

## Dubai Metro and RTA Dubai Bus: Local Efficiency and the City's Global Image

Jack KEILO,<sup>1</sup> Clémence MONTAGNE<sup>2</sup>

Since the reconfiguration of the United Arab Emirates in 1971, the three major modes of transport -maritime, air and road- were incorporated in Dubai's global identity. However, an efficient intra-urban public transport system was lacking. Since its inauguration in 2009, Dubai Metro was presented as a response to the challenges posed by the local road network, by traffic congestion and pollution, and it is more and more present in the urban image of the city and in the construction of its global identity. However, RTA Dubai Bus, is the less-known public transport system.

This paper will examine the role of the two intra-urban public transport systems in the building of Dubai's

global identity; it will compare the forceful role of Metro Dubai with the more absent one of RTA Dubai Bus. A survey was implemented to identify the users of both the Metro and the Bus; accessibility was measured by an analysis of the routes.

It is argued that Dubai Metro is being integrated in the global identity of Dubai, while the RTA Dubai Bus is not. It is assumed that cities are selective in what to integrate in their identity on the global scale, and efficiency is not the only important factor. Dubai has shown that modernity can be a clear determinant in choosing a particular mode of intra-urban public transport.

<sup>1</sup>Civil Engineer and Doctoral Student in Urban and Historical Geography at the Paris-Sorbonne University (France), Research Unit "Espaces, Nature et Culture" (UMR 8185 ; CNRS and universities Paris IV and Paris VIII), 191, rue Saint Jacques 75005 Paris, France.

<sup>2</sup>Urban Planner and Doctoral Student in Urban and Transport Geography at the Paris-Sorbonne University (France), Research Unit "Espaces, Nature et Culture" (UMR 8185 ; CNRS and universities Paris IV and Paris VIII), 191, rue Saint Jacques 75005 Paris, France.

## Dubai Metro: Towards a Renewed Image of Dubai and its Public Transport Infrastructure

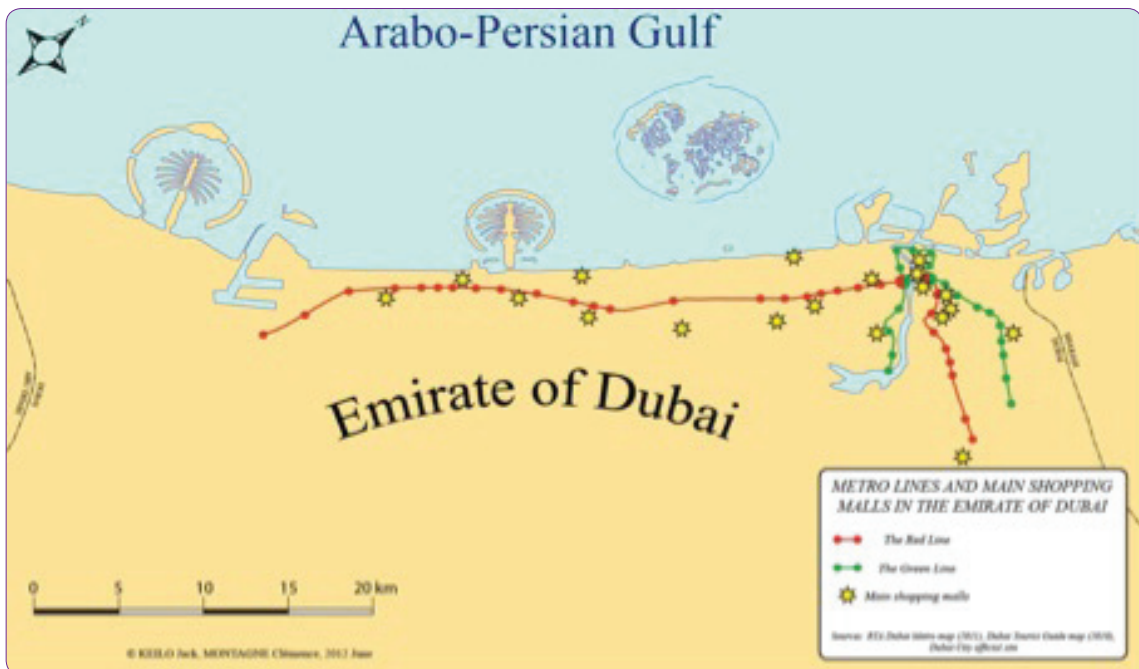
The representations of the Dubai Metro haven't been the object of a thorough academic study. Public transport system of Dubai is praised as being the most advanced public transport system not only in the UAE, but also in the whole Arabian Peninsula because of a fruitful combination of a modern taxi fleet, the existence of a water taxi and finally an automatic metro line supposed to connect major business districts and employment hubs.

The history of Dubai development has been mostly driven by road infrastructure. Until 2004, most of the investments have been concentrated on the highways, flyovers, road under bridge and road over bridge. Because of growing traffic congestion, the planning department of Dubai Municipality has been separated and transformed into a Road and Transport Authority of Dubai in 2005 (hence RTA Dubai). Some specific laws have been passed by the Dubai Executive Council to ensure a control over the real estate developers and make sure that every large development has to submit a transport master plan along. Quite simultaneously, from 2000, a new bus system has been launched in order to rationalize an informal transport system and to smooth the daily traffic congestion. Shortly after, the

idea of implementing a metro came forward. Opened in 2009, the red line stretches over 52 km with 29 stations. Operations started on 2011 on the green line over about 23 km and 17 out of the 19 stations opened.<sup>1</sup>

In a broader sense, Dubai Metro is more than only a public transport system. It is one of the "consequences" of the rebuilding of Dubai City post-crisis in a context where the economy of the city was much dependent on speculation and real estate boom (Bourdin, 2010). Therefore the Dubai Metro is seen beyond its functional role as a mode of transport: it is a resilient factor to the crisis in diversifying mobility choices and stepping towards a car-free society. Opened right amidst the global financial crisis, the Dubai Metro plays a major role in the drive of a "revived" city image. Once ago the discussion was about "planning the metro with a Land Rover" because of the image of building up a city from scratches in the desert (OMA, 2007), today the Metro is a world class infrastructure that connects "major commercial and touristic attractions" (interview with an RTA official, 2011).

The case of transport in Dubai has been once in a while submitted to inquiry and scientific studies. At first it was more about side effects of transports in the quality of life of Dubai and the environmental impacts of the car-oriented choice in the city-making (Al Me-



**Figure 1.** The map shows the two metro lines which are currently functional in the Emirate of Dubai (and within the borders of Municipal Dubai). The main shopping malls are represented as small stars.

<sup>1</sup> For more information about the Metro please refer to [www.rta.ae](http://www.rta.ae)

hairi, 1995). For a while the scientific circles omitted the transport question, but the Dubai Municipality and the Road and Transport Authority in extenso, in order to find possible solutions for congestion problems. According to a Gulf Talent survey conducted in 2007, this city was the most congested city in the Middle East. Narratives of residents described the traffic conditions in rush hours as impossible although the city being “well organized”.<sup>2</sup> In some recent studies on Dubai, as in the publication of the PhD thesis of Ahmed Kanna in The City Corporation, there is an urge to develop a “clean orderly city with modern infrastructure” (Kanna, 2011:197). Yasser Elsheshtawy’s Dubai: Behind an Urban Spectacle says that “infrastructures are lacking” and suggests that a more relevant type of transport infrastructure would be a solution to the congestion crisis the urban network is facing since 2005 (Elsheshtawy, 2010).

In several papers on urban development of the Gulf cities in the Al Manakh 1 and Al Manakh 2 the question of transit infrastructure is approached but yet not studied in depth. The two collections of articles and essays present a summary on the description of the real estate boom at that time in some of the metropolises of the Arabo-persian Gulf. In the Al Manakh 2, T. Decker writes about the Metro as a “people’icon” and role of urban rail in the socio-spatial cohesion. She gives a detailed description of the opening of the Metro that went with the “fireworks accompanied the first train’s passage through the city and television viewers were introduced to the metro’s lavish stations as Sheikh Mohammed and invited guest toured the system” (Decker, 2010). The commemorative plaque of metro inauguration on the 09.09.2009 by the Sheikh himself is visible at the Mall of the Emirates’ station, where a wall clock is fixed on the opening time and date. As per T. Decker, the Dubai metro has two main purposes at first it is a symbolic project and also an infrastructural investment. This is why the metro is connecting the main symbols of the city as the Palm Jumeirah, the Burj Al Arab and the Burj Khalifa/Downtown Dubai. Second, it has a purpose to reduce congestion, which is a negative externality, considered to be harmful to the emirate’s competitiveness.

The aim of this article is to explore some links bet-

ween the city of Dubai and its now-iconic public transport system. This research paper is on the system of public transport, developed, owned and improved by the Government of the city of Dubai in the United Arab Emirates.<sup>3</sup> At this stage of our research it is not a question to assess the efficiency of this system. We were at first assuming that the Metro impacts on daily mobility choices of city resident will be lower because of a lack of integration with the bus system. But a survey of every connection with Metro Station and Bus Line (be it feeder or casual system) revealed it was not a planning nor technical integration. Here it is proposed to go further this statement and explore the integration of the Dubai Metro in daily commuting and in resident’s lifestyles while wondering why the Dubai Metro is marketed as a way to go shopping when the bus network is misregarded.

### Methodology

Has the image of the Dubai Metro overshadowed the image of the RTA Bus system though both are interdependent and closely related? Apparently the Dubai Metro has benefited from a wide branding campaign to convince the users of taking the recently opened metro lines. The RTA Bus hasn’t had the same privilege: in spite of its importance to the city it is not considered as “prestigious” in the construction of the global city image as the Dubai Metro.

In this paper we will conduct two case studies on the public transport system in Dubai. The first case study is consisted of an analysis of representations: branding of the public transport system of Dubai in the public spaces of the city. Some malls of Dubai can be considered as “real” public spaces, being owned by the Government of Dubai’s corporations. For some others, they are private spaces but accessible to everyone, theoretically. Thus we are going to analyse representations of the public transport system branding in three of the largest malls of Dubai: the Dubai Mall, Mall of the Emirates and Ibn Battuta Mall. We are going to examine the “orientation” to public transport modes, as suggested by branding advertisements put by RTA Dubai and clearly visible to every passerby or to every visitor to these malls.

The second study is an inquiry among a sample of interviewees composed of inhabitants of Dubai contacted through a snowball strategy via emailed questionnaire. Then, the inquired persons had the possibility

<sup>2</sup> “Dubai overtakes Cairo in Traffic Congestion”, 2007, Gulf Talent, “In Dubai, you should never ever go anywhere when it’s the rush hour. The road will just NOT go. Although the city is well organized, but still the traffic is heavier than the road can handle”. <http://www.gulftalent.com/home/Dubai-Overtakes-Cairo-in-Traffic-Congestion-Article-23.html> and <http://www.gulftalent.com/home/Decongesting-Dubai-Press-50.html>

<sup>3</sup> According to our ongoing research as PhD student, we are accordingly serving this article with our research purposes, being on one side the shifting of the urban centrality in the Middle

of giving their email address to schedule a face-to-face interview and get more information on their mobility choices and patterns. This survey aims at knowing more the daily mobility of some of the inhabitants of the city. The sample was chosen according to multiple criteria (nationality, profession and number of years lived in Dubai: all of the interviewees are active workers: 70% male and 30% female, with an average age of 28. The first group of questions of the inquiry is about place of residence, place of work and daily mobility. The second group of questions concentrates on the extent of familiarity and on the knowledge the interviewees have about the public transport system in Dubai. A third group of questions is devoted to know if the interviewees are influenced, in their choices, by the advertisements promoted by the RTA Dubai and if they know the RTA Internet site.

## Results

Out of the 16 interviewed for the qualitative inquiry, one respondent is a daily user of the metro. Almost no one of them has tried the RTA Bus. All of them are daily or very frequent (more than 3 times a week) users of RTA Taxi, even car owners among them, since taxis are the most comfortable transport mode for a certain share of the resident population of Dubai.

Out of the face-to-face interviews conducted in a second set, most of the respondents expressed the wish to get a driving license and to be allowed to drive and thus be independent from the public network. Only one respondent has said that driving is too dangerous in the streets of Dubai and she would rather extend her practices of Dubai Integrated Public Transport network. She was the only person to acknowledge that RTA Bus is one of the safest modes of transport in town. The rest, fifteen persons, don't take the bus because "I don't understand" or because "it is not yet well explained". The image of the Dubai Metro is rather positive for the users as one of the respondents points out: "Dubai has awesome public transport options and choices and are very good for the people who are using them" (M-05-JLT). But it is only good for people whose home or work addresses are very close to metro stations. It is not really appropriate for going to cultural activities or for groceries. It is helpful to go for window or leisure shopping. According to the same person, the major lack of the Dubai Transport Network is that "there is not a very good network for travelling internal areas (sic)" (M-05-JLT).

Although, Dubai Metro is seen as a comfortable, "convenient and [run on] reasonable prices" (M-03-Al Qusais), according to the interviewees it is still not in-

tegrated to their origin/destination locations. In fact, we notice that most of the interviewees need to use another mode of transport to complete their journey.

Taxi ride has increased the cost of travelling with the public transport system. Most of the respondents actually own a car and use the Metro because their origin and final destination are very close to the Metro Station. The respondents think that depending on the public transportation will increase the mobility costs in time and money unless they live and work close to the Metro Stations. Indeed, one of the respondents argued that «the metro bus connection to my office is not very time-friendly and thus I end up using the taxi to commute to work" (F-01-Warsan). Another respondent explains that final destination being always reached with a taxi, the cumulated costs result in a loss of interest in the public transport and one would prefer the comfort and the privacy offered by driving cars. Not only that the taxi rides induce a higher cost of money, it is also time-consuming to shift from one transport mode to another.

As an interviewee explains, "it takes too long to go to office" (M-10-JLT). Driving from one place to another is easier for car owners in terms of time and money costs. As another interviewee tells us that while the public transport is very satisfying, she does travel by her car only to go faster (M-12-Barsha). Although most of our interviewees live in highly urbanised areas served by the Metro, they choose to use their cars to commute daily.

Except from one interviewee saying she would rather not drive because of road safety issues, most of the interviewees want to get a driving license in Dubai or already have one. She daily uses the bus feeders to move from her home to the office where she works. Some of the answers are related to the urban morphology that is not pedestrian-friendly, to the climatic and environment conditions (dust and heat), and finally the work characteristics with "site locations demand that I use the car regularly". In one case, the rare use of the Metro is only due to the "parking limitations in Deira" (M-09-International City).

Once a set of interview were done, we proceed toward another kind of survey which is more precisely the image of the Metro in some public space where are supposed to be allowed to move our pool of interviewees.

Through a reading of photos taken in three of the main malls of Dubai, we are going to discern the communication policy of RTA Dubai on public transport system. These photos show different official adverti-

sements, made by RTA Dubai to brand the city's transport. They are visible in all the big malls and easily readable, as they are put on the "strategic" passages in the malls: entrances, exits, main halls, food courts etc.

The three biggest malls of Dubai in surface, and they are located along the Red Line of Dubai Metro and along Sheikh Zayed Road, the main artery of the emirate. As this study is exploratory, the inclusion of other malls in an eventual more analytical study would reveal more relevant results. Yet this work is a necessary beginning.

### Analysis

Indeed, Dubai's public transport system is advertised, via specific images, in the three studied malls. A simple reading of the advertisements can give the following results:

1. The Dubai Metro is perceived as the city's first-choice transport. The advertisements which tell "My City. My Metro." are visible in all the main entrances of the three malls. The writing in Arabic is even more precise: *Al Metro ikhtiari* (the metro is my choice). The Dubai Metro, according to this advertisement, is the best mode of transport in town (please refer to Figure 1).

2. The Dubai Metro is perceived as related to shopping, the main commercial activity of the city. At the metro entrances/exits to the malls, big advertisements declare that "When the Metro stops, the shopping begins". The city's geographical form, sprawling along the

Persian Gulf sea shores, is structured around a major free flow arterial the Sheikh Zayed Road. As of now, one of the metro lines is following the highway on most of its extent connecting thus majors commercial centres located in the new Dubai (please refer to Figure 2). Mall of the Emirates is also the station where is located an electronic stopwatch that run since the 9.09.2009, inauguration date of the metro.

3. The RTA Bus is perceived as a part of the metro system: the feeders are made to "fill the gap" between the metro lines and the rest of the city. In one of the interesting images seen in the Ibn Battuta Mall, RTA Bus is the jigsaw puzzle piece which fills the empty space between the city and the metro. According to the advertisement RTA Bus is not a transport system *per se*, it is a support to a transport system which is the metro (please refer Figure 3). The localisation of this flag explaining public transport policies in Dubai is nonetheless not very convenient since too high in the Persian Pavilion of the Ibn Battuta Mall. For most of the clients of the mall, and though the feeder buses are important to connect Discovery Gardens residential quarter with the major centres, to see the board is not that easy: hung four meters high, one needs to pay special attention to the Persian Hall cupola of the main hall of Ibn Battuta Mall.

To conclude, we can say that an exploratory reading of advertisements related to public transport system can show that Dubai considers the metro as the first



Figure 2. My City. My Metro. The Arabic indication is even more precise: the Metro is my choice. Ibn Battuta Mall.

choice and the most appropriate means of transport in the city while RTA Bus is reduced to a sort of connection between the city and the “high transport” represented by the metro. At the same time the metro is the means of transport related to the city’s main activities of shopping and to the city’s important public spaces, namely the malls. This conclusion is affirmed by two other representations seen at the RTA Head Office Building in Rashidiya, Dubai City. In the first representation, Sheikh Mohammed bin Rashid al Maktoum, the Emir of Dubai, is depicted with the Dubai Metro (please refer Figure 4).

In the second, a model of the Dubai Metro is set just in front of the Head Office. We can say that a simple analysis of these two representations shows that the metro is the main “prestige” of RTA Dubai, as the city’s main public transport and as an important means in the city’s public image (please refer Figure 5).

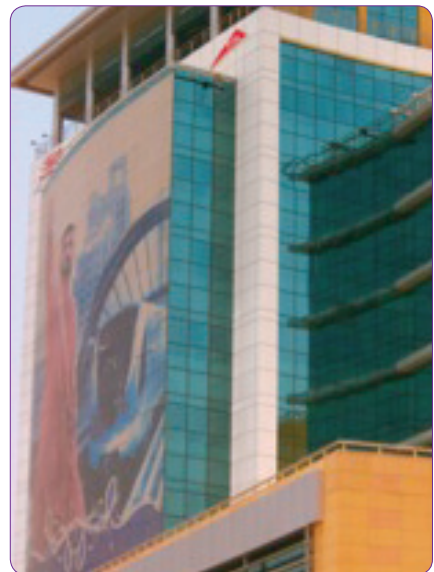
To understand how this branding of the Dubai Metro was efficient in the daily mobility choices of some inhabitants, a study of their commuting preferred transit mode have been conducted. Our exploratory analysis projects a spotlight on how residents choose their “preferred” public transport system and which criteria are taken into consideration. We have conducted two case studies: a qualitative inquiry with a snowball sample of residents of Dubai, and then a study of public transport branding in three of the largest malls of

Dubai. According to our primary results, efficiency would be insufficient to determine the first choice of the city. The prestige related to a more “modern” mode of transport can be as decisive as efficiency in the decision of what to consider as the city’s “main” transport mode. But others criteria enter in the final choices as the clear understanding of the network, the utilisation of the internet device (Trip Planner) and the time - money budgets. As per the results of the analysis of the interviews, we have isolated three types of mobility choices based on the interviewee’s narratives.

A first small group is a daily user of the metro by choice, since they deliberately avoid using a car because of the rising cost of moving around with a car in Dubai and its risks (accident, fines). But, apart from the captive users who do not own a car and who are on a tight budget for transport, very few are the others expatriate in Dubai who chose to depend entirely on the integrated public transport network. For this group, the communication tools used by RTA to brand and explain the transit network is very valuable for them as they have the feeling of having been upgraded either in their social status or in the mobility options. The hypothesis of them having a better appropriation of the metropolitan area and a different relationship with the city because of a growth of independence in mobility needs to be studied thoroughly. The inhabitants of Dubai admitting that they used daily the metro have also admitted being very familiar with the RTA boards and devices to plan their trips. For instance, the Figure



**Figure 3.** The RTA Bus Dubai is represented as the “missing” piece of the jigsaw puzzle, between the city and the metro. Ibn Battuta Mall.



**Figure 4.** The Metro is the new urban and economic driver of the Emirate launched and promoted by the person of the leadership.

6 shows most of the tools developed by RTA to make the network very accessible, comfortable and easy to use. From the electronic board located in each bus and in every bus station (but not yet at every bus stop) to the several maps of public transport network located in every metro station, RTA is developing a wide set of tools. This plate show a technical support of the image of the Dubai Metro dispersed in the city that have been shown here in Figure 1, 2, 3 and 4. While all the residents of Dubai have been encountering these images, very few of them have been actually topping by one of the maps or network, even in this specific group that are daily commuters with the public transport.

A second group of city residents who have no other choices than using the public transportation but who will prefer the convenience of the taxi over the constraints related to the use of the metro especially for daily commuting. Most of the respondent of the second group have actually no right to drive in Dubai but who can afford daily commuting in taxi. For them the Metro is convenient from time to time to the extent of being competitive with a total trip made by Taxi. Thus, a trip needing more than 2 modes (metro + Taxi) will not necessary be done as it is as expensive and not as convenient as being picked up and dropped out by a taxi. The branding of Dubai Metro's image is even more efficient when it comes to reaching major malls actually connected with the Red or the Green Line (please refer to the first map) as the Burjuman, Deira City Center, Dubai Mall, Ibn Battuta, Mall of the

Emirates and the Wafi Mall.

Then comes the third group of city respondent that have never envisaged being dependent on the metro because they don't have office schedules (freelance, home office) or because they enjoy the quality of life that is offered by the automobile freedom. None of the respondent has express any interest in using the bus network because of the lacks of information of the effort one has to make to define an itinerary with a bus -that is going to the RTA website and checking the Route Planner devices. Most of the face to face interview has shown that all of them are very satisfied with the Dubai Metro while few of them actually ride the metro to commute. Drivers have assumed that it has reduced congestion and have a broad understanding how to use the metro. They have none the less very less notions on how to travel on the public transport network. The main ground is the very less knowledge of the Trip Planner features on the RTA website -though it is commonly used by the bus users, who could not be interviewed this time but randomly met in the bus.

### Discussion

This exploratory research on the image of Dubai Metro has shown that meanwhile being the newest public infrastructure and one of the iconic symbols of the Dubai Emirate. The branding of the Dubai Metro across the public spaces of the city from scale 1 model strategically located in front of the Emirates Head Quarter (refer to Figure 5) to different boards informing



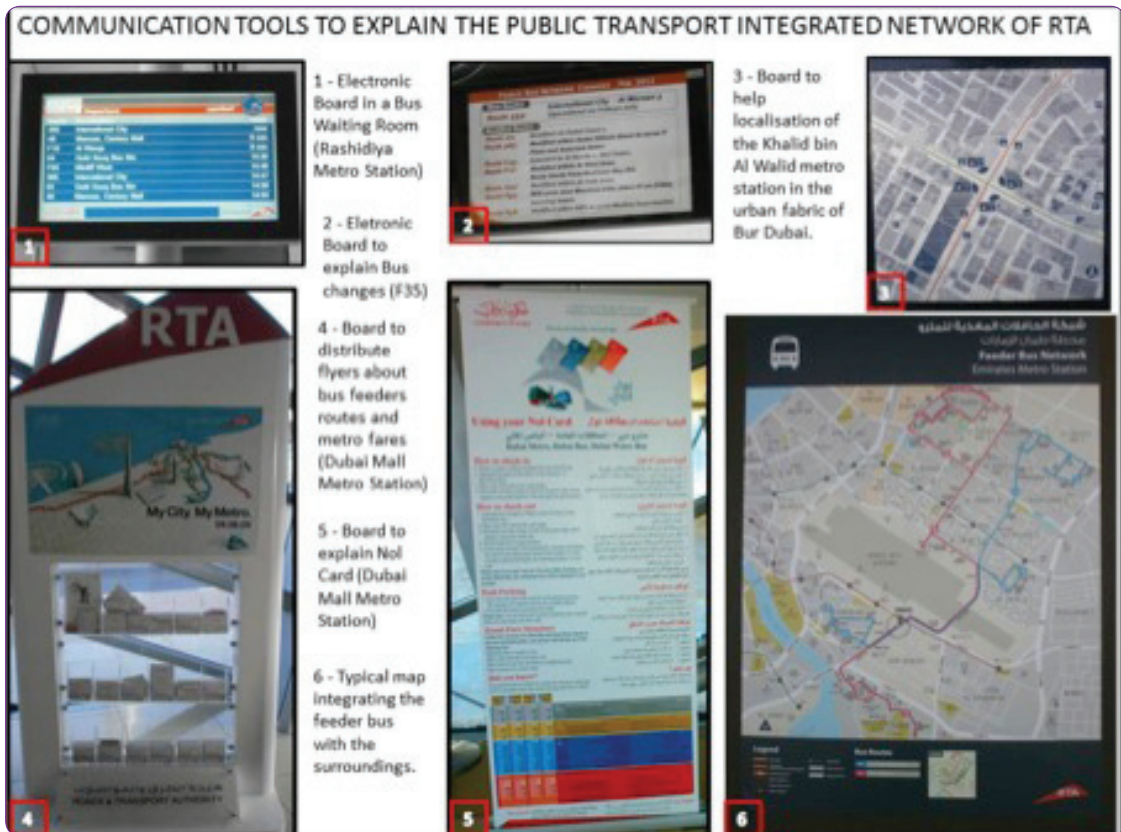
**Figure 5.** A representation of the Dubai Metro in front of RTA Dubai Head Office.

Dubai resident of the newest investment on mobility offer. As many other global cities (ex. Singapore, Kuala Lumpur...), Dubai is now equipped with a world class urban rail infrastructure. It aims at offering efficient alternative for commuting to private vehicles.

Indeed offering the possibility to travel across the Dubai City in a comfortable, relatively non expensive and in a short time, the Dubai Metro is the symbol of the integration in a global city network where a rail infrastructure is a “must”. As T. Decker phrases it is “*both an architectural and infrastructure showpiece*” [and] *the metro represents a hybrid of two of the emirate’s hallmark growth strategies.*<sup>4</sup> The “metro narrative” of the Government and authorities in Dubai is not only centred around the mitigation of the road congestion and its effects, but also on benefit for tourism and business visitors who constitute an essential part of economic development. This vision of the metro is clear in the meditations on Dubai written by Sheikh Mohamed bin Rashid al Maktoum in his book *Rou’yati (My Vision)*, released in 2006. He states that Dubai Metro is

a passage to the future and a necessity for the Emirate to keep its leadership as a global destination over its competitors in the Middle East.

Beyond this characteristic of Dubai always in the run for keeping an advanced place in the global city supposed network, the Dubai Metro, as a mode of public transport, is offering an alternative to the automobile -that is optimising trip schedules, comfort and time of travel. Indeed the aim of the Dubai Metro is more to attract the car owners rather than the captive users. That is why the advertisement campaign happens mostly in the public spaces where the first population usually go out and wander. Out in the public space it is more of a campaign branding the involvement in the leadership in the conception and the development of one of the most modernized mass rail rapid transit. Aiming at attract a broader qualified expatriate population (Westerners, Arabs, East Asians and South Asians), the Dubai Metro benefits from large shares of the RTA communication boards. The objectives of the Dubai Government are to realize multi-modal integration



**Figure 6.** The Metro is the new urban and economic driver of the Emirate launched and promoted by the person of the leadership.

<sup>4</sup> Decker, T., 2009, “The people’s Icon? Urban Rail and Socio- Spatial Cohesion in Dubai”, pp 204-207



of mass transit systems (interview with RTA officials, October 2011). Expeditious efforts are made to “*make the public transport means the ideal mobility choice for people in the Emirate*”, says the RTA chairman.

On the contrary, the bus system does not profit from the same scale of communication. As a consequence, we wonder if a better communication campaign besides a larger utilisation of public transport integrated flyers and board maps would help connections within the RTA public transport fleets. This would help people to avoid depending on taxi and on its cost. Thus the ride on the metro would be highly competitive because much cheaper. As a consequence this would make the bus-metro network self-sufficient.

The city fabric characteristics (Elshehtawy, 2004, Elshehtawy, 2010) make impossible any reliance on only one public transport system. One or two metro line can't give accessibility (in a reasonable cost of time and/or money) to every residents and/or tourists in Dubai. In the contemporary situation, it is a necessity to organize on intertwined schedules and routes the spatial distribution in public transport mode across the Dubai urban area, and to advertise RTA whole new modernized systems. All the image of Dubai metro enhanced the spectacular architecturally landscape in which the users will travel in a convenient and comfortable metro. But the actual use of the metro is not possible if transport demand is not closely related to the immediate proximity of the stops and stations. In spite of this fact, we have seen that metro branding primed over all other modes of interurban transports': metro is seen, via advertisement boards, commemorative plaques, Medias and brochures, everywhere in Dubai. But the supporting system, RTA Dubai Bus, is not as well branded as the metro itself, even if the latter depends on the feeders to attract users who live in relatively-remote residential areas from the metro stations. A development into a more integrated bus/metro system would be ideal to optimise the metro utility.

Moreover this modernization of the public transport offers a real chance for a better appropriation by the city residents of the total urbanised area. As T. Decker mentioned it the slogan My City My Metro was not “*the most likely message*”. [...] “*However the egitarian message of the marketers may signal a small but meaningful shift in the relationship between Dubai and its resident population*” (Decker in AMO, 2009). Indeed, some key interviews with users and non-users of the public transport system revealed others facts that in the geography of the everyday of Dubai it is clearly shown that the modernisation of rail public transport system has been rapidly inserted to the daily routine of the city. It has been surprisingly noticed that the newly efficient bus system has been eclipsed by the glossy and shining over expensive metro in the everyday mobility survey of middle class users.

## References

- AMO, 2007, Al Manakh 1,  
Davidson C., 2008, Dubai: The Vulnerability of Success, New York: Columbia University Press  
Ramos, S., 2011, Dubai Amplified, the Engineering of a Port Geography, London, Ashgate  
Pacione, M., 2005, «City profile: Dubai», Cities, 22 (3), pp 255–265.  
Dubai's Long Goodbye, BLOCH, 2010  
Laverge M. 2002, Dubai ou la métropolisation incomplète d'un pôle en relais de l'économie monde,  
“The people's Icon ? Urban Rail and Socio- Spatial Cohesion in Dubai”, Tabitha Decker, pp 204-207  
Wiedmann, F., 2008, « Sustainability : The Challenge of urban Development Strategies in the Gulf», in A. Moustafa, J. Al Qawasmi et A. Mitchell (dir.), Instant Cities Emergent Trends in Architecture and Urbanization in the Arab World, Amman, CSAAR 2008A, American University of Sharjah Editions  
Al-Mehairi J.-M., 1995, «Some aspects of environmental, problems caused by transport in Dubai: a geographical perspective», in L.-J. Sucharov, (dir.), Urban Transport and the Environment for the 21st century, Computational Mechanics, Southampton, pp 195–206.

This paper was selected from the papers presented at the CAUMME 2012 International Symposium that was held at Yıldız Technical University, Faculty of Architecture in 21-23 November 2012.

Bu yazı 21-23 Kasım 2012 tarihlerinde Yıldız Teknik Üniversitesi Mimarlık Fakültesi'nde düzenlenen CAUMME 2012 Uluslararası Sempozyumu'nda sunulan bildiriler arasından seçilmiştir.