



# Tomorrow's Living Station

# Forewords



**David Biggs**

*Managing Director of  
Network Rail Property*

**Our world is changing.** As traditional boundaries of space and place blur, increasing urbanisation and new technology is transforming the way we live, work and play. The impact stations large and small can have in this shift is significant, and now more than ever we need to consider the future role of stations as a catalyst for creating healthy and sustainable communities and delivering positive outcomes for passengers.

As the definition of what is and isn't part of a station becomes increasingly less relevant, we need to challenge our current perceptions and think beyond the here and now. By provoking debate in the industry about the future role of stations, we can make sure that the decisions we make today unlock future potential and reimagine stations in a way that has a real and direct impact on the success of people and places.

Of course, stations must continue to deliver on their primary purpose, safely and efficiently moving passengers to where they want to go. Yet if we view these strategic assets as more than bricks and mortar, and instead as places for people, places for growth and gateways to our towns and cities, then we will find and explore opportunities that would have previously been beyond our grasp.

This look ahead to what the future could hold allows us to embed stretching and challenging ideas in our thinking. It is not the product of a closed debate, but rather the chance to start a conversation, and we would encourage you to engage with us when thinking about how to realise your objectives and the role that stations can play in delivering them.

Come with us as we reimagine the station estate, full of history and heritage, and take it beyond the 21st century social and economic engines that we see today. “*Tomorrow’s Living Station*” is a concept we are proud to champion, and believe that by being bold and thinking differently, could realise a new and exciting chapter for the future growth and prosperity of Great Britain.



**Malcolm** Smith

*Arup Fellow, leader of  
Integrated City Planning*

**The way humans move around fundamentally shapes our world.** Movement systems change our understanding of time, distance and economics, and influence the relationships between people, communities and places.

The railway system is one of the best examples of this. The disruption caused by the arrival of the railways was the outcome of the convergence of new technologies, social structures and economic models. The entry and exit points to the railways – the stations – played a key role in this disruption.

But as our world develops, railways, and stations in particular, are themselves being disrupted by ever-changing technology, innovation and a fast-evolving notion of place. If stations are to not only remain relevant, but be a competitive contributor to human futures, they must transform from a perception of static infrastructures and become the centre of nimble systems of movement, agile places and flexible operations. They must become **Living Stations**.

We are delighted to have collaborated with Network Rail to develop “*Tomorrow’s Living Station*”, to explore how stations might develop and to make them a place of inspiration and pride. This document sets out a way of thinking that incorporates the fundamental role of stations and railways in moving people safely, but explores broader issues and opportunities for stations.

Rather than being a one-size-fits-all approach, we hope this document will help everyone involved in shaping the future of our stations to come up with their own specific ideas appropriate to the relevant station context.

# Imagine the future

73m

is the projected size of the UK's population in 2041 with the percentage of people aged 65 and over expected to rise from 18% to 26.5% <sup>1</sup>

.....

20-50%

is the possible increase in the number of people choosing to travel in a seamless mobility system <sup>2</sup>

.....

23%

of the UK population already uses sharing economy services more than once a month <sup>3</sup>

Railways have been with us for nearly two centuries. And stations, many of them more than a hundred years old, can continue to inspire wonder while still serving their intended purpose. Given their longevity, it's only right to pause and imagine the future when designing the best possible station for today.

Given how quickly technology has evolved and been absorbed into our daily lives over the past decades, it is challenging to predict how this speed of change may influence the future. Based on our research into trends and behaviours, we can take a leap and imagine a possible future to determine how our stations, their systems as well as their own, unique settings might keep up with the pace of change.

## How might the future look?

The UK population has grown, and the fastest-growing city centres are north of London.<sup>4</sup> The population is more ethnically and culturally diverse, and older, yet more active. Inclusion and equality continue to drive policy and business planning, and are anchored in society.

Technology has become a natural extension to people's lives. Digital assistants and artificial intelligence-enabled services such as self-driving cars have, in part, replaced activities and interactions carried out by humans.

Mobility is viewed and consumed as a seamless door-to-door service, and there is falling ownership of capital-intensive assets such as cars. To meet global carbon reduction targets, electric motors have replaced combustion engines as the source of power for many of our mobility needs, reducing emissions and improving air quality.

Despite these changes, stations remain the access points to the railway network, and people continue to value their

time, their health and interactions with other people in the same way.

### Living Stations and the value of people's time

In an age where the boundaries between work and play are blurred, stations have to cater for a more agile life / work environment. They can play a critical role in enhancing people's productivity.

Passengers will expect an efficient mobility service, with a well-connected, easy-to-use station at its heart that enables them to control and make best use of their time. They do and increasingly will appreciate a high-quality environment.

In the coming decades, the digital railway could be in its second generation, enabling very reliable services with a metro-style frequency. Combined with other innovations, such as driverless mobility, the railway could be much more interoperable with on-demand choices and 'Mobility as a Service' providers. This would give customers more choice, and more responsive options. The **Living** Station could become a mobility hub.

### Living Stations and the value of health and wellbeing

There is a growing focus on health and wellbeing, with customers keen to look after themselves, making more active transport choices and demanding a journey that improves, rather than harms, their health. Customers will appreciate stations that help to improve their physical and mental wellbeing by providing high-quality and healthy spaces where they would choose to spend time.

As well as beautiful public spaces, stations can be the core of a healthy network – where cycling and walking are easy and obvious choices – part of an active journey through a natural environment. **Living** Stations will be expected to provide

7.8m

estimated number of consumer drone shipments by 2020 <sup>5</sup>

£28bn

the size of the UK's connected and autonomous vehicle (CAV) market by 2035 <sup>6</sup>

54%

of travellers in the UK already consider their smartphone essential to their travel experience <sup>7</sup>

experiences like this regardless of their scale or location, always providing safe, healthy and welcoming places to meet, relax and move.

## Living Stations and the quality of transactions

With the rapid rise of the shared economy, over the coming decades we can expect people to own less and share more. We're likely to work more flexibly and use digital infrastructure to buy the things we need and desire, and interact more frequently with machines. This is likely to increase the value people place on high-quality human interaction and transactions.

In this context, communities are expected to adopt shared bikes, shared autonomous vehicles and electric passenger drones as part of their daily movement pattern. To cater for customer expectations, we imagine **Living Stations** will need to support innovation in housing, e-commerce, leisure and healthcare, to create easy, seamless links between the things people need and the routes they take throughout their day.

**Living Stations** can play a role in future urban and rural logistics. Our stations, their systems and their settings will have to evolve to keep up with the pace of change, while still meeting the needs of passengers who cherish their core function as multi-modal interchanges.

We have identified three possible ways a **Living Station** might respond to those challenges.

1. As the centre of movement for people
2. Supporting inclusive growth
3. As the heart of healthy communities

There is no one size fits all approach and depending on scale, location and context, each **Living Station** would combine these three themes in different ways, creating a unique and distinct character. Successful stations, both new or re-imagined existing ones, whether in urban or rural context, will be those that find the right balance between all three.



*The centre  
of movement*

*Tomorrow's  
Living  
Station*

*At the heart  
of healthy  
communities*

# People focus

To remain relevant in the future, stations must consider the role they play as well as the people they serve.

Building on the design principles applied by Network Rail and others to provide a world-class service, it will be increasingly important to consider each station not only in its physical context, but within the communities it serves.

Communities of the future will be more diverse and use their stations in ways we can barely imagine today. Different generations' experiences, familiarity with technology and access to information will shape their expectations of the **Living** Station. This includes providing different levels of service catering for those who may wish to pay more, and others who prefer to pay less.

Engaging with local communities or empowering employees to give their station a unique feel will humanise the **Living** Station. Whether it is local residents looking after planters or staff setting up a book exchange, the **Living** Station recognises the positive impact people can make to everyone's experience.

The adjacent personas help us imagine how different users might experience the **Living** Station in the future, what they might expect, what they like about it, what they hope to achieve and how they may want to use it.

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## Ben, 78 & Dillon, 73

*Retired, active couple living locally, still interested in travel and new experiences with some spending power*

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## Barbara, 49

*Local councillor, focussed on social inclusion of her constituents and instrumental in connecting community and station*

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## Adrian & Lara, 28 & 31

*Day visitors, aspiring to a flexible, nomadic lifestyle and expecting easy and fast access to information*

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## Paul & Isla, 37 & 5

*Health and budget conscious, highly mobile single parent with daughter who is growing up with digital tools*

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## Adaugo, 58

*Family-orientated station manager, still defined by work and career, but defies a traditional idea of age*

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## Nayan, 20

*Local student and maker, environmentally and socially aware, wants to play an active role in her community*





- Enjoy being part of “the action” and interaction the **Living Station** offers.
- Like to support the local community by volunteering.
- Value personal and human contact over digital interfaces.
- May need assistance when travelling, in particular with luggage.
- Appreciate support from rail staff when services are disrupted or delayed.



- Enjoys the collaboration between the station operator and the local community.
- Expects the **Living Station** to make a significant contribution to housing and economic opportunities for her constituents.
- Cares about affordable travel for her less well-off constituents.
- Is excited about partnership with local business and the rail industry.
- Values the sense of pride and buzz the **Living Station** brings to the area.



- Enjoy new technology and innovation as part of their life.
- Choose modes of transport that best suit their needs.
- Expect spaces and services to flex to make life easier.
- Compare the **Living Station** with other retail and entertainment offers.
- Values responsive services that intuitively understand location and context.



- Rely on personalised and flexible travel options.
- Value a high-quality, safe and healthy travel environment.
- Paul likes that Isla can explore new things in a safe environment at the **Living Station**.
- Paul appreciates services that help him organise his day and make life easier, so he can spend more time with his daughter.
- Enjoy that they can both go to the same place to do what they need to do.



- Enjoys that his job has become more connected to users of his **Living Station**.
- Likes the unique character of his station as a result of involving the local community and being more socially inclusive.
- Tries new technologies to keep the station offer relevant.
- Recognises that coordinating multiple transport modes with evolving passenger demands requires flexible spaces.
- Explores what contribution to housing, jobs and affordable transport his **Living Station** could provide.

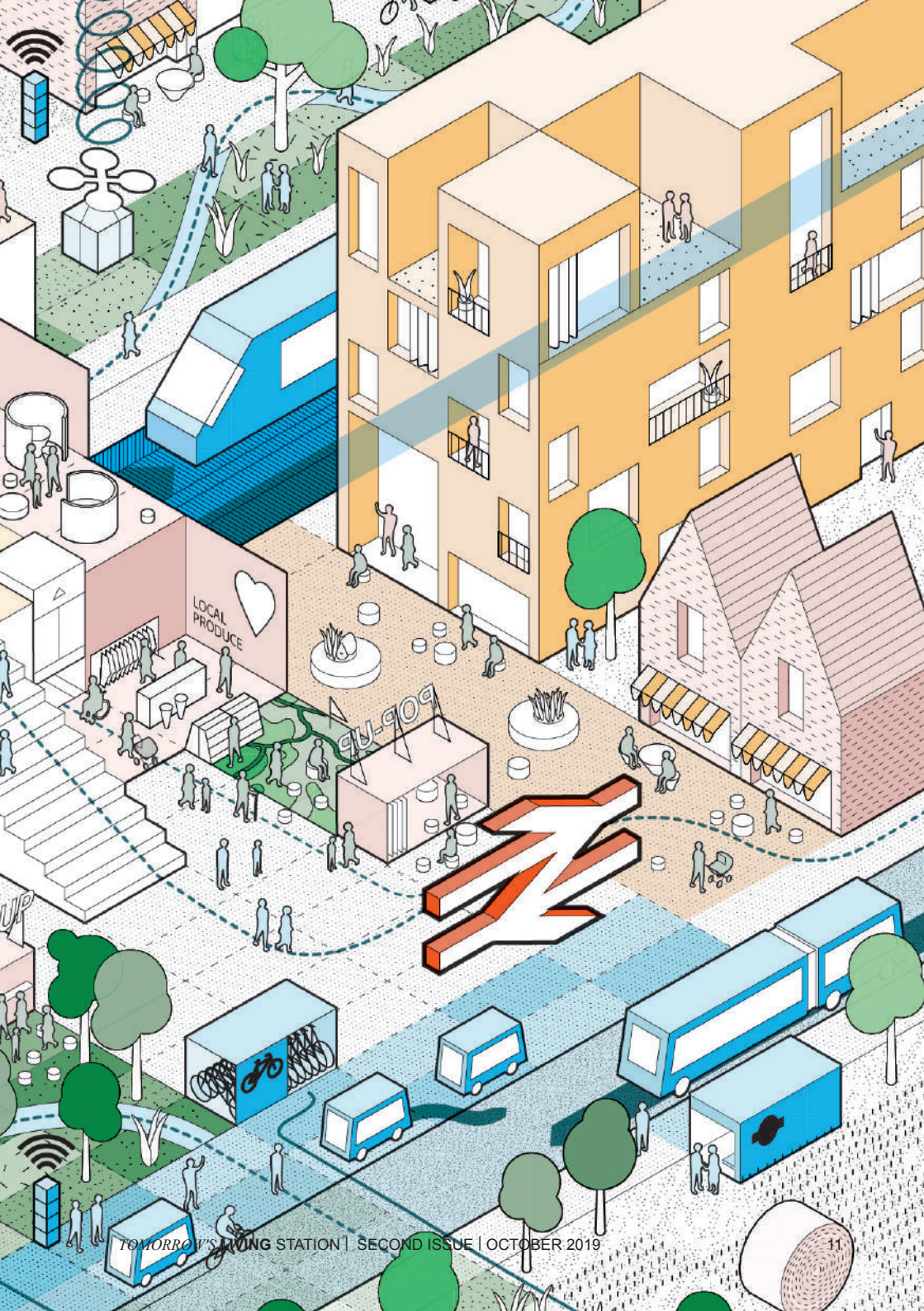


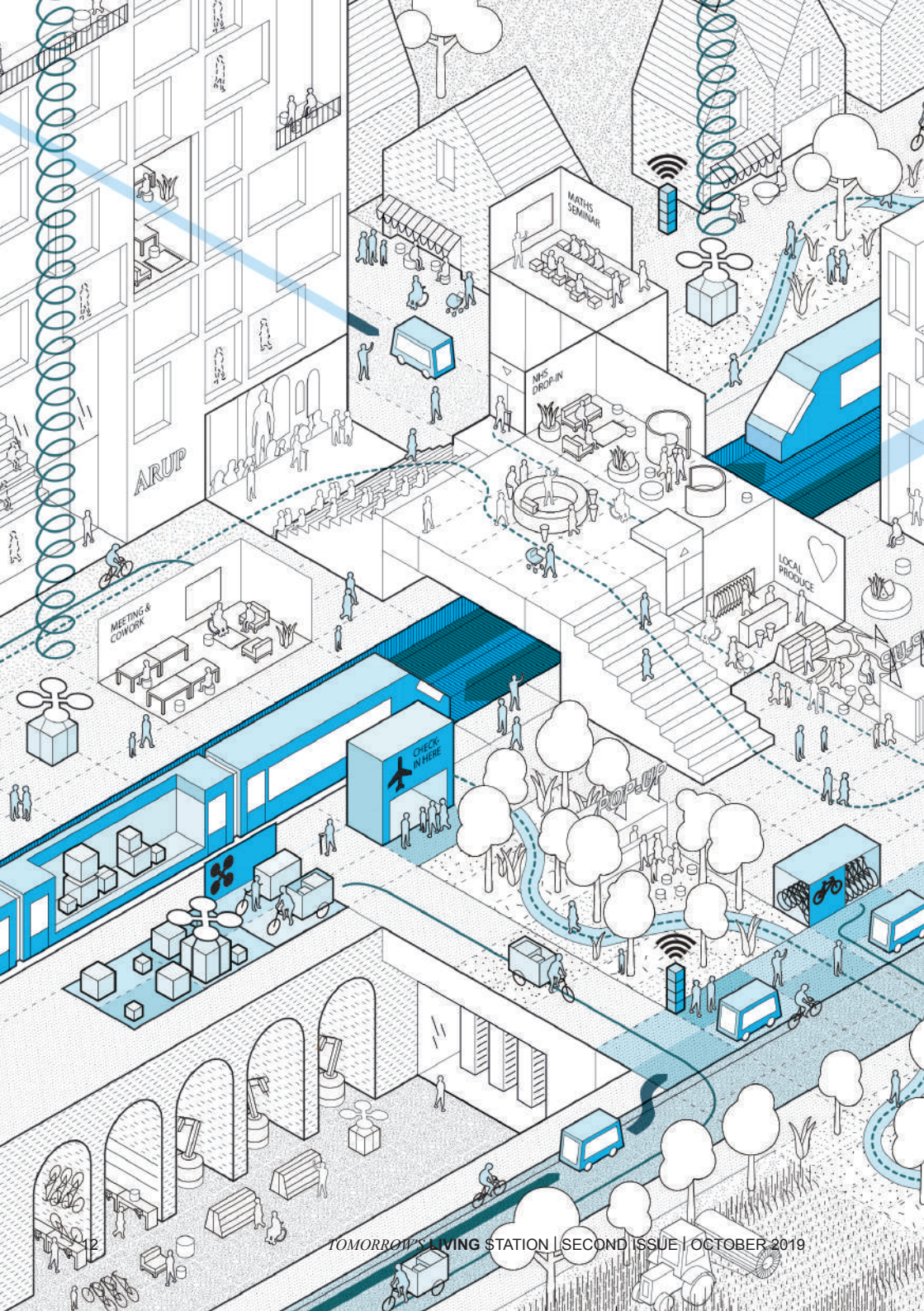
- Values the opportunities the **Living Station** has given her by providing courses linked to top universities.
- Wants to make a difference through her work.
- Expects companies and brands to be ethical and socially inclusive and enjoys the choices the **Living Station** offers.
- Regularly uses the workshop and learning facilities at her station to progress her studies and prototype her ideas.
- Enjoys the new cycle network linking her home with the station and beyond.



# *Tomorrow's* **Living Station**

Through users' experiences, this chapter explores the three emerging themes and highlights potential issues and opportunities.







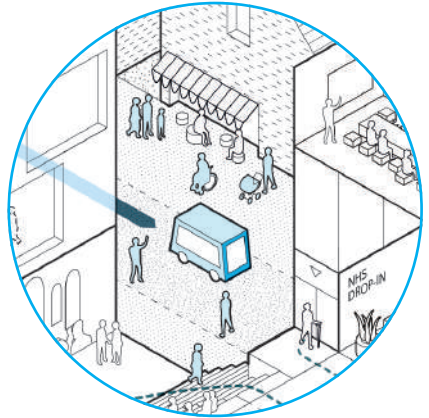
# 1 Stations as the centre of movement for people

In the future, stations can focus less on simply being the entry point to the railway network. Instead, they could become the hub for our mobility experience, connecting multiple modes and services seamlessly.

The drawing opposite illustrates some of the intersecting movements and journeys we imagine people making around the **Living** Station in both rural and urban context. Whether they are checking-in for the entire journey at the start of their holiday or sharing an autonomous drone taxi to a meeting, the station will be the natural, safe and lively touchpoint for people's mobility needs.

The following pages draw out the key issues and opportunities underpinning the role of the station as the centre of movement.

## Stations will be the hub of peoples' journeys



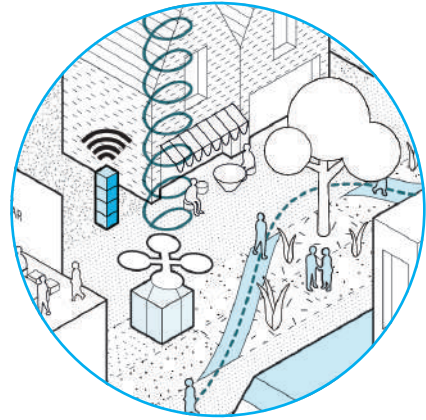
New and improved technologies, greater movement choices and more collaborative working between operators, the rail network, stations and their communities will help to place the station at the centre of seamless daily journeys.

### More personalised movement

With the continued rise in the use of mobile apps and virtual messaging, it will not be long before physical tickets and departure boards are much less heavily relied on, if not redundant. This technology shift presents an enormous opportunity to make travelling through a station fluid, seamless and easy.

Personalised, real-time navigation paths through the station will make wayfinding easier, and alternative approaches to physical ticket barriers can be explored, improving accessibility, speeding up boarding and reducing congestion at the station. Our **Living Station** imagines:

- One virtual ticket for all travel needs
- Digital information platforms
- Customer loyalty programmes and transport on subscription
- Integrated AI data gathering and personalised mobility services.



### Better choices and more of them

Stations already function as interchanges. But in a future where service and efficiency will be paramount, stations have an opportunity to become bustling, multi-modal hubs serving the whole population as opposed to predominately rail passengers. Families may arrive at the station by rapid bus routes, potentially having sent their luggage ahead, while business people may arrive from meetings in autonomous vehicles, parking just outside the entrance. Our **Living Station** imagines:

- A hub for multi-modal connectivity with just-in-time interchange and personalised scheduling
- An interchange for people and an interface for freight
- Drone ports integrated into stations
- Membership options that combine transport with other services such as shared workspaces.

### Partnership and collaboration

In the future, regional and local authorities are likely to have greater control over transport planning in their area. Stations should work in partnership with others to make the most of this new age of transport and share the rail industry's knowledge and expertise. Collaborating with local planners and other transport providers will create a better experience for passengers and support opportunities for local business. Our **Living Station** imagines:

- A key partner in integrated development around stations
- Risks and future-proofing are shared between stakeholders
- A collaborative approach to enhance user experience
- Sharing resources and skills to create better local outcomes.

Knowledge hubs and incubation spaces, enabling distance learning and supporting skills development for all ages

Community engagement and sense of pride

Customer loyalty programmes and membership options with other services such as shared workspaces

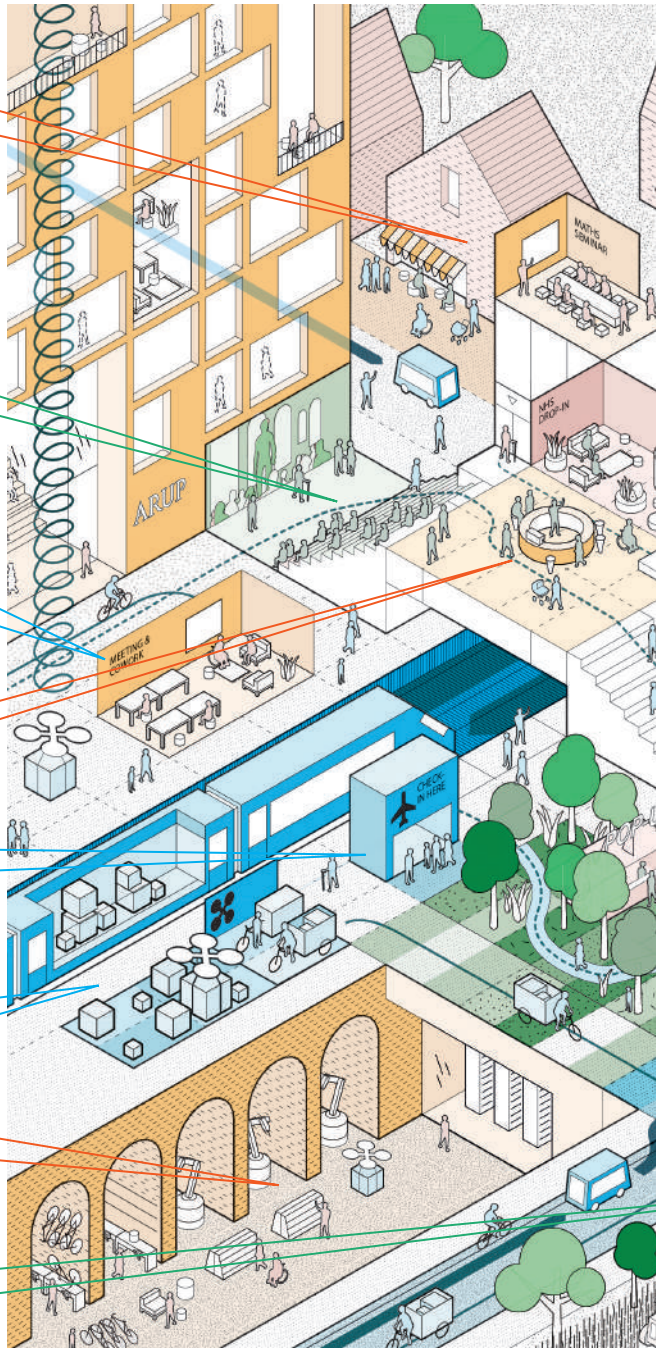
New partnerships with local services, creating new opportunities

Hub for multi-modal connectivity with just-in-time interchange and personalised scheduling

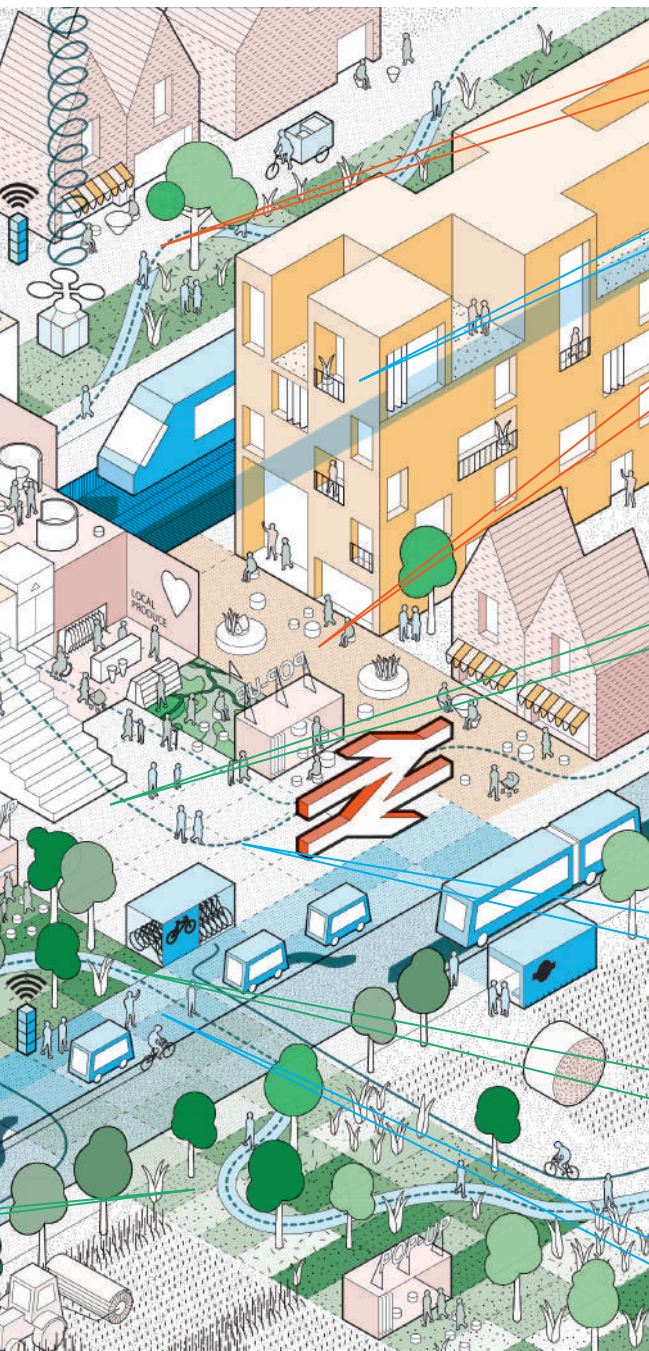
Interchange for people and interface for freight with integrated drone ports

Business and innovation opportunities, connecting jobs with homes

Enlarged public spaces around stations and improved sense of arrival







Innovative governance structures and integrated development strategies

Partner in integrated development around stations

Station Improvement Districts, creating strong links to business, commerce and innovation

Fully accessible facilities catering for people with diverse abilities and ages and potential to remove ticket gates

Partnership and collaboration, to enhance user experience, sharing resources and skills

More connected green infrastructure promoting active travel like cycling and walking

One virtual ticket for all travel needs, transport on subscription



ARUP

MEETING & COWORK

MATHS SEMINAR

NEWS DROP-IN

LOCAL PRODUCE

CHECK IN HERE



## 2 Stations supporting inclusive growth

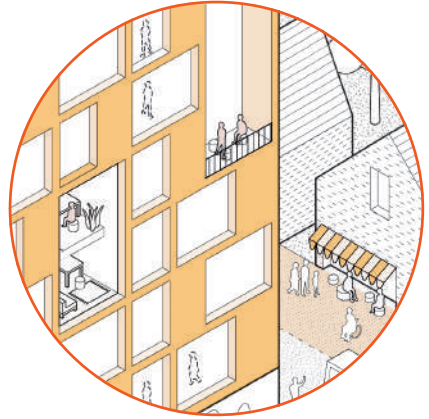
Railways have always been a conduit for commerce, not only transporting goods and workers, but supporting retail and other businesses. Though commuting and trade patterns may be more fluid in the future, the value gained from physically travelling for work, education and leisure is not likely to diminish.

The drawing opposite illustrates how stations can establish and maintain their status as vibrant community hubs and a force for positive growth in both urban and rural areas. They should, where relevant for local needs and context, aim to broaden what they offer, becoming centres of business in their own right, and contributing to wider societal ambitions such as upskilling and decentralised productivity.

In the future, the station will increasingly contribute to and enable greater prosperity, as well as more equitable growth across the network. The following pages explore the key issues and opportunities which might reinforce the role of the station as the heart of inclusive economic growth.

## Stations can drive inclusive and sustainable growth

Working in partnership with diverse agencies and stakeholders, the station of the future continues to be a catalyst for development and regeneration. Patchwork funding and partnering will help local authorities to set the agenda. In denser and more connected cities, it will need to continue helping to shape and support growing communities by connecting homes and jobs to people.



### At the heart of mixed-use places

Increasing demand for housing and greater competition for space will create an opportunity for some stations to become rich, diverse and mixed-use places. Depending on scale and context, they have the potential to integrate high-quality housing and varied retail offering with ultra-convenient transport connections.

In the right locations, night-time economy opportunities should also be explored, while maintaining safety and security standards. Our **Living Station** imagines:

- Innovative governance structures to facilitate inclusive growth
- Integrated development strategies
- Connecting jobs to homes
- Reducing dependency on cars
- Station Improvement Districts.

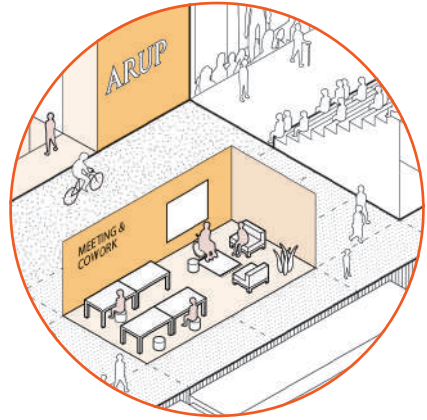


## Welcome to our community

In some places, businesses already compete to be close to stations. Locations near stations will be even more desirable, particularly with access to multiple modes of transport and high-quality, mixed-use facilities.

Flexible office space designed with start-ups in mind, incubator space for entrepreneurs to meet and work, and fully-equipped work pods for commuters or students interchanging at the station could help support business and commerce in the local area. Our **Living Station** imagines:

- Knowledge hubs/incubation spaces
- Enabling distance learning
- Generating income through educational links
- More opportunities for local communities
- Strong links to business, commerce and innovation.



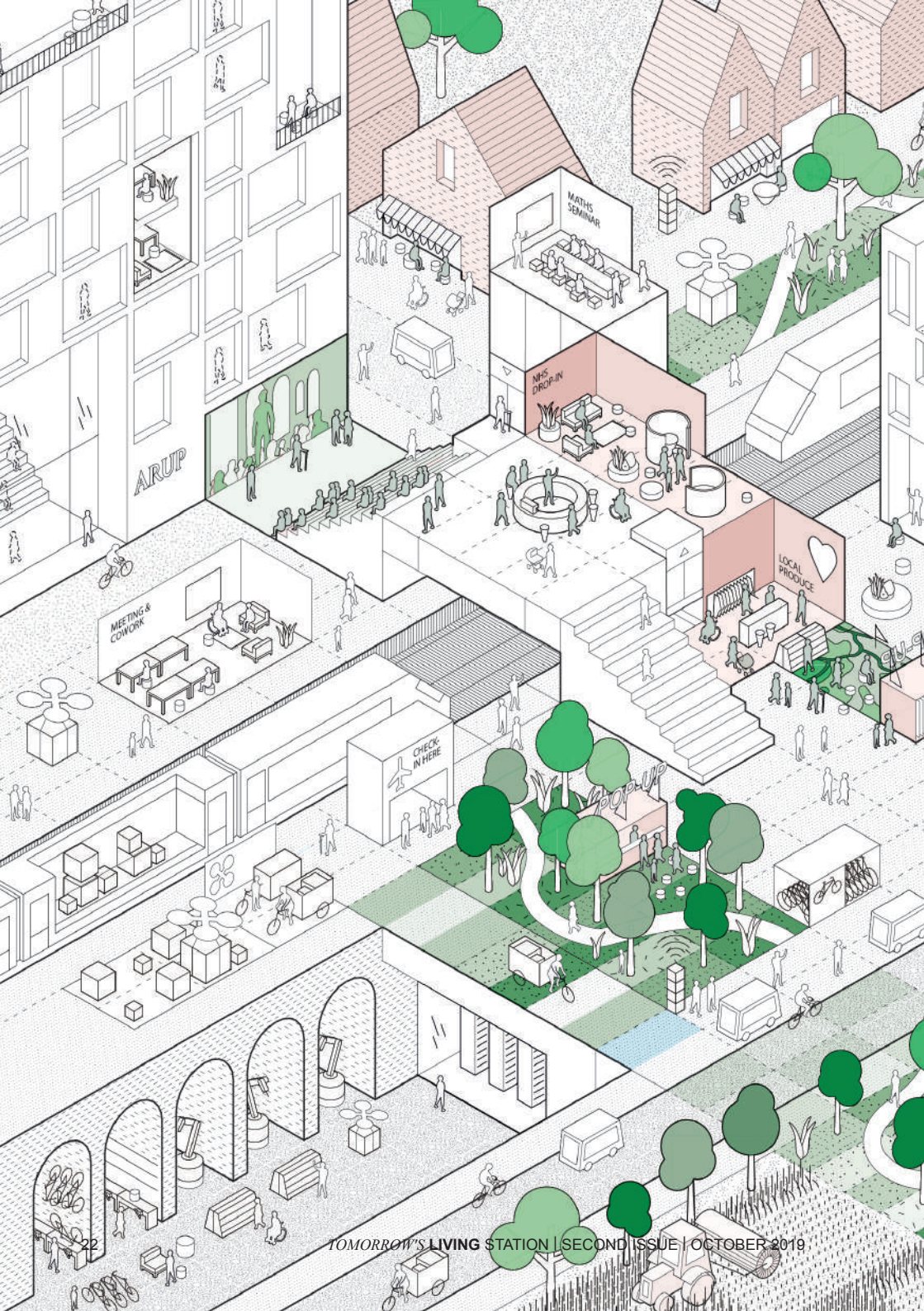
## Addressing the needs of an evolving neighbourhood

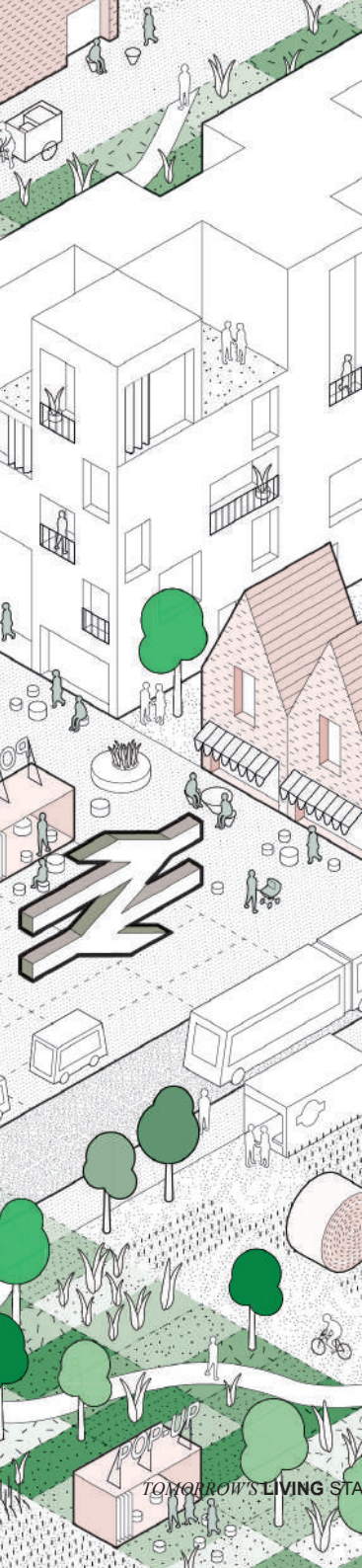
For growth to be inclusive, success in the local economy needs to benefit everyone in society, and vice versa. In certain locations the future station will be a centre for commerce, but also be a space for learning and discovery.

Visitors to the station could attend free mini lectures and job fairs; members of the community might attend skills workshops run by local businesses; and organisations linked to the station itself could employ apprentices in different fields.

Our **Living Station** imagines:

- A central point for skills and exchange
- Supporting skills development for all ages
- Creating opportunities
- New partnerships with local services.





## Stations as the heart of a healthy community

Efficient buildings, systems and use of space will enable stations of the future to use their facilities to connect and engage people with their neighbourhoods. Stations will become the heart of richer, more diverse and healthier communities.

The drawing opposite illustrates how stations can play an increasingly important role in improving the wellbeing of the communities they serve. New public spaces, beautiful and calm places to wait and meet, innovative reuse of old infrastructure and respectful treatment of heritage have the potential to create unexpected moments of delight which connect people using the station to the unique characteristics of a place.

The following pages begin to draw out the key issues and opportunities underpinning the role of the station as the heart of both rural and urban communities.

## Stations as the healthy heart of future communities



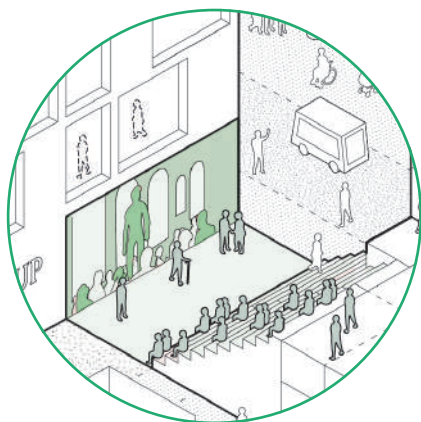
As cities get denser, growing and changing communities will need more, healthier and better integrated civic-focussed spaces and resilient green infrastructure. Stations and surrounding mixed-use development can contribute by replacing part, or all of, the traditional station building, and blurring the boundary between the neighbourhood and its movement infrastructure.

### A network of station public spaces

With the railway system seamlessly integrated into the fabric of the neighbourhood, the streets and spaces around stations will become much more closely interwoven. As the station concourses, platforms and retail environments become part of the community the railway serves, evolving technology creates greater potential for gateless stations and far more generous and enjoyable pieces of public realm, each with the station at the heart. Our **Living Station** imagines:

- Enlarged and improved public spaces around stations
- New infrastructure promoting active travel like cycling and walking
- More connected green infrastructure.





## Welcome to our place

Stations are the welcome mat for the communities they serve – the station is often the first part of a place that visitors see. What if we could put the creativity of that community front and centre in the station environment? Allied to the social and economic value of local products and services, there is a huge opportunity for stations to harness this entrepreneurial spirit by creating physical spaces and social networks that celebrate and support local communities. Our **Living Station** imagines:

- An increased sense of pride in place
- Places that create a sense of arrival
- Opportunities for local retail partnerships
- A focal point for community wellbeing.



## The needs of an evolving community

Stations of the future could address the needs of both a more mobile workforce and an ageing population through co-working spaces, amenities for time-poor commuters, day care, drop-in clinics and community spaces. By investing in and understanding a community's needs, the rail industry can help to build community ownership and enhance the experience of mobility customers, placing the station at the heart of an evolving community. Our **Living Station** imagines:

- Fully accessible facilities catering for people with diverse abilities and ages
- Integrated skills and training on offer
- Partnerships with educational institutions
- Community engagement.

# What next?

Given the degree of variety in our stations from the busiest large stations to end-of-the-line village locations – there is no one-size-fits-all solution. The ideas explored on the previous pages are a stepping stone for developing a unique, location-specific idea for a **Living Station**. Delivery may include solutions that might be novel from a traditional railway perspective as the **Living Station** is open for new ideas and open for business.

The following concepts can guide the process:

## A way of thinking (not just a building)

To reach its full potential, we need to think well beyond the building and the station's operational requirements. This means considering movement, inclusive growth and community needs beyond the station's boundaries.

## Understanding context

How might outward-facing global parameters, such as climate change or demographics, shape our future? Do we have a deep enough understanding of inward-looking parameters, such as local geography or community? It's important to consider historic and present conditions as well as the future.

## Focussing on people's experiences

To be accepted by the community and maintain customer satisfaction, design or technical solutions have to be evaluated through people-specific, human experiences. People want to use places and services that both meet their needs and provide enjoyment.

## Finding the right balance

Each **Living Station** should strive to introduce a balance of the three key themes. Their different contexts, circumstances and priorities will make each **Living Station** unique.



*Supporting  
inclusive  
growth*

*The centre  
of movement*

*Tomorrow's  
Living  
Station*

*At the heart  
of healthy  
communities*

# Contributors

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# References

## End Notes

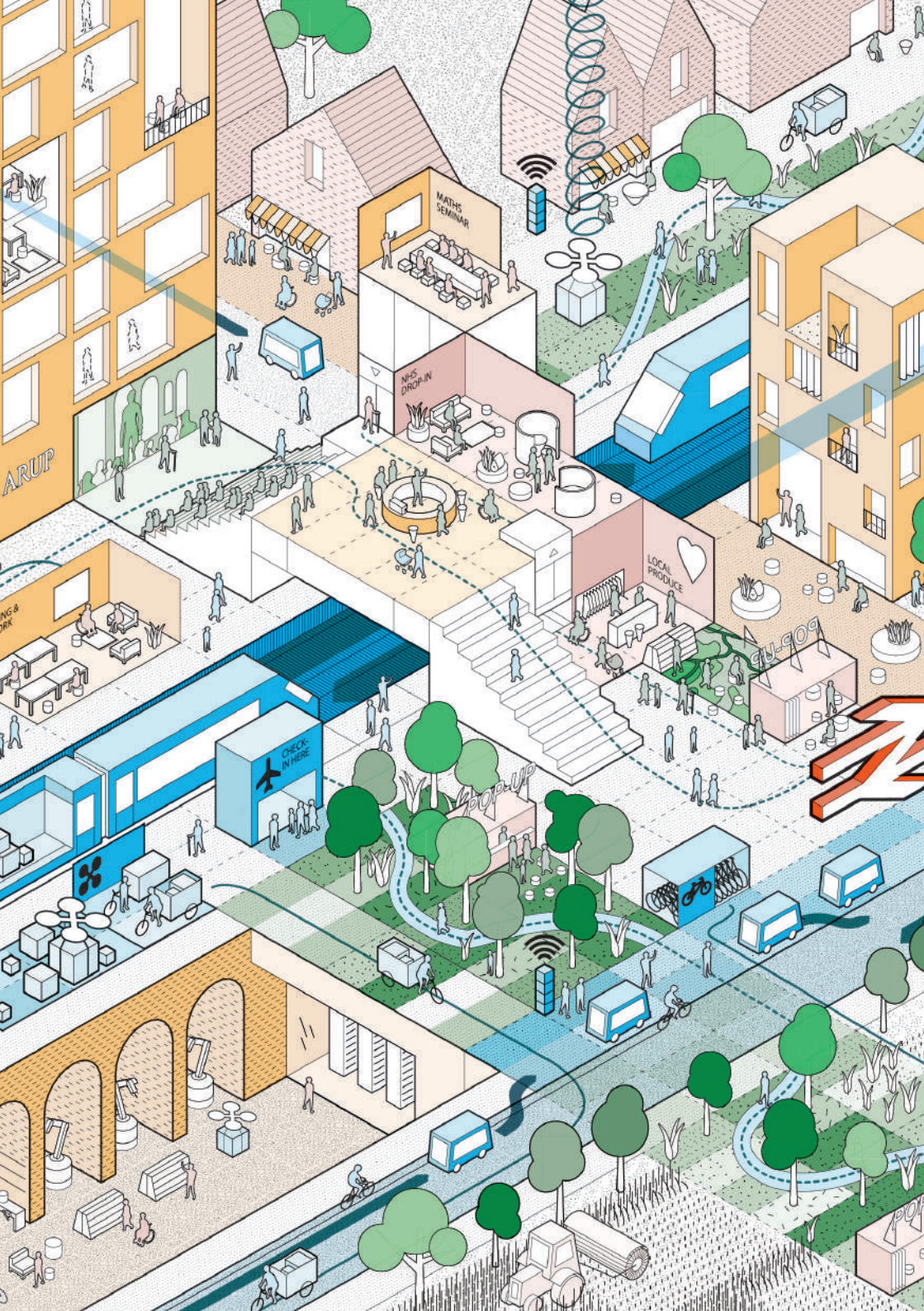
- 1 - Office for National Statistics  
November 2018, <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/articles/overviewoftheukpopulation/november2018>
- 2 - McKinsey & Company 2016, <https://www.mckinsey.com/business-functions/sustainability-and-resource-productivity/our-insights/an-integrated-perspective-on-the-future-of-mobility>
- 3 - Source: <https://www.wbs.ac.uk/wbs2012/assets/PDF/downloads/press/ResultsofUKSharingEconomyConsumerSurvey2017.pdf>
- 4 - BBC News 2018, <https://www.bbc.co.uk/news/uk-44482291>
- 5 - The Verge / Goldman Sachs Research, <https://www.theverge.com/sponsored/goldman-sachs-drones/mobile>
- 6 - Catapult Transport Systems 2017, <https://ts.catapult.org.uk/news-events-gallery/news/connected-autonomous-vehicle-industry-worth-28bn-uk-2035/>
- 7 - Catapult Transport Systems (year not stated); <https://ts.catapult.org.uk/current-projects/traveller-needs-uk-capability-study/>

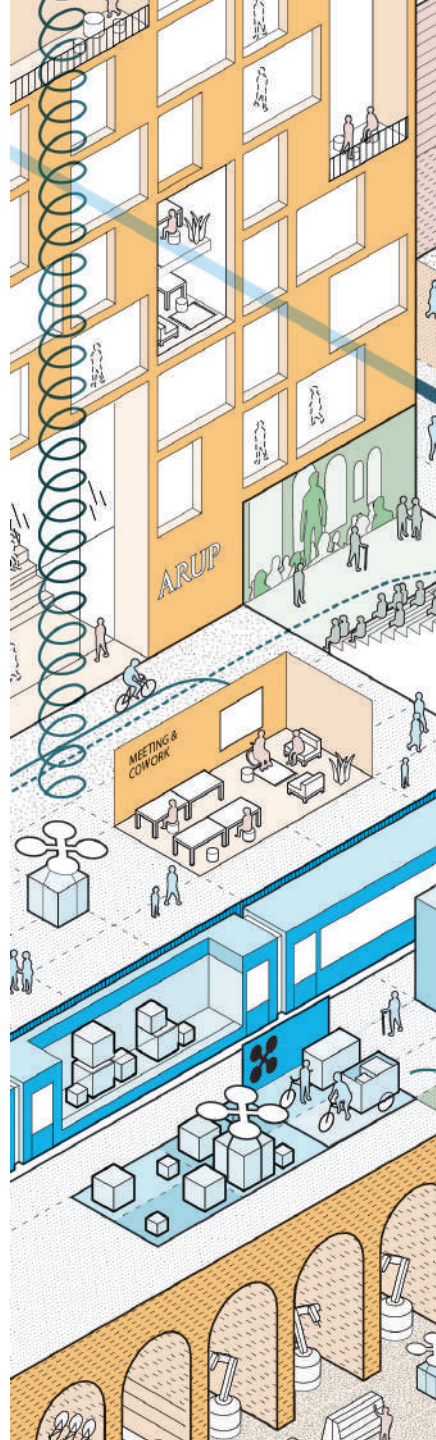
## General References

- Investment in Stations, <https://cdn.networkrail.co.uk/wp-content/uploads/2017/01/Investment-in-Stations-2017.pdf>
- Regenerating Britain's railway stations: a six-point plan, [https://www.raildeliverygroup.com/files/Publications/2017-06\\_regenerating\\_britains\\_railway\\_stations\\_plan.pdf](https://www.raildeliverygroup.com/files/Publications/2017-06_regenerating_britains_railway_stations_plan.pdf)
- Vision for Stations, <https://www.raildeliverygroup.com/component/arkhiv/?task=file.download&id=718>
- Regenerating Britain's railway stations: six case studies; [https://www.raildeliverygroup.com/files/Publications/2017-06\\_regenerating\\_britains\\_railway\\_stations\\_case\\_studies.pdf](https://www.raildeliverygroup.com/files/Publications/2017-06_regenerating_britains_railway_stations_case_studies.pdf)
- A better railway for a better Britain, <https://cdn.networkrail.co.uk/wp-content/uploads/2018/02/Strategic-business-plan-high-level-summary.pdf>
- Future of Rail 2050, <https://www.arup.com/perspectives/publications/research/section/future-of-rail-2050>
- Future of Retail, <https://www.arup.com/perspectives/publications/research/section/the-future-of-retail-2017>
- Cities Alive: Rethinking green infrastructure, <https://www.arup.com/perspectives/publications/research/section/cities-alive-rethinking-green-infrastructure>
- Rethinking Urban Mobility, <https://www.arup.com/perspectives/publications/research/section/rethinking-urban-mobility>

# Notes

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ARUP

