

Future of Mobility:

Sustainable, Efficient and Competitive

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Emerging frontiers in mobility



BY DANIEL HOWLETT

Regional Head of Commercial Banking Middle East, North Africa and Turkey,
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From walking over sand dunes to driving electric vehicles (EVs) on 10-lane highways; the rapid transformation of the MENA region's mobility over the last century is unparalleled worldwide.

Our need and desire to move is a cornerstone of our prosperity as a civilisation. Today, mobility is linked to the rise of the global economy – interconnecting countries through trade flows, currency corridors, migration, and border-hopping technology.

In 1903, the global population was less than 2 billion when the Wright brothers marked the world's first flight. Today, the International Air Transport Association (IATA) said, 4.1 billion people travel through the skies every year. Imagine what the next 100 years could bring.

STRATEGIC DIRECTION

Emerging frontiers include the electrification of transport, new-age infrastructure and smart cities, next-generation technology, and revolutionised trade networks such as the Belt and Road Initiative (BRI). Our survey, on page 4 of this report, has found that top experts believe the three biggest impacts on advancing the future of mobility over coming years will be: the 4th Industrial Revolution, Climate Change, and Future Cities.

Mobility has become an integral spoke in the world economy and geopolitical wheel, and in the digital era, the pace of change has only accelerated. As a result, leading nations look to upgrade logistics and accelerate investment in both hard and soft infrastructure to remain globally competitive.

This encompasses garnering multi-billion-dollar investments for Research and Development (R&D). Ensuring sustainable and transparent progress means this must be done in parallel to the development of robust and sustainable policies and regulations. Digitalisation must be driven forward and new partnerships and collaborative ecosystems must flourish, spanning policymakers, financial institutions, tech, and the business community.

“The future of the Middle East and North Africa is urban, young, and connected. Its population is one of the youngest and it has experienced the highest rate of growth globally over the last century*. With an emerging digital economy and strategic position between Asia, Africa, and Europe, the region is primed to lead the modern-day mobility journey.”

Even when all these boxes are ticked, advancing mobility boils down to one truth: ideas are only as brilliant as the minds that create them.

The upcoming World Expo 2020 in the UAE will bring together leading international minds, new technology, and MENA National Visions. These are the key drivers that will expand the boundaries of mobility in the MENA region.

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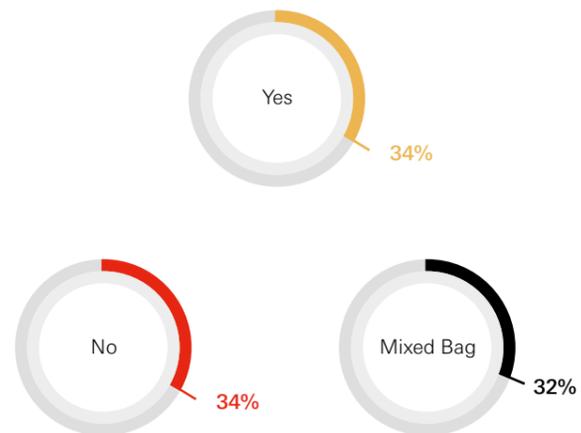
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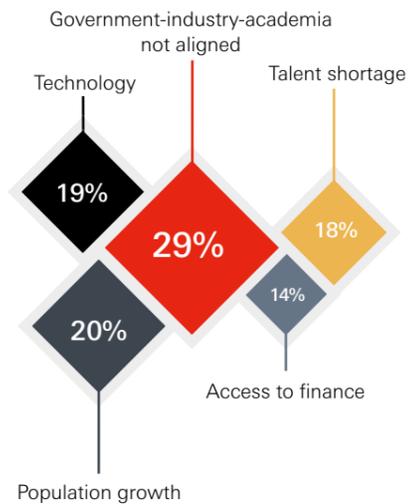
Survey: What's Next for MENA?

Mobility is a cornerstone in the world's ability to prosper, to explore, to evolve. As urbanisation increases, and with the United Nations (UN) expecting the global population set to soar by 26% to almost 10 billion by 2050, the scale in which we advance and transform mobility must accelerate. The MENA region must run twice as fast just to catch up with demands today and to ensure it is a partner for tomorrow. This survey* – answered by 100 senior industry experts in MENA – reveals how the region is currently performing and what it needs to do next.

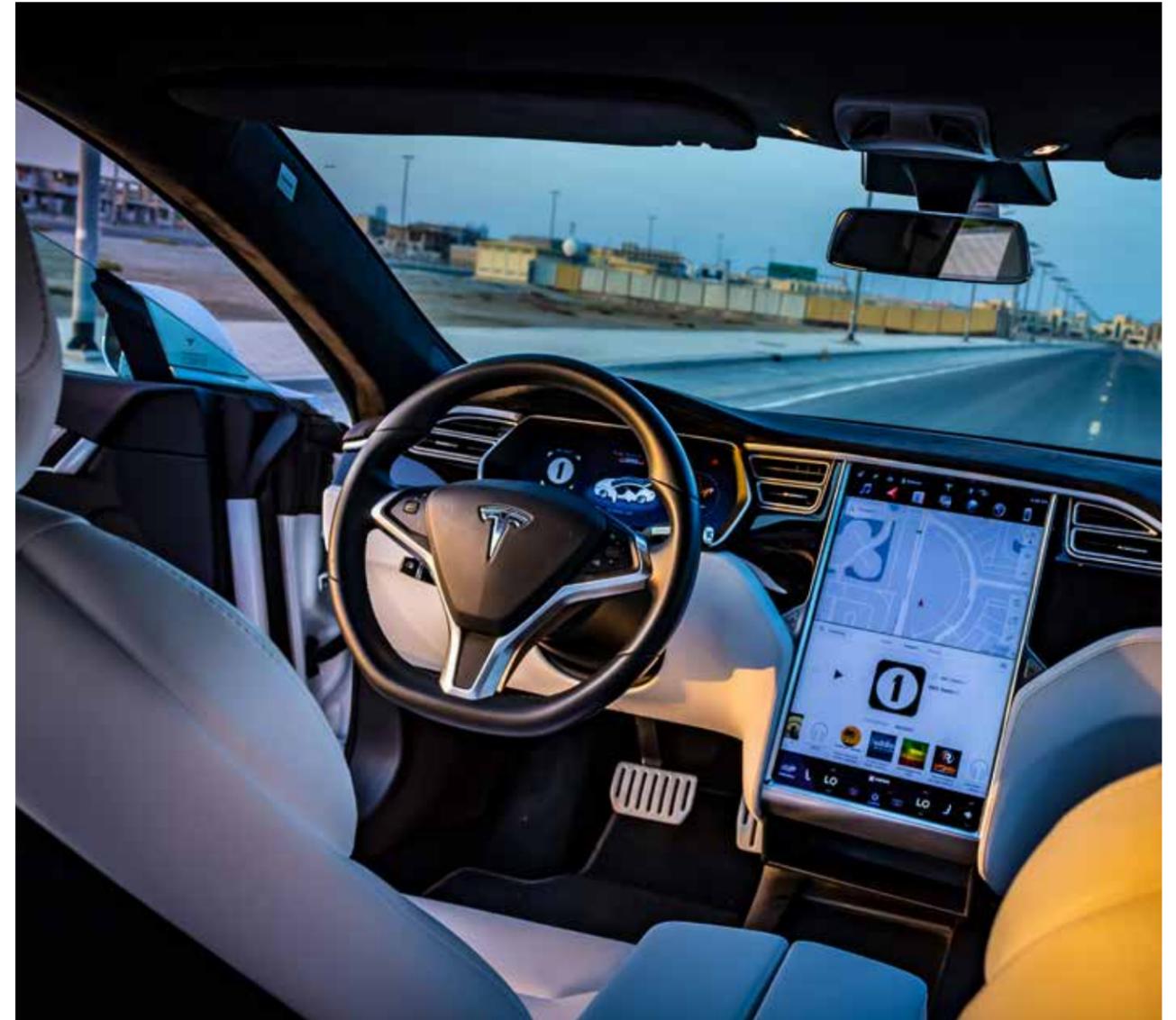
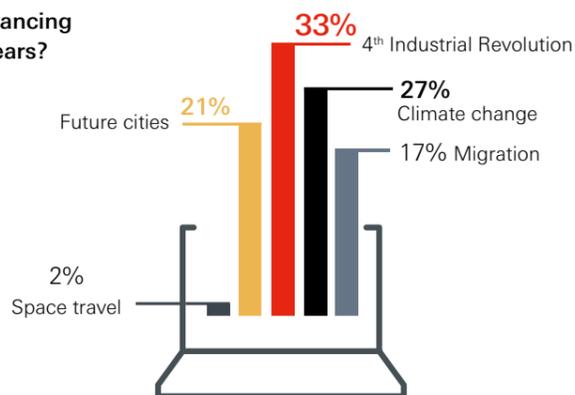
Are MENA policymakers acting fast enough to achieve global standards of affordable, efficient and low-carbon mobility by 2025?



What is the biggest hurdle facing the future of mobility in MENA through to 2025?



What will have the biggest impact on advancing the future of mobility over the next five years?



Do you think the ability of policymakers in the MENA region to stay ahead of the future of mobility will be challenged by technology accelerating faster than governments' ability to implement change?



What best describes the region's current attitude to technology partnerships and knowledge-sharing?



*Survey methodology – survey questions distributed by Gulf Intelligence to targeted subscriber database & social feeds – minimum sample size 100; Subscriber database 500.

Transport trends



2040

is when the number of cars worldwide will hit 2 billion – the same year the number of air miles flown will be a jaw-dropping 20 trillion.



is the estimated growth in the sale of cars in the Middle East between 2013 and 2020, from 2.35 million to 3.37 million.



25

million kilometres of paved roads will have to be added worldwide by 2050 to support rapid urbanisation and growing populations – roughly half the distance to Mars.



2020s

In the next decade, game changing policies will be introduced in the global shipping and aviation sector.



4.1bn

commercial passengers took to the air in 2017 – a staggering advancement from the world's first airborne flight of 12 seconds by the Wright brothers in 1903.



65mn+

jobs are supported worldwide in aviation and related tourism alone.



2027

is when compliance to the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which addresses the increase in total CO₂ emissions from international aviation above 2020 levels, will be mandatory.



3

months remain until mandatory compliance to the International Maritime Organisation's (IMO) 0.5% sulphur limit on bunker fuel, down from today's 3.5%, begins on the 1 January, 2020.



6

cities have prioritised the digital applications of smart cities: New York, Los Angeles, London, Singapore, Shenzhen, and Seoul.



4.4x

The economics of mobility has many faces; the amount contributed to the global economy by aviation jobs is roughly 4.4 times higher than that contributed by other jobs.



of airlines' operating costs is spent on fuel, up from 13% in 2001.



Up to 20% of the average commute that affects tens of millions of people could be reduced, according to McKinsey Global Institute's study of dozens of current smart city applications.

Revolutionising urbanisation



of the global population is expected to live in urban areas by 2050 versus today's 55%. This translates into 2.5 billion people moving into urban areas over the next three decades – roughly the current size of China and India's populations combined.



43

mega-cities will be established worldwide by 2030, each with more than 10 million inhabitants – near-equivalent to the UAE's population today, at 9.4 million.



37mn

people live in Tokyo, the world's largest city – roughly the entire population of Saudi Arabia in a single city.



3.4bn

people will call the Middle East and Africa home by 2050, according to the World Economic Forum – more than the populations of China and India combined – so exploring innovative mobility options is imperative.



1950

is when the urban population worldwide was 751 million versus 4.2 billion in 2018.

New horizons



2025

is when the sales of EVs will rise to 11 million, from a record high of 1.1 million worldwide in 2017.



#1

The world's first green-only city transport system is expected to be Saudi Arabia's NEOM megacity project.



1,223km

is the speed the Dubai Hyperloop would travel, leaving at a rate of one tube every 90 seconds and carry 28 passengers.



2021

is when the Dubai Hyperloop aims to start carrying passengers; a blink of an eye in terms of historical mobility advancements.



50th

The 50th anniversary of the founding of the UAE in 2021 will coincide with the Emirates Mars Mission's plans to have a spacecraft arrive on the planet.



126,000km/hr

is the speed the spacecraft will travel on its 200-day journey to the red planet with a maximum 20-minute signal delay; minor considering the distance of 55 million kilometres.

Sources: Government of China, United Nations, Environment & Transport, Air Transport Action Group (ATAG), International Air Transport Association (IATA), International Energy Agency (IEA), Bernstein, Bloomberg New Energy Finance (BNEF), McKinsey & Company, International Labour Organisation (ILO), Dubai Hyperloop, Technavio, Dubai Roads and Transport Authority (RTA), Mohammed Bin Rashid Space Centre, Neom, World Economic Forum (WEF), McKinsey Global Institute





Mind the Gap

BY PROFESSOR GREG CLARK
Senior Advisor, Future Cities & New Industries, HSBC Bank Plc



In this metropolitan century, cities are expanding beyond their historical borders worldwide with today's global population of 7.7 billion on track to grow by a quarter to 9.8 billion by 2050, as forecast by the United Nations (UN). The result? A clear gap between population growth and infrastructure provisions is emerging – in nearly every one of the world's 195 nations.

Mobility crafts the pattern of a city as a whole; shaping its success, aspirations, social structure and many more features.

It determines journey patterns, land use, forms of development and the productivity of the workforce. In short, ignore its importance at your economic and environmental peril.

Each city has its own inheritance, a unique 'DNA,' so the future must be centered on curating a distinctive new system of safe, efficient, and affordable mobility. One of the goals is that cities of the future – especially mega cities – thrive rather than surrender under the weight of

a growing population and its infrastructure demands. Significant and successful changes are already underway. More than 17,000 developers have registered for the Transport for London's open data policy. Shenzhen in China became the world's first major city to run an entirely electric bus fleet last year, and 2,500 inbound trips were made during US city Boulder's Door-to-Downtown 11-week pilot programme, for example. The core of successful mobility is public and shared transport.

POSITIVE DISRUPTORS?

Three key drivers put the spotlight on urban mobility. Firstly, digital. The 4th Industrial Revolution is spurring the use of sensors and surveillance to produce real-time reporting and new intelligent systems that quickly identify – and respond – to patterns. This helps improve the economics, environmental performance, and the customer experience of mobility, from redesigning traffic flows, to avoiding bottlenecks at peak travel periods to

Sources: Transport of London (TfL), World Economic Forum (WEF), City of Boulder, Colorado, Boards and Commissions, US



ensuring public transport capacity, frequency, and predictability meet expectations. People are more willing to use public transport if it is reliable and intelligent.

The second disruptor is the growing environmental impact on people and the planet. The correlation between the health, air pollution, and transport choices is increasingly strong. Any changes to mobility must comprehensively consider that the way a city moves – literally – directly impacts the health of its residents. The World Health Organisation (WHO) said 4.2 million deaths occur every year worldwide as a result of exposure to ambient (outdoor) air pollution – roughly the size of Kuwait’s entire population – with 91% of the world’s population living where air quality exceeds its guideline limits. At the same time, the surge in active transport in cities is an alternative to unhealthy sedentary mobility, but relies upon clean air to be viable.

And thirdly, social integration. Generally, greater equality exists in cities with more public shared mobility than those with a higher proportion of private vehicle journeys. There will be a radical change in the range of transport available soon, from e-bikes and e-scooters to shared autonomous vehicles and electrified transport systems. The importance of implementing infrastructure that provides an array of affordable, climate-friendly and efficient transport that suits the local socio-

economic dynamic, will only intensify with swelling populations. A new generation of high-quality electric buses offers the chance to re-position bus travel as something that is good for the planet and open to people of all income levels.

As cities get deeper, denser and taller, safety must be paramount. The value of aesthetics will also rise. People want seamless and affordable mobility; without uncomfortable waiting areas or dimly lit platforms with late-night trains, for example. Choices of mobility will increasingly be as much about the journey as the destination. The electrification of cars, for instance, can essentially transform vehicles into ‘connected domains’ that operate as moving computers, enabling passengers to make the most of their time on the road. Being able to easily manage agendas or have leisure time while travelling, means road time will no longer be dead time. ‘Mobility as a Service’ means not only that the mobility system provides a seamless transport service but that passengers can enjoy other services as they travel.

Achieving this balance – unique to every city – will have its challenges. But the gap between population growth and infrastructure provision is very real and proactive measures to narrow the divide must be comprehensive, creative, and immediate to avoid economic injury. Are you ready?

9.7bn

people are expected to make up the global population by 2050 – a 26% on the 7.7 billion today.

28

cities, as of June this year, have signed the C40 Fossil Fuel Free Streets Declaration, committing to procure only zero-emission buses from 2025 and to ensure that a major area of their city is zero emissions by 2030.

5.1mn

electric cars made up the global fleet last year, which is 2 million higher than in 2017 – near doubling the number of new electric car registrations.

55%

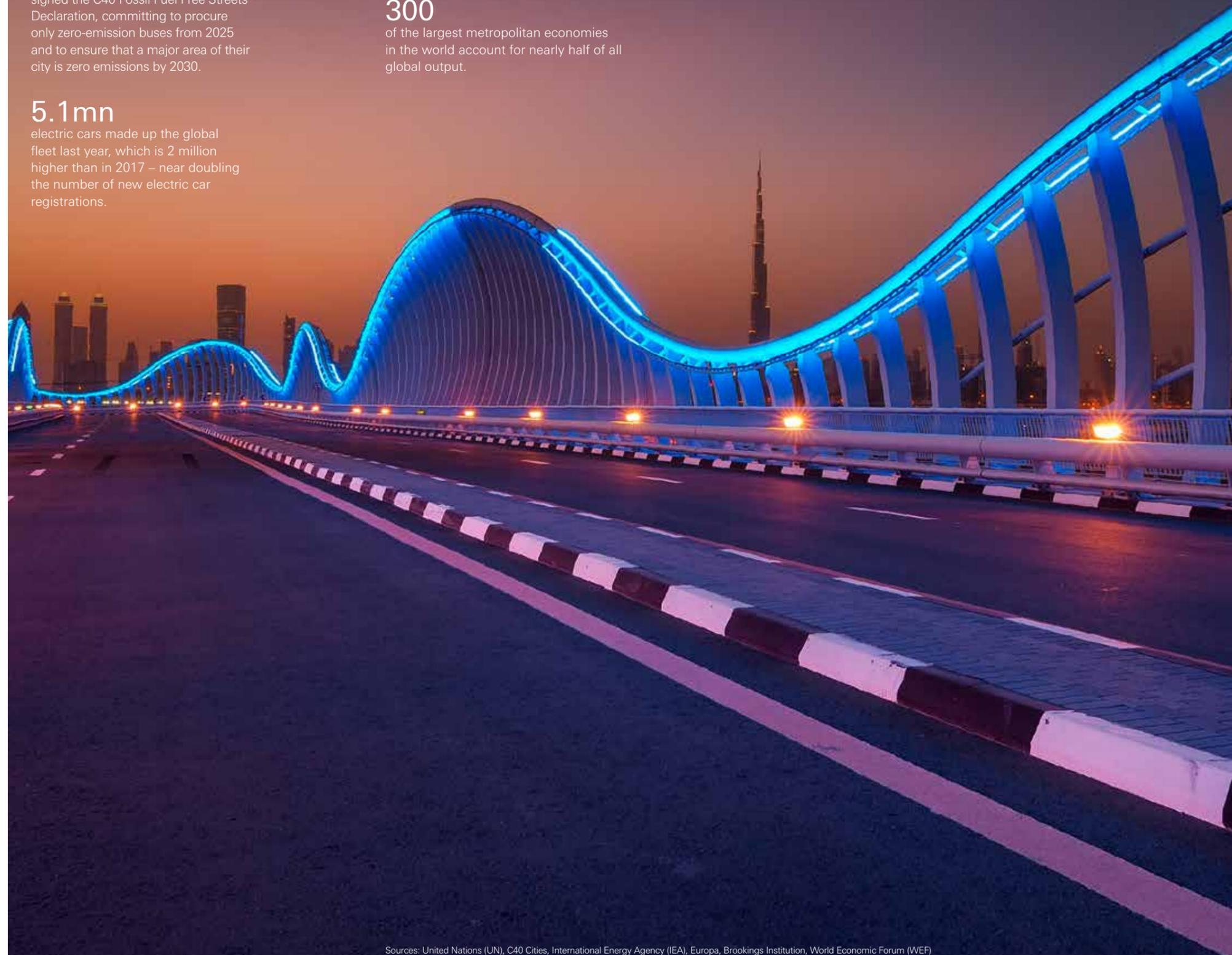
of Copenhagensers use bicycles each day amid freezing temperatures. Active forms of transport are increasingly encouraged by governments to improve global health despite adverse weather conditions.

300

of the largest metropolitan economies in the world account for nearly half of all global output.

168mn

was the average number of passengers per day in 2017 who rode metros in 178 cities around the world.



Electric vehicle market gains speed

MENA focused on cost, competition and charging infrastructure



BY BENEDIKT UNGER
Principal, Pöyry Management Consulting, UK

The most prominent and talked about trend in modern mobility is that EVs are becoming cheaper and more competitive vis-a-vis their petrol rivals for urban road travel. Consumers are buying EVs in ever increasing numbers.

In 2017, the latest year for which the International Energy Agency (IEA) has published statistics, more than 3 million EVs were on the world's roads – a 54% increase on the previous year. In China, the world's biggest market, EV sales leapt by 72%. There were also big increases in the US, Japan and in certain European countries, like Norway.

While they are still more expensive to buy than cars with Internal Combustion Engines (ICE), prices are coming down. This is mainly because of progress in the cost of batteries, which are the single most important component of EVs, and due to competition amongst vehicle manufacturers. Despite the big increases in EV usage worldwide, there is still some way to go before it seriously rivals vehicles with ICE.

REGIONAL FOCUS: MENA

In the MENA region, the situation is slightly different. Both fuel and electricity prices are lower, mainly because of low levels of taxation. Fuel costs are not as important an ingredient for the car user

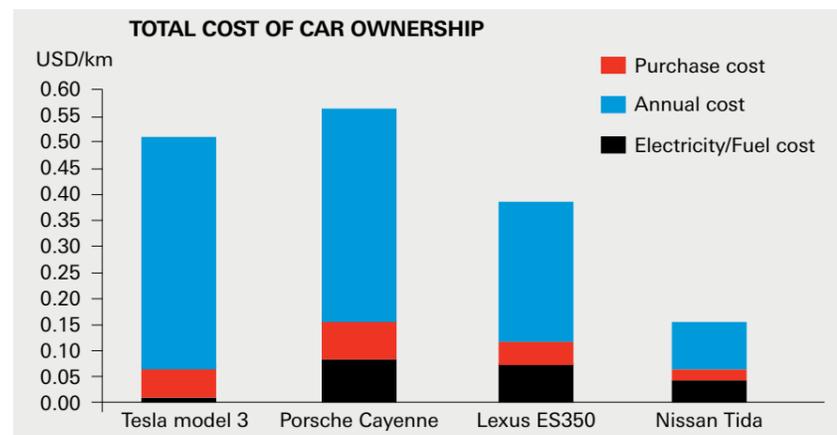
“Despite the big increases in EV usage worldwide, there is still some way to go before it seriously rivals traditional vehicles.”

in the region, especially in the oil-rich countries of the Gulf.

However, this could change quite rapidly, for two reasons. First, most

governments have either removed subsidies on petrol or have plans in place to do so within five years. There is a realisation that it makes more sense to export and achieve the global market price for fuel rather than encourage excessive domestic consumption. The resulting revenues can be used to the benefit of all citizens.

Second, the development of Solar Photovoltaic (PV) costs has the potential to change the nature of the electricity sector. Last year, Saudi Arabia reported the lowest solar PV costs in the world at 2.3 cents per kilowatt hour. The region has begun to realise that it is blessed not



Source: Pöyry Management Consulting, UK



just with abundance of oil and gas, but also with sunshine that can now become part of the power system.

While solar is gaining acceptance as the cheapest form of electricity generation, challenges remain. A key question is how to integrate large amounts of solar energy without causing capacity issues. Our analysis has shown that EVs, which themselves can be seen as big, mobile batteries, offer another possible solution to capacity and storage challenges if deployed in significant quantities.

Manufacturers must offer a wider range of EVs and continue bringing down the cost. Our analysis suggests that the new Tesla model 3, which is expected to be released this year, will be cost-competitive with some of the comparator ICE models. The main barrier will be the infrastructure and charging arrangements. There are many things that can be done to remove these barriers.

CHARGING INFRASTRUCTURE IS VITAL

Perhaps the most significant move is to roll out the appropriate infrastructure

“Several countries in the MENA region have targets for EV growth; the UAE aims for 20% of the transport market by 2030. Others are committed to the technology in a broader sense.”

for charging across nations worldwide. This must be carefully planned in terms of technology choice – slower versus faster charging – and identifying strategic location points.

The growing cities of MENA have advantages over their older counterparts in Europe or even the US. They have a lot more land on which to build the roads of the future and central planning will allow for the incorporation of features, such as an EVs charging networks or even autonomous vehicle systems, more easily than in older cities.

Some progress has already been made. Several countries in the region have targets for EV growth; the UAE aims for 20% of the transport market by 2030. Others are committed to the technology in a broader sense. Dubai and Abu Dhabi,

for example, have charging points in malls, hotels and elsewhere.

In the MENA region, there is an opportunity for governments and the private sector to work much more closely on this. The electricity sector and EVs have a natural synergy and these two sectors should come together to ensure that the full potential of EVs can be harnessed.

17,000

EVs would have equivalent storage to the largest battery storage projects with 300MW and four hours of storage.

75%

is Dubai's target of clean power in 2050.



Regulators captain sustainable shipping

Green tides set to change maritime mobility



BY CHRIS WOOD
Managing Director, Uniper Energy Dubai

6,000 years. That's how long we have used ships to move; to trade, to migrate, to explore. This forms a cornerstone of how our civilisation thrives today; 90% of world trade is by sea with 50,000 registered merchant ships. So, the biggest change in the global shipping industry since engines replaced sails in the late 1800s unsurprisingly has a major ripple effect – including a spotlight on how regulators manage mobility.

Robust regulation is vital to give strong signals to investors and the public, therefore reinforcing their confidence. This

encompasses spending time engaging with industries and with the public to develop a relevant regulatory framework that evolves with technology and demand. In an ever-increasing globalised world, regulations must also encourage developments across countries and broader geographic boundaries. Regulators face a tall order; all entities in the value chain must play a helpful role.

The International Maritime Organisation (IMO) is a good example of how global legislation with compliance structures can be improved for shipping, refining,

90%
of global trade is carried by the world's 50,000 merchant ships, providing access to everything from food to cleaning products.

2025
is when the global datasphere will reach 175 zettabytes, from 33 zettabytes in 2018.

670mph
is the planned speed of the Virgin Hyperloop One, with passengers in vacuum tubes at speeds three times faster than highspeed rail and magnetic levitation trains.



and local authorities. The IMO ruled in October 2016 that from 1 January 2020, the sulphur limit for bunker fuel will be 0.5%, down from today's 3.5%. The shipping and energy industry largely agree that the move is fair, as it is aimed at reducing pollution and supporting the Paris Agreement. But that's where the consensus ends. Now, with less than three months until compliance begins, there are far more questions than answers over implementation.

MURKY WATERS PERSIST

Three key areas of ambiguity have emerged. Firstly, how will compliance be policed on both local waters and high seas. Secondly, what is the supply-demand balance for Low Sulphur Fuel Oil (LSFO) and other compliance methods (Liquid Natural Gas (LNG), scrubbers)? As it stands, our operations at the UAE's Port of Fujairah, the world's second largest bunkering hub, provide the largest supply of LSFO in the Middle East. However, we are but one supplier in this global crossroads of sea-borne traffic; many more are needed to focus on and improve fuel quality and reduce emissions.

Thirdly, a pertinent question for us all, including consumers: how much will compliance cost? In 2017, Wood Mackenzie said \$60 billion could be added to bunker fuel costs every year from 2020 and the International Bunker Industry Association forecast \$24 billion. The difference – a cool \$36 billion – and limited analysis since, points to an urgent need for more communication

and visibility. Answering these questions must be a two-way road. Industry cannot expect to be spoon-fed answers by the IMO, but equally, regulatory powers must play a far more active role.

ENHANCE VISIBILITY

The what, when, where, how and why in regulations are deeply important. It is the glue that binds different agendas and entities towards a common goal in what is an increasingly multifaceted world. With the right signposts, incredible growth is possible. The adoption of standardised shipping containers alone improved efficiency to the point that global trade soared by more than 700% in 20 years, reported Wartsila in late 2017.

Are the right volumes and type of details being shared, both in updated regulations for established areas of mobility and entirely new areas like EVs, space, and hyperloop travel? Answering this question with a fair dose of certainty – a crystal ball eludes us all – is critical as the global population grows by 27% to 9.8 billion by 2050, as forecast by the United Nations (UN).

For example, the integration of the 4th Industrial Revolution in the bunker fuel and shipping industry increasingly encompasses automation, the Industrial Internet of Things (IIoT) and predictive analytics. Accordingly, there will be a tsunami of data points that the shipping sector and other operators in mobility must learn to gather, manage, and analyse. Poor data management heightens the risk of drowning in information. The global

datasphere will grow from 33 zettabytes in 2018 to 175 zettabytes by 2025, according to the International Data Corporation (IDC). With this soaring volume, regulators must help build digital walls against the world's new and largely invisible mafia: cyberhackers. Cybercrime cost the global economy \$600 billion in 2017, according to McAfee. Developments like Hyperloop Transportation Technologies' (HTT) planned tests on its full-scale test track in France and the rise of privately-funded missions to the moon also need firm oversight.

Regulations detailed on paper must be applicable in the real world to preserve a crucial ingredient in the positive disruption of mobility: confidence. The excitement of innovation splutters and the deep pockets of much-needed investors shrink if fortitude dwindles. Clear and consistent regulations are key as backtracking on regulations hinder investors' decision-making and wastes a commodity that every industry is short on: time. A to-and-fro eats up hours on the corporate clock that would be better allocated towards improving energy efficiency, enhancing human resources' acumen, and low-carbon initiatives.

This must all be achieved while keeping the key goal in mind: to affordably and efficiently achieve IMO 2020 compliance to reduce the environmental impact of sulphur in the global shipping industry. We are living in an era where how we move is being overhauled. Regulation may not be the most exciting topic, but it is a pillar that has reinforced the temple of innovation for millennia. Don't let cracks show.



People lie at the heart of mobility – not vehicles

Cultural change is as vital as logistical and technological advancements



BY MONICA MENENDEZ
Associate Professor of Civil and Urban Engineering,
Division of Engineering, New York University Abu Dhabi (NYUAD)

Traditionally, questions of mobility policy have focused on modes of transport – cars, bicycles, trains, planes. But really it should be about people.

A holistic approach should look at all these modes together, because any policies you implement in one will affect the other. They are all sharing and competing for the same limited space. If you give more space to bikes, there will be less space for cars, for example.

The point is not to improve car, bike or metro mobility, but people mobility. In other words, we should not be aiming to improve the capacity for cars, but the

capacity to move people from one place to another. The most effective way to achieve that is by adopting a multi-modal approach to the question of mobility.

REWRITING THE NORM

The Middle East has inherited a car-centric transport system. There are very good reasons for this. Historically, fuel has been cheap, and the weather can be very harsh. This renders the “last mile” issue of how people reach their destination after taking a bus or other public transport vehicle a very significant one.

However, the region also has advantages that other parts of the world, like the US and Europe, do not enjoy. In the West there are legacy transport systems, built around urban environments that have long existed. Thus, there is only room for marginal improvement. On the other hand, the Middle East is building its transport systems virtually from scratch. We can afford to be innovative while learning from the experience of others. In many ways, it is a blank slate for mobility.

We cannot just add car capacity. The global population is growing and the



proportion of people who live in cities is rising too. Cars are comfortable and convenient and can be made more efficient and less environmentally damaging, but the idea of everyone having a private car is not sustainable.

EVs will address some of the concerns about pollution if – and it is a big if – the electricity is generated from ‘clean’ sources. However, EVs do nothing for congestion. It is impossible to put everybody on the planet in a car. It is not a sustainable proposition in the long run, so we must look at other ways to enhance mobility.

OLD METHODS, NEW APPLICATIONS

Autonomous cars are appealing too. Not everybody can drive; young people, very old people, some disabled people, for example. So autonomous cars can address those sections of the global population, though at the risk of further increasing congestion.

The approach taken in some European cities has been to provide more and better public transport and to invest in active transport modes, such as bicycles. Bike-riding has been trialled on a limited basis in some regional cities, but it also faces big challenges related to climate and infrastructure.

Cities in the Middle East are investing a lot in public transport, with metro systems either in place or under construction in Dubai, Doha and Riyadh. Metros are globally tried and tested, but they are capital intensive projects and you might question whether the economics are justified in cities that have a high degree of urban sprawl. They do not make much sense in low-density

“Metros are globally tried and tested, but they are capital intensive projects and you might question whether the economics are justified in cities that have a high degree of urban sprawl.”

conurbations. And the challenge of the ‘last mile’ remains. You cannot build a metro station for each apartment block or villa complex. It must be complemented with other forms of transport.

In mobility, the issue is often the trade-off between accessibility and capacity, and this is the challenge with the latest innovations, like a hyperloop. This would be a huge investment to offer a very high capacity, because it can carry a lot of passengers very quickly. But accessibility, as with a traditional train, remains an issue because a hyperloop would only go between two big urban centres. There could be demand for it, but equally you might argue that demand could be satisfied by traditional rail networks.

MONITORING THE SKIES

The concept of flying cars has recently come to the fore again, but the idea of personal flying machines has been around since Leonardo Da Vinci. Certainly, the technology exists, and it makes sense when space is limited to think 3D, whether that is under ground as some have

suggested, or in the air. The challenges for flying cars are still safety, legislation, and regulation. Mobility is a highly regulated environment and the rules with flying cars would be even more complex.

Conversations need to take place between the stakeholders: consumers, scientists, planners, transportation specialists and authorities. Many questions relating to mobility are political and must be decided at that level.

It is easy to be cynical that any of the latest innovations in mobility will ever truly take off, but there is a scientific logic to them. Cars were invented in the late 1800s and mass produced since the 1920s, but since then nothing has really changed. No matter how sophisticated the technology and performance get, even if a vehicle drives itself, it is still a box on four wheels. At some stage, the inertia to change will give way.

706
cities worldwide will have a population of one million people or more by 2030.

2025
is when the total number of EVs and hybrids will account for 30% of all new vehicle sales worldwide.

0.5%
is the percentage of EVs on the road today worldwide.



Public mobility in the MENA region

Interview: Careem



How does Careem's concept of mobility differ from other ride-hailing businesses, such as Uber?

It differs because of where we operate in the world. In London, without ride-hailing options, a person can still get to where they want to go easily with a wide range of transport options. In our region, those options often don't exist. Careem has made a hugely positive impact on mobility and by extension, upon people's lives. For example, around 70% of Careem's passengers in the Kingdom of Saudi Arabia are female. Careem has been particularly beneficial for women who did not have safe and reliable transport before the introduction of our service. So great has been the impact that people in Saudi Arabia have referred to there being a time before and a time after Careem.

Why has Careem's formula been so successful in the MENA region?

We're from this region and we wanted to do something for this region – that's our focus. We really felt that people here are underserved in terms of transportation and mobility. Transportation networks in other countries were set up decades

ago, if not more than a century ago. The London Underground opened in 1863 for example, but our part of the world did not have that infrastructure. Consequently, the opportunity for impact is in this region. When people in other parts of the world talk of ride-hailing companies, they see them as a disruptor. But in this part of the world, in many cases there was nothing to disrupt. So, we're enablers.

Are the markets and strategies different in the various parts of the region? For example, the GCC versus non-oil exporting countries?

It's about matching the right service to the right country. The overall values and mission statement of 'simplifying and improving lives and creating an awesome institution that inspires' is the same, but the needs differ from country to country. Our focus is on making our service affordable for the masses and helping to solve the transport issues that we've seen across all our markets. To do this, we have been diversifying our vehicle types across all markets because the tech infrastructure we have built can support multiple vehicle types.

600mn
people live in the area that Careem operates in.

\$100bn
could be generated by improving mobility, especially given the lack of sophisticated public transport in most regional cities.

70%
of Careem's passengers in the Kingdom of Saudi Arabia are female.

10
cars marked Careem's launch in Cairo, which has now swelled into thousands with passengers waiting just 3-4 minutes for a ride.

35%
of the cost of travel can be saved on a scooter – ideal for congested cities – versus taking a car trip.



"It's about matching the right service to the right country. The overall values and mission statement of 'simplifying and improving lives and creating an awesome institution that inspires' is the same, but the needs differ from country to country."

It started with cars. For example, when we first launched in Cairo, we did so with just ten cars, which in hindsight was ridiculously few for a city that large. Someone would open the app and it said you'll get a car in 90 minutes, but people waited for 90 minutes because they didn't have any other good alternatives at the time. Since then, we have scaled from those ten cars to thousands of cars, so we now have an estimated time of arrival of three to four minutes from anywhere in Cairo.

Then we introduced motorbikes and that helped solve the issues of getting around in congested traffic, as well as bringing the cost down. A trip on a scooter is about 25%-35% of the cost of taking a car trip. In major cities across Egypt and Pakistan, our bikes now account for 15%-20% of daily trips. And having bikes on the app also allows us to provide delivery services. Auto rickshaws are 40% cheaper than car trips in Pakistan, and now they are making up 10%-15% of our daily business. Meanwhile, carpooling can bring down a trip fare by 20%-30% and we are already seeing 10% of our trips in Amman stem from pooling. Through the introduction of more diverse vehicles, we are fast becoming the dominant provider of app-based transportation in the region. Alternatives to cars means a range of price

points and that means more people can use our service. Part of our mission is to increase mobility for the region, and we feel strongly that the benefits of ride-hailing should be extended to everyone.

Careem is expanding outside straightforward car mobility. Where and why?

Careem is a tech company first and foremost. In the process of building the ride-hailing business, we have created the ecosystem to help others build their own regional internet business on our platform. While launching Careem, we developed and implemented a lot of the underlying infrastructure that was needed to run a consumer internet business in multiple countries in the region and then we harmonised them on a single platform. That wasn't easy. But now we can do many more things than just mobility. We are one of the few companies that have breadth of population and support in a large tech platform. Our focus was mobility, all forms of things that can move people. But now we're expanding to other aspects for which our app can provide a stable and far-reaching base. Last year, we launched Careem BUS as we expanded into mass transportation. We launched Careem NOW as a delivery service, focusing largely on food to start with. Soon we will be

expanding into payments, with the launch of Careem PAY. Only 14% of the greater Middle East currently has access to a bank account, so that has the potential for huge impact.

Where does the Careem journey end? How far can it go?

The potential for Careem is huge. We currently operate in a region of around 600 million people. We believe the addressable mobility opportunity to be worth more than \$100 billion given the lack of sophisticated public transport infrastructure in most of our cities. When people talk about Careem's growth and expansion, they often think of us launching into a new city or country. But within the countries in which Careem currently operates, we believe that we only have 1% of the addressable market. Even in a city that is large, we can become multiple times larger simply because only a small part of the population is currently using us. In addition, more people are moving to the cities in which we currently operate, meaning our transport solutions – from motorbikes to carpooling to boats – are going to play an even greater part in solving the increasing mass-mobility problems. As we increasingly become a multi-modal app and move beyond ride-hailing, the potential for scope and growth continues to grow.

20%
of daily trips in major cities, such as Egypt and Pakistan, are made on bikes.

15%
of daily business is made on auto rickshaws - 40% cheaper than car trips in Pakistan.

10%
of trips in Amman, Jordan's capital city, stem from pooling rides.

2018
saw the launch of Careem BUS as the company expanded into mass transportation.

14%
of the greater Middle East currently has access to a bank account, so there is great potential for Careem PAY when it launches.

Blockchain: Revolutionising how we move

Digital tools that increase efficiency, safety and transparency are on the rise



BY ANDREW RIPPON
Blockchain Technology Advisor

Blockchain can revolutionise virtually every aspect of economic and commercial life, so it would be surprising if it did not have significant applications in the field of mobility. In fact, blockchain technology has direct relevance in self-drive vehicles, urban traffic systems and safety procedures. And not just for motor cars, but across the full spectrum of planes, trains, and automobiles.

The essence of blockchain is that it creates a distributed ledger of transactions, but a ledger with a difference in that all parties holding that ledger are guaranteed to have the same data. This is augmented by 'smart' contracts within the ledger, which ensure that each person with access has an identical copy of the contract. Each party in the ecosystem has access to the same information.

Take the example of a traffic fines computer. In the days before blockchain, the computer system would be owned by one entity, such as the police or road transport department. It would be their word on which fines are correctly issued. Blockchain enables everyone who might be regarded as a stakeholder – judiciary, government auditors, transport authorities, even drivers – to have the same copy of the fine and incident details in real time.

It provides benefits that were not available before. There is trust in the data because identical data is held by all parties and it is a permanent, immutable record that was not previously possible. In the case of traffic fines, this reduces

administration costs, speeds up dispute resolution and ensures more accurate audit.

The applications in the financial system are obvious, so it's no accident that is where most of the impact of blockchain technology has been felt. This has been the case in cryptocurrencies, financial asset transfers, and cross-border trade, for example. Dubai is pioneering the use of blockchain in settling transactions that affect lots of different government departments.

DIGITAL BENEFITS

There are a lot of areas where it can impact mobility too; take self-driving vehicles. When these eventually become common, you will not have to park them anymore. You will just press the 'self-park' button and the car will park itself. But how does it pay for the parking? Or for refuelling? Or for maintenance?

Blockchain will equip the car to have a digital wallet that will pay for these services. It will enable mobility by enabling the financial processes around autonomous vehicles, allowing full automation to take place. Or take urban traffic management systems. Blockchain is effective when there is a multi-stakeholder environment, which is certainly the case in planning, operating and managing something as complicated as a modern city's traffic flow. For example, safety can be tracked in real time across systems and agencies with trusted data.

Traffic systems will ultimately depend on a network of Internet of Things (IoT)

sensors, monitoring bridges, lights, barriers, signals, and all the rest of the infrastructure of a sophisticated road network. Data will be sent from these sensors and will be made available across government departments by blockchain technology.

In the case of a traffic accident, the incident itself will be captured by a camera, but data from that event will be distributed via blockchain to all the entities that need it. This encompasses police, emergency services, traffic authorities, insurers and others. They will all have access to it via a real time audit of the accident and will not need to validate its authenticity.

Blockchain has a huge potential application across all aspects of safety procedures and response. The engines of a modern airplane produce a lot of data about performance and maintenance needs, but currently that data is transmitted to the manufacturers and it remains their property. Blockchain will make it possible to make it available to safety authorities, environmental groups, regulators, accident investigators and consumers. It could be a 'black box' to which everybody has access. Blockchain removes the need to validate data authenticity independently, while keeping in place laws regarding privacy, security and safety.

WHAT'S NEXT?

The Middle East is well-placed to implement blockchain technology in the mobility sector. There is some element of 'legacy' in transport systems, but nothing like many other parts of the world. Transport systems are relatively modern, so it is easier to implement new technologies like blockchain.

Many parts of the region also are fortunate to have leadership that displays vision and direction. These technologies can be disruptive, so their introduction needs careful management. The Gulf region has governments that can take big decisions and implement them.

2021

is the year the Vice President and Prime Minister of the UAE and Ruler of Dubai, His Highness Sheikh Mohammed Bin Rashid Al Maktoum, expects blockchain technology to account for half of the UAE's government transactions.

22%

of GDP could be lost by some countries over a 24-year period because of road traffic accidents.

\$11.7bn

will be spent on blockchain development worldwide by 2022.

Green mobility of the future

Drone, robots and EVs are transforming delivery services



INTERVIEW WITH AMADOU DIALLO
CEO, DHL Global Forwarding in the Middle East & North Africa

Where does innovation in the sphere of mobility impact DHL?

Pursuing sustainability is a top priority for the group. In August 2017, we announced our climate protection goal of zero emissions logistics by 2050. This target is part of our group-wide environmental protection programme, GoGreen, which marks its tenth anniversary this year. The use of vehicles with alternative drives and technologies plays an important role in this regard, which is why DHL is testing and implementing various concepts worldwide, such as EVs. One of our main focuses is on our own first and last mile services, as we want to improve the lives of people right where they live and work. We have, for instance, developed our own electric delivery van called StreetScooter. This EV is produced by Deutsche Post DHL Group and our colleagues from DHL Parcel use it for parcel delivery in inner cities. We are also selling this vehicle to third parties that have a significant delivery aspect to their businesses, such as bakeries and craft enterprises.

What are the challenges of 'first' and 'last mile' delivery?

We are continuously exploring how we can make our last and first mile delivery services 'greener' and more efficient. This

can be achieved, for instance, by using innovative alternatives to the traditional van or truck, like EVs and bicycles. Another focus area is how we can make the lives of our employees easier and optimise work processes at the same time. For example, DHL Supply Chain is already deploying 'follow-me robots' in some warehouses to support our warehouse staff on their picking tasks so they do not have to handle heavy trolleys anymore. In Africa, we have recently completed a pilot project for drone delivery. During the trials, an autonomous DHL Parcelcopter 4.0 completed a 60km flight from Mwanza in Tanzania to an island in Lake Victoria, averaging 40 minutes per trip. The drone opens new opportunities to address the logistical challenges. This includes in the public health sector in many parts of Africa, to help them overcome poor infrastructure, and make deliveries to hospitals and pharmacies possible.

What parts of the DHL value chain will benefit most from innovations in mobility?

Deutsche Post DHL Group sees innovations in mobility as a big opportunity to transform the way in which the logistics industry works. This encompasses how

innovations can ease our employees' daily work lives and at the same time, we are able to contribute to the sustainability agenda. Within the group, we also have a dedicated business unit (DHL Customer Solutions & Innovations), which looks at innovations and trends in the logistics sector. Every two years, our colleagues publish the Logistics Trend Radar exploring future trends and innovations in the logistics sector. Mobility is one of the focus areas in this context.

How can DHL benefit from mobility innovations in air and sea delivery systems?

DHL benefits from mobility innovations in every transport mode. As the leading logistics provider in the world, we make extensive use of all transport and delivery systems. Continuous innovation will help to make our logistics services more sustainable and efficient and improve the service quality for our customers.

What are the challenges for a logistics company in a competitive market for mobility innovation?

Collectively, the Deutsche Post DHL Group has been around for more than 500 years and despite the many changes the world has seen, we continue to provide the best services for our customers. This year, we celebrate 50 years of the DHL brand and to me, our heritage and brand promise are the best testimony of how we embrace change and innovation. It's in the DNA of Deutsche Post DHL Group to be open to this. Mobility innovations bring forth opportunities for the logistics industry and we should leverage the outcomes to ensure that we remain ahead of the game.

2050

is the year the company wants to achieve zero emissions logistics.

2

Every two years, the Logistics Trend Radar, which explores future trends and innovations in the logistics sector, is released.

10th

It's the tenth anniversary of the company's environmental protection programme – GoGreen this year.

500

is the number of years that The Deutsche Post DHL Group has existed.

Oman's Duqm leverages global crossroads

Investment improves the region's logistics industry



INTERVIEW WITH REGGY VERMEULEN
CEO, Port of Duqm, Oman

What is the strategy behind the development of a port facility at Duqm?

The Port of Duqm is critically important for the development of the new Special Economic Zone Authority (SEZAD), an engine of growth for Oman, which is expected to significantly increase industrialisation and diversification of the country's economy away from oil. The Port's strategic position on the Strait of Hormuz, at the crossroads of international trade routes between Asia and Europe, locates it perfectly to service Indian and African markets, as well as Oman's neighbours in the Gulf Cooperation Council (GCC). Duqm's central location within Oman also positions it as the ideal point of entry for cargoes destined for inland projects and oil and gas concession areas.

How does the port enhance the logistics industry in Oman and the region?

Efficient logistics in any country – whether it be roads, rail, sea or air – are an enabler, which allow a nation to achieve its full economic potential by reducing frictional costs. The large investments that Oman is making in this sector will make the import and export of goods more globally competitive, particularly given that the bulk of international cargo trade is moved by sea routes. Having deep draft ports is also critical nowadays with average vessel sizes increasing in a consolidating global shipping industry.

“We are hoping to attract firms that are currently operating in high tax environments, which will benefit from Duqm's manufacturing base and from the land on offer in proximity to the port. In effect, a one-stop solution for port services, industrial logistics and land use.”

As a greenfield project, initially we expect imports at the port to be geared towards development works. Following that, we would expect industrial cargo to flow, such as the import and export of raw materials and products for factories. The port will also act as a critical part of the Duqm refinery supply chain. The Oman Rail Mineral Line project is also expected to link Duqm to the south of the country, rich in mineral deposits. All these factors should significantly reduce the cost of internal transport and imports and exports, while enhancing cargo volumes.

What is the role of foreign investment in developing the port?

SEZAD is designed to attract foreign investment via financial and non-financial incentives, such as 30-year corporate tax exemptions, customs duty exemptions on the import of machinery and raw materials, and 100% foreign ownership for companies. We are hoping to attract firms that are currently operating in high tax environments, which will benefit from Duqm's manufacturing base and from the land on offer in proximity to the port. In effect, a one-stop solution for port services, industrial logistics, and land use.

Is Duqm competing with other facilities in Oman and the wider region?

I would say it complements other sea ports in Oman, which each serve different markets. The value proposition of Duqm also differs in that it lies entirely within SEZAD, which renders it ideally suited for the duty free transit of goods. The flat terrain in and around the port also makes it ideal for lifting heavy cargo, particularly for oil and gas projects. In the wider GCC region, our location, facilities and surrounding 2,000 square kilometre area for development also provide a compelling alternative.

What products will be shipped through the Duqm port?

We are a deep draft, multi-purpose port with several dedicated terminals for handling virtually all cargo types. The port is already operational albeit in the pre-development set



up phase. The top deck infrastructure on the 2.2 kilometre commercial quay is expected to be finalised by the first quarter of 2020 and on completion, will have a Phase 1 container terminal with a 1.5 million TEU [twenty-foot equivalent unit] per annum capacity. In addition, there will be a Navy terminal, a dry bulk terminal, a Roll On, Roll Off (RORO) terminal and a multi-purpose terminal. We also have a liquid bulk terminal currently under construction, expected to be ready by the end of this year.

So far, we have handled break-bulk and project cargo. We have also been running our Early Operations Container Terminal, facilitating imports and exports of containers via a feeder service operated by Oman Shipping, connecting Duqm with Salalah and Sohar in Oman and Jebel Ali in the UAE.

What are the main sectors represented in the adjoining industrial zone?

The Duqm refinery is an anchor project and ultimately, we expect to have a downstream petrochemicals complex adjoining the refinery. Aside from being a Port Authority and Terminal Operator,

“Today, market fundamentals are weak and competition intense, so ports and shippers are struggling and that's when size becomes all important.”

we also act as a landlord mandated with developing 5,000 hectares of land for logistics and light, medium and heavy industry, such as the mining of minerals like limestone and dolomite.

What are your views on trends in global logistics and mobility?

Today, market fundamentals are weak and competition intense, so ports and shippers are struggling and that's when size becomes all important, and why we are seeing consolidation in the maritime industry. Globalisation, digitalisation and e-commerce are also rapidly transforming business processes and so to retain customers and unlock the full potential of global trade, we must stay ahead of this curve.

How important is the location of the MENA region in global trade patterns?

The significance of oil has always placed this region at centre stage strategically, but this has increased in the last 20 years as a conduit to Asia's rising role in international trade.

What is your assessment of regional security risks to global trade?

We obviously monitor the geopolitical security situation closely, even though Duqm is less exposed to trade risks than other ports in the region by virtue of its location outside the Strait of Hormuz. The sultanate also prides itself on being an agent of promoting peace and playing a neutral role in regional politics.

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