

PULSE

Insights

Ideas

Inspirations

Smart mobility for big shows

Sharing ideas to shape the future of mobility



p. 03

Introduction

Foreword

Key contributors

6 months in headlines

**p. 08**

Viewpoints

Opinion — "Today's cost of living crisis is the primary driver of the energy transition" by Stéphane Barbusse

Roundtable — Energy conservation: how the transport sector is meeting the challenge

Interview — "Energy-mix questions are always highly context-specific"

**p. 14**

On the ground

Improving demand forecasting for an enhanced passenger experience

Open innovation: A breath of fresh air!

Best practices for curbing the worst excesses

**p. 22**

Feature article

Smart mobility for big shows

Focus:

- Organising people flow & crowd management for large-scale events

- Just the ticket for players too!

Ideas:

- Groupama Stadium

Business cases:

- FIFA World Cup Qatar 2022
- Formula 1 in Melbourne

**p. 34**

In pictures

Test, adapt, adopt: transport in agile mode

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TO VIEW BACK
ISSUES.

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Pulse No. 10

Will the future be frugal? For this 10th issue of Pulse magazine, we focus on one of the big challenges facing society today – **resource frugality**.

With prices soaring, the rational use of energy has become a key topic of discussion. It's an issue that clearly concerns local authorities, responsible for keeping public transport services running at a time when budgets are under increased pressure. In our “Viewpoints” section, we provide insight into this issue and take a closer look at how higher energy prices are affecting transport authorities' investment decisions and users' mobility practices.

In “On the ground”, we review passenger expectations, which have evolved considerably since the pandemic. Crowding levels, for example, now play a decisive role in people's choice of itinerary and mode of transport. Other areas of particular importance to passengers today are air quality and antisocial behaviour.

Our feature article is about transporting crowds. Every year, cities around the world host major sporting and cultural events that attract large numbers of people. Extraordinary moments require extraordinary measures! In the run up to the 2024 Paris Olympics, we take a look at some examples, including Rammstein's concert in Belgium, events at Lyon's Groupama Stadium, the World Cup in Qatar and the Australian Grand Prix in Melbourne, to reflect on the challenges associated with large-scale gatherings and the efforts made behind the scenes to ensure operations run smoothly.

And lastly, because mobility is constantly moving, we take you on a quick tour of some of the interesting and unusual initiatives underway to enhance the passenger experience.



Enjoy your read!

Key contributors...

8



Stéphane Barbusse
R&D Coordinator, Transport and Mobility department, ADEME (French Agency for Ecological Transition)

argues that decarbonising transport helps tackle today's cost of living crisis.

13



Jonathan Anderson
Sustainable Mobility Manager, Keolis Downer

discusses why accelerating decarbonisation in Australia means working with a broad energy mix.

12



Karl Orton
Fleet Director, Keolis Sweden

talks about Sweden's long track record in developing its energy mix.

10



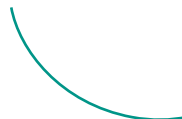
Antonia Höög
Sustainable Development and Engagement Director, Keolis

explains how Keolis is activating all available levers to reducing energy consumption and drive energy efficiency.



Bruno Gazeau
President of FNAUT (France's National Federation of Transport Users)

calls on local authorities to continue investing to develop more energy-efficient transport options in line with people's expectations.



11

24



Bart Busschaert

CEO of Scelta Mobility

discusses smart and safe mobility at big shows.

24



Vincent Traen

Business Development Manager, Keolis Belgium

shares his expertise on organising efficient transport services for large-scale events.

10



Karine Mabillon

Transport Managing Director, Bordeaux Métropole

addresses the importance of adjusting services to cope with rising energy costs.

11



Aurélien Bigo

Engineer and researcher in the transport sector's energy transition

underlines the need for a collective commitment to more energy and resource efficient modes of transport.

Didier Cazelles

Deputy CEO France, French Regions

speaks about Keolis' extensive experience in providing world-class transport for top sportspeople.

29



...to this issue



6 months in headlines

① OCTOBER 2022

Winter arrived, together with higher energy prices. The cost of gas and electricity rose sharply for households, companies, communities and public transport operators as a result of the Russia-Ukraine war. Europe braced itself for supply problems and urged everyone to be frugal with energy resources.

② NOVEMBER 2022

State-of-the-art bus depot inaugurated in Antibes. Certified as a sustainable building, the new depot for alternative energy buses meets three key objectives: a smaller environmental footprint, waste recovery and reuse, and wastewater recycling. To achieve this impressive environmental feat, Keolis, which operates and maintains the Envibus network, worked closely for three years with the Sophia Antipolis urban community and around 50 other companies.

③ DECEMBER 2022

Joint effort to address driver shortages. To alleviate the shortfall in driver numbers, the French Public Transport Union (UTP), France's Labour and Transport Ministers and national employment agency Pôle Emploi signed a joint charter for the recruitment of more than 2,000 men and women by June 2023. A campaign was launched in France early in the year to help promote careers in public transport – a sector with a promising future.



④ JANUARY 2023

Keolis Bordeaux Métropole mobilités became a mission-driven company. As part of its new public service delegation contract, valid until 2030, Keolis adopted an ambitious and proactive CSR strategy featuring commitments to act responsibly for the planet with objectives to convert buses to biogas energies and to reduce water use for network maintenance. The subsidiary also aims to support employee development with measures including increasing the proportion of women in the workforce to 30% by 2030.

⑤ FEBRUARY 2023

Gamification of mobility solutions in Shanghai. The Suishenxing app already enabled users to manage all aspects of their movements through the city, from paying for public transport to reserving a parking space. Now, when users opt for a more sustainable mode of transport, they earn “green credits”. These can be used to play games or to buy items from a dedicated gift shop.

⑥ MARCH 2023

Showcasing mobility innovations. Several events of interest to stakeholders in the public transport sector were held in March, including Transport Ticketing Global in the UK, Rail Infra in the Netherlands and the Autonomy Mobility World Expo in France. Featuring prime networking opportunities, the latest innovations and engaging roundtable sessions, these trade shows fuel discussion on how to make our cities more sustainable, more accessible and more socially responsible.



/ Opinion /

The energy squeeze

“Today’s cost of living crisis is the primary driver of the energy transition”

Stéphane Barbusse
R&D Coordinator,
Transport and
Mobility department,
ADEME (French
Agency for Ecological
Transition)

“Decarbonised public transport will only happen if policymakers embrace energy conservation.”

Over the past year, our daily lives have been overshadowed by the energy crisis. The hike in fuel prices, along with supply shortages, have been a major source of concern for public transport operators and authorities, OEMs and, of course, consumers. As a pivotal player in the energy transition, ADEME, the French Agency for Ecological Transition, assesses potential energy scenarios in order to inform and support political and economic decision-makers in their choices regarding mobility and other cross-cutting agendas.

The first lever for tackling the energy crisis is obviously to reduce consumption. The Covid-19 pandemic showed that we're capable of cutting back on travel without necessarily bringing all our activities to a standstill. Before planning to travel, we have to ask ourselves: “Is this trip really necessary? Couldn't we hold the meeting online?” Another effective lever to attenuate the effects of the crisis is a modal shift, when this is possible. This means going by public transport, opting for active transport like cycling or walking,



travelling by mass transit modes like trains for longer distance trips or signing up for carpooling when a journey by road remains the only option.

Operators have everything to gain from implementing green practices like eco-driving techniques across their organisations, while extending their portfolio of services to improve occupancy rates.

Manufacturers meanwhile can help make savings by improving the energy efficiency of existing vehicles and infrastructure, for example by optimising fuel consumption and reducing

vehicle weight. It will take them longer to convert their fleets to more sustainable energy carriers like electricity, liquid and gas biofuels or hydrogen.

Like many other transport players, we believe it's important to adopt a diversified energy mix, rather than focusing on a single source. We also think that the key to reducing energy costs over the long term is to aim for net zero emissions, and decarbonised public transport will only happen if policymakers embrace energy conservation. So we've come full circle: today's cost of living crisis is the primary driver of the energy transition in public transport. At ADEME, we've been predicting this for years; the current energy squeeze has proved us right. And to see through the transition, we believe there's a need for more effective information about the true environmental cost of journeys and vehicles used. This would alter people's perceptions and make the transition more socially acceptable.

“We’re using all available levers to reduce energy consumption and, ultimately, GHG emissions.”

ANTONIA HÖÖG,
SUSTAINABLE DEVELOPMENT AND
ENGAGEMENT DIRECTOR, KEOLIS



Energy conservation is a key focus, be it by turning down heating, limiting the use of air conditioning or eliminating waste. Next comes energy efficiency. This includes adopting eco-driving techniques, particularly smooth acceleration and braking, and better insulating our buildings. This year, to do our bit to ease pressure on Europe’s energy system we’re taking action to quickly and significantly reduce consumption during peak periods. Hopefully this is just a temporary requirement.

To help us cope with the substantial price increase, a decision needs to be taken on the potential sources available for financing the additional costs: the transport payroll tax, the Bordeaux Métropole authority’s budget and, lastly, passenger fare revenue. We can all make small savings but the only decision that would have an immediate and significant impact on our energy consumption would be to cut back on services, for example, in the evenings and on Sundays. However, this is not on the agenda.



Energy conservation:

“All our networks will be impacted, since energy is one of the largest operating expenses after payroll.”

KARINE MABILLON,
TRANSPORT MANAGING DIRECTOR,
BORDEAUX MÉTROPOLE

“For consumers, energy conservation means changing their travel habits, such as opting for public transport.”

BRUNO GAZEAU, PRESIDENT OF FNAUT (FRANCE'S NATIONAL FEDERATION OF TRANSPORT USERS)



To make this happen, we have to continue developing our networks and return to pre-Covid levels of service. For public transport services to meet people's expectations, local authorities need to continue investing. This will encourage people to switch from fossil-fuel private cars to public transport.

How the transport sector is meeting the challenge

The hike in energy prices has impacted all sectors of the economy – including transport. Public transport authorities (PTAs) are facing spiralling operating costs, while some passengers, such as those in the Paris region, have seen fares increase by more than 10%. This raises issues about the future of mobility, the solutions available and potential avenues for absorbing these costs. We asked a group of experts to share their views.

“High energy requirements are at the heart of the transport sector's challenges.”

AURÉLIEN BIGO, ENGINEER AND RESEARCHER IN THE TRANSPORT SECTOR'S ENERGY TRANSITION

Until we reduce consumption and shift to more energy efficient transport solutions, the strong pressure on prices won't relent. So one of the effects of the current crisis will be to step up the move to more energy- and resource-efficient modes of transport. Of course, this can be done on an individual level, but above all we need a collective commitment, backed by public policies that actively encourage the shift.





KARL ORTON, FLEET DIRECTOR,
KEOLIS SWEDEN

/ interview /

“Energy- mix questions

Worldwide, public transit networks are still dependent on fossil fuels for around 80% of their energy needs. Yet in some European regions, public transport is already approaching carbon neutrality, whereas in other parts of the world, it is still at the beginning of this journey. We bring together Karl Orton, Fleet Director of Keolis Sweden, and Jonathan Anderson, Sustainable Mobility Manager at Keolis Downer (Australia), to compare notes and exchange ideas about how public transport authorities can go about reducing carbon emissions.

Pulse: Karl, Jonathan, can you start by outlining the energy mixes in the networks you help to run?

JONATHAN – Here in Australia, we are working with a broad mix. In Melbourne, for instance, we run the world’s largest tram network on electricity purchased from 100% renewable sources. At the other end of the scale, in Sydney, Brisbane, Perth, and Adelaide, we have whole bus networks which are still almost entirely fossil-powered. And there’s everything in between: we run rail services in South Australia, some on electrified lines, the rest diesel; and in Newcastle, the ferries and buses are diesel, but the light rail line uses an innovative catenary-free electric system...

KARL – In Sweden, we generate around 45% of our electricity from hydroelectric power and another 45% from nuclear. At Keolis, we have just over 1,700 buses on the road in the Stockholm, Gothenburg, and Borås urban areas, as well as the region of Dalarna, and all vehicles are running on alternative low-carbon fuels such as biogas (555) and biodiesel (over 1,000) and all electricity is procured from renewable sources.

Pulse: So you don’t run electric buses?

KARL – Currently, we have 59 in service – and they’ve proven quite complex to use. The operation is far more complicated than many people assume: not only do you have to refit the depot, you have to digitise it! Then there are all manner of changes to ways of working to take into account. It’s more straightforward to use biofuels: in many cases, you can simply convert existing diesel vehicles and then run them like usual.

“When people ask about electric vehicles, I always ask them what specific problem they’re trying to solve.”

Karl Orton

are always highly context-specific!”



JONATHAN ANDERSON, SUSTAINABLE MOBILITY MANAGER AT KEOLIS DOWNER (AUSTRALIA)

JONATHAN – Here in Australia, some PTAs are now stipulating that diesel buses be replaced with battery-electrics on retirement, but, to date, electrification has happened in the depots which are best suited: i.e. with the capacity for megawatt loads and the space for charging berths. Electrifying other sites is more challenging, although solutions have been found, like in Sydney, where we’re using pantographs⁽¹⁾ to overcome space constraints. Not only does this allow for quicker charging than plug-in, it also increases the ratio of buses to berths from 2:1 to around 10:1 or more.

Pulse: So are PTAs wrong to specify electric traction as a way to reduce emissions?

KARL – In Sweden, decarbonisation has been happening for decades now across the board. So when people ask about electric vehicles, I always ask them what specific problem they’re trying to solve. If you want to reduce carbon emissions, biofuels are often the simplest way of doing this quickly. That is, if you have access to large

volumes of biofuels, which is not the case everywhere. Then again, biofuel buses still have combustion engines, so they produce other gaseous emissions, as well as noise: if you’re looking to improve here, electric might well be the better bet.

It also depends on what kind of service you need to run: short routes with high frequencies in urban areas like Stockholm are easier to electrify than trunk routes out in rural Dalarna. On the other hand, electricity is cheaper in northern Sweden, and biofuels are priced locally, too. So essentially, PTAs need to do total cost of ownership analyses based on their own regional structures first – and then decide.

JONATHAN – I totally agree: energy-mix questions are always highly context-specific. Let me give you an example. Newcastle is at the centre of Australia’s coal industry, so decarbonisation will mean changes in the city’s economy. Luckily, the region has excellent possibilities for hydrogen: sun and wind for green electricity and, thanks to existing industrial

infrastructure, storage and export facilities. So we’re pushing for a trial of 5-10 fuel-cell buses: hydrogen has a higher energy density than lithium batteries, giving equivalent ranges for less weight, but with all the benefits of electric drive-trains including better efficiency and less noise and maintenance requirements. I’m also talking to the PTA about trialling electric ferries: the Stockton service shuttles back and forth across 500 metres of quiet water and doesn’t run at night, so it would be absolutely perfect for light-weight electric boats.

(1) A pantograph is an articulated arm on the roof of an electric bus to enable fast charging.

“I’m also talking to the PTA about trialling electric ferries in Stockton, where a service shuttles already exists.”

Jonathan Anderson

Improving demand forecasting

for an enhanced passenger experience





← In Dijon, 'nudges' encourage students to travel by bus.

The number one organisational criterion for transport services is passenger demand forecasting. And since COVID entered our lives, avoiding crowded trains and buses has also become a key factor for passengers when choosing how to get to their destination. On the ground, operators and public transport authorities (PTAs) are trialling innovative smart solutions to forecast peak usage and keep passengers informed in real time.

Monday, 8:30 a.m., somewhere in France... Crowds of people are waiting on the metro platform. A packed train pulls into the station. It's rush hour and passengers jostle to get on the train. They don't intend to wait for the next one.

It's a scene played out most days in big city metro stations – and one of the five main sources of frustration with public transport identified by the Keoscopie mobility trends observatory. It has even become a source of stress since the COVID pandemic, due to social distancing protocols. Today, crowding is a key factor for passengers when choosing how to reach their destination, which is why both operators and PTAs are working to anticipate it better.

Several cities have grasped the nettle of crowding to avert nightmare scenarios. How can we anticipate peak usage? How do we help passengers choose the best options before setting out? Increasingly, transport professionals are innovating with passenger information

and travel demand forecasting solutions. In Dijon, for example, Keolis Dijon Multimodalité has installed signage to guide students towards bus and tram stops in the city's main square. The goal is to ease crowding in trams at peak hours by encouraging students alighting from line T2 to catch the Liane 3 bus to the university campus rather than line T1, with almost the same trip time. This approach has proved popular, earning Keolis Dijon an award from the French transport innovation agency.

↓ In Dijon, coloured arrows prove popular with passengers.



In Besançon, to anticipate peak overcrowding Keolis Besançon Mobilités has been trialling its Ginko app since last September with a group of beta testers. The app provides information on passenger numbers in real time and also predicts bus and tram usage in the Ginko network. Users can see passenger numbers at any given time as well as forecast usage – by day, line and stop – from data collected by counting systems and predicted peak usage adjusted in real time at each stop. The operator is eagerly awaiting the first results.

On Lyon's TCL network, passenger numbers are bouncing back. Last August, PTA SYTRAL Mobilités announced nearly 400 million journeys on its network in 2022, up 19% on the previous year. To improve traffic flow and the passenger experience on metro line D – used by up to 300,000 people a day – last November the PTA and Keolis launched a new trial service. Here's how it works: seconds before a train comes into a station, green, amber or red indicators light up



on the platform just above where the doors open. These colour codes tell passengers how crowded each carriage is using captures from two cameras at previous stations on the line. After a six-month test phase, this new service is now operational at Sans Souci station. If results prove conclusive, it could be extended to other stations.

In the Netherlands, the city of Twente is using artificial intelligence (AI) to predict transport usage on the

← At Sans Souci station on the Lyon metro, coloured LEDs on the platform let passengers choose to get on less crowded carriages.



basis of weather conditions. With its North Sea coastline, the Netherlands gets mostly mild but also often damp and cloudy weather. This regularly generates extra demand for public transport, notably on weekdays. To optimise its bus service, Keolis Nederland used a deep-learning algorithm to analyse networks in this region bordering Germany. AI matched records of passenger journeys to weather conditions at bus times to reliably forecast passenger numbers. With this information, Keolis Nederland can adapt and optimally configure its services and dispatch buses in accordance with the weather. AI also improved usage forecast accuracy on Twente's network by 27% during the week and 66% at weekends – a great result!

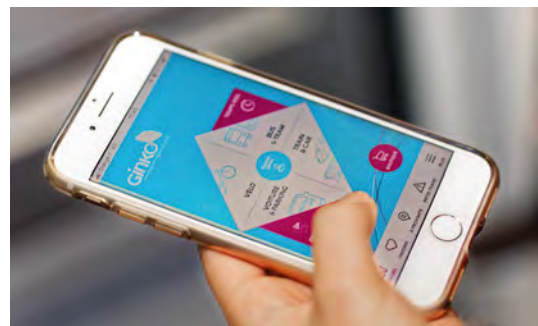
← In Twente, bus services are adjusted according to weather conditions.

In a nutshell

In 2017, France's SNCF initiated its Experience & Cognition study to gain deeper insights into passenger behaviour. Strand IV of the study focused on passenger flows and behaviours. In 2022, screens displaying train occupancy were trialled at stations across the Paris region. The aim was to measure passengers' ability to read and understand the screens, while also analysing their behaviour.

Reducing overcrowding in public transport, improving safety, enhancing network planning and management and optimising costs – passenger information and usage forecasting systems have become crucial to boost network performance and provide a better passenger experience. No need for a crystal ball to predict that travel demand forecasting solutions have a bright future ahead!

↓ In Besançon, the Ginko app tells passengers how busy arriving buses and trams are.



Open innovation

A breath of fresh air!

From CO₂ to air pollution emissions, the environmental footprint created by transportation is leading cities and mobility operators to trial new solutions to measure and mitigate transport's impact on people's health and surroundings. Let's take a closer look at three recent innovations.



#1 - MEASURE

Microsensors on Rennes buses

The Air Quality and Mobility (AQMO) consortium in Rennes was formed out of a partnership between Keolis, the Rennes Metropolitan Area, the University of Rennes 1, CNRS/IDRIS and Air Breizh. The partners have installed microsensors on the city's buses and are analysing the data to gain closer insights into air quality.



(1) World Health Organisation. In 2016, the WHO estimated that 4.2 million deaths a year were directly attributable to air pollution.

(2) Source: French Ministry for the Ecological Transition



#2 - PURIFY

Microalgae air purifiers in Lille

Air quality trials were conducted on the Lille Metro from March to July 2022 thanks to a collaboration between Lille European Metropolis (MEL), Keolis and startup company Bioteos. Installed on the platforms at one of the stations, the Oxylon air purifiers capture air then use microalgae to purify it.

“Open innovation” – what’s behind the buzzword?

For a company, open innovation means thinking differently about R&D and involving others outside the department responsible for innovation including colleagues, third-party companies and public-sector players. The goal is to create synergies for a more relevant offering, responding to an ecosystem of needs.



#3 - CLEAN

Particulate capture in Lyon and Paris

Para-PM is a unique French technology. The result of 10 years of research and testing, it’s now being used in Lyon and Paris. This capture system employs particle ionisation and electrostatic filtration to clean the air resulting in the removal of up to 95% of fine particulate matter.

Best practices for curbing the worst excesses

“Hell,” as a character in a play by Jean-Paul Sartre famously observes, “is other people.” And wherever lots of people share space, bad behaviour on the part of just a few individuals affects everyone else: littering, loudness, a lack of common courtesy. For operators of public transport like Keolis, tackling this kind of anti-social behaviour is key to protecting staff and passengers, and so to ensuring that services remain reliable and attractive.

Although a vast majority of people are willing to respect the basic rules of shared public space, some remain either unaware of – or unwilling to abide by – the tenets of common courtesy. This sad fact can be no excuse for defeatism, however, as Mikael Mourey, Group Management System and Health & Safety at Keolis explains: “We can’t afford to lose people’s trust. It’s a strategic issue.” Stéphanie Boisnard, responsible for security and revenue protection at Keolis, agrees, identifying three key reasons to curb anti-social behaviour: “Firstly, it’s about people’s mental and physical wellbeing. Secondly, it’s about keeping up service provision.

And thirdly, it’s about the attractiveness of public transport.” Essentially, if standards of behaviour decline, this affects both staff and passengers, leading to increased absenteeism and, as services worsen, declining ridership.

Dedicated trainings

Keolis is keenly aware of this risk – and due to the size and breadth of its worldwide operations, is uniquely well-placed to share examples of best practice, as Mikael Mourey explains, and



← In the Netherlands, Keolis drivers show schoolchildren how to deal with anti-social behaviour on public transport.



← Awareness campaign in Saint-Brieuc-Armor (Brittany).

offer staff training accordingly. One such example is to be found in the Netherlands, where safety & security staff and trainees take part in a course in how to tackle anti-social behaviour. Working with experienced drivers and guards, teams learn how best to deal with problem passengers. In addition to quizzes to learn about fines for different forms of anti-social behaviour, the teams also conduct role-plays so that they can practice techniques for de-escalation and enforcement. In Belgium, drivers are also trained in assertiveness and communication with passengers as part of a seven hour federal-level training programme to become a bus driver.

Prevention campaigns

But it's not just about training staff: Keolis Netherlands drivers volunteer in secondary schools to make young passengers aware of how social pressure is exerted in a group and how this can influence behaviour in a negative way. Many transport authorities run awareness campaigns to remind and educate all passengers about the importance of showing politeness and consideration. In the Brieuc-Armor region of Brittany, France, for instance, Transports urbains briochins (TUB) is running a poster campaign with six basic reminders: move down the vehicle to avoid overcrowding; lower the volume of your music (and voice); fold your pushchair; dispose of your rubbish in the bins; validate your travel card every time you

get on; greet drivers politely as you pass. Transport for London (TfL) has gone for a simpler, more visual approach, with reminders to “Be kind” on multi-coloured hearts or to “Be patient” in a stylised hour glass.

Encourage good behaviour

In Singapore, meanwhile, a place famed for strong social conventions and public civility, the Land Transport Authority (LTA) has been experimenting with design elements to encourage the right kind of behaviour: on the metro, colourful footprints lead away from doors down the car, while fun themed carriages discourage vandalism thanks



↑ Nudge messaging on the Singapore metro encourages passengers to spread out throughout the carriage.

to interesting decorative elements. Just like TfL, LTA has also introduced set spots for buskers, retaining the urban vibrancy of its public transport spaces while adding to the feeling of security essential for passengers to enjoy their ride. Give them a guitar and, sometimes, just a few individuals can have a positive effect on everyone else, too.



FEATURE ARTICLE



Smart mobility for big shows

INSIGHTS
P. 24-29

IDEAS
P. 30-31

INSPIRATIONS
P. 32-33



VINCENT TRAEN,
BUSINESS DEVELOPMENT
MANAGER, KEOLIS
BELGIUM

/ Conversations /

Organising people flow & crowd management

for large-scale events

BART BUSSCHAERT,
CEO SELTA MOBILITY



At concerts, festivals and sports fixtures, people gather to let their hair down and live in the moment. But for this shared experience to pass off without incident, transport has to be planned down to the last detail. We speak to Vincent Traen, Business Development Manager at Keolis Belgium, and Bart Busschaert, CEO of Selta Mobility, about how they work together to ensure people get to events – and get home again – safely.

Pulse – Vincent, Bart, you work together on transport for major events in Belgium. Bart, what does Scelta Mobility do – and Vincent, where does Keolis come in?

/ BART / Bringing together large numbers of people at an event venue requires a lot of organisation. At Scelta, we provide tailor-made mobility solutions for large-scale events, working with the organising companies to develop a mobility plan incorporating a range of efficient mobility concepts. Here in Belgium, Keolis is one of our long-standing partners for dedicated services for concerts and festivals.

/ VINCENT / That's right, once Bart has agreed a plan with the organisers and the relevant authorities, we supply transport. That could mean anything from shuttles running between a train station and a stadium to dedicated coach services picking people up and driving them straight to the venue.

Pulse – What kind of events have Keolis and Scelta worked together on in recent years?

/ VINCENT / Primarily, we've supported Scelta at large-scale concerts, including The Rolling Stones concert at the King Baudouin Stadium in 2022.

/ BART / And then again last summer for the concert by the German heavy metal band Rammstein in Ostend. To give you an idea of the scale, the event drew a crowd of 47,000. Belgians love Rammstein and Rammstein loves Belgium!

/ VINCENT / We provided 130 coaches to take 7,000 concertgoers from 105 separate pickup points. We call this our EventShuttle service: passengers book their journey in advance, and we not only drive them straight to the venue but make the bus part of their concert experience, too, with videos, music and other entertainment.

Pulse – Bart, what are the main considerations when planning mobility solutions for an event of this scale?

/ BART / There are multiple challenges: the sheer number of spectators, the specific layout of the venue and public transport infrastructure, and the type of fan according to age and musical preferences. Take last year's Rammstein concert: there were almost 50,000 people coming to a town with a population of 70,000! If too many had arrived by train and bus, local transport services would have been overwhelmed. Similarly, car traffic would have caused serious congestion – and the venue only had 7,500 parking spaces in any case. Plus, we know that Rammstein fans like to have a drink or two before the concert, so many didn't want to drive.

/ VINCENT / Yes, one constant is the challenge of moving crowds from A to B, but the make-up of each crowd varies quite a lot between, say, Harry Styles or One Direction, where most of the audience will be teenage girls, and Rammstein!

Pulse – We can imagine... So, what can go wrong in transporting concert crowds?

/ BART / Not wishing to be overly dramatic, mass panic can be really dangerous. Whenever large groups of people come together in places they're unfamiliar with, there's always the potential for things to get out of hand. So we have to move crowds without overcrowding by ensuring a smooth flow away from the venue. The solution is to provide a range of different transport options.

60% to **80%**

of carbon emissions caused by a large-scale event come from transport to and from the venue.



↑ During large-scale events EventShuttle buses help get people quickly and safely to and from the venue.

/ VINCENT / In transport terms, the overriding imperative is to avoid bottlenecks. The worst possible thing is for people to get the impression that there isn't a plan. It's late at night, you've just enjoyed a fantastic concert, but now you're tired, irritable maybe, and just want to get home...

/ BART / ... and then only one bus is waiting in the car park outside the venue! And so what happens? Everyone tries to get on it at once. Even if there are 20 more buses just around the corner, we're dealing with mass psychology here. The same applies to car parking: if there's only a single parking area, then delays are inevitable – especially at the end of the night, because people tend to arrive over several hours in the lead-up to a concert, but then all leave as soon as it's over. It doesn't take long for people sat in long tailbacks to get agitated, start beeping, shouting and losing their temper...

Pulse – So how do you avoid these kinds of bottlenecks?

/ BART / Two things are absolutely key: starting early and working systematically. By 'early', I mean from the moment tickets go on sale (at the very latest). The more time we have to devise a concept, analyse ticket-buyers' addresses and contact them

about booking transport – as well as to liaise with local authorities and the police force – the better. By 'systematically', I mean following tried and tested principles such as inciting the maximum number of spectators possible to use dedicated transport solutions, taking the load off the roads and public transport. So you have to provide sufficient bus capacity and prioritise communication accordingly: advertise alternative dedicated services first; next, provide information about public transport; directions to parking areas should be the last thing people find.

Another, interlocking principle is concentric circles for arrivals. Car drivers are in the outer circle, with parking areas accessible from various directions. In the middle circle, people travelling by public transport get off at the nearest bus stops and train stations. In the inner circle, those using dedicated services or arriving on foot or by bike.

Pulse – Specifically, what are the important factors in planning dedicated services?

/ VINCENT / This, of course, is where we come in. First off, Bart is entirely right: the longer the lead-time, the better. The Rammstein concert was great, for example, because tickets sold out within two or three hours. Providing 130 vehicles with drivers and stewards would be difficult if we didn't know numbers in advance.

Secondly, our end of the bargain is making sure our planned capacity is actually available on the day. In operational terms, that means having enough staff rostered to cover absences due to illness, for instance, and carrying out enhanced maintenance in the run-up to events to ensure that the agreed number of vehicles are in service.

Last, but not least, there are the organisational details. As we said earlier, avoiding crowding and long waiting times is essential, so everything has to run smoothly. With our EventShuttle service, when they get on passengers are given a coloured bracelet with their bus number and an emergency telephone number. After the event, they can then follow

“We provided 130 coaches to take 7,000 concert-goers from 105 pickup locations. With EventShuttle, we drive them straight to the venue and make it part of the experience.”

Vincent

“Thanks to online booking systems, we get access to reliable data about how many people have bought tickets and where they live, allowing us to plan pickup points for dedicated transport.”

Bart

“To avoid crowding and long waiting times, everything has to run smoothly. Our passengers are given a coloured bracelet so that they can follow signage back to the right zone.”

Vincent

“Whenever large groups of people come together, there’s always the potential for things to get out of hand. So we have to move crowds without overcrowding.”

Bart

coloured signage to the right zone outside the venue and get back on their bus. It's a simple, intuitive system! And stewards are always on hand to help anyone having trouble finding the right zone.

Pulse – You've both mentioned the importance of analysing ticket sales and pre-booking transport. Most of this now happens online. Is technology making planning transportation for events easier?

/ BART / Certainly! Thanks to online booking systems, we get access to reliable data about how many people have bought tickets and, crucially, where they live. Information about where people are travelling from is incredibly useful because it allows us both to forecast demand for parking and public transport and to plan pickup points for dedicated transport. This is a real asset – as is the ability to market services like EventShuttle directly to concert-goers.

/ VINCENT / At our operational level, too, technology helps – and we're learning all the time. Our coach drivers and stewards now work with an app which provides lists of passengers scheduled to get on at each pickup point. They asked us: "Can you put the names in alphabetical order? That would save us a lot of time at each stop." The next step is to use mobile technology to keep passengers informed about delays: there's nothing worse than standing at a pickup point worrying about whether your coach will arrive – ten minutes can seem like an eternity! So we'd like to start providing real-time information.

Pulse – Presumably, getting people to use dedicated and public transport services also has an important environmental impact?

/ BART / Each bus or coach takes 30 cars off the road and, as ecological concerns gain prominence, event organisers are interested in this kind of data. After all, anywhere between 60% and 80% of carbon emissions caused by a large-scale event come from transport to and from the venue. From a corporate point of view, it's becoming increasingly important to demonstrate reductions in environmental impacts,

so providing sustainable transport is essential. For most attendees, this aspect is less important. What counts for them is the price of transport, how long it takes and how convenient it is. That said, 6,000 fans came to the Rammstein concert last summer by bike, which had never happened before! Alternatives to the car are not just eco-friendly, they're also increasingly seen as the best option.

/ VINCENT / We know from customer feedback that one thing people really like about our EventShuttle service is that it takes them straight to the venue: no long walks, no changes. Also, for parents like us, if your 16 year-old daughter is going to her first concert, it's comforting to be able to put her on the coach and know she'll be taken straight there – and brought straight back just as safely to the pickup point. Safety and security for both our passengers and our staff is a top priority at Keolis, which is why all our Belgian subsidiaries now hold ISO 39001 certification.



↑ In Brussels, Keolis buses transport rock fans to and from the Rammstein concert.

/ Focus /

Just the ticket for players too!

Keolis doesn't just help to move crowds, it also provides transport for the talent! Didier Cazelles, Deputy CEO France, French Regions, gives us some insights into the logistics of chauffeuring top sportspeople during major events.

Here at Keolis France, we have a strong track record of providing transport to top-flight sports teams. In 2019, we drove the sides competing in the FIFA Women's World Cup. This year will see us chauffeuring squads around the country for the Rugby World Cup. And then for the Paris 2024 Olympic Games we'll be providing 30 coaches for events held in Lyon, Nantes, Marseille and Nice amongst other locations. Transport plans for events staged in the Paris region are still being finalised.

When entering into this kind of contract, we're taking on responsibility for the most essential components: if a team doesn't make it to the stadium, the game doesn't happen! Organisers come to us because we're present in all parts of France and so have the structures, vehicle fleets and human resources required. That is what it all comes down to: guaranteeing – and I mean 100% guaranteeing – vehicles and drivers are available at the agreed service level.



For this year's Rugby World Cup, for instance, we'll be servicing 20 base camps for the teams, providing transfers to and from hotels, training grounds and the stadiums. Both for safety reasons and to help players feel at home, each team gets a dedicated vehicle and two drivers, and the vehicles have to be as comfortable (and as environmentally-friendly) as possible.

So before we sign agreements, we go through all of these detailed requirements with a fine toothcomb to make sure

we can deliver without fail. We plan backup vehicles and have standby drivers available in case of a hitch, and of course the coach livery is designed to incorporate the organisers' logos.

Despite the unique challenges in providing team transport, we're always delighted to do it. It's not primarily a commercial decision, either. It's part of our broader societal role as a public transport operator that, when the country plays host to the best sportspeople from around the world, we're on hand to help. And obviously, it doesn't do our corporate image any harm to be driving the world's top athletes!

Crowd movers: Groupama Stadium, Lyon, France

GROUPAMA STADIUM, STAR OF LYON

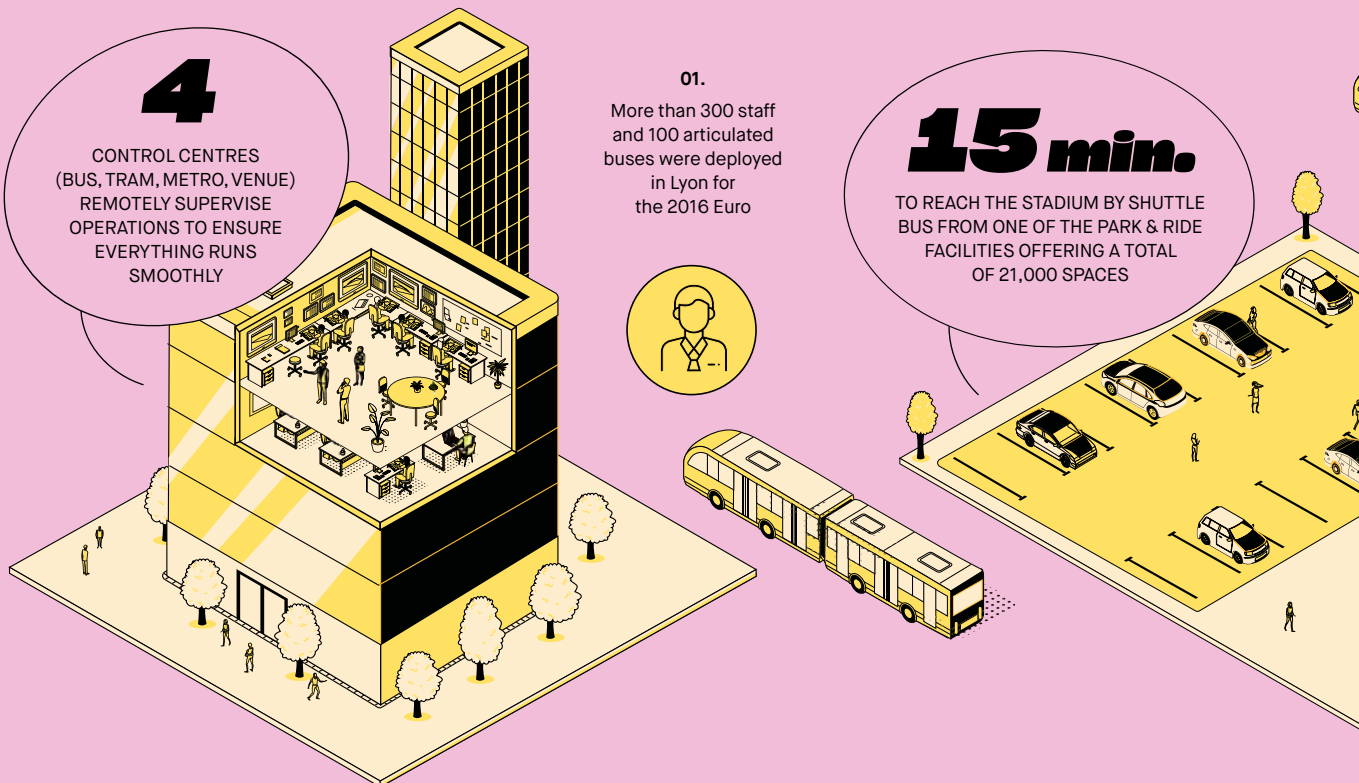
Opened in 2016 just ahead of the Euros football tournament, Lyon's Groupama Stadium is a key venue and adds much to the city's appeal. The complex includes the stadium with a nearly 60,000-seat capacity plus a retail & leisure park with restaurant, gym, theatre and more. Every year, it hosts some 40 large-scale events. And for Keolis, a major gathering means moving thousands of people. For this reason, the stadium's design had to take full account of the issues around

how to best serve such a vast hub of activity. SYTRAL Mobilités (the public transport authority), the City of Lyon, the Rhône department prefecture and Keolis worked together on the public transport arrangements for the complex.

SMART CROWD TRANSPORTATION BY KEOLIS

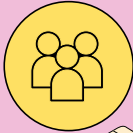
To move visitors to and from the Groupama Stadium as quickly and efficiently as possible, Keolis set up a system that can be readily adapted to each event, depending on the numbers of spectators and

where they arrive from. The Keolis system cleverly combines different modes of transport — trams from Lyon's main rail hub (Part-Dieu station) and articulated (bendy) shuttle buses from the Eurexpo convention centre carpark, Vaulx-en-Velin La Soie metro station and the Meyzieu Panettes parking facility. The operation begins two and a half hours before an event starts to ensure everyone arrives safely, comfortably and in plenty of time. Hundreds of drivers, security staff and other personnel are brought in to handle the volumes, assist everyone and manage the flows of passengers.



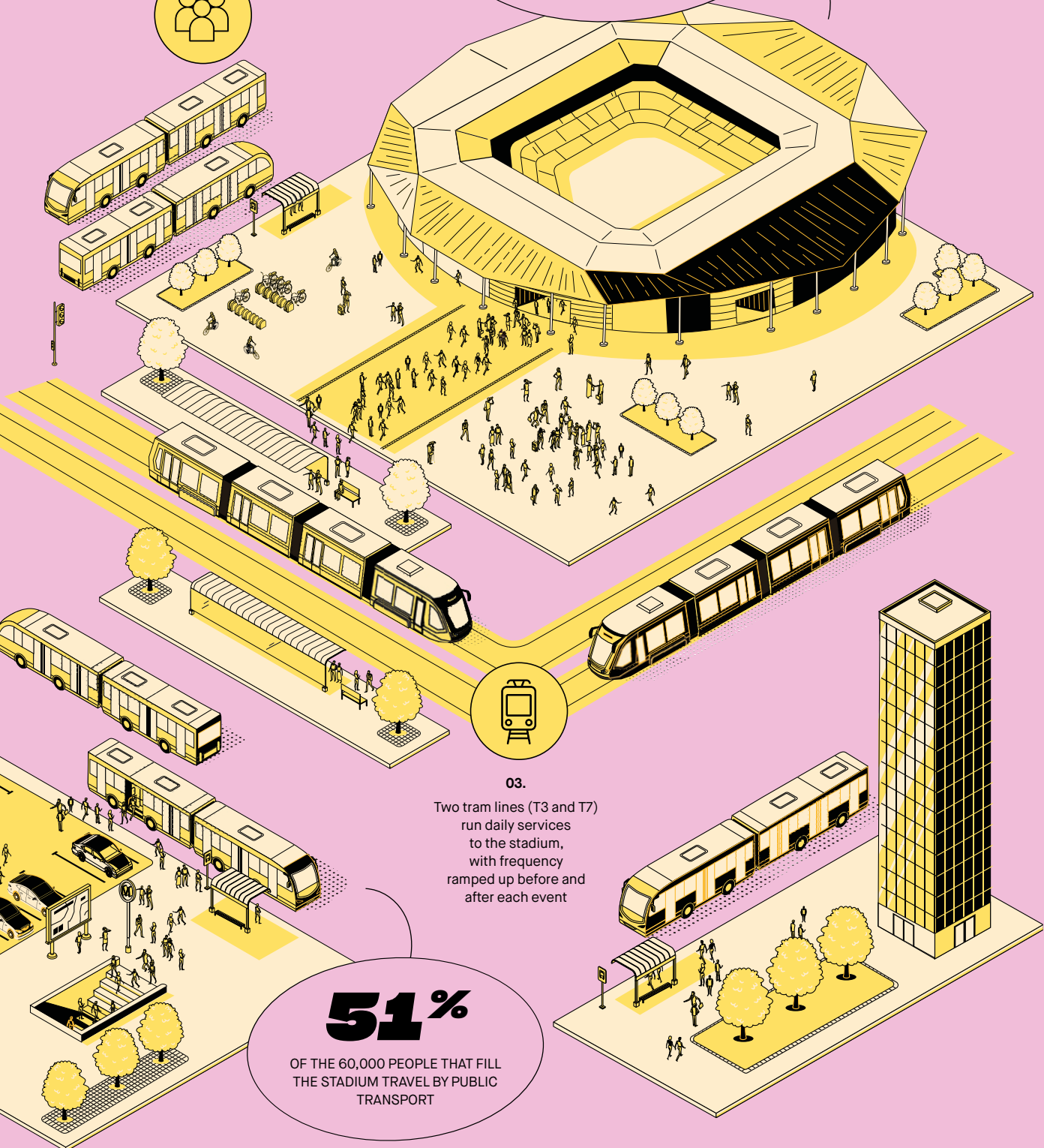
02.

In 2022, the Groupama Stadium hosted 28 Olympique Lyonnais FC matches and 6 concerts, drawing more than 1 million spectators



5

MODES OF TRANSPORT CONNECT THE STADIUM TO THE CITY CENTRE 20 KM AWAY: TRAM, SHUTTLE BUS, BICYCLE, METRO AND PARK & RIDE



03.

Two tram lines (T3 and T7) run daily services to the stadium, with frequency ramped up before and after each event

51%

OF THE 60,000 PEOPLE THAT FILL THE STADIUM TRAVEL BY PUBLIC TRANSPORT



Business case 01

FIFA World Cup Qatar 2022

OBJECTIVES

In December 2022, the global sporting world turned its gaze on Qatar, where the FIFA World Cup kicked off for the very first time in the Middle East. Qatar is a small country of just under three million people on the Persian Gulf. The influx of around one million visitors over the month-long 22nd edition of the tournament represented a 25% boost to the resident population. On match days, between 450,000 and 850,000 football fans travelled by metro or tram to get to and from the stadiums — enough to keep the transport operator constantly on their toes!

SOLUTIONS

To gear up for this major event, metro operator RKH Qitarat (a joint venture between Keolis, RATP Dev and the Hamad Group), and public transport authority Qatar Rail had worked hand in hand since 2019. Throughout the tournament,

the public transport network operated virtually 24/7 to handle the increase in passenger numbers. An additional 3,000 station staff were hired to assist passengers, together with 500 technicians and front-line staff and more than 200 security guards. By the day of the opening game, almost 96,000 hours of staff training had been provided and 800 hours of resiliency testing conducted on the metro system.

OUTLOOK

When the final whistle blew, RKH Qitarat was more than satisfied with its network's performance. Some 18.2 million passengers had been carried over 29 days without a significant safety or technical incident reported. 51% of journeys for the matches were made by metro, totalling nearly 1 million miles travelled. The network recorded 99.66% punctuality and 99.81% traffic flow - an outstanding performance that will no doubt catch the eye of other sporting event organisers!

“We thank our Keolis colleagues from around the world who committed their time and experience in support of this amazing achievement. Everyone involved can be proud and cherish the memories we made together — One Team One Goal”.

KEVIN THOMAS,
MANAGING DIRECTOR, RKH QITARAT



Business case 02

Formula 1 in Melbourne

CHALLENGES

Melbourne has been hosting the Australian Grand Prix – a Formula One World Championship round – since 1996, with races taking place on the Albert Park Circuit located three kilometres (1.8 mi) south of the city centre. The event attracts more people every year: in 2022, spectators totalled 420,000 across the Grand Prix weekend. And in 2023, four AFL football matches are scheduled to take place at the same time as the F1 races. For Yarra Trams, the challenge is two-fold. It needs to encourage fans to travel to sporting events by public transport rather than car, while also maintaining service efficiency.

SOLUTIONS

To meet this challenge, in 2022 Yarra Trams delivered 2,500 dedicated Grand Prix shuttle services over the four days of the race and customer Service Employees trained in

Keolis Signature Service were deployed at all key locations. During peak times, Yarra Trams operated a shuttle every two minutes between the major train station and the track, moving up to 5,000 people every hour. The combination of low-floor trams and level access stops along the Grand Prix service ensured passengers with accessibility needs could enjoy a step-free journey to the race – as well as speeding up passenger movements when boarding and alighting.

NEXT STEPS

With a new contract between the FIA and the Australian Grand Prix Corporation (AGPC) putting the Grand Prix in Melbourne back on the F1 calendar for another ten years, Yarra Trams is already thinking about how it can further improve the quality of its services. And with Melbourne hosting not only F1 but also F2 and F3 races from 2023, the surge in demand for public transport will be even greater.

“By focusing on increased tram frequency and shorter waiting times and by implementing our Keolis Signature Service, we’ve made sure that the tram trip to the circuit is an integral part of the incredible Grand Prix experience.”

CARLA PURCELL,
CEO YARRA TRAMS

Transport in agile mode

Pets, pushchairs, surfboards and more — transport operators are always testing new ideas to meet emerging needs and devise more responsive services. From Le Mans in France to Australia's east coast, here are just some of the smart pilots and services on public transport around the world today.



Where I go, my board goes! Australia's Flexity 2 trams are the only light rail vehicles in the world with specially designed racks for surfboards. Introduced in 2014, they allow Gold Coast surfers to take public transport instead of their cars to the beach!



Dog-friendly transport: In Lyon, all dogs (except dangerous breeds) are now welcome on public transport — provided they're on a leash and muzzled. This follows a pilot test in 2021. Owners purchase a one-day WAF ticket, which lets them travel with their canine companion for an extra €1. In Manchester, a similar trial was conducted in late 2022.



Commuting in Rome just got more interesting:

Rome has launched a mobile digital library allowing passengers to choose from hundreds of e-books, magazines, podcasts and music tracks for free while waiting for their bus, tram or metro, and then continue to enjoy them on their journey. Some 18,000 QR codes are available at stops across the capital's networks.



Even bikes ride up front: In the United States, over 70% of public buses have front-mounted bike racks. A simple and visible way to promote cycling and encourage intermodal travel.





In Greater Paris, commuter trains have been transformed into museums. For two years, the walls of RER D trains have featured movie posters and actor profile pictures to celebrate 120 years of the Gaumont Film Company. RER E trains have displayed 400 exhibits from the Quai Branly Museum to take passengers on a journey through non-Western civilisations.

Keep calm and carry on: Passengers keen for some peace and quiet on two of Belgium's busiest train routes can opt to travel in "quiet zones". In a pilot phase run by Belgian railways SNCB until 31 May 2023, quiet-carriage passengers are requested to speak as softly as possible, put their mobile phones on silent, and reduce the volume of their headphones.



Shared transport of goods: Founded in 2021, WePost France enables collaborative delivery of goods by train. The startup connects travellers via its website with individuals who need to send packages. Customers using France's TGV high-speed rail service carry the parcels and are paid up to €20 for a trip from Paris to Marseille, for example.



Pulse Magazine

A Keolis initiative, *Pulse* is aimed at all shared mobility decisionmakers, stakeholders and influencers. Available in print and digital format, and via social media, its purpose is to inform the conversation and foster dialogue around the issues and trends shaping our sector.

Check out the online version on our website

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KEOLIS 34 avenue Léonard de Vinci
92400 Courbevoie **Pulse Magazine – Spring 2023**. Publication Director: Sophie Durand – Executive Editors: Catherine Miret and Giles Spence – Editor: Marion Granier Deferre – Translators: IDJ Communications – Illustrators: @Jiaqi Wang / Agence Pocko – Photographers: @AirBreizh; @Bioteos; @Divia Mobilités; @Antoine Doyen; @Envibus; @Forum del libro ETS; @GettyImages / Jozef Polc; @Ginko; @iStock / milindri / vchal; CHUNYIP WONG; enigma_images; @Franck Juery; @Keolis - Nicolas Gornas / Robert Oosterbroek / Hub Institute / Richard Soberka; @Keolis Downer; @Keolis G:Link; @Keolis North America; @Land Transport Authority (LTA Singapore); @Para-PM; @UTP (Union des Transports Publics); @Shutterstock / Ever Vera; @SNCB; @SNCF; @SYTRAL Mobilités; @Transport Ticketing Global; @Transports Urbain Briochins (TUB); @RKH Gitarat; @WePost – All rights reserved Design/production: Angie

ISSN: 2741-8030 – This magazine is printed on PEFC certified paper (sustainable forest management) by Imprimerie Solidaire, the first special-needs industrial printing firm in France.



Keolis is hiring

Rolled out in 2022, Keolis' disruptive global recruitment campaign #DIVERSITYDRIVESUSFORWARD illustrates that talent has no boundaries, colour, gender, limits, orientation or age.

