

# Beyond COVID-19: Transitioning to where?

Seizing the opportunity to  
decarbonise transport in the  
United Arab Emirates





# Executive summary

“Despite the impacts of the coronavirus pandemic, the world mustn’t forget the environmental emergency facing the planet. The crisis is also a wake-up call, to do things right for the future.”

Antonio Guterres, UN secretary general

What does COVID-19 mean for the future of mobility? What are the temporary effects and what are the lasting changes? Can this crisis be turned into an opportunity to address the threats posed by climate change? This could be a once-in-a-lifetime opportunity to address national travel programmes to start to shape the future of mobility for the UAE and encourage significant changes in travel behaviour.

Mott MacDonald recently held an external workshop entitled ‘Beyond COVID-19: Transitioning to Where?’ as part of our wider approach to making cities more resilient for the future. The workshop brought together participants working in both the public and private sectors to explore and provide insights for the following questions:

- Can COVID-19 be a catalyst for decarbonising mobility in the UAE?
- How might we influence that in a positive way?
- What should we avoid in the short to medium term?

The workshop was structured using the FUTURES toolkit, which is a Mott MacDonald scenario-planning methodology designed to embrace uncertainty. Participants were asked to undertake a series of exercises from the FUTURES toolkit to explore what a utopian and dystopian pathway for the UAE might look like for 2025, in terms of decarbonising mobility. This included using the Three Horizons exercise, which is a method used to expose the risks and opportunities during the transition phase. It should be noted that by 2025, the UAE is unlikely to be in utopia or dystopia, but could use COVID-19 to realign its trajectory towards utopia. The aim of the workshop was to provide insights for decision and policy makers to set the UAE onto a utopian pathway and avoid transitioning onto a pathway towards dystopia.

The outcome of the workshop was 10 key insights to decarbonising mobility. They are summarised below:

1. **Inaction or misdirected action could lead to dystopia quite quickly.** Misdirected action or inaction from authorities could see the UAE divert onto a pathway heading towards dystopia. It is easy to see this happening far quicker than moving towards a utopian future.
2. **Introduce measures to disincentivise private car and taxi use and incentivise public transport.** Strong measures are needed to prevent increased private car and taxi use as lockdown measures are lifted which could lead to higher CO<sub>2</sub> levels than pre-COVID-19.
3. **Travel demand management (TDM) could be the key.** COVID-19 presents a rare opportunity to introduce TDM measures that might have previously been considered challenging for the UAE.
4. **Corporate social responsibility (CSR) to encourage working from home and alignment with government entities.** While confidence in returning to office spaces is low, companies should encourage working from home, reducing the need to travel and therefore driving down emissions from employee commuting. This should be supported through the increased use of digital communication tools and collaboration with government entities to allow companies and the UAE to thrive.
5. **Regain confidence in public and school transport.** This will be easier said than done but infrastructure epidemiology offers a possible solution by combining infrastructure and healthcare.
6. **Reconsider road building portfolio and manage existing assets more efficiently.** The lockdown has highlighted that there are other means of remaining connected such that the pre-COVID-19 level of dependence on private cars is not as certain anymore.
7. **Transforming streets to encourage walking and cycling.** With confidence in public transport low and social distancing guidelines in place, we need to act fast to strike a new balance to ensure sustainable travel progresses.
8. **Encourage other forms of micromobility (e-scooters and e-bikes).** With streets transforming, assisted micromobility devices have great potential to provide first and last mile connectivity, provide alternatives to public transport in the short term and prevent people relying on cars, especially during the difficult summer months.

9. **Move away from single/central projections for the future.** If COVID-19 has proven anything, it’s that you cannot predict the future. The old planning methods using forecasting tools to predict demand were previously considered outdated and this has been highlighted further by the global pandemic.
10. **New designs and awareness to support working from home and social good.** The market response to working from home could see changes to apartment design to combat mental health issues and stimulate productivity. This includes the design of communities to create better live, work and play environments and to support the social aspects of increased working from home.

As president Obama highlighted in his graduation speech in May, the status quo has been changed beyond what we might have previously thought conceivable. The old ways of doing things have led us to this point and they need to change. This workshop attempted to shine a light on some of those issues and address the impending climate change challenge, while also bringing to the fore a number of wider issues created by the pandemic.

The rapidly evolving situation has forced us to re-address many of our previous assumptions and strategies for how the future might turn out. Behavioural change is difficult, but COVID-19 has dramatically changed behaviours almost overnight, which can be seen as an opportunity to effect positive change. However, one of the key insights from the workshop was that “through inaction, the UAE could quite quickly deviate onto a dystopian Pathway that will be hard to return from”.

“This pandemic has shaken up the status quo... the old ways of doing things just don’t work... our society only works when we think not just about ourselves, but about each other.”

President Barack Obama





# Introduction

The world is reeling from the seismic shock that COVID-19 has had on our way of life. The effects have been profound, rapidly turning the world on its head and creating such uncertainty that for many it is hard to see how the future will unfold.

Decarbonising mobility has long been a challenge for transport and city planners. The climate crisis has been front and centre as the main driver for many new projects, not least because of the stark findings in the IPCC 2018 report which stated that the old target of limiting the average global temperature rise to 2°C above pre-industrial levels was insufficient, and that a more ambitious target of 1.5°C should be the aim<sup>1</sup>.

**The challenge to decarbonise mobility is often blamed on society's dependency on the private car, but many people require their cars to access opportunities that would not be afforded to them otherwise, perhaps because of poor land use planning.**

The impact that COVID-19 has had on mobility was the inspiration for the workshop, whether it could be used to positively or negatively affect the way forward and whether it could be used as a catalyst for positive change in the UAE. As an example of what could be possible, figure 1 shows how Amsterdam used the oil crisis in the 1970s as a catalyst for change<sup>2</sup>. The first image shows a street dominated by the private car and the second image shows the radical redesign of the street to allow for active travel and public transport, making it harder for private car users.

Now is the opportunity to revisit and perhaps reset the previous approach to decarbonising mobility in the UAE. Both Abu Dhabi and Dubai have targets to decarbonise mobility with public transport as a key cornerstone, which may need to change post-COVID-19. Experience from other historical events has shown that the pace of change increases and therefore we need to capitalise on the opportunity that COVID-19 has presented.

**Are the existing targets to decarbonise mobility still relevant? Could we go further? What should we prioritise? What lessons can be learned from elsewhere? What decisions can we make now to steer the UAE onto a 2025 utopian pathway and avoid slipping towards dystopia?**

To try and answer these questions, Mott MacDonald designed a FUTURES-style workshop, inviting participants from the public and private sectors to engage and explore whether the UAE could use COVID-19 as a catalyst to decarbonise mobility.

During the workshop, participants were asked to identify two plausible future pathways for 2025. The pathways were at the two opposite ends of the spectrum to establish how the UAE might head towards a utopia or a dystopia. Utopia and dystopia in this context are in relation to decarbonising mobility and tackling climate change. We also examined the risks and opportunities during the transition period, between now and 2025, with the aim of converging our ideas and coming to a consensus, if possible, over what is undoubtedly a complex issue.

The result was a set of insights that could be used to support policy and decision makers to shape the future of the UAE, focussing on Dubai and Abu Dhabi, and to ensure we are on a utopian pathway heading towards a green recovery.



Figure 1 – Amsterdam street redesign following the 1970 Oil Crisis<sup>3</sup>





# FUTURES approach

Future Uncertainty Toolkit for Understanding and Responding to an Evolving Society (FUTURES) is a scenario-planning toolkit, developed by Mott MacDonald, that supports decision making in the face of an uncertainty. The traditional way of planning for the future is to look back at the past and use historical data, but the FUTURES toolkit enables a vision-led approach to decide the future we want. This allows proactive decision making so cities can become more resilient in the future.

The workshop comprised of a series of exercises using some of the tools and techniques from the FUTURES toolkit, aimed at exploring possible 2025 pathways specifically for the UAE, as shown in figure 2.

Figure 2 – FUTURES workshop process

## Discussion:

Could COVID19 be a catalyst to decarbonise mobility in the UAE?



## Exercise 1:

Plausible utopian and dystopian pathways



## Exercise 2:

Three Horizons method



Closing remarks

## Exercise 1 – Plausible 2025 future pathways

The participants were divided into two groups, looking ahead to 2025, to explore two possible future pathways for the UAE. It is important to set out that the pathways must be plausible. It is unlikely, for example, that by 2025, all the vehicles in the UAE will be powered by sustainably sourced fuels and materials given the average fleet turnover rate and financial implications. Fully decarbonising mobility will also require sustainably sourced energy and materials, re-use/recycling and carbon offsetting. For the purposes of this workshop, these areas were considered out of scope.

- **2025 Utopian pathway:** Using COVID-19 as a catalyst to transition the future of the UAE onto a utopian pathway by 2025 means that we are on our way, but have not yet arrived at utopia. Steps have been taken to support a green recovery and decarbonise mobility by changing behaviours towards sustainable travel modes to meet targets to reduce global warming.
- **2025 Dystopian pathway:** Conversely, if COVID-19 is a catalyst for the UAE's transition onto a dystopian pathway by 2025, this would mean we are on our way to a climate catastrophe and we have missed the opportunity to change our trajectory. We have moved further away from our goals to decarbonise mobility with an increase in car use and rising CO<sub>2</sub> emissions.

## Exercise 2 – Three Horizons

The participants were again divided into two groups and used a FUTURES tool called Three Horizons as a method to explore the risks and opportunities in the transition between now and where we could get to in 2025. One of the groups explored the pathways to a utopian future and the other group explored the pathways to a dystopian future. The aim was to develop insights to help shape the future of the UAE as we recover from this crisis.

The workshop was concluded with closing remarks to summarise the key insights obtained through the process to help guide the UAE moving forwards.

## Workshop inspiration

The workshop was heavily inspired by the Driverless Car Emulsion Initiative. This was a Mott MacDonald sponsored event that comprised of a series of workshops in the UK to explore the complex topic of driverless cars. The aim was to examine transitioning from today to plausible 2050 future scenarios to identify key issues and insights. For more information, please see the following link:  
<https://uwe-repository.worktribe.com/output/5859439/driverless-cars-a-great-opportunity-for-society-final-report-of-the-driverless-cars-emulsion-initiative>





# Setting the scene

## The past

Mobility has long struggled to decarbonise in comparison to other sectors. Some countries have taken strong steps and legislated requirements to decarbonise mobility, such as the UK, which has legislated that by 2050 mobility should be net zero. This is a huge change from where we are now, even considering the lengthy timeframe, although environmental campaigners would argue that the timeframe should be brought forward.

These lofty ambitions are illustrated in the graph shown in figure 3 from the Department for Business, Energy and Industrial Strategy in the UK. The general trend for greenhouse gas emissions across almost every sector has started to decrease compared to their 1990 levels, apart from transport, which has actually increased slightly. Cars have become more efficient, but the rise in the sale of SUVs combined with the continued dominance of the car has led to this increase.

The UAE in particular is dominated by the private car and there are almost 3M cars on the road, as of 2018<sup>4</sup>. In Dubai, the transport sector is now the third-highest emissions-producing

sector and there are plans to build 4,569km of lanes and 118 new junctions<sup>5</sup>. The UAE has begun deregulating energy prices in order to phase out fossil fuel subsidies to limit emissions. However, petrol and diesel prices are below the global average which means it is very affordable to own and operate a car in the UAE<sup>6</sup>.

A major component of the strategy to decarbonise mobility is based around public transport, increasing patronage and increasing density around transport nodes. Both Dubai and Abu Dhabi have major investment plans to expand their public transport networks. The current public transport share in Dubai is 11% and there are plans to extend the red line by 15km with seven new stations<sup>7</sup>. By 2030, Dubai is aiming for 26% of trips to be by public transport<sup>8</sup>.

According to the Abu Dhabi Capital Surface Transport Master Plan (CAPSTMP), trips by private transport accounts for 56% of all trips made in the Emirate, while public transport accounts for 20% of trips. However, this includes public buses, company buses, school buses and taxis.

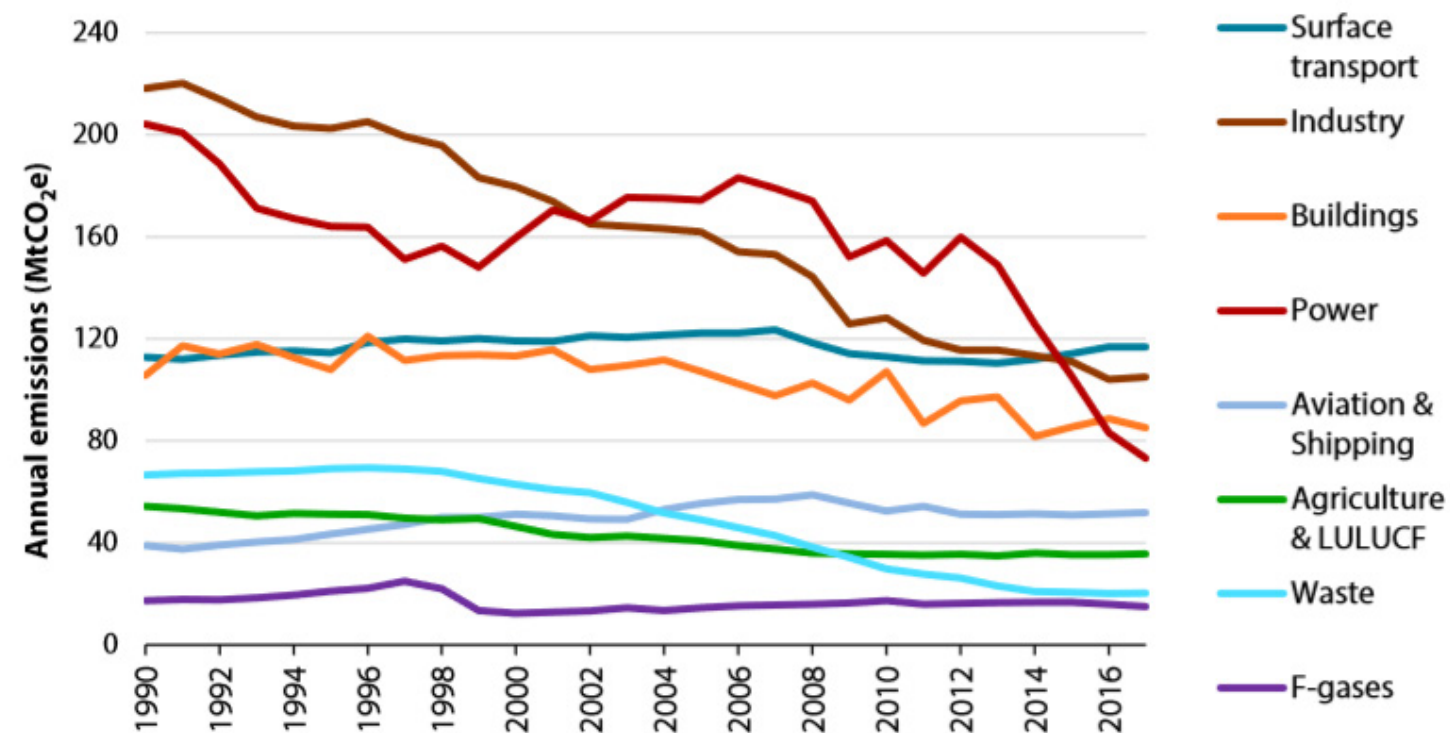


Figure 3 – UK greenhouse gas emissions, Department for Business, Energy and Industrial Strategy 2019



Walking and cycling is a challenge in the region due to the hot climate, land use issues, a lack of shading provision and, in places, a lack of or unsafe supporting infrastructure. A total of 23% of trips are made by active travel in Abu Dhabi, according to the CAPSTMP. Land use in Abu Dhabi and Dubai is different, such that it is perhaps easier to live, work and play in Abu Dhabi. Abu Dhabi is expanding its bicycle network and Dubai has plans to expand its network to 850km by 2030<sup>9</sup>.

A new service offered by Careem Bikes has recently launched, offering shared bikes on a subscription service. E-scooters have offered a new form of mobility for many cities, which has had both positive and negative impacts. E-scooters are allowed in Abu Dhabi in certain locations, however they are still banned in Dubai.

The UAE does have targets to decarbonise. Dubai and Abu Dhabi are both strong supporters of the UN Sustainable Development Goals (SDGs) and have committed to the targets set in 2015 at COP21. Dubai was aiming for 2% of all vehicles to be electric/hybrid by 2020 and 7% of their energy coming from renewable sources. By 2030, the aim is to have 10% of all vehicles EV/hybrid and a 25% renewable energy mix by the same point<sup>10</sup>. This was pre-COVID-19.



# Setting the scene

## The present

2020 began with societies dealing with floods and fires, and we're now having to deal with a global pandemic that has spread rapidly through globalisation and our interconnected lives. The scale of the impact from COVID-19 is only just starting to be realised. Many of the changes occurring will be temporary but there are signs of lasting and, in some cases, worrying changes. This event has caused a shockwave worldwide and deviated our future pathway, perhaps permanently. It has changed the plans and strategies for the UAE that might have been approved just a few months ago, such as the speed of change from the virus. Even since this workshop was held two weeks ago there have been changes in our understanding of the virus and the World Health Organisation (WHO) is now reporting that we may never be rid of COVID-19 with no guarantees that a vaccine will bring it under control<sup>11</sup>.

This revelation means that previous assumptions that we might return to our previous normality in a few months seems very unlikely, and raises serious questions about the future of mobility and how to decarbonise in the face of such uncertainty. Public transport has been central to most strategies to decarbonise mobility, which includes increasing the densities around public transport nodes. With the revelation by the WHO and as our understanding of the virus increases, what will become of public transport?

Google has released global data on the movement of people using insights from their products such as Google Maps. These insights show how the movement of people has changed following COVID-19<sup>12</sup>. The figures on the right-hand side show mobility data for the UAE. Figure 4 shows mobility

data for 5 April compared to a mid-February baseline just as the UAE entered lockdown. It shows that there was a significant decrease in the number of trips to various key destinations. Trips to places of work were down by 57% and were largely replaced by people working from home. Trips to retail and recreational facilities and grocery and pharmacy stores were significantly lower, however, much of these trips will have been replaced by online shopping and deliveries which may not have been captured by Google Maps. The largest impact is at public transport stations which had an almost 80% reduction in trips to and from station hubs.

Figure 5 shows how mobility has changed since the lockdown measures were partially lifted on 9 May. It can be seen how trips to all the highlighted locations have increased compared to the data from 5 April as society began to emerge from lockdown. How these trips are being made and why are key questions that need to be studied going forward. One positive is that trips to public transport hubs have increased and the Dubai Metro is now open, with strict social distancing measures in place to ensure public safety.

Figure 6 poses the question of what mobility will look like in 2025 for the UAE and highlights that it will be very difficult to try to predict mobility patterns in the traditional way. Historical data on patterns and behaviours will not be applicable and the more lasting changes on our behaviours are not yet known. The UAE now has an opportunity to influence mobility and our behaviours and start to shape what 2025 and beyond might look like.



Figure 4 – Google mobility data for the UAE on 5 April compared to a mid-February baseline

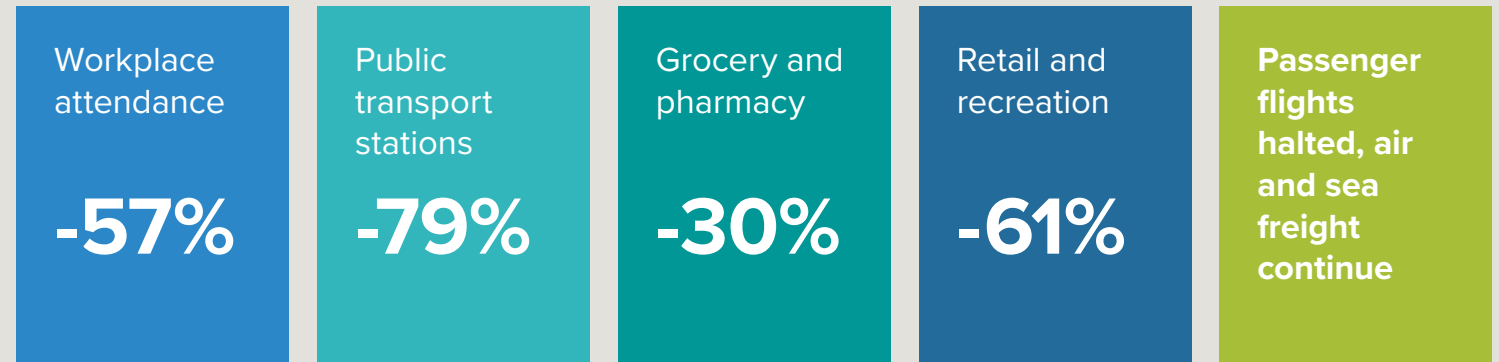
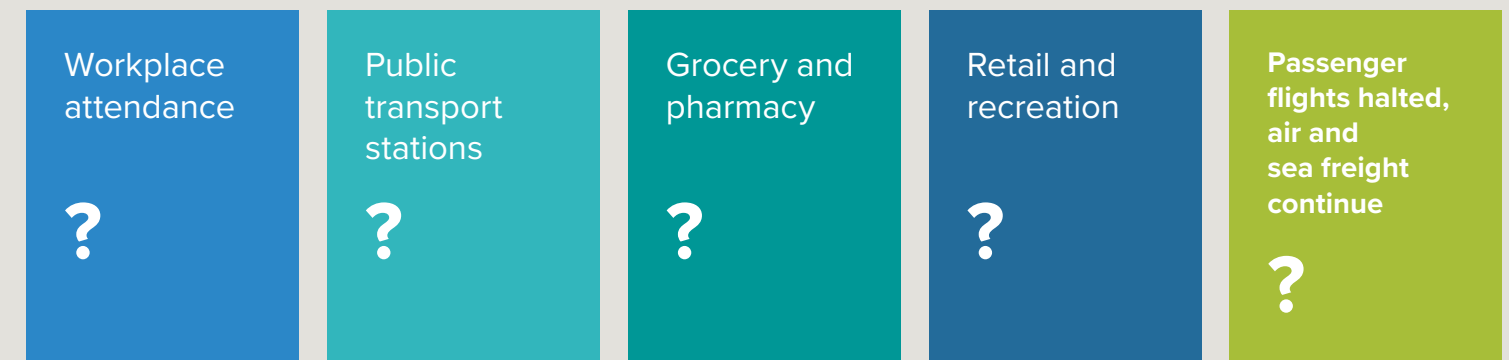


Figure 5 – Google mobility data for the UAE on 9 May compared to a mid-February baseline



Figure 6 – 2025 mobility data for the UAE?





# Setting the scene

## The future

When shaping the future of mobility, the aim must be to decarbonise. We know that we must work collectively to deliver a 7.6% emissions reduction every year between now and 2030 in order to limit average global temperature rise to 1.5°C<sup>13</sup>. Decarbonising mobility has always been a challenge as we try to move away from a system that has been designed around the private car and particularly so in the UAE where there are a number of challenges including land use, culture, climate, available alternatives and the price of petrol and diesel.

The challenge has now become even greater with the realisation that public transport may not be able to operate at full capacity, even with a vaccine. British prime minister Boris Johnson is advising people to use all other forms of mobility ahead of public transport<sup>14</sup>. Ensuring the safety of public transport users should be the first priority. Once safety can be guaranteed, inspiring confidence in its use should be a key focus for government entities before non-sustainable behaviours become the new normal. A lack of public transport options will affect those on low incomes the hardest. 95% of users on the Abu Dhabi bus network do not have any other mobility options. The UAE is one of the few countries that operates dedicated school buses. There are over 6,000 school buses in Dubai, each one replacing on average 12 cars. If confidence in school buses remains low this could have a major impact on traffic and congestion.

Working from home has been enabled by the increased use of digital technology and organisations have adapted quickly. Even as lockdown measures have been partially lifted, traffic on the roads is down when compared to pre-COVID-19 levels, which has raised questions around the need to travel. Perhaps the biggest impact will be on the weekly commuters between Dubai and Saudi Arabia, and Dubai and Abu Dhabi, where many of those meetings could now take place online.

Evidence suggests that air pollution in cities has significantly reduced during the lockdown period. Daily global CO<sub>2</sub> emissions have fallen by 17% compared to early April<sup>15</sup>. However, even with the lockdown measures enforcing restricted travel, the International Energy Agency (IEA) expects that annual emissions will be down just 6-8%, much of which is attributed to rebound emissions as countries emerge from lockdown measures<sup>16</sup>. There is a fear that CO<sub>2</sub> levels will rebound as lockdown measures are lifted and confidence in public transport remains low. This shows the scale of challenge to decarbonise and achieve the targets set out in the IPCC 2018 report.

A range of cities have started to develop and implement strategies to encourage sustainable travel both during the COVID-19 crisis and for longer-term strategic plans with the goal of decarbonising mobility<sup>17</sup>. Two examples are highlighted below, however there are many more.

### London

Recent announcements from London will see the largest car-free areas in the world. Residents have been advised not to use public transport until safety can be guaranteed so to avoid significant increase in private car use leading to congestion and pollution, London has announced a range of measures including banning private cars in certain areas, increasing congestion and low emission zone (LEZ) fees, and increased spending to redesign streets for walking and cycling<sup>18</sup>.

### Milan

Milan has introduced some permanent measures to fend off the resurgence of private car use as residents go back to work. The city is transforming 35km of streets with cycle lanes, widening pavements and giving priority to active travel by reducing speed limits to 30kph. There is also the hope that such measures will kickstart the local economy by allowing more space for commercial activity and re-imagining Milan in a different way<sup>19</sup>.

### Economic realities

As well as the positive interventions there are also negative consequences as the economic reality of COVID-19 starts to take hold. Businesses and governments are coping with a loss of revenue while unemployment across the world is skyrocketing. The UK recently announced that unemployment had risen from 50,000 to 2.1M since the start of the year<sup>20</sup>. The US has had the largest number of deaths and its GDP has had the sharpest contraction since the financial crisis over a decade ago. The Middle East region is particularly affected by the oil price which has fallen more than 47% since the start of the year<sup>21</sup>. In the aviation industry, Airbus and Rolls-Royce recently announced that they have cancelled the E-Fan X demonstrator programme, a year before the hybrid-electric engine airliner was set for its first flight<sup>22</sup>.





# How about the UAE?

## Workshop discussion:

At the start of the workshop, participants were asked to undertake an exercise to share and discuss each of their positions when answering the question:

### Could COVID-19 be a catalyst for decarbonising mobility in the UAE?

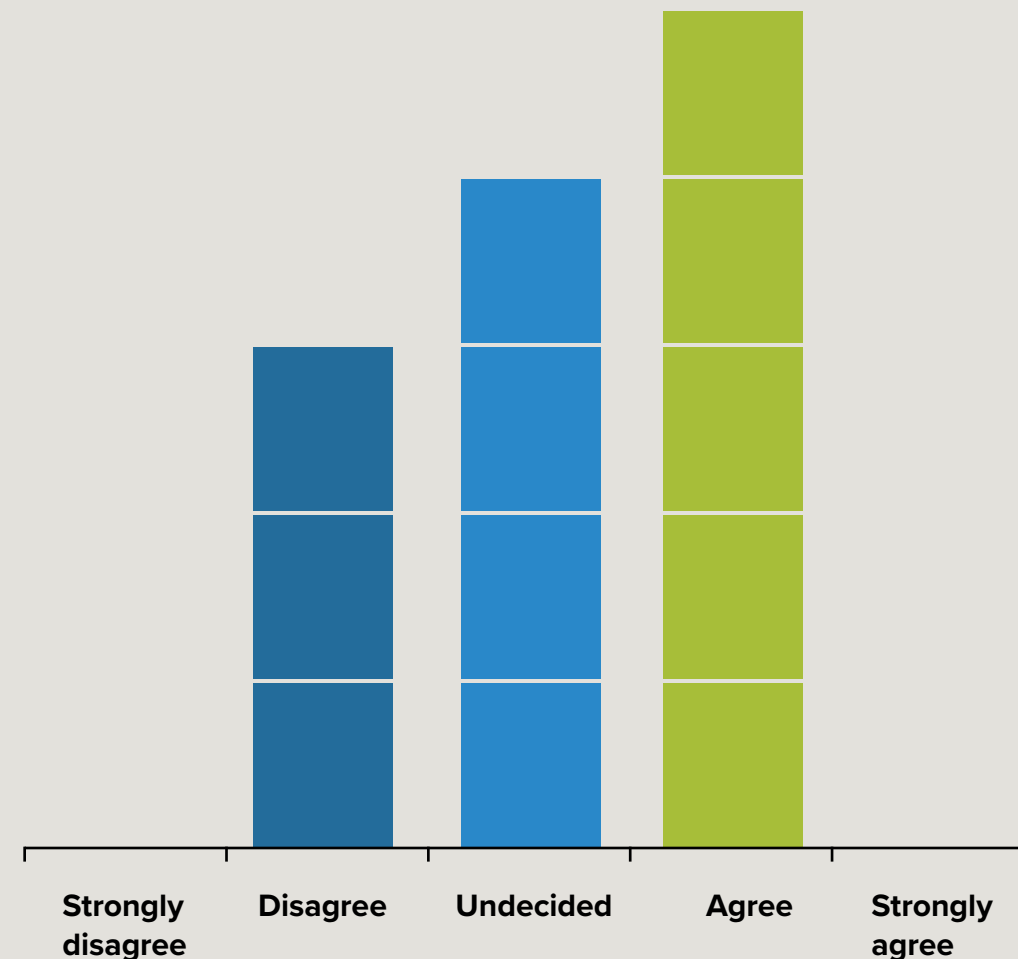
This is not to ask whether the pandemic will or won't be a catalyst, but instead explores the idea of whether or not it could be a catalyst specifically for positive change.

The complexities and current level of uncertainty surrounding the future of mobility and how we can decarbonise mobility in the UAE are reflected in the results when the question was asked of workshop participants, as shown in figure 7. Participants were largely undecided on the central issue, with a slight lean towards 'agree'. It is perhaps telling that no one in the group positioned themselves as 'strongly agree' or 'strongly disagree'.

This indecision could be attributed to a deep uncertainty created by a virus that has affected the world in a way that has never been seen before. It may also be a reflection of the UAE emerging from a full lockdown which makes it difficult to determine the way forward, with conflicting daily news reports as the world tries to educate itself against a new global threat.

This exercise served to set the tone for the other exercises and open up a discussion. It was good that there were participants that both 'agreed' and 'disagreed', as it led to some healthy debates and the exploration of potential positive and negative effects.

**Figure 7 – Participant positions on whether COVID-19 could be a catalyst for decarbonising mobility in the UAE**





# Utopian pathway 2025

In exercise one, participants were split into two groups and were asked to explore what a plausible utopian and a dystopian pathway in 2025 for the UAE might look like.

The first group looked at a utopian pathway, recognising that by 2025 the UAE would not yet be at utopia but could make decisions to move towards it. The exercise required participants to fill in the template, shown in figure 8, for first order positives and second order positives. Because this is a plausible future, there may also be some secondary negatives as a result of the positive interventions. A utopian pathway for 2025 in the UAE is characterised by the following description.

**Pathway description:**  
A bold commitment to minimise new road infrastructure and prioritise better management of existing assets has helped set the UAE on a utopian pathway by 2025. This has pushed travel demand management to the fore and the UAE has a clear programme by 2025 and ties many of their measures together in a holistic approach. Confidence in public transport has been improved but not yet fully restored and improvements have been made to the level of service. Bus priority lanes are now fully established in Abu Dhabi and there are plans to expand the network post-2025. Dubai has also taken the opportunity to introduce bus priority lanes and signal pre-emption in certain areas that were previously considered too challenging. Services that were struggling financially have been supported so that by 2025 they are still operating and providing equitable mobility options.

Investment in measures such as infrastructure epidemiology have seen an increase in confidence in public transport. New public transport services such as elevated PRT systems are still being planned with construction underway in 2025. It is planned for this new system to link communities together. Working from home is now a normal occurrence for many which has had a major impact on reducing travel and flattening peak hour traffic. This is supported by companies and by government entities through the use of digital technology. There are plans to redesign communities and typologies to activate ground floor spaces, local economies and support working from home and mental health. Money that was committed to building new roads was repurposed to redesigning the public realm to support walking and cycling and also to expand the trials for e-scooters and new e-bike sharing services, which have encouraged

sustainable ridership during the summer months. Online shopping has grown but centralised collection points has meant that localised congestion has improved and trials for delivery drones have been halted to prevent noise and visual pollution.

A coordinated approach to the implementation of measures to discourage private car use and encourage the use of other modes of transport has led to longer-term behaviour change. However, the road to full utopia will take a long time as there are many other factors contributing to fully decarbonising mobility that means continued investment is required. The land use patterns of Dubai are particularly challenging and requires more collaboration between government and developers in the medium to long term.

“Transport demand management holds a lot of the measures together, to capitalise on what’s happening and to have a lasting effect on the future.”





# Dystopian pathway 2025

The second group was asked to explore what a plausible 2025 future might look like for the UAE if we were on a pathway to dystopia.

Using a similar format to the utopian group, the participants considered what the first order negatives might be as a result of COVID-19 and the associated second order negatives. The dystopian future described below is completely at odds with decarbonising mobility and the UAE's climate change targets. Because this is a plausible future pathway to dystopia, there were also some positives, as shown in figure 9. A dystopian pathway for 2025 in the UAE is characterised by the following description.

**Pathway description:**  
Without the implementation of measures to discourage private car and single occupancy taxi use, the UAE has slipped onto a dystopian pathway by 2025 and now more than 60% of trips are made by private car or single occupancy taxis. When the lockdown measures were lifted, residents returned to their private cars and this behaviour has continued to grow in 2025. Inaction saw the UAE slip on to a dystopian pathway quite quickly and private companies like Uber and Careem were able to capitalise. Developing density around public transport nodes has stopped and plans have been drawn up for new developments further away from central Dubai and Abu Dhabi.

Social distancing and a loss of revenue has seen a decline in confidence in public transport, an increasing shift in behaviours towards alternative less sustainable modes and the closure of certain loss-making bus routes. With public transport routes closing this will negatively impact the people who are less able the most. If public transport routes are closed or operate less frequent services because of a lack of demand or a fall in revenue, the people without alternative means of travel may be left without access to the same opportunities as those with access to other modes. As a potential positive, if the cost of public transport increases this has slightly encouraged more trips to be made by active travel or micromobility but a lack of infrastructure investment means many feel unsafe.

A lack of confidence in school buses as schools re-open has seen a rise in the use of private cars and taxis, Uber and Careem. This has led to a significant increase in traffic during peak hours, particularly localised traffic in school zones. The knock-on effect of increased traffic around schools means it is less safe for people to make those trips by walking or cycling. Increased working from home has reduced travel and flattened the peak. It has also led to urban sprawl and the total distance of trips made is longer than before leading to an increase in CO<sub>2</sub> emissions. Online shopping and deliveries have been allowed to continue unregulated and the use of door-to-door delivery drones in early trials provides more convenient service.

“It’s easy to see negative things happening, and it’s hard to see positive things.”

“Dystopia might be similar to business as usual, pre-COVID-19.”

Figure 9 – Participant outputs to a plausible dystopian pathway in 2025.

First order negatives

Decrease in use of public transport – this will harm those with low incomes the most	Increase in single occupancy vehicle use	Increase in car ownership	Prices and economical viability of public transport	Replacement of school buses by personal car trips, private cars, Uber and Careem.
Social distancing on public transport – reduced capacity	Parking fees, loans on cars waived	Urban sprawl as people move away from CBD/dense communities	Travelling by car is still cheap	Return to normal aviation operations

Second order negatives

Opting for alternative unregulated shared mobility options	Additional expenses in sanitising vehicles	Increased costs of transport – time and money	Health impacts such as obesity and car dependency	Regular weekly commute between the UAE and Saudi Arabia
Increased congestion around schools	Increased congestion means less safe for walking and cycling to school	Less regulated shared options with no social distancing precautions	Closure of PT routes	

Positives

Push for micromobility and active mobility	Possibility of pop up bike lanes in the short term	Less regulated informal sharing options provide equitable travel options
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# Three Horizons method

In exercise two, participants used the Three Horizons methodology as a structure to think of the opportunities and risks in the transition period between now and 2025 for the UAE.

Participants were split into two teams for a utopian pathway and a dystopian pathway and explored what could happen that's positive and should be encouraged, and what's negative that should be guarded against, from a decarbonising mobility point of view.

The three horizons method involves five key questions, as outlined below:

## 1. Where are we now?

Today's mobility system in the UAE is defined by COVID-19.

## 2. Where could we get to?

This is the utopian and dystopian pathways for 2025 as described on the previous pages.

## 3. What's already happening?

What early signs are there now of a plausible 2025 utopian or dystopian pathway.

## 4. What do we need to preserve?

This section describes the utopian and dystopian characteristics from the present that are just starting to emerge that we want to keep and encourage in 2025.

## 5. What obstacles, risks and opportunities do we see in the transition?

Obstacles, risks and opportunities identified that could arise in the future that should be planned for now to help steer the UAE onto a plausible 2025 pathway.

## Where are we now?

The **positive** and **negative** characteristics are shown below in the context of decarbonising transport. It is clear that there are more negative characteristics from today's mobility system despite the significant reduction in vehicular traffic as a result of COVID-19.





# Three Horizons method

## What's already happening and what should we preserve?

There are some early signs that a plausible utopian pathway could emerge by 2025, however, there are also early warning signs of a dystopian pathway as lockdown measures begin to be lifted.

It was noted in these exercises that it might be difficult to sustain the positive elements as lockdown measures continue to be reduced and there has so far been a lack of policies in response to COVID-19 to try and steer the UAE towards a green recovery. For the participants in the dystopian team it was challenging to think of what should be preserved in order to support a dystopian pathway as this goes against many of the principles for which they were trained.

Figure 10 shows the early signs for both a utopian and dystopian pathway and the characteristics that are starting to emerge that should be preserved and encouraged for 2025. For a utopian pathway, the most significant change is working from home which presents a major opportunity through reduced congestion and low trafficked streets. Companies are embracing digital technology and for many this has been a big shift away from their traditional culture of face-to-face meetings which has reduced the need to travel. New technology, like virtual reality (VR), could support this further. E-scooters have been a recent addition to the mobility eco-system in Abu Dhabi and there is a planned pilot trial in Dubai in certain areas that could potentially lead to wider adoption. Bus priority lanes are being studied in the UAE as a way of improving existing public transport services and infrastructure epidemiology is being presented as a solution to social distancing issues.

There are plenty of warning signs as the lockdown measures start to be lifted. Public transport use remains low due to a lack of confidence. Traffic is low but there are signs of an increasing number of trips being made by private car and taxi with restrictions on the number of occupants. Businesses are looking to respond and capitalise on opportunities presented by COVID-19 such as Uber and Careem advertising on Google maps and persuading riders away from public transport and school transport could lead to a significant increase in traffic congestion as the lockdown measures are lifted and schools reopen. Cheaper loans to buy cars should continue as well as the continued low price of fuel, relatively cheap cost from Salik and readily available parking in community facilities and residential buildings. The rise of online shopping has led to an increase in the number of trips made by delivery vehicles, especially when orders arrive from different suppliers and this is something that should be encouraged and left unregulated in order to achieve a dystopian future.

The use of drone deliveries has been discussed and trialled in other parts of the world and is highlighted in both utopian and dystopian pathways. This would remove the human element from deliveries potentially improving safety by reducing the likelihood of spreading future viruses. However, this could lead to a significant increase in noise and visual pollution in cities.

“Measures to encourage working from home could lead to significant change. But it's hard to see much change to existing infrastructure without a significant kickstart.”

Figure 10 – What's already happening and what should be preserved?

### Utopian pathway

Requires a multi-pronged approach to improve	Investment in infrastructure and holistic approach	Human right to move
Shift from individualism to the common goal?	Electric vehicles are slowly being introduced into the ecosystem	Accelerate adoption of virtual reality
Increasing use of renewable energy	Development of digital tools and improved remote communication	Increasing use of integration manuals
Drone delivery	Increasing micromobility options	Home schooling and remote learning
Accelerate move away from individualism to a common goal	Companies to encourage and incentivise working from home	Support and increase adoption of e-devices

### Dystopian pathway

Business models of Uber and Careem – Car manufacturers responding	Back-to-work policies coming in	Rise in online deliveries
Continued dependency on fossil fuels	Social distancing requirements on transport/activities	Drone delivery
Investment in roads and parking facilities	Current short-term policies, free parking and cheap loans	No action, 'do nothing' approach
Low take-up of electric vehicles and lack of incentives	Low fuel costs and affordable toll gates	Developments that encourage urban sprawl
Low confidence in public transport	Drive towards personalised autonomous vehicles	Low confidence in school transport



# Three Horizons method

## What are the opportunities, risks and obstacles in the transition?

For the last part of exercise two, the Three Horizons method, participants were asked to explore the opportunities, obstacles and risks for both a utopian and dystopian pathway for the UAE.

Figure 11 shows the results from the assessment of the transition between now and 2025. Many of the opportunities that the utopian team identified were also risks for a dystopian pathway, and visa-versa. The similarities are represented in figure 11 by mirroring the coloured cells. A key insight from the utopian team was that the participants felt that without investment or policy measures to affect change there is a real risk of setting the course towards dystopia quite quickly. However, there could be opportunities to reconsider infrastructure investment decisions and target investment towards sustainable behaviours, improving public realm and capacity optimisation/management.

Restoring consumer confidence to public transport and school transport will be one of the key challenges over the next few years. Low public transport use and a loss of revenue might lead to the closure of certain routes creating social inequality. 95% of the users in Abu Dhabi do not have access to other means of mobility and without public transport they would not have access to opportunities. A utopian pathway does not have to be dependent on a vaccine. Advanced travel demand management (TDM) has the potential to influence behaviours as lockdown measures are lifted. This is based on the four ‘R’s principle (reduce, retime, remode and reroute). Measures for the UAE could include staggered school hours, working from home, remote learning and points-based incentivising systems.

Action should be taken quickly to avoid heading towards dystopia. The ‘do nothing’ approach could lead to a drastic increase in private vehicle and single occupancy taxi use if there is a lack of alternatives. This would mean we have missed the opportunity presented to society through COVID-19, resulting in increased CO<sub>2</sub> levels. School transport, in particular, has the potential to create a large increase in peak hour travel. If school buses are replaced by private cars and taxis this could lead to significantly more cars on the road.

Figure 11 – What are the opportunities, risks and obstacles in the transition?

Utopian pathway	Dytopian pathway
Opportunities	
<ul style="list-style-type: none"><li>• Reduce need to travel and therefore reduce travel emissions (ie Abu Dhabi to Dubai and UAE to KSA commutes).</li><li>• Increase the use of digital technology to encourage long-term behaviour change, including advanced technology such as augmented reality (AR) and virtual reality (VR).</li><li>• Utilise planned investment in new roads for the redesign of public realm to encourage sustainable mobility and improve communities.</li><li>• Support shared e-bikes and e-scooters to address climate challenges and provide alternatives to car travel.</li><li>• Advanced TDM programmes to better manage assets.</li><li>• Pilot bike/scooter bus priority lanes while travel demand is low.</li><li>• Improve integration of modes and infrastructure through the use of available integration manuals and frameworks.</li><li>• Measures to discourage driving (congestion low emission zones, increase toll road fees).</li><li>• Improvements in testing equipment, potential vaccines and infrastructure epidemiology to improve confidence in shared mobility.</li><li>• Looking further ahead, the use of electric vehicles as the UAE’s energy mix becomes more reliant on renewables.</li></ul>	<ul style="list-style-type: none"><li>• The ‘do nothing’ approach could see behaviours switch to less sustainable habits that would be hard to recover from.</li><li>• No investment or policy measures to change existing infrastructure, the UAE is already designed around the private car.</li><li>• Misdirection for actions that could lead to dystopia, such as infrastructure changes that encourage driving.</li><li>• Businesses capitalising on a lack of confidence in public transport (ie single occupancy Uber and Careem travel).</li><li>• Maintain low fuel costs.</li><li>• Businesses not promoting a work-from-home culture or providing sustainable travel means.</li><li>• Drone deliveries leading to noise and visual pollution.</li><li>• Increase in unregulated online shopping.</li><li>• Continued reliance on fossil fuels and reduced incentives for electric vehicles.</li><li>• Focus on growing the economy, irrespective of impact on environment.</li><li>• Investing in new roads to serve the increase in demand to travel by car.</li><li>• New developments to facilitate urban sprawl.</li></ul>
Obstacles/risks	
<ul style="list-style-type: none"><li>• Lack of/low investment in new infrastructure.</li><li>• Working from home and remote working leads to urban sprawl.</li><li>• This might mean distance travelled increases despite less trips.</li><li>• Confidence in public transport remains low.</li><li>• Confidence in school transport remains low – removing 6,600+ school buses could lead to a significant increase in congestion.</li><li>• Low confidence in public transport would lead to a loss of revenue for the government.</li><li>• This may also lead to a rise in trips by private cars, increasing congestion and CO<sub>2</sub> emissions.</li><li>• Inequality through lack of access if public transport routes are cancelled.</li><li>• The price of oil remaining low would reduce investment and keep fuel prices affordable</li><li>• Increased Careem and Uber advertising.</li></ul>	<ul style="list-style-type: none"><li>• Working from home and reducing the need to travel with business and government support.</li><li>• Remote education and online learning reducing the need to travel.</li><li>• Increasing awareness of climate change and the ‘Greta effect’ making society more conscious of sustainable mobility choices.</li><li>• Returning confidence in public transport and school transport.</li><li>• Facilities to support increased walking and cycling.</li><li>• New sustainable travel alternatives such as shared e-scooters.</li><li>• Wider use of available integration manuals.</li><li>• New congestion or low emission zones.</li><li>• Increasing fuel prices or taxes on fuel.</li><li>• Drone deliveries reducing traffic on the roads.</li><li>• Improvements in regulated online shopping.</li></ul>



# Ten insights into decarbonising mobility for the UAE

## 1.

Misdirected action or inaction from authorities could see the UAE divert onto a pathway heading towards dystopia and it is easy to see this happening far quicker than moving towards a utopian future.

## 2.

**Introduce measures to disincentivise private car and taxi use.** Strong measures are needed to prevent increased private car and taxi use as lockdown measures are lifted which could lead to higher CO<sub>2</sub> levels than pre-COVID-19. These measures might include congestion charges/low emission zones, increasing toll road charges (Salik), tougher regulations on Uber and Careem, speed restrictions, and/or fuel tax.

## 3.

**Travel demand management (TDM) could be the key.** COVID-19 has presented an opportunity to introduce TDM measures that might have previously been considered too challenging for the UAE. This could include measures such as flexible hours, staggered working hours and rotating staff required in the office in order to reduce the need to travel, retiming travel outside of busy periods, remodeling onto more sustainable travel and rerouting to avoid more congested routes. In the short term, this would provide better management of existing assets to encourage lasting behaviour change as more permanent infrastructure changes can be introduced in a holistic approach for both Abu Dhabi and Dubai.

## 4.

**Corporate social responsibility (CSR) to encourage working from home and alignment with government entities.** While confidence in returning to office spaces is low, companies should encourage working from home, reducing the need to travel and therefore emissions from the movement of staff to support the UAE's climate change efforts. This should be supported through the increased use of digital communication tools and collaboration with government entities, which might allow companies, and more broadly the UAE, to thrive. Working from home can lead to a greater sense of community and improve happiness for some. However, it is not without its challenges. Mental health challenges require more support and the risk of urban sprawl needs to be guarded against.

## 5.

**Regain confidence in public and school transport.** This will be easier said than done but infrastructure epidemiology offers a possible solution by combining infrastructure and healthcare. While confidence is low this may give rise to unofficial car-sharing and minibuses without proper regulations and health precautions. Infrastructure epidemiology has the potential to make public transport safer than other unregulated modes of travel. The same applies to school buses which significantly reduce congestion during peak hours.

## 6.

**Reconsider road building portfolio and manage existing assets more efficiently.** The lockdown has highlighted that there are other means of remaining connected such that pre-COVID-19 levels of dependence on the private car is not as certain anymore. Instead, further investment should be made into digital infrastructure to provide access without the need to travel. Building new roads now could further encourage private car and single occupancy taxi use as society starts to return to work.

## 7.

**Transforming streets to encourage walking and cycling.** With confidence in public transport low and social distancing guidelines in place, we need to strike a new balance to ensure sustainable travel progresses. Walking and cycling may not work everywhere and there should be an assessment of the infrastructure in the UAE to determine where improvements can be made and prioritise, aligning with public transport hubs, key attractions and future plans. Use of the Dubai Integration Manual and the Abu Dhabi Urban Street Manual should be used for every new development and to assess existing infrastructure, which includes proper provision for secure storage facilities.

## 8.

**Encourage other forms of micromobility (e-scooters and e-bikes).** With streets transforming, assisted micromobility devices have great potential to provide first and last mile connectivity, provide alternatives to public transport in the short term and prevent people relying on cars, especially in the difficult summer months. This includes continuing to support new shared services, such as Careem bikes, strategically locating them in the UAE with the associated storage facilities. This may prevent people buying a second or a third car, but significant infrastructure and land use changes will be required to ensure user safety. A 'build it and they will come' approach can make people nervous, however, now is the opportunity to trial pop-up lanes at minimal cost with a view to more permanent change.

## 9.

**Move away from single/central projections for the future.** If COVID-19 has proven anything it's that you cannot predict the future. The old planning methods using forecasting tools to predict demand were previously considered outdated and this has been highlighted further by the global pandemic. Regime change to a vision-led approach should become more mainstream.

## 10.

**New live, work and play designs and awareness to support working from home and social good.** The market response to working from home could see changes to apartment design to combat mental health issues and stimulate productivity. This should extend to the design of local communities and facilities to stimulate interaction, reduce the need to travel and enable live, work and play environments and support the social aspects of increased working from home.

“Through inaction the UAE could quite quickly deviate onto a dystopian pathway that will be hard to return from.”

### Other insights:

During the workshop, issues arose that were outside the scope of this report but which are worth highlighting for further consideration:

- **Data privacy concerns** – Google has produced data which shows the company is tracking our collective movements around the world. Apps are being trialled to track who we have been in contact with and many apps collect our personal data. Might this infringement on our privacy increase in the future to guard against future pandemics and is this what we want? Do we trust that our data will be protected and that it is safe from cyber attacks? EasyJet recently revealed that 9M customers have had data hacked in an attack<sup>23</sup>.
- **Attractiveness of the UAE** – A lack of confidence in flying might make the UAE unattractive for tourists and potential new residents of the UAE. If it is no longer possible to fly home on a regular basis, many international residents may be put off remaining in the UAE and it may put tourists off travelling, with many predicting a rise in domestic holidays. This could have a big impact on GDP.
- **Electric vehicles powered by renewable energy** – In the longer term, electric vehicles powered by renewable energy could be a solution to decarbonising mobility. However, there are concerns about the environmental impact of sourcing batteries as well as the impact of their waste disposal. The UAE will only source 25% of its energy mix from renewable sources by 2030 and this will not be enough to meet the targets in the IPCC report which suggests that making the private car more sustainable cannot be relied upon. This has the potential to be a longer-term solution but between now and 2030 it is only likely to have a minimal impact. However, investment should continue to be made to encourage low emission vehicles.
- **Rise in waste from online deliveries** – The growth in door-to-door online deliveries from multiple sources will lead to an increase in packaging and waste. Even orders from the same supplier can be delivered separately. Localised collection points could help solve this. This needs to change with a more centralised approach benefitting the whole rather than the individual.



# Closing remarks

We would like to extend our thanks to the participants for taking the time to offer their thoughts on this complex topic during unprecedented times. The FUTURES approach for this workshop allowed us to cast a future lens over a problem of decarbonising mobility post-COVID-19 to expose the longer-term risks and opportunities and brought together some of the region's leading experts to better understand the challenges ahead. This type of exercise can be used to help the UAE prepare for future problems, future pandemics and adversity. Achieving long-term sustainable goals must be driven by prosilience.

While the outcome was 10 insights, both sets of participants looking at utopia and dystopia remarked on several occasions that this is a complex challenge that requires a great deal of investment and management. However, it could be argued that investment in sustainable practices now will set the UAE on a path towards a green recovery that would be more expensive and harder to achieve as time goes on and new behaviours post-COVID-19 set in. Experience from other historical events has shown that the pace of change increases and therefore we need to capitalise on the opportunity that COVID-19 has presented.

As president Obama highlighted in May, the status quo has changed beyond what we might have previously thought conceivable<sup>24</sup>. The old ways of doing things have led us to this point and they need to change. This workshop attempted to shine a light on some of these issues and address the impending climate change challenge and it also brought to the fore a number of wider issues created by the pandemic.

The rapidly evolving situation has forced us to re-address many of our previous assumptions and strategies for how the future might turn out. Behaviour change is difficult, but COVID-19 has dramatically changed behaviours overnight, which could be seen as an opportunity to effect positive change. However, one of the key insights from the workshop was that "through inaction, the UAE could quite quickly deviate onto a dystopian pathway that will be hard to return from".

It is likely that as our understanding of the virus increases and the situation changes further, this workshop should be revisited again.

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