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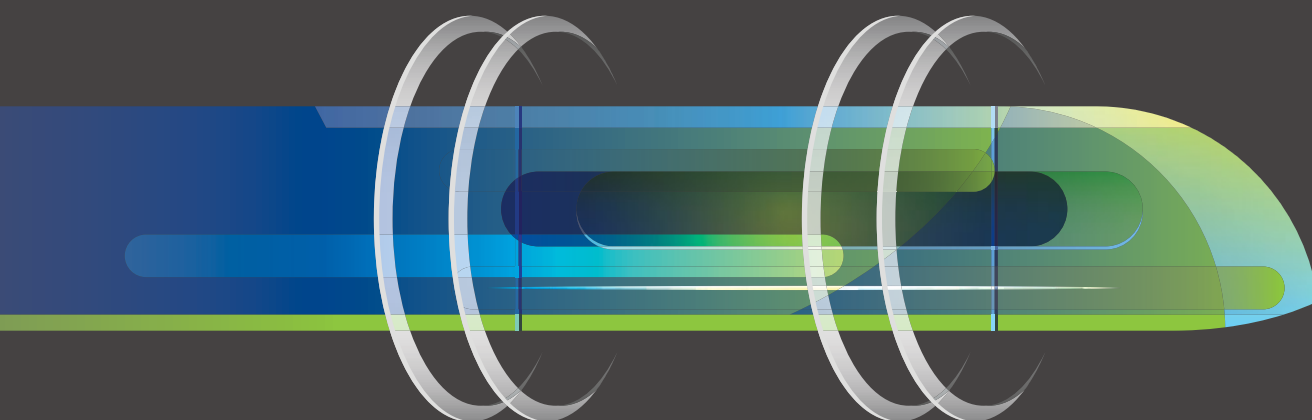
Smart
Mobility



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GCC transport, planning and mobility market report 2018/2019

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THE GCC OUTLOOK: PIONEERING THE FUTURE

In this market report we look at the most notable digital initiatives, projects and emerging opportunities in the GCC region across transport infrastructure, urban planning and smart mobility.

The Middle East seeks to foster advanced innovation in all areas of urban planning and is positioning itself to be pioneering mobility and smart transport infrastructure models globally. Even businesses from other sectors are now penetrating the transportation and infrastructure markets in the region.

The GCC is striving for their urbanisation strategies to measure up with the world's leading nations. With radical economic diversification, shifting demographic paradigms, an increasing youth population and a rise in tourism, investment in transportation and infrastructure has become a top priority. Transport operators, governments and suppliers are implementing new delivery models, alternative funding sources and advanced mobility solutions in a bid to meet the region's aims for interconnected, technologically integrated cities and systems.

Government authorities and regulators are recognising the transformative effects of smart urban planning and mobility and are applying new policies, frameworks and standards to ensure implementation and engagement.

Amongst this rapid and forward-thinking rate of innovation, expansion and change, there are huge opportunities emerging in the region. The GCC is as a key region to establish strategic partnerships and one of the world's most exciting markets.



Fiona Craib
Conference Manager

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MODELLING URBAN MOBILITY: FORMING THE FUTURE OF URBAN PLANNING AND TRANSPORTATION

Mobility lies at the very centre of urbanisation enablement.

Urban transport plays a fundamental role in meeting the objectives of achieving economic prosperity, social inclusion and steady, sustainable growth. In this visionary region, public mobility innovation is now high on the agenda for governments and regulators and exciting projects are being carefully designed and planned as a result.

GCC planners seek to maintain legacy transport infrastructure to optimise lifestyles and plan to make way for new innovative mobility possibilities, bringing them to life in line with the ambitious smart city model.

Transport operators in the region know that they are in a key position to lead the transport transformation and alongside global urban mobility stake holders, are reacting to paradigm shifts disrupting urban mobility:



Automation



Ridesharing



Trip planning tools
and technology



Environmental
considerations

Innovative urban planning has emerged as a key trend in the region. Governments and planners seek to enhance urban spaces with **transit orientated developments** to better integrate new mobility services. With Expo 2020 approaching and other huge visionary projects and objectives set in place across the GCC, stakeholders intend to improve mobility with efficient, inclusive, safe and innovative public transport.

AUTOMATION: THE NEW FACE OF TRANSPORT TECHNOLOGY



Automation and driverless mobility systems are the driving force behind transport innovation. GCC countries have realised the benefits and are striving to implement automated technologies to meet their smart mobility goals.

The benefits of integrating autonomous vehicles to transportation networks:



Increased lane and
line capacity



Greater transport accessibility
and cheaper mobility



Reduced
travel times



Lower carbon
emissions

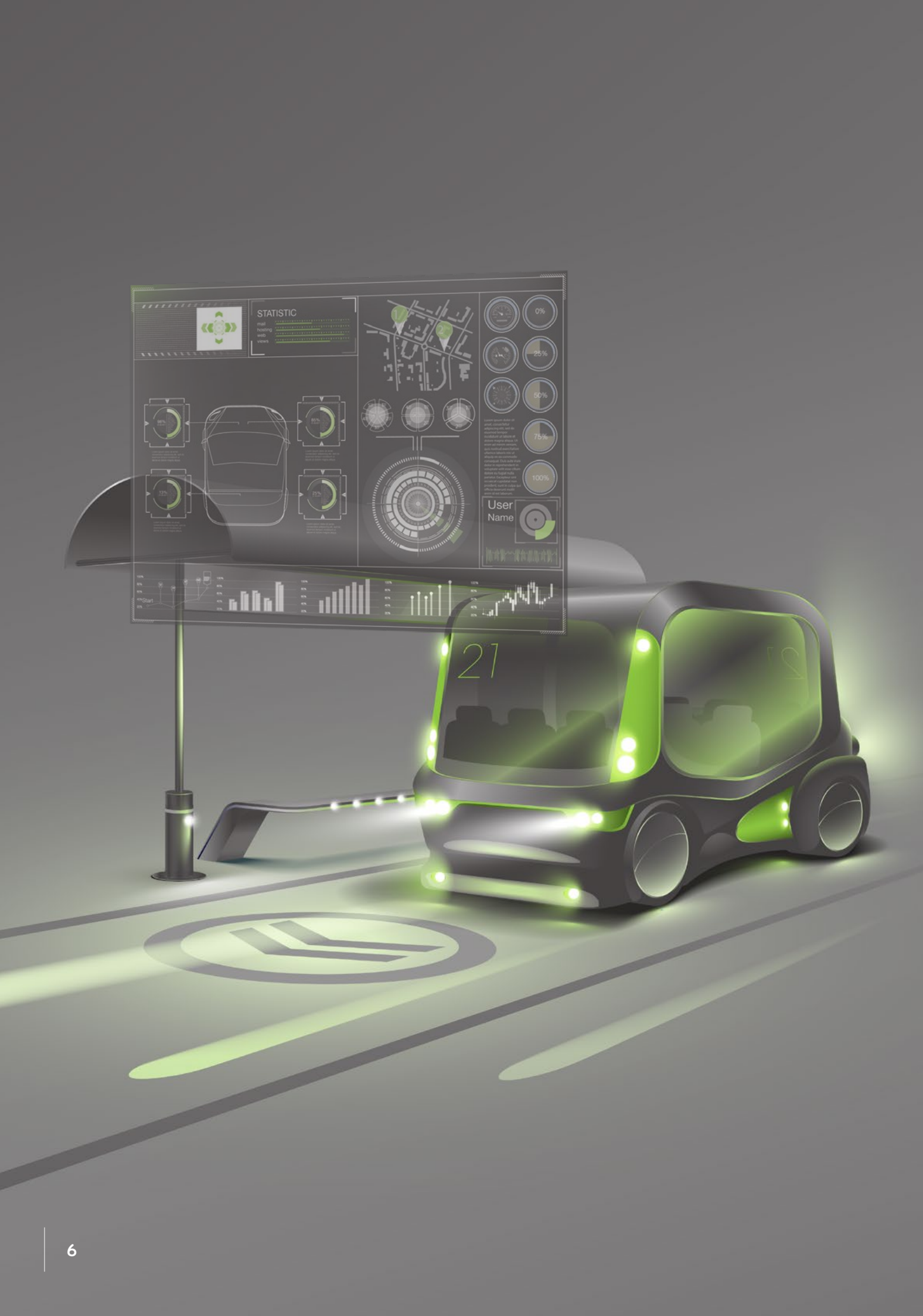


Fewer accidents and
incidents



Supporting economic
sustainability

The continued development and adoption of autonomous electric vehicles and driverless metro systems leads to the prediction that, by 2020, 75% of all new metro systems will be driverless. In the UAE alone, Dubai Autonomous Transport Strategy aims to convert 25% of mobility journeys in Emirate to autonomous transportation by 2030.



AUTOMATED TRANSPORT OPPORTUNITIES:

Autonomous Pods

Dubai's **RTA** has been testing the world's first autonomous pods in cooperation with **Next Future Transportation**. The pods are designed to travel short and medium distances in dedicated lanes, travelling at an average of 20 kilometres per hour and carrying 10 riders. The pods are also fitted with batteries supporting three hours of operation.

Abu Dhabi's **Masdar City** holds the world's first large-scale outdoor sustainable transportation system but plans are in place to expand this Personal Rapid Transport network. The new system will offer more sustainable functionality, ease traffic congestion and provide first and last mile transportation opportunities to its passengers. French autonomous vehicle producer **NAVYA** will supply the first fleet of 15-passenger autonomous shuttle vehicles. While the existing vehicles operate on tracks, the next generation vehicles will operate on the roads and will use vehicle infrastructure technology that communicates directly with traffic lights and IoT features on the road.

Aerial taxis

Looking for new ways to shorten trips made due to of distance or traffic congestion, Dubai wants to have aerial taxis in operation within the next five years, undoubtedly an innovation set to be assimilated across the region in the following years.

In addition, as **Uber** plans to construct the world's first urban aviation rideshare network, the **RTA** has signed a partnership with **Volocopter**, a German manufacturer, but has asked for additional safety measures to be applied before the project continues.

Driverless Cars

The **RTA** is the first transport sector in the world to announce an autonomous transport initiative, and Dubai is building capabilities to support **Tesla**, **Uber** and **Google**. Dubai Autonomous Transportation Strategy expects to save \$6 billion in annual economic revenue, reduce operation costs and raise productivity.

Tesla recently delivered a fleet of 50 Model S sedans and Model X SUVs, to Dubai which are fitted with the company's Autopilot software. The emirate and has already signed an agreement for the operation of autonomous vehicles in the Sustainable City project in Dubailand.

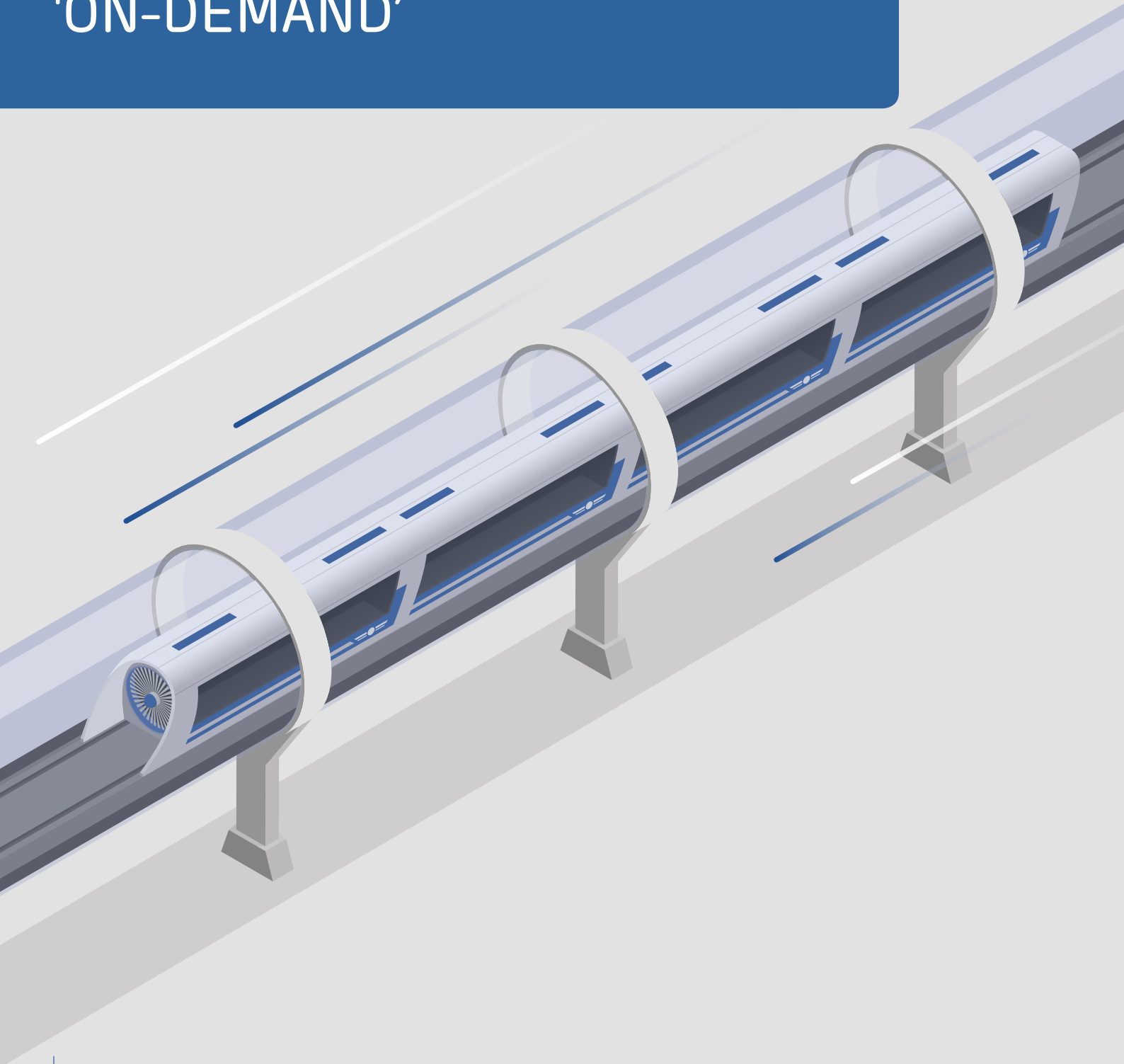
Abu Dhabi Integrated Transport Centre have instigated a \$31 billion intelligent transport infrastructure programme in Al Ain. The five-year initiative will involve supply, installation, operation and maintenance to prepare for autonomous vehicles and driverless cars.

Maglev Technology

Without the need for electrical power, maglev networks are very much of interest to decision makers and stakeholders in the GCC. This technology is not replacing traditional rail, but complements it instead, integrated maglev systems frees up the capacity and reduces impact on existing infrastructure, which allows it to be less expensive to maintain and less expensive to use.

In Abu Dhabi, developer **Miral** has plans to double the visitors to Yas Island to 48 million by 2022 and has signed up to the **NASA Skytran** to deploy a magnetic levitating transit pod system around the island. Built for four passengers at a time, this project will function more like a taxi than a monorail.

HYPERLOOP: RADICALLY REDEFINING CITIES 'ON-DEMAND'



Offering a next generation approach to transport, Hyperloop is preparing to disrupt the entire transport ecosystem with complex, innovative technology.

In the Middle East, **Hyperloop** is edging ever closer to reality, bringing a future vision to a future reality. **HyperloopTT** has been in the region for over two years and the UAE has since positioned itself to soon be home to the most revolutionary, most efficient, and fastest transportation system in the world.

Hyper speed is impacting on current networks:

- Reaching more people worldwide
- Delivering goods and services to businesses and consumers at the speed of flight
- Facilitating growth in intelligent operating systems from the bottom up

The key driver for hyper speed in the region is the rising need for mass public transit, energy efficient transportation, eliminating road traffic incidents and improving journey time.

CURRENT GCC PROJECTS:

In April 2018, an agreement signed for world's first commercial **Hyperloop** system of 10km between Abu Dhabi and Dubai to be open and functioning by Expo 2020

The recent partnership with **DP World**, the Dubai-based ports operator, and **Virgin Hyperloop One**, where the two companies are looking to build ultra-high-speed cargo delivery systems around the world. Supporting economic diversification and transportation infrastructure development to drive economic and logistics industry growth in the MENA region. The region has emerged as a major trans-shipment hub, with its strategic location advantage and improvement in air and sea port infrastructures

The eventual **Hyperloop** goal is to construct, execute and run one of the world's largest infrastructure projects: a hyper speed network to connect all the GCC states. Reimagining how people and goods move across countries by 2030 and with an increase of passenger and freight demand



INTERCONNECTIVITY IS NOW: IOT AND CONNECTIVITY

Smart cities and transport innovation will rely on greater connectivity and stronger linkages between people, places and resources to drive economic activity and boost regional productivity. Transport operators can drive positive change industry-wide with interconnectivity across both passenger and freight network systems.

The GCC countries adopting IoT for smart transportation is a priority and imminent.

The Internet of Things (IoT) will generate economic benefits worth up to **\$11 trillion** globally by 2025 and it is predicted that the total IoT investment in Middle East and Africa will surpass **\$14 billion** by 2020.

IoT has also quickly become a necessity for transit systems and networks. By looking at IoT sensors and advanced analytics, the transport industry can evolve without extensive infrastructure investments. Harnessing the ability to communicate and capture data for analytic purposes, transport operators can provide riders with a superior journey and offer greater capacity for freight functions.

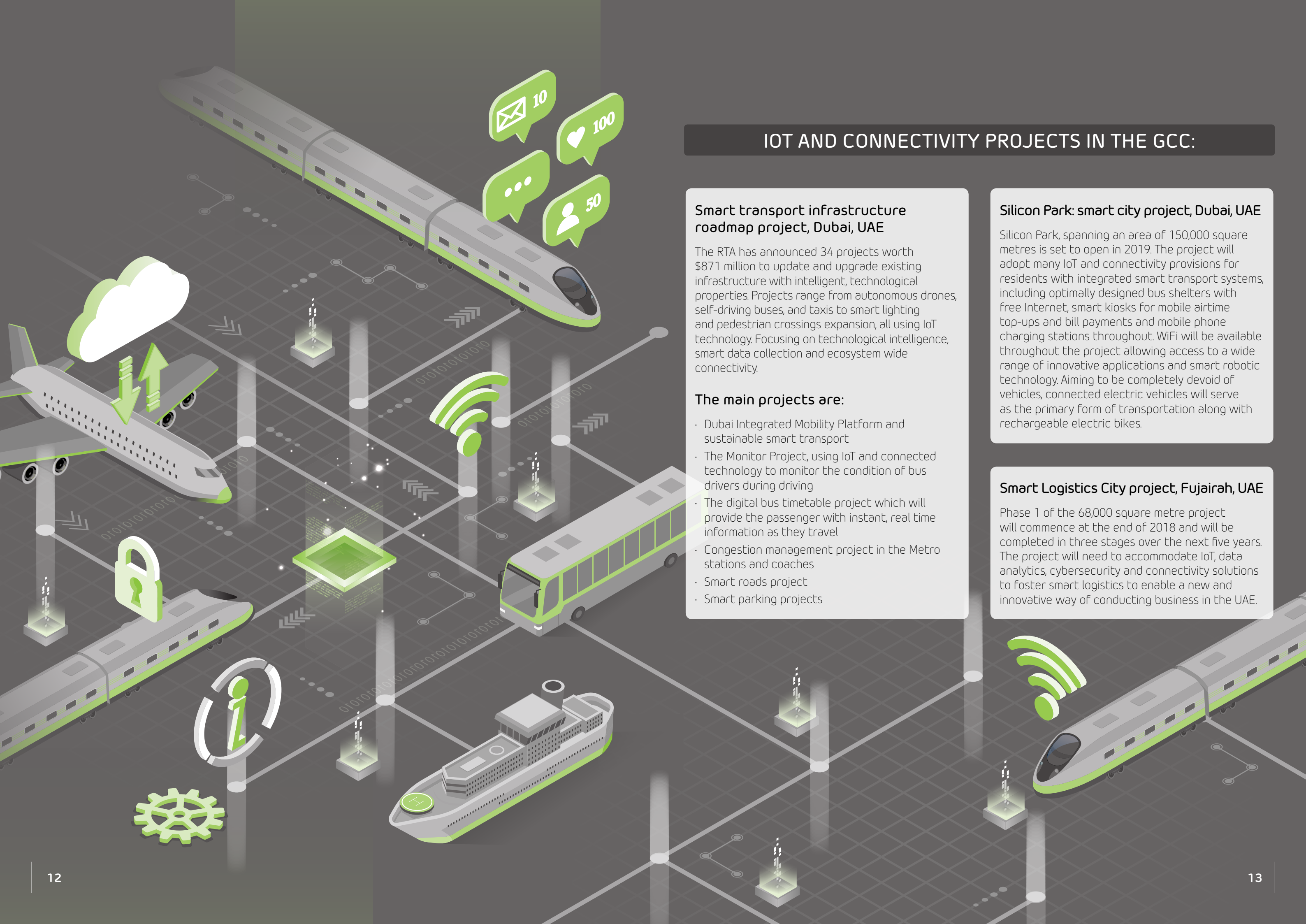
Transformative capabilities of IoT technology in transport:

- Greater reliability and safety: identifying problems, incidents or issues before they arise
- Inter vehicle connection: intelligent transport systems will rely on connectivity and data to enable transport modes to communicate with each other
- Advanced analytics for efficient operations: capturing and storing digital data in real time
- Modernised customer experience: enabling passengers to remain connected while travelling and delivering uninterrupted connectivity

Alongside smart data collection, storage, analysis, and implementation, connectivity is governed by **cybersecurity** provision and breach prevention models. The threat of remote hacking, already evident against infrastructure, may expand to smart transport systems. The challenge for cities and operators will be to create safe mobility and transport access for individuals and networks. Regulators in the region are looking to provide robust cybersecurity requirements to support their growing, digital networks.

In addition, connectivity technology can seamlessly support the mobility of 21st century digital lifestyles and **Mobility as a Service** (MaaS) is making journeys easier for the modern-day traveller. Enabling travel from point A to B by leveraging various transportation modes, MaaS will connect all players in the transportation sector, disruptive business models and the sharing economy to put the passenger first. With MaaS, IoT connectivity will provide greater convenience, effectiveness and personalisation for the individual traveller.

With a series of modes available across GCC transportation networks to choose from, the entire ecosystem strives to serve its city with advanced interconnectivity and efficiency.



IOT AND CONNECTIVITY PROJECTS IN THE GCC:

Smart transport infrastructure roadmap project, Dubai, UAE

The RTA has announced 34 projects worth \$871 million to update and upgrade existing infrastructure with intelligent, technological properties. Projects range from autonomous drones, self-driving buses, and taxis to smart lighting and pedestrian crossings expansion, all using IoT technology. Focusing on technological intelligence, smart data collection and ecosystem wide connectivity.

The main projects are:

- Dubai Integrated Mobility Platform and sustainable smart transport
- The Monitor Project, using IoT and connected technology to monitor the condition of bus drivers during driving
- The digital bus timetable project which will provide the passenger with instant, real time information as they travel
- Congestion management project in the Metro stations and coaches
- Smart roads project
- Smart parking projects

Silicon Park: smart city project, Dubai, UAE

Silicon Park, spanning an area of 150,000 square metres is set to open in 2019. The project will adopt many IoT and connectivity provisions for residents with integrated smart transport systems, including optimally designed bus shelters with free Internet, smart kiosks for mobile airtime top-ups and bill payments and mobile phone charging stations throughout. WiFi will be available throughout the project allowing access to a wide range of innovative applications and smart robotic technology. Aiming to be completely devoid of vehicles, connected electric vehicles will serve as the primary form of transportation along with rechargeable electric bikes.

Smart Logistics City project, Fujairah, UAE

Phase 1 of the 68,000 square metre project will commence at the end of 2018 and will be completed in three stages over the next five years. The project will need to accommodate IoT, data analytics, cybersecurity and connectivity solutions to foster smart logistics to enable a new and innovative way of conducting business in the UAE.

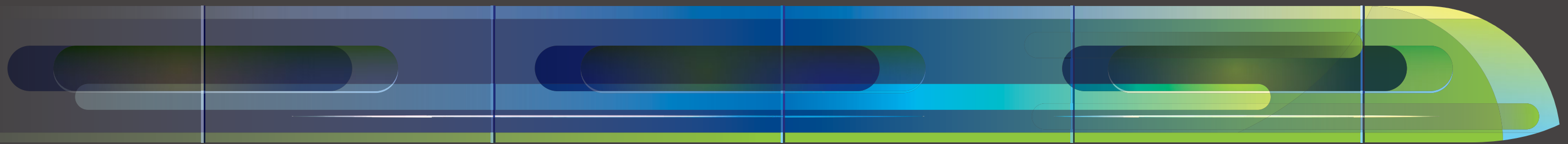
THE TOP URBAN PLANNING, TRANSPORT AND INFRASTRUCTURE PROJECTS: GCC DEVELOPMENT

Across the GCC, the member states seek to showcase innovation, encourage collaboration, streamline intermodal transportation and stabilise their national economies. Therefore, opportunities in infrastructure are rife across the region.

In the GCC at the beginning of April 2018, approximately \$715 billion of urban and transport projects were under construction or at tendering stage. On top of that, \$393 billion worth of projects are in production and a further \$322 billion worth of projects are in the initiation phase.

Today, the total value of GCC road, bridge and tunnel projects are estimated to be worth \$140.6 billion.

Here, we discover some of the major urban planning, transport and infrastructure projects, planned or in early construction phases from across the region.





UNITED ARAB EMIRATES



KEY PLAYERS

- Federal Transport Authority, UAE
- Ministry of Infrastructure Development, UAE
- Department of Transport, Abu Dhabi
- Roads & Transport Authority, Dubai
- Etihad Rail
- Abu Dhabi Urban Planning Council
- Department of Urban Planning and Municipalities
- Abu Dhabi Municipality
- Abu Dhabi Police
- Environment Abu Dhabi
- Abu Dhabi Ports Company

DUBAI EXPO 2020 PROJECTS

Preparing to be the global destination for choice for the year 2020

The UAE Government Plans to Spend Over \$6.81 Billion on infrastructure projects for Dubai Expo 2020

Dubai Metro 2020 Expansion



- Expected to be completed several months ahead of Expo 2020. Including 15km of new track and seven new stations, four of which will include transit-oriented development (TOD) schemes
- The new green line is expected to carry 125,000 passengers per day by 2020 and 275,000 passengers by 2030

Al Maktoum International Airport Expansion



This large-scale infrastructure project, now in phase one, will involve two parallel, 4.5km-long runways, a new 165,000 square metre terminal, offering a capacity of 35 million passengers a year. Six new train tracks will be constructed to connect the terminals and three stations will be built at each concourse

Road Upgrades And Improvements



Ensuring smooth traffic to and from the Expo site the RTA looks to upgrade Jebel Ali-Lehbab Road and Sheikh Mohammed Bin Zayed Road intersection in six phases with a total cost of Dh1.36 billion. Phase two will include the construction of two bridges, one with three lanes, the other with two

ABU DHABI MASTER PLAN

Established by government stakeholders to provide an advanced surface transport network to support the planned growth of the city and complement a future where public transport, walking and cycling are more central to the way people travel. This phased program of new transport networks, junction improvements, road widening and additional strategic links is planned to improve road safety and quality of life for residents

UAE National Rail Project: Etihad Rail



Etihad Rail's 1,200 km network will extend across the UAE from the border of Saudi Arabia to the border of Oman and carry 16 million passengers. Stage two will consist of 628km and Stage 3 will extend the network from the emirate of Dubai to the northern regions of Fujairah, Ras Al Khaimah and Sharjah

Abu Dhabi Metro and Light Rail Project



In line with the emirate's economic vision for 2030, the new network will relieve traffic congestion on the highway network and facilitate efficient connectivity, over an area of 131km. The project consists of four lines and combines 'heavy rail rapid transit' and LRT

The Al Sufouh Tram phase two



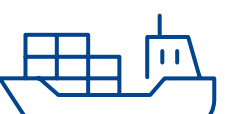
The second phase of the Dubai tram will extend the track by 4km and link the network to Mall of the Emirates in Dubai

Abu Dhabi Road Projects



- Enhancing traffic movement on three islands, Abu Dhabi will spend Dh1.131 billion on a 10.5km new road corridor which will have five bridges connecting Umm Lafna and Reem Islands to Shaikh Zayed Street
- New Abu Dhabi to Dubai main road Abu Dhabi has announced the plan alleviate traffic congestion and preventing accidents on the road connecting Abu Dhabi to Dubai as well as creating a strategic link between the region's ports, airports, railways and industrial zones

Abu Dhabi Ports

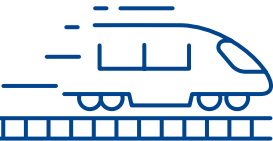


- **Khalifa Port** Berths Deepening Programme and new terminal construction: increasing the port's capacity to 5.3m TEUs by 2020, making it one of the top 25 ports worldwide and first port in the region able to accommodate the world's largest shipping vessels
- **Fujairah Port** upgrade a recently announced \$136.1 million development alongside Abu Dhabi Ports to deepen berths and establish new quays and storage areas. The project will include a 1,000m quay and a 300,000m² storage yard, 16.5m deep berths increasing the ports capacity and enabling larger vessels



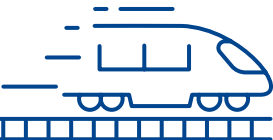
- Ministry of Transport, KSA
- Public Transport Authority, KSA
- Saudi Railways Organisation (SRO) Saudi Railway Company (SAR)
- Arriyadh Development Authority
- Jeddah Metro Company
- Makkah Mass Rail Transit Company

KSA National Rail Network



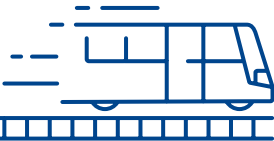
Upgrading the rail and transportation infrastructure. Opportunities in the operation and maintenance of existing lines and in the PPP agreements on new railways and infrastructure

North-South Railway



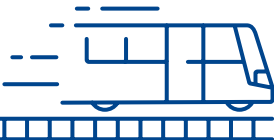
The world's largest railway construction and network, launched in February 2017 to support the massive development of the mining industry; prioritised as KSA's third pillar of the economy after oil and gas. The \$3.5 billion passenger and freight rail line originates in Riyadh and ends in Al Haditha in the south and connecting Riyadh, Al Qassim, Hail, Majmaah, Al Jouf and Al Qurrayat

Riyadh Metro



Currently the largest metro project in the world, the \$22.5 billion project will be driverless and will consist of six metro lines spanning a total length of 176 km, with 85 stations. Test runs have now begun after a series of strategic partnerships and contracts have been announced

Landbridge



KSA is establishing a new line to connect the two major cities in KSA; Riyadh in the East and Jeddah in the West to link to GCC ports and the wider gulf. Predominantly for freight, the 1,600km line and \$7 billion project is to be funded by the private sector from local and international engineering companies and financial institutions

King Abdulaziz International Airport



Remaining projects with \$3.2 billion of work include plans for the world's tallest control tower (135m), a major new transport terminus linking to the Haramain High-Speed rail route and a new four lane tunnel for ground service equipment being built below the runway


King Abdullah Port expansion



The \$2 billion project is to expand the country's second largest port to align it with that of other GCC countries. The first phase of upgrading the bulk and general cargo terminals to a capacity of three million tons is intended to start in the second half of 2018



There are currently \$120bn worth of project opportunities in Oman, set to establish a diversified national economy and position the nation as a key strategic logistical hub for the GCC



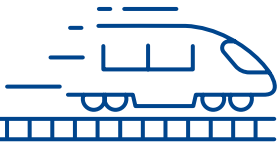
OMAN



KEY PLAYERS

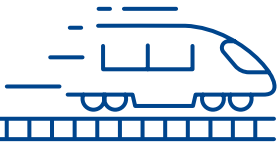
- Ministry of Transport & Communications, Oman
- Asyad Group
- Oman Rail
- Public Establishment for Industrial Estates, Oman
- Supreme Council for Planning, Oman

Oman National Rail Network



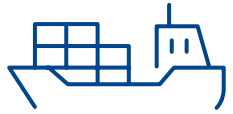
In Oman, rail construction has become a high priority. Oman Rail plans for a national network of 2,135km, part of the GCC rail network and linking southern parts of the country for port connectivity. The network will host passengers and carry freight with maximum speeds of 220 km/hr and 120 km/hr respectively

Mineral Line



A logistical hub transformation, the Oman Mineral line, will facilitate the transportation of 5 million tonnes of gypsum, 5 million tonnes of limestone, and around 1 million tonnes of oilfield equipment annually. Made up of 375km track, the minerals based railway freight line connects Shuwaymiyah and Manji areas with Duqm Port, connecting mines to ports

New port in Sur



Oman has announced the construction of a new port near Sur Industrial Estate, positioned just outside Muscat to strategically connect Oman with other trade hubs



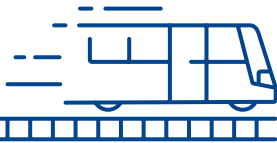
KUWAIT



KEY PLAYERS

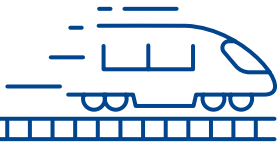
- Ministry of Communication, Kuwait
- Public Transport Authority, Kuwait
- Kuwait Authority for Partnership Projects (KAPP)

Kuwait Metro



\$7 billion metro rail project is back on track after plans to proceed to the next stage were approved. The 160km system, due to be built over five phases, is expected to include 68 stations and four lines. Delays, setbacks and challenges have emerged due to macro factors including the paucity in public transport culture and the sandy terrain is not appropriate for the rail line

Kuwait National Rail Road (KNRR)



Aiding the nation's long-term diversification goals, the KNRR is an integrated rail network with 511km of track and serving both freight and passenger needs. Designed to link Kuwait City and airport and the other GCC countries and functioning by 2023

New Road Projects



Kuwait intending to spend in upgrading KWD8 billion national road networks, easing congestion and cutting carbon emissions. 2018 will see the announcement of eight finalised road projects



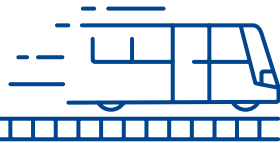
BAHRAIN



KEY PLAYERS

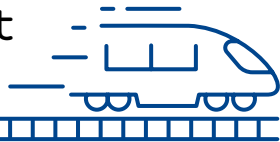
- Ministry of Transportation & Telecommunications, Bahrain
- Urban Planning & Development Authority

Bahrain Light Rail



Bahrain's monorail link to seaport is 'steadily progressing' aiming to position Bahrain as a cargo transit hub for the Northern Gulf. Timescales and completion dates are yet to be revealed, however, it has been announced that the project will run with a PPP funding model

Bahrain Urban Transit project



The 70km railway connecting a passenger terminal in Salmabad and freight facilities at Bahrain's Khalifa bin Salman port to the Saudi railway system. The project will be implemented in phases, with phase one being 25km with 17 elevated stations and eventual capacity is expected to be 8,000 to 10,000 passengers per hour per direction. Phase one will include the first line between Airport and GCC Rail Station in Salmabad, and a depot construction. Phase 1 will also see Line 2 section between Juffair and Bahrain Financial Harbour. Bahrain has announced that it aims to appoint rail transaction adviser by end of 2018 to facilitate these transformative project



Airport Modernisation Programme



Turning Bahrain International Airport into one of the key regional hubs for tourism and services. A 20-year airport masterplan, which includes the construction of a new passenger terminal, in addition to the expansion and refurbishment of the existing terminal planned to be completed by 2020

King Hamad Causeway: linking Bahrain and Saudi Arabia, again



Bahrain is due to construct a second link to ease congestion on the existing link and is expected to cost between \$4 and \$5 billion. The causeway will link directly with the new railway lines for optimal cross border connectivity



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Middle East Rail is the largest event of its kind in the region which offers an unmissable annual opportunity to analyse the visions, technologies and partnerships needed for the transport of the future.

As an exciting addition to the event this year, we are co-locating Middle East Rail with three new event brands, Middle East Smart Mobility, Middle East Transport Infrastructure and Middle East Intermodal. The introduction of these new conferences is to serve the entire transport ecosystem and further integrate the very latest, cutting edge technology for the whole industry.

Welcoming a truly international audience and bringing together over 200 speakers and 7,500 attendees from across the region, the strategic premium conference and co-located exhibition acts as the leading platform for high-level transport leaders to engage with the community and tackle the biggest challenges in the industry including:

- Privatisation and planning
- Intelligent transport systems and connected vehicles
- Digital technologies and automation
- Urban mobility and supply chain innovation
- Transport corridors of the future and modernising legacy networks
- Exciting regional and international project updates