

Transport in the 2020s: eight trends shaping the future

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Introduction

In 2020, the convergence of COVID-19 and climate change has forced us to rethink almost every aspect of our lives, including how we get from A to B.

In the spring of this year, as governments around the world imposed lockdowns, towns and cities were emptied of people. The traffic congestion, air pollution and noise that had become such unwelcome features of urban life melted away. For some, this offered a vision of life in a post-COVID era.

But the price of those gains has been high, with economies hit by a deepening recession and rising unemployment. A permanent lockdown is not a sustainable solution.

Even before coronavirus struck, the transport sector was reassessing its future, in the light of economic, demographic and environmental change. The pandemic has provided further incentives to reimagine how we can travel in ways that are good for humanity and for the planet.

This report presents an overview of the ways in which governments and transport authorities have been adapting to these challenges. We look at some of the possibilities to make changes for the better in tackling air pollution, integrating planning and transport, reaping the benefits of technology and responding to the questions raised by COVID-19. And we highlight the work of Idox in facilitating easier and informed travel for all.



Clearing the air: how transport is tackling the toxic pollution in our cities

2020 has been the year of the virus. But while COVID-19 remains a serious public health issue, there is another hidden killer which has been responsible for more deaths than coronavirus, HIV and malaria combined.

In Europe, nearly half a million people die each year from respiratory infections, heart disease and lung cancer caused by poor air quality. In 2015, air pollution caused¹ an extra 8.8 million premature deaths around the world.

Motor vehicles, which produce considerable amounts of nitrogen dioxide and particulate matter, are the main source of these emissions in urban areas. As a result, authorities at European, national and local levels have been setting and implementing policies aiming to tackle the pollution in our air.

“From Athens to Aberdeen, and from London to Ljubljana, there is an eclectic smorgasbord of initiatives with over 200 low emission zones (LEZ) around Europe excluding more polluting vehicles, and some cities employing road-user charging to deter vehicles from entering.”²

London has adopted especially ambitious goals to improve air quality. The Mayor of London has introduced the world’s first Ultra Low Emission Zone (ULEZ),³ which requires drivers to meet specified emissions standards or pay a daily charge to drive within the zone. In addition, all new double-decker buses in London are now hybrid or zero-emission, giving the city Europe’s largest electric bus fleet.

Elsewhere, national and local authorities have been trying to persuade travellers to abandon their private vehicles in favour of public transport. In 2020, Luxembourg abolished charges for anyone using trains, trams and buses across the country. The move seems part of a trend, with cities such as Dunkirk (along with 23 smaller municipalities in France), and the Estonian capital of Tallinn offering fare-free public transport in efforts to reduce traffic, congestion and emissions.

¹ <https://www.sciencedaily.com/releases/2020/03/200302200734.htm>

² Traffic Technology International, April/May 2017

³ <https://tfl.gov.uk/modes/driving/ultra-low-emission-zone>

Greener mobility: how transport is tackling climate change

As well as being bad for our health, vehicle emissions are bad for our planet. In 2017, transport overtook energy supply as the largest carbon emitting sector, and transport now accounts for 27% of UK greenhouse gas emissions.

Local authorities and national parliaments around the world have declared climate change emergencies, acknowledging that failing to act risks increasing incidence of floods, droughts and other serious consequences of an overheating planet Earth.

Transport authorities in large cities and small communities are playing their part to find inventive and effective approaches to tackle the climate crisis:

- Since 2017, all electric trains in the Netherlands have been running on electricity powered by wind turbines;
- Ainsdale railway station has become the most eco-friendly station on Merseyside, thanks to a refurbishment that brought a new building, complete with solar panels, low energy LED lighting with smart controls and rainwater harvesting tanks to serve the toilet facilities;
- a north London bus garage is being transformed into a “virtual power station” – taking energy stored in the batteries of parked electric buses and feeding it back into the electricity network;
- inspired by New York’s High Line, a former railway line at the western gateway to the Forth and Clyde Canal is being repurposed into a fully accessible linear park and pathway.



Active travel - cycling and walking

Active travel is good for individuals, for the economy and for the environment. Research by Public Health England has found that if everyone in England were sufficiently active, nearly 37,000 deaths a year could be prevented. The same report suggested that physical inactivity could be costing the economy up to £10 billion a year in healthcare, premature deaths and sickness absence. This research is part of a rising tide of evidence that has pushed active travel further up the political agenda.

In 2020, the UK’s Department of Transport presented its new plan for cycling and walking, which highlighted the significant benefits of active travel:

“Increasing cycling and walking can help tackle some of the most challenging issues we face as a society – improving air quality, combatting climate change, improving health and wellbeing, addressing inequalities and tackling congestion on our roads.”

The government’s £2bn plan includes cycling training for children and adults, more cycle racks in towns and cities, the construction of thousands of miles of cycle routes and a new e-bike programme to help those who are older or less fit.

The plan also includes proposals to encourage GPs to prescribe cycling, something that’s already being trialled in the West Midlands.

Walking is a cheap and accessible form of activity. But when it comes to cycling, affordability can be an issue, especially for those living in poverty. To address this, a partnership between ComoUK, the Glasgow Centre for Population Health, Cycling Scotland and Nextbike has launched the Bikes for All initiative. Anyone on a low/no income can try cycling by accessing a bike for £3 through Glasgow’s bike share scheme (which usually costs £60). Participants don’t need a bank card or smart card to access the scheme, and can also take part in a mentoring programme to build their confidence.

“In a quality city, a person should be able to live their entire life without a car, and not feel deprived”

Paul Bedford
City of Toronto Planning Director (2014)

Plugging into the future: can electric vehicles drive diesel out of town?

Diesel is now a dirty word. Around the world, governments have been setting targets to phase out the sale of new diesel and petrol vehicles, which emit dangerous levels of nitrogen dioxide and poisonous particulate matter. The UK government will ban the sale of new petrol and diesel cars by 2035, while the Scottish government's target is 2032. These moves replicate measures introduced by France and cities such as Amsterdam and Hamburg.

As diesel and petrol cars are phased out, alternatives, such as battery electric, plug-in hybrid electric and hydrogen-powered vehicles are moving in. These have a lower environmental impact and could also help the UK to meet its target of net zero carbon dioxide emissions by 2050.

At present, electric-powered vehicles make up a very small share of the UK car market – just 0.9% of new cars are electric. But sales of electric cars have been rising – 2019 saw the biggest annual increase in number of registrations with over 70,000 electric vehicles registered, showing a growth of 38% on 2018.

Diesel and petrol cars could be phased out much more quickly if more drivers could be persuaded to go electric. Many are still reluctant to make the switch due to concerns about the distances that electric cars can travel between charges, and the availability of a robust charging infrastructure. For most drivers, the leap in costs of switching to electric has proved the major stumbling block.

In the UK, the government has cut subsidies and grants for some hybrid and electric vehicles, leading to a slump in hybrid sales. By contrast, Norway's government has backed up its ambitious goal to stop selling new gas and diesel passenger cars and vans by 2025 with incentives to go electric. These include tax breaks for electric cars, access for electric vehicles to fast-track bus lanes, plus discounts on parking and charging. Drivers are getting the message: in April 2019, almost 59% of all cars sold in Norway were electric.

Although electric vehicles have been heralded as an environmental good news story, manufacturing their batteries requires raw materials such as cobalt, the mining of which has considerable environmental and human costs. At the same time, the electricity used to charge the vehicles is largely generated from fossil fuels. And, just like petrol and diesel vehicles, electric cars produce large amounts of pollution from brake and tyre dust.

Despite the drawbacks, electric vehicles are on the move. Manufacturers are launching new ranges to meet increasing demand and to comply with EU rules on carbon dioxide emissions limits. The International Energy Agency predicts there will be 125 million electric vehicles in use worldwide by 2030.

Transport and planning: joined-up thinking

"We need an efficient and integrated planning and transport system to not only support a strong and prosperous economy but to reduce carbon emissions. As a sector, we are not achieving these goals."

On the face of it, transport and planning make a good match. New housing developments require integrated, sustainable transport, and good transport connections link people and homes with jobs and social infrastructure.

But recent reports suggest insufficient collaboration between transport and planning in the UK is creating barriers to developments that serve the needs of communities without causing pollution or other damage.

In 2019, a KPMG survey of transport and planning stakeholders found that many of them are unhappy with the fragmented approach to the planning of local public transport, highways and housing:

"...all too often the planning and delivery of sustainable transport and new housing operate in silos. As a result, new housing development in England is often criticised for being car-dependent, isolated, and sprawling."



However, there are a growing number of examples of imaginative approaches to planning and development. A report by the Campaign for Better Transport highlighted some of these, including:

- A new housing development in Leighton Buzzard, Bedfordshire, was designed to tackle car dependency among residents. The new scheme included new and more reliable bus services. As result, more passengers were carried on some routes in the first 10 weeks of operation than a previous service carried over 12 months.
- The Black Country Plan (formerly known as the Black Country Core Strategy) is a planning framework for the whole of this area in the West Midlands. It is a joint plan produced by the four councils (Dudley, Wolverhampton, Sandwell and Walsall) and seeks to meet the future development needs of the area and the aspirations of local communities. All new developments are required to provide adequate access for all transport modes, with priority being given to improving transport in key corridors through a 'Smarter Routes' initiative based on improving public transport, traffic management and better facilities for cyclists and pedestrians.
- Shawfair, on the outskirts of Edinburgh, is Scotland's first new town in 50 years. It is being constructed on a site close to a station on the re-built Borders Railway, offering a 10-minute journey time to the centre of Edinburgh. The town is intended to be a self-sufficient community, and will include a network of cycling and walking paths, as well as plenty of landscaped green space, woodland and open water.

The report concluded that these and other examples demonstrate that there are more thoughtful and effective alternatives to housing estates where residents are dependent on a car for nearly every journey:

“These approaches are not prohibitively expensive, they do not require a recasting of lifestyles, nor is their application confined to forward thinking parts of continental Europe – they are already working effectively in everyday settings in towns and cities across Britain. In short, a new relationship between spatial planning and transport which is better – economically, socially and environmentally – can be achieved.”

Smart mobility: transport's digital revolution

'Smart cities' has become a widely used but contested term. But while some are debating the definition of smart cities, others are getting on with the job of creating them.

While many of us are becoming familiar with some of the elements of smart mobility, such as digital apps for ticket booking, smart travel cards and electric vehicle charging points, these represent just the small beginnings of a transport revolution.

At its heart, a smart city depends on data and technology. By gathering and sharing data, real-time processing, data analytics and visualisation, cities can become more effective, efficient, productive and sustainable. The near-universal uptake of mobile devices offers an opportunity to innovate in order to make our urban areas more adaptive and resilient.

A report by McKinsey Global Institute in 2018 highlighted some of the benefits of smart city applications:

- deploying a range of applications to their maximum effect could potentially reduce fatalities (from homicide, road traffic, and fires) by up to 10%;
- by 2025, cities that deploy smart-mobility applications have the potential to cut commuting times by 15 to 20% on average;
- smart city technologies have the potential to reduce the years lost to ill health and premature death by up to 15%;
- a combination of smart city applications could cut emissions by 10 to 15%.



The emergence of new technologies is rapidly transforming both traffic management systems and the analysis of travel activity and transport modelling. Initiatives such as the Future Cities Demonstrator (based in Glasgow) and the Catapult Centres – both established by Innovate UK – are exploring innovative ways to use technology and data to make life in cities safer, smarter and more sustainable.

Elsewhere, local government and transport authorities are putting smart city applications to work:

- London and Barcelona have opened up data on transport, energy, environment, security and healthcare to enable developers to create a range of apps which improve citizens' quality of life in areas such as public transport information, traffic management, bike sharing and smart parking;
- Amsterdam has developed several smart mobility tools, including a car-sharing platform that improves commuting to workplaces, and reduces congestion and emissions. The city is also looking ahead to the coming challenges raised by self-driving vehicles in its Smart Mobility Action Programme.
- Dundee is now home to a Mobility Innovation Living Lab, which will design, test and commercialise new mobility products and services;
- Data from Europe's first ever 'smart canal' in Glasgow will help experts at Scottish Canals and Scottish Water decide what actions are needed to mitigate flooding.



Moving into Mobility as a Service (Maas)

Just as streaming services like Netflix and Spotify have fundamentally changed the way people search for, consume, and pay for media, MaaS is promising to change the way people get around.

MaaS is about framing transport systems around customer preferences. It puts tailor-made, on-demand transport options into the hands of consumers, enabling them first to use online technology to locate available taxi, car-sharing and bike-sharing options, bus and rail services, and then to choose the transport mode that suits them best, using flexible payment systems.

MaaS is still at the early stages of development. Pioneering services include the Whim app in Finland, which has now expanded to projects in the UK and Europe; Transport for Greater Manchester; UbiGo in Gothenburg, which has expanded to Stockholm; and NaviGoGo, Scotland's first MaaS web application, which was piloted in Dundee.

Uber is expanding its market by bringing different forms of transport onto the platform, while Citymapper, a journey planning app is bringing in different ways of paying for and commissioning your own travel.

For users and transport providers, the benefits of MaaS are becoming clearer:

- the customer can plan their journey based on personal preferences, such as time, cost, comfort, and convenience;
- MaaS offers easy and convenient access to transport services via a range of devices, such as smartphones and smart cards;
- the customer is kept up-to-date about any changes to transport services on their journey in real time;
- MaaS promises transport providers new sales opportunities, as well as simplified payment management systems.

Some public transport providers remain wary of MaaS as a potential threat to their business. But others, such as Go-Ahead Group, see MaaS as an opportunity to grow.



Moving into the unknown: transport and coronavirus

The restrictions on travel imposed to prevent the spread of coronavirus have been far-reaching in their scope and profound in their impact. But if necessity is the mother of invention, then COVID-19 has generated a wave of new thinking about mobility.

One consequence of the pandemic has been greater demand among public transport users for contactless and mobile ticketing, which has prompted transport authorities to accelerate the shift away from cash payments.

But while there are many benefits to contactless payment, especially at a time when a touchpoint can be a potentially high risk environment, cash payments remain vital for the 1.3 million UK adults who do not have a bank account (the 'unbanked'), many of whom are on low incomes.

A Transform Scotland report has highlighted other ways in which the effects of lockdowns have not been equally felt.

As public transport services were reduced, non-car households found their access to shops, services, medical appointments, school and (for key workers) employment severely restricted. Car users, in contrast enjoyed the unexpected benefits of reduced traffic congestion and cheaper petrol.

The Transform Scotland report made four key recommendations that aim to lock in social justice and reduce inequalities:

- restore public transport service frequencies to pre-lockdown levels;
- extend free or discounted public transport travel beyond existing categories of users;
- provide face coverings to passengers at boarding points, at free or nominal cost;
- make online booking of rail services as easy as possible, and provide alternatives for those unable to book online.

It's much too soon to assess the long-term impact of coronavirus on transport. Some believe the reluctance of people to return to public transport will drive an increase in active travel, or the micromobility solutions offered by MaaS – or a return to private cars. Others suggest that the vast numbers of people who have discovered the benefits of working from home will be happy to leave the cost and inconvenience of commuting behind. Others still speculate that once COVID-19 has been overcome, travel patterns will return to normal within a few months.

Transport network management: Idox solutions

As this report has demonstrated, the transport sector is experiencing unprecedented change. Even before coronavirus struck, governments, transport authorities and businesses were reassessing the future of mobility in the light of economic, demographic and environmental challenges.

Idox is at the forefront of designing a response to these challenges. As a respected name in the transport sector, we work with transport professionals across the UK and internationally, transforming the way transport data and information is accessed and utilised.

Idox systems for Transport Network Management:

- enable traffic managers to model, monitor and control the environmental effects of travel as well as reducing congestion and cutting pollution;
- facilitate the tracking and management of all vehicles within a fleet;
- allow operators of real-time traffic signals to curb congestion and reprioritise traffic;
- enable travel information to be viewed in a highly user-friendly format.

Recent and ongoing work by Idox, which demonstrates increased efficiencies and harnessing of data to improve transport management, includes:

- Implementing Suffolk County Council's Travel Assist solution, combining information from multiple bus operators to provide a single source of information for passengers at any of the county's bus stop installations.

- Canadian transport operator Metrolinx has chosen Idox to deliver a state-of-the-art Terminal Management System for a new bus station in Toronto. Once live, the system is intended to manage bus movements between the new terminals and staging areas efficiently and safely. Not only will this better utilise terminal space (by up to 70%) and improve bus flow, it will also improve the experience and flow of passengers and drivers by providing accurate, real-time arrival and stand allocation information.
- Idox is moving Somerset and Cambridge Councils away from reliance on Advanced Automatic Number Plate Recognition (ANPR) cameras to detect traffic flows, and towards a hardware-free solution. Real-time maps will highlight severe and non-typical congestion, track average speed, delay times and queue lengths around individual roadworks and incidents. The new system also anticipates the arrival of connected autonomous vehicles.
- Idox has implemented Green Light Optimal Speed Advisory (GLOSA) systems for a pilot project with Birmingham City Council in order to reduce the amount of stationary traffic (especially heavy goods vehicles) waiting at traffic lights. The next step for Idox is to integrate with connected autonomous vehicles.
- Idox is supporting Bath and North East Somerset Council in implementing its Clean Air Zone (CAZ). This involves integrating air quality monitors, traffic signal junctions and ANPR cameras in order to control congestion and pollution to within safe and legal levels. In addition, Idox is working to improve message signage on the outskirts of Bath to nudge drivers into using Park and Ride facilities.



Conclusion

In 1962, an Italian magazine presented a startling vision of transport in the future. The story suggested that in years to come drivers would travel in single-seater vehicles, encased by a glass bubble.

The author suggested that these 'singolettos' would resolve the major transport headache of the day – traffic congestion. However, the accompanying illustration, showing a street jam-packed with these tiny vehicles, indicated that one form of congestion would only be exchanged for another.

What a difference 60 years makes. Today, while there are still concerns about traffic congestion, numerous other economic, demographic and environmental challenges face the transport sector, to say nothing of a global pandemic.

As the world looks to a post-COVID future, how we get around is at the very heart of considerations about rebuilding our economies and our lives.

The future in 2020 is as uncertain as it was in 1962, but as we have shown, the transport sector is proving it has the capacity, invention and determination to face the challenges ahead.

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