



## **Background Paper**

### **The Middle East – A growing market for Siemens mobility solutions**

Traffic flows have increased substantially in recent decades. Mobility is becoming increasingly important for cities and metropolitan regions. The market for infrastructure is growing. A study by business consultants Booz Allen Hamilton forecasts that the world's major cities will be investing more than five trillion euros in their road and rail infrastructures by the year 2035.

Transportation, however, accounts for about one-fifth of the world's primary energy consumption and is also responsible for almost one-quarter of the global CO<sub>2</sub> emissions. The task for the future is therefore to organize mobility on a sustainable basis. That means not only ensuring the smooth flow of traffic, but also increasing the energy-efficient transport of people and goods and promoting eco-friendly means of transport. The leading market for sustainable mobility currently has a total volume of 200 billion euros worldwide – and this trend is rising. Sustainable, and therefore green, mobility includes not only environmentally compatible vehicle systems and ecological designs but also improved logistics concepts for freight traffic and traffic management systems.

In their world market projection to 2020, the German Federal Ministry for the Environment, Nature Conservation and Reactor Safety (BMU) and HSBC, a London investment company, see great potential for sustainable mobility. The world market for environmental technologies is over three trillion euros, 300 billion of which are accounted for by sustainable mobility. Economic stimulation programs include 300 billion euros for promoting green solutions, of which about 84 billion euros are intended for rail-bound transportation. During that time span, the BMU and HSBC expect solid growth of 3 percent to 81 billion euros per annum for rolling stock construction and infrastructure. Transport telematics is expected to grow even faster by six percent to 61 billion euros.

The 2010 UNIFE World Rail Market Study forecasts that the accessible market in the Africa/Middle East Region will grow by about 4.5 percent per annum until 2016. That means, in the period under review, it will rise from 3.2 billion euros in 2007-2009 to 4.3 billion in 2016.

#### **Mobility as a prerequisite and challenge for growth**

As market figures show, mobility is a basic prerequisite for economic growth. However, sustainable mobility also contributes to cost efficiency and environmental protection. For example, LED traffic lights use up to 90 percent less electricity than conventional traffic lights and also have a service

life that is ten times longer. A large city with 700 traffic intersections can save around 1.2 million euros on its electricity bill each year by switching to LED technology. Modern traffic management systems prevent, or at least reduce, traffic congestion that causes financial losses amounting to three percent of the GDP and millions of tons of emissions in industrialized countries every year.

Like many other countries, the cities and regions in the Middle East are confronted with the same challenges: how to promote growth while avoiding undesirable consequences such as air pollution and traffic congestion. Siemens Mobility is therefore well positioned in this region. The products and solutions in the Complete Mobility portfolio are suitable not only for optimizing the state of the infrastructure as it is today but also for helping countries and governments to prepare for the time when their oil and natural gas resources have run out.

### **Siemens Mobility has been proving its competence in the region for years**

Siemens has traditional ties with the Middle East that go back as far as 1856, when Werner von Siemens organized the laying of telegraph cables through the Red Sea on the way to India. Since the 1930s, Siemens Mobility has been heavily involved in the development of the transportation infrastructure of Saudi Arabia and has set milestones in rail operations in the biggest country in the Middle East. In the Emirate of Abu Dhabi in the UAE, the first traffic-light controlled intersection went into operation in the 1970s and the first traffic computer with a microprocessor was installed in the 1980s. These systems have been maintained and further developed down to the present day.

Siemens currently has its own branches in all the Gulf States and has secured and successfully implemented a number of mobility and logistics projects in the region. The competence of Siemens Mobility in all areas of modern mobility is illustrated by examples involving railway infrastructure, rail signaling, traffic guidance and multi-storey car park management systems, postal and airport logistics, traffic control and monitoring systems.

### **Electrification of the Mecca Metro**

At the beginning of 2011, Siemens Mobility successfully completed the first phase of electrification of the “Al Mashaaer Al Mugaddassah” Metro Project. The new rapid transit link from Mina to Arafat has meanwhile entered service. Designed to transport 72,000 passengers per hour per direction, it is helping pilgrims to travel quickly and comfortably between the holy sites in and around Mecca. In connection with this project Mobility supplied and installed the complete electrification equipment, including the traction power substations with high-voltage systems, cabling and overhead catenary lines.

### **Signaling and train protection equipment for the railway in Saudi Arabia**

In 2009, the rail link between Dammam and Riyadh, Saudi Arabia, was equipped with state-of-the-art signal and telecommunications technology, and the European Train Control System (ETCS). It was the first time that this technology had been implemented in the Arab world. In December 2005, a consortium of Siemens and the Saudi Arabian Nour Communications Company received an order to equip the rail link between the two cities with a train protection system, a GSM railway (GSM-R) network and a CCTV video monitoring system for grade crossings. Drivers, maintenance personnel and stationmasters can now communicate with one another by GSM-R mobile radio throughout the entire route network. The control center is located in Dammam and equipped with four Siemens VICOS (Vehicle and Infrastructure Control and Operating System) operator stations and a panorama wall. It has been designed to be capable of controlling the entire future rail traffic in Saudi Arabia.

### **Road traffic control in Dubai**

However, Siemens Mobility supplies more than just railway equipment to the Gulf Region. In 2007, Siemens installed the "Falcon" traffic control management system in Dubai, which now monitors and controls the road traffic in this city of over one million inhabitants. Falcon uses 69 monitoring cameras and video systems that automatically detect accidents and control more than 300 lane signals on the main traffic arteries. Up-to-date information is made available promptly by SMS and Internet.

### **Airport solutions in Dubai and Qatar**

Airport logistics is another important field of activity in the region. Dubai International Airport counts more than 60 million passengers each year and has set itself a target of increasing this figure to 75 million passengers by 2015. In order to cope with the growing numbers of transit passengers, Siemens Mobility has installed one of the most modern baggage handling systems in Terminal 3. The system can sort approximately 15,000 bags per hour, thus enabling the capacities to be increased to 18 million passengers per annum. Siemens supplied all the control, sensor and motion elements and the tray solutions. These included Simatic control components for automation, Sivacon switchgear, and Baggage Base software. Under the terms of an operation and maintenance contract, Siemens has also assumed operating responsibility for the entire baggage handling system. Some 420 employees work in shifts around the clock to perform maintenance, maintenance controlling, material supply and control tasks for the system. Another 800-meter-long check-in complex is currently being built alongside Terminal 3. It is scheduled to be completed within the next one or two years.

While the new Doha International Airport was still under construction in 2006, Siemens Mobility erected a temporary airport terminal based on its "CapacityPlus" concept to increase the check-in capacities during the Asian Games. This task called for the installation of an 8,000-square-meter

terminal with arrival and departure areas arranged under a tent-like structure. The facility was fully integrated into the existing airport logistics and equipped with a separate power supply.

### **Postal logistics in Saudi Arabia and the UAE**

Siemens Mobility has supplied a number of postal logistics systems. In 2009, Siemens Mobility installed an automated mail sorting system for Saudi Post. It covered the entire sorting process, including additional functions, such as direct mail forwarding and carrier sequence sorting for the delivery people. The installed Siemens Artread reading software recognizes Arabic handwriting and typescript and achieves a reading rate of about 95 percent. Siemens has also set up mail sorting centers for Emirates Post and the Qatar Postal Corporation.

### **Multi-storey car park management for the UAE**

Siemens Mobility has equipped the new Convention Center in Qatar with the Sipark SSD multi-storey car park guidance system. For the combined guidance and parking space management system, a total of 2,500 ultrasonic sensors for the individual parking spaces and dynamic LED zone indicator panels were installed. They are connected to a management system via a Simatic-based control system. Pay stations and barriers were also installed in the car park, which has around 3,000 parking spaces. The Sipark SSD system in multi-story car park 983 in Abu Dhabi guides drivers quickly and accurately to a free parking space.

### **Transportation infrastructure and technology in the Arab Emirates**

Abu Dhabi has invested a total of 16 million euros in the development of the traffic control systems on the islands of Al Reem and Yas. Together with its regional partner, Electro Mechanical Co. LLC, Siemens Mobility provided both islands with complete and modern traffic control infrastructures. The equipment included Sitraffic Scala traffic computers, control centers, detectors and a total of 70 traffic lights including controllers. A new Formula 1 racing circuit was also built on Yas Island, the first Abu Dhabi Grand Prix being held there in November 2009. A residential, finance and business construction project is currently under way on Al Reem Island and is scheduled to be finished by 2014.