SPRING 2022 NEW IDEAS TO CHALLENGE DAILY MOBILITY #8

PULSE

MOBILITY AND CO_2
AN IRRECONCILABLE DUO?

Pulse is intended for all stakeholders, decision-makers and opinion leaders involved in everyday mobility. A Keolis-led initiative, this biannual magazine aims to fuel debate and generate discussion about the trends and challenges that are shaping our industry.

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What if a mere upgrading of our vehicle fleets was not enough to truly decarbonize mobility? Huge investments are already dedicated to the development of low-carbon hydrogen and synthetic fuels. Although the electrification of mobility remains a key lever for energy efficiency, energy transition is a long-term process and requires multiple solutions. It is precisely on these various levers that we focus today in this issue of *Pulse*. As part of our pledge to significantly reduce our carbon footprint, we have embarked on a continuous improvement process, driven by clear and quantified decarbonization commitments. To go even further, why not collectively imagine, alongside technological efforts, more efficient mobilities?

We wanted to give a voice to those calling for this transition to start now to make shared mobility synonymous with a decarbonized mobility that is sustainable and accessible to all.

Enjoy your magazine!

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A graduate in human sciences and management, Sylvie Landriève began her career in urban planning before joining SNCF, where she spent 12 years at the real estate and human resources departments. Within the Forum, her role is to assess public policies and to study citizen engagement. ●

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A graduate in political science and psychosociology, Christophe Gay spent 17 years at SNCF, France's national rail operator, where he held several positions in communications (TER regional network, major projects, strategic planning). In 2010, he set up this think tank on the mobility and lifestyles of the future, with the support of SNCF. Imaginings, representations and social norms are his main areas of focus. ●

Stephen Cotton

General secretary of the International Transport Workers' Federation (ITF)

Stephen Cotton was appointed general secretary of the ITF in 2014. This global union federation gives a voice to 20 million transport workers in 147 countries, 7.3 million of whom work in public transport. Stephen talked to Pulse about the "The Future is Public Transport" campaign, rolled out in March 2021 with the C40 Cities network. ●

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A geology engineer with a master's degree in environmental economics, Aurélien Bigo is an associate researcher with the Energy and Prosperity Chair, set up in 2015 to inform the decisions of French public and private players in managing the energy transition. He talked to Pulse about how carbon neutrality could be achieved in the transport sector by 2050. ●

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Director General, Chairman of the Board of Executive Directors of the Roads and Transport Authority (RTA) in Dubai, United Arab Emirates

A graduate in civil engineering from the University of Wisconsin, USA, Mattar Al Tayer held a number of senior positions with the Municipality of Dubai before becoming one of the main architects of the rapid development of public transport in the UAE, with the founding of the RTA in 2006. ●

CONTENTS

SYLVIE LANDRIÈVE & CHRISTOPHE GAY, co-directors of the Mobile Lives Forum

NO MORE NEED FOR SPEED

The challenge of reducing GHG emissions from our mobility, coupled with people's aspirations today, means we need to collectively rethink our mobility systems and put an end to the need for speed.

Illustration: ***Maria Contreras Aravena***

SYLVIE LANDRIÈVE focuses on the evaluation of public policy and the involvement of citizens in its development. She set up and managed private and public-sector real estate and urban development projects before helping create the Mobile Lives Forum.

&

CHRISTOPHE GAY is interested in questions of imaginings, representations and social norms as determinants of lifestyles and mobilities. Before creating the Mobile Lives Forum, he was in charge of strategic planning for SNCF communications.

BUT THE REAL ISSUE IS SPEED

People properly began travelling on a wide-scale basis in the 20th century, with the democratization of fast forms of transport. First came the train, which increased average journey speeds by a factor of over 20, compared to the previous century. Then came the automobile and the aeroplane. Two centuries ago, people typically travelled four kilometres (2.5 mi) a day in France. Today, it's 60 kilometres (37 mi).[1] That's 15 times more. What's most surprising is that the amount of time we spend on routine journeys has remained similar. In other words, the speed offered by new transport modes hasn't saved us any time, it simply lets us go further. The result? Our activities are spread further apart. This is true for everyday mobility: work, shopping, entertainment, etc. It's also true for weekend leisure pursuits and vacations. We often travel long distances for just a short stay.

With the car, we've gone from exhilaration to dependency. Today, the private car is ubiquitous in countries like France. So much so that it accounts for **70%** of all miles travelled every year. **7 out of 10** people drive to work, most of them on their own. Our geographies, activities and pace of life have been organized around car use to such an extent we've become dependent.

Yet, speed is harmful in many ways. First, our societies are extremely unequal when it comes to mobility. People living in some places are much more reliant than others on the car and speed, especially in outlying suburbs and rural areas. Second, the transport sector generates huge amounts of CO_2 (almost **30%** of emissions in France) and cars alone account for **15%** of the country's emissions. Third, the ever faster pace of mobility contributes to our poor health. Negative factors include sedentary lifestyles — since travel got faster we've never been so physically inactive — not to mention local pollution, noise, fatigue and stress.

So, what's the answer? Our research at the Mobile Lives Forum shows we can't reduce our carbon footprint while continuing to move around so fast. Political leaders have been making the environmental case for several decades but with few tangible results because the focus is always on technology as the way forward. Electric and self-driving vehicles are symbols of the hope manufacturers and authorities continue to place in technology. But it's not working for two reasons. First, the carbon footprint over the lifecycle of these vehicles is mixed at best. And second, conventional vehicles aren't being replaced fast enough. Ultimately, the CO_2 emissions curve continues to follow the increase in miles travelled. Obviously, restricting private car use without offering a viable alternative would be detrimental for the people most reliant on their cars today — as evidenced by the Yellow Vests crisis in France.

Aspirations could accelerate the transition, if heard. Many people aspire to a less-frenetic pace of life, wanting to live more locally. Our survey of future aspirations[2] shows that **8 out of 10** want a slower pace of daily life and **80%** want to work within 30 minutes of home and **50%** directly in their neighbourhood. Many also want to leave the major cities, where travel times are skyrocketing, with Paris leading this trend.

If we take aspirations and environmental issues seriously, we need to end our reliance on speed and individual, high-CO_2 modes of transport. To achieve this, we must and can offer a real alternative to the private car. And we must do so now, with a "supply shock" in the form of better, more regular public transport, networks dedicated to active modes (walking, cycling, etc.) and a new industry policy for small, light, low-CO_2 vehicles for those who simply can't do without them.

"OUR RESEARCH AT THE MOBILE LIVES FORUM SHOWS WE CAN'T REDUCE OUR CARBON FOOTPRINT WHILE CONTINUING TO MOVE AROUND SO FAST."

At the same time, we need to rethink regional planning so we can live our daily lives more locally. This includes a progressive shift that brings routine activities, services and facilities closer to where we live. It also means more people working locally and from home. And with it, the growth of the local residential economy: grocery retailers, cafes, bars and restaurants, sports and leisure activities, and so on. Depending on whether you walk, cycle or use an electric vehicle or public transport, you must be able to access these vital daily services and facilities within a radius of two to fifteen kilometres (1.25 to 10 miles), irrespective of whether you live in a rural village, town, larger city or major regional centre. It also means putting an end to the "race for size" by many of today's metropolises. For all, daily travel will be less hurried, the distances shorter and our reliance on fossil-powered forms of transport much reduced. ●

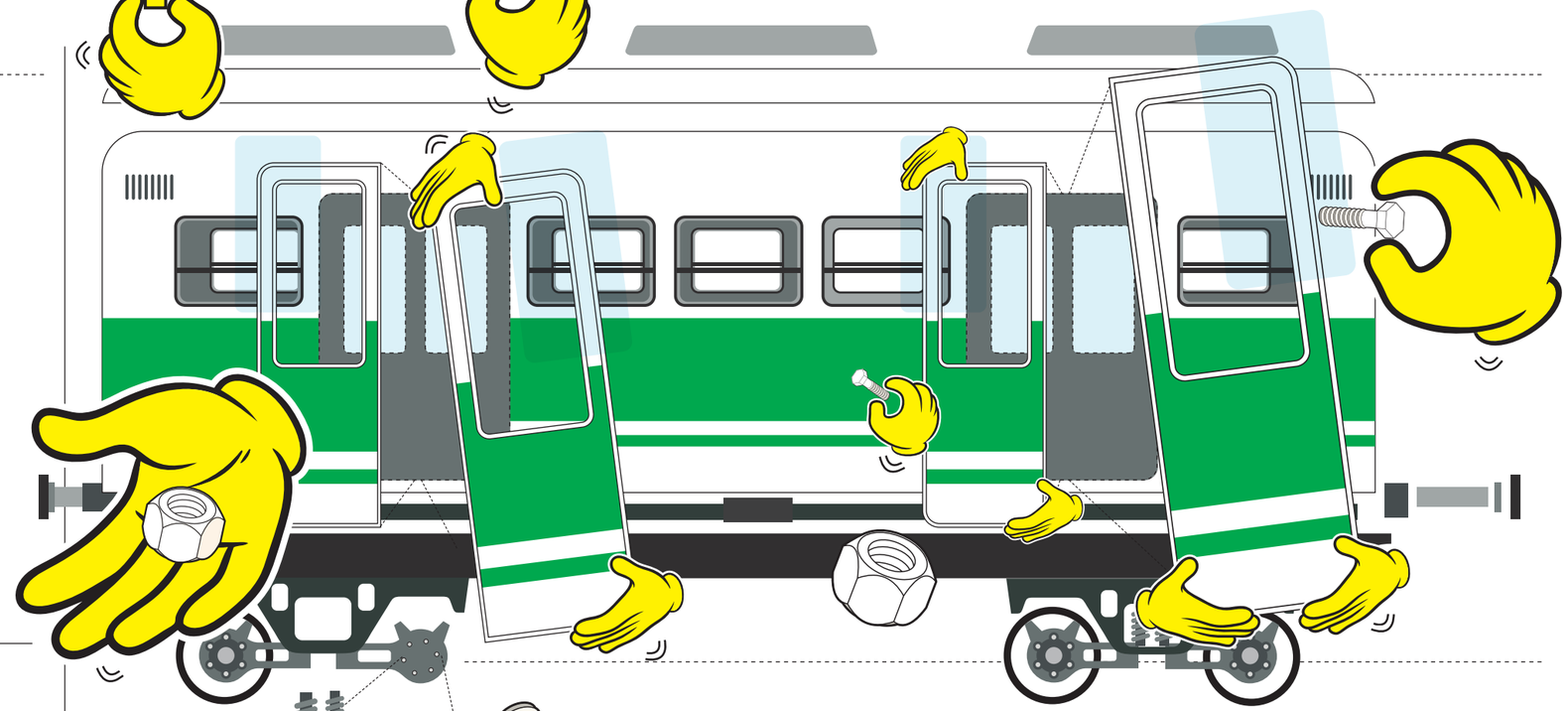
1. National survey of mobility and lifestyles, Mobile Lives Forum, L'Obsoco, 2020.
2. International survey of mobility and lifestyle related aspirations, Mobile Lives Forum, 2016.

TRAINS, ON TRACK FOR ENDLESS RECYCLING!

By Adeline Tissier

Spurred by the increasingly urgent need to cut greenhouse gas emissions, the transport sector is rethinking the processes used to create its rolling stock. More responsibly designed materials and systems are either dismantled for reuse in other carriages and locomotives or broken up and stripped down for recycling and transformation into secondary raw materials or new products.

Through this increasingly efficient process, a whole new circular economy industry has emerged, creating new jobs and improving the recovery and reuse rates of used materials. Some can even be recycled indefinitely, for a recovery and reuse rate of 100%! French rail operator SNCF manages to reuse 98-99% of its locomotives – an excellent reason to take a closer look at the company's new "eco-deconstruction" strategy.



Some recyclable materials recovered from trains are melted down into new raw materials. Panels, frames, liners and other fixtures are cut up or taken apart by hand and then recycled accordingly.

DISMANTLE AND RECYCLE, ONE MATERIAL AT A TIME

- Aluminium panels => 100% recycled
- Copper from electrical devices => copper coils 100% recycled
- Steel (60,000 tonnes recovered per year) => structural steelwork, I-beams, concrete-reinforcing steel, rails
- Stainless steel in liners => saucepans, tanks
- Windows => recycled glass

Ceilings, floors, windows, insulating materials, greases and certain systems and materials – such as asbestos and polluting oils – require specific depollution.

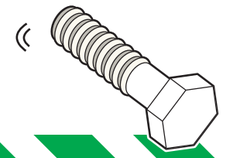
CLEAN AND DEPOLLUTE

Materials containing asbestos in particular go through a rigorous process, as France has the most stringent regulations in the world.

Everything that can be recovered from trains at the end of their life is recovered. Many components and systems are easily removed and reused in other carriages. In some cases, carriages that have been stripped bare are even repurposed for refurbished night trains or low-speed trains – an eco-friendly and money-saving solution.

DISMANTLE AND REUSE

- Reading lights
- Traction and intensity controllers (on wheel in driver cab)
- Wheelsets dismounted, overhauled and remounted on other high-speed trains
- Engines, bogies
- Transformers, electronic racks and circuit boards



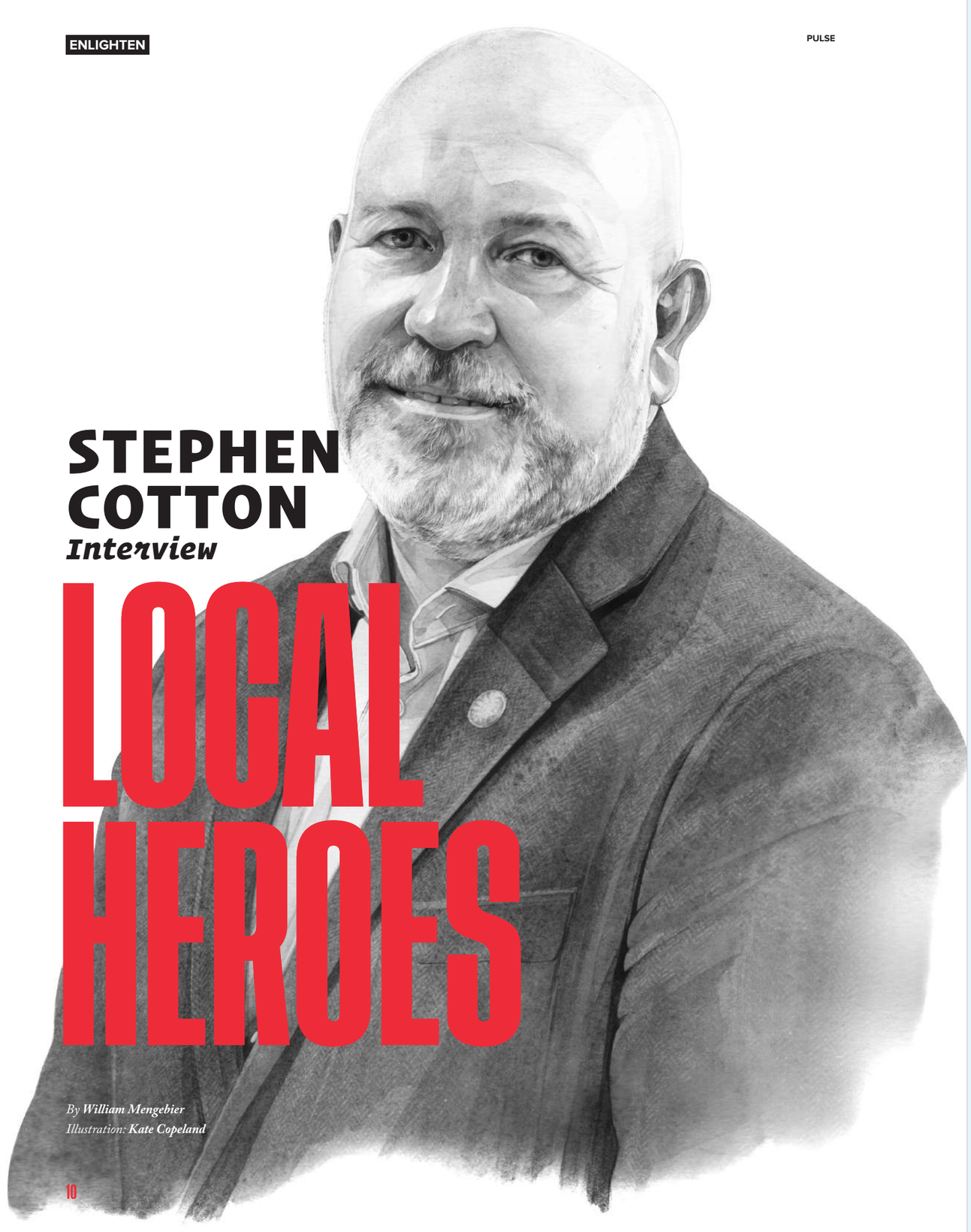
Eco-design to maximize recovery and reuse

Whereas the recovery and reuse rate for locomotives is 98-99%, it's only 92-95% for coaches, so there's real room for improvement.

Coach designers and manufacturers are today adopting a **holistic approach** using train materials with a zero environmental footprint. In France, **Alstom** for example is working to optimize component dismantlability, developing eco-friendly materials — 100% renewable ceilings and floors, recoverable seat structures so that only seat fabrics are changed — and incorporating end-of-life management processes for materials from the earliest stages of design, notably through convenient how-to guides for the industry's stakeholders. **Eco-design innovations** also aim to improve component durability, by maximizing their reuse. It's no longer rare these days to see a driver console or reader screen that's reached the end of its life recovered and **reused for an entirely new train.**

The circular economy in action

In the space of a decade, **SNCF** has developed a mature industrial stream capable of handling **1,000** to **1,200** units per year, i.e., 22 to 25 kilometres of rolling stock. This process involves diverse dismantling, depollution and recycling stakeholders who have organized and grown to meet the rail operator's needs. Funded partly by the resale of recycled rolling stock and materials, this stream is continuing to flourish thanks to new recycling processes set to keep improving in the years ahead.



STEPHEN COTTON

Interview

LOCAL HEROES

By ***William Mengebier***
Illustration: ***Kate Copeland***

STEPHEN COTTON has served as the General Secretary of the International Transport Workers' Federation (ITF) since 2014 and has held positions in the organisation for 25 years, beginning as Assistant Secretary, then Maritime Coordinator and Secretary in its Special Seafarers Department. He is a graduate of Kingsway College and Ongar Comprehensive School.

International Transport Workers' Federation

The International Transport Workers' Federation (ITF) is a leading voice on global transportation issues on behalf of nearly 20 million working men and women across the world, including 7.3 million involved in public transport. ITF connects nearly 700 affiliated trade unions from 150 countries, helping their members to secure rights, equality and justice.

In a world rocked by a global pandemic, frontline workers have been called upon to perform their roles and continue to deliver essential services. For many, getting to their jobs is possible only via public transport, highlighting the degree to which society's critical functions are dependent on mobility and the people who make it possible.

But even beyond its indispensable role in our day-to-day lives, public transport touches multiple facets of our world. An important source of employment, public transport is responsible for more than 7 million direct and millions more indirect jobs. As urban populations soar, public transport relieves congestion, keeping citizens and commerce moving. A recent report by the C40 Cities network and the International Transport Workers' Federation (ITF) on "The Future of Public Transport" found that additional investment in public transport by major cities could halve carbon emissions generated by urban transportation by 2030 and reduce air polluting particulates by 45% — while creating an additional 4.6 million jobs.

Climate change, employment, urban congestion, economic development — these and other powerful forces are driving public transport issues to the forefront of budget and policy decision-making. Well-positioned to comment on lessons learned from Covid-19, current challenges for public transport and the outlook going forward is ITF General Secretary Stephen Cotton who responds to our questions.

What have been the main impacts of the Covid-19 health crisis on public transport?

Stephen Cotton: The pandemic has highlighted the vital role of public transport. Formal and informal public transport services have kept cities moving and helped key workers get to and from work. There are very positive lessons we can learn from this.

But there have also been massive drops in ridership in many cities, in some cases up to 90%, causing a serious loss of revenue for public transport systems, particularly where revenue is heavily dependent on fares. This happened at the same time as there were increased operating costs related to the Covid-19 response. So there are huge budget shortfalls in many systems.

To win back public confidence, it is important for public transport to be seen as Covid safe for both passengers and the workforce. Research has shown that the risk of being infected on public transport is low if safety measures are implemented.

How have frontline public transport workers been affected?

Stephen Cotton: High infection rates among public transport workers were recorded in some cities, which were sometimes due to a lack of PPE and other safety measures. Tragically, there have also been some deaths among public transport workers as a result of Covid infections. With existing occupational health and safety (OSH) problems exacerbated by Covid-19, we are calling for OSH to be recognized by the International Labour Organisation (ILO), a UN agency, as a fundamental principle and right at work.

Workers have also been exposed to violence and harassment when trying to enforce safety measures. Violence in the public transport workplace is not new, but the pandemic has exposed workers to additional risks.

Despite all of these and other challenges, public transport workers are proud of their work and deserve recognition.

What about the impact on workers for whom public transport is essential?

Stephen Cotton: Many key workers could not work from home. They continued to rely on public transport services to get to and from work, particularly key workers like health workers. This showed how equitable access to public transport is key to economic and social life in cities, and how the resilience of cities during pandemics and disasters, rely on good public services like public transport. For this reason, a green and just recovery from Covid-19 must prioritize funding for quality public services, including public transport.

What new lessons have been drawn from the health crisis on the role of public transport?

Stephen Cotton: Covid-19 exacerbated and exposed inequality in public transport services within and between countries. Depending on how public transport systems are planned and funded, they may exacerbate inequalities or contribute to overcoming them.

Public transport in developing countries is largely informal; in some cities, 85% of services are informal. Informal workers had almost no access to PPE or washing facilities, social security and legal protections. They were faced with the impossible choice of going to work and risking infection, or staying at home and losing their livelihoods. We have many examples of workers having to provide their own protection. The pandemic has highlighted the urgent need for formalisation of services and jobs in public transport.

A major lesson of the pandemic is the reliance of cities on public transport, particularly during moments of crisis, and its importance as a force to combat economic and social inequality which must be treated as a public good. Access to integrated public transport services that are reliable, safe and affordable are a must for local and national economies.

The pandemic has also shown that we need sustainable long-term funding models for public transport systems.

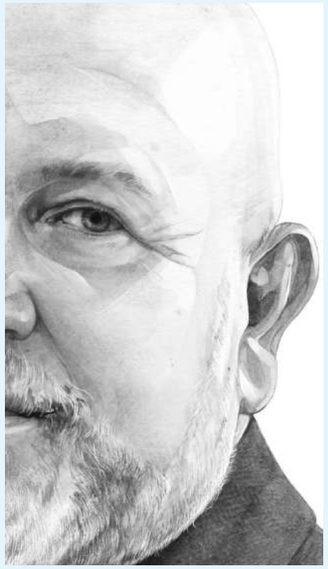
Another major lesson has been that quality services and quality jobs go hand in hand, and for this there needs to be strong occupational health and safety legislation to protect both workers and passengers.

What are the main benefits from investments in public transport in terms of the environment? In terms of job creation? In terms of other areas?

Stephen Cotton: ITF is running a global campaign The Future is Public Transport with C40 cities and other international organisations, including UITP, which calls for public investment because of these multiple benefits.

Public transport is the only real alternative to the private car. Enhancing public transport and designing cities around it could contribute 20-45% of the total emissions reductions required to limit global heating to 1.5°C.

Our joint report launched at COP26 shows that investing in public transport generates 30% more jobs than building roads. Investing in line with climate goals in five cities alone could create over 650,000 new good-quality jobs in those cities. For every job created through investment in public transport, another job is created elsewhere in the same country.



There is huge potential for a global youth employment strategy in public transport as well as increasing women's employment. ITF has an excellent agreement with UITP which outlines measures on how to recruit and retain women in the public transport workforce.

Prior to the health crisis, what kind of momentum had there been for developing modern public transport around the world?

Stephen Cotton: Investment was not yet on the scale required by climate science. A modal shift to public transport was and is still not a substantial part of the national and city level climate action plans of governments. So, transport emissions worldwide are increasing!

For example, in many developing country cities, Bus Rapid Transit (BRT) has been introduced with international financing. These have often not been the win-win solutions promised by the international institutions. All too often, new BRT systems crush the livelihoods of informal transport workers while replacing only a fraction of the jobs lost. We support new modern public transport systems, but workers and unions need to be involved from the beginning of the formalisation process. Their knowledge and skills can shape improvements and make the introduction of new solutions a smoother process.

There needs to be employment impact assessments focusing on the numbers of jobs that will be lost, and the number and quality of jobs that will be created. At an ILO technical meeting on urban transport services last year, this was an agreed conclusion between governments, employers and labour.

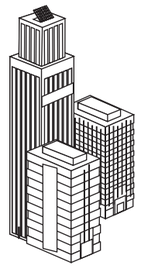
How did public transport's role in lowering cities' (or countries') carbon footprints contribute to this momentum?

Stephen Cotton: Reducing emissions is a major part of transport reforms. There is recognition that public transport is a positive solution to the climate crisis. Often financing for public transport comes from climate funds. However, as I have said before, modal shift is not happening on the scale required. Instead, the dominant discourse now emphasizes electrification. Energy efficiency

PERSPECTIVE

Public transport: investing for a brighter future

By enabling frontline workers to continue to provide healthcare and other essential services, Covid-19 has underlined public transport's crucial role in the community. At the same time, the drop in passenger numbers during the pandemic has further weakened the finances of public transport systems, already undermined by years of underfunding.



68%

of the global population will live in urban areas by 2050

Source: United Nations, 2018

90M

people in Europe have care responsibilities for children

Source: "The Future of Public Transport: Investing in a frontline service for frontline workers", C40 Cities, 2020

20%

of low-income households in the United States don't have access to a car

Source: World Bank, 2020

70 to 90%

is the estimated drop in public transport ridership caused by the pandemic

Source: World Bank, 2020

75%

is the portion of people living in large cities who support investment in public transport as part of Covid-19 recovery plans

Conclusion:

urgent action is needed to boost investment in this vital resource as part of the global recovery.

Public transport networks are the backbone of cities around the world, connecting users with their workplace and with their family and friends, while also providing employment to millions of people. Public transport generates enormous benefits – for the economy, the environment and the community. Access to safe, reliable and affordable public transport is a key public asset and must be included in any equitable, environmentally-responsible recovery plan.

1/ **Public transport's key economic benefits:**

+1 job

created elsewhere for every job created by investing in public transport

Source: "The Future of Public Transport: Investing in a frontline service for frontline workers", C40 report, 2020

30%

more jobs created through investments in public transport versus road construction

5

in potential economic returns generated for every dollar invested in public transport

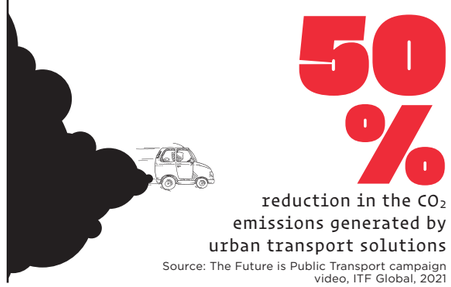
Source: "Want to create 5 million green jobs? Invest in public transport in cities", World Economic Forum, 2021

2/ **Environmental benefits by 2030 of a "green" recovery strategy that includes additional investment in the public transport systems of major cities:**

7.3 M

direct jobs in the public transport sector worldwide

Source: "COVID-19 and Urban Passenger Transport Services", International Labour Organisation, 2020



50%

reduction in the CO_2 emissions generated by urban transport solutions

Source: The Future is Public Transport campaign video, ITF Global, 2021

is very important, but we need the structural change away from private cars to really make a difference to the carbon footprints of cities and countries. Electrification alone will not reduce the environmental impact from transport. And we want the quality of life in cities to improve through greater access to mobility and public space, and less congestion.

We cannot treat the environmental benefits of public transport separately from the wider social benefits. The ITF is advocating for a just transition for workers. In other words, new public transport solutions must guarantee social and employment benefits alongside environmental benefits. Decent work must both drive sustainable transport policies and be a major outcome. For example, we want to see cities and countries create good, green jobs in public transport as a means of driving economic recovery from the pandemic and overcoming the climate challenge. At the same time, sustainability policies must include work and employment outcomes.

What was the effect of the health crisis, accompanying economic slowdown and falling ridership on this momentum?

Stephen Cotton: In most developed countries, there has been emergency funding for public transport. But this is not enough – we need long-term sustainable funding solutions.

I want to use the example of London. The city is facing a major crisis due to a collapse in fare revenue. While the national government has provided a series of short-term bailout packages, if there is no long-term operating grant from national government, then there are going to be cuts to services, cuts to jobs in public transport operations and the supply chain, asset decline, an end to new infrastructure projects and air quality improvements, including electrification.

In developing countries, governments face many more obstacles in supporting their public transport systems due to more stringent macroeconomic constraints. The questions of whether and how to provide emergency relief and/or increased long-term funding for public transport are part of a complex web of policy priorities, of which the most urgent is still to contain the spread of the virus and save lives.

"The modal shift is not happening on the scale required to reduce carbon emissions." Stephen Cotton

Why is it crucial to regain this momentum and what must occur to do so?

Stephen Cotton: It is vitally important to intensify the momentum as part of the recovery from the pandemic and to avoid a climate catastrophe.

But public transport is also crucial for overcoming inequalities. We argue that mobility is a right and public good, providing a service for millions of people who cannot afford their own car. So public transport is vital to overcoming inequalities and creating economic opportunities. It is an enabler of other rights – to education, to work, to healthcare, to a fulfilling life where people are connected to their family and friends. Without good public transport services, our cities are much worse places to live.

And it is a major employer worldwide creating direct and indirect jobs. Globally, 7.3 million workers are employed in public transport services and several million more in the supply chain and informal economy. It could be a major job creating sector, contributing to youth employment and gender equality.

What are some of the specific actions you are calling for?

Stephen Cotton: At COP26, we called for governments to double the share of public transport. By 2030, a mode share of active travel (for example, walking and cycling) and public transport of between 40% and 80% is needed. Governments must immediately set out a path towards delivering it within a year, including the scale of public investment required for a significant commitment to modal shift to public transport.

There must also be advances in decarbonizing public transport: we support electrification but only with a just transition for affected workers.

As the ITF, we are also calling for long-term sustainable funding solutions including funding for formalisation of public transport services and jobs, and democratic participation by workers and passengers in economic decisions and public transport planning.

What are the priority areas for investing in public transport?

Stephen Cotton: As I have already mentioned, there needs to be investment in formalisation of services and jobs, and at the ITF we have strong recommendations on how this transition should take place. But it is vital that there is government investment in this process. We have seen in cities in the Philippines that there has been positive steps towards service contracts with government funding and workers' participation.

From citizen polling, we know that three-quarters of residents in major cities support investment in public transport as part of Covid-19 recovery plans. An immediate priority is to protect existing services and jobs. Workers who have been on the frontline of the pandemic should not have to pay the price through cuts to their terms and conditions, and job losses. ●

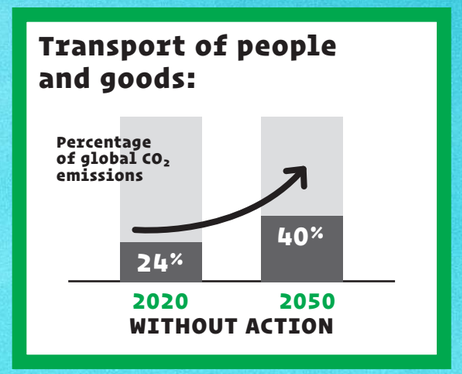
MOBILITY CO_2

AN IRRECONCILABLE DUO?

Not only is the transport sector the world's biggest producer of GHG emissions due to its dependency on fossil fuels, but economic and demographic growth over the last four decades have resulted in a dramatic increase in its carbon footprint.

Six years after the Paris Agreement, has passenger transport at last begun to break this vicious cycle thanks to the energy transition, at a time when demand for mobility is expected to rise? What other levers are available to drive further change? And what role can the various shared modes of transport play?

By ***Tiphaine Clotault***



92%[1]

of mobility still depends on fossil energies

It seems like a long time ago. The Kyoto Protocol in 1997 committed **37** industrialized nations to reduce their greenhouse gas emissions by **5%** over 15 years (compared to 1990 levels). A promise never delivered – mainly due to the huge increase in CO_2 emissions from goods and passenger transport over the same period. Indeed, as long as the sector is largely powered by fossil fuels, how could it be otherwise, without drastic measures? As the UN's Intergovernmental Panel on Climate Change (IPCC) published one alarming report after another, finally in 2015 with COP21 the energy transition of motor vehicles became *a priority* for the international community. The goal is to keep global temperature rise below **2°C** by 2100 and, ideally, below **1.5°C**. The International Energy Agency (IEA) has set a global decarbonization target of over **90%** for transport as a whole by 2050.[2] And an even greater effort will be required from ground mobility to offset the decarbonization of air transport, which won't be complete by 2050.

Since COP21, most developed countries now support the electrification of all modes that can be (cars, urban buses, motorcycles/mopeds, trains). The development of other decarbonized energy carriers, like hydrogen and bioenergy, is well underway. And the sale of new fossil-fuel light vehicles will be phased out from 2025 to 2040 in some **20** countries, while the **27** EU member states plan to ban new sales from 2035. But for now, six years after the Paris Agreement, the results fall a long way short. At global level, the decarbonization trajectory is far from underway. CO_2 emissions from transportation continue to grow at a much faster rate than other sectors – **2.2%** a year for passenger road travel.[3]

CO_2 up

44%[3]

in 20 years from travel by car, bus and two/three-wheelers

The reason transport decarbonization is taking so long to deliver is mainly because countries are prioritizing the technology side of the energy transition. However, rolling out the necessary new technologies will be slow, especially to transform all cars on the world's roads (currently **1.2** billion), which account for three-quarters of transport emissions in cities. In its Net Zero by 2050 report published in May 2021, the IEA predicts **20%** of cars will be electric by 2030 (compared to **1%** today). So, until then, we shouldn't expect a significant impact in terms of CO_2. What's more, electric cars generate more carbon emissions during their manufacture than conventional vehicles, so their footprint only becomes positive after a certain time on the road.

The second promising technological lever in the short term is the higher efficiency of current combustion engines, which translates into better fuel consumption. But recent results (**-0.7%** in 2017) fall short of targets (**-3.7%** a year) and far behind the progress made from 2005 to 2016. The reason is the huge popularity of SUVs, which now account for **40%** of the global new car market.

This failure to rapidly decarbonize also betrays the root cause of the spiralling CO_2 emissions generated by the sector in the last 40 years – the ever greater speed of our vehicles and, with it, the ever greater distances travelled. Yet, demand for passenger transportation will continue to grow. It's set to increase by a factor of **2.3** by 2050 (from 2015 levels). According to the ITF Transport Outlook 2021, this figure "reflects the uncertain path of recovery after the Covid-19 pandemic". It suggests stronger action is needed to break the vicious cycle between rising demand and surging emissions. But so far, few countries have stepped up to the challenge.

Decarbonizing mobility: what does it mean?

REALITY TODAY:

Transport of people and goods = **24%** of global CO_2 emissions (of which **10%** is road travel).

Up **2.2%** a year for road passenger transport.

PROJECTION TO 2050 WITH NO ACTION:

X 2.6 demand for urban passenger transport.
X 2.1 on intercity and regional routes.
= **60%** more CO_2 – equivalent to **40%** of global carbon footprint in 2050.

2050 TARGET: net zero carbon emissions

What does that mean?
The amount of CO_2 emitted by transportation doesn't exceed the amount naturally absorbed by the atmosphere.

How can we achieve it?
Reduce CO_2 emissions globally by nearly **90%** (compared to 2020)

+

Offset the rest with carbon capture solutions

=

DECARBONIZATION

*NO TO VEGETABLES WHICH TRAVEL MORE THAN ME

5 AREAS FOR ACTION:

1. Reduced demand for transportation

2. Modal shift

3. Increased occupancy rates

4. Better vehicle fuel efficiency = lower energy consumption

5. Decarbonization of energy **= Substitute oil and gas with energy carriers that don't emit CO_2 when driving or that are low carbon:**
- Electrification
- Carbon-free hydrogen
- Biofuels
- Biogas

2050 target:
a nearly 90% decarbonized transport energy mix:

24.2%[4]

of buses in the European Union already powered by electricity.

In contrast to this initial, rather gloomy assessment, shared modes of daily transport are a shining example of the energy transition in motion. By late 2020, bus electrification had reached **2%** worldwide, with the EU leading the charge with **22.1%** of buses running on battery power and **2.1%** on hydrogen fuel cells. Two main factors are driving this encouraging trend. First, fleets are replaced more quickly than private cars. And second, cities are really stepping up their efforts, backed by increasingly stringent domestic legislation to decarbonize heavy road transport. In dense urban areas, electrified rail systems have also been expanding rapidly since 2010 (**3.5%** more track miles a year). In addition, **46** more cities now have a metro, **34** of them in Asia and **65** more now have a tram system, **28** in Europe. And while more costly, the construction of high-speed lines is helping drive the modal shift over long-distance routes. This is the strategy in China, which has built a **24,000** km (≈ **15,000** mi) network in just 10 years. It's also how India is connecting its main cities, with the first high-speed link (Mumbai–Ahmedabad) scheduled to start operating in 2028.

From 2040, the IEA estimates electricity will become the dominant energy source for passenger mobility. Why the enthusiasm for it? Electricity offers three benefits. First, we can produce it by decarbonized processes

1. International Energy Agency (IEA).
2. IEA report: "Net Zero by 2050 — A Roadmap for the Global Energy Sector" (May 2021).
3. IEA, "Transport Sector CO_2 Emissions by Mode in the Sustainable Development Scenario, 2000–2020".
4. European Bank for Reconstruction and Development (EBRD) report "Going electric — A pathway to zero-emission buses" (June 2021).

(renewables, nuclear). Second, it doesn't emit any CO_2 while driving. And third, it's more energy efficient than petrol to power a car. But as an energy carrier, is it totally virtuous? No, not yet, because **61%** of the world's electricity still comes from fossil fuels – including coal, which is the main contributor to climate change. So, at the heart of the energy transition in transportation there's also a huge challenge to accelerate the use of wind and solar. And here, cities and transport operators have a pivotal role to play in support of national electricity decarbonization strategies. The International Association of Public Transport (UITP) recently called for such initiatives to be extended more widely, citing the bus networks in Fujian Province, China, and Madrid, Spain, as examples, as well as the Delhi Metro in India, which use their own solar photovoltaic systems to meet all or part of their electricity requirements.[5]

Just

30%[6]

of countries in the Paris Agreement are integrating public transport development into their strategies.

But will the energy transition alone be enough to achieve carbon neutrality by 2050? No, say the ITF and IEA in their latest reports on transport decarbonization. The International Transport Forum has stated: "Even if today's commitments are fully met, CO_2 emissions from transport will increase nearly **16%** by 2050. The expected emissions reductions will in fact be more than offset by the rise in demand for transport". The International Energy Agency says, "the sector is in a critical state of transition. Existing energy efficiency and consumption reduction measures must be strengthened and expanded in the next 10 years. Any delay in decarbonization would mean even stricter and more costly measures will be needed".

In light of this, alongside the technological levers, it's vitally important to encourage more restraint in our mobility. This starts with cities, which due to their scale (**50%** of the global population) and huge carbon footprint (**70%** of annual emissions) makes them the obvious place to achieve rapid results. According to the ITF, limiting car use through a massive modal shift to shared mobility is the most effective way to meet rising demand for transportation. The direct impact of public transport on the decarbonization of cities was modelled by New York in 2009, which stated at the time it would have emitted **30%** more CO_2 (or **18** million tonnes a year) without the services of the Metropolitan Transportation Authority.

Having a solid ecosystem of shared modes of transport is also a prerequisite for the second stage – namely, further stepping up decarbonization by developing active mobility (walking, cycling, etc.). In a 2017 joint study, McKinsey and the C40 Cities Climate Leadership Group estimated that, depending on their local specifics, cities will need to achieve a combined modal share for public transport/cycling/walking of **40** to **80%** by 2030 to meet the Paris Agreement target. To make this happen, the ITF believes this modal shift must be backed by a policy of restricting car access to urban centres. Before introducing congestion charging in 2005, for example, London deployed **300** extra buses in the charging zone. Even in suburban and rural areas and for regional travel, where decarbonization is primarily based on the energy transition of vehicles, the ITF urges an unrelenting effort to reduce car use, with initiatives like carbon levies and carsharing/carpooling services.

54%[7]

of people think that to combat climate change a lifestyle change will be needed.

If this arsenal of measures isn't enough, there's still a final lever: travel less and forego all unnecessary motorized trips. A recent opinion survey by Ipsos for EDF in **30** countries with the highest CO_2 emissions showed, however, that transport restrictions (limited access to city centres, congestion charging, etc.) are by far the least popular public policies.

Fortunately, not all of them will necessarily be so restrictive. Current thinking in favour of urban development on a more compact scale is a step in this direction, since it effectively reduces everyday travel distances. And while its possible long-term negative externalities have yet to be gauged, home working is one adjustment many of the largest employers have begun to make, as far as jobs allow, helping reduce their carbon footprint. Six years after the Paris Agreement, all scenarios currently re-evaluating decarbonization trajectories to 2050 agree on one thing: to make do with available resources, the world won't be able to do without energy saving measures, even if they're decarbonized or renewable energies. ●

WHICH COUNTRIES ARE ALREADY ACTING?

Fighting climate change is on the agenda for the 196 countries committed to make their "national contribution" as part of the 2015 Paris Agreement.

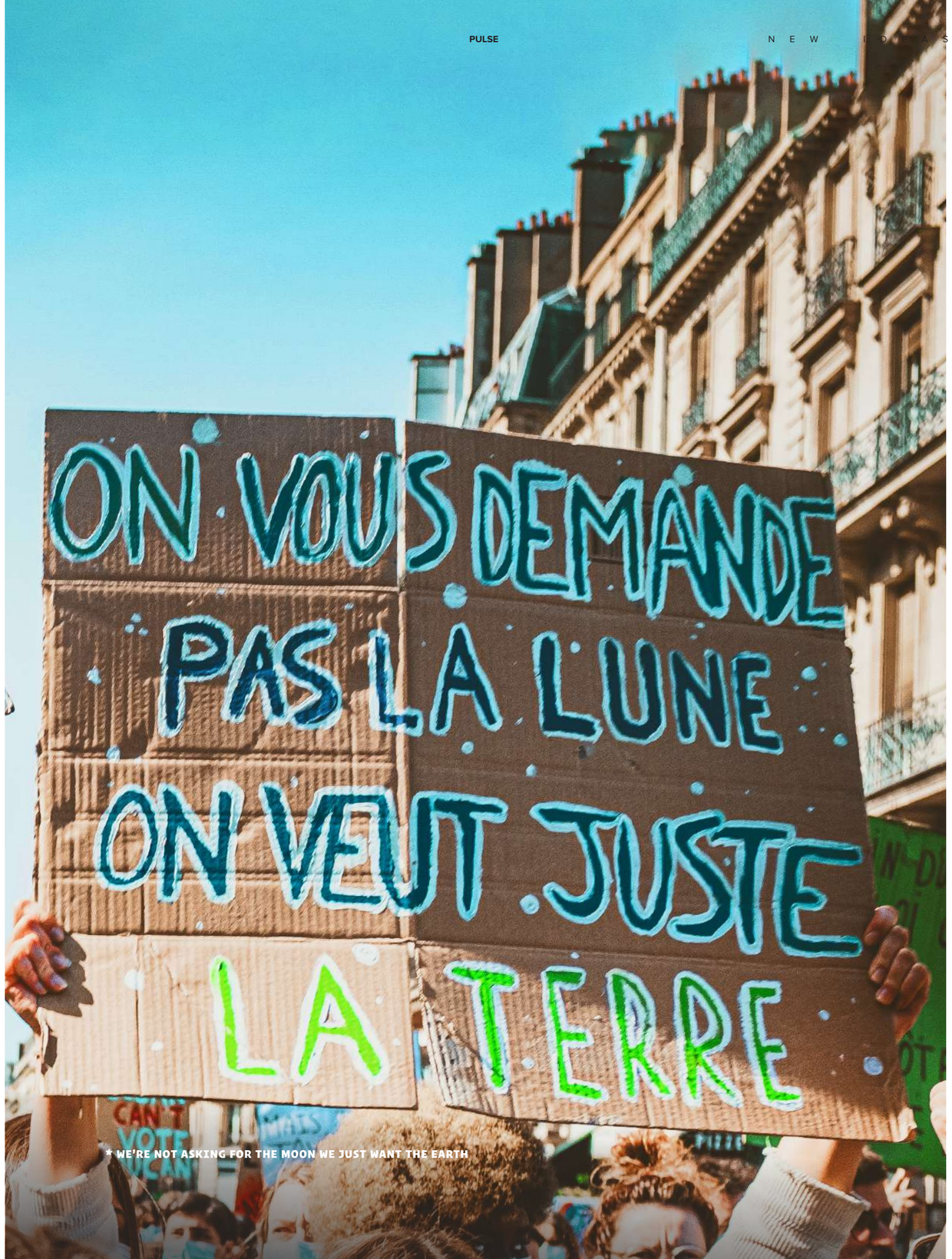
But few have adopted concrete targets for reducing carbon emissions from transportation:

97%
of these countries **mention** it as a line of action.

81%
have announced **measures.**

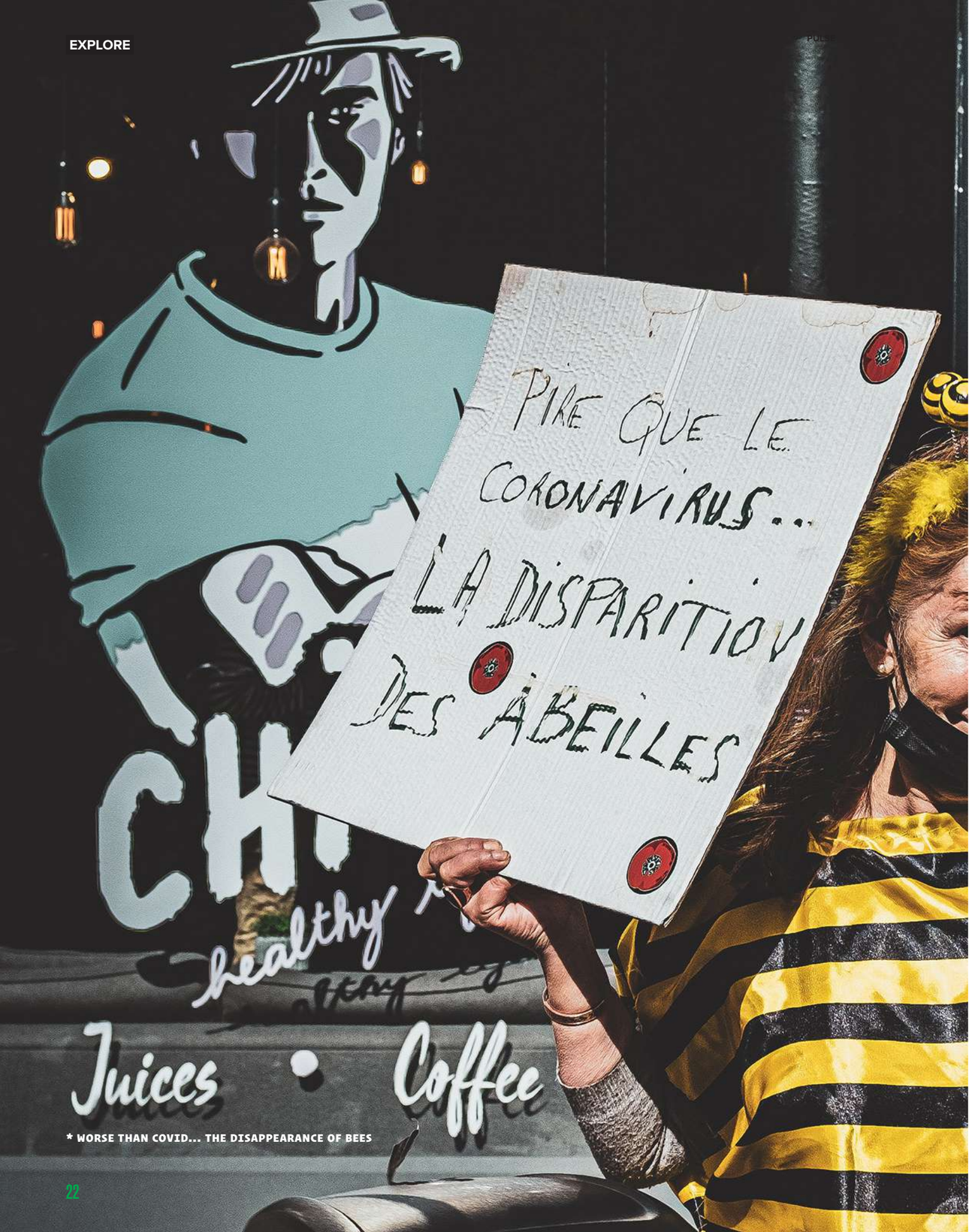
16%
have set actual **targets.**

Sources: International Energy Agency (IEA) reports: "Tracking Transport 2021" (November 2021) and "Net Zero by 2050 – A Roadmap for the Global Energy Sector" (May 2021). International Transport Forum (ITF) report: "ITF Transport Outlook 2021" (October 2021) and "Transport NDC Tracker".



* WE'RE NOT ASKING FOR THE MOON WE JUST WANT THE EARTH

5. International Association of Public Transport (UITP) publication: "A smooth ride to renewable energy: "7 actions for public transport to address emissions and air pollution by advancing renewables" (November 2021), in collaboration with REN21.
6. UITP at COP26 (November 2021).
7. Obs'COP 2020, Barometer of public opinion on climate change perception in 30 countries, Ipsos-EDF.



* WORSE THAN COVID... THE DISAPPEARANCE OF BEES

INTERVIEW

Interview

AURÉLIEN BIGO

"DECARBONIZATION IS PAVED WITH AVOIDABLE RISKS."

What lessons can we learn from public policies to decarbonize passenger mobility in France? What will be the contribution of the five levers we can act on between now and 2050? Aurélien Bigo, researcher in the field of energy transition in transportation, shares his thoughts, based on his study of the various scenarios.

Vehicle electrification will take time to generate a tangible decrease in CO_2. What can we reasonably expect?

Aurélien Bigo: All medium and long-term scenarios show electrification of mobility will significantly reduce exhaust CO_2 emissions. However, technology won't be enough to decarbonize transportation. And to focus on technology alone would actually undermine the broader decarbonization effort. Transport needs to undergo a much more comprehensive transformation and apply the other levers at our disposal: reduce demand for transportation, make the modal shift, improve vehicle occupancy rates – by expanding carpooling/carsharing services for example – and pursue other ways to improve vehicle efficiency like lower weight and speed. If countries are already so far behind in their short-term decarbonization targets, it's precisely because their public policies don't focus enough on efforts to encourage what I call "sobriety" – i.e. efficiency and moderation or restraint in our mobility aspirations.

How much carbon reduction could potentially be achieved by these measures to encourage efficiency and moderation?

A. B.: Together, they could effectively halve carbon emissions from transportation, compared to the "business-as-usual" scenario, thanks to an equivalent reduction in energy consumption. This would also help spur the energy transition in transport, because the less energy you have to decarbonize, the easier it'll be to use decarbonized energies. Compared to electrification, which mainly acts on CO_2 emissions, moderation or restraint also has side benefits for the environment and helps reduce other transport-related negatives, like urban congestion, lack of physical activity, road traffic accident rates and preservation of raw material resources. However, as you can see, the interactions between the various levers, whether technology or more moderate mobility, are hugely important. To succeed, we need to apply all these levers in a concerted effort.

What would be the risks of a piecemeal approach?

A. B.: The results achieved would be cancelled out or greatly diminished by the negative externalities and potential rebound effects. For example, electrifying cars without incentivizing motorists to buy more lightweight models is counterproductive. This is a major risk today. The CO_2 saved when driving is partly lost by the larger carbon footprint when making the higher-capacity batteries needed. Developing new shared mobility solutions to encourage modal shift without simultaneously acting to reduce overall demand for carbon-based transport doesn't make any sense either. Continued suburban development, even around train stations, will likely create rebound effects. Who's to say that the new residents in those areas will use public transport? And if nothing's done to reduce car use, there won't be any modal shift.

What might a "balanced" public policy to decarbonize everyday transport look like?

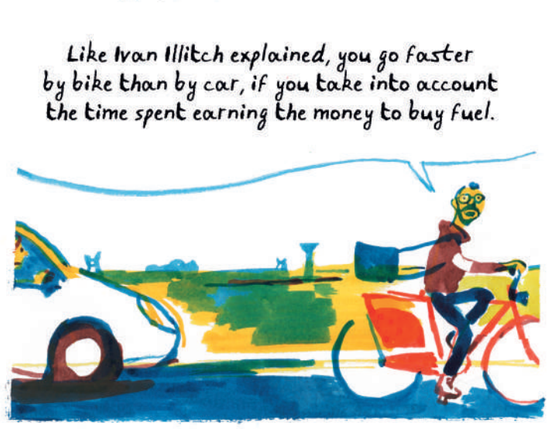
A. B.: There's no one-size-fits-all scenario. Solutions need to be tailored to each geography and combine technology and "sobriety", or moderation/restraint. But the priority must always be to curb the increase in distances and speeds of travel and promote sustainable forms of mobility and shared, decarbonized transport, because there's an historic causal link between rising demand for motorized transport and the increase in carbon emissions from the sector. New urban planning practices like the "15-minute city" can help spur progress in this direction. In the future, the rebalancing of populations from major metropolises to small and medium-sized towns/cities is an issue countries will undoubtedly need to address. Industry will also have a role in developing new vehicles midway between a bicycle and car – like two seater electric cars, velomobiles and speedelecs – and really aligning them with people's actual needs. ●

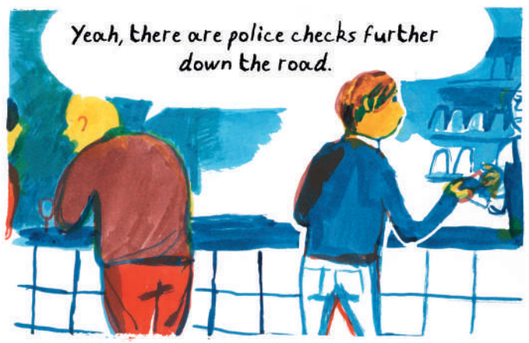
AURÉLIEN BIGO is a researcher specializing in transport decarbonization. He's associated with the Energy and Prosperity Chair, created in 2015 to help public and private-sector players in France make more informed decisions as they navigate the energy transition. His PhD thesis was on "Transport and the challenge of energy transition: explorations between past and future, technology and sobriety, acceleration and deceleration". He also contributed to a set of forward-looking scenarios entitled "Transition(s) 2050", published by ADEME, the French environment and energy management agency, in late 2021.

WHAT IF CARBON FOOTPRINT WERE THE NEW CURRENCY?

By Benoît Guillaume

Like Ivan Illitch explained, you go faster by bike than by car, if you take into account the time spent earning the money to buy fuel.






18 eco-points
BIP
Move on please!
Oh no, my eco-points credit is going down really fast!
You have a credit of:
17.8 eco-points
HOW TO GET MORE CREDIT
Join
GREEN FOREST PROJECT
> earn eco rewards <
Greenfoot
Everyday hikers
Other options


I feel on top of the world!
Here we are.
HOTEL
I've booked a single room.
We weren't expecting you this early.
I'm surprised myself! I feel like I've crossed a time zone,
but with none of the negative effects, for once!
Can I use my new credits to pay?
That's what they're for! I just need to convert them...
So, a single room... Would you like breakfast?
Sure, if I've got enough credit!

THE ROAD TO UNIVERSAL ACCESSIBILITY

In the world of mobility, accessibility is an ongoing issue and its scope continues to expand.

_____ In the past, it was exclusively focused on people with disabilities. Today however, it's much more inclusive. Everyone should have access to all facilities and services. We now talk about "universal accessibility". This applies to everyone with a vulnerability, whether visible or unseen, permanent or temporary at some point in their lives – a pregnant woman, an elderly person, someone reliant on a stick or crutches, a tourist with suitcases, an office worker with stress, or a parent with a baby in a pushchair.

These and other vulnerabilities can affect each of us for around 11% of our lives.

_____ This paradigm shift and the broadening of the notion of accessibility is happening at varying rates from one city or country to the next. That said, one thing is for sure: universal access to mobility is shaping the design of transport networks, guiding research and innovation in mobility and inspiring local authorities around the world. We look at a range of initiatives that are delivering results.

*By **Adeline Tissier***
*Illustrations: **Sebastian Schwamm***

Tours / 🇫🇷
Inclusive mobility

A holistic approach to accessibility

In Tours, an ambitious accessibility plan has been introduced on the ***"Fil bleu"*** public transport network. ***All buses*** and ***83%*** of bus stops are now accessible to people with reduced mobility. Visual and audio information, equipment and ticket/information offices are adapted for vision-impaired, hearing-impaired and illiterate people. Staff have received training in invisible disabilities. And a personalised door-to-door service called ***"Fil blanc"*** offers transportation in adapted vehicles for anyone with an ***80%*** disability card or who simply uses crutches. ●

Lyon / 🇫🇷
Reducing cognitive stress

Soothing shades of blue

In October 2021, the ***"Ligne bleue"*** (blue line) service was introduced in Lyon to offer a calmer travel environment for neuroatypical people, such as people with autism. Blue is recognized as a soothing colour by these communities and is therefore used throughout the network. Signage is suitably adapted, pictograms are easy to follow and text is simplified. Journeys are also made more stress-free by an ***"inclusive ticket holder"*** with three slots: ticket currently in use, next tickets and used tickets.

If needed, passengers can also ask to be accompanied by a member of staff to help familiarise themselves with the system and build their confidence. ●

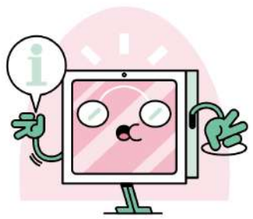
Takanawa / 🇯🇵

Robotics and accessibility

Robots to the rescue

Japan is often held up as an example for its innovative approach to universal accessibility. And since it's also the land of robots, service robotics is now part of the picture.

Last year, ***Takanawa*** train station in the Tokyo suburbs introduced autonomous wheelchairs to carry people with reduced mobility to their destination points. ***Six types of robots*** handle tasks such as guiding passengers, cleaning the station and performing security duties. They're also programmed to provide help for visually impaired people. Multilingual digital signage devices are available to help anyone who needs assistance or information. ●



Paris / 🇫🇷

Support for the deaf and hard-of-hearing

Information service in sign language

In Paris, the Pam75 public transport service for the disabled helps deaf and hard-of-hearing travellers plan their trips with peace of mind, thanks to a dedicated information service called ***Elioz***. This connected platform lets users interact directly from a computer, tablet or smartphone with a remote adviser in French sign language or cued speech, or via real-time speech transcription. This innovative service is also available in Lyon, Aix-en-Provence, Lille, Rennes, Tours, Bordeaux and Caen. ●

New York / 🇺🇸

Personalised wayfinding system

Follow (listen to) the guide

Evelity, the first indoor GPS for smartphones, is designed to help users navigate complex interior spaces, such as museums, airports and metro stations. "Take the escalator to the next floor, turn right, cross the tactile paving…"

After Lyon, Lille and Paris, this service will now be tested in two New York subway stations. It's aimed primarily at all users with disabilities or cognitive impairments, with versions of its interface ***tailored to each specific use case.*** It's also designed for parents with a pushchair or tourists with suitcases, helping take the stress out of journeys in new and unfamiliar places. ●

Montréal / 🇨🇦

Disabilities and reduced mobility

Metro for all

For the last 10 years, the ***Société de Transport de Montréal*** (STM) has been pursuing the goal of universal accessibility across its metro network. ***Major investments*** include installation of new elevators, motorised butterfly doors and tactile paving, as well as staff training, upgraded ticket sales systems and improved passenger information and signage. As of 2018, seats are more ergonomic, doors are wider and trains have height-adjustable suspension to match varying platform levels. All cars have spaces reserved for wheelchairs and the audio information system is now automated. ●

France / 🇫🇷

Peer-to-peer rental of adapted vehicles

Wheeliz for less-reduced mobility

In France, ***Wheeliz*** is the first website for the rental of adapted vehicles between individuals with reduced mobility. This ***collaborative platform*** is where supply and demand meet by enabling people with disabilities to search and book vehicles adapted to their needs (thanks to features like wheelchair ramps or modified driving systems) from owners who make their vehicle available for hire for a limited period. The platform already features more than 10,000 users and 1,500 adapted vehicle owners. ●

Barcelona / 🇪🇸

Voice guidance for the visually impaired

Walk, tag remotely, discover…

NaviLens is an image recognition technology based on the same principle as a QR code, but much easier to tag. It's designed to ***"detect"*** a coded panel, without needing to be near it. Simply walk with your smartphone pointing up. The app tags the NaviLens code and communicates the information to the user.

In Barcelona, Madrid, Cartagena and Versailles, NaviLens is providing guidance for blind and visually impaired people as they make their journeys. The app is available in ***33 languages*** and is helping make cities more inclusive and accessible. ●

STAR of the desert

A transport system serving one of the world's fastest growing cities. A network seamlessly integrated with other modes of transport. A showcase for innovative technologies and an accelerator of green mobility. 🇦🇪 Dubai's transport network is all of these and more. H.E Mattar Mohammed Al Tayer, Director General Chairman of the Board of Executive Directors of the Roads and Transport Authority & Commissioner General for Infrastructure, Urban Planning and Well-Being, talks about the network — and relations with its new operator, Keolis.

By ***William Mengebier***

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In October 2021, Expo 2020 finally opened to the public in Dubai, after a year of being postponed due to the Covid-19 pandemic. Visitors could be assured of a timely arrival at the gates of the exhibition aboard the brand new Route 2020 on Dubai's state-of-the-art driverless metro system, managed by **Keolis-MHI**.

Close attention to the project's management ensured a smooth opening for the new line section. ***"New stations were added along the network's Red Line without affecting business continuity, and operations were successfully transferred from the previous operator to Keolis-MHI in September 2021 without disrupting Expo 2020,"*** says H.E Mattar Mohammed Al Tayer, Director General and Chairman of the Board of Executive Directors for Dubai Roads and Transit Authority (**RTA**).

Just in time to start moving the estimated **15** million visitors expected over the Expo's six-month duration.

PLANNING FOR GROWTH

It's all part of a continuing success story for a public transport network that serves Dubai's **3** million inhabitants and more than 16 million tourists annually.

Since its establishment in 2006, the **RTA** has worked to develop the network, which today extends to marine, road and rail transport modes, including **1,700** public buses, **10,000** taxis, **54** metro stations (including **7** stations on Route 2020), and **11** tram stations.

The system's scale isn't just happenstance. To forecast the potential number of commuters using the network's multiple transportation platforms, the **RTA** invested in sophisticated strategic transport modeling software. Data was collected on expected population, employment, real estate developments, travel behaviour and socio-economics for the upcoming 20 years. Rail facilities and infrastructure, including rolling stock and stations were designed based on the projected results.

Today, the integrated network connects all strategic and central business districts throughout the Emirate and is designed to provide accessibility to all, including those with special needs referred to in UAE as "People of Determination". Concessional fares and seasonal tariffs are provided to commuters based on eligibility.

"The public transport network in Dubai has become an essential backbone in serving the mobility and access needs of people across the Emirate," says Mattar Mohammed Al Tayer. ***"Our roads and transportation systems underpin the framework of the city and support its growth and development, further enhancing its competitiveness."***

INNOVATION SHOWCASE

Modern and sophisticated, the Metro has been essential in supporting the thriving economy of Dubai. The world's longest driverless metro system features an array of notable technologies, including:

- a third-generation driverless train control system with enhanced performance and reliability;
- smart fare gates with 3D cameras that control closing for enhanced safety and passenger flow;
- a remote monitoring system to aid maintenance prediction;
- enhanced security and intrusion detection using high resolution cameras and laser technology detection sensors.

The system also integrates digital technologies to offer the latest generation Wi-Fi service on board the train and in Route 2020 stations

star_abeer

to provide seamless connectivity. Digital platform information displays on top of platform screen doors provide improved visibility and flexibility while also generating revenues through advertisements.

In addition, passengers on board the trains can consult dynamic digital line maps and video broadcasting system displays for passenger information and ads. Drivers parking their cars at metro facilities can enter more quickly thanks to cameras equipped with automatic vehicle plate number recognition.

MULTIPLE BENEFITS

The success of the Metro Red Line since its inauguration in 2009 has triggered a paradigm shift in local perception of public transport as an efficient, safe and seamless mode of transport used by all. The public's embrace of the system is reflected in the steady rise in ridership, which has tripled from **6%** in 2006 to **18%** in 2019, continuing to progress towards a 2030 target of **26%**.

This translates into an average of more than a half million passengers who use the system for their daily commute.

Further evidence of the system's popularity can be seen in the interest shown by real estate developers and investors who have integrated future metro extensions into their development planning. The Dubai Metro has contributed to the appreciation of some commercial properties around the metro stations, which have increased in value from **14** to **36%.**

The benefits are not limited to the metro. The Dubai Tram, inaugurated in 2014, has further enhanced metro ridership and connectivity, extending the metro's reach to dense urban areas where the large-scale footprint of metro stations cannot be accommodated. The metro and tram's guided transit systems ensure punctuality, giving riders confidence in the reliability of the overall travel time.

Not least of the system's benefits is its contribution to the achievement of Dubai's low carbon objectives as commuters switch from cars to public transit. Through mid-2021, the metro has helped reduce carbon emissions since the start of its operation in 2009 by **2.87** million metric tons. Building on this progress, Dubai announced in 2021 its ambition to achieve carbon neutral public transport by 2050. Along with renewable energies and a circular economy – notably to preserve water resources – the development of electrified public transport is the mainstay of a strategy to accelerate the city's conversion to green growth.

OPERATING SUCCESS STORY

Operating the modern and sophisticated Dubai Metro system requires a specialized team. Much of its equipment is supplied by original manufacturers based overseas, which lengthens the supply chain, increasing the criticality of maintenance planning. **"Thanks to the knowledge and experience of [RTA]'s team, we have managed to turn the challenges into opportunities by maintaining optimum performance levels and safe jour-**

sazikinivan

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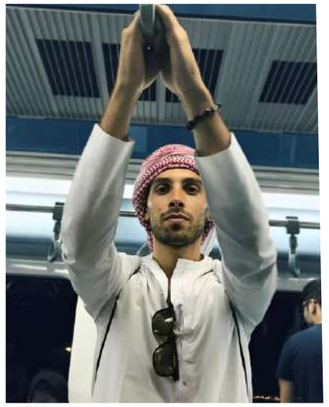

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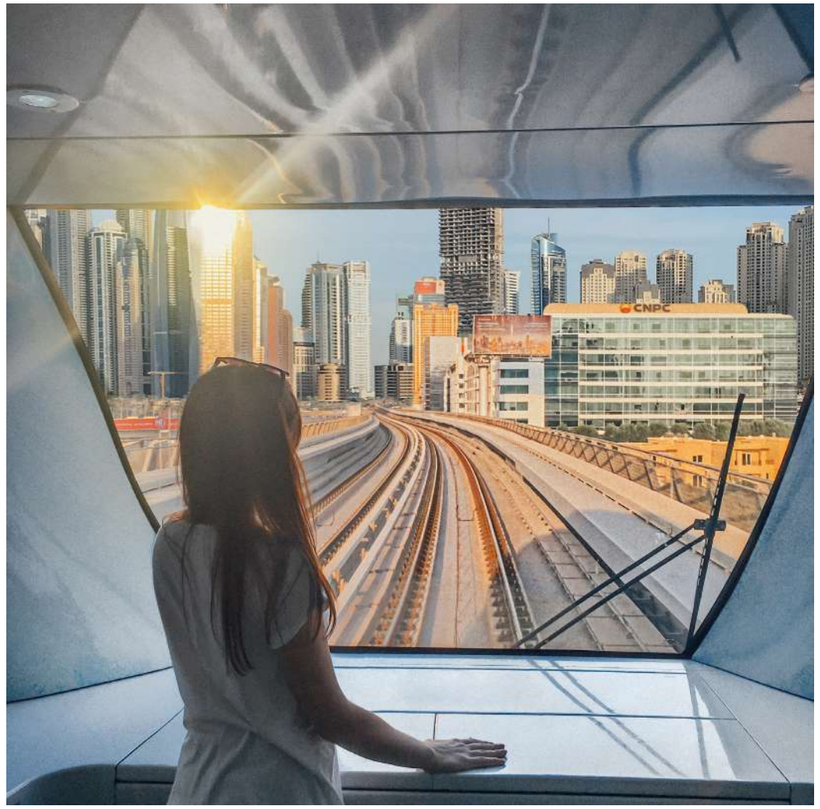

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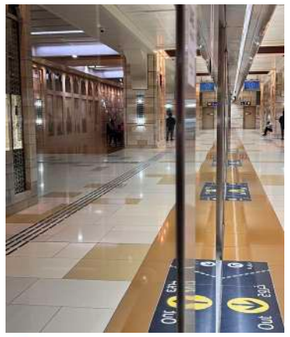

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neys," says Mattar Mohammed Al Tayer. "**This in turn has attracted investments through naming rights and contributed to increased ridership.**"

Communicating with the public has also been a key factor in growing ridership and improving service. Since the metro's launch in 2009, social media marketing and public relations campaigns have marked milestones such as station openings, journey pricing, discounts and connectivity improvements. Integration, smooth journeys, safety and reliability are the key focus areas of all communications.

During the pandemic, the **RTA** communications team played a crucial role in planning and communicating pivotal preventive measures, focused on three elements: protecting the health of all employees through the provision of a safe working environment; ensuring the safety of all facilities and transit means to ensure the continuity of services; and supporting the Dubai government's efforts to tackle Covid-19 outbreaks.

This year, **RTA's** communications have sought to reassure commuters it is working to ensure that international best practices for safety are being implemented to protect public health. Initiatives have been communicated to Dubai and UAE residents through press releases, videos and social media.

On September 8, 2021, **Keolis** took over the responsibility for managing the operations and maintenance of Dubai's driverless metro, as well as operations of the tram network, under a 15-year contract. A service agreement forms the basis of the relationship between **RTA** and **Keolis-MHI** and stipulates the communications and governance processes to be used on a periodic and day-to-day basis.

"**Together, the partners are continuing to encourage the growth of public transport through this laboratory of sustainable mobility.**" says Marie-Ange Debon, Keolis Chairwoman and CEO. "**We are proud to have been chosen by the RTA to operate and maintain Dubai's world-renowned public transport network and are committed to ensuring its continued success.**"

CENTRE STAGE AT EXPO 2020

The focus on planning, operations and communications has helped make the system a central showcase of Expo 2020. The **seven** new stations of Route 2020 received **LEED Gold Certification**, reflecting the selection of the best locations for the stations and the implementation of strategies for cutting consumption of power and water, curbing carbon emissions, use of environmentally-friendly recyclable building materials and reducing construction waste.

RTA also introduced free bus rides to transport visitors to Expo 2020 Dubai aboard 203 Expo Riders buses, operating from **18** stations, nine of them in Dubai. Two additional routes bring visitors directly from Dubai hotels to the Expo site.

The Expo 2020 transit service features top-quality buses that meet the highest safety and luxury standards, with comfortable seats and compatibility with Euro 6 low-carbon emissions limits, the first of their kind in the Middle East and North African region. Buses have low floors for easy boarding and disembarkation making them accessible to people of determination.

Mattar Mohammed Al Tayer comments: "**By deploying these high-quality buses with wide geographical coverage, RTA seeks to make mass transit the ideal choice of mobility for Expo visitors.**"

To further respond to visitors' mobility needs, taxis are automatically dispatched to the Expo 2020 Dubai site based on passenger demand. Through an innovative digital solution, the ride hailing service is able to know exactly how many taxis are needed at any given time using AI and Big Data technologies to automatically dispatch taxis to the Expo site. The increased taxi fleet enables the service to optimally balance supply and demand, making it more convenient for riders traveling to and from the Expo grounds. ●

EFFECTIVE RESPONSES TO SECURITY ON PUBLIC TRANSPORT

In addition to dealing with general public safety issues, public transport networks face specific kinds of anti-social behaviour, such as passengers flouting rules and regulations and everyday tensions that can arise in shared public spaces. To tackle these challenges, French public transport authorities and operators are strengthening their strategies through a threefold prevention-deterrence-fare enforcement approach. *Pulse* reviews the most effective levers available.

By ***Tiphaine Clotault***
Illustrations: ***Lucia Pham***

In France, recent data (from 2019 to 2021) points to a significant drop in pickpocketing and non-theft related physical assault. At the same time, however, robbery using violence, intimidation or threats is on the rise. The French rail and public transport union (UTP) has reported an increase in fare evasion, the carrying of illegal weapons and the emergence of train, bus or tram 'surfing' – riding either on the side, rear or roof of vehicles – which not only puts people's lives at risk but also seriously disrupts traffic. The Covid-19 pandemic and the protective measures introduced to prevent the spread of the virus have also exacerbated tensions and aggressive behaviour among passengers and towards staff.

QUANTITATIVE INDICATORS FOR COORDINATING EFFORTS

This is a tricky issue because there's a high risk of either reading too much into serious but isolated incidents, or overlooking antisocial behaviour (ASB) that creates a feeling of lack of safety among passengers. A prerequisite to effectively tracking and determining actual rates of crime and antisocial behaviour is to compare data from all available sources. In France, this means collecting data from network operators, the police authorities and public surveys on perceptions of safety and fear of crime on public transport. ***"The other imperative is to enable operators to all speak the same language. This calls for a specific classification of crimes committed on public transport that covers the entire spectrum – from antisocial behaviour to the most serious offences,"*** explains Fabrice Fussy, head of the government observatory for crime on public transport (ONDT) set up by the Ministry of Transport. ***"In France, the ONDT has established a national classification comprising four main categories and 27 types of offences, which is now available to transport operators."***

QUALITATIVE DATA TO HELP PASSENGERS FEEL SAFER

In recent years, 'exploratory walks', led by groups of women or diverse customer panels, have emerged as an effective way of improving situational crime prevention. These walks allow people to identify facilities that make them feel safer including lighting, video surveillance, urban equipment and overall cleanliness. Used extensively in Lyon and Lille, this form of 'dynamic assessment', which relies on the involvement of volunteers from the public, has also sped up the rollout of on-demand stops for buses that operate in the evening, where such needs exist. Introduced by 12 Keolis networks in 2021, this service reduces the distance passengers have to walk to reach their final destination.

CCTV CAMERAS: ANOTHER EFFECTIVE DETERRENT

In addition to helping the police identify criminals recorded with cameras, video surveillance is increasingly deployed for crime prevention, thanks to 'virtual patrollers' trained to detect suspicious behaviour on control room monitors.

Source: Sentiment d'insécurité dans les transports collectifs franciliens – Feeling unsafe on public transport in the Paris region – Survey, 2019, L'Institut Paris Region).
2. Source: Victimation et sentiment d'insécurité en Ile-de-France – Crime and perceptions of safety on public transport – Survey, 2021, L'Institut Paris Region

INSIGHTS

"One of our key roles is to enable transport operators to measure and monitor crime and antisocial behaviour on their networks and compare data with other networks either of a similar kind or close geographically. Thanks to a tool called ISIS developed by the Ministry of Transport, we can now collect data from around 20 operators, particularly those in France's large metropolitan areas, which meet around 40% of the country's shared mobility needs. Our aim is to be as exhaustive as possible, especially by integrating data from other urban networks as well as intercity networks and school services. Not all of these operators have the resources to collect information about incidents, so at the end of 2022 we'll launch a new tool that will enable their staff to report crime and antisocial behaviour directly via a smartphone. Another of the ONDT's tasks is to raise awareness of these issues through studies on specific topics. For example, we recently produced our first report on sexual assaults and harassment on public transport. In addition, we provide network operators with guidelines for implementing concrete preventive action."

Fabrice Fussy,
head of the government observatory for crime on public transport (ONDT).

Transport safety
is the focus of the 7th International Conference on Crime Observation and Criminal Analysis, to be held in October 2022 in Paris, and organised jointly by the French Ministry of Transport (through its ONDT observatory), the International Centre for the Prevention of Crime (CIPC), the International Union of Railways (UIC) and the International Association of Public Transport (UITP).

The four most effective preventive measures
according to daily commuters (out of six proposals) are: the presence of operators' own security guards (59% of respondents), a police presence (45%), video surveillance (33%) and on-demand stops for evening/night buses (21%).[1]

Providing body-worn cameras (BWCs) for operators' accredited security staff is another effective tool to help protect against verbal and physical assault. BWCs have been deployed to great effect by French national rail network SNCF, helping to defuse potentially conflictual situations between staff and the public. As a result, sick leave due to physical assault on staff wearing a BWC dropped by ***27%*** in 2021 compared to 2020, while there was only an ***8%*** decline for staff without them.

LOCALLY ADAPTED PREVENTION STRATEGIES

In France, public transport operators work within the scope of local partnerships governed by local safety and crime-prevention contracts, which are overseen by each municipal authority. Preventive actions are therefore tailored to local specifics. This notably includes the deployment of "mediators" who form a visible presence on and around public transport to make passengers feel safer and who can intervene to ease tensions caused by antisocial behaviour, like playing loud music, smoking and fare evasion. Preventive actions are also conducted in schools and sports clubs, helping to promote better behaviour on transport networks.

OPERATIONAL PARTNERSHIPS WITH POLICE AUTHORITIES

Improving safety on public transport also entails strengthening partnerships between operators and the police authorities. Keolis takes a proactive stance through formal agreements that effectively structure collaborative efforts, such as sharing information and video surveillance footage in real time between transport operator and police control rooms and organising regular joint operations. For example, a threefold increase in one year in the number of agreements between the Bordeaux Métropole network and the municipal police force led to ***67%*** more joint operations in 2021. ●

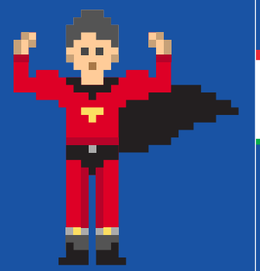
Public transport: particularly prone to SEXUAL VIOLENCE
In France, the so-called Savary Law of 2016 on safety on public transport, followed by the 'LOM' law of 2019 on sustainable mobility, gave accredited staff expanded scope for intervention, while also making network operators more answerable for tackling gender-based assaults and harassment. Twenty-five percent of France's network operators that took part in a 2020 Transport Ministry survey had introduced targeted actions, including staff training, passenger awareness campaigns, and alert and reporting mechanisms. Keolis networks account for 75% of them. Similar efforts are being made around the world. In the UK, for example, Keolis has deployed a mobile patrol unit at five stops on the Manchester Metrolink tram/light rail system to reassure female passengers and help prevent sexual assaults.

1 Source: Sentiment d'insécurité dans les transports collectifs franciliens – Feeling unsafe on public transport in the Paris region – Survey, 2019, L'Institut Paris Région).

BY TIPHAINE CLOTAULT

WARNING:
THESE VIDEO GAMES ARE COMPLICATED AND EXTREMELY ADDICTIVE!

GAMING TO SOLVE REAL-WORLD TRANSPORT CHALLENGES



Among the dozens of transport management games on the market, you won't find any superheroes, swords or high-speed chases. What they offer instead are simulations of the real world 🌎 with all its complexities – and the considerable challenge of managing them as effectively as possible. This "strategy game" sub-category is virtually unknown to the general public but has hundreds of online fan communities and YouTubers pushing its content, as well as annual refresher updates for the most popular titles. We look at some of the classics of the genre, covering everything from urban planning to transport network management and even driving simulators.

OPEN TTD

STILL A CULT CLASSIC

The goal? Ride the wave of economic prosperity in the 1950s to become a transport magnate. In this no-holds-barred game, players are free to use any method they like to reach the top, including stifling competition on the most lucrative routes, only serving profitable cities and sites, starting with coal-fired power stations, and expanding in every direction without a single thought for the environment. Not taking life (too) seriously is probably the key to success for this open-source remake of the world's first transport simulation game, Transport Tycoon Deluxe, created back in 1994. Despite its dated graphics, OpenTTD remains a reference in the gaming world and is considered across the generations as a "must-have" and a "cult classic".

Chris Sawyer,
designer of Transport Tycoon Deluxe

" OF COURSE, THERE ARE OTHER THINGS PEOPLE ENJOY IN THESE GAMES, LIKE MAKING A PROFIT AND BEATING OTHER COMPANIES 🤑, BUT THE MAIN ENJOYMENT COMES FROM BUILDING THINGS AND WATCHING 😮 THE WORLD IN ACTION."

"WHAT MOVES ME IS SOLVING PROBLEMS 🤔 AND MAKING VERY HIGH, TECHNICALLY 🍳 SOPHISTICATED SOLUTIONS FOR SOMETHING."

Carlos Carrasco,
designer of NIMBY Rails

NIMBY RAILS

THE CHALLENGE OF STAYING ON TRACK

Equipped with a comfortable starting budget of one billion dollars and a map of the real world courtesy of Google Maps, players set out to build and operate new (virtual) tram, subway and train lines. But it's not as simple as it sounds. With a title that includes the acronym for "not in my backyard", it comes as no surprise that **NIMBY Rails** faithfully replicates the challenges associated with real-world transport networks. Players have to make allowances for buildings, roads and topographic features during route design. They also need to make tough decisions throughout the game: choosing the best route and infrastructure to stay on budget, reinvesting to upgrade the network and aligning it with the needs of a growing population, even taking into account feedback from passenger satisfaction surveys!

CITIES: SKYLINES

SOLVING THE ROAD TRAFFIC PUZZLE 😰

Played by 16 million die-hard fans worldwide, this popular urban planning game leaves no room for respite. As soon as the city-building fun ends [84 million cities in six years, for a total population of 428 billion!], traffic congestion begins. And so do all the consequences — unhappy residents and plunging property prices. The solution, of course, is to develop a mass transit system. To do this, players have access to some amazingly precise and realistic tools, including diagnostics on congested sectors and data about the impact of public transport services, in terms of modal shift, occupancy rates and carbon footprint. But they also need to take into account negative externalities, energy use and the city's budget.

TRAIN SIMULATOR 2022

A TICKET TO DRIVE

Calling all railway enthusiasts! This ultra-realistic train simulation game puts players in the driver's seat on locomotives from around the world that exist in real life. Tutorials are available to help players with everything from manoeuvring their rolling stock to managing safety systems and passengers. The game has attracted a vast community of fans in different countries, who share local signals and sound effects to enhance its many scenarios.

BUS SIMULATOR 21

AN URBAN OBSTACLE COURSE

After playing this city-based simulation game, you'll have a new-found respect for all urban bus drivers worldwide. Do you think it's easy to get a bus load of people safely from A to B, day and night, in all kinds of traffic and weather conditions, while also keeping to the timetable and warmly welcoming passengers aboard? Play this game and you'll think again. It's exhausting!

Wenel,
gamer and train enthusiast

" I SPEND MY EVENINGS DRIVING 🚂 IN EVERY POSSIBLE SETTING, FROM MOUNTAINS AND SUBURBS TO HIGH-SPEED LINES, ALONG REAL ROUTES OR ONES I'VE CREATED MYSELF."

~ SPECIAL THANKS ~

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