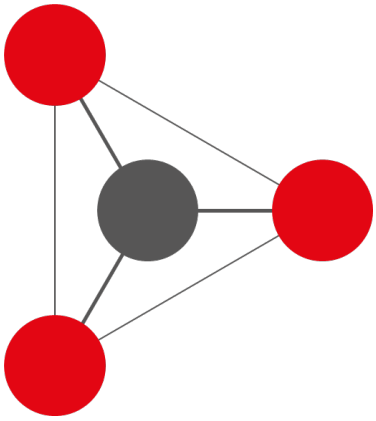

Triple Access Planning
for Uncertain Futures –
A Handbook for Practitioners

March 2024

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Foreword

The challenge of access is as old as life itself. All living organisms thrive best when they have the optimal access to the things that are important to them such as the right soil, sunlight and temperature for plants or the right type of plant to eat for a herbivore. As humans, we want access to shelter, food, family, friends, employment, and all the things that make us who we are.

We can't all live in exactly the same perfect location though and this leads to conflict. Helping to manage who can use what land for which purpose has been the role of land-use planners for centuries.

As we organised ourselves into different communities, we built transport networks to be able to move from place to place. Rivers and seas were our original natural 'highways' followed by roads, canals, railways, and airways. Transport planning was well underway.

Then, in the late 20th century, a new kid on the block arrived in the form of the internet and in just a few short decades, digital connectivity is now as ubiquitous as the transport system.

This Handbook draws together the three domains of land-use, transport and telecommunications into the Triple Access System. That is not all though; as every good planner knows, not everything can be planned. Over 2,000 years ago, Socrates wrote:

"To be uncertain is to be uncomfortable, but to be certain is to be ridiculous."

Put these together and you have the 'Triple Access Planning for Uncertain Futures' Handbook.

But wait, there's more! It's very easy for our focus, as planners, to be on what we know most about. As we're all human, it is all too easy for our focus to be on the movement of people. As my good friend, Tim Gent, once said to me though:

"The only thing you do that doesn't require transport is staying in bed
… but you'll need to go out to buy the bed."

The rise of digital connectivity has changed not only how we ourselves move but also the movements of the goods we consume and dispose of.

Finally, whilst lived experience for people is in the Triple Access System, our institutions are often still organised in individual silos. Triple Access Planning for Uncertain Futures is not a policy, it is simply a better way of understanding and addressing the real world, but that change in thinking may require a change in the way that we, as planners, do our business. When you push for the adoption of Triple Access Planning in your institution it is a change to the status quo. Change is always a challenge and the Handbook looks at those challenges and at ways to overcome them.

It has been my privilege to watch the fabulous team who developed and wrote this Handbook in action. They have brought together their knowledge and expertise, working across five different European countries and testing this concept out with a wide range of partners (see Acknowledgements).

This Handbook is really important for me professionally. I am a Chartered Transport Planner working as a Civil Servant in the Scottish Government. Our team advises decision makers on the Strengths, Weaknesses, Opportunities and Threats to proposed policies and infrastructure investments.

The Scottish Government has bold ambitions to tackle the challenge of climate change. Globally, the transport sector, at time of writing, has roughly the same share of emissions as it did in 1990. While engines have got more efficient, we've bought bigger vehicles and more of them. As Einstein said:

> *"Insanity is doing the same thing over and over and expecting different results."*

I believe that if we are to achieve different results then transport, spatial and digital planners all need to change their mindset and think as triple access planners.

I hope that you will find this Handbook useful and that you will join us in thinking and doing planning in each of the domains of transport, land-use and telecommunications differently.

This is however, just the start of the journey. We would encourage you to join the Triple Access Planning community on LinkedIn and share your thoughts and experiences.

We're all in this together and no-one has all the answers, so let's work collaboratively on this to improve the quality of all people's lives.

Stephen Cragg

Head of Appraisal and Model Development, Transport Scotland

Testimonials

“Accessibility enables people and businesses to flourish, but accessibility isn’t solely about providing good transport connections. Triple Access Planning (TAP); the holistic consideration of land use, transport and digital accessibility is increasingly recognised by national, regional and local authorities as key to creating thriving, resilient and sustainable communities. The TAP Handbook is timely as it provides essential guidance, practical case studies and evidence of why and how to plan and deliver TAP in urban and rural contexts and how it can be part of the solution to many of the local and global challenges we face.”

Annette Smith, Head of Future Mobility, Mott MacDonald, UK

“In its development of tools for transport strategic work, the Swedish Transport Administration sees that the TAP perspective offers a comprehensive and urgently needed approach to the generation of accessibility. Bringing digital accessibility into operative action is for the time being a challenge and a new approach for many.”

Mathias Wärnhjelm, Swedish Transport Administration, Sweden

“TAP introduces the municipality of Renkum to a promising approach in our development of a new mobility plan, transitioning from prediction to deciding. TAP promotes integrated planning across transportation, land use, and telecommunications to shape access in accordance with evolving societal needs, facilitating connections with people, employment, goods, services, and opportunities - exactly what we seek. We aim to incorporate considerations of health, environment, sustainability, accessibility, and safety into the implementation of mobility policies, with the goal of collectively reducing distances and pursuing broad prosperity and welfare for all residents.”

Christian Ratering, Policy Advisor Traffic, Municipality of Renkum, Netherlands

“The mobility of people and goods is the result of complex interactions between the transportation system and land use with which transportation planners are usually faced. Accessibility, traditionally viewed as the ease of physically reaching a place, now takes on new meaning as a result of the opportunities offered by digital connectivity. The TAP approach provides planners with a new way to deal with mobility planning by clarifying how to read the interactions between Land Use, Transportation System and Digital Connectivity and how to govern the elements of uncertainty in defining future scenarios.”

Cristina Contu, transport planner, Mlab srl, Italy

“This Handbook is an excellent educational resource for transport planners to help move from demand-led planning to planning for the desired future. For such planning it is still necessary to carefully determine the general framework of development, the limits of densification of urban areas, promote self-sufficiency, reduce logistical pressures and rationalise the consumer society. The Handbook contains many concrete communication, collaboration and planning techniques. The challenge now is also to find digital planners as well as spatial planners to help deliver Triple Access Planning.”

Andreja Kuzmanič, ZUM Maribor, Slovenia

Summary

Planning for the future continues to evolve in the face of a changing world. What we did in the past will not work for the future. Even the recent shift, with greater interest in transport planning being vision-led and focused on people rather than traffic, it is still not enough.

Below is a summary of a new Handbook which is the next evolutionary step. It supports a way of thinking and acting that is intended to mark a **change from transport planning in the 'predict and provide' paradigm to 'Triple Access Planning' in the 'decide and provide' paradigm**. This is vision-led ('decide') instead of forecast-led ('predict'). It includes digital accessibility alongside spatial proximity and mobility (together making 'triple access'). It also includes addressing **uncertainty** about the future.

This summary offers a much shorter read than the Handbook itself and should not be considered a substitute. Both rely upon the reader being ready to invest some time in contemplating how we plan for the future.

The Handbook is a companion guide for those who are already conversant with transport planning or other planning approaches. It explains the **triple access perspective** on planning, the handling of **uncertainty**, addressing **access for goods**, and the **organisational and institutional challenges** associated with Triple Access Planning. For each of these themes, four planning phases are examined: (i) **Philosophy** - why take this approach?; (ii) **Preparation and Analysis** – assessing the current and future situations; (iii) **Strategy Development** – determining visions/goals and the approaches to achieving these; and (iv) **Measure Planning** – identifying more specifically what needs to be implemented to achieve goals. The first of these is an important (informal) orientation phase. The other phases reflect those recognised in European Sustainable Urban Mobility Planning (which also includes 'Implementation and Monitoring').

Triple Access Perspective

Philosophy

To plan is to set about shaping a system's future - first we must understand the system being shaped. Travel is often seen to be a derived demand when it arises from our desire or need to access people, goods, employment, services, and other opportunities. Fulfilment of access requirements has relied heavily upon the transport system with transport planning traditionally operating within a 'predict and provide' paradigm where forecasts are made of future travel demand to assess the transport infrastructure and services required to serve it. This has tended to neglect the contribution of spatial proximity and digital connectivity to meeting everyone's accessibility needs in a more sustainable way.

The alternative is a paradigm of 'decide and provide'. This is vision-led rather than forecast-led and identifies a preferred future for accessibility, and alternative pathways (enabling adaptation if needed) towards that future. **In the digital age, accessibility can increasingly be achieved via digital connectivity as well as physical mobility and spatial proximity**. The Triple Access System of transport, land-use and telecommunications is the world we inhabit. During the COVID-19 pandemic we exhibited our incredible capacity to adapt behaviours when circumstances change. We also came to realise the resilience provided to society by having the Triple Access System. To plan for the future of this system, we need **Triple Access Planning**.

The Triple Access System offers tremendous opportunity to support urban and rural living in ways which assist economic activity and social justice and are compatible with a need to reduce greenhouse gas emissions. By planning for this system, we provide society with the support it needs to fulfil access requirements while encouraging redistribution of access demand. Digital accessibility (having access to activities through digital infrastructure) can help to ease demands placed upon the transport system by viewing mobility through the triple-access lens.

It is important to assess the merits of this approach. It is more fit for purpose than conventional transport planning, but this does not make it an easier option for the planner or decision maker. It's strengths, weaknesses, opportunities, and threats should be considered before adoption. This is very much reflective of **the important principle of '*thinking before planning*'**.

Preparation and Analysis

Planning to improve the current situation must begin by understanding that situation. To look only at the current *mobility* situation risks overlooking the combined significance of mobility, proximity, and digital connectivity in providing access – triple access.

Digital connectivity is a necessary but not sufficient condition for digital accessibility. Digital connectivity reflects the availability of digital infrastructure. **Digital accessibility is about the ability to *use* digital connectivity to engage in activities**. This involves having appropriate devices, sufficient digital literacy, and the availability, affordability and suitability of online activities and services to fulfil people's economic and social needs or desires. It can seem remarkable that **while digital connectivity and accessibility are for many now part of everyday life, they can be all but absent from transport and mobility planning**. They influence transport system use in many ways: substituting for, stimulating, supplementing, redistributing, improving the efficiency of, enriching and indirectly affecting travel.

It is important to try to articulate our understanding of the Triple Access System and the part that could be played by digital connectivity alongside spatial proximity and mobility. Systems thinking can be used to develop formal models that can help us understand the complex behaviour of a dynamic system. **We need to share, combine and write down our mental models to establish a common understanding of the system our planning is focused upon**. This also helps develop institutional capacity in terms of mutual learning across organisational boundaries and enhanced mutual trust.

While the concept of accessibility may be powerful and of value in directing transport policy, it is necessary to have concrete indicators or measures to assess accessibility. It is also important to embrace accessibility as a way of thinking to influence practice, foregoing the difficulties of complex accessibility measurement, in favour of simple indicators. Simple indicators can allow a representation to be produced of the variability in triple-access available to the population of an area, helping to pinpoint where improvement can be made. **Our minds are opened to the future prospects for how digital accessibility could change and be changed in potentially quite significant and substantial ways**, with ramifications for how we plan in terms of transport and land use.

Across a population, **people's circumstances and needs vary**. Such variation can easily be overlooked in planning and has in the past been neglected in the shaping of the built environment and forms of access available. This has exacerbated disability and inequity. It now merits close attention.

Strategy Development

Triple Access Planning recognises that a **change in supply of the means of access influences behaviours of people and businesses**. It also accommodates uncertainty rather than concealing it. From a triple access perspective an approach to strategy development should be rooted in an understanding that the future makeup of access supply and demand is not pre-determined but is ours to shape.

A triple-access strategy requires joined-up planning and decision making across transport, land-use and telecommunications. There is a need to establish what institutional changes are required to entertain such a strategic approach. For a triple access strategy to be supported and have the prospect of being deliverable and effective, **it is not enough for planning professionals to be on board. Public and political support are needed**. Participatory methods have an important part to play here.

Measure Planning

It is said that if a problem is presented to different professions, different solutions will be put forward. In practice, the best prospect can come from the professions working together to understand the problem (or opportunity) and to ensure an appropriate array of solution options are brought forward.

Solution options are needed that change the availability and relative attractiveness of accessibility choices. Serious consideration is needed of non-transport measures to tackle transport problems. In the Triple Access System there are credible and attractive alternatives to car use for some journeys for some people some of the time. Digital accessibility measures are increasingly being introduced and evolved beyond the typical remit of transport planning or mobility planning. Spatial proximity and digital connectivity measures accompany physical (motorised) mobility measures in making a strategy suitable, acceptable and feasible to deliver successfully.

Triple Access Planning opens up greater co-benefits whereby reduced car use arises from greater availability and usage of alternatives. This introduces both more flexibility into people's lives and changes the experience of access for everyone. Key to the success of Triple Access Planning is being able to bring different perspectives and administrative functions together into participatory dialogue, shared learning and united action.

Uncertainty

Philosophy

Charting a purposeful course into the future requires that *possible* futures (i.e. what could happen) and *preferable* futures (i.e. what should happen / what we would like to happen) are considered alongside the strategies and measures developed to reduce the gap(s) between these. Possible futures are largely determined by unpredictable developments. Visions and preferences can also change over time due to shifting norms and values. **Futures thinking helps identify the possible types and magnitudes of future mobility and accessibility problems and opportunities and ways to handle them**.

Planners are ever more confronted with conditions of uncertainty as they make or inform choices regarding a system to change the system outcomes in a desired way. Uncertainty is the gap between available knowledge and the knowledge decision makers would really need

to be confident in the consequences of their chosen policies. There can be uncertainty about future external developments to the system, the way the system works, the impact of plans on system outcomes, and the way system outcomes are traded-off. **In addition to different forms of uncertainty, planners are also confronted with different *levels* of uncertainty** ranging between *complete determinism* and *total ignorance*. Traditional planning practices usually include low levels of uncertainty while not acknowledging or addressing higher levels of uncertainty. Ignoring uncertainty can lead to seriously misguided planning decisions and planning outcomes. Conversely, plans designed to take uncertainty into account (robust plans) will perform better than plans designed to perform well in one specific future world.

Preparation and Analysis

Scenarios help us to explore different *possible* futures considering different types of uncertainty. They represent alternative futures which are shaped by internal and external forces. They can be qualitative, quantitative or a combination of both.

Traditional predictive scenarios are based on forecasts of the future, assembled from data-driven trends. *Plausible* scenarios are scenarios that explore more widely what could happen, based on our current understanding of how the world works, and therefore should be considered in testing a potential strategy (and measures within it). The aim is to **find a promising strategy that both delivers the *preferable* future for the area (i.e. the vision) and performs well across different *plausible* futures (a robust strategy)**.

It is important to have representation from all of the transport, spatial and digital sectors, to create plausible triple access scenarios. Involving different stakeholders in scenario planning will help better understand what the future might have in store, foster sharing of ideas and a sense of ownership over the scenarios that emerge. The output is a set of ***plausible* scenarios for the planning process that are credible, coherent and challenging**.

Strategy Development

A visioning process generally consists of divergence (participants expressing their differing ideas, preferences, and future desires) and convergence (data collected from the divergence part being interpreted, analysed and processed into a vision or a set of visions). The process can be implemented through a variety of participatory methods (typically workshops and focus groups) that bring together participants from a diversity of perspectives. **Uncertainty plays a role in visioning**. Stakeholders' preferences might change in unknowable ways over time (and new stakeholders will become involved). Objectives and in particular trade-offs among objectives can change.

Preferred (triple access) futures are normative scenarios. Although all types of scenario development ideally include stakeholders, for normative scenarios it is a necessity. **Shared visioning exercises require a high level of transparency, balancing, and credibility, where trade-offs are constantly studied and discussed with all parties** depending on their level of involvement.

In a world that is changing in uncertain ways it is important to **bring uncertainty into the psyche of those who are co-creating visions – encouraging them to open their minds to what may be deemed 'plausible utopias'**. Advice on participatory visioning includes avoiding relying only on the 'usual suspects' since they will tend to be strongly biased in relation to their professional backgrounds and experience. In the case of Triple Access Planning it is important to include participation from transport, spatial and digital planning.

Measure Planning

Even if the vision is agreed upon, there can still be many uncertainties about the measures and external factors outside our control to achieve the vision. In Triple Access Planning, *plausible* scenarios not only help thinking early on in the planning process; they should also play an important part in informing and influencing the dialogue and decision making surrounding the identification of measures. This **'stress testing' in Triple Access Planning involves an examination of measures / policy interventions and how they would perform in different *possible* futures**.

Stress testing gives greater confidence in having established a robust planning approach than the conventional forecast-led approach of transport planning that relies upon the assumption of a 'most likely' future. Nevertheless, higher uncertainty may call for dynamic or adaptive robustness. Adaptive planning can extend robustness by allowing implementation to get underway in the face of high uncertainty by monitoring change and having contingencies in place to reshape and redirect implementation as emerging developments dictate.

Access for Goods

Philosophy

Approximately one third of transport greenhouse gas emissions is attributed to freight transport. The growth of online retailing and last-mile deliveries in particular has reshaped and increased the complexity of transport systems. This transfers responsibility for delivering retail purchases from consumers to online retailers and carriers, leading to a shift in the use of vehicles for freight movement. **Increased volumes of online shopping and last-mile deliveries have intensified (and created new) inefficiencies in local transport systems**. Many residents are experiencing a growing number of vans with non-optimised loads transiting their streets every day which are often parked inappropriately during deliveries.

Transport planning tends to be predominantly focused upon movement of people rather than goods. In terms of Triple Access Planning, **goods movements should be treated alongside people movement as a significant component of the dynamics of shopping behaviours and preferences in accessing goods**. Given the knowledge of the places, people, and businesses they serve, local authorities are uniquely placed to play a role in the design and implementation of policies and measures to improve the sustainability of last-mile deliveries to support the local economy and community well-being. However, many local authorities are currently unprepared to manage local freight challenges.

The three dimensions of the Triple Access System can together contribute to improving access for goods, while limiting the negative impact of their movements. Triple Access Planning involves considering the main factors that influence end-consumers' choices when they buy products online, especially with respect to the way they have their products delivered, and how urban areas can respond to these needs while designing and planning for an efficient Triple Access System.

Preparation and Analysis

When creating a mental model of the Triple Access System and considering variables that are specific to the freight domain, the complexity of the following should be recognised: shopping behaviour and individual preferences; local freight stakeholders; the local freight

system; and spatial design (e.g., commercial areas, residential areas, loading/unloading areas, logistics estates). The main factors that end-consumers assess when they buy products online should also be considered, especially with respect to the way they have their products delivered, and how local areas can respond.

When considering problems (and opportunities), the accessibility perspective of goods will enrich the final strategy. With the increasing number of last-mile deliveries, **a holistic planning system that integrates goods movement within the broader transport system is now essential**.

Strategy Development

Decide and provide equally applies to access for goods to develop a vision that integrates specific goals to improve accessibility to places, opportunities, and goods. Local freight poses particular challenges due to the involvement of various stakeholders with diverse needs. **The lack of local freight data increases the difficulty of understanding the problem and designing appropriate strategies**. Local political support on freight may not be as forthcoming as it is when it comes to understanding and addressing movement of people. Many transport strategies have not addressed local freight issues. Triple Access Planning can be key in supporting local authorities in accounting for goods movements, as it supports them to integrate freight solutions within their planning to solve accessibility challenges.

The inter-relationships of the Triple Access System are very relevant when considering goods movements. Indeed, **the growing rates of online shopping and home deliveries are key challenges for accessibility**, and this requires using a more holistic approach with appropriate measures targeting each part of the Triple Access System.

Digital accessibility complements proximity logistics (e.g., spatial proximity and active travel), ultimately reducing dependence on motorised mobility for a sustainable future. **Using Triple Access Planning for goods movement helps in finding the right balance across supporting the local economy, reaching environmental goals and improving the quality of life of residents**.

Measure Planning

With a Triple Access Planning mindset, and appropriate policies and planning, areas can support the (re)integration of logistics facilities to facilitate and enable the shift to an efficient and sustainable logistics system. It is important to consider how to engage with stakeholders (e.g., retailers, logistics operators, residents) and developers to understand what the best and more accepted solutions might be for the area.

Freight related activities are usually business-led, and less regulated by local authorities, despite the increasingly significant impact they are having on the quality of life of local areas. There are potential challenges in measure planning relating to team skills and knowledge to inform thinking, being able to speak the right ‘logistics’ language, understanding stakeholders’ needs and expectations, and data to be able to assess potential effectiveness of measures. Consider having in the planning team a digital planner who plans for more activities to be done (or managed) online and works with the transport and spatial planners to understand what kind of impact these online activities could have.

Using triple access thinking when designing measures for goods movements can help tackle cross-cutting issues, such as noise, congestion, and road safety issues

associated with delivery vehicles. Some demand related issues might require more holistic solutions, including partnering with the private sector.

Addressing organisational and institutional challenges

Triple Access Planning cannot be applied in a vacuum. It must be adopted by organisations, and it has to fit with existing institutions (which are understood here as *ways of doing* planning – both formally and informally). Organisational and institutional challenges are themselves set within a governance context.

Philosophy

As Triple Access Planning thinking and practice becomes more widespread, organisations and especially institutions will need to change. This involves **considering formal and informal institutional settings and governance practices from the beginning of the process and thereby reducing the uncertainty caused** by informal institutions (their impacts on the process otherwise being potentially 'invisible').

Triple Access Planning is an innovation that will diffuse into wider institutional norms – first finding those organisations that are prepared themselves to be innovators or early adopters and then in turn reaching further to the later adopting organisations and perhaps eventually those organisations and/or institutions slowest or most reluctant to embrace change.

Part of Triple Access Planning is to adopt a vision-led rather than forecast-led approach in which instead of having demand-led supply there is supply-led demand. This is **a new way of thinking that some politicians and planners will be reluctant to adopt**. The best response to this is to provide some evidence that predict and provide has failed to deliver and that **decide and provide is less costly and less risky**.

Preparation and Analysis

Existing ways of working and thinking greatly affect what data are gathered for the planning process, and in what way; this is an institutional issue. This in turn can affect (whether and) how uncertainty is dealt with (particularly where there is an assumption that the data gathered have a level of certainty to them). It can affect what future depictions of the transport system, and measures within it, are developed. If data gathered are primarily related to motor vehicle trips, this will tend to skew the generation of the vision and measures towards those that are related to motor vehicles. Assumptions about the importance or otherwise of the data that are being gathered should be reviewed and where appropriate challenged.

Once planners agree that they are working with higher levels of uncertainty, this implies that new methods are needed. *Plausible* scenarios are very different to traditional predictive scenarios, and completely different from policy packages (sometimes also referred to as policy scenarios). People may not feel comfortable with these because they may be viewed as lacking the credibility, rigour and precision that predictive scenarios appear to have. It is **helpful to emphasise that evidence is not synonymous with truth when it comes to the future and that it is better to be approximately right than precisely wrong**.

Engaging the modellers in the Philosophy and Preparation and Analysis phases of Triple Access Planning is a useful way of identifying practical and achievable evolutionary steps in analytical approaches. It will also help to develop organisational capacity to plan using

different forms of scenario. **Involving the public in scenario development is important but not easy** because people have a tendency when talking about planning the future of transport (let alone access) to jump straight to the schemes (measures) that they think are important, and to not discuss the strategic context. There is value in employing a professional process facilitator.

Strategy Development

Organisational capacity is needed to do the joined-up planning and decision making across transport, land-use and telecommunications that the Triple Access Planning approach recommends. This essentially requires breaking down the walls between silos and coordinating planning across policy areas. To do this, **changes are required so that professionals can get to know each other and preferably work together on a regular basis**. At a very basic level, this means regular meetings between different professionals to discuss planning developments from their different perspectives. Integrated departments and co-located office space can also help to improve integrated planning.

Measure Planning

A key message of the Triple Access Planning approach is that in the Measure Planning phase, the widest possible range of measures should be considered. As a key way of giving a plan the best prospect of being more robust in the face of uncertainty, **selection of adaptable and resilient measures is encouraged – which might not be the 'typical' measures of traditional transport planning**.

Measures that are seen to be new or untested may never make it in the Measure Planning phase because they are unfamiliar, there is scepticism about their relevance, impact and/or because there is a lack of knowledge about how to include them in processes such as modelling. Courses of action to address this can include: workshops and training sessions on different measures to discuss their effectiveness; and training colleagues to understand how conventional modelling techniques lead towards the selection of certain types of measure to the exclusion of others.

Planning for accessibility is obviously key to the concept of Triple Access Planning as a whole, but there are practical challenges – many of which are institutional – of which organisations should be aware. **Whilst Triple Access Planning does not offer an easier approach than established planning practices and institutions, it is more fit for purpose in relation to the challenge and opportunities we now face**.

Looking Ahead

What does the future hold? In the planning task, will we be more or less uncertain about the future *in future* than we are now? **It would be wise to assume that planners and decision makers will need to make it their business to address and accommodate uncertainty**.

Meanwhile, the developments within the digital age in terms of the art of the possible in relation to digital connectivity and accessibility seem set to continue and thereby further strengthen the significance of taking a triple-access perspective when we plan. **It seems remarkable that transport and mobility planning has done so little to explicitly account for digital accessibility. It is untenable as we look to the future that it continues to be ignored.**

This Handbook is a staging post in the onward journey of change in how we make sense of, and seek to be prepared for and shape, the future. Please embrace it.

Introduction

Thank you for choosing to take a look at this Handbook which supports readers in better understanding and engaging with Triple Access Planning (TAP).

What is TAP and why consider it?

Transport (or mobility) planning examines the existing conditions of the transport system and wider built environment. It determines how they could and should change in future, and sets a course (in terms of policies and measures) to shape the future. Sustainable urban mobility planning in Europe emphasises the need to be vision-led and to focus upon the mobility of people over the movement of traffic, recognising the importance of multi-modality in supporting a functioning society. Such planning has much responsibility resting upon it in a world that is in a state of considerable flux and faces a climate emergency.

This Handbook is intended to challenge and support those involved in the planning task and encourage greater consideration of how society functions, the place of mobility (for people and goods) within this, and the philosophical stance that is needed in approaching the planning task.

More specifically the Handbook emphasises and addresses the importance of two fundamental considerations needed to support stewardship of the future:

- Triple access perspective[1] – recognising, understanding and addressing the inter-dependent roles of physical mobility, spatial proximity and digital connectivity in providing access; and
- accommodating uncertainty – exploring drivers of change affecting urban areas that are partially or entirely beyond the control of the planning authority and which, in often unknown ways, could influence the efficacy of measures being pursued to help realise a vision for an urban area.

TAP is vision-led not forecast-led. It is access-focused not transport-focused. It exposes and accommodates uncertainty instead of concealing it. TAP is a planning process, not a planning policy.

Background to the Handbook's creation

As part of JPI Urban Europe's ERA-NET Urban Accessibility and Connectivity (ENUAC) initiative, funding was awarded to a consortium of academic and non-academic partners spanning Italy, the Netherlands, Slovenia, Sweden, and the UK. The three-year project 'Triple Access Planning for Uncertain Futures'[2] has run from 2021 to 2024. The consortium embodies expertise and experience in local and national transport planning, sustainable urban mobility planning, foresight and futures techniques, accommodating uncertainty,

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[1] TAP is specifically defined as "The tripartite consideration of fulfilment of society's access needs in pursuance of social, environmental and economic outcomes, in which actions are cognisant of and seek to influence the inter-related mechanisms of physical mobility, spatial proximity and digital connectivity". See Lyons, G. (2021). Discovering 'the sweet spot'. *Local Transport Today*, 823, 17 May, 16-17. https://uwe-repository.worktribe.com/output/7420650

[2] https://www.tapforuncertainty.eu/

modelling and appraisal, travel behaviour and accessibility, goods movement, and leading efforts to bring forward a different approach to planning. Specifically, this different approach to planning is called TAP and reflects a vision-led 'decide and provide' paradigm in contrast to the forecast-led 'predict and provide' paradigm.

The Handbook draws upon prior developments in understanding and practice (including those involving consortium members) and further understanding and experience generated during the course of the project and its engagement with theory and practice and with academics and practitioners with relevant knowledge and roles.

The purpose of the Handbook and who it is for

The Handbook introduces TAP and allows judgement of its merits. In turn it provides practical guidance on how to think and act differently within the planning process.

The Handbook has been prepared with the intention of being accessible to a wide professional audience but is especially targeted at those who are already involved in planning and who are familiar with traditional and established approaches to transport planning (as well as spatial planning). It is intended to appeal, in particular, to those professionals who recognise the need for further change in planning practice. The Handbook is not intended to be an exhaustive guide on how to think about and undertake planning. For example, it does not provide detailed explanations on how to undertake modelling and quantitative analysis. It should be seen as **a companion guide to complement but also challenge wider guidance on planning**. It complements European guidance on sustainable urban mobility planning[3] as well as equivalent national guidance.

Terminology within the Handbook includes reference to different forms of planning, and terms are to some extent used interchangeably and flexibly according to the context in question. For instance, the focus of particular interest of the project underpinning the Handbook has been on **sustainable urban mobility planning**. Meanwhile this can more broadly be referred to as **local transport planning**, which can cover urban but also rural areas. **TAP** is an evolution of urban mobility planning or transport planning rather than an entire replacement of them. At the same time, TAP addresses land use and **spatial planning** as well as **digital planning**.

The Handbook is intended to encourage rethinking, perhaps even 'unthinking', and new thinking as part of the process of understanding the system being addressed by the development and implementation of plans. Such thinking is not a luxury in planning, it is a necessity. It is foundational (as shown in Figure 1). How we think - our philosophical standpoint - affects how we plan and in turn the actions that are taken to shape the system.

The decide and provide paradigm was set out based on work nearly a decade ago[4]. From this also emerged TAP. While several examples of decide and provide and TAP have already emerged in practice (innovators and early adopters in the diffusion of this planning innovation), the approach remains relatively new. Accordingly, TAP itself will continue to

[3] https://urban-mobility-observatory.transport.ec.europa.eu/sustainable-urban-mobility-plans/sump-guidelines-and-decision-makers-summary_en

[4] Lyons, G. and Davidson, C. (2016). Guidance for transport planning and policymaking in the face of an uncertain future. *Transportation Research Part A: Policy and Practice*, 88, 104-116. http://dx.doi.org/10.1016/j.tra.2016.03.012

evolve through a shared learning-by-doing approach. As such, this Handbook should not be seen as the definitive guide but something for others to build upon and further improve.

Figure 1. Thinking is foundational to strong planning and implementation

Navigating the Handbook

The main content of the Handbook has been structured to address three main considerations (**Triple Access Perspective**, **Uncertainty**, and **Access for Goods**) and to do so across four planning phases (**Philosophy**, **Preparation and Analysis**, **Strategy Development**, and **Measure Planning**). It should be noted that the latter three of these phases mirror those in the European guidance on sustainable urban mobility planning[5]. TAP includes the prior informal but important phase of Philosophy. This Handbook does not address the final phase of sustainable urban mobility planning, namely Implementation and Monitoring. However, it should be understood that this is nevertheless as relevant to TAP as it is for other forms of planning.

As the reader you may wish to either: (i) focus principally on one of the main considerations (across all phases); (ii) focus principally one of the planning phases (for all considerations); or (iii) examine all considerations across all phases. At the top of each page for the main content of the Handbook you will find a clickable 'Handbook navigation bar' as shown in Figure 2.

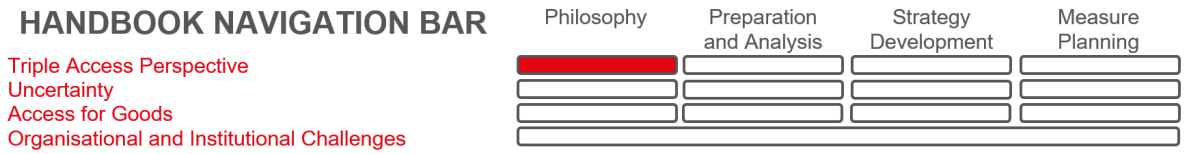

Figure 2. Clickable Handbook navigation bar (red highlighted button shows the current location of the reader in the Handbook)

At the end of each of the main sections of the Handbook is an indication of **Further resources**. You may find helpful if you wish to go into more detail in developing your understanding, or in considering how to include TAP in your planning approach. All such further resources are available free in the public domain.

In addition to the three main considerations already mentioned and the four planning phases, the Handbook also addresses a fourth consideration, namely the **organisational**

[5] https://urban-mobility-observatory.transport.ec.europa.eu/sustainable-urban-mobility-plans/sump-guidelines-and-decision-makers-summary_en

and institutional challenges associated with introducing TAP as an alternative to established thinking and practice (this is also shown in the Handbook navigation bar).

Triple Access Perspective

Philosophy

Planning aims to shape a system's future, but which system is being shaped? This section introduces the so-called Triple Access System of transport, land-use and telecommunications that determines how transport plays its part in a wider system that supports social and economic activity in society. It helps open the mind to being a Triple Access Planner and its strengths, weaknesses, opportunities and threats.

Why should you consider this and what's involved?

To plan is to set about shaping a system's future - first we must understand the system being shaped

Travel is often seen to be a derived demand when it arises from our desire or need to access people, goods, employment, services and other opportunities. Fulfilment of access requirements has relied heavily upon the transport system and, substantially over past decades, on motorised mobility. Although mobility planning is evolving, in the past it has often been assumed that to increase economic and social prosperity, accommodating more demand for travel was inevitable. Yet in reality, fulfilment of access requirements comes in three forms: physical mobility, spatial proximity and digital connectivity, as shown in Figure 3 – the Triple Access System (TAS).

Transport planning has traditionally operated within the predict and provide paradigm where forecasts are made of future travel demand to assess the transport infrastructure and services required to serve it[6]. The spatial pattern of travel demand in an area is predicted based on the distribution of land use and is usually assumed to be outside the influence of transport planning. Where there are negative impacts associated with forecast travel demand, transport planning seeks to modify the relative attractiveness of different transport options to influence their usage levels. This highlights that the paradigm is forecast-led and centred upon accommodating physical mobility without considering the contribution of spatial

[6] ITF (2021), *Travel Transitions: How Transport Planners and Policy Makers Can Respond to Shifting Mobility Trends*. ITF Research Reports, OECD Publishing, Paris. https://www.itf-oecd.org/travel-transitions-policy-makers-respond-mobility-trends

proximity and digital connectivity to meeting everyone's accessibility needs and whether this is a desirable future for society.

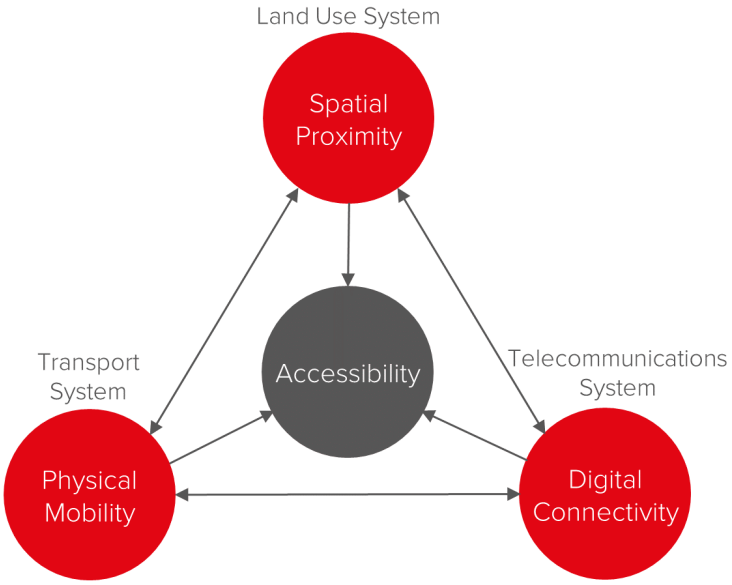

Figure 3. The Triple Access System[7]

Adopting an accessibility perspective

The alternative is a paradigm of decide and provide[8]. This is vision-led rather than forecast-led and entails identifying a preferred future and a pathway towards that future.

Given that the ultimate purpose of the transport system is to facilitate the movement of people and goods to provide access to destinations and activities, **accessibility can be viewed as a suitable goal for mobility planning**. The case for accessibility as a primary goal can be made on economic, social or environmental grounds. On economic grounds, an efficient economy needs people and goods to have good accessibility – being reachable or within reach. On social grounds, there may be sections of the population lacking adequate access to key opportunities. On environmental grounds, a focus on accessibility rather than only on mobility can assist in identifying solutions that are less harmful to the environment. Addressing access needs should be recognised as contributing to a wider planning purpose to deliver sustainable development.

In contrast to solely considering mobility, an accessibility perspective enables "a more holistic approach to [urban] development and mobility management" and hence "a useful

[7] Reproduced from Figure 2 (p.112) in Lyons, G. and Davidson, C. (2016). Guidance for transport planning and policymaking in the face of an uncertain future. *Transportation Research Part A: Policy and Practice*, 88, 104-116. http://dx.doi.org/10.1016/j.tra.2016.03.012

[8] Lyons, G. and Davidson, C. (2016). Guidance for transport planning and policymaking in the face of an uncertain future. Transportation Research Part A: Policy and Practice, 88, 104-116. http://dx.doi.org/10.1016/j.tra.2016.03.012

framework for the design of integrated land use and transport policies"[9]. In the digital age, **accessibility can increasingly be achieved via digital connectivity** as well as physical mobility and spatial proximity. Hence there is a move away from focusing only on mobility and a move towards recognising that the main purpose of transport – to enable access to opportunities – can also be achieved through the TAS. There remains a need to consider how changing access fulfilment contributes to or exacerbates sustainable development.

The TAS is the world we all inhabit and it is impossible to isolate physical mobility from spatial proximity and digital connectivity in terms of their combined effect on how people live their lives, businesses operate and society functions. Instead of transport or mobility planning **we need to plan for the future of the TAP. In short, we need TAP**.

The influence of triple-access in our lives has grown - dramatically

TAP is about shaping the future of the TAS. **By changing the supply of access opportunity in an area across the TAS, patterns of demand in turn adapt**. Indeed, in a bi-directional way, one shapes the other and they co-evolve. Across a population, needs and opportunities for access are varied. However, at a collective level it is apparent how digital connectivity has grown and how it has become increasingly common for *some* people *some* of the time to access what they need online (notwithstanding that this form of access has its own strengths and weaknesses both in terms of inclusivity and environmental sustainability).

In 1996 <10% of the UK population had 56k dial-up internet access. Today >90% have access with most able to get gigabit broadband (equivalent to 19,000 x 56k). **And what of the future?**

Our reliance upon the TAS and the scope it provides for flexibility of access fulfilment was emphatically demonstrated during the COVID-19 pandemic (as was our exposure to dependence to particular forms of access when these became unavailable). Many parts of the economy turned to digital connectivity to meet their access needs and spatial proximity became more important in people's lives during lock-downs. **As humans we exhibited our incredible capacity to adapt our behaviours when circumstances change. We also came to realise the resilience provided to society by having the TAS.**

To ignore the TAS is to invite more uncertainty than ever into transport and mobility planning

Uncertainty (see Uncertainty - Philosophy section) arises when we are unable to, or lack confidence in (or consensus over), judging cause and effect. If we ignore the interdependencies between transport, land-use and telecommunications (as illustrated in Figure 4), we invite more uncertainty into making sense of the transport system. In the past, it was not fully appreciated that better transport connections to urban peripheries lead to dispersal of land use and growth in travel demand. This is better understood today but we now need to try to understand how telecommunications interact with the transport and land-

[9] Silva, C. and Larsson, A. (2018). *Challenges for Accessibility Planning and Research in the context of Sustainable Mobility*. Discussion Paper, International Transport Forum, Paris. https://www.itf-oecd.org/challenges-accessibility-planning-sustainable-mobility

use systems. **If the aim is to make robust decisions and achieve strong planning, then TAS needs to be accounted for.**

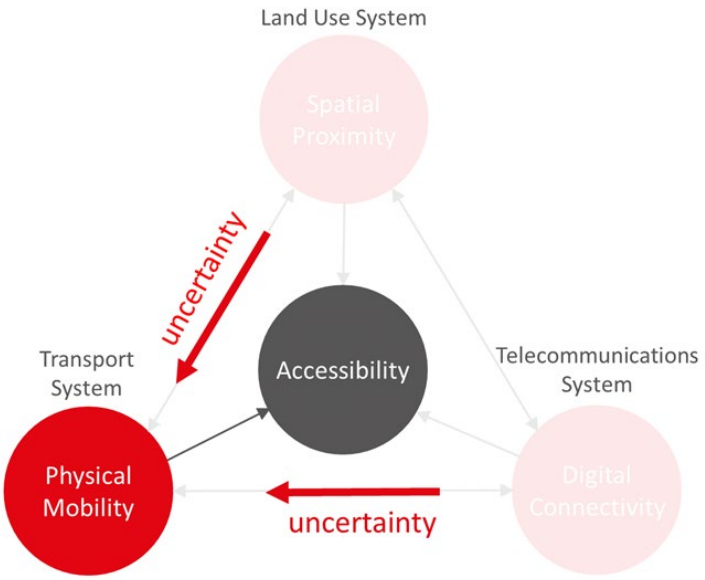

Figure 4. Uncertainty associated with only observing and analysing part of the Triple Access System

What benefits can it bring you?

A chance to rebalance how access in society is provided

The TAS offers tremendous opportunity to support urban and rural living in ways which assist economic activity and social justice and are commensurate with a need to reduce greenhouse gas emissions.

Traditionally, transport planning has taken a demand-led supply approach which has focussed on accommodating physical mobility demands (a so-called physical transport approach). TAP encourages a different mindset and approach – namely supply-led demand: **provide society with the support it needs to fulfil access requirements while encouraging redistribution of access demand** (an accessibility approach).

Confidence to plan in the knowledge that endless growth in physical mobility is not inevitable

It is important for mobility planning to recognise that **while society's overall need for accessibility may grow over time[10], the same need not be true for motorised mobility**. It is possible to conceive of maintaining or reducing motorised mobility (and redistributing between motorised modes) while increasing overall accessibility as illustrated in Figure 5.

[10] This may be as a result of population growth. It could also be a consequence of those parts of society that have restricted access being provided with more opportunity. Whether or not more overall accessibility is needed (as opposed to being desired) may be challenged and links into wider societal change and debates such as those concerning economic growth in a resource constrained world.

Consider the example of access to sporting events as a spectator. Watching sporting events used to require physical presence at the venue whereas, thanks to television, such sporting events have been made accessible to being watched by countless millions as opposed to a few thousand. Access has increased without necessarily increasing physical mobility (albeit that quality as well as quantity of access matters).

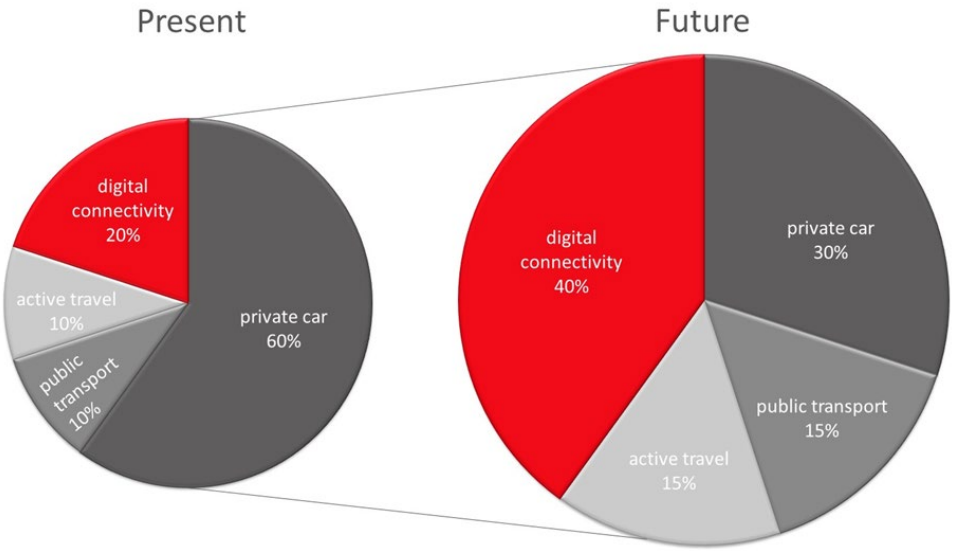

Figure 5. Change in the relative and absolute amounts of different forms of access (illustrative only (made up figures) and without units of measurement)

Digital accessibility can help to ease demands placed upon the transport system. For example, digital healthcare appointments are becoming more mainstream. Online grocery shopping still generates delivery trips but removes shoppers' trips to retail centres. Digital meeting services and tools enable meetings to take place without travel. Broadband providers, and others offering digital connectivity, underpin all of this but that only considers the supply side and cannot be looked at in isolation.

Weighing up the pros and cons of adopting TAP

While mobility may be the principal consideration expected of a Sustainable Urban Mobility Plan or a Local Transport Plan, TAP concerns a need to view mobility through a triple-access lens.

While this section considers the philosophy of a triple-access approach to planning, **it is important to also have a rounded appreciation of the merits of TAP**. **It may be more fit for purpose than conventional transport planning but this does not make it an easier option for the planner or decision maker**. To help in understanding the benefits TAP will bring to a planning authority and the challenges it may need to overcome, Table 1 summarises TAP's *potential* Strengths, Weaknesses, Opportunities and Threats (SWOT). Strengths and Weaknesses relate to TAP itself while Opportunities and Threats reflect the (changing) context within which it is being or could be applied.

A serious card game using these SWOT elements (in more detailed form as shown in the Appendix) has been developed (see Further resources below) to allow practitioners to interact with and critically examine TAP and its merits (see Figure 6). Each suit in the deck of

cards relates to either S, W, O or T and each card provides more detail about the SWOT element. Players are encouraged to work together to prioritise the most important elements (and identify further elements if appropriate) that form the basis for whether or not it seems appropriate for their organisation to consider adopting TAP for its planning approach.

Table 1. SWOT analysis of TAP (elements identified by Handbook authors as a basis for others to explore and expand for themselves – for further detail and explanation see Appendix)

Strengths	Weaknesses	Opportunities	Threats
Acts as a complement	It doesn't guarantee better outcomes	The need for adaptive capacity	Silo mentality
Future proof	Contested territories	Responsible planning	Damned by faint praise
Conceptually appealing	It doesn't compute	Moving beyond white male privilege	Professional resistance to change
Encourages ambition	Dependence on more actors	COVID-19 exposure	Lack of appraisal framework
Better reflects the world we live in	Lack of precedents	Necessity is the mother of invention	Other access influencers
Access at the core	Cognitive overload	Accommodating uncertainty	Hard to understand
Helps us to unthink	Lack of evidence	'De-car'bonise	A need to quantify
Inspires a new generation	New skills required	Rethinking measures	Politics
Considers the art of the possible	Hard to model	Preparing for the worst	Lack of headspace
Encourages diversity of perspective	Too abstract and intangible	Appetite for change	Lack of public buy-in

Engaging with this game (or at least with the insights provided by the game cards) is strongly encouraged. It is very much reflective of **the important principle of thinking before planning and of thinking together**. It is intended to help open minds to the issues presented by the approach, allowing a 'no surprises' introduction to becoming a triple access planner.

Figure 6. TAP-SWOT in a BOX – a serious card game to examine the merits of TAP

Takeaway points

- We live in a triple-access system and should therefore put transport in its place by becoming triple access planners
- We have the opportunity to 'TAP' into the adaptive capacity of humans by reshaping access supply and the choices available to people and businesses
- The digital age could provide immense opportunity for change for the better if we are prepared to rethink planning
- TAP does not necessarily make the planning task easier but should make more fit for purpose

Further resources

- **Discovering the Sweet Spot** – a short practitioner-facing article that makes the case for TAP.
- **TAP-SWOT in a BOX** – a downloadable serious game with which to engage and explore the merits of a triple-access approach to planning (available in digital and printable game-play formats).
- **'TAP-SWOT in a BOX' – a serious game for exploring the merits of an alternative approach to transport planning called Triple Access Planning** – paper introducing TAP and how a serious game

can be used to help you learn more about it (please contact Glenn.Lyons@uwe.ac.uk for a personal copy).

- **Uncertainty and Triple Access Planning in European Sustainable Urban Mobility Plans: a long way to go yet?** – a paper examining how well Sustainable Urban Mobility Plans currently account for TAP and uncertainty in their approach.
- **Practitioner Views on Transport Planning's Evolution – A Sisyphean Task Still Ahead?** – A paper examining practitioners' experience of transport planning practice over time, their hopes and fears for its future and what could be achieved, and their views on enablers of, and barriers to, positive change (please contact daniela.paddeu@uwe.ac.uk for a personal copy).

Triple Access Perspective

Preparation and Analysis

Models are simplified representations of reality that we use to make sense of a system and its dynamics. In this section the role of systems thinking in helping co-create a mental model of the Triple Access System is introduced. This provides a means to make sense of the multiple interacting factors or variables that influence the present performance of the system. Methods of analysing spatial variation in accessibility and how these can be extended to include digital accessibility are considered. This in turn helps in addressing what data and analysis may be important to improve understanding and inform strategy development.

Why should you consider this and what's involved?

The European guidelines for creating Sustainable Urban Mobility Plans recognise that, from the outset, developing a Plan "should be a decision to improve the current mobility situation and a strong conviction that change towards greater sustainability is needed". Such a decision contributes to a Plan's general aim of "improving accessibility for all"[11].

Improving the current situation must begin by understanding that situation. **To look only at the current *mobility* situation risks overlooking the combined significance of mobility, proximity and digital connectivity in providing access – triple access**.

As noted in the Triple Access Perspective - Philosophy section, we live in the Triple Access System (TAS) and within this, digital connectivity and accessibility have grown hugely in their significance for our lives (alongside physical mobility and spatial proximity). Particular attention is given in this section to digital connectivity and accessibility, recognising the greater familiarity already established in planning concerning physical mobility and spatial proximity.

[11] Guidelines for Developing and Implementing a Sustainable Urban Mobility Plan, p.32 - https://urban-mobility-observatory.transport.ec.europa.eu/sustainable-urban-mobility-plans/sump-guidelines-and-decision-makers-summary_en

Distinguishing between digital connectivity and digital accessibility

Digital connectivity is a necessary but not sufficient condition for digital accessibility. Digital connectivity reflects the availability of digital infrastructure. Digital accessibility is about the ability to *use* digital connectivity to engage in activities. This involves having appropriate devices, sufficient digital literacy, and the availability, affordability and suitability of online activities and services to fulfil people's economic and social needs or desires.

How digital connectivity and accessibility can influence mobility and proximity

It can seem remarkable that while digital connectivity and accessibility are for many now part of everyday life, they can be all but absent from mobility planning: **digital connectivity and accessibility are simultaneously pervasive and invisible**.

As is shown in the Triple Access Perspective - Philosophy section, ignoring them would simply invite more uncertainty into our attempts to understand the mobility demands placed upon the transport system. **Triple Access Planning (TAP) requires that we come to terms with the TAS. This is not easy**. Doing so begins with an appreciation of the different ways in which digital connectivity and accessibility can influence transport system use[12]:

- **substitute for travel** - an activity is undertaken without the individual needing to make a trip (e.g. a medical consultation online)
- **stimulate travel** - information flows encourage the identification of activities and encounters at remote locations that individuals then choose to travel to (e.g. ease of searching online for somewhere to go socially)[13]
- **supplement travel** - increasing levels of access and social participation are experienced without further increasing levels of travel (e.g. keeping in touch with friends and family online in addition to periodically seeing them in person)
- **redistribute travel** - even if the amount of travel does not change at the level of the individual or at the aggregate, when, and between which locations, travel takes place can be changed (e.g. travelling outside the peak period through flexible working)
- **improve the efficiency of travel** - data and information flows can enhance the operation and use of the transport system (commonly considered under the heading of 'intelligent transport systems') (e.g. real-time information on public transport online to support journey planning and execution)
- **enrich travel** - whereby opportunities to make worthwhile use of time while travelling are enhanced, helping generate a 'positive utility' (e.g. enjoying some 'me time' by listening to podcasts when walking home from work)
- **indirectly affect travel** - can enable or encourage changes to social practices and locational decisions over time that in turn influence the nature and extent of travel

[12] Lyons, G. (2015). Transport's Digital Age Transition. *Journal of Transport and Land Use*, 8(2), 1-19. http://dx.doi.org/10.5198/jtlu.v0i0.751

[13] Travel can also be stimulated as a result of substitution, for example meeting new people online who are then met in person or online shopping generating goods deliveries.

(e.g. relaxed home location constraints in relation to employment opportunities due to flexible working)

Such effects can be difficult or impossible to untangle – and this continues to change over time. So how can we prepare ourselves for the planning task ahead? One route is to revert to a more narrow focus on mobility and the transport system. The other is to try to articulate our understanding of the TAS and the part that could be played by digital connectivity alongside spatial proximity and mobility.

Developing a shared mental model

Systems thinking can be used to develop formal models that can help us understanding the complex behaviour of a dynamic system[14].

As individuals, we carry in our minds **mental models** of the world around us. A relatively simply mental model is illustrated in Figure 7.

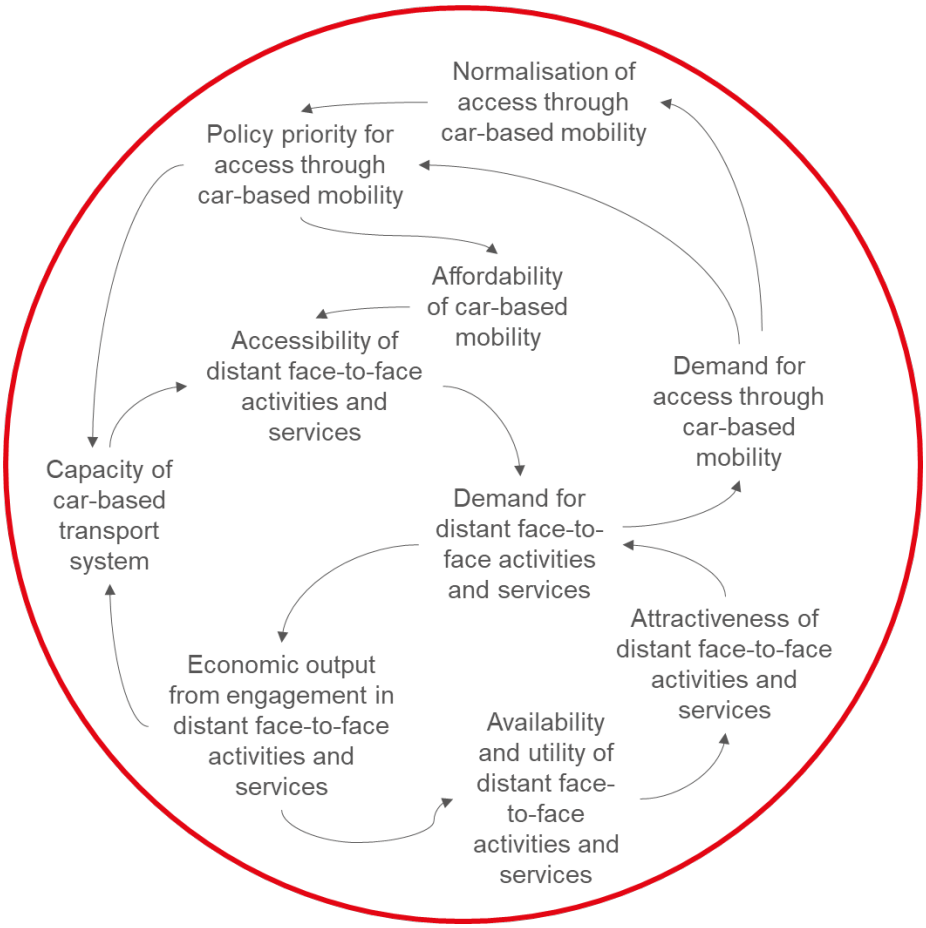

Figure 7. An example of a simple mental model of the transport system in relation to car-based mobility (in which the positive influences between variables is depicted by the arrows in a self-reinforcing system – in the absence of other variables exerting influence)

[14] Forrester, J.W. (1961). *Industrial Dynamics*. Cambridge, MA, MIT Press.

Our models are informed by knowledge we have acquired and experience we have gained. Therefore individuals' mental models will likely differ. This is not a good basis for planning. **We need to share, combine and write down our mental models in the interests of establishing a reasonable common understanding of the system our planning is focused upon**.

This can be achieved through systems thinking, and in particular the co-creation of Causal Loop Diagrams (CLDs). **The process itself, as much as the end result, can be thought-provoking and illuminating and help open minds to a wider appreciation of the system under examination**. It can also help develop institutional capacity in terms of mutual learning across organisational boundaries and enhance mutual trust (see the Addressing organisational and institutional challenges section). One of the advantages of systems thinking is that outputs concerning the system being considered can be used by experts and non-experts, policymakers and decision makers.

CLDs are comprised of (i) variables which can either increase or decrease; (ii) links between variables showing directions of influence between variables; and (iii) signs on the links showing the nature of effect of one variable on another ('+' indicates that the influencing variable increasing would lead to an increase in the influenced variable (or similarly both decreasing), while '-' indicates that the influencing variable increasing would lead to a decrease in the influenced variable (or decreasing leading to increasing)). Figure 8 illustrates these building blocks. As the variables and links between them are built up, the composition of the system and how it is understood to behave is made apparent.

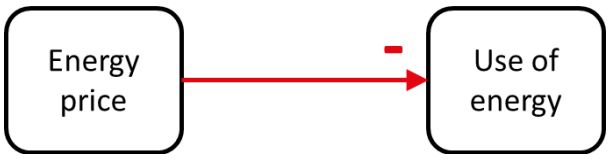

Figure 8. Components in a CLD – variable, link between variables, and sign (+/-) of one variables effect on another variable (in this case, as energy price goes up, use of energy goes down)

Figure 9 provides a CLD that has been co-created by transport, land-use and digital planners[15]. It aims within a single page to help articulate the TAS. This can be used by others as a basis for reflecting upon their mental model of the TAS, and comparing this with those of fellow practitioners. **It is advised to go further and consider developing a CLD of the TAS as part of a planning process – building a sense of common understanding focused upon the specific nature of the area of interest.**

In the Further resources below, separate detailed insight is provided into how to create a TAP CLD.

[15] In this Handbook 'digital planner' refers to a planning professional who is focused upon the onward provision for, and shaping of, digital connectivity (and in turn shaping of digital accessibility) in society.

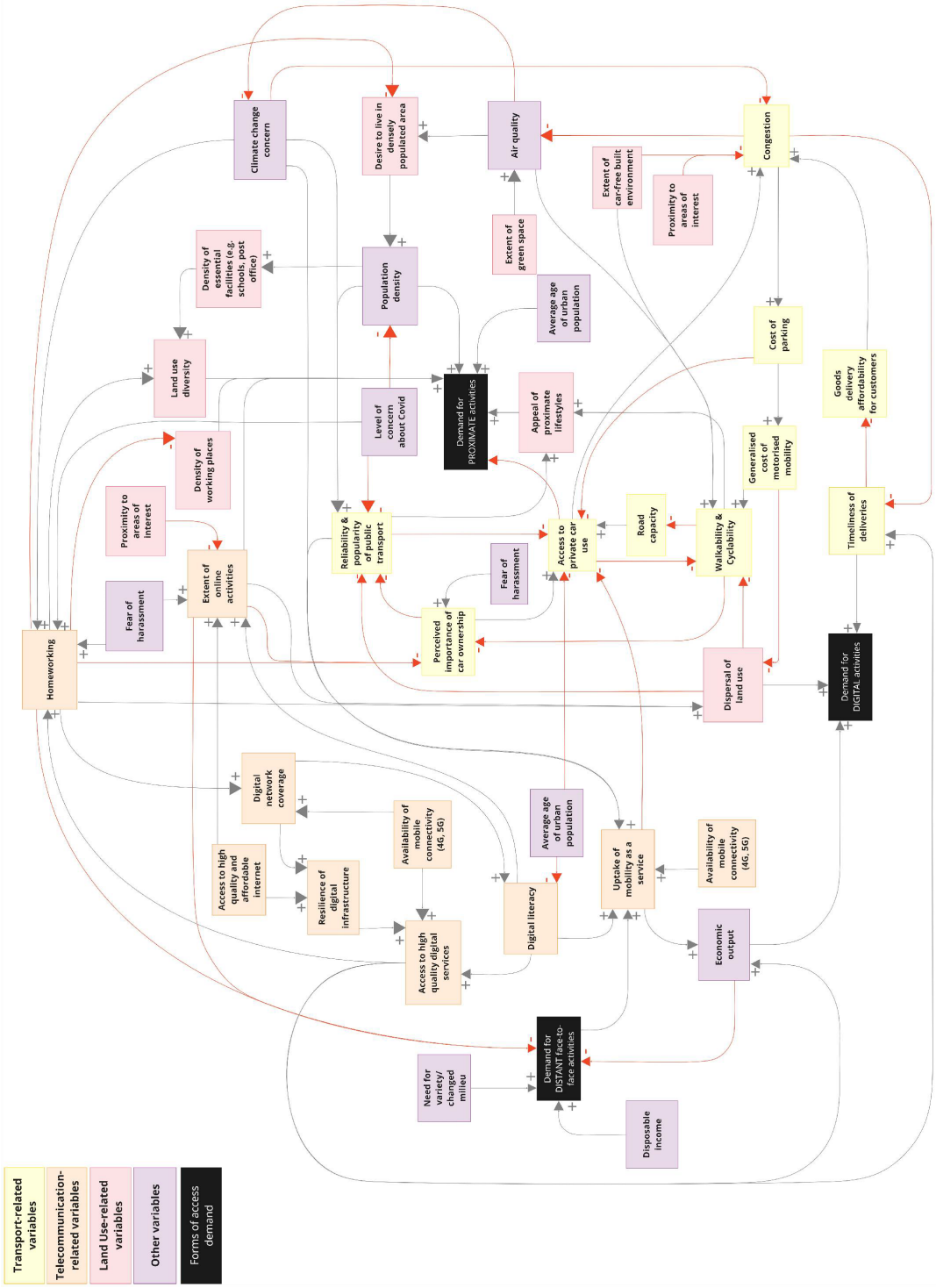

Figure 9. A non-area-specific co-created mental model of the Triple Access System (produced as part of the project 'Triple Access Planning for Uncertain Futures')[16]

[16] Reproduced from Figure 6 in Paddeu, D. and Lyons, G. (2024). Foresight through developing shared mental models: The case of Triple Access Planning. *Futures*, 155. https://doi.org/10.1016/j.futures.2023.103295

A mental model such as this cannot be treated as 'fast food'. Value does not come from a quick glance but from studying and 'walking around' the model[17] to develop a stronger appreciation of how the TAS is comprised and thereby a better familiarity with what might be important to account for in, and help inform, the planning process ahead. The model can be used as a reference point subsequently by those involved in the planning process and as a framework for discussion and engagement. Walking around the model can help later in understanding which variables may need to be influenced to help change a dependent variable in line with the vision and strategy being developed. This can also point to potential consequences (i.e. implications for other variables) of the variable in question being changed within the dynamic system.

For example, consider homeworking as a variable. In the model, as homeworking increases, it reduces demand for distant face-to-face activities and reduces the perceived importance of car ownership. Meanwhile it exerts an upwards pressure on digital network coverage as well as dispersal of land use (through reduced need to live close to the workplace). Climate change concern and access to high quality digital services exert an upwards pressure on the level of homeworking. Homeworking is also assumed to increase if fear of harassment increases[18]. Such interplay between variables highlights how homeworking can affect and be affected by other variables. It becomes apparent that the dynamics of the system are complex and need to be weighed up in the round.

Given the complex nature of both urban and rural systems, it is clear that this cannot be an exact science. However, it has the potential to significantly help orientation and co-operation among those engaged in the planning process by exploring such issues together on the basis, ideally, of a co-created and visibly articulated mental model.

Analysing spatial variation in accessibility

In moving from a mental model of the overall system to analysing the spatial variation of accessibility in a particular place, it is helpful to refer to **established principles and methods used by transport planners to study accessibility**.

Transport accessibility has been defined as "**the potential for participating in activities (or, equivalently, interacting with people) that are distributed over space**"[19]. This brings in an explicit spatial dimension with the implication that movement is needed to get to activities. Instead, with the increasing role of digital connectivity, we need to account for the increasing viability of participating in activities without physical movement. A more people-oriented definition of accessibility which is also applicable to accessibility achieved by digital

[17] Following different pathways through the model to examine cause and effect and sequences of influence between variables.
[18] Fear of harassment outside the home can negatively impact women's willingness to commute and in turn exacerbate employment inequality.
[19] Miller, E. (2020). *Measuring Accessibility: Methods and Issues*. International Transport Forum Discussion Paper. OECD Publishing: Paris. https://www.oecd-ilibrary.org/transport/measuring-accessibility_8687d1db-en

connectivity is "**the ability of people to reach and take part in activities normal for that society**"[20].

While the concept of accessibility may be powerful and of value in directing transport policy, it is also necessary to have **concrete indicators or measures to assess accessibility**. There are many different types of accessibility measure that have been developed in transport studies and can be briefly summarised as follows[21]:

Location-based accessibility measures are the most used type of measure for accessibility analysis. Location-based accessibility can take an origin or destination perspective. For example, the availability of jobs from a residential neighbourhood is an origin perspective, whilst the number of workers within reach of an employment area is a destination perspective.

Person-based accessibility measures assess accessibility at the level of individuals, such as the activities in which an individual can participate at any specific time taking into account spatial and temporal constraints.

A limitation with standard accessibility measures is that people's capabilities and perceptions of what is possible to access may be different to that assumed possible by the analyst (based on travel times etc.). Another limitation is that no method has been firmly established to incorporate digital connectivity into accessibility measurement. An example which *has* used a simple representation of digital accessibility is illustrated next.

Triple access mapping applied to a specific place

The notion of access and putting it at the core of mobility planning may not be conceptually hard to grasp. Yet dealing with its definition and measurement has proved over some years to be challenging and to act as an impediment to turning the concept into practice. Critical assessment of this matter[22] advocates **the importance of embracing accessibility as a way of thinking in order to influence practice, foregoing the difficulties of complex accessibility measurement, in favour of simple indicators**.

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[20] Farrington, J.H. (2007). The new narrative of accessibility: its potential contribution to discourses in (transport) geography. *Journal of Transport Geography*, *15*(5), 319-330. https://doi.org/10.1016/j.jtrangeo.2006.11.007

[21] Geurs, K.T. and Van Wee, B. (2004). Accessibility evaluation of land-use and transport strategies: review and research directions. *Journal of Transport Geography*, *12*(2), 127-140. https://doi.org/10.1016/j.jtrangeo.2003.10.005

[22] Handy, S. (2020). Is accessibility an idea whose time has finally come? *Transportation Research D: Transport and Environment*, 83. https://doi.org/10.1016/j.trd.2020.102319

Triple Access Indicators – the case of Transport for the West Midlands

Spatial proximity was based on access by foot and bike (weighted equally) within 15-minutes to a basket of local amenities and services. This included local centres (a proxy for everyday retail); primary, and secondary education; primary healthcare; open space and fitness amenities; and cultural and social facilities.

Physical mobility was based on access to employment by public transport, derived from the local strategic transport model and calculated at the spatial level of the model's zones.

Digital accessibility was based on Internet user classification data which provides neighbourhood profiles that reflect how people in their neighbourhoods access and engage with the Internet. The data provides insight into the propensity for local populations to access services digitally. This choice was made because provision of fast broadband services is good across the West Midlands, and such a measure (digital connectivity) showed relatively little spatial variation.

For each triple access dimension, the resulting indicator values were mapped to a hexagonal grid. These values were then normalised, so that for each dimension the scores fell within the same range of values. The three dimensions were then combined by summing with equal weighting, on a per-cell basis.

The analysis applies several simplifying assumptions. Some of these assumptions could be tackled and refined or dropped altogether in future enhancements of the method, always subject to the availability of suitable data.

The spatial proximity analysis assumes a generic pedestrian and cyclist without accounting for variations in age, gender, or disability, which is a crude assumption that means in its current form, the analysis is insensitive to accessibility issues related to these characteristics. This part of the analysis also makes assumptions about the composition of the basket of amenities to which access is measured. The analysis can easily be adapted to baskets of different composition, and this lends itself to tailoring though engagement with local stakeholders in order to get an analysis that is localised[23].

In terms of physical mobility, the analysis here focuses only on a single trip purpose and a single mode. The choice of a single mode reflects the priorities of the transport authority, while the employment trip purpose was chosen to reflect purposes not otherwise explicitly catered for in the spatial proximity analysis. The method itself is flexible and could accommodate more modes and purposes contributing to the physical mobility scores, though this should be subject to those scores remaining easy to interpret. Alternatively, the analysis could be repeated for different journey purposes.

Another simplifying assumption is that quality is not a determining factor in terms of the amenities and places people need or wish to access, or in terms of their means of access to them.

[23] For example, such a process has been undertaken with Leeds City Council in the UK in a separate spatial proximity project.

Simple indicators can allow a representation to be formulated of the variability in triple-access available to the population of an area of interest. The example in the box above and in Figure 10 relates to application of TAP in the West Midlands in the UK[24]. Geographically-based representations of access through physical mobility, spatial proximity and digital accessibility are first represented separately and then combined to form a geographic representation of triple access availability that can inform the planning process.

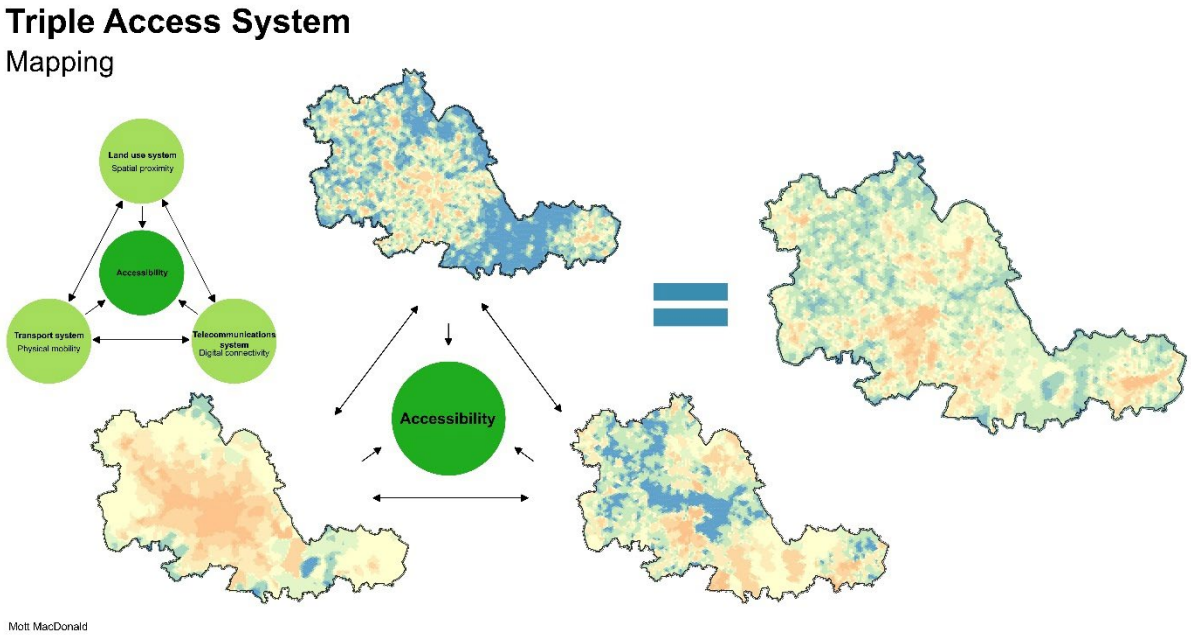

Figure 10. Geographic information representing physical mobility, spatial proximity and digital connectivity-based access (produced by Mott MacDonald as part of urban mobility planning in the West Midlands, UK)

What benefits can it bring you?

If promoting fairness and accessibility for all is to be a central aim of planning then access in all its forms must be addressed. If being better able to reach people, employment, goods, services and opportunities is what planning aims for, then being able to identify the most appropriate means to achieving that end involves understanding (and subsequently influencing) the TAS.

Becoming more conscious of and conversant with digital accessibility in particular as a component of triple access helps in taking a more holistic view of the role of motorised mobility relative to other options (which be more sustainable or affordable). Improved understanding of the part digital accessibility is playing for the population of the area helps to pinpoint areas ripe for improvement. It can also **open minds to the future prospects for how digital accessibility could change and be changed in potentially quite significant**

[24] This has been developed by Mott MacDonald on behalf of Transport for West Midlands (TfWM). As a transport authority, TfWM is actively addressing TAP, having acknowledged the significance of the TAS in their 2021 Green Paper 'Reimagining transport in the West Midlands: a conversation about change'. https://www.tfwm.org.uk/who-we-are/our-strategy/green-paper-2021/

and substantial ways, with ramifications for planning in terms of transport and land use.

A strengthened position from which to more thoroughly analyse accessibility

An improved appreciation of the triple-access nature of the current situation is important. This becomes the basis for subsequent planning efforts in relation to promoting fairness and accessibility for all for the geographic area of interest.

Figure 11 provides an overview of an approach for examining accessibility in more detail in a particular area. It is partly inspired by a process called accessibility planning which local transport authorities in England were required to undertake between 2003-2011[25] and a methodology for a people-based approach to accessibility applied to Rotterdam[26].

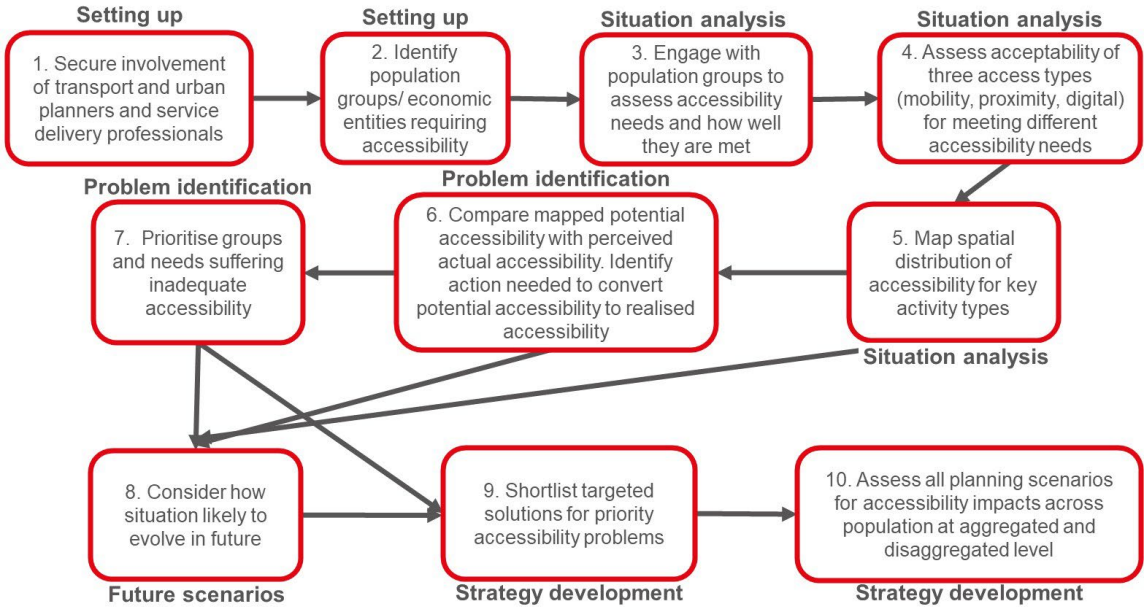

Figure 11. A 10-step approach for analysing accessibility[27]

It starts with setting up a cross-sector working group before analysing the existing accessibility situation through a combination of primary research with the public and spatial mapping. It then proceeds to consider future scenarios for how accessibility will evolve and testing intervention scenarios.

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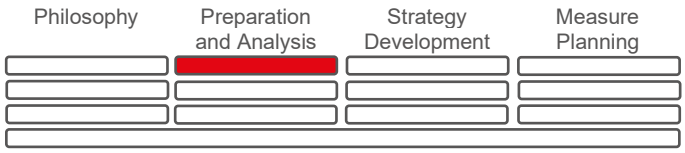
[25] Kilby, K. and Smith, N. (2012). *Accessibility Planning Policy: Evaluation and Future Directions - Final*. https://www.gov.uk/government/publications/accessibility-planning-policy-evaluation-and-future-directions. See also Halden, D. (2014). Shaping the Future: case studies in UK accessibility planning. *Transportation Research Procedia*, 1, 284 – 292. https://doi.org/10.1016/j.trpro.2014.07.028

[26] van der Veen, A.S., Annema, J.A., Martens, K., van Arem, B. and de Almeida Correia, G.H. (2020). Operationalizing an indicator of sufficient accessibility–a case study for the city of Rotterdam. *Case Studies on Transport Policy*, 8(4), 1360-1370. https://doi.org/10.1016/j.cstp.2020.09.007

[27] Derived from review work within the Triple Access Planning for Uncertain Futures Project (including engagement with expert academics and practitioners on accessibility).



Fairness and accessibility for all

Figure 11 recognises (in steps 2 and 7 especially) that **people's circumstances and needs vary. Such variation can easily be overlooked in planning and has in the past been neglected in the shaping of the built environment and forms of access available.** This has exacerbated disability and inequity and needs to be addressed if planning is to uphold the Sustainable Development Goal of 'leave no one behind' (no sustainability without equity)[28].

Varied circumstances and needs relate to diversity in multiple forms not only concerning income, education and employment, but characteristics across society including age, disability, gender identity, ethnicity, pregnancy, sexual orientation and religion. **The understanding of who experiences barriers, what these are and where they are located, should be a key component of any planning and its accountability to the populations being serves**.

Takeaway points

- It is important to understand the system that the planning process intends to shape and improve. Formalising a representation of the TAS through systems thinking helps foster common understanding and a strong foundation for subsequent planning decisions.
- Considering accessibility as the central focus of planning enables a more integrated approach to planning, bringing together transport, built environment and service delivery functions.
- Access solutions need to be sensitive to citizens' needs – the use of accessibility mapping and modelling tools needs to be accompanied by dialogue with citizens (see the Triple Access Perspective – Strategy Development section) on unmet accessibility needs and solutions, recognising that the relative emphasis on mobility, proximity and digital access solutions will vary across population groups and activity needs.

Further resources

- **Foresight through developing shared mental models: the case of Triple Access Planning** – A paper that describes in greater detail the process involved in co-creating a Causal Loop Diagram to represent an understanding of the TAS.
- **Making Accessibility a Central Focus of Transport Planning in the Digital Age** - A paper reviewing developments in thinking on using the accessibility concept in transport and making the case that

[28] United Nations (2017). *Leaving No One Behind: Equality and Non-Discrimination at the Heart of Sustainable Development - A Shared United Nations System Framework for Action*. Asia-Pacific Disaster Report. UN, New York. https://doi.org/10.18356/6991756e-en

transport planning should frame its efforts around accessibility and consider the role of digital connectivity alongside the transport system and the land use system in serving accessibility needs (please contact Kiron.Chatterjee@uwe.ac.uk for a personal copy).

Triple Access Perspective

Strategy Development

Shaping the future of access involves considering how to support society's changing need or desire to reach people, employment, goods, services and opportunities. This section introduces the changing prospects of digital connectivity and accessibility and how to contemplate a preferable future (vision) in terms of a rebalancing of physical mobility, spatial proximity and digital connectivity. This includes supply-side approaches that can influence the forms of access available to people as they lead their lives.

Sustainable Urban Mobility Planning Guidelines[29] describe the goal of strategy development as being "to define the strategic direction of the Sustainable Urban Mobility Plan in cooperation with citizens and stakeholders". The Guidelines centre upon three key questions: What are our options for the future?; What kind of city do we want?; and How will we determine success? They encourage attention to be given to accessibility rather than only mobility and traffic. This Handbook helps you do this with added emphasis given to digital accessibility and can be equally applied in rural areas as it is in urban areas.

Options for the future reflect alternative *desirable* futures. Triple Access Planning (TAP) takes a vision-led perspective as part of the decide and provide paradigm and it seeks to directly recognise triple-access as part of that vision and the goals and approaches that follow.

Why should you consider this and what's involved?

Comparing paradigms and planning approaches

Transport planning has traditionally reflected a planning paradigm with the shorthand title of predict and provide. It has been forecast-led and centred upon mobility. Expectations of future demand have guided what changes may be appropriate to transport infrastructure and service provision to accommodate that demand. There has been a tendency to conceal uncertainty as a result of presenting unrealistic confidence in 'most likely' forecasts. Overall the approach can be considered reactive. Meanwhile, TAP reflects the planning paradigm known as decide and provide. It is vision-led and centred upon accessibility, not (only)

[29] https://urban-mobility-observatory.transport.ec.europa.eu/sustainable-urban-mobility-plans/sump-guidelines-and-decision-makers-summary_en (p.79)

mobility. It recognises that **change in supply of means of access shapes behaviours of people and businesses**[30]. It also accommodates uncertainty rather than concealing it. Overall the approach can be considered more proactive. This is summarised in Table 2.

Table 2. Alternative planning paradigms

Predict and provide	Decide and provide
Forecast a most likely mobility future	Decide on a preferred accessibility future
Demand-led supply	Supply-led demand
Conceals uncertainty	Accommodates uncertainty
Reactive	Proactive
⇨ Transport planning	⇨ Triple access planning

From a triple access perspective, an approach to strategy development should be rooted in an understanding that the future makeup of access supply and demand is not pre-determined but is ours to shape.

With TAP, **the supply side of the Triple Access System (TAS) is shaped with the intention of reshaping demand for its use to achieve associated goals**. In practice, orthodox transport planning ultimately amounts to supply-led demand even if the motivations to change supply (and those more familiar to, and perhaps therefore believable for, some politicians and planners) seem driven by anticipated future demand pressures.

Introducing a triple-access perspective to strategy development is best illustrated through examples. The Wales Transport Strategy 2021[31] refers at its outset to "planning ahead for better physical and digital connectivity to support access to more local services, more home and remote working". Further examples are set out below.

A triple-access approach to deciding

When the notion of TAP was first introduced in 2015 an illustration of what this might mean for strategy development was set out, as shown in the box below[32].

Significant in this example is the emphasis on supply-led demand. Such objectives point to reshaping triple-access supply in society to support wider goals relating to carbon emissions, health and wellbeing as part of a vision-led strategy.

What becomes apparent is that a triple-access strategy requires joined-up planning and decision making across transport, land-use and telecommunications. It is important to

[30] Behavioural response to changes in supply can be gradual and non-linear with an important role for behavioural sciences inputting to the planning process.
[31] Welsh Government (2021). *Llwybr Newydd The Wales Transport Strategy 2021*. https://www.gov.wales/sites/default/files/publications/2021-03/llwybr-newydd-wales-transport-strategy-2021-full-strategy_0.pdf
[32] Lyons, G. and Davidson, C. (2016, p.113). Guidance for transport planning and policymaking in the face of an uncertain future. *Transportation Research Part A: Policy and Practice*, 88, 104-116. http://dx.doi.org/10.1016/j.tra.2016.03.012

establish what institutional changes may be needed to entertain such a strategic approach (see the Addressing organisational and institutional challenges section). If this is not deemed achievable then **it is important to at least promote dialogue at a professional level across the planning disciplines and teams so that a triple-access mindset can be fostered across them** whereby some degree of co-ordination and shared learning permits component parts of the TAS to be influenced through planning and decision making in a complementary rather than contradictory way.

Illustrating the notion of what TAP might mean for strategy development

"We should undertake to decide on a policy path that provides an evolution of the TAS and which builds in options so that along that path, as more information becomes available, adjustments can be made. Much planning debate would clearly be called for in order to produce candidate policy paths. As a simple illustration, the following long term objectives, alongside existing policy targets, could set the policy framework for the TAS (either at city, regional or national scale):

(i) **maintain at 2015 levels (with the option to reduce) the overall land take of surface transport** (with further options for changed use of land take between modes and in relation to improved operating efficiency and carrying capacity within modes);

(ii) **increase by x per cent annually (with the option to accelerate), the population density of urban areas**;

(iii) **increase by y per cent annually (with the option to accelerate), the proportion of population with access to superfast broadband** (with the option to raise the threshold definition of 'superfast')."

From theory into practice – the case of Scotland and national TAP

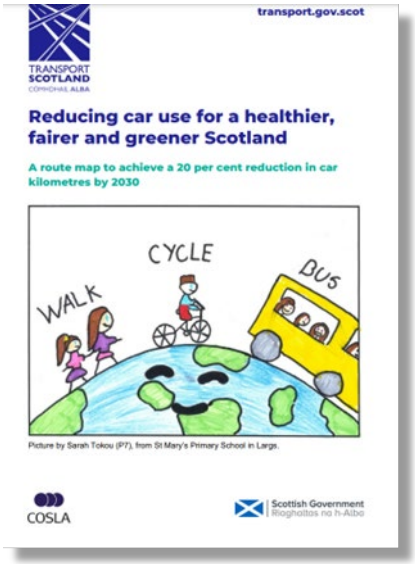
Transport Scotland[33] has been a pioneer in terms of triple-access strategy development. The Scottish Government's Climate Change Plan[34] made a commitment to reductions year-to-year in car kilometres travelled nationally leading to a 20% reduction by 2030 compared to pre-pandemic levels. In this example of decide and provide, the *decision* was to influence how access would in future be fulfilled in Scotland with less reliance on the private car. What followed focused on *providing* measures that would help bring about such change. The result in January 2022 was 'Reducing car use for a healthier fairer and greener Scotland – a route map to achieve a 20% reduction in car kilometres by 2030' (see Further resources).

[33] Transport Scotland is one of the partners in the project 'Triple Access Planning for Uncertain Futures'

[34] Scottish Government (2020). *Update to the Climate Change Plan 2018-2032 – Securing a Green Recovery on a Path to Net Zero*. https://www.gov.scot/publications/securing-green-recovery-path-net-zero-update-climate-change-plan-20182032/documents/

The box below shows extracts from the Foreword of the route map with identifiers of TAP self-evident (note also that TAP in included in Scotland's Local Development Planning Guidance[35]).

A triple-access approach to achieving a national goal for Scotland



The route map "acknowledges that people's travel behaviours are shaped by the wider context in which they live and services they need to access. Our route map to reduce car use therefore includes a range of non-transport policies interventions, including the provision of good connectivity and digital access to services; the way we plan and invest in our public places; where we locate key services such as healthcare; and how we support our children and young people to make healthy, fair and sustainable travel choices from an early age".

The route map "identifies four key behaviours that we want everyone in Scotland to consider each time we plan a journey: make use of sustainable online options to reduce your need to travel; choose local destinations to reduce the distance you travel; switch to walking, wheeling, cycling or public transport where possible; and combine a trip or share a journey to reduce the number of individual car trips you make, if car remains the only feasible option".

A new conversation to begin shaping the future of urban areas

The COVID-19 pandemic shone a light around the globe on how we lead our lives and the forms of access we rely upon. It highlighted the forms of access we could turn to if we were minded to or if measures were introduced to help make them available to us and more attractive. **For a triple access strategy to be supported and have the prospect of being deliverable and effective, it is not enough only for planning professionals to be on board. There is a need to foster public and political support**. Triple access strategy development from the City of Gold Coast in Australia is helpful to consider as an example. In July 2022 the authority published a document[36] to start a conversation about the development of its city transport strategy 2041. The box below illustrates that triple-access

[35] The Scottish Government's Local Development Planning Guidance (May 2023, p.118) states as follows: "In advance of developing a spatial strategy authorities should consider the interdependency between physical and spatial proximity as well as digital access. This transport planning concept (sometimes known as Triple Access Planning) encourages the integrating of land use and transport planning along with digital planning, all of which influence decisions around where development should take place to ensure sustainable mobility patterns." - https://www.gov.scot/publications/local-development-planning-guidance/documents/

[36] https://gchaveyoursay.com.au/76440/widgets/367776/documents/235110

strategy development has people at its heart and in turn needs to engage people in a conversation about the sort of city they want in the future.

Triple access strategy development in Queensland, Australia

"In the digital age access involves proximity to places, physical mobility and digital connectivity. The triple access system demonstrates individual needs can be met in more than one way - through transport, land-use and digital access. Putting people at the centre of this approach will help identify viable options for different areas and people enabling us to reduce the impacts of traffic congestion while protecting and enhancing the liveability of the Gold Coast."

The engagement approach uses personas to help illustrate challenges faced by different types of people in the city and imagines how their lives could be changed by 2041 through pursuit of the proposed strategic approach in which rethinking access is at the heart.

Having triple access conversations to inform strategy development

Mott MacDonald and the University of the West of England[37] developed a vision-led six-stage approach to strategic planning for TAP called FUTURES (Future Uncertainty Toolkit for Understanding and Responding to an Evolving Society). The FUTURES interactive guide is freely available (see Further resources). The six stages are as follows:

- **Gearing up** – Tuning into TAP and gauging appetite, readiness and needs
- **Preferred future** – Co-creating a shared vision with different values and preferences
- **Opening out** – Embracing and opening out uncertainty with scenario development
- **Options** – Identifying triple-access ways to deliver the vision
- **Closing down** – Stress-testing options for robustness against explorative scenarios
- **Review** – Setting in place a plan for monitoring, review and adaptation

[37] Mott MacDonald and the University of the West of England are both partners in the 'Triple Access Planning for Uncertain Futures' project.

To help people engage with FUTURES, a practical two-part four-hour online workshop was designed and used in several cities around the world called the FUTURES Relay[38].

The Relay allows planners and policymakers to come together online to get hands-on experience of TAP including exploring future possibilities, identifying a preferred future and determining what sorts of steps might allow a realisation of that future. In 2023 the first citizens' Relay was run in Bristol in the UK - see the box below. More details are available in the Future resources section below. This example is a reminder of both **the importance but also challenge of citizen engagement. This challenge extends further when the concept of triple-access is concerned because citizens, like transport professionals, can easily fixate on what change is needed to the transport system and are less naturally inclined to take a triple-access perspective**.

Citizen engagement in strategy development in Bristol, UK

"While in other cities, the FUTURES Relay had been run with professionals, Bristol was the first city in which the process was trialled with citizens. In all cases, the workshop was held online (using Microsoft Teams). Ahead of the Bristol workshop, adaptations were needed to its format to make the process as inclusive as possible."

"Participants were recruited through an announcement in Bristol City Council's fortnightly mailer "Ask Bristol"."

"The workshop has been a reminder of the importance of citizen engagement both to give a voice to the community affected by change but also to benefit from citizens' perspectives alongside those from professionals in terms of planning for change for the better."

What benefits can it bring you?

Becoming more attuned to triple-access thinking, and in turn the way the strategy is contemplated and developed, leads to the opportunity to take advantage of a greater range of approaches to help shape the area of interest. The strategy can be more people-centric

[38] The FUTURES Relay has been developed by Mott MacDonald, a partner in the 'Triple Access Planning for Uncertain Futures' project and has been used during the project in Cagliari (Italy), Nova Gorica (Slovenia), Aberdeen (Scotland) and Bristol (England). While the Relay is run by Mott MacDonald, you would be able to draw up your own workshop design to help put FUTURES and in turn TAP into practice.

and less dependent upon motorised transport in terms of supporting economic and social activity and the area's vibrancy.

The reality in any case is that **while digital accessibility may not always be as visible a part of life as queues of cars, public transport pulling in at stops and stations, or people gathered in public places passing the time, it plays an important part in fulfilment of access needs and desires**. It is contributing to changing behaviours and in turn can form part of efforts to support and shape behaviours into the future in a way that complements the role of spatial proximity and active travel and lessens dependence on motorised mobility.

Takeaway points

- Forecasting triple-access demand patterns is not a precondition of triple-access strategy development because TAP is centred upon *deciding* upon how best supply of access may be changed to in turn support and shape patterns of demand in pursuit of a vision.
- Triple-access strategising has been helped by the greater real world experience of planners, politicians and the public of behaviours during the COVID-19 pandemic.
- Triple-access strategies are already emerging in practice. Part of fostering their development and support is to engage with citizens and be able to articulate what triple access can mean for people's everyday lives in urban areas.
- The triple-access perspective helps in managing risks and uncertainties for future policies (as addressed further in the Uncertainty – Strategy Development section).

Further resources

- **Guidance for transport planning and policymaking in the face of an uncertain future** - the foundational paper setting out decide and provide and the triple access approach.
- **Reducing car use for a healthier, fairer and greener Scotland** - Transport Scotland's triple access strategy for achieving a 20% reduction in total car kilometres travelled.
- **A Conversation About the Future of Transport. Transport 2041 Strategy Discussion Paper** – putting TAP into practice in the Gold Coast, Australia.
- **FUTURES (Future Uncertainty Toolkit for Understanding and Responding to an Evolving Society) –** interactive guide to a six-stage vision-led approach to strategic planning that applies decide and provide.
- **FUTURES Relay** – a short video explaining how the Relay works.

- **FUTURES Relay around the world** – an interactive microsite that offers insights into how FUTURES has been applied to cities in different parts of the world.
- **Net Zero: The Future of Bristol's Transport System** – an example of citizen engagement in TAP.
- **FUTURES Relay - bringing citizen engagement into vision-led planning** – a paper explaining the FUTURES Relay as a means of citizen engagement in strategic planning (please contact Glenn.Lyons@uwe.ac.uk for a personal copy).

Triple Access Perspective

Measure Planning

Traditionally transport planning has taken a rather narrow approach, considering measures that directly address transport supply and demand. In this section recognition is encouraged of how the goals of a triple access strategy can be met by a wider scope of measures that addresses the roles of spatial proximity and digital connectivity. A rethink of transport measures is needed in light of the wider dynamics of the Triple Access System that could influence how such transport measures perform.

Sustainable Urban Mobility Planning Guidelines[39] describe Measure Planning as the move from strategic to operational with a focus on "measures to achieve the agreed objectives and targets". Key to this phase is to "create a longlist of measures and assess their effectiveness and feasibility to select those that best contribute to meeting your objectives and targets". In short, it is necessary to consider what things need to be implemented to achieve the objectives and ultimately deliver the vision set out in the strategy. **Critical to getting the best from the TAS is that minds are open to measures that span transport, land use and telecommunications.**

Why should you consider this and what's involved?

Bring digital accessibility into your consciousness

According to Eurostat[40] as of 2022: 93% of EU households[41] have internet access (slightly higher in urban areas than rural areas); 16% of individuals in the EU had followed an online course; 8% had participated in online consultations or voting; 52% sought health-related information online; and 68% of individuals aged 16-74 had ordered or bought goods or services over the internet for private use. As discussed in the Triple Access Perspective - Preparation and Analysis section, it is important to have a triple-access understanding of access for the population of interest (and the Access for Goods - Preparation and Analysis

[39] https://urban-mobility-observatory.transport.ec.europa.eu/sustainable-urban-mobility-plans/sump-guidelines-and-decision-makers-summary_en (p.79)
[40] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Digital_economy_and_society_statistics_-_households_and_individuals
[41] As of 2023, the UK is also in line with this figure, see https://www.ofcom.org.uk/__data/assets/pdf_file/0029/272288/online-nation-2023-report.pdf

section underlines that access relates to goods as well as people). Digital accessibility is both omnipresent but invisible. **Make digital accessibility visible – bring it into the consciousness of those involved in Measure Planning**.

There is more than one way of achieving an aim

It is said that if a problem is presented to different professions, different solutions will be put forward. If congestion is the problem, a highway engineer may suggest more road capacity, a traffic engineer may suggest traffic management improvements, a transport planner may suggest improving the travel alternatives, a spatial planner may suggest changing the design of the built environment and the locations and forms of new development. A digital planner may suggest more services and opportunities need to be available online.

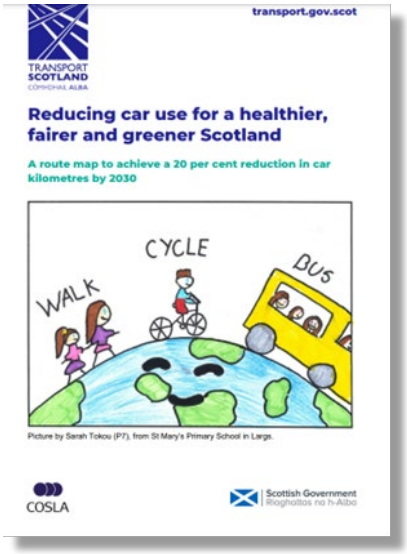
In practice, the best prospect may well come from the professions working together, both to understand the problem (or opportunity) and to ensure an appropriate array of solution options are brought forward. A highway infrastructure solution to a highway traffic problem is not always the answer. Yet it can appear so if the range of solutions considered is too narrow.

It is widely recognised that travel is predominantly a derived demand. Problems from traffic are, to a significant extent, a consequence of choices that are made individually and collectively about how connectivity needs are met. Choices of where to locate, whether to travel, how and when to travel and to where, all contribute to the traffic that is seen on the road network. **Solution options are needed that change and promote the availability and relative attractiveness of those choices**.

Consider whether team responsible for Measure Planning has adequate diversity of expertise and experience. Work together to stretch minds and explore the range of triple-access possibilities for measures that could help realise the vision. Beware of the unconscious bias called ‘cognitive fluency’ – things that we better understand we find more believable. **Do not reject too hastily the serious consideration of non-transport measures to tackle transport problems.**

In the Triple Access Perspective - Strategy Development section is the case study of a triple-access strategy at a national level in Scotland. The box below indicates some of the interventions that have been identified to realise a vision to reduce car use nationally (for more details see Further resources below). Turning such interventions into specific measures underlines the scope for Measure Planning to extend well beyond online measures centred directly on the transport system (such as journey planners).

A triple-access approach to achieving a national goal for Scotland



Interventions (leading to measures) to reduce the need to travel:

- Finalising and adopting the National Planning Framework to continue to support the roll-out of digital infrastructure across all of Scotland.
- Extending superfast broadband to 100% of premises in Scotland
- Mapping digital connectivity alongside transport connectivity
- Support for the provision of flexible working arrangements where appropriate (including a commitment to offer flexible working as a criteria for public sector grants and procurement)
- Creating quiet, safe, hygienic and connected local work hubs
- Delivering 20 minute neighbourhoods, improved town and city centres and a 'loves local' culture
- Reducing the need to travel for National Health Service staff, patients and visitors

Triple-access measure planning offers greater scope for measure packages

In the world of transport planning it has been common to see measure planning as being rather single-mindedly focused on transport measures. To discourage car use through measures such as pricing and removal of capacity ('sticks') it has been assumed that these must be accompanied by measures such as more affordable, frequent and attractive public transport services ('carrots')[42]. However, getting buy-in from the public and hence political support for the sticks to accompany the carrots can be hard won and easily lost.

In the world of TAP there is greater scope to provide credible and attractive alternatives to car use for some journeys for some people some of the time. The case study in the box below highlights the art of the possible when opening minds, beyond considering only (motorised) transport measures, to the role of land-use measures including both reallocation of road space and placemaking measures. There is no mention of digital connectivity. Yet consider the following[43]: over 80% of Norwegians live in urban areas; 99% of the population of Norway are online; and they have some of the fastest internet connection speeds in the world, with median fixed and mobile connection speeds of around

[42] In some cases the revenue raised from sticks can be used to help pay for the carrots.
[43] https://datareportal.com/reports/digital-2022-norway

100Mbps. **Visible or not, digital connectivity and accessibility are in the background playing their part in changing life** in Oslo for its citizens.

Digital accessibility measures are increasingly being introduced and evolved beyond the typical remit of transport planning or urban mobility planning. This can mean that such measures can be implicitly incorporated into measure packages in TAP – they exist as pull ('carrot') measures to complement push ('stick') measures that may discourage demand for other forms of access. Meanwhile, measures may be considered to help ensure a greater part of the population can truly draw upon the benefits of digital accessibility – for example digital education or publicly subsidised digital (community) facilities.

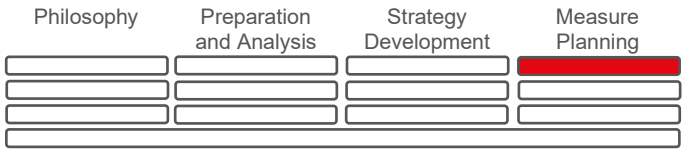
How Oslo gave its streets back to people

"Our main objective is to give the streets back to people" – Oslo's Vision Zero has been aiming to eliminate all deaths on public roads.[44]

- Vision Zero is at the intersection of reducing Oslo's carbon footprint, and increasing city life
- "It is no secret that Oslo also has faced challenges in regard to opposition against our plans for a car-free city" – "To get buy-in...piloting changes has been an important tool in the program"
- The city has been:
  - Closing off streets in the city centre to cars
  - Removing on-street parking spaces inside the city's ring road
  - In place of cars, installing cycle lanes, benches and miniature parks
- COVID-19 has had an effect and Oslo is working on how to reduce car traffic even more.

Innovation and change possibility in terms of spatial proximity and digital connectivity measures could help accompany physical (motorised) mobility measures in making the strategy suitable, acceptable and feasible to deliver successfully.

[44] Image, insights and quotes in this case study are from "How Oslo Reached Vision Zero" by Terje Elvaas, Transportation Alternatives



What benefits can it bring you?

It is well-known that achieving integrated approaches to planning is not easy – institutional structures and silo-mentalities can lead to transport planners doing transport planning, spatial planners doing spatial planning and digital planners (if they exist) doing digital planning (see also the Addressing organisational and institutional challenges section). **TAP offers the prospect of a triple-access whole being greater than the sum of its parts**. By ensuring different types of planners are brought together to think through the art of the possible in terms of Measure Planning, there is the prospect of a much richer repertoire of candidate measures. In turn it will be possible to consider how different combinations of measures could work effectively together to help realise the objectives of the strategy and deliver the vision.

Triple-access Measure Planning may open up greater possibility for co-benefits whereby reduced car use is arising from greater availability and normalisation of alternatives that introduces both more flexibility into people's lives and changes the experience of access for everyone. It can also help in managing risk and uncertainty (see Uncertainty – Measure Planning section).

In this way, **TAP's Measure Planning aligns with the approach known as Avoid-Shift-Improve**[45]: avoiding the need for motorised travel where possible; shifting travel that does take place to more environmentally friendly modes; and improving the efficiency/sustainability of motorised travel. This is also referred to as 'Trias Mobilica'[46], involving three steps: scale down, switch, sustain[47]. First introduced in 1997, the 'four-step principle'[48] advocated by the Swedish Transport Administration in terms of Measure Planning likewise complements, and is complemented by, TAP very well:

- Step 1 – consider if it is possible to address an identified deficiency by reducing or changing demand
- Step 2 – identify more efficient ways of using existing transport infrastructure
- Step 3 – consider limited renovations to existing infrastructure
- Step 4 – consider new investments or major renovations.

The four-step principle is widely used among local transport authorities and in transport strategies in Sweden. A further intermediate step (between steps 2 and 3) has also been

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[45] Bongardt, D., Stiller, L., Swart, A. and Wagner, A. (2019). *Sustainable Urban Transport: Avoid-Shift-Improve (A-S-I)*. Transformative Urban Mobility Initiative (TUMI). https://www.transformative-mobility.org/wp-content/uploads/2023/03/ASI_TUMI_SUTP_iNUA_No-9_April-2019-Mykme0.pdf

[46] Bakker, S., Moorman, S., Knoope, M., van Zyl, S., Moncada Botero, J. and Mulder, H. (2022). *Energy chains for carbon neutral mobility – Efficiency, costs and land use in perspective*. Netherlands Institute for Transport Policy Analysis (KiM), September. https://english.kimnet.nl/binaries/kimnet-english/documenten/publications/2022/09/09/energy-chains-for-carbon-neutral-mobility/KiM_Energy-chains-for-carbon-neutral-mobility_report_def.pdf

[47] https://www.wur.nl/en/show/Mobility-policy-2030-WUR.htm

[48] Swedish National Audit Office (2018). *The four-step principle in transport infrastructure planning – is it being applied as intended?* RIR 2018:30, 14 November. https://www.riksrevisionen.se/download/18.2fb606e41681a5d0f12cf15f/1547423999841/RiR_2018_30_ENGLISH.pdf

advocated which concerns experimentation (creating testbeds that adapt to, and take tactical advantage of, evolving circumstances) which can help address dynamics and uncertainty.

Takeaway points

- The end does not need to dictate the means – triple-access thinking when it comes to Measure Planning opens up a more inspiring longlist of possible measures that can help realise the vision, be more efficient and better manage risks and uncertainty.
- Attempting to understand how people's lives function and the alternative ways and means of fulfilling their access needs will reveal opportunities to make triple-access changes that improve rather than restrict quality of life in an area.
- Key to the success of triple-access Measure Planning is being able to bring different perspectives and administrative functions together into participatory dialogue, shared learning and united action.

Further resources

- **Reducing car use for a healthier, fairer and greener Scotland** - Transport Scotland's triple access strategy for achieving a 20% reduction in total car kilometres travelled.

Uncertainty

Philosophy

Transport planning has traditionally been shaped by, and encouraged, a view of the future that is strongly informed by the past and is in turn considered knowable. This section promotes thinking about the reality that the future is less knowable and thus more difficult to forecast precisely. It explains the importance of accepting uncertainty, how this better manages risk, and gives guidance on how to use this to plan for our future systems.

Why should you consider this and what's involved?

Planning by its very nature is future-facing. Charting a purposeful course into the future requires that *possible* futures (i.e. what could happen) and *preferable* futures (i.e. what should happen / what we would like to happen) need to be considered as well as strategies and measures developed to reduce the gap(s) between these. However, both types of futures are unknown. Possible futures are largely determined by unpredictable developments affecting the outcomes of plans. Visions and preferences can also change over time due to shifting norms and values (e.g. importance of climate change or of addressing inequality). In planning these future-related uncertainties should be adequately taken into account and clearly communicated to decision makers. Futures thinking in transport and mobility planning should be carried out for two reasons:

- to identify the possible types and magnitudes of future mobility problems and opportunities; and
- to identify ways to handle these problems and take advantage of these opportunities.

Identifying ways to handle problems may not be a trivial process. For instance, some options might currently be under development (e.g. new vehicle technologies) or even unknown. In addition, many policy options are long-term in nature, taking time for impacts to unfold.

Planning depends on anticipating change, but this is becoming increasingly difficult, leading to anxiety when we seek to reconcile short-term decisions with long-term objectives or to prepare for rare events. Planners, and the analysts upon whom they rely, have had good reason to feel decreasing confidence in their ability to anticipate correctly future technological, economic, and social developments, future changes in the system they are trying to improve, or the many different preferences of stakeholders regarding the system's outcomes. In other words, planners are ever more confronted with conditions of uncertainty.

What does it mean to plan under uncertainty?

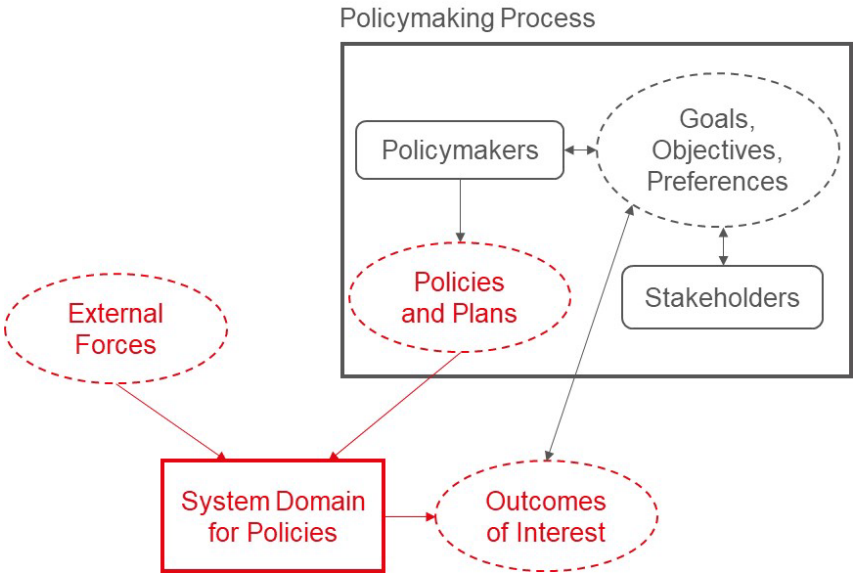


Figure 12. A systematic view on policymaking

Before defining uncertainty it is helpful to set out a view of planning itself – see Figure 12Figure 12. According to this view, **planning (or policymaking), in essence, concerns making choices regarding a system to change the system outcomes in a desired way**. At the heart of this view is the system of interest in the planning domain. The Triple Access System (TAS) can be defined by distinguishing its physical and human components and their mutual interactions (based on the underlying institutional structure) – see also the Triple Access Perspective – Preparation and Analysis section. The results of these interactions are outcomes of interest and refer to the aspects of the system that can be used to evaluate policies' effects (on, for example delivery of policy objectives, including climate change mitigation, health and wellbeing, and liveable neighbourhoods). The valuation of outcomes refers to the (relative) importance or weights given to the outcomes by key stakeholders, including policymakers. **Two types of forces act on the system: external forces, and policies and plans. Both types of forces are developments outside the system that can affect the structure of the system** (and hence in turn the outcomes of interest to policymakers and other stakeholders). External forces refer to forces that are not controllable (for the most part) by the decision maker but may influence the system significantly (exogenous influences) such as changes in demographics or the labour market. **A plan is a set of actions intended to be taken to influence the performance of the system so that it delivers better outcomes.**

This rational view on planning is adopted for specifying and analysing uncertainties from a systems perspective. It inevitably entails simplifications and anomalies due to complex process dynamics, informal practices and institutional uncertainty that characterises planning in reality (see Addressing organisational and institutional challenges section).

In a broad sense, uncertainty may be defined simply as limited knowledge about future, past, or current events. **In decision making, uncertainty is the gap between available knowledge and the knowledge decision makers would really need to be confident in the consequences of their chosen policies**. All aspects of a problem of interest can be

uncertain: the system of focus, the world outside the system, the outcomes from the system, and the importance stakeholders place on the various outcomes from the system. Consequently:

- Planners are confronted with uncertainties about external forces such as demographic, economic, social and technological developments.
- Planners do not know the mobility/accessibility system sufficiently well (uncertainties about the human and technical interactions in the system (variables + relations)) and are confronted with a wide range of (sometimes unknown) outcomes of alternative plans.
- Choosing a specific plan is very hard given the uncertainties about the valuation of the outcomes by different stakeholders.

In addition to different *locations* of uncertainty in policymaking and planning, planners are also confronted with different *levels* of uncertainty. Figure 13 presents a framework which specifies these different levels[49]. The four levels of uncertainty range between *complete determinism* and *total ignorance*. Traditional planning practices usually include low levels of uncertainty (Level 1 and 2). These are based on *a clear vision of the future*, or *predicting a few alternative probable futures*, respectively. Level 1 uncertainty has often been treated in transport planning through a simple sensitivity analysis of transport model parameters. Level 2 uncertainty is any uncertainty that can be described adequately in statistical terms. In the case of uncertainty about the future, Level 2 uncertainty is often captured in the form of either a (single) forecast (usually trend based) with a confidence interval or multiple forecasts ('scenarios') with associated probabilities.

On the other hand, **higher levels of uncertainty are not often acknowledged or addressed in most planning practices**. Level 3 and 4 uncertainty relates to situations with a limited set of *plausible* futures (Level 3) or a wide (or even unbounded) range of *possible* futures (Level 4), respectively. The often long-term related Level 3 and Level 4 uncertainties cannot be dealt with by use of probabilities and cannot be reduced by gathering more information. They are **basically unknowable and unpredictable at the present time**. Furthermore, they can involve uncertainties about all aspects of a policy problem and related modelling - external or internal developments, the appropriate (future) system model, the parameterisation of the model, the model outcomes, and the valuation of the outcomes by (future) stakeholders.

In dealing with Level 3 uncertainties, the (implicit) assumption usually made is that the future can be specified well enough to identify policies that will produce favourable outcomes in one or more specific plausible future worlds. Such policies are termed 'static robust'. The future worlds are called scenarios. Scenario planning is addressed in more detail in the Uncertainty – Preparation and Analysis section.

[49] Image from Walker, W. (2000). Policy analysis: a systematic approach to supporting policymaking in the public sector. *Journal of Multi-criteria Decision Analysis*, 9(1-3), 11-27. https://doi.org/10.1002/1099-1360(200001/05)9:1/3%3C11::AID-MCDA264%3E3.0.CO;2-3

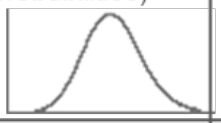
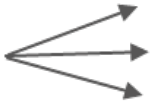
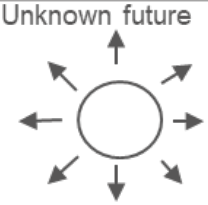
		Level 1	Level 2	Level 3	Level 4	
Context	Complete determinism	A clear enough future 	Alternate futures (with probabilities) 	A few plausible futures 	Unknown future 	Total ignorance
System Model		A single (deterministic) system model	A single (stochastic) system model	A few alternative system models	Unknown system model; know we don't know	
System Outcomes		A point estimate for each outcome	A confidence interval for each outcome	A limited range of outcomes	Unknown outcomes; know we don't know	
Weights		A single set of weights	Several sets of weights, with a probability attached to each set	A limited range weights	Unknown weights; know we don't know	

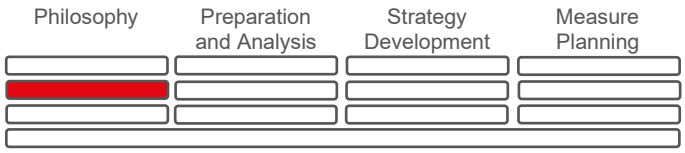
Figure 13. The progressive transition of levels of uncertainty

However, in case of Level 4 uncertainties, a traditional scenario approach is insufficient. Under these conditions of high uncertainty, analysts and/ or decision makers cannot agree upon system models, planning outcomes, or how to value the desirability of alternative outcomes. Decision making in the context of Level 4 uncertainties has to shift to a 'monitor and adapt' approach. See Further resources for an example of adaptive planning. The way adaptive planning can be used is addressed further in the Uncertainty – Measure Planning section.

What benefits can it bring you?

It is important first to acknowledge that ignoring uncertainty can lead to seriously misguided planning decisions / planning outcomes. Ask yourself, would I make investment decisions ignoring uncertainty if I were committing my own money?

Conversely, plans designed to take uncertainty into account (robust plans) can perform better than plans designed to perform well in one specific world, without necessarily knowing how it might perform in other futures (optimal plans). By considering uncertainty, new planning ideas and possibilities might emerge that may not have otherwise been contemplated.



Takeaway points

- Planning can benefit significantly from recognising that the future is highly uncertain and being prepared to plan in a way that takes multiple possible futures into account.
- Uncertainties do not only refer to external developments but also to the system itself that is the focus of planning interest, its outcomes and the way stakeholders value these outcomes.
- A distinction should be made among futures that are probable (Level 1 and 2 uncertainties), plausible (Level 3 uncertainties), and possible (Level 4 uncertainties).
- Traditional planning mostly uses Level 1 and Level 2 approaches, although there are well-defined approaches for handling Level 3 uncertainties (scenario planning) and Level 4 uncertainties (adaptive planning).

Further resources

- **Transport Futures Research** – an article that explains further the need to deal with and the handling of uncertainty in planning.
- **Decision Making Under Deep Uncertainty – From Theory to Practice** – a book that focuses on both the theory and practice associated with the tools and approaches for decision making in the face of deep (or high) uncertainty, including a chapter on adaptive planning.

Uncertainty

Preparation and Analysis

In developing plans, it is important to understand (and entertain) the various uncertainties related to the current and future problems and/or opportunities at hand. This section provides guidance on how to identify and communicate these uncertainties. A systems view for decision making under uncertainty as well as steps to apply this view in practice are offered.

Why should you consider this and what's involved?

A way to structure the various uncertainties related to the current and future Triple Access System (TAS) problems and/or opportunities draws upon the systemic view on planning from the Uncertainty – Philosophy section and the TAS from the Triple Access Perspective – Planning and Analysis section. This gives the representation set out in Figure 14.

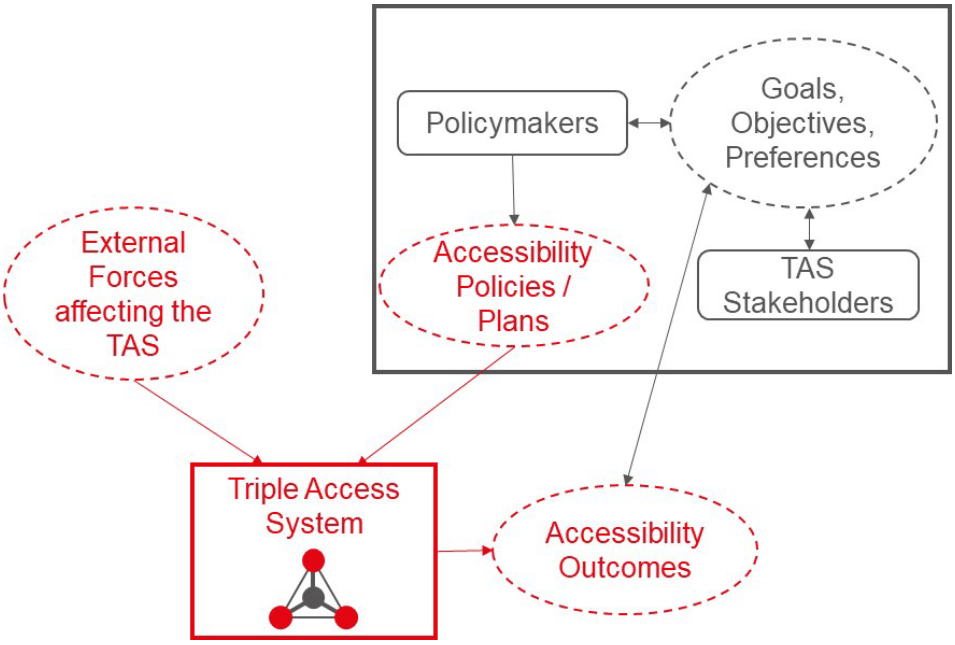


Figure 14. A systematic view on Triple Access Planning

The system comprising the policy domain is the Triple Access System (TAS), i.e. the interacting transport, land use, and digital subsystems. Hence, the resulting outcomes of

interest involve transport, spatial, and digital subsystem outcomes (i.e. accessibility-related outcomes of interest). The external forces that influence the TAS refer to forces that are not controllable by the decision maker but may influence the TAS significantly, i.e. external forces that influence the transport, spatial and/or digital subsystems. Policies and plans could focus on affecting one subsystem within the TAS or on affecting multiple subsystems at the same time.

As indicated in the Uncertainty – Philosophy section, different levels of uncertainty require different approaches. Scenarios can help us to explore these different levels of uncertainty about the future (probable, plausible or possible scenarios). **The broad understanding of scenarios is that they represent alternative futures which are shaped by system-internal and external forces**. The term 'scenario', however, can be a source of misunderstanding regarding what it represents and what part a scenario can play in the planning process. The 'Futures Cone' can be a helpful depiction of some of the different types of scenarios, as shown in Figure 15.

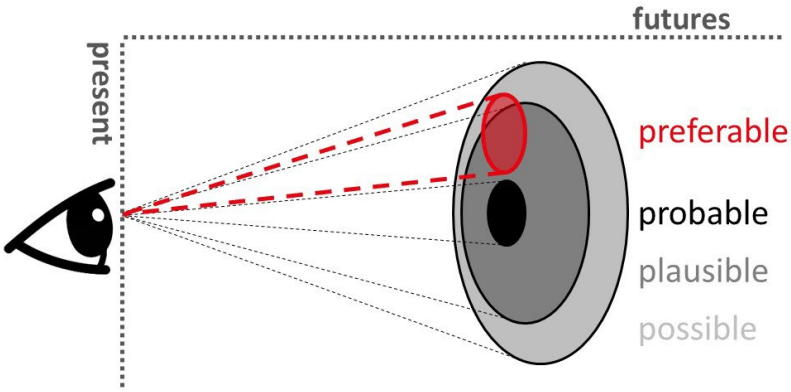


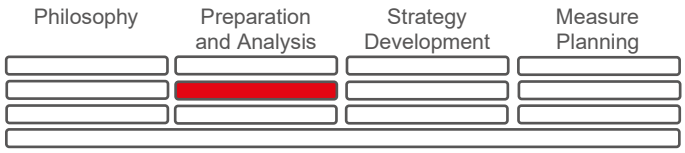
Figure 15. The Futures Cone[50] depicting different futures viewed from the present

Scenarios can be qualitative depictions of possible futures or quantitative representations or a combination of both. These futures can be representations of system-external forces only or also include system-internal forces. They can be predictive (probable futures based on forecasts) or explorative (plausible or possible futures). These are now considered further.

Types of scenarios

Predictive scenarios are based on forecast or probability estimations of the future, assembled from data-driven trends. Predictive scenarios have been the most common type of scenarios in planning: they rely on extrapolating trends. They are built using techniques that involve mixing trends with quantitative external impacting factors or qualitative considerations of future events. In these approaches, the produced scenarios are descriptive, quantitative, and forecast-dependent and the scenario team would tend to be dominated by expert external consultants. Such scenarios are suitable for low levels of uncertainty (Levels 1 and 2, see the Uncertainty – Philosophy section).

[50] For the history of the futures cone see https://thevoroscope.com/2017/02/24/the-futures-cone-use-and-history/



Plausible scenarios are scenarios that could happen, based on our current understanding of how the world works, and therefore should be considered in testing a potential strategy (and measures within it). The aim is to find a strategy that both delivers the desired future for the area (i.e. the vision) and performs well across different plausible futures (a robust strategy). Plausible scenarios assume, or explore and narrate, the developments that could happen within and/or outside the system being considered. Plausible scenarios are suitable for Level 3 of uncertainty (see the Uncertainty – Philosophy section). Plausible scenarios, however, should not include a preferred future vision. Formulating preferable futures is part of Strategy development (see the Uncertainty – Strategy Development section).

Possible scenarios refer to futures that might happen, based on some future knowledge we do not yet possess (Level 4 of uncertainty), but which we might possess someday.

You should note that there are contested views on when to refer to possible or plausible futures. In this Handbook the Futures Cone in Figure 14 is intended to help make a distinction. For decision makers, entertaining scenarios reflecting Level 4 uncertainty may be too unlikely. Attention below therefore considers Level 3 uncertainty and the development of scenarios referred to as plausible. Plausibility (the credibility of such a future potentially coming to pass) is a subjective notion and views between individuals are likely to vary. **What is important is that the plan being developed is taking adequate account of uncertainty about the future to improve confidence in the appropriateness and effectiveness of the plan and its elements and thus reduces the risk to the policies and investments being made**. Those involved in developing the scenarios should be prepared to open their minds and be receptive to future developments beyond their own 'comfort zone'.

How to make plausible scenarios – some basics

Plausible scenarios can be produced by internal contributors from the organisation, scenario experts that are invited to facilitate the process, as well as external experts and public stakeholders who are also invited to generate and test new ideas. As for Triple Access Planning (TAP) it is important to have representation from all of the transport, spatial and digital sectors, to create triple access scenarios. The process of creating plausible scenarios requires communication skills of the people involved. Identifying the key driving forces of future change for the plausible scenarios is based on judgement and intuition (as well as knowledge about the past and present). Plausible scenario development is based on the following steps (see Further resources for more detailed insights):

1. **Identifying the focal question** – an expression of the focus or purpose that the scenarios are intended to help address.
2. **Identifying drivers of change** - variables that could influence the future and are pertinent to the focal question. The PESTEL approach can be used in which drivers are identified across the following categories: political, environmental, social, technological, economic, and legal.
3. **Mapping the drivers of change** – drivers are considered and sorted according to their relative importance to the focal question and relative uncertainty concerning their future projection.

4. **Selecting critical uncertainties** – based upon the driver mapping, the most important and most uncertain drivers are identified. Selection should be mindful of avoiding overlapping drivers and should favour those which are more orthogonal (independent) from one another.

5. **Selecting scenario wireframes** – each critical uncertainty is assigned two or more future projections (e.g. high, medium, or low). Consistency analysis examines the coherency of different combinations of projections coexisting. Within the subset of coherent combinations, a small number of combinations of projections for the set of critical uncertainties are selected. Each combination constitutes an outline depiction of a scenario ('wireframe'). It is typical to identify three to six combinations – sufficient in number to expose uncertainty (challenging) and depict divergent credible (plausible) future states, but few enough to avoid cognitive overload in their subsequent use.

6. **Developing scenario narratives** – using each wireframe as a basis, a storyline is developed (potentially also using other drivers of change) which paints a picture of the future in question and helps assure its sense of plausibility. The aim is to bring the scenario to life in a way that helps those using the scenarios to engage in effective thinking about the future in relation to the focal question of concern. Each scenario is also given a short, distinctive and memorable name to aid recall and engagement.

Involving different stakeholders in scenario planning will help better understand what the future might have in store, foster sharing of ideas and a sense of ownership over the scenarios that emerge. The output are scenarios for the planning process that are credible, coherent and challenging.

Participatory scenario planning in preparation and analysis

In general, stakeholders may participate in scenario development to varying extents:

- **Informing** - scenarios are presented to participants for raising their awareness about plausible futures
- **Consultation** - in which participants are consulted to give input for some steps in scenario development
- **Co-creation** - where participants follow through the entire process of scenario development together

Most of the current practices involve participants through the first two approaches. Co-creation is less common as this type of stakeholder participation can be perceived as increasing complexity of the planning process and being more time and resource intensive. In addition, there is a risk of including stakeholders with wrong expertise and/or missing stakeholders with essential expertise. There are limits to participation that should be considered (see Addressing organisational and institutional challenges section[51]).

[51] See also Svensson, T. and Witzell, J. (2023). *Institutional Aspects Which Condition Sustainable Urban Mobility Planning - A Brief Literature Review*. KTH Working paper. https://kth.diva-portal.org/smash/get/diva2:1817599/FULLTEXT01.pdf

Nevertheless, scenario development should ideally involve all main stakeholders that are likely to be affected by the plan. In general, there are three main categories of stakeholder: the general public; subject experts; and professionals from other organisations involved. Furthermore, it is important to note that **the quality of the process is highly impacted by the diversity of stakeholders**. Therefore, in major planning projects, it is important to provide platforms for citizen participation. It is also strongly advised to involve experts and decision makers from different departments and domains (including transport, spatial and digital planning). The degree of involvement of each category of stakeholder varies depending on their role, time, and duration or amount of engagement.

An example of plausible Triple Access Planning scenarios

The 'Triple Access Planning for Uncertain Futures' project produced - through a participatory process with its academic and non-academic partners - a series of six plausible triple access futures for 2040. These are not specific to a given area but are intended to reflect what might come to pass for the future of urban mobility and accessibility in Europe[52]. The scenarios are structured according to a common set of key drivers of change with a distinct set of projections for those drivers for each scenario (the first seven drivers are critical uncertainties *while the remaining two were considered key drivers where there was more certainty about their future projections*):

- Climate Change Concern
- Economic Performance
- Perceived Importance of Car Ownership
- Need for Variety / Changed milieu
- Cost of Motorised Transport Relative to Income
- Urban Land Use Diversity
- Population Density
- *Utility of Online Activities*
- *Attractiveness of Walking and Cycling*

The following six scenarios resulted (see Further resources for a paper that provides a full narrative for each scenario):

Scenario 1 - Too Slowly Greener: There is persistently high consumerism and slow-to-recede dependence upon car use, 'greener' though it is. These are awkward reminders of past behaviours in a world in which climate change is still a major concern. This is despite an ever more depended-upon digital world of access, a richer urban mix of land use, and complementary appetite for active travel to compensate for sedentary, digital lifestyles.

Scenario 2 - Uneconomically Net-Zero: Strong and effective efforts to tackle climate change in the 2020s and 2030s have come at some cost to economic performance and

[52] While these were created with urban areas in mind, the implications for (surrounding) rural areas could also be considered in turn in each scenario.

public finances and contributed to a reshaping of economic and social activity. Motorised multi-modal mobility is affordable and accessible but in a society in which digital activity dependence is much greater and urban land use less diverse.

Scenario 3 – In a Fix: Concerted global effort to tackle climate change has been ineffectual and economically costly. Climate anxiety has shaped attitudes and behaviours and dampened the role of motorised transport in access provision, driving a prudent live-local-act-global urban dynamic.

Scenario 4 - Bye Bye Car: There has been a marked shift in attitudes and lifestyles since the 2020s with a high level of consciousness concerning the environmental consequences of behaviours. Climate change remains a serious threat although the transition to a green economy is underway with appetite for local living, and 'responsible' access fulfilment, with car use moving into the shadows.

Scenario 5 - Happy Green Dispersal: Society is thriving in a green economy, with an environmental consciousness that accompanies greater optimism over climate change than was seen in the 2020s. Many people invest in having their own means of motorised mobility and digital connectivity at their disposal for access, as land use patterns have changed and urban density declined, but for travel itself there is an established modal hierarchy

Scenario 6 - Tech Innovation Bonanza: Concurrent successful diffusion of technological innovations in physical mobility and digital connectivity have shaped a society able to be quietly confident that decarbonisation is in check. People enjoy a richness of access choice that includes balanced and complementary patterns of access fulfilment in highly populated urban environments.

Planning for a specific area would benefit from the generation of bespoke scenarios. However, it is also possible to use the scenarios above as a resource, around which to stimulate thinking and structured dialogue. They can be a means of being able to sense-check or 'stress test' candidate strategies and associated measures.

What benefits can it bring you?

Plausible triple access scenarios bring the following benefits:

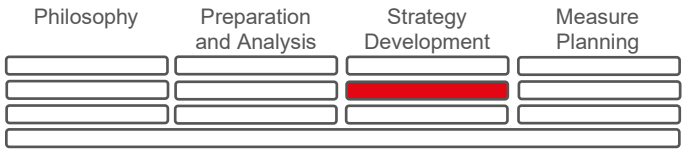
- They help you to reduce the risk that comes with the reality of many sources of uncertainty in planning.
- They allow you to examine 'what ifs' related to such uncertainties, including ways in which the system could change in the future and the implications of these changes.
- They provide a way to prepare for the future by exploring the implications of uncertainty for decision making, including: identifying potential future problems, robust plans for dealing with these and a basis for discussions about such matters with stakeholders.

Takeaway points

- The future of mobility and accessibility is surrounded by uncertainties.
- Plausible scenarios present a common (co-created) view on how mobility and accessibility futures might look like if nothing (else) is done.
- They are a basis for specifying mobility and accessibility problems and opportunities.
- Such scenarios can be used to help establish robust strategies (see the Uncertainty – Strategy Development section) and associated measures (see the Uncertainty – Measure Planning section).

Further resources

- **Foresight through developing shared mental models: the case of Triple Access Planning** – A paper that describes the creation of a set of triple access future scenarios.
- **Scenario Planning for Transport Practitioners** – A paper that addresses several key questions about developing and using scenarios.



Uncertainty

Strategy Development

A strategy for shaping the future needs to be mindful of the art of the possible, the appeal of the preferable, and the influence of the unknown. This section briefly explains how desirable depictions of the future - 'visions' - can be developed and highlights the association visions can have with uncertainty.

Why should you consider this and what's involved?

Sustainable Urban Mobility Planning Guidelines[53] describe the goal of Strategy Development as "to define the strategic direction of the Sustainable Urban Mobility Plan in cooperation with citizens and stakeholders". Strategic direction is usually provided through a vision. A vision (with associated objectives and in turn targets) is understood as the depiction of the desirable or preferred future – see Figure 15 in the Uncertainty – Preparation and Analysis section.

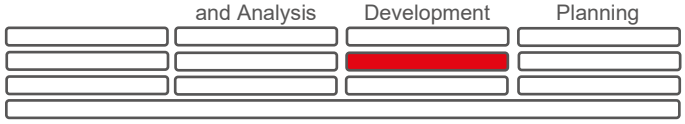
A visioning process generally consists of two main parts: divergence and convergence. Divergence involves participants expressing their differing ideas, preferences, and future desirabilities. Convergence involves data collected from the divergence part being interpreted, analysed and processed into a vision or a set of visions. The divergence and convergence parts can be implemented through a variety of participatory methods that bring together participants from a diversity of perspectives. The general means of engagement in visioning processes are workshops and focus groups.

Uncertainty plays an essential role in visioning. Stakeholders' preferences might change in unknowable ways over time (and new stakeholders may become involved). Objectives and in particular trade-offs among objectives can change.

Normative scenarios for shared visioning

Scenario planning is a key means to help accommodate uncertainty in planning (see the previous Uncertainty - Preparation and Analysis section). Scenarios can also be employed in vision development in the form of *normative* scenarios[54]. Normative Scenarios represent

[53] https://urban-mobility-observatory.transport.ec.europa.eu/sustainable-urban-mobility-plans/sump-guidelines-and-decision-makers-summary_en (p.79)
[54] Normative scenarios involve active change to the future brought about by the planning authority (with its stakeholders), commonly represented as preferred futures or visions.



preferred (triple access) futures. They are created mainly for long term planning and used more often within the public sector. They are built on the principle that the future can be shaped towards a deliberate goal. **Normative scenarios serve as guiding visions and as a basis for future actions.**

Although all types of scenario planning ideally include stakeholders, for normative scenarios it is a necessity: by discovering the preferred futures in a co-creation process, a strategy can gain direct relevance and support. To generate normative scenarios, preferences regarding the future should be set out. For individual scenarios, this can be done in the form of one-way consultations, such as interviews, although when shared visions are concerned (where there is convergence between multiple parties on an agreed preferable future) forms of collaborative engagement are required: participatory planning workshops, focus groups, citizen juries, future forums, and envisioning workshops. As a consequence, **shared visioning exercises require a high level of transparency, balancing, and credibility, where trade-offs are constantly studied and discussed with all parties depending on their level of involvement**. From a Triple Access Planning (TAP) perspective, such a vision should broaden from one that only or principally concerns mobility to one that embraces the Triple Access System (TAS), accounting for transport, land-use and telecommunications (see the Triple Access Perspective – Strategy Development section).

The goal of planning should be determining a *preferred* destination, and charting a course towards it that can handle uncertainty. In orthodox transport planning language, we must recognise that **there are multiple possible 'do nothing' futures against which we must assess our 'do something' interventions (as set out in a plan) to ascertain how well the intervention may help fulfil our strategic goal, our vision**.

Shared visioning and uncertainty

Most shared visioning approaches in mobility planning involve linear thinking and are consensus-oriented, resulting in long-term visions similar to business-as-usual projections. In a world that is changing in uncertain ways it is important to bring uncertainty into the psyche of those who are co-creating visions – encouraging them to **open their minds to what may be deemed 'plausible utopias' in terms of what is both desirable and achievable in the face of uncertain dynamics**.

Advice on participatory visioning[55] includes avoiding relying only on the 'usual professionals' since they will tend to be strongly biased in relation to their professional backgrounds and experience. Instead, other types of **participants representing a wide heterogeneity in social-economic backgrounds and expertise can act as thought provocateurs and catalysts for less linear thinking about preferable futures**. In the case of TAP it is important to include participation from transport, spatial and digital planning. Visioning processes themselves, as noted earlier, should provide space for divergence of views on preferable futures and the different dimensions of such futures. They can also help in identifying and addressing (the variability in) current stakeholder preferences that may

[55] Drawing upon Soria-Lara, J.A., Ariza-Álvarez, A., Aguilera-Benavente, F., Cascajo, R., Arce-Ruiz, R.M., López, C. and Gómez-Delgado, M. (2021). Participatory visioning for building disruptive future scenarios for transport and land use planning. *Journal of Transport Geography*, 90, 102907, https://doi.org/10.1016/j.jtrangeo.2020.102907

otherwise constitute uncertainty. It should be noted that such preferences could also vary over time. The box below illustrates how explorative scenarios can be used to inform visioning[56].

Dutch scenarios for urban development, infrastructure and mobility

PBL Netherlands Environment Assessment Agency formulated a set of scenarios that explored uncertainties about the (changing) norms and values that shape society. The scenarios resulted from extensive discussions, workshops and reflections involving a diversity of participants that revealed three groups of uncertainties: governance, sustainability and society. Taken together these lead to the four scenarios displayed below.

While serving other purposes as well, the scenario development and the scenarios themselves have helped in a process of discovery for those creating and using them as they 'rehearse the future'.

The scenarios reflect dynamics of change both within and beyond the planning authority's direct control or influence. They have helped in 'foraging' for potential ingredients within possible futures that can inform how a vision of a preferred future is then formulated.

What benefits can it bring you?

Participatory visioning will help support explorations of preferable triple access futures. By ensuring a diversity of input to the visioning process it becomes possible to better recognise the uncertainty implications for visioning and contemplate non-linear ways of responding to this in terms of how a vision is shaped.

[56] Snellen, D.and Hamers, D. (2020). *Rehearsing the future. Scenarios for urban development, infrastructure and mobility in the Netherlands in 2049*. PBL Netherlands Environmental Assessment Agency. https://www.pbl.nl/uploads/default/downloads/pbl-2019-scenarios-voor-stedelijke-ontwikkeling-infra-en-mobiliteit-3381.pdf

Takeaway points

- Uncertainty plays its part in both the orientation for visioning but also in terms of affecting the durability and relevance of the vision over time.
- To handle uncertainty about stakeholders' preferences, shared visioning should ensure participation beyond the 'usual professionals' and methods should be used to allow diverging views to play out before convergence is sought.

Further resources

- **Quality criteria for visions and visioning in sustainability science** – a paper that sets out criteria for vision formulation and guidelines on how to craft such visions.
- **The Driverless Cars Emulsion: Using participatory foresight and constructive conflict to address transport's wicked problems** – a paper that sets out and applies a methodology for co-creation of different preferable futures in which diversity of participants' perspectives is key.
- **Visioning future transport system with an integrated robust and generative framework** – a paper reviewing participatory visioning in transport in the context of uncertainty.

Uncertainty

Measure Planning

Selecting measures should involve an understanding of the case for change and in turn an effort to openly consider how changes across the Triple Access System might be made so that the geographic area of interest evolves in a direction towards the vision. In selecting preferred measures or measure packages, consideration should be given to how well measures can accommodate uncertainty of change and thereby ensure a 'least regrets' contribution to vision realisation.

Why should you consider this and what's involved?

Even if the vision is agreed upon there can still be many uncertainties about the measures and external factors (outside the control of planning) to achieve the vision. For instance, suppose the 15-minutes city is the agreed vision. There are several triple-access policies possible to contribute to achieving this vision, including:

- physical mobility options, improved public transport, mobility-as-a-service, and automated driving;
- spatial proximity options, e.g. mobility- and activity-hubs, and dedicated active travel infrastructure; and/or
- digital accessibility options, e.g. digital infrastructure, e-learning, e-shopping, and telehealth.

The feasibility and outcomes of these measures are very uncertain as over time (unpredictable) developments or events might occur which could delay measure implementation or even require another measure. It is essential to think and prepare as much as possible for the uncertainties (see the Uncertainty – Preparation and Analysis section).

Triple-access measure planning under uncertainty

In Triple Access Planning (TAP), explorative scenarios not only help thinking early on in the planning process. They should also play an important part in informing and influencing the dialogue and decision making surrounding the identification of measures. Figure 16 conceptually depicts **how a measure or 'policy intervention' would ideally, across the six possible triple-access futures described in the Uncertainty - Preparation and Analysis section, work to shape change in a way that moves towards the vision**. In

other words, the strategy performs well in the face of uncertainty about wider change that will affect the future. This is also known as a (static) robust intervention.

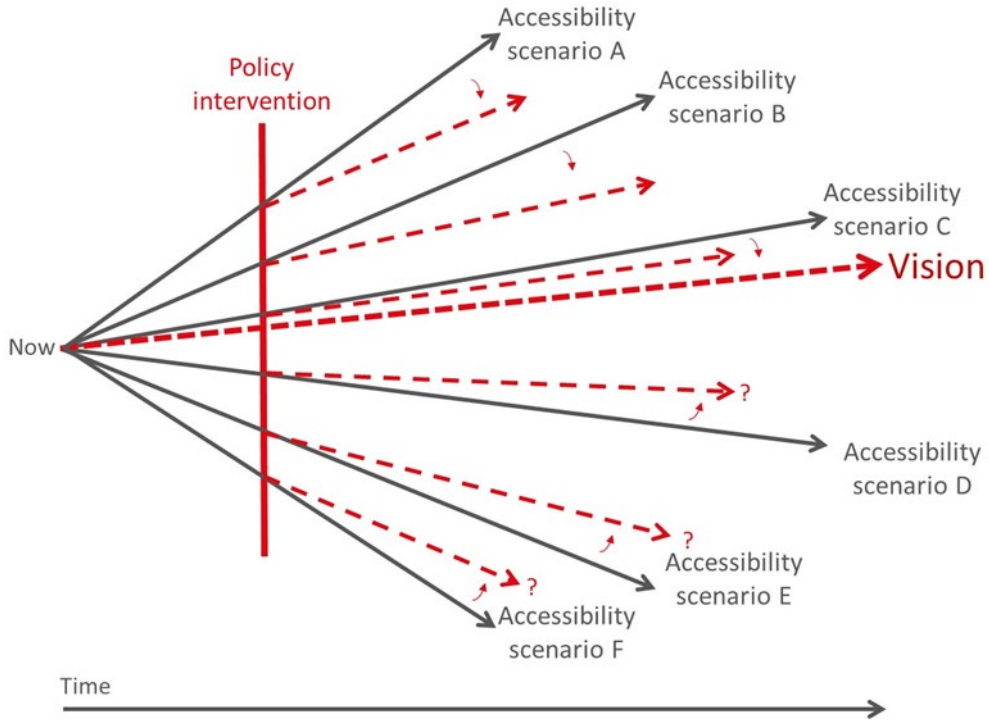


Figure 16. Policy interventions that will ideally influence change in the face of uncertainty in favour of moving towards the vision of the preferred future

So-called 'stress testing' in TAP involves an examination of measures / policy interventions and how they would perform in each of the different scenarios (see Figure 17).

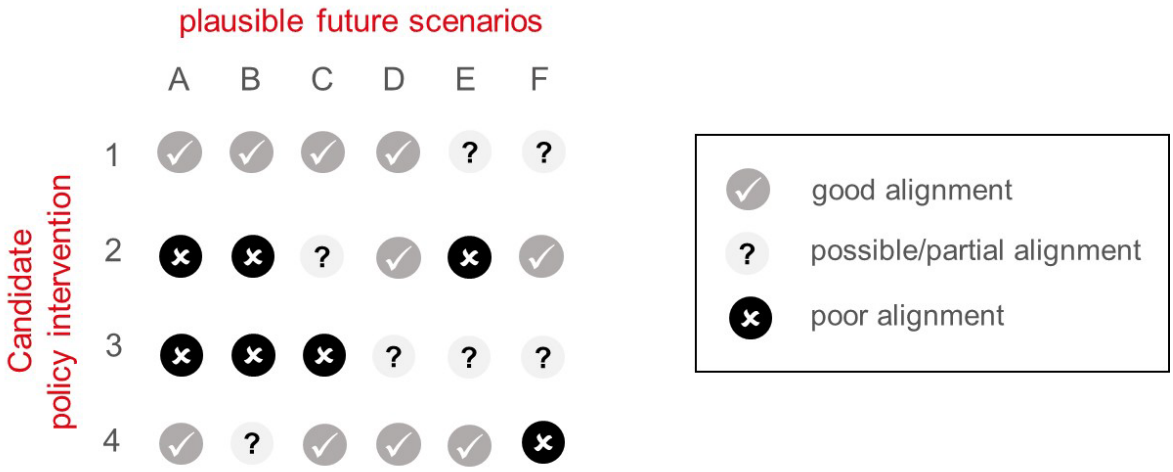


Figure 17. Stress-testing candidate policy interventions for their performance in different future scenarios

The process of stress testing should ideally be participatory, involving key policy-making actors. It is an important opportunity to probe each candidate intervention, and thereby inform the wider policy-making process. While the exercise is not intended to be reduced to numerical scoring and ranking, the stress-testing is framed by rating a policy on a three-point (-1, 0, +1) or five-point (-2, -1, 0, +1, +2) scale in terms of its alignment or misalignment. Where good alignment with progress towards the vision is sensed across all scenarios then there can be good confidence that the action has a place in the plan to realise the vision. Where a measure is seen to perform less well and be at odds with the vision in the face of one, some or all of the scenarios then this suggests cause for concern. It may prompt either a rethink of the measure or policy package of measures. It may prompt consideration of whether or not its implementation should be delayed until clearer indications emerge of how society is changing, or whether implementation should proceed but with the option to scale back if change is unfavourable.

Considering the introduction of further adaptive capacity

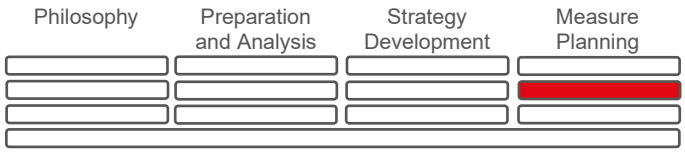
The approach above gives greater confidence in having established a robust planning approach than the conventional forecast-led approach of transport planning that relies upon the assumption of a 'most likely' future. Nevertheless, this treatment of Level 3 uncertainty cannot necessarily prepare for Level 4 uncertainty (see also Uncertainty – Philosophy section). **Under these conditions a plan may be subject in future to unknown unknowns or so-called 'Black Swans'[57] – developments that are a surprise (to the observer) and can have major unforeseen impacts**. Dynamic or adaptive robustness involves making adaptation explicit at the outset of plan formulation. Within an adaptive policy framework, individual actors would carry out their activities as they would under normal policy conditions, but policymakers - through monitoring and mid-course corrections - would try to keep the system headed toward the original goals.

The process of (adaptive) plan development focuses on: the specification of a promising plan; and the identification of the conditions needed for the basic plan to succeed. Vulnerabilities can reduce the impact of a plan to a point where the plan is no longer successful, but opportunities are new developments that can make the plan more successful, or succeed sooner. In addition, signposts can be defined that should be monitored to be sure that the underlying assumptions remain valid, that implementation is proceeding well, and that any needed plan adaptation is taken in a timely and effective manner.

A participatory workshop-based approach can be taken to introduce such adaptive planning. This should involve:

- identifying strengths, weaknesses, opportunities and threats of the currently established 'basic' implementation plan;
- identifying the most important of these SWOT elements;
- scoring these elements on their uncertainty and importance for the outcomes of the basic plan (scoring items on a 5-point scale);
- defining threshold values for the vulnerabilities and the opportunities for the high uncertain/high impact elements; and

[57] Taleb, N.N. (2007). *The Black Swan: The Impact of the Highly Improbable*. Allen Lane.



- developing contingent actions to be prepared in case of developments beyond the specified threshold value.

What benefits can it bring you?

Uncertainty is always present in measure planning and ignoring uncertainty is a terrible idea as this can lead to a high risk of seriously misguided decisions. Plans designed to take uncertainty into account (robust plans) can perform better than plans designed to perform well in one specific future 'most likely' context (optimal plans).

Takeaway points

An adaptive approach is a good way of dealing with high uncertainty:

- Planning that includes stress-testing of candidate policy interventions against different plausible futures helps identify plan elements that will be more robust for supporting vision realisation.
- Adaptive planning can extend robustness by allowing implementation to get underway in the face of high uncertainty by monitoring change and having contingencies in place to reshape and redirect implementation as emerging developments dictate.

Further resources

- **Opening out and closing down: the treatment of uncertainty in transport planning's forecasting paradigm** – a paper that critically examines orthodox treatment of uncertainty in transport planning and new thinking on how to address higher uncertainty.
- **Travel Transitions - How Transport Planners and Policy Makers Can Respond to Shifting Mobility Trends** – a report from the International Transport Forum that sets out how transport planning should evolve in the face of change, including handling uncertainty in assessing travel transitions.
- **TAG Uncertainty Toolkit** – a document that offers practical information on the analysis of uncertainty, techniques for exploring it, how to present related information to decision makers, and a set of 'common analytical scenarios'.
- **FUTURES (Future Uncertainty Toolkit for Understanding and Responding to an Evolving Society) –** interactive guide to a six-stage vision-led approach to strategic planning including the role of explorative scenarios in stress-testing candidate measures.

- **Dynamic adaptive policymaking for the sustainable city: The case of automated taxis** – a paper providing an example of how an adaptive plan might be designed in the field of urban mobility.
- **Dynamic Adaptive Planning (DAP): The Case of Intelligent Speed Adaptation** - a book chapter that offers practical information for designing an adaptive plan with multiple stakeholders.

Access for Goods

Philosophy

In planning there is a tendency to focus on the movement of people rather than to also recognise the importance of the movement of goods. One can impact on the other with interdependencies affecting, and affected by, the Triple Access System. This section helps open minds to why goods movements matter to planning as well as to the agency and agendas of stakeholders on the supply and demand side.

Why should you consider this and what's involved?

The growing importance of goods' movements

Transport is widely recognised as a **major contributor to greenhouse gas emissions** globally, with approximately **one third of the transport emissions attributed to freight transport**[58]. The environmental impact of freight movements is particularly significant in urban areas due to their high population density, and the presence of buildings that exacerbates the concentration of air pollution from traffic, especially from truck and van exhausts. Exposure to traffic-derived air pollutants poses a direct threat to public health[59].

The growth of online retailing and last-mile deliveries has reshaped and increased the complexity of urban transport systems, transferring the responsibility for delivering retail purchases from consumers to online retailers and carriers, leading to a shift in the use of vehicles for freight movement. **Globally, freight movements contribute to about 14%[60] of urban transport emissions, and this figure is expected to rise due to increasing demand for goods and freight transport's reliance on fossil fuels**.

[58] https://www.gov.uk/government/statistical-data-sets/tsgb04-freight#full-publication-update-history
[59] McKinnon, A. (2023). Environmentally sustainable city logistics: minimising urban freight emissions. *Handbook on City Logistics and Urban Freight*: 463-482. https://doi.org/10.4337/9781800370173.00036
[60] International Transport Forum (2019). *Transport Outlook 2019*. Paris: OECD. https://doi.org/10.1787/transp_outlook-en-2019-en

The COVID-19 pandemic has accelerated digitalisation and significantly changed the way people access goods

The share of e-commerce with respect to the total retail sales has been growing for some years. **Online shopping and home deliveries** significantly increased during the COVID-19 pandemic due to the restrictions on physical mobility and this increase has largely been sustained[61].

The diversity of goods available online and the convenient delivery and return policies offered by online retailers makes online shopping more competitive than more traditional in-store shopping. Indeed, it enables people to access products that would be not accessible locally, both in terms of availability and affordability. However, **the increased volumes of online shopping and last-mile deliveries have intensified (and created new) inefficiencies in local transport systems in response to increasingly demanding receivers (retailers and end-consumers). Receivers are often not aware of the challenges they pose to logistics providers when they decide to shop online and opt for same/next-day deliveries**. Residents are therefore experiencing a growing number of vans with non-optimised loads transiting their streets every day which are often parked inappropriately during deliveries. This results in a negative impact on road safety, congestion, noise, pollution, and in general a decreased quality of life in local areas. On the other hand, the **freight market is highly fragmented**, with many stakeholders with different needs and expectations who try to manage the pressures of very high costs and low margins of last-mile deliveries.

The mobility of goods can be a neglected aspect of transport and mobility planning

Considering the important role freight plays in local areas, one would expect this to be a key component of transport and mobility planning. However, at present such planning tends to be predominantly focused upon movement of people rather than goods. In terms of Triple Access Planning (TAP), goods movements should be treated alongside people movement as a significant component of the dynamics of shopping behaviours and preferences in accessing goods. While it might seem like moving goods is just a response to what people want, it actually goes both ways. Planning for goods movements affects how easily people can get what they need, and making things accessible affects how goods move. **TAP encourages planning to be more strongly contextualised by an appreciation of, and thinking about, how freight flows generated by people are factored into visions and plans for triple access futures in local areas**.

What benefits can it bring you?

An opportunity for transport planners to build capabilities and respond to (growing) local freight challenges and opportunities

Given the knowledge of the places, people, and businesses they serve, local authorities are uniquely placed to play a role in the design and implementation of policies and measures to improve the sustainability of last-mile deliveries to support the local economy and community

[61] https://www.statista.com/statistics/281241/online-share-of-retail-trade-in-european-countries/

well-being. However, many local authorities across Europe are today unprepared to manage local freight challenges. Some national guidelines and plans include interventions on last-mile deliveries. However, it is not clear what the expectations are in terms of local roles and responsibilities. There needs to be further consideration of the practicalities of the solutions proposed in planning. Currently, local authorities have limited powers and funding, and national government could play a key supporting role.

TAP offers an opportunity for new thinking about access to goods

The three dimensions of TAP can together contribute to improving access to goods, while limiting the negative impact of their movements. In particular, the rise of e-commerce and home deliveries can have a great impact on demand for last-mile deliveries (e.g. size and frequency), demand for land space (e.g. loading/unloading bays, and specific infrastructure design depending on the delivery alternative used – e-cargo bikes, pack-stations, micro-consolidation centres etc.) and demand for digital connectivity (e.g. tracking systems, online shopping, mobility-as-a-service).

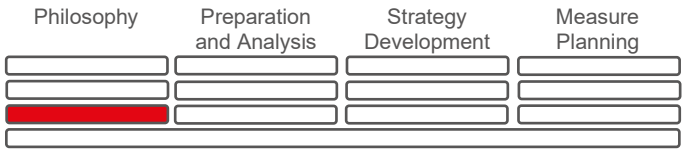
Despite the great financial benefits companies might have from increased online shopping, **inefficient management of local freight flows would be expected to generate increased road congestion, poor air quality, increased road traffic collisions, increased costs for freight companies, and a general negative impact on accessibility**, with direct impacts on accessibility for people as well as for goods. TAP encourages planners to consider the main factors that influence end-consumers' choices when they buy products online, especially with respect to the way they have their products delivered, and how areas can respond to these needs while designing and planning for an efficient Triple Access System (TAS).

Takeaway points

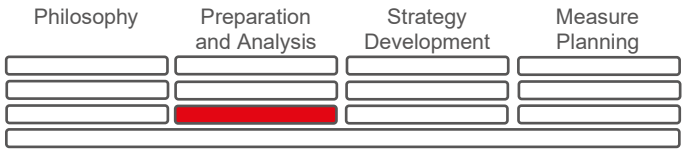
- The increasing significance of goods movement, the impact of online shopping trends and the need for holistic local freight planning underscore the relevance of the TAP approach in addressing local freight challenges and enhancing sustainability.
- Last-mile deliveries to local areas are largely unregulated and inefficient. TAP can help local authorities to understand how to manage goods movements and how to design and implement appropriate measures, and therefore to overcome barriers related to limited local freight knowledge and expertise.
- TAP highlights the need for local authorities to address local freight challenges and opportunities, ensuring integration within broader plans that also address movement by people.

Further resources

- **Topic Guide – Sustainable Urban Logistics Planning** – one of a series of topic guides that accompany guidance on sustainable urban mobility planning.



- **The future of last-mile deliveries: Understanding the local perspective** - a report exploring the role of local authorities in co-designing and implementing sustainable local freight solutions for the ‘last mile’ of parcel deliveries.



Access for Goods

Preparation and Analysis

Triple Access Planning helps co-create a shared understanding of triple access in the form of a mental model. In this section, considering the variables and dynamics of relevance to goods movement in such a model is considered, and the importance of this to the planning approach.

Why should you consider this and what's involved?

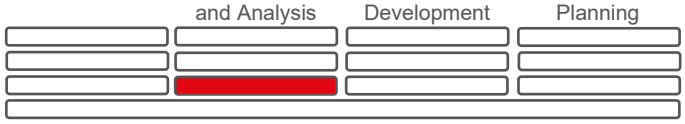
As noted in the Triple Access Perspective - Philosophy section, we live in a Triple Access System (TAS) and within this, accessibility should be enabled and improved through the integration of appropriate measures that address the demand for distant face-to-face activities, proximate activities and digital activities. In doing this, the **integration** and **interaction** of specific variables that have an impact on the **mobility of people and goods** within the broader TAS should be considered.

Reflect goods movement in your mental model of the TAS

When creating a mental model of TAS (see Figure 9 in the Triple Access Perspective - Preparation and Analysis section) and considering variables that are specific to the **freight domain**, the **complexity** of the system of systems should not be ignored but acknowledged - try to understand how this complexity can be represented within the mental model. With respect to goods, mental models should consider and reflect (in terms of interactions and influences) the complexity of:

- **shopping behaviour and individual preferences** towards last-mile deliveries, which influence the way goods are moved in the built environment;
- **local freight stakeholders** (e.g., logistics operators, retailers, end-consumers, residents, policy makers, independent delivery workers and the gig economy[62]) involved in the local freight system, with different needs and expectations;
- the **local freight system itself**, and the integration and interaction of goods movements within the broader system of systems; and

[62] 'Gig economy' can be defined as a labour market characterised by the prevalence of short-term contracts or freelance work, as opposed to permanent jobs - https://www.bbc.co.uk/news/business-38930048



- **spatial design of urban and rural areas**, and the spatial distribution of residences, workplaces, and commercial areas and the way future changes in individual behaviour might re-shape the way we live in our local areas.

How can goods movements be considered in your mental model of TAS?

The Triple Access Perspective - Preparation and Analysis section explains how to create a shared mental model of the TAS, using systems thinking. However, there is a need to include **thinking and understanding of the movement of goods as well as the movement of people**. When identifying key variables to formulate a mental model, it may be appropriate to ask questions such as the following:

What are the main factors to consider when planning for access for goods, from a 'land use' perspective?

- Have a clear understanding of the current situation. **How is the local area designed to enable goods accessibility?** This means, for example, looking into zoning and spatial plans, to understand where shopping areas are located and to what extent these are accessible to people coming from different areas.
- Consider public transport connections and services, as well as cycling paths and appropriate infrastructure to support sustainable mobility and accessibility to these areas.
- After having a good understanding of what the current system looks like, plan development should look at specific land-use factors influencing goods access, for example:
    - What are the requirements to enable loading/unloading operations using sustainable delivery vehicles?
    - What criteria should be used to locate parcel lockers or other collection points, including micro-consolidation centres, considering the overall network and land-use diversity?
    - How should shopping areas be (re-)designed considering the role they might have in the future – e.g. to respond to the reduction of in-store shopping?
    - How might people like their local areas to be re-designed to respond to their shopping needs?

What are the main factors to consider when planning for local goods movements from a 'transport' perspective?

- Similarly to land-use, there is a need **to understand what the state of play is from a transport perspective in the current system**. This means, for example, looking at specific traffic restriction measures in place, as well as infrastructure design (e.g., loading bays) to enable goods vehicles to access and move around the area.
- When examining how to address goods accessibility in planning, specific questions could include:
    - What would be the best set of alternatives to reduce the number of goods movements and their impact on the transport network and the environment?

- How would people prefer to have their goods delivered?
- What is the role of collaborating with stakeholders in responding to people's increasing demand for home deliveries?
- Would new technologies improve urban accessibility in future local freight systems?
- Would shared passenger-freight systems be an option to decrease congestion and improve accessibility in urban areas (for example, using part of public transport vehicle capacity to move goods during hours of low demand by passengers)?

What are the main factors to consider when planning for local goods movements from a 'telecommunications' perspective?

- This might be very new to those involved in the planning process, as **online activities related to goods movements are usually led by the freight industry** (e.g., retailers, logistics operators), rather than local authorities.
- It will be helpful to gather information about what the current demand and offer are for online shopping and more broadly for online activities related to goods movements, to clarify what the needs are from a digital perspective (e.g., access to broadband, network coverage). This will help in thinking and planning for the local area including digital access for goods.
- Some key questions could include:
  - What is the role of digital accessibility in improving the efficiency of digital (and physical) freight flows in local areas?
  - What digital tools and systems might people like to use for online shopping and home deliveries?
  - Where are online orders being delivered from? Who is delivering them, and what are their commuting patterns?
  - Would mobility-as-a-service integrating passengers and freight mobility services be an option to improve accessibility in local areas?

Dynamics of relevance to goods movements within your mental model

Remember that **mental models are shaped by our knowledge and experience**. For example, online shopping can have an economic, environmental, and social impact which can be perceived with different importance depending on the perspectives of the stakeholders involved (end-consumers, residents, logistics service providers, local authorities etc.). It can (as noted previously in the Access for Goods – Philosophy section) therefore have a great impact on demand for last-mile deliveries (e.g. size and frequency), demand for land space (e.g., loading/unloading bays, specific infrastructure design depending on the delivery alternative used – e-cargo bikes, pack-stations, micro-consolidation centres), and demand for digital connectivity (e.g., tracking systems, online shopping). Based on these concepts, a simple mental model is illustrated in Figure 18.

Figure 18. *An example of a mental model started* from *considering an increase in online shopping (grey lines indicate positive relationship i.e., when one variable goes up, the other goes up; red lines indicate negative relationship – i.e., when one variable goes up, the other goes down*; *variables in bold (and associated relationships) are included in* the mental model of the TAS *(see* the Triple Access Perspective - Preparation and Analysis *section*))

Starting from such a mental model, further considerations can be introduced (reflective of a richer understanding of the system). For example, people will probably buy more online if they have greater access to high quality digital services, which would encourage them to use more online tools and buy from e-retailers. This would however generate an increased demand for last-mile deliveries, which are difficult to optimise, especially when end-consumers ask for next day delivery. Therefore, there will be a higher number of vans on the road network, which will increase congestion. This will probably worsen the quality of the air of the local area where the vans are circulating, with a likely negative impact on the quality of life of residents, and related public health implications. This would probably also increase general concern about climate change. All these considerations could be integrated into the mental model illustrated in Figure 18 to develop it further (for example, see Figure 19).

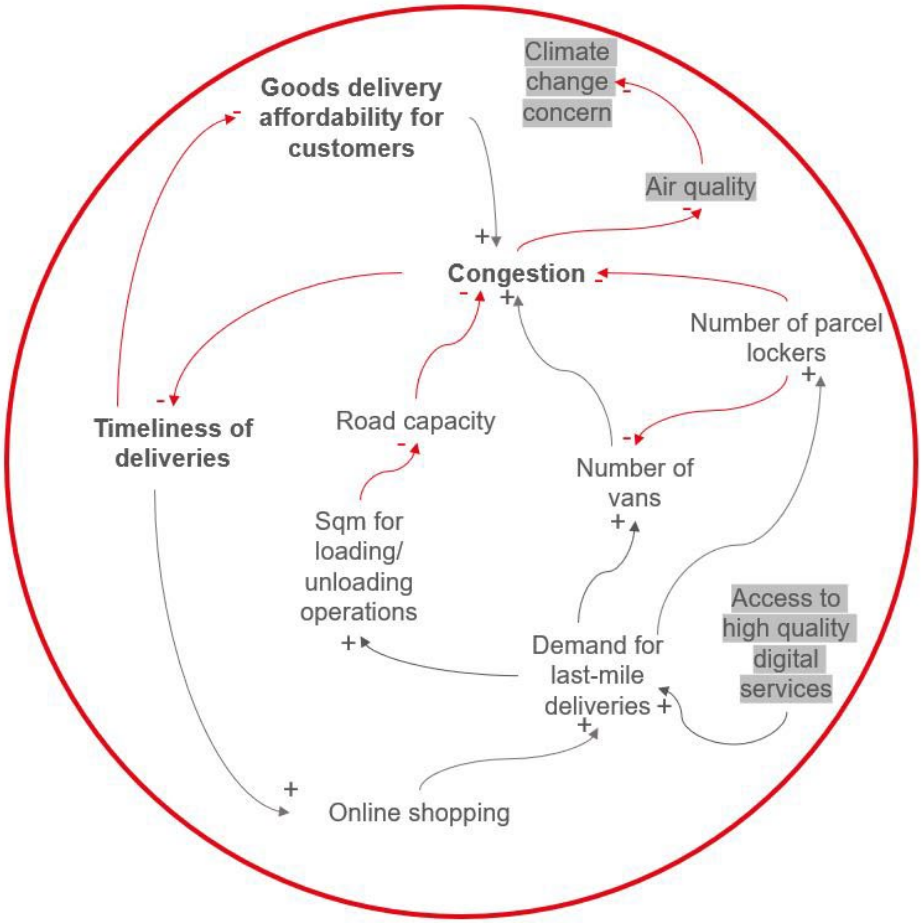
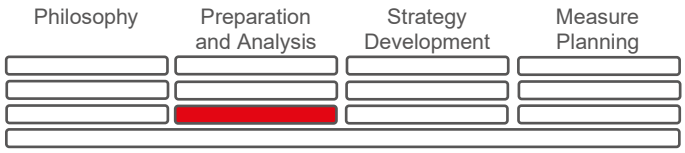


Figure 19. Further development of the mental model illustrated in Figure 18

When designing a mental model of the TAS, **seek to identify the main factors that end-consumers consider when they buy products online**, especially with respect to the way they have their products delivered, and how local areas can respond to these needs while designing and planning for an efficient system of systems.

Other variables relating to goods movement that can impact upon the wider system might include:

- **Transport**: traffic restrictions to goods vehicles, delivery time windows, availability of cargo bike delivery services, cycling infrastructure, quality of rural road infrastructure.
- **Land-Use**: parcel lockers, proximity to shopping area, price of land for commercial purposes (which will have then an impact on online vs physical stores), allocation of land for warehousing and retail.
- **Telecommunications**: digital literacy, broadband coverage (especially in rural areas), tracking systems, online delivery booking, dynamic unloading bays.
- **External (but key) variables**: quick commerce (emphasis on extremely quick deliveries following online purchase), dark stores (warehousing facilities used to



facilitate 'click and collect' services), ageing population, physical impairment, consumerism, 'convenient' retailing policies, return flows (i.e., free return policies).

What benefits can it bring you?

When considering accessibility, **the inclusion of goods enriches perspective in terms of opportunities (and problems)**. Considering goods movements within the TAS helps prepare for how to influence how people access goods as well as places. Considering the increasing trends of last-mile deliveries and related van movements in local areas, it is now of key importance to have in place a planning system that integrates goods movements within the broader transport system. Being more aware of dynamics and inter-relationships within the integrated TAS enables better informed decisions to be made regarding accessibility, in the interest of a better future.

Including diverse inputs to enrich your mental model

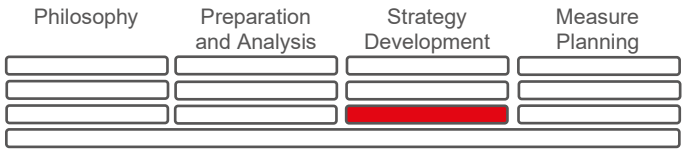
Asking different people to create their mental models of TAS can result in **the production of different mental models**. This is not a drawback. It is a key advantage of the process of co-creating a shared mental model that reflects diverse views, knowledge, and perceptions. However, it is important to establish a **coherent and shared understanding of the system** being planned for, and it is therefore key to collaborate and integrate mental models to have a more comprehensive understanding of the TAS. By **engaging different team members**, key freight variables and their inter-relationships can be identified. This also leads to a TAS representation reflecting differing mental models across a team. This enables the creation and **sharing of a common understanding of the world we live in**, **including a reflection of the role freight systems play**.

Takeaway points

- To effectively incorporate goods movements within thinking and planning, the diverse set of variables affecting both people and goods mobility within the broader TAS should be considered.
- When co-creating a mental model, it is important to acknowledge and reflect the complexity of the TAS, including recognising factors such as the impact of shopping behaviour on goods movement, the diversity of the stakeholders involved in the local freight system, the design of the built environment and the interplay of digital and physical activities.
- With the increasing number of last-mile deliveries, a holistic planning system that integrates goods movement within the broader transport system becomes essential. Co-creation of shared mental models, enriched by diverse perspectives and knowledge, helps develop a comprehensive understanding of the complex local freight system, fostering effective and future-resilient planning.

Further resources

- **The future of last-mile deliveries: Understanding the local perspective** - a report exploring the role of local authorities in co-designing and implementing sustainable local freight solutions for the ‘last mile’ of parcel deliveries.



Access for Goods

Strategy Development

While the Triple Access Perspective - Strategy Development section illuminates the notion of vision, objectives, and approaches for addressing triple access, this section helps apply a similar approach to goods movements. Through examples it illuminates some of the preferences local authorities may have for future goods movements as well as the types of approaches that present themselves as credible in helping realise better futures for goods movements. It will also help in terms of an appreciate the opportunities and limitations public authorities have in exerting influence.

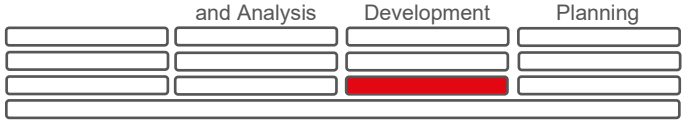
As mentioned in the Access for Goods - Philosophy section, planning guidance and practice has tended to focus substantially on people while giving only limited attention to goods. The movement of goods should be introduced as a key consideration within Triple Access Planning (TAP).

Why should you consider this and what's involved?

Decide and provide for goods

The Triple Access Perspective - Strategy Development section introduces the decide and provide planning paradigm, upon which TAP is based. It is vision-led and centred upon accessibility, not (only) mobility. This can be applied to the **movement of goods**, as well as people, to develop a vision that integrates specific goals to improve accessibility to places, opportunities and goods.

Consider the example long-term triple-access objectives suggested in the Triple Access Perspective - Strategy Development section. Our minds should be alert to how such objectives relate to accessibility concerning goods as well as people:



Illustrating the notion of what TAP might mean for strategy development, accounting for goods movement

(i) ***Maintain at 2015 levels (with the option to reduce) the overall land take of surface transport*** *(with further options for changed use of land take between modes and in relation to improved operating efficiency and carrying capacity within modes)* - when addressing this objective, be open-minded and do not limit thinking to people's mobility; think of new forms and modes for freight movements, such as e-cargo bikes, electric vans, drones, and new technologies.

(ii) ***Increase by x per cent annually (with the option to accelerate), the population density of urban areas*** - when addressing this objective, be open-minded, include freight in your thinking, and think of what this might imply in terms of goods accessibility and last-mile deliveries.

(iii) ***Increase by y per cent annually (with the option to accelerate), the proportion of population with access to superfast broadband*** *(with the option to raise the threshold definition of 'superfast')* - when addressing this objective, be open-minded, think out of the box, and think of online shopping and delivery company platforms for food last-mile deliveries.

Alongside these objectives, more specific objectives for addressing accessibility concerning goods could include, for example:

(iv) **reduce by A per cent, by a future date, the total km travelled by vans in local areas** (addressed by approaches such as leveraging behaviour change and encouraging people to wait longer for their deliveries, and increased freight consolidation);

(v) **reduce by B per cent, by a future date, individual trips made for shopping reasons by car or other motorised vehicles**;

(vi) **increase by C per cent, annually, the total km of cycle paths** to encourage personal and cargo cycling; and

(vii) **increase by D per cent, by a future date, number of commercial sites located within 15 minutes (on foot or cycling) from major transit nodes in the public transport system**.

These objectives highlight the importance of a **triple-access perspective** to consider not just transport and physical mobility, but also land use and digital, to encourage 'proximity logistics' (e.g. cargo-bike deliveries and parcel lockers) and online activities to replace physical activities (e.g. online shopping). However, achieving these objectives requires **joined-up working in the planning and delivery process**.

Local freight poses **particular challenges** due to the involvement of **various stakeholders** with **diverse needs, retailers, logistics operators, carriers, shoppers, residents**. Due to the strong link to national and local economic prosperity of freight, it is very important for local authorities to **coordinate with central government** to understand how to best align

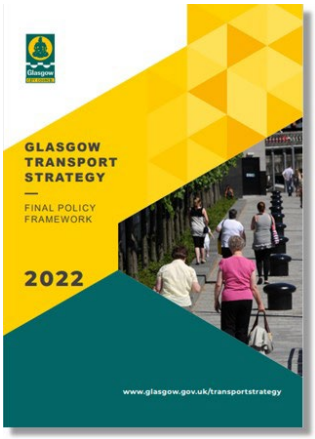
with the national vision (if it exists), making sure all of the stakeholders are considered and engaged.

The **lack of local freight data** increases the difficulty of understanding the problem and designing appropriate strategies. Gathering goods movements data would give local authorities a better understanding of local freight systems, their dynamics, and potential impact of the implementation of specific measures. However, these data are commercially sensitive and therefore businesses are usually not willing to share. It is important understanding how to engage and ask companies to share such information, to evaluate and monitor local freight flows and inform strategy development and implementation. Meanwhile local political support may not be so forthcoming as it is when it comes to understanding and addressing movement by people.

For all these reasons, many local transport strategies have not yet addressed local freight issues. **TAP can be key in supporting local authorities in accounting for goods movements within a broader approach to addressing mobility and accessibility.**

From theory into practice – the case of Glasgow

Incorporating goods movement into a wider planning approach: the Glasgow Transport Strategy[63]



This is a city-wide strategy and provides a framework for investment and decision making up to 2030.

“Support for a vibrant City Centre that prioritises the movement of people and goods by low carbon forms of transport and has enhanced sustainable transport connectivity”.

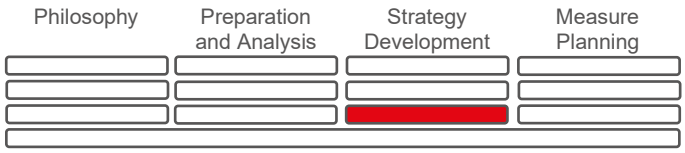
“We all know how important transport is to our daily lives. We often need to travel to get to work or education; to healthcare services; to shop; to visit friends and family. Businesses and industry, as well as individuals, also rely on transport for the movement of their goods and for access to their services”.

“Organisations should also consider sustainable transport accessibility in their decision making around the location of goods and services, and the Council will work to support this with access to accessibility information”.

“Uncertainties and risks: Consumer choices - more online shopping, moving towards an experience-based economy instead of consumption, changing environmental values & awareness, work/life balance”.

“Transport Scotland has policy aspirations to increase the proportion of freight moved by rail, and regional planning policy advocates strategic freight transport hubs. Glasgow City Council supports these aspirations and aims to support lower carbon transportation of goods within the city, particularly last-mile deliveries”.

[63] https://www.glasgow.gov.uk/transportstrategy



The Glasgow Transport Strategy is a strong example of decide and provide and aims to address inequality and climate change by promoting fairness and accessibility for all while reducing reliance on private cars. Glasgow City Council has committed to reduce car travel by 30% by 2030 and designed a transport strategy to achieve this goal, as well as improved air quality, increased road safety, and improved neighbourhood liveability. In particular, the strategy claims: "By 2045, Scotland will be net zero with a 75% reduction in greenhouse gases by 2030. Glasgow has ambitions of being a net-zero carbon city by 2030. Transport of people **and goods** will play a key role in achieving this goal".

The Case for Change[64] is a technical report of evidence of problems to tackle in the new Glasgow Transport Strategy, opportunities to build on, draft outcomes and initial policy focus areas, and an initial discussion of how travel demand may change in the future. This was finalised in 2021 and presents the vision for transport in Glasgow as: "a sustainable transport system for people **and for goods**, which is affordable and inclusive, accessible and easy to use, clean and safe, integrated and reliable". This vision was then used to write the local transport strategy, which integrates people and goods' movements throughout the whole document. The box above shows extracts from the Policy Framework[65] (Part 1 of the Glasgow Transport Strategy).

The link between transport, land use, and digital to enhance triple access to goods

The 'Reducing car use for a healthier fairer and greener Scotland – a route map to achieve a 20 per cent reduction in car kilometres by 2030' document published in January 2022 by Transport Scotland is referred to in the Triple Access Perspective - Strategy Development section as a good example of TAP application to transport strategy. The document presents several references to TAP and includes considerations about the movements of people and goods. For example, a framework of sustainable travel behaviours encourages "**reducing the need to travel**, such as by using **online options to access goods**, services, amenities and social connections, if these cannot be accessed locally in a sustainable way". Throughout the whole document there is an encouragement to reduce the need for travel and "**increase access to goods**, services, amenities and social connections", which fosters "**proximity logistics**" and active travel.

As set out in the Triple Access Perspective - Preparation and Analysis section, the telecommunications system and digital accessibility within the Triple Access System (TAS) include key variables to enable take up of online activities that can reduce the need to travel. The three dimensions of the TAS (and their inter-relationship) are very relevant when considering goods movements. Indeed, the growing rates of online shopping and home deliveries are key challenges for urban accessibility, and this requires using a more holistic approach with appropriate measures targeting the three sub-systems.

How can you do this in practice?

In the Triple Access Perspective - Strategy Development section, hands-on experience of TAP through the FUTURES-Relay is introduced, including exploring future possibilities, identifying a preferred future and determining what sorts of steps might allow a realisation of

[64] https://www.glasgow.gov.uk/CHttpHandler.ashx?id=53543&p=0
[65] https://www.glasgow.gov.uk/CHttpHandler.ashx?id=55054&p=0

that future. In the first citizens' Relay run in Bristol in the UK in 2023, citizens co-designed their vision for the city and a set of plausible futures. These included considerations towards what needs to change in the current transport system to enable everyone to access places and goods, and specific considerations were made towards **more efficient logistics** (e.g., smaller electric vehicles, rationalised trips) **to enable everyone to access goods**, while reducing the impact (e.g., congestion, irregular parking, road safety, air quality and carbon emissions) of increased and non-optimised delivery vehicles in local areas.

How can you take specific aspects of future freight uncertainty into consideration when designing your strategy?

As explained in the Uncertainty - Preparation and Analysis section, key uncertainties (or drivers of change) about the future can be explored appropriate explorative scenarios can be developed to understand what the future might look like. How scenarios are developed is explained in the Uncertainty - Preparation and Analysis section. Within the 'Triple Access Planning for Uncertain Futures' project[66] we developed several sets of future scenarios. One of these sets was focused upon plausible triple access futures for urban freight in 2040. This was a real case study for the city of Cagliari, Italy.

The scenario development process involved 45 different city stakeholders, including local authorities, transport and logistics operators, retailers, and end-consumers (shoppers). The scenarios were designed considering key uncertainties such as the evolution of society, the environment, traffic regulations, the economy, policies to be implemented, infrastructural network and technologies. After projecting the variables and selecting an internally consistent and cross-cutting diverse set of scenarios, a set of six scenarios emerged. These are summarised below to help offer thought provocation and a reminder of the importance of keeping movement of goods alongside movement of people in mind when developing a plan.

You may find yourself questioning the plausibility of one or more of the scenarios. This is because at their heart, scenarios make us think (and perhaps think the unthinkable). That what is set out below may be questioned is also a reminder of the significance and value of being involved as a stakeholder in the scenario development process itself. This means experiencing the diversity of views and the convergence upon a position of determining critical uncertainties and in turn a set of scenarios over which this is some sense of ownership.

Scenario 1 – Modern Society: In a consumerist era with an ageing population, e-commerce thrives as shopping trips decline. A growing environmental and well-being consciousness permeates society, prompting institutions and citizens to embrace strict regulations. Despite citizens' economic development interest, transport operators are sceptical about delivery trends like home deliveries and instant services, questioning their real benefits.

Scenario 2 – Technological Society: In a rapidly advancing society in technological terms, openness to new technologies fuels business development. Stakeholders' decisions are driven by technological opportunities. Despite potential for sustainability, cost concerns limit societal interest in a greener world. Compliance with sustainability laws raises logistics

[66] https://www.tapforuncertainty.eu/

costs, but confidence in technology's ability to replace personnel, such as autonomous vehicles, tempers concerns, reflecting a belief in the transformative power of innovation.

Scenario 3 – Conservative Society: In a scenario marked by societal resistance to change, preferences cling to traditional tastes and habits. Citizens exhibit reluctance towards wholesale adoption of digital accessibility, in many cases favouring physical stores over online purchases. Denial of climate change prevails, reflected in transport companies resisting fleet renewal and stricter urban access regulations. Economic development takes a backseat as private cars persist. Despite rising resource costs, transport operators and public administrations show little inclination to revise outdated business models or enact sustainability-focused regulations.

Scenario 4 – Liberal Society: Citizens favour socio-economic developments driven by individual freedom. Online purchases rise further with increasing demands for instant deliveries. Sustainability is pursued within limits, avoiding constraints and excessive costs. A laissez-faire policy dominates, opposing state intervention in private economic activities. Restrictions on heavy vehicle use in the city, along with the introduction of new trade taxes, face resistance. Society embraces new infrastructures and technology, prioritising improved delivery services in this liberal and accommodating environment.

Scenario 5 – Green Society: There is a strong environmental and social responsibility. Citizens prioritise sustainable services over ownership, fostering a culture of sharing and collaboration. Both online and in-store, consumers minimise purchases. Retailers and logistics operators cooperate to mitigate urban logistics' negative impacts. Society aims to reduce the use of motorised vehicles, favouring active mobility. Despite opposition to traditional economic development, rising energy costs inspire logistics operators to renew fleets with low-emission vehicles and optimise resources through collaboration, welcoming eco-friendly initiatives like relocating logistic establishments to the suburbs.

Scenario 6 – Anarchic Society: Individual autonomy and a deep aversion to established power define a society predominantly devoid of environmental concerns. Retailers, transport, and logistics operators vehemently resist rules and regulations, rejecting both taxes and the promotion of active mobility areas. An anarchic ethos prevails, fostering hostility towards infrastructure and technological initiatives within this independent and anti-authoritarian society.

The scenario development process was found to encourage critical thinking and allow sharing of perspectives between stakeholders from diverse backgrounds (public administration, shoppers, retailers, transport operators etc.). It challenged established planning practice, in terms of introducing multiple future contexts, and highlighted differences between stakeholders in terms of a given factor either being under their control or something they are influenced by.

What benefits can it bring you?

The TAP approach helps in designing a strategy that reduces reliance on motorised transport for economic and social activities, promoting a vibrant urban environment. Digital accessibility plays a key role in meeting access needs and shaping behaviours. Therefore, when designing the strategy, reflect on how this could reduce the negative impact of goods movements in local areas, while fostering access to goods. Digital accessibility complements

proximity logistics (e.g., spatial proximity and active travel), ultimately reducing dependence on motorised mobility for a sustainable future. **Using TAP for goods movement can help in finding the right balance between supporting the local economy, while reaching environmental goals and improving the quality of life of residents.**

Be aware: it will not be easy!

There are barriers likely to be faced in bringing 'goods' into the strategy development conversation. These include:

- A **lack of capacity**[67] **and capabilities**[68] within local authorities on local freight-related matters.
- A **lack of national and local data on local freight movements**, making it important to engage and partner with other organisations.
- A **lack of political support**, as local freight is usually not among decision makers' top transport priorities.

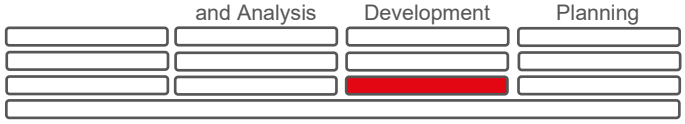
Takeaway points

- We are experiencing increasing trends of online shopping and home deliveries (and in general, increased consumption). This may be strengthened by population growth and urbanisation making this a very serious issue for local authorities in the coming years. There is therefore a growing need to integrate goods movements into mobility strategies to enhance accessibility. This includes setting specific objectives related to goods movements, alongside goals for people's mobility and accessibility.
- Implementing triple-access thinking to maximise goods accessibility benefits spatial and transport planning by prioritising people's needs, reducing reliance on motorised transport and considering digital solutions and online activities, such as online shopping. However, barriers such as a lack of data of local freight flows and political support for potentially more unpopular local freight measures (e.g., pricing schemes, traffic restrictions) need to be addressed to be successful in strategy implementation.

Further resources

- **Development of a co-designed zero-carbon urban freight system** - a report considering the challenges and opportunities of freight decarbonisation in urban areas from the perspective of key freight stakeholders.
- **Forth Freight Study: Case for Change** - a report to explore the barriers faced by multimodal freight terminals when trying to

[67] Capacity refers to the ability of an organisation to use resources effectively and efficiently to achieve its goals.
[68] Capabilities refer to the intangible, strategic assets that an organisation draws from to get work done, and include skills, knowledge, and expertise on a specific topic.



target and encourage customers to make the switch and evaluate the potential environmental benefits and commercial viability of sustainable freight/goods movements.

- **Understanding UK freight transport system** - an evidence-based review of the current 'landscape' of the 'freight transport system' in the UK, with observations on how the future freight transport system might develop over the next 10 years.

Access for Goods

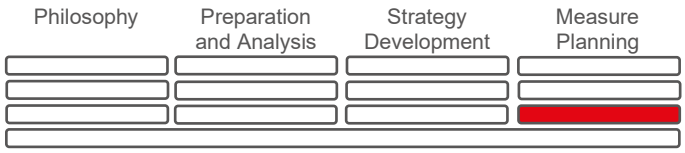
Measure Planning

The Triple Access Perspective - Measure Planning and Uncertainty - Measure Planning sections address measure planning more broadly for Triple Access Planning. This section introduces insights into the sorts of measures that not only relate to improving goods movements, but which capitalise on the different dimensions of triple access and which can complement measures for people movement and access.

The Access for Goods - Strategy Development section explained why and how to consider goods movements when designing a transport strategy. This section provides insight into what actions should be undertaken to achieve the objectives of the strategy, and therefore deliver the vision. To do so, triple access thinking promotes consideration of measures that might be more specific to transport, land use and/or telecommunications, but together will help maximise the accessibility of goods for the local area, while at the same time reducing negative externalities due to freight transport and logistics[69] activities. **Triple Access Planning (TAP) helps in considering not only how goods movements can be managed, but also how places can be designed to foster more sustainable logistics and last-mile deliveries**.

In the Handbook, access for goods is mainly focused upon shopping and how people access goods. However, it is important to acknowledge that goods access and movements involve much more than this in practice. This means that when looking at how to integrate measures addressing access for goods, the impact of decisions on a previous leg of the supply chain (upstream) should be considered, to make sure business operational and financial efficiency are achieved while environmental sustainability goals for a local area are pursued.

[69] Logistics activities in local areas can include freight consolidation hubs (including micro-consolidation centres), local depots, freight transport (including depot-to-depot, depot-to-retailer, and depot-to-end-consumer), as well as reverse logistics (return flows of unwanted/unsold products or other items – e.g., recycling materials).



Why should you consider this and what's involved?

Integrating logistics into your thinking within spatial planning

Although only 15% to 25% of urban transport kilometres travelled can be attributed to goods vehicles, they occupy 20% to 40% of motorised road-space, cause 20% to 40% of CO_2 emissions, and are responsible for 30% to 50% of air pollutants[70].

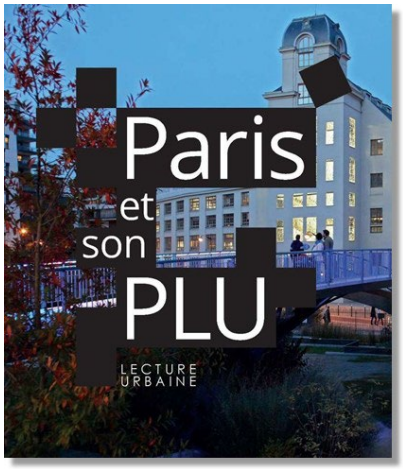
This underlines the need to consider **how to integrate specific policy and planning measures for goods movements to achieve sustainability goals**. The role of spatial planning becomes particularly important when looking into solutions for logistics. For example, a more sustainable (or net zero) urban logistics system would require a reduction of fossil fuels consumption by goods vehicles, and space to unload, cross-dock, consolidate and stock goods closer to their destinations. In rural areas, the challenges of operational and financial viability may arise, requiring attention to the nature of the rural road infrastructure and how to design the network to efficiently and sustainably respond to the needs of rural receivers.

Due to the high costs of estates in urban areas, logistics hubs are usually placed in suburban locations. With a **TAP mindset**, and appropriate policies and planning, cities can support the (re)integration of logistics facilities (usually located outside of an urban area, in a low-density environment) in urban areas to facilitate and enable the **shift to an efficient and sustainable urban logistics system**. **Consider how to engage with city stakeholders (e.g., retailers, logistics operators, residents) and developers** to understand what the best and more accepted solutions might be.

The boxes below provide examples of specific urban planning measures: a set of measures implemented in Paris[71] (a city with an established track record in advancing urban logistics policies including the concept of **planning for urban logistics**); and Rotterdam, a pioneering city in urban logistics in Europe.

[70] Smart Freight Centre (2017). Available at: https://smartfreightcentre.org/en/
[71] https://www.paris.fr/pages/le-plan-local-d-urbanisme-plu-2329

Urban logistics measures in Paris



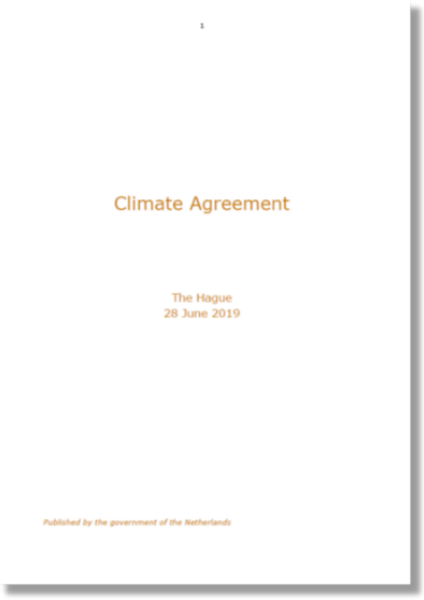
As part of its approach to proximity logistics, Paris is establishing 'logistics hotels' - multi-modal and multi-activity urban facilities that bring together a range of city functions, including retail, offices, housing and entertainment, alongside logistics activities (e.g., storage, handling, consolidation, cross-docking operations).

Due to their innovative design, logistics hotels are more accepted by the residents of the area where they are established. This enables logistics companies to share higher urban land use costs with other more profitable businesses. However, this requires private-public partnerships, and the City of Paris plays an active role through a major holding in a logistics real estate company.

The local land use and zoning plan for Paris[72] includes 'logistics' under 'buildings and facilities that are necessary for public services or collective interest' and identifies 62 'lzones' where developers must include an urban logistics facility in their development plan, whatever the development project is. Although only small and medium-sized trucks are allowed to enter the city during the day, heavy goods vehicles are still important in the vision Paris has for the future of urban logistics. As such, the capacity to accommodate large freight flows is a determining factor in the search for suitable location perimeters.

[72] https://cdn.paris.fr/paris/2020/02/26/16107d9c38a049046444a7b6301df1aa.ai

Urban logistics in Rotterdam



The focus on urban logistics in Rotterdam gained momentum following the Dutch Climate Agreement of 2019[73]. This agreement officially introduced **zero-emission zones for urban logistics** to reduce carbon emissions in line with the Paris Climate Agreement. However, the policy evolved **beyond zero-emission goals** to **prioritise efficiency in logistics** due to the high cost of replacing conventional vehicles with electric ones. Challenges such as congestion, safety concerns, and limited road space also influenced the shift in policy focus. The announcement of the national zero-emission zone acted as a catalyst for Rotterdam to develop comprehensive policies addressing both environmental and spatial aspects of urban logistics.

The city established an **urban logistics team**, engaged in research projects and collaborated with stakeholders to formulate policies promoting **clean and efficient last-mile transport**. The policies emphasise **spatial planning to accommodate logistics hubs**, considering different environmental impacts and specifying areas for various logistics activities. Policies included the design and realisation of **robust charging infrastructure for urban logistics** to foster electrification of the commercial fleet. The principles include prioritising logistics facilities that serve the city, mixing functions where possible, and setting requirements for logistics in new developments. Rotterdam's active involvement in national forums and the Logistics 010 Community (where stakeholders are involved in the design of the policies) demonstrates its commitment to addressing logistics challenges and inspiring other municipalities.

While the examples above focus on urban freight, rural communities can be the ones benefitting most from online shopping and home deliveries, as they have less physical access to a wide range of shops in their local areas. However, local freight solutions that work in urban areas might not work in rural areas, mainly due to the very small margins of last-mile deliveries.

An emerging solution proving successful in urban and rural areas is the creation of **PUDO** (Pick-Up and Drop-Off) services. PUDO points are usually existing commercial activities (e.g., local shops, restaurants, pubs, petrol stations) where consumers can pick-up or drop-off parcels, which are typically related to e-commerce orders and dropping off returns.

PUDO is business-to-business and allows for consolidation, reducing the number of delivery vehicles and the number of failed deliveries. As well as reducing impact on the local

[73] https://www.government.nl/documents/reports/2019/06/28/climate-agreement

environment and reducing costs for the delivery company, this can also potentially support the local economy, as consumers who visit a local shop (PUDO point) to pick-up or drop-off a parcel, might take the opportunity to buy something at that shop.

The specific needs of the local area should be addressed in Measure Planning, accounting for: the way the area is designed (land use); the characteristics of its residents (e.g., socio-demographics, mobility habits, shopping behaviour); and the mobility options that are available.

Embedding digital accessibility for goods into your plan

Freight related activities are usually business-led, and not regulated by local administrations, despite the increasingly significant impact they are having on the quality of life of local areas. The rapid growth of online shopping demand during recent years has seen an increase of omnichannel retail[74], offering non-perishable products (e.g., clothes, electronics) and food (e.g., restaurants, supermarkets, quick commerce[75], dark stores[76]). This is generating an **evolving relationship between commercial and logistics spaces in local areas** for many European cities with an intensification of urban freight transport flows, especially during specific times of the day.

Consider having a digital planner[77] involved in the Measure Planning who can help identify how more activities could be done (or managed) online and who works with the transport and spatial planners to understand what kind of impact online activities could have on the local area.

Consider the goal of designing a greener and less congested area. From a transport planning perspective, parts of the area could have restricted access for motorised vehicles and increased provision for more cycling and walking (including reallocation of road space). From a spatial planning perspective there could be an increase in the number and size of green areas (e.g., parks, gardens), as well as re-design of a core area with more restaurants, terraces, and social and cultural activity sites, to increase physical mobility and spatial proximity and, overall, improve the quality of life of a specific area. However, this means that the area will need to receive deliveries of goods made by delivery vehicles, as well as services provided by vans (or trucks) to offer people the goods and services that they need to access. To ‘make some space for goods’ in this greener and less congested area

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[74] Omnichannel retail refers to a strategy employed by retailers to provide a seamless and integrated shopping experience across multiple channels, both online and offline. This approach aims to integrate various sales channels, such as physical stores, websites, mobile apps, social media platforms to create a cohesive experience for customers. The aim is to optimise the shopping experience for customers, who increasingly expect convenience, flexibility, and a consistent experience regardless of how they choose to shop.

[75] **Quick commerce** (or **Q-commerce**) is a model of e-commerce characterised by rapid order fulfilment and delivery mechanisms, minimising the time between customer order placement and the receipt of the goods.

[76] A **dark store** is a shop that acts like a warehouse, where workers fulfil online orders for delivery or pickup instead of serving in-store customers. Dark stores usually offer *quick commerce* delivery service. However, due to the increasing proliferation of dark stores since COVID-19, some European cities are considering reviewing their zoning plans to understand where and under what preconditions dark store services can be permitted.

[77] In this Handbook ‘digital planner’ refers to a planning professional who is focused upon the onward provision for, and shaping of, digital connectivity (and in turn shaping of digital accessibility) in society.

options could include: designing appropriate loading bays close to commercial areas; or using digital tools to optimise the use of space, such as dynamic loading bays[78], to be more efficiently used by (smaller) commercial vehicles, or by other essential vehicles when they are not used for commercial purposes. **A digital planner can help in understanding how to replace some physical activities (e.g., in-store shopping) with online activities and therefore reduce the need for travel**. For example, the establishment of parcel lockers could be considered, to reduce the number of kilometres travelled by vans for home deliveries. Combining and integrating thinking and background from the three TAP dimensions helps address goods accessibility.

What benefits can it bring you?

Integrated solutions for cross-cutting issues

Ensuring access to goods entails considering different perspectives and integrating different solutions. Stakeholders have different needs and different expectations, and there is a need to clarify what impact the intended measures for implementation will have on the different stakeholders, to maximise acceptance and adoption of specific solutions.

Using triple access thinking when Measure Planning for local goods movements can help tackle cross-cutting issues, such as, for example, noise, congestion, and road safety issues associated with delivery vehicles. Some operational issues may be solved by, for example, implementing traffic regulations and kerb-side management. Alternatively, setting up specific delivery schedules and night deliveries (e.g., off-peak times) can help reduce congestion and lead to more efficient freight operations, in particular in dense urban environments with high levels of congestion during the day.

Pilot programmes in New York, London, Paris, and Stockholm showed that off-peak deliveries can lead to travel time savings of more than 50% compared to peak periods[79]. However, this might require retailers to have staff working overnight to receive the goods, which would add extra costs. It will also produce noise during the night which might be not accepted by local residents.

Some demand related issues might require more holistic solutions, including partnering with the private sector (e.g., retailers, logistics operators) to offer online services to replace physical shopping activities to change people's behaviour towards more sustainable shopping options.

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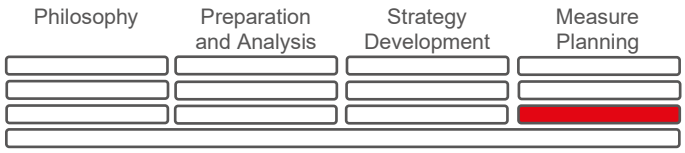
[78] A **dynamic loading bay** refers to a multifunctional and adaptable infrastructure situated strategically in proximity to commercial or retail centres of an urban area, that accommodates varying spatial and temporal demands of urban logistics to facilitate the efficient loading and unloading of goods. The term "dynamic" underscores its capacity for flexible resource allocation, considering the dynamic nature of urban environments and the need to optimise the flow of goods, while managing spatial constraints and time-sensitive operational requirements.

[79] International Transport Forum (2022). The Freight Space Race: Curbing the Impact of Freight Deliveries in Cities. *International Transport Forum Policy Papers*, No. 109, OECD Publishing, Paris. https://www.itf-oecd.org/sites/default/files/docs/freight-space-race-curbing-impact-deliveries-cities_0.pdf



There is not a 'one size fits all' solution to addressing goods accessibility. With a triple access approach the specific local context should be considered.

What challenges will you face?

While this Handbook aims to help design and integrate appropriate goods measures, it is also important to be aware of potential challenges. There is a need to:

- **Integrate team skills and knowledge to feed thinking** - For example, in the case of logistics hotels or any other integrated land-use and transport measures, transport and spatial planners will need to work together very closely, but they will also need to establish collaborations with other teams, such as those concerned with the local economy and environment.
- **Speak the right language** - Usually there is not a person working on local freight and logistics within these teams, and it might therefore be very challenging to explain and agree on a common solution every time. It is therefore important that there is someone who is responsible for this at least in the planning authority team.
- **Understand stakeholders' needs and expectations** - A local freight system is very complex and includes different stakeholders with different needs and expectations. It will be important to engage with key freight stakeholders and take them on board in the design of local freight policies. Remember the need to include and discuss a range of TAP measures that will address cross-cutting issues from a multi-stakeholder perspective.
- **'Measure the size' of the problem** - Probably the biggest challenge faced will be the lack of data on local goods movements and volumes. Engaging key freight stakeholders will give a clearer understanding of the local goods system and its mechanisms. This helps in the design of appropriate and effective policies that will maximise the efficiency of freight flows, while reducing their environmental impact and maximising the social benefit.

Takeaway points

- To embrace TAP thinking and design a local area where everyone can access places, opportunities and goods, goods movements must be integrated into local transport strategies and plans. Even though goods vehicles represent a relatively small percentage of travelled kilometres, they occupy a substantial portion of road space and contribute significantly to pollutant emissions (and related impacts on public health).
- Land use and spatial planning play a key role in achieving a sustainable local freight and logistics system. Examples from Paris and Rotterdam demonstrate innovative approaches, such as 'logistics hotels' and zero-emission zones, showcasing the importance of integrating logistics facilities within urban areas.
- The rise in online shopping, accelerated by the COVID-19 pandemic, prompts the need to incorporate digital accessibility for goods into spatial planning. Local areas need to adapt to the evolving relationship between commercial and logistics spaces,

considering the impact of online activities on local freight transport flows. TAP thinking helps design appropriate measures to enable digital accessibility and encourage the design and provision of appropriate online activities to enhance goods accessibility.

- The TAP perspective helps address cross-cutting issues by designing appropriate local freight and logistics measures. However, some challenges must be addressed in doing so, including: the need for strong integration across different teams; collaboration with key freight stakeholders; and the lack of data on local goods movements. Engaging stakeholders is key.

Further resources

- **Paris Land Use Plan** – a document that offers an example of how urban logistics provision can be incorporated into regulatory requirements for spatial planning.
- **The Freight Space Race: Curbing the Impact of Freight Deliveries in Cities** – a report that explores ways of making deliveries in cities less disruptive and more sustainable by focusing on the street space use of freight activities.
- **The Cargo Bike Action Plan** - a report to promote and enable the growth of cargo bikes to make them London's leading option for last-mile freight and servicing trips.

Addressing organisational and institutional challenges

The previous sections of this Handbook provide guidance on why and how to apply Triple Access Planning (TAP). However, the approach cannot be applied in a vacuum: it must be adopted by organisations, and it has to co-exist with existing institutions. This section of the Handbook highlights the organisational and institutional challenges of applying TAP and offers some guidance on how to address them (see also the potential strengths, weaknesses, opportunities and threats of TAP set out in the Appendix). It differs in structure from the previous sections because it focuses on particular challenges of following, and putting into effect, the advice set out in those sections.

Some of the issues in this section can appear complex. This is often the reality faced, including in the case of Triple Access Planning (TAP). The section uses the term "institution" which is defined here as "**the humanly devised constraints that structure political, economic and social interaction**", such as laws, planning documents, but also ways of working. Distinction is also made between formal and informal institutions. Formal institutions include rules, policies and goals that *are explicitly stated* and regulated in legal frameworks, and in policy and planning documents. Informal institutions encompass habits, traditions, networks and contacts, attitudes and ways of working that are *not explicitly stated*, but still influence planning processes[80]. **Institutions are distinct from organisations, which are the formal bodies within and between which institutions are situated**.

It is also important to note that organisational and institutional challenges are themselves set within a governance context. While 'government' is often used to mean formal decision making and exercise of power, 'governance', in addition to the formal, often refers also to more informal ways of managing organisations or planning processes, and their implementation. **Understanding the governance context is essential to being able to manage some of the challenges presented** in this section.

[80] North, D.C. (1990). *Institutions, institutional change and economic performance*. Cambridge University Press. https://doi.org/10.1017/CBO9780511808678

Addressing the overall institutional challenges of better incorporating TAP and uncertainty into planning

The literature on, and previous experience of, institutional challenges show the need to align planning approaches to local conditions. This requires that **an inventory of the formal and informal institutional settings and governance practices should be made**. For this purpose, the concept of institutional capacity[81] can be useful in the Preparation and Analysis phase of the planning process, when knowledge and relational resources, and mobilisation capabilities can be identified. This mapping of institutional capacity can be complemented by identifying the strengths and weaknesses of the organisation. It may also **encourage thinking about the creation of new institutions such as informal cross-organisational working groups or non-statutory documents** that help to address the institutional barriers and challenges identified.

Making thinking about institutions integral to the TAP process

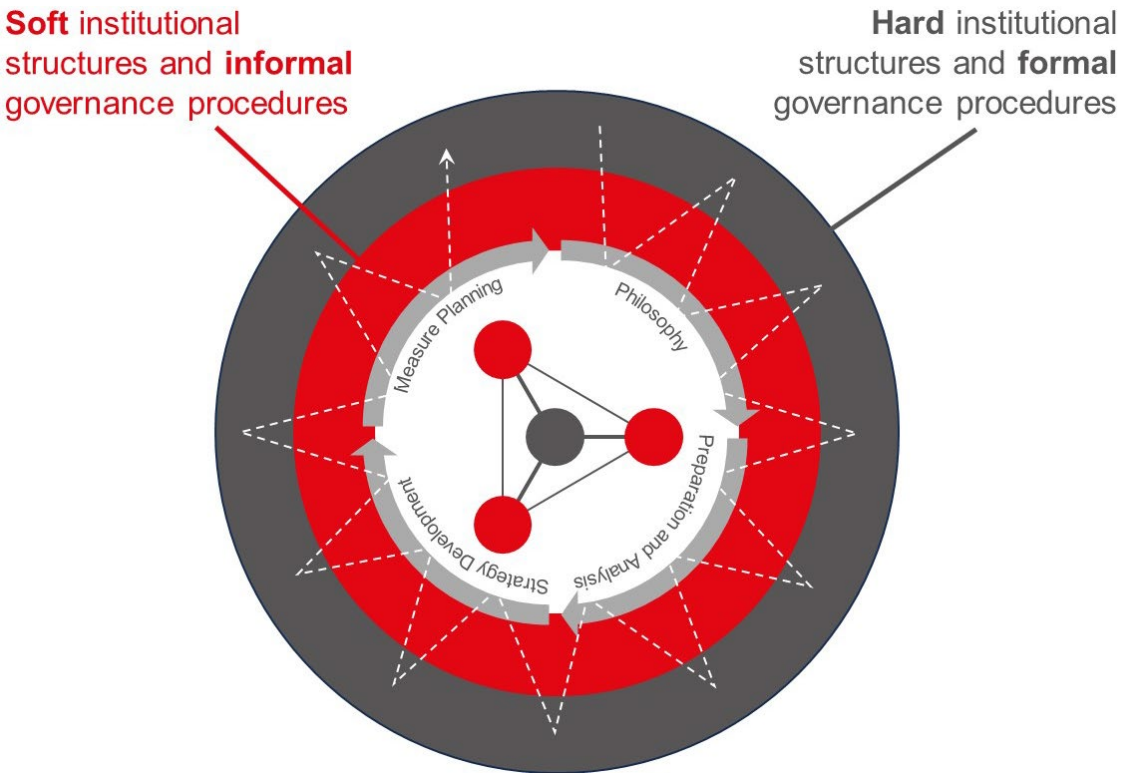


Figure 20. Formal and informal institutional structures and governance procedures within and through which Triple Access Planning is delivered through its phases[82]

[81] Healey, P. (1998). Collaborative planning in a stakeholder society. The Town Planning Review, 1-21. https://www.jstor.org/stable/40113774

[82] Implementation and Monitoring is a phase (recognised in Sustainable Urban Mobility Planning guidance) that follows Measure Planning. This will be familiar for most planning processes. It is not addressed in the Handbook which more specifically concerns itself with distinctive features of TAP, but could be envisaged as a fifth phase added to this Figure.

Since the integration of TAP into the existing process of planning takes place in the context of formal and informal institutions, it is essential to understand that context, but also to use the planning process as an opportunity to change those institutions so that they better support the integration desired. A way to think about this is to recognise that **the TAP process is enveloped by, or embedded in, both formal and informal institutions**, as shown in Figure 20[83].

Examples of how formal and informal institutions may be integrated into the TAP process include:

- In the Preparation and Analysis phase, mapping institutional conditions and actors; mapping uncertainty; and understanding how the TAP process fits into formal institutional conditions and decision making.
- In the Strategy Development phase, learning through iterative development of explorative and normative scenarios.
- In the Measure Planning phase, using backcasting[84] to develop transformative pathways, and reshaping institutional conditions to implementation.

Philosophy

Changing institutions: encouraging planners to think differently

If TAP thinking and practice are to become more widespread, organisations and especially institutions need to change. For example, planning transport by trying to predict future demand and then supplying sufficient capacity to meet that demand is an institution (a way of doing) that has been part of (the psyche of) transport planning for decades. TAP challenges this institution, both by planning from a vision-led and supply-led perspective, and by acknowledging and deliberately seeking to accommodate uncertainty about the future. support

To change these institutions, making an inventory of formal and informal institutional settings and governance resources and practices should **focus on the informal aspects of institutional practice, such as norms, values, mental models and discourse, as well as tools and incentives for implementation**. They can thus be made more explicit from the beginning of the process and thereby reduce the uncertainty caused by informal institutions and their impacts on the process otherwise being 'invisible'.

It can be useful to conceptualise the transformation of institutions so that they better integrate TAP into planning as a series of steps of gradually increasing capacity, from self-learning through to creating and supporting entirely new institutions. This has been set out in the International Transport Forum report 'Travel Transitions – How Transport Planners and

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[83] This diagram is simplified representation of that created by Svensson and Witzell (2023) – see Further resources below.
[84] See for example: Dreborg, K. H. (1996). Essence of backcasting. *Futures*, 28(9), 813-828. https://doi.org/10.1016/S0016-3287(96)00044-4; and Holmberg, J. and Robèrt, K.H. (2000). Backcasting - A framework for strategic planning. *International Journal of Sustainable Development & World Ecology*, 7(4), 291-308. https://doi.org/10.1080/13504500009470049

Policy Makers Can Respond to Shifting Mobility Patterns' (see Further resources below) and is shown in Figure 21.

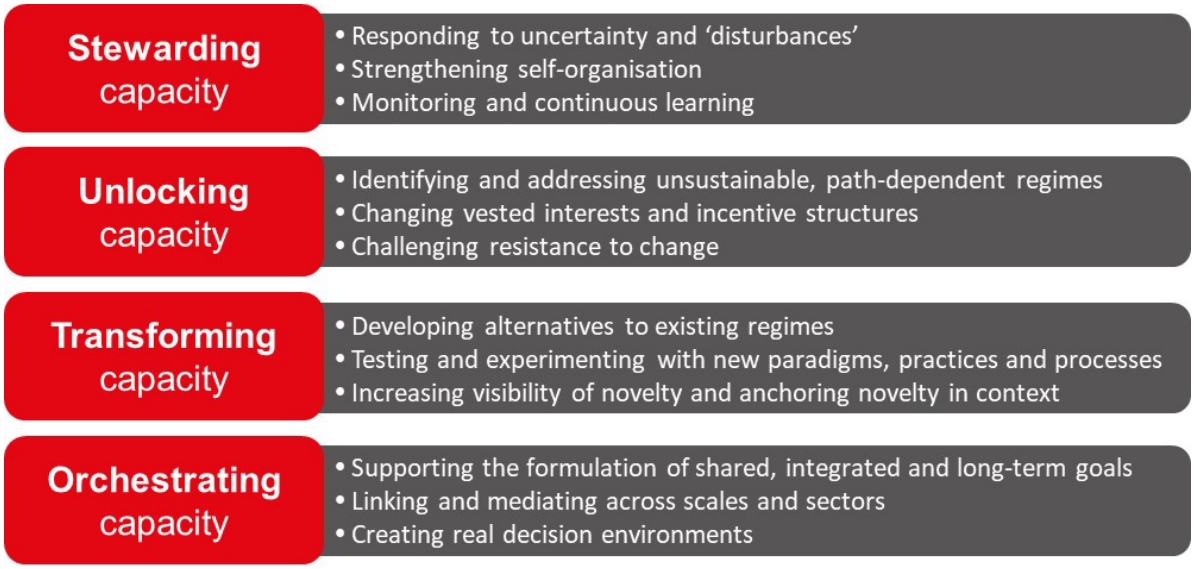

Figure 21. A framework for transformative capacity[85]

How can planners and politicians accept that planning for uncertainty is relevant, reasonable and not too politically risky?

The Sustainable Urban Mobility Planning approach in Europe[86] can be seen as an institution (a way of doing) within transport planning, seeking to replace other, more infrastructure-driven, ways of transport planning (also institutions). Within mobility planning (which is itself evolving), **TAP represents a further new institution seeking its place**. It would be unrealistic to expect that its new approaches will mesh seamlessly with existing institutions. For example, it is an unusual elected politician who says "I am not sure about the future and so we should plan for uncertainty". Politics as an institution is one that normally markets *certainty*. This may make it difficult to gain political support for a mobility plan that has TAP at its heart.

Formal institutions such as legally-required land use plans or transport infrastructure plans are further examples of institutions with which TAP has a potential clash. For example, in Sweden, planning for multifunctional streets where there is a move away from the formal road hierarchy defined in land use plans is not an easy thing to achieve since there can be several layers of legislation to navigate.

There is no simple solution to these institutional incompatibilities where they arise. **TAP can be seen as an innovation that will diffuse into wider institutional norms** – first finding those organisations that are prepared themselves to be innovators or early adopters and

[85] Reproduced from 2021 International Transport Forum report and originally adapted from Hölscher, K. et al. (2019). Tales of transforming cities: Transformative climate governance capacities in New York City, U.S. and Rotterdam, Netherlands. *Journal of Environmental Management*, 231, 843-857. https://doi.org/10.1016/j.jenvman.2018.10.043
[86] https://urban-mobility-observatory.transport.ec.europa.eu/sustainable-urban-mobility-plans_en

then in turn reaching further to the later adopting organisations and perhaps eventually the 'laggards' (those organisations and/or institutions slowest or most reluctant to embrace change). Take-up will grow if more people become aware of the concept, if more people are trained in using it, and if its benefits are clear, and clearly communicated. Adoption of the concept by leading transport politicians would also be of enormous benefit.

Consistently identifying and responding to formal and informal institutional issues in the TAP process also builds capacity to handle uncertainty, through learning. Alongside this is the importance of **creating a planning framework which allows for successive adaptability including adoption of policies in a stagewise manner** which will allow for a successful implementation even under influence of sudden shifts in external and internal circumstances[87]. A further way to build acceptance and understanding of uncertainty is by differentiating the type of action planned into strategic, tactical and operational categories.

Preparation and Analysis

How institutions can shape the data gathered in preparation and analysis and the consequences of this

Existing ways of working and thinking greatly affect what data are gathered for the planning process. This is clearly an institutional issue driven by, for example, different professional disciplines and what they consider to be important or valid. This in turn can affect whether and how uncertainty is dealt with (particularly where there is an assumption that the data gathered have a level of certainty to them) and therefore what future depictions of the transport system, and measures within it, are developed. Examples include:

- a bias towards gathering data about motorised trips at the expense of non-motorised trips;
- a tendency to exclude very short trips from data gathering because they are judged to be less important or less strategic;
- a focus on person kilometres rather than person trips, thus emphasising longer trips;
- a focus only on injury accidents as a measure of road safety rather than people's *perception* of how safe it is to use the transport system;
- when surveying the state of the transport network, a failure to assess the pedestrian network, including its accessibility for people with reduced mobility; and
- a tendency to consider land use as a given rather than something that can be influenced.

It should be noted that none of the examples above directly relate to digital accessibility. As the digital age continues to become integral to modern lifestyles and behaviours it is critical that data are also gathered that reflect this. If not, there will be a further barrier to the integration of digital with other forms of access in planning.

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[87] As set out in Banister, D. (2008). The sustainable mobility paradigm. *Transport Policy*, 15(2), 73-80. https://doi.org/10.1016/j.tranpol.2007.10.005

If data gathered are primarily related to motor vehicle trips, this will tend to skew the generation of the vision and measures towards those that are related to motor vehicles. Additionally, there is often a tendency in the Preparation and Analysis phase to assume that current trends will continue into the future, without considering major uncertainties that could change these trends completely (thinking the unthinkable). Both of these factors are likely to lead to a continued emphasis on predict and provide rather than decide and provide, and on larger less adaptable measures, as opposed to scalable and adaptable investments in, for example, improved pedestrian facilities.

The way to address this challenge is to **be very aware and questioning of the assumptions that are being made about the importance or otherwise of the data that are being gathered**. For example, some travel surveys disregard trips that are shorter than 15 minutes in duration. This is clearly wrong, as well as being incompatible with TAP; a trip is a movement, however short, that is undertaken to access something. This argument must be repeated until the survey is modified. Cycles of self-reflexive learning will also assist in challenging assumptions about what data should be gathered.

Determining levels of uncertainty under which you're working (1, 2, 3 or 4)

In the Uncertainty – Philosophy section, the different levels of uncertainty are explained, as are the reasons why at Levels 3 and 4 of uncertainty, deterministic predictions of future trends are unlikely to deal adequately with the prevailing uncertainties. If planners agree that they are working with level 3 and 4 uncertainties, this implies that new methods are needed to deal with them. While it has become less common in the wake of the COVID-19 pandemic, some planners may not agree that the planning context is indeed so uncertain. How far this argument is accepted or contested in the planning organisation is a matter of institutional design. In this situation, **it may be necessary to illustrate the risks of *not* planning at this level of uncertainty**.

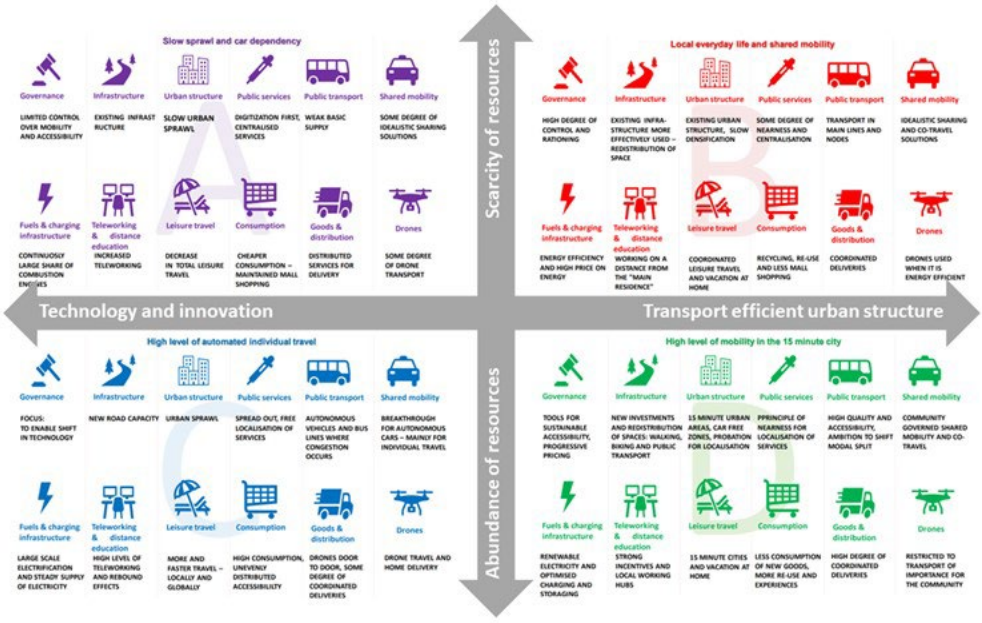
Making the case for the use of explorative scenarios

Explorative scenarios are very different to traditional predictive scenarios, and completely different from policy packages (sometimes also referred to as scenarios). Some individuals in the planning process may not feel comfortable with these because they may be viewed as lacking the credibility, rigour and precision that predictive scenarios appear to have. A key argument to make here is that because there are so many uncertainties that affect the future, it is inappropriate to develop scenarios for decades into the future that are precise; and because explorative scenarios are by definition not trying to predict, but just trying to represent possible futures, they can still play an important role in showing us how plans can be affected by those different possible futures. **It is helpful to emphasise that evidence is not synonymous with truth when it comes to the future and it is better to be approximately right than precisely wrong**. Running sessions to generate explorative scenarios iteratively (with at least two iterations) will help to build acceptance and understanding of the use of these types of scenario. Such an approach was used in the Triple Access Planning for Uncertain Futures project, working with planners in the Swedish town of Norrköping, as explained in the box below.

Institutional learning from explorative scenario development in Norrköping

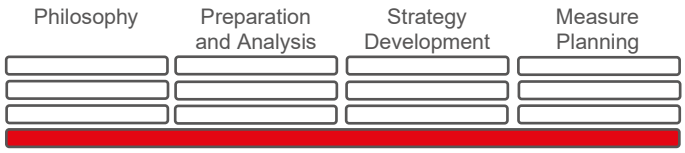
The Triple Access Planning for Uncertain Futures project staged an explorative policy lab for scenario development in the Swedish city of Norrköping, a municipality of about 145,000 inhabitants comprising both dense urban fabric and sparsely populated rural areas. The city has a recently adopted transport strategy and an ongoing strategic comprehensive spatial planning process. The policy-lab intended to explore both the robustness of the adopted strategies and the institutional challenges, and the capacity needed to handle the Triple Access System (TAS) perspective in an everyday planning practice setting.

It was set up as a series of co-creative workshops. Public officials and KTH project researchers identified a set of TAS variables and explored their importance and uncertainty. The most important and uncertain variables formed the two axes from which four future scenarios for Norrköping under the condition of an increased population of 175,000 by 2045 were developed, drawing inspiration from existing scenario constructs from elsewhere:



The scenarios were used both for identifying accessibility effect chains (similar to simplified Causal Loop Diagram development) and for stress-testing current policy and municipal plans – “What might it imply for Norrköping´s planning”. Discussion of decision making, organisational needs and implementation of accessibility futures was followed by a final roundtable evaluation with reflections on applicability and usefulness.

Several institutional challenges surfaced during the policy-lab; meanwhile institutional capacity development was considered a main reward of the scenario development process. Core lessons from the scenario building process are that: (i) officials moved beyond sectoral lines (silos) into explorative exchanges resulting in mutual learning; (ii) insights into local institutional challenges and opportunities are drawn out; and (iii) mapping current institutional capacity of the planning authority and ‘external’ actors and their resources is an important step in the preparation phase and becomes beneficial for making visible the institutional challenges and structures that support or hinder planning and (new) policy implementation.



How does the use of TAP mental models sit with the use of established four-stage transport models?

In the Triple Access Perspective – Preparation and Analysis section the role of systems thinking and Causal Loop Diagrams is set out. This helps in making sense of the system that planning and underpinning analysis aims to shape. These mental models may seem very different from the types of model that are typically used in transport planning, the latter being normally highly quantitative, largely deterministic in their predictions, and based on a more limited range of inputs. Even for someone who is not accustomed to conventional transport modelling (which commonly adopts the four-stage approach of trip generation, trip distribution, mode split, and traffic assignment), expressed mental models can be difficult to understand. For someone who has worked on the models conventionally used for transport plans, their applicability to TAP may be even more problematic and be seen as a challenge to an established discipline.

Conventional transport modelling is in any case confronted with a need to review its ongoing fitness for purpose either in terms of how models are developed or how they are used. It is recognised that **accounting for digital accessibility in modelling terms could present much greater levels of complexity and demands on data collection and analytical resource**. However, there can be scope within established models to make some representation by proxy of the sorts of variables and dynamics highlighted by systems thinking and mental models, even if such representation relies on simplification and assumptions. Engaging the modellers in the Philosophy and Preparation and Analysis phases of TAP is likely to be a helpful way of identifying practical and achievable evolutionary steps in analytical approaches.

Public involvement in development of explorative scenarios

Involving the public in scenario development is not easy because people have a tendency when talking about planning the future of transport (let alone access) to jump straight to the schemes (measures) that they think are important, and to not discuss the strategic context. The solution to this issue is to ensure that the people facilitating any public participation events on developing scenarios are experienced in managing such discussions; and to continually remind participants of the purpose of explorative scenarios in the planning process. As set out in the Triple Access Perspective – Strategy Development section, the Triple Access Planning for Uncertain Futures project has developed and applied an online approach to citizen engagement for exploring uncertainty (as well as considering preferable futures and measures that may be appropriate to get there). Public engagement can be helped by considering representations of different types of people and how they live currently and might in future and draw upon the TAS (these are known as 'personas'). In the Triple Access Perspective – Strategy Development section, reference is made to the example of planning for the City of Gold Coast in Australia that takes a TAP approach. This includes the use of personas, recognising that "**our community is made up of people with different experiences, perceptions, needs and abilities and the city is made up of a diverse mix of places with different challenges and opportunities**"[88]. Serious games

[88] https://gchaveyoursay.com.au/76440/widgets/367776/documents/235110

can offer another means of citizen engagement that can help in unlocking and exchanging knowledge.

Experience also points to the value of employing a professional process facilitator, whilst it may also be helpful to very carefully consider the different forums to be used for different participation activities, and the participants at those forums. Distinguishing between forums for open deliberation, formal decision-areas and more informal experimentation arenas can open the way for **a strategic sorting of actors and activities between strategic, tactical and operational actions as well as situations where different forms of knowledge – lay, normative, and expert – can be modulated**.

Strategy Development

Organisational capacity is needed to do the joined-up planning and decision making across transport, land-use and telecommunications that the TAP approach recommends. This essentially means trying to break down the walls between silos and coordinate planning across policy areas. To do this, changes are required so that professionals can get to know each other and preferably work regularly together. At a very basic level, this means regular meetings between different professionals to discuss planning developments from their different perspectives. Integrated departments and co-located office space can also help to improve integrated planning. Such ways of working while pertinent to Strategy Development should be addressed much earlier in the planning process.

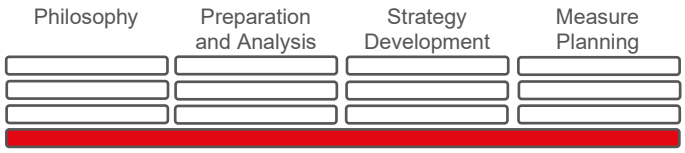
Measure Planning

A key message of the TAP approach is that **at the option generation stage of planning, the widest possible range of measures should be considered**, and as a key way of giving a plan the best prospect of being more robust in the face of uncertainty, **selection of adaptable and resilient measures is encouraged** – which might not be the 'typical' measures of traditional transport planning. However, this approach is not without its challenges.

How to avoid certain types of measure being rejected or ignored within sustainable urban mobility planning processes

An important part of looking at TAP from an institutional point of view is to recognise the wide range of perspectives of actors involved, and the (sometimes implicit) types of measures that are instinctively associated with these perspectives.

Measures that are seen to be new or untested may never make it to the option generation stage of identifying candidate measures for a plan, let alone actually being selected. This can be: (i) because there is scepticism about their impact and/or because there is a lack of knowledge about how to include them in processes such as modelling; (ii) because they are seen to be outside the set of standard transport-related measures (digital and land use measures can fall into this category); or (iii) simply because people have never heard of them.



How then to raise the status and acceptance of different types of measure so that measures selected draw upon the full scope of the TAS? While this would helpfully be primed earlier in the planning process, a few suggested courses of action are set out below:

- As part of the planning process, set general pathways (approaches or strategies) which clarify broadly how objectives are to be achieved. For example, 'safety' is an objective; a pathway or strategy to achieve it can be decided as 'reducing speeds'. Once this discussion has been had and the pathway agreed, this guides the option generation process towards certain types of measure[89].
- Use available resources that document evidence of the impacts of different measures[90].
- Run workshops and training sessions on different measures to discuss their effectiveness. This should include critical examination of the effectiveness of conventional measures, such as infrastructure construction, in solving problems such as lack of accessibility, or pollution. It should involve experts who can discuss the travel-reducing properties of digital connectivity.
- Train colleagues to understand how conventional modelling techniques lead towards the selection of certain types of measure to the exclusion of others (e.g. models typically poorly address walking, and may not address walking trips made solely within one zone in the model at all). Consider a long list of TAP measures and then how many of these can be effectively modelled by traditional transport models.
- Subject major infrastructure measures to stress testing to consider what different projections of uncertainties would do to the measures' delivery of their objectives and value for money.

Experimentation (as mentioned in the Triple Access Perspective – Measure Planning section) and creating testbeds or labs for real world-trials can also help to deal with uncertainties about the impact and effectiveness of measures.

How to plan for measures that both maintain strategic direction and are adaptable

If measures are selected to support the achievement of objectives (using for example a Multi Criteria Analysis (MCA) approach)[91], this will ensure that they align with the strategic direction of the plan. From an institutional point of view, measure selection should allow for appropriate reflective consideration from different disciplinary perspectives. In terms of adaptability, this should be included as a criterion in the MCA. For example, a programme of

[89] More guidance on this is available on pages 23 and 24 of the SUMP Measure Selection Manual, part of the suite of EU SUMP Guidance, available here http://www.sump-challenges.eu/kits
[90] The KonSULT toolkit by the University of Leeds is very helpful, as it has an extensive list of measures and details of experience of their impacts (though coverage of digital accessibility is not prominent) - http://www.konsult.leeds.ac.uk/
[91] See for example Dean, M. (2020). Multi-criteria analysis. *Advances in Transport Policy and Planning*, 6, 165-224. Academic Press. https://doi.org/10.1016/bs.atpp.2020.07.001

bus speed improvements based on bus lanes converted from standard traffic lanes is adaptable and scalable because it can be done incrementally; it would score well on this criterion in an MCA. A new metro scheme, in contrast, would score less well because it cannot easily be adapted nor scaled up or down. Measure selection should also include the use of stress-testing to better account for uncertainty, as set out in the Uncertainty – Measure Planning section.

TAP and planning for accessibility

Planning land use to reduce the need to travel, and doing so by measuring and then seeking to improve accessibility, has been discussed in the academic literature and attempted to some extent in practice for many decades. In this sense **the focus on proximate accessibility in the TAS is not new (although conceiving of it as part of a system together with digital accessibility is more novel)**. However, there are some significant challenges with planning for accessibility, of which any organisation that seeks to adopt TAP thinking and practice should be aware, such as the following (based upon review work undertaken by the 'Triple Access Planning for Uncertain Futures' project). Many of these are institutional issues:

- Accessibility is intuitively straightforward but less easy to harness and apply in practice, with varying definitions and delimitations. Translating accessibility into usable planning instruments has been quite limited (though see the geographical representation of triple access provision illustrated by example in the Triple Access Perspective – Preparation and Analysis section).
- There are no standard measurements of accessibility, and combining different methods/measurements/indicators may be appropriate.
- Having an accessibility lens can help plan more holistically but at the same time risks broadening considerations to the extent that they become difficult to navigate and organise.
- Having a focus on accessibility as a concept can help planners 'ask the right questions'.
- Lack of data and fragmented organisations are common practical barriers to addressing accessibility.
- Previous mandatory UK accessibility analyses turned out to be difficult to carry out in practice for several reasons including: difficulties engaging relevant actors; difficulties integrating affected policy sectors; insufficient funding; and lack of systematic monitoring and evaluation of measures/initiatives.

Whilst TAP does not offer an easier approach than established planning practices and institutions, it does offer the prospect of being more fit for purpose in relation to the challenge and opportunities now faced by planning.

Although digital accessibility is not directly addressed, the box below provides an example of how it is possible to do the impossible through effectively addressing organisational and institutional issues.

Le Plessis Robinson – a town that did the impossible

In a 15-minute video[92], the case of Le Plessis Robinson, a municipality near Paris, "was able to transform itself from a gloomy dispirited town, dominated by decaying concrete flats into a thriving, friendly and beautiful community".

Key to its success was "a steadfast mayor, a couple of visionary architects and sheer will".

The video portrays an inspiring sense of how effectively addressing organisational and institutional issues combined with a strong planning approach can lead to being able to achieve what might have seemed impossible.

Seven critical success factors have been: (1) having a long-term vision; (2) 'smart' policies using public-private partnerships; (3) getting the urban form right; (4) recognising the importance of dignity in terms of social housing; (5) boosting biodiversity to create 'more than just a park'; (6) focusing on shops and services being accessible close by; and (7) beauty matters in attracting people and businesses.

Takeaway points

The guidance in this section of the Handbook points to the following overall conclusions on how to ensure that institutional issues are addressed when adopting TAP:

- Be aware of context – stick to principles but allow practical discretion.
- Attend to institutional and governance factors throughout the planning process.

[92] https://youtu.be/XfonhIM6I7w?si=MNTLRLB8uh_ASoxV

- Understand that there are limits to integration and participation – consider where and when they contribute the most.
- Accommodate processual reflexivity, iteration and local discretion when following guidelines.
- Develop institutional capacity in the planning organisation, through mapping the institutions that exist, and spending time on reflexive learning.

Further resources

- **Institutional Aspects Which Condition Sustainable Urban Mobility Planning: A Brief Literature Review** – an examination of the many organisational and institutional issues than can arise and what this means in terms of planning context and process.
- **Travel Transitions – How Transport Planners and Policymakers Can Respond to Shifting Mobility Trends** – an examination by the International Transport Forum of how transport planning is evolving and needs to evolve and with what governance challenges and opportunities.

Looking ahead

While Triple Access Planning (TAP) presents plenty of challenge to established thinking and in terms of how it might be brought (further) into practice, the need for transport and mobility planning to evolve is inescapable. **TAP offers a credible and promising prospect for helping to ensure planning can be as fit for purpose as possible in a changing and challenging world.**

TAP in Swedish national guidance on strategic transport planning

The 'Handbok för trafikstrategiskt arbete' (national handbook for strategic transport planning) reflects an adoption of TAP by Trafikverket (the Swedish Transport Administration).

It advocates developing an analytical and systematic approach to working with accessibility - digital connectivity, spatial proximity and physical mobility - to achieve an accessible society.

In terms of the different means of achieving the objective of a sustainable society, an order of priority is set out:

	Order of priority for sustainable accessibility
1	Digital accessibility
2	Allocation of destinations
3	Walking, biking and other modes of micro mobility
4	Transport with shared vehicle
5	Individual transport with motor vehicle

Innovations diffuse as new ideas are adopted. According to the diffusion of innovations theory[93], diffusion begins with the innovators, followed by the early adopters, then early majority and late majority and ending with the so-called laggards. **Decide and provide and TAP are diffusing**, particularly in the UK but also beyond. For example: decide and provide was adopted by the UK sub-national transport body Transport for the North[94]; formal planning guidance on decide and provide is now available in the UK[95]; and in 2022 the first local authority in England formally adopted decide and provide in place of predict and provide[96]. TAP has appealed to some authorities that are considering it in their strategic

[93] Rogers, E. (1962). *Diffusion of Innovations*. Simon and Schuster.
[94] TfN (2020). *Future Travel Scenarios*. Transport for the North. https://transportforthenorth.com/wpcontent/uploads/TfN_Future_Scenarios_Report_FULL_FINAL_V2.pdf
[95] TRICS (2021). *Guidance Note on the Practical Implementation of the Decide & Provide Approach*. TRICS Consortium, February. https://www.trics.org/decideandprovideguidance.html
[96] https://news.oxfordshire.gov.uk/new-transport-planning-approach-approved/

planning - for example Transport for West Midlands in England[97] and City of Gold Coast in Australia[98]. As shown in the box above, the Swedish Transport Administration has adopted the concept of TAP in its new national handbook for strategic transport planning (officially adopted and published in 2022)[99]. There is explicit inclusion of TAP in the latest Scottish local development planning guidance[100].

TAP is vision-led, access-focused and accommodates uncertainty.

The developments within the digital age in terms of the art of the possible in relation to digital connectivity and accessibility seem set to continue and thereby further strengthen the significance of taking a triple-access perspective when we plan. It has only been in the last 20 years that internet access has moved from the preserve of the minority in its nascent state to the norm for the majority with a much richer set of capabilities and offerings. **While it may seem remarkable in that time that transport and mobility planning has done so little to explicitly account for digital accessibility, it seems untenable as we look to the future that it could continue to be ignored**.

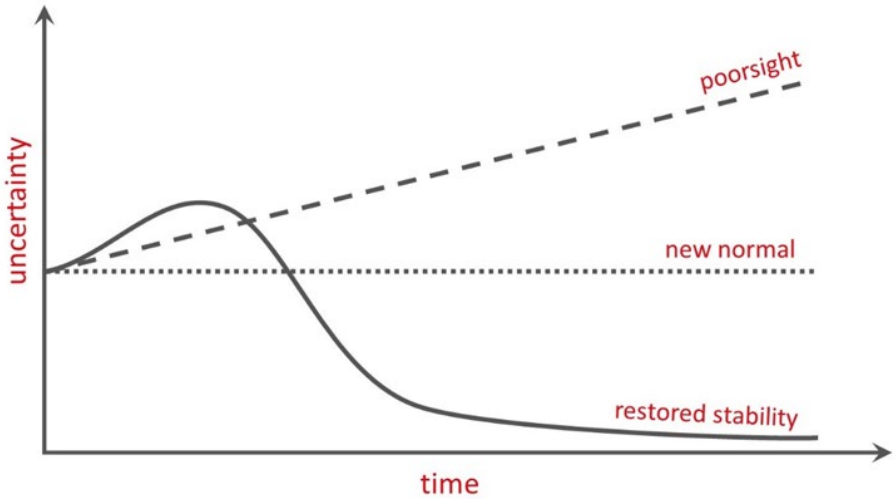


Figure 22. Conceptual depiction of different scenarios for how uncertainty about the future could change over time[101]

What does the future hold for the planning task in terms of the extent of uncertainty that may be faced? Will those involved be more or less uncertain about the future *in future* than they

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[97] TfWM (2021). *Reimagining transport in the West Midlands: a conversation about change*. West Midlands Local Transport Plan Green Paper, Transport for West Midlands. https://www.tfwm.org.uk/media/tcgf3ik2/local-transport-plan-green-paper-final.pdf

[98] City of Gold Coast (2022). *A Conversation About the Future of Transport*. Transport 2041 Strategy Discussion Paper. City of Gold Coast, July. https://gchaveyoursay.com.au/76440/widgets/367776/documents/235110

[99] Sandberg, L. and Wärnhjelm, M. (2022). *Handbok för trafikstrategiskt arbete*. Trafikverket. ISBN: 978-91-8045-094-2. https://bransch.trafikverket.se/contentassets/740b84c13230422e851eeef569fa73f4/trv-handbok-for-trafikstrategiskt-arbete_2023-01-12.pdf (The Swedish Transport Administration is a partner in the 'Triple Access Planning for Uncertain Futures' project)

[100] Scottish Government (2023). *Local development planning guidance*. Scottish Government, May. https://www.gov.scot/publications/local-development-planning-guidance/

[101] Reproduced from ITF (2021). *Travel Transitions: How Transport Planners and Policy Makers Can Respond to Shifting Mobility Trends*, ITF Research Reports, OECD Publishing, Paris. https://www.itf-oecd.org/travel-transitions-policy-makers-respond-mobility-trends

are now? Figure 22 illustrates three scenarios. It is possible that the collective sense of uncertainty about the future could reduce *in future* as a clearer and clearer direction of travel emerges (the 'restored stability' scenario). Meanwhile the extent of uncertainty sensed today could remain so out into the future (the 'new normal' scenario). Alternatively, it is possible that uncertainty about the future could increase (the 'poorsight' scenario). Rather than betting on restored stability, **it would be wise to assume that planners and decision makers will need to make it their business to address and accommodate uncertainty**.

This Handbook can only hope to be a staging post in the onward journey of change in how we make sense of, and seek to be prepared for and shape, the future. We hope it will provide significant impetus to planning professionals to become part of the movement of change that is needed and in turn that others will share their experiences and lessons in the interests of collective progress and improved future prospects.

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[102] https://www.tapforuncertainty.eu/

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Appendix – TAP's strengths, weakness, opportunities and threats

The information on the following pages provides what is intended to be a balanced consideration of the merits of Triple Access Planning, covering potential strengths, weaknesses, opportunities and threats. This information is the basis for the serious card game 'TAP-SWOT in a BOX'[103] that allows groups of practitioners to explore together what TAP has to offer and to form their own views on what matters to them about the approach and the prospects of adopting it.

Strengths		
Acts as a complement	*The new approach can enhance existing mobility planning*	Triple Access Planning and its handling of uncertainty are not a wholesale substitute for conventional mobility planning. The new approach encourages a rethinking and broadening of planning perspective and promotes the need to stress-test a plan against uncertainty. This helps reframe the mobility planning process at its outset and adds new means of engaging in and applying that process.
Future proof	*Realising a vision involves being able to accommodate uncertainty*	Exposing uncertainty about the future involves developing different possible future contexts – explorative scenarios - to which a plan's implementation may be exposed. Scenario planning allows the plan itself to be devised in a way that its creators can ask "is this part of the plan going to work regardless of what the future has to throw at us?". A policy or measure that in any scenario helps progress towards a vision for a better future is more robust or 'future proof'.
Conceptually appealing	*The new approach resonates with what professionals feel they need*	Many planning professionals would recognise the merit of being vision-led rather than forecast-led, of looking beyond road traffic, and of confronting uncertainty. The portrayal of the Triple Access System within which transport finds its place and role in access is simple and compelling. As such the new approach is conceptually appealing which encourages challenge to conventional mobility planning.
Encourages ambition	*Stronger planning can result from inviting us to dream*	While conventional mobility planning does not prohibit 'thinking big', it can tend towards conservatism and preserving the established form and function of mobility. The new approach more explicitly invites us to explore new possibilities both in terms of what could change and what could be encouraged to change. By better engaging with understanding how the world is changing, could change and needs to change, ambitious vision-led planning is possible.

[103] The game pack for TAP-SWOT in a BOX is freely available online and can be downloaded: https://uwe-repository.worktribe.com/output/10879448/tap-swot-in-a-box

Strengths (continued)		
Better reflects the world we live in	*People live their lives in a triple access system, not (only) a transport system*	How people fulfil their access needs and desires is influenced by the supply of access opportunity across transport, land-use and telecommunications systems. A planning approach that recognises this is better able to understand and shape overall access and the place of mobility within this.
Access at the core	*Society thrives on access, with mobility being only one means to that end*	The functioning of society and the wellbeing of individuals relies upon being able to access people, employment, goods, services and opportunities. Motorised mobility is not synonymous with access. It is a means to an end. Spatial proximity and especially digital connectivity represent other important (complementary) means to that end. Triple Access Planning helps ensure all means are drawn upon to help achieve the end in the most appropriate way.
Helps us to unthink	*By stepping back and helping open our minds new perspective can emerge*	It is easy for conventional thinking in transport planning and analysis to blinker how we perceive the present and how best to take steps to shape the future. By developing new mental models of the present and future of our triple access world it becomes possible to question prior assumptions. It becomes possible to unthink and then rethink the scope of urban mobility planning and reimagine what steps could be taken on a pathway ahead.
Inspires a new generation	*Earlier career planning professionals are motivated and empowered*	As the transport and wider planning profession evolves, new blood and new perspectives come into play. There is substantial recognition of the need to plan differently, not least given the imperatives of addressing climate change. The underlying philosophy of this new approach and the support it provides to reimagine the future creates a flexible and empowering environment within which professionals with new ideas and priorities can flourish.
Considers the art of the possible	*Being encouraged to imagine future change strengthens planning*	Consider how much change has happened in the last 20 years to access. Consider how, where and when you work and play and engage with others. The future is not just more or less of what we have now. The form and qualities of activities and their access is likely to change, perhaps quite substantially. A planning approach that actively encourages exploration of what change might unfold helps better determine how to account for and shape such change.
Encourages diversity of perspective	*Actively thinking beyond the transport system brings new insight and prospects*	The system (or system of systems) of transport and society is a complex one in relation to supply and demand. Mobility planning with only a transport mindset constrains the ability to make sense of the system that planning seeks to shape. A planning approach that considers triple access naturally lends itself to bringing transport, spatial and digital planners and other experts together. Their shared mental model of the present and future can strengthen planning.

Weaknesses		
It doesn't guarantee better outcomes	*What is a better future is subjective and in the hands of those involved*	Within conventional mobility planning it is possible to progress towards a future that for some is desirable. The new approach is intended to offer a process that is more overtly vision-led and broader in outlook through its triple-access view. However, the actors involved in the process are what determines the plan that results. They bring their own values, vested interests and preconceptions. Be careful what you wish for.
Contested territories	*Limited understanding of triple access dynamics produces difference of opinion*	The nature and use of the Triple Access System continues to change and be changed. Research efforts reveal how challenging it is to make sense of the System and how its elements interact. As a result, while the new approach invites an opening of minds to thinking more broadly than only about motorised transport, it may not be possible to achieve a strong shared level of confidence in a particular interpretation of the System.
It doesn't compute	*Getting people to buy-in to the new approach is not guaranteed*	Whether as decision makers, planners or analysts, not everyone sees the need for a new approach. They may not be convinced that uncertainty about the future is that great. They may have strong faith in a transport-centric approach to mobility planning and believe the existing processes and tools are sufficient. The new approach is predicated on people's buy-in to engaging with it and seeing a need to innovate.
Dependence on more actors	*A greater pool of expertise is needed to capitalise upon what the approach offers*	Conventional mobility planning has been centred upon the transport system with mixed experience of engagement with spatial planning. Even more remote has been any engagement with evolving expertise in digital planning. Added to this is a need for expertise in foresight methods to explore possible futures and how they may be reached. This all points to a need for a greater range of expertise to be involved in the planning process which is harder to find and harness.
Lack of precedents	*Planning authorities taking a lead with a new approach can feel exposed*	While conventional urban mobility planning may not be perfect or may even fall short, there is strength in numbers, strength in conforming with norms of practice and norms of professional, public, political expectation. In contrast, embracing triple access with vision-led appetite, and addressing uncertainty is more novel. The reassurance of others having already tried and tested the approach to good effect is in short supply.
Cognitive overload	*The complexity of present and future triple access is too hard to process*	There are many, many factors at play in making sense of the present day Triple Access System and its use in a diverse society. The complexity is compounded by the challenge of contemplating how and to what extent such factors are important in influencing the future. Being able to process this and draw planning conclusions from it with confidence can be highly demanding if not unmanageable.

Weaknesses (continued)		
Lack of evidence	*How different forms of access are at work is poorly understood*	While evidence on the transport system and its use is integral to transport planning, the picture is less clear in relation to the land-use system and even more so in terms of the telecommunications system and its use. The three systems and how they are used are interconnected and changing (at different rates). Making sense empirically of the Triple Access System is challenging (albeit that the TAS exists and affects transport whether sense is made of it or not).
New skills required	*This planning approach calls for new capabilities and competencies*	Not only does this new planning approach encourage a fresh philosophical perspective on how and why we plan and how we might plan differently, it also demands new skills and processes – and related capabilities and competencies. Being able to co-create a shared triple-access vision, being able to constructively explore uncertainty, and being able to guide more robust decision making are challenging prospects for those unfamiliar with them.
Hard to model	*Representing a more complex system is too resource and time hungry*	Representing supply and demand for physical mobility, spatial proximity and digital connectivity would need further model development, and data may not exist to support this. To then model multiple 'what-if' futures would need more resources and time that could slow the planning process.
Too abstract and intangible	*The new approach is conceptually appealing but hard to apply*	Triple Access Planning points to the triple access reality of our lives and in this respect can be conceptually very appealing. However, moving from the abstract to the specifics of how to observe, understand and influence triple access demands more than a new philosophy. It can well demand tools and processes, and detailed guidance for their use. The new approach does not 'hand hold' practitioners through its application.

Opportunities		
The need for adaptive capacity	*In the face of system shocks society needs to be adaptive and resilient*	COVID-19 highlighted our collective reliance upon the Triple Access System as a source of resilience within which businesses and individuals could adapt their behaviours. Resilience and adaptive capacity would seem of growing importance. A planning process that is able to actively improve examination of, and changes to, a system comprised of multiple forms of access should be of great appeal.
Responsible planning	*Strong planning is needed that is more than only accountable to due process*	While established planning process and appraisal offer a framework for addressing future mobility, it is no longer sufficient to have demonstrated accountability in following due process. There is a need for planning that helps decision makers to take greater responsibility for charting a course ahead that holds the prospect of achieving meaningful change to help address environmental and social as well as economic concerns. The approach offered more proactively facilitates this.
Moving beyond white male privilege	*In order to better account for a diverse population we must think differently*	The transport system has predominantly been designed by men; in many countries by white, men. Gender, ethnicity and other protected characteristics that reflect the true and diverse makeup of the society that transport and access support have been largely overlooked. Thankfully, this is changing and needs to change. A planning approach that is less rooted in the past and more concerned with engaging diverse voices in the present about preferable futures is key.
COVID-19 exposure	*Greater familiarity with triple access and uncertainty opens people's minds*	The COVID-19 pandemic was a global shock that demonstrated how things can change in unexpected, uncertain ways. Many people shifted significantly from a reliance on physical mobility to a greater reliance on digital connectivity. Professionals and the public alike are more likely to 'get it' now.
Necessity is the mother of invention	*Uncertainty and a climate emergency invite new, bolder ways forward*	Uncertainty becomes an opportunity in the sense that if the future cannot be predicted then we are offered greater invitation to shape it. The climate emergency demands that it is shaped in pursuit of a vision that is different to business as usual and which involves a makeup of access that treads more lightly on the planet. The proactive and participatory nature of the approach lends itself strongly to enabling and helping to justify bolder ways forwards.
Accommo-dating uncertainty	*Society is in a state of flux with a heightened need to plan for uncertainty*	Once upon a time it may have seemed that 'more of the same' car-dependent planning would suffice in a world where road traffic and economic output seemed to be tightly coupled. Now the world is changing. Decarbonisation demands something different. The digital age may well further transform how we live our lives, but in ways that can be hard to imagine. Being able to explore and account for different possible triple access futures is preferable to (only) forecasting traffic.

Opportunities (continued)		
'De-car'-bonise	*Triple access offers the prospect of less motorised mobility and emissions*	Alongside economic prosperity and social wellbeing is environmental sustainability and the imperative to urgently address climate change. Giving greater emphasis to spatial proximity and digital connectivity in urban mobility planning can help reduce dependence upon motorised mobility and especially the private car, leading to reduced carbon dioxide emissions while still allowing people to lead their lives socially and economically.
Rethinking measures	*Transport measures could have new consequences in a triple access world*	Transport measures within mobility planning have been seen as transport solutions addressing a transport problem. Problems more fundamentally relate to access, and in this respect a triple access lens can increasingly be used to think through the possible consequences of transport measures as part of an urban mobility plan – e.g. road pricing is not just about the choice between car and public transport but may influence the role of spatial proximity and digital connectivity.
Preparing for the worst	*If the need for major change intensifies, forecast-led planning won't do*	It is hard to judge different forms of planning or even their outcomes as right or wrong. Weaker planning that 'goes with the flow' of external forces may seem sufficient. However, in the face of climate change and shifting attitudes and behaviours, the demand for stronger planning that can respond to this may grow. Planning authorities that are engaging with, and growing their proficiency in, the new approach stand to be better placed to respond.
Appetite for change	*There is growing recognition of a need to move away from business as usual*	The adage 'if you do what you've always done you will get what you've always got' is pertinent to mobility planning. Whether as professionals, politicians or as members of the public, there is a wish (albeit not universal) to work with the dynamics of our times to shape a different type of future society that supports diversity and prospers while living within its means and environmental boundaries. A new approach to planning helps free up our minds to embrace new possibilities.

Threats		
Silo mentality	*Joined-up government can often remain elusive making triple access problematic*	Efforts in the past to more strongly embrace access-based planning have proved challenging due to differing perspectives and understandings and the difficulty of bringing these together across different jurisdictions of responsibility. It is rare for mobility, spatial and digital planning to be treated as a combined function. Existing organisational structures may work against being able to fulfil such a function.
Damned by faint praise	*A new approach that doesn't fit someone's agenda is unwelcome*	Stronger planning suggests shaping a more inclusive, fair, environmentally sensitive and prosperous future. This may not fit the narrative of beneficiaries of a present system that serves them well. As a result they may either seek to exert disproportionate influence on a new and participative approach, or they may subtly cast doubt on the credibility of the approach, anxious to preserve the more familiar orthodox approach to planning where their influence is established.
Professional resistance to change	*Those invested in established approaches may be uncomfortable*	Sense of purpose, reputation and security come from achieving a level of proficiency in the application of particular tools, methods and processes. Understandably individuals and organisations have invested in such proficiency associated with established approaches. They may be instinctively reluctant to embrace a new approach that is seen to diminish their return on the investment in skills and experience that they have made.
Lack of appraisal framework	*The planning system continues to expect conformity with approved approaches*	The new approach may be, or be perceived to be, acting outside of the bounds of recognised appraisal practice. By not being able to demonstrate conformity or to effectively offer a convincing alternative appraisal framework, Triple Access Planning, including its treatment of uncertainty, may fail to garner support and endorsement. Without this sense of legitimacy, putting it into practice could be jeopardised.
Other access influencers	*There are multiple influencers of access and this complicates shaping the future*	With recognition of the triple access nature of transport comes a realisation of how many different players are involved in shaping the forms of access available in society. The way employment, shopping and other services are organised in space and time and their functional form all affect access. Digital and transport service providers in the private and public sectors are at play. This makes it challenging to co-ordinate understanding of access in the present and shaping of it in the future.
Hard to understand	*If the concepts are new they may be harder to understand and buy into*	Planners are familiar with urban mobility planning that is forecast-led and transport-focused. They have a confidence in practicing this approach. A new approach requires new understanding which can make it harder to believe in and in turn invest effort in.

Threats (continued)		
A need to quantify	*Analytical rigour often means numbers, and precise numbers at that*	The adage 'if you can't count it, it doesn't count' reminds us that what matters may lie beyond what (big) data and numbers are able to convincingly represent. The concept of 'access' has struggled to be embraced in mobility planning because a unifying definition and means of measuring has proved elusive. Definitions and numbers can only go so far in helping us in a meaningful way in planning for the future. Nevertheless if a new approach cannot play the numbers game…
Politics	*Stakes are high for politicians in the face of change and they need legitimacy*	Decision making on policies and investments that shape the future is seldom easy for the politicians involved. They are unlikely to welcome any suggestion of uncertainty bringing into question their judgement. They may wish to assert confidence in more conventional thinking and a belief that primacy of motorised mobility will endure. Conversely a vision-led approach in which uncertainty abounds could be mis-used in service of vested interests.
Lack of headspace	*Planning authorities may lack capacity and resources for planning differently*	Many transport authorities are resource constrained and facing short-term pressures and demands that have been exacerbated significantly by the COVID-19 pandemic. This can make it difficult to prioritise strategic planning for the longer-term. While expectation for onward mobility planning and its delivery will exist, this can already be intellectually and procedurally challenging. Accordingly, it may be difficult to find the capacity and resources to engage in a new approach.
Lack of public buy-in	*Many people see themselves as locked-in to car dependent lifestyles*	Triple Access Planning seeks to better equip society for a sustainable prosperous future by 'putting the private car in its place' in a wide repertoire of forms of access. While this may be the case, the sort of mobility planning it produces may provoke strong resistance from parts of the public who see the way ahead as incompatible with their present-day means of access fulfilment.