and enhance the use the public transport regardless of age, sex, income and ability*' by the year 2025. However, few details were available on how this would be accomplished, especially in regards to women's issues.

110. Bowman, 2007.

111. Al Hakeem, 2008.

112. World Bank, 2000.

113. World Bank, 2011a.

114. Majar, 2009 (cited at <http://siteresources.worldbank.org/INTMENA/Resources/QuickNote21.pdf>).

A recent report laments the lack of urban policy in general as well as a lack of a developed heavy public transport systems in the region. However, many regions have accepted the growing demand for public transport and well as its vital role in reaching both environmental and social justice goals and are beginning to implement large-scale planning initiatives.¹¹⁵ Additionally, a recent collaboration between the European Union (EU) and the 12 Mediterranean Countries (MEDA) resulted in the EuroMed plan, a comprehensive plan with a stated goal ‘to contribute to the overall economic and social development of MEDA countries’. The plan has a focus on large-scale infrastructure and trade but also places an emphasis on more broad social issues.¹¹⁶ However, the region as a whole suffers from a lack of transportation planning, particularly for active and public transit. According to a 2009 World Health Organization report, only Yemen has a national policy to promote active forms of transportation, and only roughly 60 per cent of countries in the region have policies to encourage public transportation.¹¹⁷

According to the 2007 report ‘Overview of Public Transportation in Middle East and North Africa’, the Cairo transit system keeps a low fare due to reasons of social benefit, however, this also has an adverse effect on revenue. Morocco also faces similar economic constraints.¹¹⁸ This pattern is observed throughout the region, particularly in regards to rail transport.

In countries with more progressive social policies, transport infrastructure may be more accessible and fair. For example, the Marmaray tunnel project in Istanbul, Turkey, has been independently assessed as having high social equity value and high accessibility for all residents.¹¹⁹ Jordan established a Public Transport Regulatory Commission in 2001 with an expressed goals to take into account both strategic and social goals.¹²⁰

Currently, road deaths and injuries are the third leading cause of healthy life-years lost in the region. The World Bank estimates that this will be the leading cause of death in 2020 with an increase of 68 per cent in road deaths. The burden of road crash deaths and injuries disproportionately affects the poor. These injuries have larger consequences for long-term employment prospects and health care costs.¹²¹

Table 9 shows the estimated road traffic death rate per 100,000 inhabitants by income level and GNI per capita. Road deaths by income level vary greatly among MENA countries; low income levels generally indicate higher rates of estimated traffic-related deaths. However, the correlation fluctuates, with several high income countries accounting for a larger share of traffic fatalities, such as Egypt and Libya. This indicates the presence of other influential factors, and the strong social dimensions which affect the equity and sustainability of urban transport.¹²²

115. UITP, 2007.

116. Euro-Med, 2007.

117. WHO, 2009.

118. UITP, 2007.

119. Zeybek and Kaynak, 2009.

120. UITP, 2007.

121. World Bank, 2000.

122. WHO, 2009.

Table 9. Proportion of road deaths by income level across MENA

Country/Area	GNI per capita for 2007 in US dollars	Income level	Estimated road traffic death rate per 100,000 population
Bahrain	20,610	High	12.1
Egypt	1,580	Middle	41.6
Iraq	1,646	Middle	38.1
Israel	21,900	High	5.7
Jordan	2,850	Middle	34.2
Kuwait	40,114	High	16.9
Lebanon	5,770	Middle	28.5
Libya	9,010	Middle	40.5
Morocco	2,250	Middle	28.3
Oman	11,275	Middle	21.3
Qatar	66,063	High	23.7
Saudi Arabia	15,440	High	29
Sudan	960	Low	34.7
Syria	1,760	Low	32.9
Tunisia	3,200	Middle	34.5
Turkey	8,020	Middle	13.4
UAE	41,082	High	37.1
Occupied Palestinian Territory	1,422	Middle	4.9
Yemen	870	Low	29.3

Source: WHO, 2009.

9. Urban Transport and the Environment

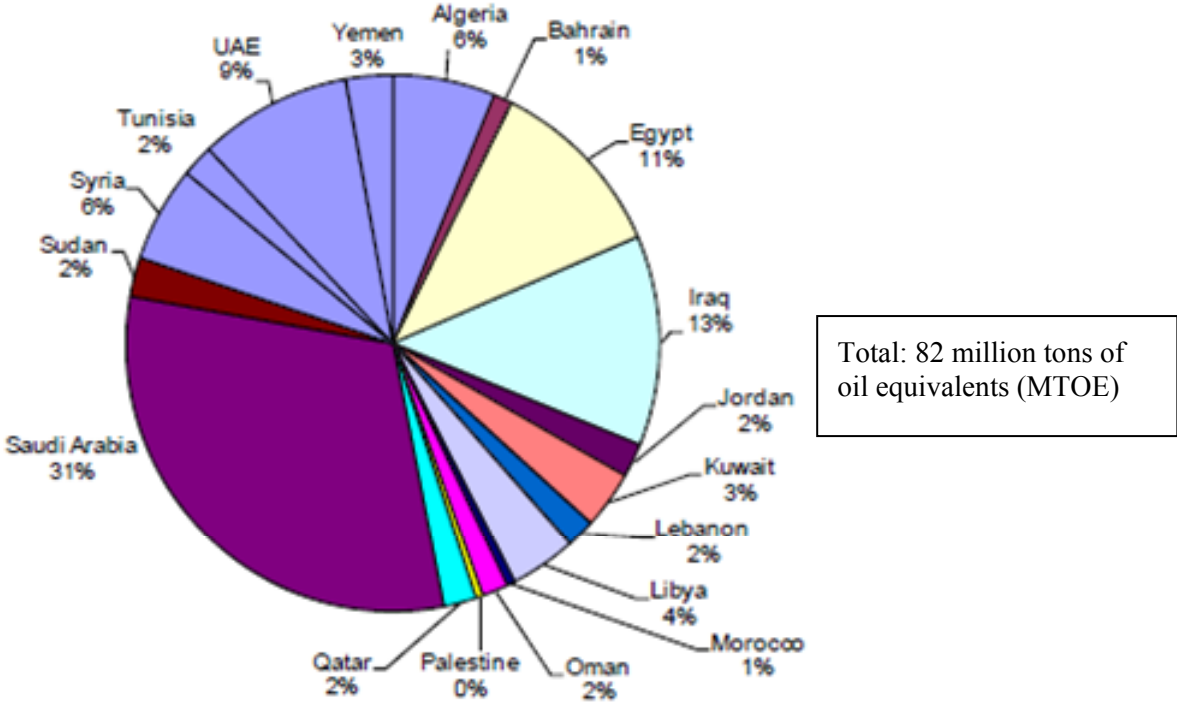
The transportation sector represents a key area for targeted environmental policy initiatives, given that it is a major source of greenhouse gas emissions as well as harmful pollutants, particularly in urban areas. In discussing the various actions planned or taken to minimize the environmental impacts of this sector, it is important to note whether a particular initiative has explicit environmental aims, or whether the potential environmental benefits represent a positive, yet unintended, external effect. This chapter will discuss the environmental issues, and review initiatives and policies (or in some cases a lack there of) related to urban transport within the study region.

9.1. Overview and importance

In the Arab region alone, the transport sector accounts for 22 per cent of the total greenhouse gas emissions, of which 85 per cent is attributed to urban transportation. The most harmful impact of the transport sector comes from the daily use of vehicles in cities, most of which are over 15 years of age and not regularly maintained, except for in certain Gulf states. Adopting and enforcing environmental standards and regulations is subject to sounder traffic management operations. Environmental specifications are furthermore limited to the ability to license vehicles and conduct inspections.

The total gasoline and diesel oil consumption in road transport in 2005 in the Arab region, excluding Comoros, Djibouti, Mauritania, Somalia and Western Sahara, reached about 82 millions tonnes of oil equivalents, and CO₂ emission reached about 258.4 million tonnes.¹²³ Whereas Saudi Arabia represented about 31 per cent of fuel consumption in urban road traffic, Morocco only represented 1 per cent, as shown in Figure 6.

Figure 6. Distribution of fuel consumption in road transport in the Arab countries (2005)



Source: ESCWA, 2009.

123. ESCWA, 2009.

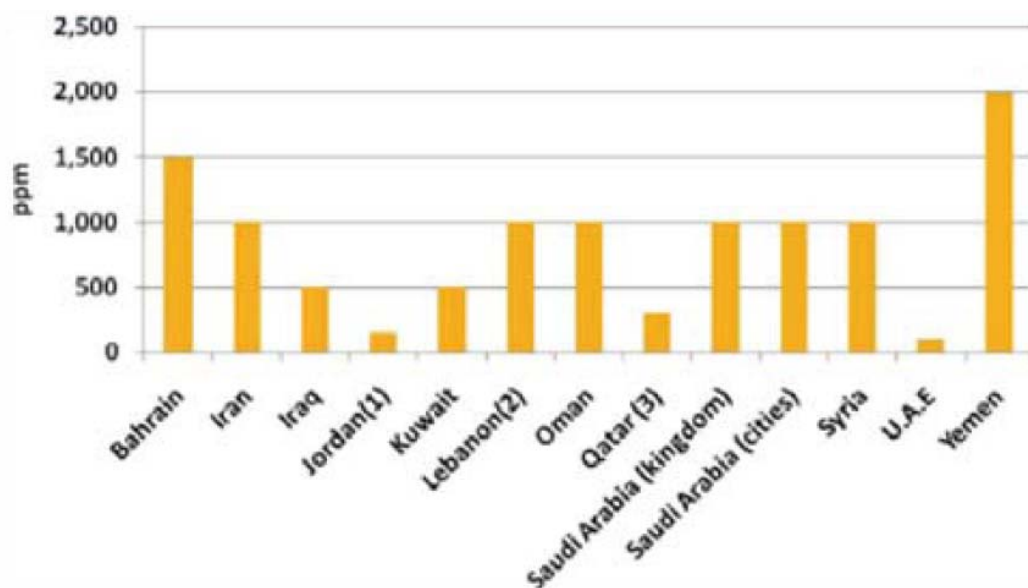
Fuel consumption in road transport, gasoline and diesel oil, in 2005 represented about 51 per cent from total final oil consumption in the Arab region, but ranged considerably between 13 per cent in Morocco, and 92 per cent in Bahrain.¹²⁴ The average per capita fuel consumption in the transport sector in the Arab region in 2005 was about 0.27 tonnes, and average per capita emission of CO₂ was 0.82 tonnes, with a considerable variety in these values among Arab countries.¹²⁵

9.2. Trends and conditions

Environmental transport related problems are found in areas with limited regulation. For example, in Lebanon, where air quality is already impacted by the high rate of motorization in the country, it is made worse by lax controls on fuel quality. While leaded gasoline has been banned for use in much of the developed world, in many developing countries it is still in use. Today, only Afghanistan, Iraq and Yemen still have leaded gasoline in their markets, though Yemen aimed to phase-out leaded gasoline starting in 2009. Iraq and Yemen allow leaded gasoline with maximum content levels of 0.4 grams per litre and 0.15 grams per litre, respectively.¹²⁶

In Algeria, the use of fuel that does not conform to environmental regulations found in Europe and North America has led to deteriorating air quality in urban areas. In a recent report on fuel quality in the developing world, diesel fuel sold in the MENA region was found to contain ten times more sulphur particles than diesel fuel sold in Europe and North

Figure 7. Current maximum gasoline sulphur limit in the Middle East



Notes:

1. Waiver in place with sulphur content set at max of 400 ppm (parts per million).
2. Two grades available (RON 98 and RON 95) with max sulphur limit set at 500 ppm and 1,000 ppm, respectively.
3. Two grades available (RON 97 and RON 90) with max sulphur limit set at 100 ppm and 300 ppm, respectively.

Source: Asian Clean Fuels Association, 2009, citing, International Fuel Quality Center, July 2009.

124. ESCWA, 2009.

125. ESCWA, 2009.

126. Asian Clean Fuels Association, 2009.

America.¹²⁷ The maximum sulphur limit varies from 100 parts per million to 2,000 parts per million content, although usually gasoline provided into the local markets may have lower levels. The UAE and Qatar lead the region at the lower limit for gasoline, while Yemen is at the other end of the scale with the highest gasoline sulphur specification. Figure 7 indicates the current maximum sulphur limits for gasoline in select countries of the region.

As the countries of the MENA region are among the world's largest producers of petroleum-based energy sources, the levels of CO₂ emissions in the region are steadily rising. Table 10 presents CO₂ emissions levels by sector in the MENA region in 2005, confirming that the transportation sector, which includes not only road transport, but rail, air and water freight transport, is responsible for 22 per cent of CO₂ emissions in the region, which is almost similar to the global average (23 per cent). In the region, Iraq has the highest share of CO₂ emissions in the transportation sector, contributing to 35 per cent of CO₂ emissions. The majority of the transportation sector in the region has an average share of between 15 to 27 per cent of CO₂ emissions. However, only a few countries in the region are monitoring air pollution levels per pollutant in sufficient and consistent manner, which actually limits scientific research and policy recommendations.¹²⁸ Throughout the region, CO₂ emissions generally account for the highest percentage of the greenhouse gas emissions. For example, in Tunisia, CO₂ emissions account for around 92 per cent of the total greenhouse gas emissions, while methane and nitrogen oxide emissions account for 7 per cent and 1 per cent respectively.¹²⁹

Table 10. CO₂ emissions by sector in the MENA region in 2005

Country/Region	Energy sector		Manufacturing industries and construction		Transport		Other sectors		Total
	Million tonnes of CO ₂	%	Million tonnes of CO ₂	%	Million tonnes of CO ₂	%	Million tonnes of CO ₂	%	Million tonnes of CO ₂
Iran	108.14	27	76.44	19	100.31	25	122.21	30	407.10
Saudi Arabia	171.98	54	71.44	22	72.52	23	3.74	1	319.68
Egypt	61.56	42	37.41	25	31.59	21	17.03	12	147.59
UAE	53.08	48	31.52	29	22.06	20	3.72	3	110.38
Iraq	29.08	34	17.54	21	29.63	35	8.39	10	84.64
Algeria	35.59	42	11.18	13	17.78	21	19.75	23	84.30
Kuwait	50.14	67	12.42	17	8.04	11	4.02	5	74.62
Israel	40.27	67	1.81	3	9.86	16	7.91	13	59.85
Syria	22.30	47	9.78	20	11.74	25	3.94	8	47.76
Libya	23.60	52	7.31	16	11.72	26	2.77	6	45.40
Morocco	18.03	44	7.16	17	1.82	4	14.34	35	41.35
Qatar	21.05	58	9.04	25	6.14	17	0.14	0	36.37
Oman	17.08	63	5.10	19	3.61	13	1.19	4	26.98
Tunisia	6.78	35	3.85	20	4.54	24	4.11	21	19.28
Yemen	5.76	31	1.83	10	6.18	33	4.92	26	18.69
Bahrain	11.39	62	4.05	22	2.65	14	0.23	1	18.32

127. UNEP, 2007.

128. University of Gothenburg, 2010.

129. UNEP, 2006.

Country/Region	Energy sector		Manufacturing industries and construction		Transport		Other sectors		Total
	Million tonnes of CO ₂	%	Million tonnes of CO ₂	%	Million tonnes of CO ₂	%	Million tonnes of CO ₂	%	Million tonnes of CO ₂
Jordan	7.02	39	2.91	16	4.78	27	3.20	18	17.91
Lebanon	6.76	43	3.19	20	3.97	25	1.89	12	15.81
Total MENA	689.61	44	313.98	20	348.94	22	223.50	14	1,576.03
Asia (excl. China)	1303.11	50	634.89	25	407.53	16	245.46	9	2,590.99
Latin America (excl. Mexico)	262.94	28	238.83	25	324.37	35	111.54	12	937.68
Non-OECD Total	6,636.35	50	3,294.63	25	1,856.69	14	1,479.87	11	13,267.54
World	12,307.24	45	5,184.04	19	6,337.02	23	3,308.06	12	27,136.36

Source: Zhang, 2008, citing IEA Database.

9.3. Impacts and challenges

There are significant opportunities for environmental benefits associated with developing alternative transportation options, both for passenger and freight transportation, in terms of both global emissions and local exposure to specific pollutants. With regards to more sustainable forms of passenger travel, this usually involves bus or train options, whereas for freight this takes the form of urban rail, water or pipeline systems. Unfortunately, the analysis and rationale for these projects are often made independently of environmental planning processes, and are typically justified on the basis of economic efficiency rather than their environmental benefits.

Partnerships between assorted countries in the region with international bodies such as EU and non-governmental organizations have resulted in various pilot projects specifically aimed at reducing the environmental burden of transportation. Syria has recently joined other Mediterranean countries in cooperating with the EU programme called ‘Negotiation and Application of Policies for Lowering Emissions.’ Within this framework, the Syrian Ministry of Transport has proposed a programme to use compressed natural gas (CNG) and liquefied propane gas (LPG) in public transport vehicles with the aim of improving urban air quality.¹³⁰ Egypt has engaged in a 5-year project (2009–2013) aimed to reduce the increase in energy consumption and greenhouse emissions from Egypt’s transport sector, and to decrease the level of congestion and poor air quality related to traffic. The latter project is funded by the Global Environment Facility, United Nations Development Programme (UNDP), the Egyptian government and the private sector.¹³¹ In Egypt, another successful policy that started in 1994 and still progressing is encouraging taxi and individual drivers to convert into CNG operation in order to improve air quality. Currently some 63000 vehicles converted into CNG, almost 75 per cent of which are taxis, mainly operating in Cairo and Alexandria. This represents about 3 per cent of the world’s CNG vehicles.¹³²

In Algiers, various measures were adopted in support of private vehicles and taxis using LPG by subsidising prices for clients and car dealers, which attract individuals to convert their

130. Chahoud, 2006.

131. Sustainable Transport Project for Egypt, 2009.

132. Houpin, 2010.

vehicles to LPG fuel. In addition, the Algerian Ministry for Energy and Mines has implemented a programme of action aimed at the use of CNG in particular for public transport buses in the urban environment. This conversion of public buses service also took a place in Turkey and Egypt in order to decrease energy consumption, greenhouse gas emissions and local pollution.¹³³

However, a major impediment for implementing sustainable transportation policies in the region is the low cost of transport fuel, often priced artificially low in oil-exporting countries. In addition to the intense climate and other factors cited in Chapter 2 that favour the use of private motorized transportation, the availability of low cost fuel is one of the major impediments to achieving better environmental performance in the transportation sector. One country that is using pricing to calibrate demand for automobile travel is Bahrain. In order to mitigate the effects of increased traffic from the soon-to-be-built Qatar-Bahrain causeway, the Bahrain Transport Ministry is implementing measures to improve their bus system, including introducing exclusive laneways, park-and-ride locations and cordon pricing policies to reduce driving in the Manama city centre.¹³⁴

While several promising environmentally focused transport initiatives, such as the examples cited above, have been implemented in recent years, there remain many challenges to addressing the significant challenges associated with this area. As investment and development occurs and incomes rise, rates of motorization and attendant emissions have a strong tendency to increase. In order to offset these emissions, initiatives aimed at reducing vehicle kilometres travelled, using cleaner fuels and developing more sustainable freight transport practices will need to be implemented. While detailed analysis of emissions was not conducted for the countries surveyed, it remains highly unlikely that the impact of environmental initiatives enacted in recent years will be able to neutralize – let alone reduce – the emissions associated with current and increasing motorization. Progress in this area will require bolder actions on the parts of governments, as well as measurable objectives.

133. Houpin, 2010.

134. Trade Arabia, 2010.

10. The Economics of Sustainable Urban Transport

Sustainable urban transport systems require a dynamic balance between the main pillars of sustainable development, namely economic, social and environmental aspects and considerations. As transportation projects tend to be expensive endeavours, financing of transportation projects becomes increasingly challenging. Whether for capital investments or ongoing operations, the issue of funding is always a concern for transportation authorities. This chapter will explore the economics associated with providing sustainable urban transport in the MENA region, through a discussion of the current impacts, as well as strategies that have been applied throughout the region to finance and reduce the costs of urban transport projects and services.

10.1. Evidence of impact

As a region where many countries derive a significant proportion of their revenues from the export of crude oil and petroleum products, the historically high price of this resource has provided new funding sources for various transportation projects. However, since petroleum resources are not found everywhere in the region, other methods of funding transportation projects have been employed by governments, such as long-term and low-cost bank loans, public-private partnership financing scheme, and build-operate-transfer (BOT) financing schemes.

With regard to pricing policies for public transit, user fees (fares, tariffs) throughout the region are too low to efficiently finance the public transit network. For example, transit system in Cairo maintains a low fare for social equity reasons.¹³⁵ Transit providers in Morocco (loss of US\$32 million for 2005–2006), Tunisia (deficit of almost US\$174 million in 2007) and Syria, among others, face similar issues related to inadequate pricing policies.¹³⁶ Worsening the situation is the fact that already low transit fares are usually not adjusted to account for inflation, and transit service providers are often not compensated for providing reduced fares to certain groups, despite being obligated by authorities to do so.¹³⁷ As a result of these low fares, many transit service providers in the region suffer great financial difficulties. In the extreme case of Meknes, Morocco, the transit authority suffered such extreme debt (220 million dirhams) that it fell into bankruptcy.¹³⁸ These deficits lead to transit services decreasing in quality, which in turn inhibits their ability to provide services to accommodate the ever-growing urban population, which thus increase the competitiveness of informal transit services. The challenge with pricing policies in this region is finding a balance between having users fees high enough to generate revenues to fund the service provided, while keeping fees low enough to ensure access of the service to the urban poor. Syria and Tunisia, among other countries in the region, have turned to private investors for support in order to make the necessary improvements to their transit system while maintaining low fees.¹³⁹ Thus, inadequacies in public transit pricing policies has created further impetus for the implementation of innovative funding schemes throughout the region, some of which will be discussed below.

10.2. Existing policies in face of challenges

Financing urban transport projects through public-private partnerships has been gaining ground in recent years. While different models exist within this framework, normally private

135. UITP, 2007.

136. UITP, 2007; Regional seminar on urban transport in the Mediterranean region, 2008.

137. Regional seminar on urban transport in the Mediterranean region, 2008.

138. UITP, 2007. US\$28 million according to December 2007 exchange rates.

139. UITP, 2007.

capital is invested to finance the construction of new transport infrastructure, which is indefinitely operated privately, or turned over to a public agency after a given period of time. While this model is proliferating around the world, it has become particularly popular in Jordan, Saudi Arabia, Egypt and the UAE.¹⁴⁰ A major conference on public-private partnerships took place in January 2011 in Abu Dhabi, a city whose rapid growth has been largely focused on the public-private partnership model.¹⁴¹ In 2006, the government of Egypt adopted a new unit called the Public-Private Partnership Central Unit under the Ministry of Finance, which aims to pursue long-term policy partnership with the private sector to provide a new source of investment capital for required infrastructure projects. This unit is currently managing the Heliopolis metro project through a 20-years contract.¹⁴² In addition, this unit is managing several urban roads enhancement projects, such as the Alexandria City ring road project aimed at enhancing accessibility and mobility in Alexandria City, and the 10th of Ramadan City ring road project aimed at providing a transportation system that meets international standards for efficiency and quality, and to reduce the high traffic volumes on other roads.¹⁴³

The Egyptian New Taxi Programme is another example of a public-private partnership in the region's transportation sector, with clear economic and environmental goals.¹⁴⁴ Egyptian law requires that taxis over 20-years old (about 34,000 are older than 30 years) are not allowed to operate in Cairo as of July 2011. In the second half of 2009, the number of replaced old taxis reached 14,000 vehicles.¹⁴⁵ In 2010, the government of Egypt applied for a €1 million grant from the French Development Agency, to be used as a consultancy services to create and enhance the efficiency and attractiveness of public transport in Cairo. These services include mainly public-private partnership support to present a pilot high-quality bus services on some routes, in order to attract potential new users, as well as to market and modernize the bus services managed by the Cairo Transport Authority.¹⁴⁶ Although their use is expanding throughout the region, critiques have been raised that the cost-saving benefits of public-private partnerships may be lost in an inefficient project-tendering process.¹⁴⁷

Some countries in the region have adopted build-operate-transfer (BOT) schemes as an alternative to traditional public financing for urban infrastructure projects. Examples of countries using BOT include Turkey, Israel, and Egypt. In Cairo, BOT was used in the construction of El-Torgoman station (operating since 2009), one of largest hub-transfer terminals in Egypt for regional and local buses (60 buses), which also includes multi-storey car parking (2,700 cars), taxi lines (50 taxi), administration areas, retail and recreational areas. The total cost of this project was 280 million Egyptian pounds (US\$46 million).¹⁴⁸ An issue with the BOT scheme in project financing stems from the untrusting relationship between the public and private sector, the high complexity of projects, and conflicts of interest between the parties involved.¹⁴⁹

Another tool some governments use to gain revenues from existing transportation systems is through outright privatization, where a government sells a publicly owned asset to a private firm with the expectation that private interests will operate this service more cost-

140. International Finance Corporation, undated.

141. Ameinfo, 2010.

142. El Kouedi, 2007.

143. Public Private Partnership Central Unit, 2008.

144. African Development Bank, 2009.

145. Huzayyin and Salem, 2010.

146. Devex, 2000–2011.

147. Soliño and Gago de Santos, 2010.

148. Manar and Reem, 2009.

149. Kreydieh, 1996.

effectively. While the day-to-day decisions regarding the operation of the transport service will be beyond the government's jurisdiction, the sale of major infrastructural assets can generate revenue for new capital investments. At the time of writing, this is being considered in Bahrain, where the Transport Ministry has proposed to privatize the public transport sector, which it claims will make it more economically sustainable and improve the quality of service.¹⁵⁰

Bank loans are one of the most important financing methods to support formal and informal transport throughout the region. For instance, informal transport is based on private investment for operating licences and vehicle purchase. This form of transport creates many jobs in cities in terms of running and maintaining fleet vehicles. An example of bank loans used to finance formal transport projects is the Marmaray Project in Istanbul, a mega urban transport infrastructure project, aimed at connecting Europe and Asia (since the city of Istanbul spans both of these continents) with an urban railway tunnel under the Bosphorus. This project takes an integrated approach toward sustainable mobility, connecting rail transit systems, thus increasing the sustainability of Istanbul's urban transport network while preserving the heritage and landscape the city. The project costs more than US\$3 billion, and is financed by the Japan Bank for International Cooperation (US\$950 million loan) and the European Investment Bank (€650 billion loan).¹⁵¹ The project is expected to significantly mitigate traffic congestion, air pollution and reduce the total commuter travel time in the city by 44 per cent. A major limitation is the high cost of the project, and the lack of clarity in its commercial operation.¹⁵²

Urban sprawl is considered one of the major impediments to financing efficient urban transport systems. In the MENA region, urban sprawl is generally being driven by informal settlements (as discussed in Chapter 7).¹⁵³ This sprawl is generally characterized by heavy car dependence due to the shortage of public transportation. It increases the commuting time and energy costs due to congestion. This in turn reduces cities competitiveness, attractiveness and economic development. Thus measures aimed not only at raising revenues, but also controlling costs have been implemented in some areas. In Turkey, for example, the municipal government of Istanbul has proposed land use policies that support major transport improvements, along with measures to limit urban sprawl. This strategy promotes compact urban development and walkable neighbourhoods, with the goal of reducing the operating costs of public transport, meanwhile increasing ridership and thus revenues. However, as a cost-saving measure, such strategies must be consistently applied over time and supported by complementary policies at the national level.

One of the new strategies that have been implemented in the region to increase revenue from urban transport projects is through tolls system. These systems charge either on a per-usage basis, or for a given block of time. While a complete list of toll roads is unavailable, one of the world's most prominent toll systems has been employed within the region: the Dubai Salik toll system. In 2007, this system has been implemented on one of the busiest roads in Dubai, Sheikh Zayed Road. Salik, which means open or clear road, employs an advanced technology which uses 'radio frequency identification' technology to achieve free-flow operation with no impact on traffic flow, thus allowing vehicles to move freely through the tolling point at permitted speeds.¹⁵⁴

150. Bahrain Ministry of Transportation, undated.

151. Net Resources International, 2011.

152. Zeybek and Kaynak, 2009.

153. Houpin, 2010.

154. Roads and Transport Authority, 2011.

11. Urban Transport Institutions and Governance

The structures dividing responsibility for transportation policy-making and implementation throughout the region are as diverse as the different governance systems found there. As in any domain, different structures of government offer different benefits and drawbacks with regard to planning, financing and operating transportation networks. The involvement of different levels of government varies considerably, with different associated advantages and disadvantages. While a federal transport ministry may be better positioned to mobilize resources, it may be less attuned than municipal governments to local circumstances. This chapter explores the various models of institution and governance throughout the region, and how these affect urban transport.

11.1. Evidence of impact

The territorial organization of countries within the MENA region varies throughout the region, as summarized in Table 11. Some governmental structures are rather complex, such as in Jordan and Morocco where the countries are divided into different regions, inherently result in the decentralization of responsibilities rather early on.¹⁵⁵ Throughout the study region, there are examples of both centralized and decentralized approaches to urban transport institution and governance, each experience met with a different level of success. A decentralized model of urban transport governance appears to be emerging in a more widespread manner throughout the region, as a result of recent decentralization reforms related to rapid urbanization. The move toward decentralization and a more local governance approach in Arab states is supported by the UNDP, as an important step toward good, sustainable governance in the region and to achieve the objective of the Millennium Development Goals.¹⁵⁶

Table 11. Territorial organization of countries within the MENA region

Country	Population (2007, in millions)	Regional level	Provincial level	Local level
Algeria	33.9		48 provinces/ <i>wilayas</i> , 160 districts/constituencies (<i>da'iras</i>)	1,541 municipalities (communes)
Egypt	80.1		26 governorates, each divided into districts	217 towns + Luxor (with special status) 4,617 villages
Jordan	5.9	3 regions (creation announced in 2006)	12 governorates	99 municipalities
Lebanon	4.2		6 governorates (<i>muhafazat</i>), each (except Beirut) divided into districts (<i>aqdaya</i>)	930 municipalities and villages
Morocco	31.2	16 regions	49 provinces (rural areas) and 13 prefectures (urban areas)	1,497 municipalities (communes)
Occupied Palestinian Territory	4.0		14 governorates (9 in the West Bank and 5 in the Gaza Strip), 2 autonomous provinces	74 municipalities (63 in the West Bank and 11 in the Gaza Strip), 368 village councils
Syria	20.5		14 departments	107 cities, 248 small cities, 207 villages

155. Bergh, 2010.

156. Sarrouh, 2003.

Country	Population (2007, in millions)	Regional level	Provincial level	Local level
Tunisia	10.1		24 governorates (<i>wilayat</i>), each divided into districts	264 municipalities
Turkey	73.0	12 regions	81 special provincial administrations	3,225 municipalities, 16 metropolitan municipalities, and 35,000 villages

Sources: Bergh, 2010, citing GOLD World Report 2008 and UCLG country profiles; population data from UNDP Human Development Report 2009 (available at http://hdr.undp.org/en/media/HDR_2009_Tables_rev.xls).

Efforts to centralize responsibilities for urban transport has recently taken place in Cairo, where the operation of public transportation, which was previously under the jurisdiction of the Cairo Governor and the Interior Ministry, has been placed under the jurisdiction of the Ministry of Transport. In addition, the Prime Minister of Cairo has called for the formation of a Public Transportation Regulatory Authority, which will control all urban transport modes in the City. Given that this centralized approach is still relatively new in Cairo (with the new authority set to begin its work in 2011), it is too early to tell what impact these changes will have.¹⁵⁷ While there may be benefits to this type of central control, it may also result in ‘one-size fits all’ solutions which are not responsive to local conditions.

A decentralized model of urban transport governance, on the one hand, permits multiple agencies to contribute specific expertise; on the other hand, however, it can result in situations where a lack of coherent leadership prevents timely responses to changing realities. A decentralized model characterizes the delivery of transportation services in Algeria, for example, which is divided into 48 *wilayas* (provinces), each having its own land transport division which comprises urban transport.¹⁵⁸ Multi-level governance of urban transport is also found in Jordan, and has proven to be quite successful in the capital city of Amman where the Greater Amman Municipality is responsible for policies and transportation system stewardship. At the national level, the Ministry of Transport is responsible for all the plans and studies looking into the intermediate and long-term. Public transportation on the national level is under the responsibility of the Public Transport Regulatory Commission, which is affiliated with the Ministry of Transport but has its own financial and administrative independence.¹⁵⁹ This multi-stakeholder structure, with a strong regional focus, has likely contributed to Jordan taking a leadership role in the region.

11.2. Existing policy

Generally, in countries within the MENA region, the partitioning of various sectors and competition or rivalry between different institutions creates administrative problems for development and decision-making in the transport sector. For example, disagreements between transport, town planning, political, and security institutions or sectors can arise when decisions are being made at the highest governmental/institutional level. In order to solve such problems, some countries within the region have created independent public agencies devoted to rolling out territorial projects. In Istanbul, for example, there are dedicated urban transport authorities. The Istanbul Metropolitan Municipality is one such authority that is responsible for urban transport. This authority administrates a large range of bodies devoted to land use, local and regional planning, traffic regulation and transport management in the

157. Ragheb, 2010.

158. UITP, 2007.

159. Kingdom of Jordan Ministry of Transport, undated.

city. For the transport sector, there are two bodies, namely, UKOME and AYKOME, which are responsible for coordinating all of the authorities and bodies involved with infrastructure planning procedures and project implementation. In Istanbul, a total of approximately 50,000 employees are involved in urban transport planning and management. However, one of the main reasons for the transport system's lack of efficiency in Istanbul is the differences in intervention strategies and the lack of coordination between the several departments and municipality agencies, thus decreasing the efficiency of strategic planning approaches taking place within the state institutions.¹⁶⁰

The urban transport system in Sana'a, Yemen, suffers from considerable problems affecting its performance and efficiency. These problems include the weak institutional and strategic framework for urban transport planning and management, the lack of traffic management and parking policies, and finally the insufficient and unbalanced financing of urban transport.¹⁶¹ Like other countries in the region, the institutional obstacles and strategic weaknesses are due to the division of responsibilities related to urban transport between different public institutions, including the Municipality of Sana'a, the Ministry of Transport, and the Ministry of Interior, without reasonable coordination among these groups. Urban transport and traffic management issues are not appropriately addressed by the current institutional framework, as there is no special unit in charge of them. Recently, the government of Yemen created a Land Transport Agency under the Ministry of Transport to address these public transport issues. However, the new agency has limited human resources and institutional capacity, as well as a shortage of logistical and financial resources to realize its objectives. In Yemen, generally, there is a shortage of trained transport planners and traffic engineers. Another problem is that the city's plan for future transport policy and traffic management, Comprehensive traffic management studies (CTMS), offers only a partial solution to Sana'a's transport problems as the strategy proposed is not comprehensive and lacks the consideration of multimodality.¹⁶²

In Morocco, there is limited institutional capacity for policy making or implementation, within both the central and local governments. Although many actors are involved, including the municipalities, other local governments, and the de-concentrated services of the central government, their responsibilities are always divided resulting in many gaps, as well as overlaps. According to the Charte Communale (Law 78-00), municipalities are responsible for urban transport; however, these municipalities always have very limited means and resources to achieve their objectives. In February, 2009, this law was amended by Law 17-08, until that, there were no practical mechanisms to solve the problem of that urban areas and urban transport issues are often spanned along several municipalities. Now, provinces and regions are responsible for filling some of these gaps, but they have a capability and resources problems to do so. Furthermore, for long term urban development and land use projects, there is a key problem of coordination and cooperation between urban transport development and the broader planning and investment decisions. These problems are intensified by the limited knowledge of the current situation at local and regional levels of the inhabitants' needs and use of urban transport systems and the absence of urban transport comprehensive plans. These problems are coupled with the lack of financing, which limited the capability for the central government to monitor progress or provide technical support for the local authorities. However, only Casablanca and Marrakech cities have well developed transport comprehensive plans and knowledge that can help decision-makers.¹⁶³

160. Houpin, 2010.

161. World Bank, 2010.

162. World Bank, 2010.

163. World Bank, 2011b.

11.3. Challenges

There are several challenges to achieving the successful and sustainable institutionalization and governance of urban transport in the MENA region. As discussed in the examples of Sana'a (Yemen) and Morocco, there is generally a lack of capacity among governments and agencies to fully carry out their duties and meet their set objectives, thus impeding the movement toward sustainable governance in the region. This lack of capacity stems from a shortage of human resources and a general lack of financial autonomy at local levels.¹⁶⁴

There is also the issue of too many groups/actors involved in governing urban transport in some parts of the region. In Tunis, for example, there are a large number of urban transport players, including ministries, governorates, communes, agencies and public operators, which inevitably result in increased issues related to coordination and cooperation. Such a structure also increases the probability of wasting time and money, when these public players function against one another. Furthermore, the complexity of such a system with a large number of actors is intensified by the systematic, highly noticeable partitioning within Tunisia's institutional organization itself. For example, the transport sector in Tunis City involves five different ministries, and the cooperation and coordination procedures to set up a common vision or development plan are unclear. Therefore, coordination has to be done at the highest level of authority.

Many cities within the region, such as Cairo and Tangier, suffer from major centralization at the administrative levels and a general lack of autonomy at intermediate levels within the institutional framework.¹⁶⁵ In addition, there are many cases where there is a limited effectiveness of expertise because they are widely scattered between many public and private institutions (for example, in Algeria and Morocco, where part of the formal public transit service is administered by public parties and some parts under private administration due to inadequate funding in the public sector¹⁶⁶), thus resulting in the poor regulation of the private transport sector and this a lack of coordination (in schedules, routes and so on) between service providers operating in the same area.

There are also specific challenges related to the widespread informal public transit sector throughout much of the region. This private informal transportation sector, which includes minibus and taxis operations (as discussed in Chapter), does not fall within the direct control of local or regional authorities. Such services are unregulated for the most part, and generally lack a strategic vision. This, therefore, results in weak public transportation systems with inadequate service planning, no obligation to provide services, as well as a huge gap in terms of network coverage.¹⁶⁷

164. Bergh, 2010.

165. Houpin 2010.

166. UITP, 2007.

167. Houpin, 2010.

12. Towards Sustainable Urban Transport

Sustainable urban transport in MENA region, as measured by the various criteria in this study, remains a complex issue that requires dialogue, coordination and capacity-building among key stakeholders and institutions. Moreover, the successful integration of both environmental and economic sustainability within an institutional framework is proving to be difficult to realize in practice.

Some of the more wealthy emirates of the UAE have integrated environmentally sustainable technologies with ongoing and future transportation projects, such as Abu Dhabi's 2008 Surface Transport Master Plan. This plan has identified environmental sustainability as a major part of future planning efforts in hopes to reduce carbon emissions with a greater focus on public transit, coupled with the use of low carbon technologies in these systems.¹⁶⁸ Also a new endeavour in Abu Dhabi attempts to incorporate the 'three Es of sustainability', environment, economy and equity, in the world's first zero-carbon city. Construction for the City of Masdar began in 2007, and the first phase is expected to be completed by 2015. Masdar will be an innovative research hub with a strong focus on renewable energy, led by the Masdar Institute of Science and Technology. Plans for the city include several strategies for sustainable urban transport, including: the exclusion of cars; the promotion of active transport (walking and cycling) through innovative shading and cooling strategies; light rail connections through the city and to surrounding cities; and a Personal Rapid Transit system which relies on compact, automated 'podcars' running on magnetic tracks.¹⁶⁹ Although there are some criticisms of the project, this multi-billion dollar venture (funded through revenue from oil industries in the UAE) reflects a forward-thinking approach to the state of sustainability in the MENA region. It is important to note that many of the ambitious capital projects in the UAE have funding shortcomings; thus, the economic sustainability of these projects is questionable.¹⁷⁰ Conversely, economically sustainable transportation policy in the region has shown to negatively impact environmental sustainability.¹⁷¹

The previous four chapters provided an overview of each of the four pillars of sustainability as they relate to urban transportation within the region. From this discussion, it is evident that there are many challenges which are impeding the progress of sustainable urban transport in many areas. Table 12 identifies seven common obstacles. In a 2009 Economic and Social Commission for Western Asia (ESCWA) questionnaire, Arab countries have identified and ranked the importance of seven general barriers facing the efforts and plans to achieve sustainable transport policies. These challenges were ranked as '1' for the most important, and '7' as the least important.

Table 12. Ranking of sustainable transport barriers in some Arab countries

Barriers	Egypt	Jordan	Lebanon	Palestine	Qatar	Sudan	Syria	Total Score	Ranking of the barriers	Relevant chapters of this report
Limited funding	1	1	3	1	7	1	1	15	1st	2, 3, 10, 11
Weak/lack of integrated policies and plans	4	4	1	5	5	3	3	25	2nd	7, 11

168. MENA Infrastructure, undated.

169. Stilwell and Lindabury, 2008.

170. IISS, 2010.

171. Hughes, 2007.

Barriers	Egypt	Jordan	Lebanon	Palestine	Qatar	Sudan	Syria	Total Score	Ranking of the barriers	Relevant chapters of this report
Lack of appropriate technical expertise	5	3	7	2	1	4	4	26	3rd	7, 11
Lack of data and information	6	5	2	4	2	7	2	28	4th	All
Inappropriate implementation mechanisms	3	6	6	6	4	2	5	32	5th	3, 4, 8, 10, 11
Lack of awareness and capacity-building	7	2	4	7	3	5	6	34	6th	3, 11
Inadequate institutional and regulatory frameworks	2	7	5	3	6	6	7	36	7th	11

Source: Adapted from ESCWA, 2009.

The responses from the questionnaire heavily lean towards the challenge of limited funding in moving towards sustainable transport. The least insurmountable barrier is reported as inadequate institutional and regulatory frameworks, with only Egypt listing this challenge as secondary importance. The major setbacks as defined by ESCWA are expanded upon: lack of financial resources, integrated policies and plans, technical expertise, data and information, awareness and capacity-building, as well as inadequate implementation techniques and regulatory frameworks.

The lack of financial resources is a major barrier to achieve sustainable transport in most Arab countries. The region deals with pressing developmental issues that retain priority over funding, where many are projects that focus on investments and approaches that do not adequately address the sustainability of future needs. Furthermore, reliable and available data is as expensive as it is valuable; however, extensive data and information for public and private sectors is needed for sound policy making and development plans. A lack of data availability and integrated information is a major hindrance to the adoption, implementation and development of sustainable transportation infrastructure.

Policies and plans lack coordination and integration among varying levels of actors and stakeholders, primarily due to a lack of institutional cohesion or ability to adopt and implement programmes. Transport planning is often poorly integrated with urban planning, which increases the difficulty for further improvements. This is coupled with inappropriate implementation mechanisms, and inadequate institutional frameworks. The coordination of stakeholders is paramount for the appropriate implementation of plans and policies. Technology partnerships on development are inadequate due to weak communication and poor regional and international cooperation in the field of sustainable transport. Regulatory frameworks are poor: most transport systems in the Arab region are under government control, limiting coordination with the relevant institutions. The enforcement of regulations is passive and ineffective, requiring more stringent monitoring networks.

Moreover, the onset of new technologies and modalities for technology transfer require technical experience that needs to be enhanced, either for the development of transportation systems or for the production of cleaner fuel and/or specifications. This technical expertise should complement capacity-building and awareness campaigns. Knowledge resources are limited, which may affect public perception on sustainable transport and lead to conflicting

interests among stakeholders. Building awareness and promoting capacity-building programmes on the issues of mobility may have the advantage of gaining political support and ultimately, funding.

In order to achieve a truly sustainable urban transport system, these barriers must be overcome. Several reports examining the impact of these barriers on urban transport in the region have generated recommendations as to how cities in MENA region countries can move towards more sustainable transport.

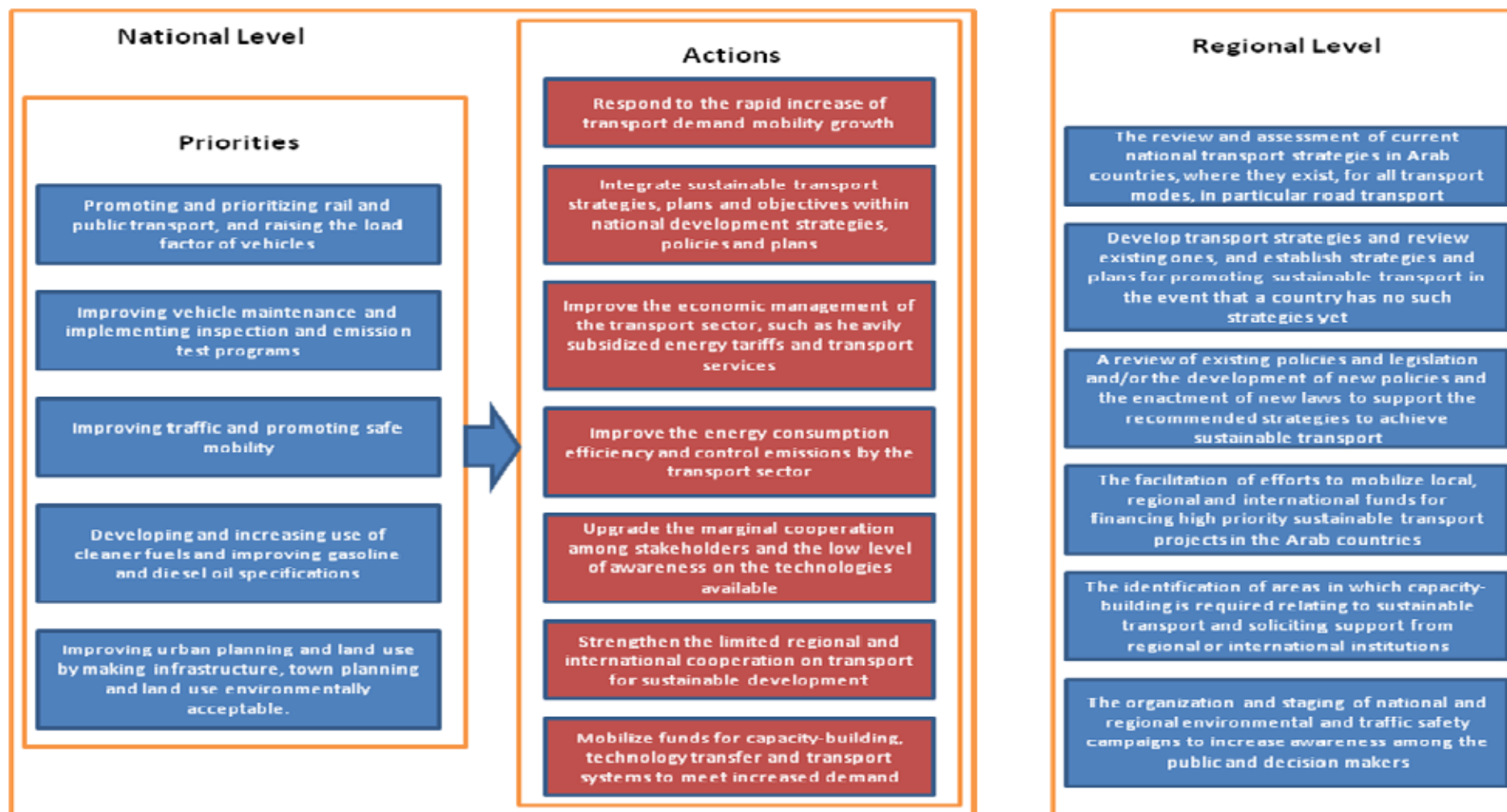
Population growth, coupled with economic growth, has led to accelerated mobility demand. In addition, the price subsidy for transport fuels (gasoline and diesel oil) and the inadequate operation and maintenance of the transport fleet has led to low vehicle energy efficiency and a high emission rate. Therefore, in recognition of the need to move towards a more economic and sustainable management of the transport sector, countries in the region should accelerate their efforts to adhere to sound policies and recommendations. ESCWA have compiled priority areas for action and recommendations for the Arab region at the national and regional level, as illustrated in Figure 8.

ESCWA stresses that implementing a sustainable transport programme is a highly complex task and, therefore, requires a coordinated approach by all players, including governments, vehicle users, fuel producers, non-governmental organizations, and regional and international organizations. Communication among the multi-level stakeholders is essential, as is regional cooperation in any or all of the activities listed above. It is important that international organizations can support governments in the formulation of policies to increase investment and financial flows in sustainable transport projects. Supporting the development of national capacities to access and utilize resources will enable the implementation of appropriate policy instruments in order to achieve sustainable urban transport.¹⁷²

These recommendations would greatly enhance the economic, environmental, and social sustainability of urban transport in MENA region countries. As has been shown, the policies that are most effective are those that are made and implemented in an integrated fashion. This is a difficult balance to achieve, with economic sustainability often negating improvements made in environmental sustainability and vice versa. Many transport authorities in the region currently demonstrate a commitment to improving automobile mobility and safety, while making symbolic gestures towards public forms of transport. More holistically, policies aimed at maximizing accessibility of all citizens using a variety of modes, rather than those which prioritize auto-mobility for a privileged few, will lead to other significant benefits in terms of economic development, environmental gains and greater social equity in the region.

172. ESCWA, 2009.

Figure 8. National and regional priority areas and recommendations



Source: ESCWA, 2009.

List of References

- Abdalla, I. M. (2002) 'Fatality risk assessment and modeling of drivers responsibility for causing traffic accidents in Dubai', *Journal of Safety Research* **33**(4): 483–496
- African Development Bank (2009) 'Support to the national program for taxi replacement scheme based employment: Arab Republic of Egypt', African Development Bank
- Ahmed, A. (2006) 'Abu Dhabi to build metro rail system', *Gulf News*, 10 May, <http://gulfnews.com/news/gulf/uae/traffic-transport/abu-dhabi-to-build-metro-rail-system-1.236372>, last accessed 27 May 2011
- Al Hakeem, M. (2008) 'New Saudi traffic law does away with gender of driver', *Gulf News*, <http://gulfnews.com/news/gulf/saudi-arabia/new-saudi-traffic-law-does-away-with-gender-of-driver-1.118304>, last accessed 27 May 2011
- Al Theeb, A. (2007) 'Illegal taxi operators face Dh5,000 penalty', *Gulf News*, 29 August, <http://gulfnews.com/news/gulf/uae/traffic-transport/illegal-taxi-operators-face-dh5-000-penalty-1.197461>, last accessed 27 May 2011
- Albassam, E., A. Khan and V. Popov (2009) 'Management of air quality in the vicinity of Congested Area in Kuwait', *Environmental Monitoring and Assessment* **157**(1–4): 539–555
- Algeria National Statistics Office (2009) 'Situation semestrielle des immatriculations des véhicules automobiles', http://www.ons.dz/IMG/pdf/marc_AMC_S2_09.pdf, last accessed 27 May 2011
- Al-Ismaïly, H. and D. Probert (1998) 'Transport policy in Oman', *Applied Energy* **61**(2): 79–109
- Aljounaidi, L. (2010) 'Gender and transport in MENA: Case studies from West Bank Gaza and Yemen', *MENA Knowledge and Learning*, Quick Notes Series Number 21
- Al-Saleh, O. I. and P. A. Koushki (2007) 'Assessment of urban traffic infractions in Kuwait', *Transportation Research Record* **2038**: 16–22
- Alterkawi, Mezyad M. (2006) 'A computer simulation analysis for optimizing bus stops spacing: The case of Riyadh, Saudi Arabia', *Habitat International* **30**(3): 500–508
- AMEInfo (2010) 'Public-private partnerships regain industry focus in Middle East', <http://www.ameinfo.com/245366.html>, last accessed 27 May 2011
- Applied Research Institute Jerusalem (2007) 'Status of the environment in the Occupied Palestinian Territory', Applied Research Institute, Jerusalem
- Arab Information Network (2010) 'The Egyptian Government looking to reduce subsidies on gasoline', 20 April, http://www.moheet.com/show_news.aspx?nid=367164&pg=1, last accessed 17 May 2011
- Asian Clean Fuels Association (2009) 'Middle East region fuels quality progress', October, *ACFA* **7**(6), <http://www.acfa.org.sg/pdf/acfa1009.pdf>, last accessed 15 May 2011
- Bahrain Ministry of Transportation (undated) 'Public transport', <http://www.transportation.gov.bh/en/modules.php?name=Content&pa=showpage&pid=119>, last accessed 27 May 2011
- Barry, K. (2009) 'Take the monorail to Mecca', *Wired*, 8 September, <http://www.wired.com/autopia/2009/09/take-the-monorail-to-mecca/>, last accessed 27 May 2011
- Bener, A., T. Özkan and T. Lajunen (2008) 'The driver behaviour questionnaire in Arab Gulf countries: Qatar and United Arab Emirates', *Accident Analysis and Prevention* **40**(4): 1411–1417

- Bergh, S. (2010) 'Decentralisation and Local Governance in the MENA Region', http://www.iemed.org/anuari/2010/aarticles/Bergh_decentralisation_en.pdf, last accessed 27 May 2011
- Bowman, J. (2007) 'Saudi women car owners skyrocket', *Arabian Business*, <http://www.arabianbusiness.com/506100-female-car-owners-skyrocket-in-saudi>, last accessed 27 May 2011
- Catnaps (undated) 'Planning in Qatar', <http://www.catnaps.org/islamic/planning.html>, last accessed 27 May 2011
- CERTU (*Centre d'Études sur les Réseaux, les Transports, l'Urbanisme et les Constructions Publiques* – Center for Studies on Networks, Transport, Urban Planning and Public Construction) (2008) 'Stratégie de mobilité durable dans les villes des pays en développement: Guide pédagogique'
- Çetin, T. and F. Oğuz (2010) 'The effects of economic regulation in the Istanbul taxicab market', *Journal of Economic Affairs* **30**(3): 59-64, <http://onlinelibrary.wiley.com/doi/10.1111/j.1468-0270.2010.02023.x/full>, last accessed 27 May 2011
- Chaaban, F., G. Ayoub and M. Oulabi (2001) 'A preliminary evaluation of selected transport-related pollutants in the ambient atmosphere of the City of Beirut, Lebanon', *Water, Air, and Soil Pollution* **126** (1–2): 53-62
- Chahoud, J. (2009) 'Public transport policy and measures that could improve the air quality in major cities in Syria: A case study, Damascus', in B. Morel and I. Linkov (eds) *Environmental Security and Environmental Management: The Role of Risk Assessment*, Springer, The Hague, Netherlands, pp. 287–296
- Cities Alliance (2009) 'Sana'a: a City Development Strategy', <http://www.citiesalliance.org/ca/sites/citiesalliance.org/files/Cities%20Alliance%20Sana%27a%20pub%2010-5-09.pdf>, last accessed 27 May 2011
- Corder, R. (2007) 'Dubai metro on track for 2009', *Arabian Business*, http://www.arabianbusiness.com/index.php?option=com_content&view=article&id=9635, last accessed 27 May 2011
- Devex (2010) 'Support to sustainable urban transport in Cairo, Egypt', <http://www.devex.com/en/projects/support-to-sustainable-urban-transport-in-cairo-egypt>, last accessed 27 May 2011
- Downing, A.J. (1991) 'Pedestrian safety in developing countries', Paper presented at the Proceedings of the Vulnerable Road User: International Conference on Traffic Safety, 27–30 January, New Delhi
- El Araby, M. (2002) 'Urban growth and environmental degradation: The case of Cairo, Egypt' *Cities* **19**(6): 389–400
- El Kouedi, H. and M. Mostafa (2007) 'Tackling the shelter challenge of cities: Thinking it through together – Cairo, Egypt', Presentation for World Bank on 30 April, <http://siteresources.worldbank.org/INTHOUSINGLAND/Resources/339552-1180637750307/Cairo.pdf>, last accessed 27 May 2011
- El Zarif, J. (2005) 'Conducting the first traffic impact analysis in the absence of legal and regulatory frameworks: A case study from Beirut', *Institute of Transportation Engineers* **75**(7): 32
- ESCWA (Economic and Social Commission for Western Asia) (2009) 'Transport for sustainable development in the Arab Region: Measures, progress achieved, challenges and policy framework', United Nations Report, New York, <http://www.escwa.un.org/information/publications/edit/upload/SDPD-09-wp-1.pdf>, last accessed 27 May 2011

- Euro-Med (2007) 'Regional transport action plan for the Mediterranean Region 2007–2013', <http://p23680.typo3server.info/232.0.html>, last accessed 27 May 2011
- Euro-Med (2010) 'Status report on the implementation of RTAP road transport actions in the MEDA Mashrek countries,' Road Study, European Union
- Fletcher, E. (1999) 'Road transport, environment and social equity in Israel in the new millennium', *World Transport Policy and Practice* **5**(4): 8–17
- Fletcher, E., G. Ginsburg and Y. Garb (1999) 'Transport, environment and equity in Israel', ADVA Center for Research on Israeli Society, Tel Aviv-Jafo
- Fox, J. (2011) 'As bike lanes expand, Tel Aviv residents demand a voice in planning', *Sustainable City Blog*, 24 April, <http://www.sustainablecityblog.com/2011/04/as-bike-lanes-expand-tel-aviv-residents-demand-a-voice-in-planning/>, last accessed 27 May 2011
- Gallo, L. (2010) 'Small bike shop cultivates cycling culture in Istanbul', *Hürriyet Daily News*, 27 March Istanbul
- Garb, Y. (2004) 'Constructing the Trans-Israel Highway's inevitability', *Israel Studies* **9**(2):180–217
- Godard, X. (2007) 'Some lessons from the LRT in Tunis and the transferability of experience', *Transportation Research Part A* **41**: 891–898
- Godard, X. (2009) 'Variété des systèmes de mobilité urbaine face aux enjeux de développement et d'environnement', Paper presented at the Environment and transport in different contexts, Algiers
- Greater Amman Municipality (undated) 'Amman plan: A liveable city is an organized city...with a Soul'
- GTZ (2009) *International Fuel Prices, 2009, Vol 6*, <http://www.gtz.de/de/dokumente/gtz2009-en-ifp-full-version.pdf>, last accessed 27 May 2011
- GTZ (German Technical Cooperation) (2002) 'Urban transport and poverty in developing countries analysis and options for transport policy and planning', <http://www.gtkp.com/assets/uploads/20091127-182046-6236-en-urban-transport-and-poverty.pdf>
- Gulf News (2009) 'RTA intensifies drive against illegal taxi drivers', 2 February, <http://gulfnews.com/news/gulf/uae/general/rta-intensifies-drive-against-illegal-taxi-drivers-1.474541>, last accessed 27 May 2011
- Hayek, K. (1996) 'Infrastructure development in Lebanon: Public/private partnerships' Massachusetts Institute of Technology
- Held, C. (2006) *Middle East Patterns: Places, Peoples, and Politics*, Westview Press, Boulder
- Hopfinger, H. and R. Khadour (1999) 'The development of the transportation sector in Syria and the actual investment policy', *Middle Eastern Studies* **35**(3): 64–71
- Houpin, S. (2010) 'Urban mobility and sustainable development in the Mediterranean Regional diagnostic outlook', http://www.codatu.org/english/conferences/conference-regional/4.3c-ENUrban_mobilty_and_sustainable_development_in_Mediterranean.pdf
- Huber, N. (2009) 'Algiers delays metro opening until 2010', *Middle East Economic Digest* **53**(41): 14
- Hughes, M. (2007) 'Desert riches fuel network revival', *Railway Gazette International* **163**(4): 205–207
- Huzayyin, A. and H. Salem (2010) 'Past and present trends of urban transport and related energy consumption, greenhouse gas and pollution emissions in Greater Cairo', Reviewed papers track, World Conference on Transport Research WCTR 12, Lisbon

- IISS (International Institute for Strategic Studies) (2010) 'Dubai's debt woes expose governance model', *Strategic Comments* **16**(2): 1–2, <http://www.informaworld.com/smpp/content~db=all~content=a921751135>, last accessed 31 May 2011
- Integrated Urban Development in the City of Aleppo (undated) 'Home', <http://www.udp-aleppo.org/?id=1>, last accessed 27 May 2011
- International Finance Corporation (undated) 'IFC supports public-private partnerships in the Middle East and North Africa', http://www.ifc.org/ifcext/media.nsf/content/mena_public_private_partnerships, last accessed 27 May 2011
- Kaveh, Y. (2007) 'Israel bike trail gets ready to roll' Keren Kayemeth LeIsrael-Jewish National Fund
- Kingdom of Jordan Ministry of Transport (undated) 'About us', <http://www.mot.gov.jo/aboutus>, last accessed 27 May 2011
- Koushki, P. A. (2007) 'Personal cost of auto travel in Kuwait', *Journal of Transportation Engineering-ASCE* **133**(4): 275–280
- Koushki, P. A., S. Yaseen and L. I. Ali (1999) 'Evaluation of bus transit maintenance and operation costs in Kuwait', *Transport Reviews: A Transnational Transdisciplinary Journal* **19**(4): 305–314
- Kreydieh, A. (1996), 'Risk management in BOT project financing'. Master thesis, Department of civil and environmental engineering, MIT, <http://dspace.mit.edu/bitstream/handle/1721.1/40594/35265574.pdf?sequence=1>, last accessed 27 May 2011
- Kuwait Times (2008) 'Five companies to build Kuwait Metro', *Kuwait Times*, 26 May
- Lonely Planet (2007) *Oman, UAE and Arabian Peninsula*, Lonely Planet Publications
- Lu, T.H., T.L. Chiang and J.W. Lynch (2005) 'What can we learn from international comparisons of social inequalities in road traffic injury mortality?' *Injury Prevention*, **11**(3): 131–133
- Maatouk, A. (1992) 'Les transports urbains en Algérie', In Groupe Interuniversitaire de Montréal (eds) *Villes et développement – Conférences*, Montréal
- Madbouly, M. (2009) 'Revisiting urban planning in the Middle East North Africa region', Regional study prepared for UN-Habitat Global Report on Human Settlements 2009, <http://www.unhabitat.org/downloads/docs/GRHS.2009.Regional.MENA.pdf>, last accessed 27 May 2011
- Manar, K. and T. Reem (2009) 'Dr.Ahmed Nazif, the Prime Minister of Egypt opens Cairo Gateway Plaza', Almasryalyoum, 13 January, <http://www.almasry-alyoum.com/article2.aspx?ArticleID=194590&IssueID=1284>
- Maoh, H. and J. Isaac (1999) 'The status of transportation in the West Bank', *World Transport Policy and Practice* **5**(4): 18–29
- Meehan, S. (2010) 'Kuwait cabs for women paint the town pink', *Elan*, <http://elanthemag.com/kuwait-cabs-for-women-paint-the-town-pink/>, last accessed 27 May 2011
- MENA Infrastructure (undated) 'A world-class transport system', MENA Infrastructure, <http://www.menainfra.com/article/A-world-class-transport-system/>, last accessed 27 May 2011
- Ministry of Transport, Egypt (2009) 'Report on recent development of the Ministry of Transport – the implementation of the national transport development strategy', Ministry of Transport, Egypt
- Moussa, H. (2010) 'The Alexandria cyclers club', *Alex Med NewsLetter* **18** (Feb-April): 5

- Nabti, J. (2004) 'Leveraging infrastructure: Sustainable bus rapid transit route planning in Beirut, Lebanon' Masters Thesis submitted to the Massachusetts Institute of Technology
- Net Resources International (2011) 'Marmaray railway engineering project, Istanbul, Turkey', <http://www.railway-technology.com/projects/marmaray/>, last accessed 27 May 2011
- Odero, W., P. Garner and A. Zwi (1997) 'Road traffic injuries in developing countries: A comprehensive review of epidemiological studies', *Tropical Medicine and International Health* **2**(5): 445–460
- Oualalou, T. (2002) 'Le métro va-t-il trouver sa place dans l'évolution du tc De Casablanca', in X. Godard and I. Fatonzoun (eds) *La Mobilité Urbaine Pour Tous*, Swets and Zeitlinger, Lisse
- Portail national du Maroc (2006) 'Transports au Maroc', <http://www.maroc.ma/NR/exeres/A2AB1ADB-D7C8-474D-8395-B70285DA4E45.htm>, last accessed 27 May 2011
- Public Private Partnership Central Unit (2008) 'Homepage', <http://www.pppcentralunit.mof.gov.eg/pppcusite/content/home/default>, last accessed 27 May 2011
- Ragheb, K. (2010) 'PM puts Cairo public transport under ministry's jurisdiction', *Al-Masry Al-Youm*, 30 August
- Railway Gazette (2007) 'Tgvs to Marrakech', *Railway Gazette International* **163**(4): 203
- Regional seminar on urban transport in the Mediterranean region (2008) 'Urban transport in the Mediterranean region guidance and recommendations', http://www.cmimarseille.org/_src/Report_GuideUrbanTransport_EN.pdf, last accessed 27 May 2011
- Roads and Transport Authority (2011) 'Welcome to Salik', Emirate of Dubai, <http://www.salik.ae/>, last accessed 27 May 2011
- Sarrouh, E. (2003) 'Decentralized governance for development in the Arab States: A background paper on decentralization and local governance policies, legal frameworks, programmes, lessons learned and good practices', UNDP Sub-Regional Facility for Arab States, arabstates.undp.org/contents/file/DGBackgroundPaperSURFAS.doc, last accessed 27 May 2011
- Sengupta, J. (2009) 'RTA to crack whip on illegal taxi operators', 3 February, http://www.khaleejtimes.com/DisplayArticle.asp?xfile=data/theuae/2009/February/theuae_February56.xml§ion=theuae&col=, last accessed 27 May 2011
- Shariff, O. (2007) 'Dubai traffic woes inflict losses of Dh4.6b a year', *Gulf News*, <http://gulfnews.com/business/shipping/dubai-traffic-woes-inflict-losses-of-dh4-6b-a-year-1.75892>, last accessed 27 May 2011
- Soliño, A. S and P. Gago de Santos (2010) 'Transaction costs in transport public-private partnerships: Comparing procurement procedures', *Transport Reviews* **30**(3): 389–406
- Stilwell, B. and S. Lindabury (2008) 'Masdar: evaluating the world's most sustainable city', Final project for city and regional planning 3840, green cities, <http://courses.cit.cornell.edu/crp384/2008reports/07MASDAR.pdf>, last accessed 27 May 2011
- The Peninsula (2010) '300 Camrys added to Mowasalat fleet', *The Peninsula*, <http://www.thepeninsulaqatar.com/qatar/3409-300-camrys-added-to-mowasalat-fleet.html>, last accessed 27 May 2011
- Today's Zaman (2009) 'Konya municipality to start 'smart bicycle' system' *Today's Zaman*, Istanbul
- Trade Arabia (2010) 'Bahrain mulls bus service revamp', <http://www.tradearabia.com/news/newsdetails.asp?Sn=STN&artid=179089>, last accessed 27 May 2011

- UITP (International Association of Public Transport) (2007) 'Overview of public transport in Middle-East and North Africa', http://www.euromedina.org/bibliotheque_fichiers/Doc_Transports_UITPOverview.pdf, last accessed 27 May 2011
- UNDP (United Nations Development Programme), GOE (Government of Egypt) and GEF(Global Environment Facility)(2008) 'Sustainable transport: Project document', http://stpegypt.org/Project_Document.pdf, last accessed 17 May 2011
- UNEP (2007) 'Opening the door to cleaner vehicles in developing and transition countries: The role of low sulphur fuels', Report of the Sulphur Working Group of the Partnership for Clean Fuels and Vehicles (PCFV), UNEP, Nairobi
- UNEP (United Nations Environment Programme) (2006) *Africa Environment outlook 2 - Our Environment, Our Wealth*, UNEP, Nairobi, http://www.unep.org/dewa/Africa/publications/AEO-2/content/pdf/AEO2_Our_Environ_Our_Wealth_English.pdf, last accessed 27 May 2011
- UN-Habitat (United Nations Human Settlements Programme) (2010) 'Percentage of slum population – Percent – Urban', <http://www.devinfo.info/urbaninfo/>, last accessed 27 May 2011
- United Nations (2010) *World Urbanization Prospects: The 2009 Revision*, CD-ROM edition, data in digital form (POP/DB/WUP/Rev.2009), United Nations, Department of Economic and Social Affairs, Population Division, New York, NY
- University of Gothenburg (2010) 'This environmental and climate change analysis - MENA', http://www.hgu.gu.se/Files/nationalekonomi/EEU/Helpdesk/EnvPolicyBrief/2010/MENA_Env%20CC%20Policy%20Brief.pdf, last accessed 27 May 2011
- US Bureau of Consular Affairs (undated) 'Egypt: Traffic safety and road conditions', http://travel.state.gov/travel/cis_pa_tw/cis/cis_1108.html#traffic_safety, last accessed 27 May 2011
- WHO (2010) 'Eastern Mediterranean status report on road safety: call for action', http://www.emro.who.int/vip/pdf/EMSRRS_1_4.pdf, last accessed 27 May 2011
- WHO (World Health Organization) (2009) *Global Status Report on Road Safety: Time for Action*, WHO, Geneva
- World Bank (2000) 'Reducing vulnerability and increasing opportunity: A strategy for social protection in Middle East and North Africa', <http://info.worldbank.org/etools/docs/library/79646/Dc%202003/courses/dc2003/readings/menasps.pdf>, last accessed 27 May 2011
- World Bank (2008a) 'Royaume du Maroc, Secteur des déplacements urbains: Note de stratégie sectorielle', Rapport No. 40199-MOR
- World Bank (2008b) 'Urban challenges in the MENA region', <http://go.worldbank.org/VU5JBJZ3Y0>, last accessed 27 May 2011
- World Bank (2010) 'Republic of Yemen; Urban transport in Sana'a strategy note', Middle East and North Africa Region Energy and Transport Unit, http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2011/04/26/000333037_20110426001620/Rendered/PDF/491760ESW0WHIT1n0Transport0in0Sanaa.pdf, last accessed 27 May 27, 2011
- World Bank (2011a) *Poor Places, Thriving People: How the Middle East and North Africa can Rise Above Spatial Disparities*, World Bank, Washington DC, http://www.cmi-marseille.com/_src/Report_MenaDevReport2011.pdf, last accessed 27 May 2011
- World Bank (2011b) 'International Bank for Reconstruction and Development on a proposed development policy loan to the kingdom of Morocco in support of the urban transport sector', Sustainable Development Department Middle East and North Africa

- Region, World Bank, http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2011/02/21/000356161_20110221013355/Rendered/PDF/580100PGD0P1151e0only1910BOX358291B.pdf, last accessed 27 May 2011
- World Travel Guide (undated) 'Libya local transport', Columbus Travel Media Ltd, http://www.worldtravelguide.net/country/148/internal_travel/Africa/Libya.html, last accessed 27 May 2011
- Yemen Times (2008) 'Public transportation: An ignored sector cries for attention', *Yemen Times*, 26 July
- Yesguer, H. (2008) 'Les incidences Du système de transport sur l'ouverture des zones rurales isolées, Le cas de la Kabylie (Algérie)', *Les Cahiers Scientifiques du Transport* **54**: 125–146
- Zeybek, H. and Kaynak, M. (2009) 'Role of mega-projects in sustainable urban transport in developing countries: The case of Istanbul Marmaray Project', <http://www.codatu.org/english/conferences/codatu13/CodatuXIII-CDrom/codCD-Zeybek.pdf>, last accessed 27 May 2011
- Zhang, Y. (2008) 'Opportunities for mitigating the environmental impact of energy use in the Middle East and North Africa region' Energy Sector Management Assistance Programme, <http://siteresources.worldbank.org/INTMNAREGTOPENERGY/Resources/DiscussionpaperMENA.pdf>, last accessed 27 May 2011