*Changing Mobilities*

# CHANGING MOBILITIES

Monika Büscher and Greg Marsden

*Changing Mobilities* is a game changing book in the best way possible. It shows us the realities we face in transportation's contribution to the climate crisis. It analyses the massive yet also day-to-day transformations that need to take place in how we live. And it offers up hopeful possibilities of how we might get there. Büscher and Marsden build on decades of experience in real-world analysis and experimentation, each bringing unique perspectives that are beautifully woven together here. Anyone interested in our collective future should read this book and consider how to start changing mobilities in your own local context. The task before us is sobering yet inspiring, practical yet full of imagination, terribly daunting yet perfectly do-able if only we collaborate and work together. The message they leave us with: We can think and act differently – bolstered by ideas such as *buen vivir* and the mobile undercommons – to overcome obstacles and move beyond our deadly over-reliance on automobility.

**Dr. Mimi Sheller**, *Dean of The Global School, Worcester Polytechnic Institute, USA*

This is an amazing book. It perfectly outlines the issue of sustainable mobilities and the urgent need to include research currently excluded from the mainstream knowledge system, for change to happen. It addresses the topic both theoretically and empirically and pushes theoretical thinking forward – toward what could be possible. Very importantly, it still manages to hold onto hope for the future.

**Malene Freudendal-Pedersen**, *Professor in Urban Planning, Department of Sustainability and Planning, Aalborg University, Denmark*

A powerful and passionate argument for what *buen vivir* worldviews and their practices have to offer to our common future, and for the role that mobilities, divergent, dissenting, and shared, can play in its shaping. Evocative and clear sighted, wide-ranging and political, *Changing Mobilities* is transformative scholarship at its best.

**Professor Carlos López Galviz**, *Chair in History and Social Futures, Lancaster University, UK*

What a stunning read! Büscher and Marsden take a stand against climate change ignorance, fake news, and systematic disregard for facts, humanity, and justice. Two outstanding scholars show what the mobile risk society needs: science with a hot heart and a cool analytical mind – not ready to surrender!

**Sven Kesselring**, *Professor in Sustainable Mobilities, Nuertingen – Geislingen University, Germany*

# Changing Mobilities

Climate change demands rapid and radical changes in the way people on Earth live and move. Mobility systems the world over must change, and they are changing. Massive global efforts are underway to make transport more sustainable. However, this is mainly focused on technological solutions, such as electrifying automobility, even air travel, and the pace and scale of change are insufficient. The inequalities of existing and changing mobility systems are inhuman. So, how can we get better at changing mobilities? Which are the areas and dimensions where "better" matters most? And what approaches can we take – given that the initiatives already underway are pushing hard? What more can we do? And, most importantly, how can we do it, and do it fairly? *Changing Mobilities* explores key dimensions of change.

The book takes the reader on a journey, beginning with establishing the imperative to act. Having established the urgency to act, it reflects on the struggle for radical transformation between activism and vested interests and discusses the potential of different approaches. It then turns to exploring why change seems so hard, or is so strongly resisted, exploring issues of inter- and intra-generational inequities of consumption of mobility, finding within the macro narrative opportunities to build on by recognising these differences. The final part of the book reflects on the need to change not just behaviours but institutions. It does this by reviewing how institutions operate today and why they might resist adapting to the new reality. It offers a hopeful reading of how to overcome the barriers to radical change by recognising, exploring, and accelerating the change already here and the change potential that exists through agonistic experimentation. Change is going to happen as a result of global warming – this book argues that we need to move to a more adaptive and radical footing to enable society to continue to flourish.

This book is aimed at researchers, practitioners, and citizens who want to bring about positive change for their communities. The book allows a deep dive into the systemic problem of climate change, but also provides examples of how research can work with communities to both think and act differently.

**Monika Büscher** is Emerita Professor of Sociology at Lancaster University, UK. Her research on mobilities explores low-carbon transport innovation, the informationalisation of emergency response and risk governance, IT ethics, and infrastructuring equitable urban futures. She has led research in a range of national and international projects (DecarboN8, GREAT, BRIDGE, and SecInCoRe). She has published many articles and books, including *Ethnographies of Diagnostic Work, Mobile Methods, and Design Research: Synergies from Interdisciplinary Perspectives*. She established the book series *Changing Mobilities* (Routledge) with Peter Adey.

**Greg Marsden** is Professor of Transport Governance at the Institute for Transport Studies at the University of Leeds. He has researched issues surrounding the design and implementation of new policies for over 20 years, covering a range of issues. He is an expert in climate and energy policy in the transport sector and the governance of smart mobility. He is currently exploring the role of place in the energy transition and the potential for transformative post-car-ownership futures.

**Changing Mobilities**
Series Editors: Monika Büscher, Peter Adey

This series explores the transformations of society, politics and everyday experiences wrought by changing mobilities, and the power of mobilities research to inform constructive responses to these transformations. As a new mobile century is taking shape, international scholars explore motivations, experiences, insecurities, implications and limitations of mobile living, and opportunities and challenges for design in the broadest sense, from policy to urban planning, new media and technology design. With world citizens expected to travel 105 billion kilometres per year in 2050, it is critical to make mobilities research and design inform each other.

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# Changing Mobilities

**Monika Büscher and Greg Marsden**

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# 1 Introduction

Modern mobility technologies, from mass-produced cars to space missions, have brought great benefits to humans. But some human mobilities are now linked to anthropogenic overshoot on six out of nine Earth system boundaries, pushing the planet "well outside of the safe operating space for humanity" and much of non-human life (Richardson *et al*. 2023, 1). Governance is failing. The 196 countries that pledged to limit the temperature increase to 1.5°C above pre-industrial levels at COP21 in Paris in 2015 have already seen the annual average global surface temperature rise to 1.63°C for the period May 2023–June 2024 (World Meteorological Organization 2024), and the 30-year average temperature is on course to breach 1.5°C in 2033 (Global Temperature Trend Monitor 2024). The effects of climate change are already devastating for millions of people. Current policies put the world on course for 3.1°C warming this century (United Nations Environment Programme 2024), and models of Representative Concentration Pathways (RCP) suggest that "between half (RCP2.6 [1.6°C]) to three-quarters (RCP8.5 [4.3°C]) of the human population could be exposed to periods of life-threatening … impacts of extreme heat and humidity by 2100" (IPCC 2023, 922). Delaying climate action is also highly consequential, because every day that passes without a reduction in $CO_2$ emissions either increases the speed and scale of reductions required in the future or the global average temperature. Figure 1.1 visualises the precipitous pathway global society is on.

Transport produces around 24% of global $CO_2$ emissions from energy alone (discounting embodied and infrastructure emissions), and it is one of the hardest sectors to decarbonise, because it is a socio-cultural system that has become deeply embedded in material infrastructures and land-use patterns, everyday practices, as well as financial, socio-economic, cultural, and political systems the world over (Brand 2021). Keeping it that way serves some very powerful people and interests.

Limiting $CO_2$ emissions to 1.5°C means that oil deposits worth US$ 59 trillion (740 billion barrels) will have to stay in the ground by 2050 (Welsby *et al*. 2021). Continued expansion is either:

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> a vast carbon bubble, with investors and companies wildly over-speculating on the value of fuel reserves that can never be burnt, or no major corporation believes that there is any chance of keeping to the limits … Burning all these carbon reserves would increase global temperatures by at least 6°C.
>
> (Urry 2014, 116)

The prospect of stranded assets provides strong incentives for some to develop strategies of "climate [disaster] capitalism" to benefit from destruction, and extreme forms of offshoring or "off-earthing", which involve "utterly massive geo-engineering projects", space travel, terraforming, and asteroid mining (Urry 2014, 116). Major fossil fuel companies like Exxon also mobilise "merchants of doubt", who question the seriousness of climate change consequences, and the efficacy of mitigation measures (Oreskes and Conway 2010; Supran, Rahmstorf and Oreskes 2023). Supported by "think-tanks and pundits who launder the most extreme positions into subtler, more 'palatable' lines of attack, ensuring that climate delay is always in the news" (King 2023, 4), fossil fuel industries, car manufacturers, and other actors with vested interests practice green-washing as well as lobbying and manipulation (Maani *et al.* 2022). This effectively undermines a public sense of crisis.

In her incisive investigation of how Earth became the *Petrochemical Planet*, Alice Mah finds "a calculated war mentality" at the heart of efforts to delay climate action (Mah 2023, xiv). Powerful actors strategically invest billions in political influence, with the "largest expenditure" being on advertising and

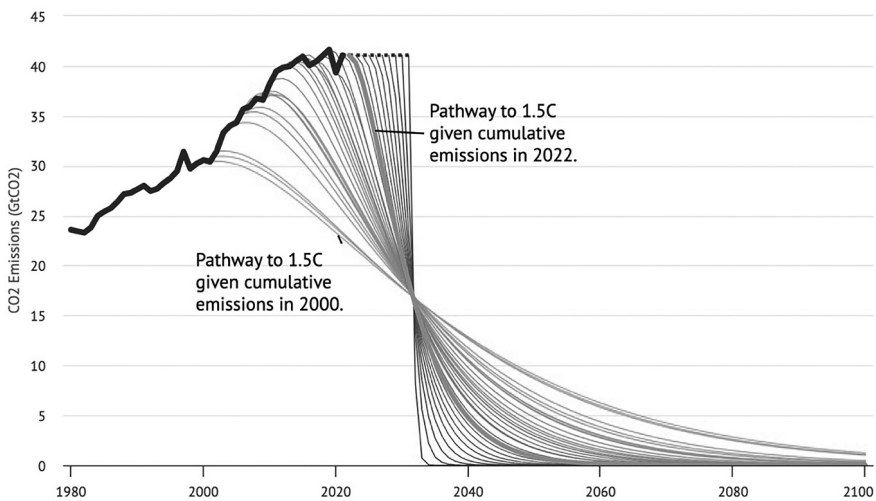


*Figure 1.1* Emission reduction trajectories associated with a 50% chance of limiting warming below 1.5°C.

*Source:* CarbonBrief 27.10.2022. CC-BY-NC-ND-NC-ND4.0. https://www.carbonbrief.org/unep-meeting-global-climate-goals-now-requires-rapid-transformation-of-societies/.

promotion, which has "played a key role in thwarting government attempts to implement climate policies" (Brulle and Downie 2022, 1). They also fuel a "misinformation machine" that circulates "discourses of delay" to stir up public support for their interests (Ruths 2019; Lamb *et al.* 2020). Taking stock of the varied strategies employed to suppress climate action and better understand "what we are up against", Steinberger finds that overall, "the neoliberal project has always been, and continues to be, antidemocratic at its very core" (Steinberger 2024, 8). Given the neoliberal focus on freedoms, this sounds counterintuitive, but its proponents "view freedom not from the perspective of human beings who require a decent minimum from the economy" but through the eyes of producers "who should be utterly free to act without any social or democratic claims or curbs" (Steinberger 2024, 7), and they believe that only markets, not governments can provide that freedom. Steinberger draws on Wendy Brown's analysis of neoliberalism, which traces this antidemocratic momentum to the historical context of Nazi totalitarianism in Germany (Brown 2019). Friedrich Hayek and the members of the Mont Pelerin Society were convinced that "so long as the belief in 'social justice' governs political action, this process must progressively approach nearer and nearer to a totalitarian system" (Hayek, quoted from Brown in Steinberger 2024, 7). Their free market ideologies now drive a powerful zombie spirit of capitalism and business-as-usual high-carbon mobilities, making the radical and rapid change needed to address ecological overshoot extremely difficult. We deepen this discussion and address the question "How to be radical?" in Chapter 2.

At the same time, a groundswell of grassroots and municipal initiatives is challenging this direction of travel. The 2015–16 car-free observatory reviewed 200 initiatives from 95 cities around the world, and found that they are powerful catalysts for more "liveable" cities (Ortegon-Sanchez, Popan and Tyler 2017). Now, more than 2,355 jurisdictions and local governments in 40 countries, representing over 1 billion citizens, have declared a climate emergency (Aidt 2024). Initiatives to go "car-free" were spreading as a new norm for governing change in urban transport well before the COVID-19 pandemic (Kirkbride 2019), although many are not aiming to be literally "car-free". It would be more appropriate to talk of post-automobility futures (Dennis and Urry 2009), which may include (combinations of) many innovations, such as active travel and shared mobilities (e.g.(Loorbach *et al.* 2021), "playborhoods" (Shrestha and Mathema 2023), mobility as a service (MaaS) (Pangbourne *et al.* 2020; Milne *et al.* 2024), 15-minute cities (Samson and Freudendal-Pedersen 2022), the smart city (Jirón *et al.* 2021), and automated mobility (Büscher and Yu 2024). Public support is strong in some places. In 2018, 63% of Spanish citizens, for example, were in favour of "severely restricting" cars from city centres, and the Spanish coalition government claimed an area of 472 hectares for a low-emissions "Madrid Central". Nearly 300 diverse regions, towns, and cities across the world have implemented fare-free public transport schemes, developing inter-municipal solidarity and connectivity. Many of them are using fare-free public transport to support sustainable and inclusive mobility systems (Kębłowski 2023). In Cali, Colombia, residents of "informal" or popular

settlements are working with researchers and policymakers to address intersectional injustices of the urban mobility system (Gallego Méndez *et al*. 2023), and cities and communities across Africa are developing measures that support the one billion people on the continent who walk and cycle every day (UNEP 2022). As we explore in Chapter 3, thriving mobile societies are possible when we engage with the question "What moves us?" creatively. But decarbonising mobility at scale is a struggle, linked to the "long revolution" for social justice (Williams, 1961). At a time when radical and rapid change is needed, and 60% of people globally believe that they will be failing future generations if they and their governments do not act (IPSOS 2023), efforts to change mobilities are caught in a welter of obstacles. In this book, we explore how to overcome them.

## Transport Mobilities

Mobilities are changing continuously, and this has been a focus of investigation across different disciplines. Awareness of the social and political nature of mobility cuts across this transdisciplinary field. When "[c]hanging patterns of global mobilities developing in the 1990s seemed anomalous", they triggered "social scientists to develop accounts that did not presume sedentary, bounded, and static states and societies" (Sheller and Urry 2016, 11). At the same time, physical and virtual mobilities accelerated time-space compression (Harvey 1992). Social scientists observed how "liquid modernity" dissolved traditional certainties of identity, work, family, and social mobility (Bauman 2000; Giddens 2013), and rendered individuals responsible for their own life-chances in increasingly precarious worlds of work, relationships, and risk. Mobile lifestyles were an integral part of this process, connecting and disconnecting people (Elliott and Urry 2010). Invisibilisation of structural societal forces and responsibilisation of individuals coincided with the neoliberal financialisation of everything from healthcare to education to public transport.

The mobilities paradigm develops an analytical orientation that examines the centrality of changing patterns of mobilities, blocked movements, immobilities, and mobility infrastructures across the world (henceforth captured as im|mobilities). Multiple interlocking mobility systems shape the extraction and distribution of resources, the movement of people, goods, ideas, information, and policies, intersecting with the im|mobilities of animals, biota, chemicals, viruses, and diseases. The social and material dynamics involved are the subject of a vibrant research field, with two handbooks that link studies of migration, tourism, communications, as well as transport (Adey 2014; Büscher *et al*. 2020). Through its comprehensive focus on the ontology and politics of interconnected im|mobilities, this research provides unique critical and creative leverage on the obstacles that stand in the way of sustainable transport (Adey 2006; Sheller and Urry 2006; Hannam, Sheller and Urry 2006; Cresswell 2012). Most significantly, it reveals how patterns of im|mobilities constitute social and material realities in a process with many openings for change, but also many mechanisms for perpetuation.

Mobilities-inspired research identifies that "A key political, economic, and ideological barrier to addressing the petrochemical crisis, across multiple scales, is lock-in" (Mah 2023, 145). Rather than seeing lock-in just as the well-established institutional construct from political science, mobilities research draws on complexity theory to understand the infrastructural and cultural path dependencies underpinning the way global society works. Deeply "locked into a system driven by the imperative for expansion and consumption" of petrochemicals, which "are ubiquitous in modern life" (Mah 2023, 145), driving, flying, and shipping are complex socio-material systems; they have become an integral part of more and more people's lives, and they are also the most high-carbon-emitting mobilities (Figure 1.2). Moreover, the energy consumption of the transport sector has increased more rapidly than other sectors, "with almost a threefold growth from 1971 to 2015, higher than industry consumption (around +80% increase) or residential consumption (roughly +90%)" (Noussan, Hafner and Tagliapietra 2020, 2). This growth is unsustainable but locked into everyday life.

The "automobility system" has come to dominate everyday life across the world, with huge inequalities. It has evolved around "six components that in their *combination* generate and reproduce the 'specific character of domination' that it exercises", including the car as a highly desirable object, often the most or second-most expensive object that people own, and "an extraordinarily powerful *complex*" of technologies and industries with

> car parts and accessories; petrol refining and distribution; road building and maintenance; hotels, roadside service areas and motels; car sales and repair workshops; suburban house building; retailing and leisure complexes; advertising and marketing; urban design and planning; and various oil rich nations.
>
> (Urry 2004, 26)

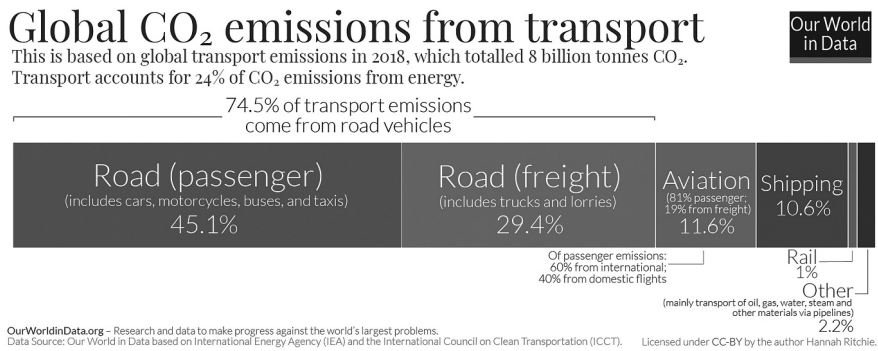


*Figure 1.2* Global $CO_2$ emissions from transport in 2018.

*Source:* Our World in Data, Hannah Ritchie CC-BY https://ourworldindata.org/co2-emissions-from-transport.

The "aeromobility system" similarly involves "technology, community, governance, time/space perceptions, social interaction, urban development and the environment" as well as a cultural "*habitus to fly*" (Cwerner, Kesselring and Urry 2008, 9). In shipping, the largest containership today, the MSC Irina, built by the Chinese Jiangsu Yangzijiang Group, has the capacity to carry 24,300 twenty-foot containers, holding 72,900 sports utility vehicles, 216,000 microcars, such as Microlino, or more than one billion smartphones. More than 5,500 container ships are part of a global system that also comprises "various air, rail and road networks, which contingently supply those living in the North with an estimated 90 per cent of 'everything'" (Birtchnell, Savitzky and Urry 2015, 1). But to really understand the system of "cargomobilities", "one must drill down from the port to the ship to the container to the commodity to the labour processes and, ultimately, to the social relations of production that are being 'moved' across seemingly abstract space" (Steinberger in (Birtchnell, Savitzky and Urry 2015, 36)). Mobilities research shows that Cartesian conceptions of space as an abstract surface "across", or container "through", which people or goods move from A to B, are too simplistic. Such flat ontologies veil the fact that time and space are lived, and actively constituted through im|mobilities. In fact, it is through the "restructurings of time and space" that mobility systems generate "the need for ever more cars [planes, ships] to deal with what they both presuppose and call into existence" (Urry 2004, 27). This reflexive restructuring reaches deep into social imaginaries.

Transport mobilities are driven by im|mobilities of ideas and emotions that shape social interactions and are shaped by a "magic system" of advertising (Williams, 1961) that links driving, flying, and consumption to freedom and the good life. In a study of "automotive emotions", Sheller argues that

> Emotional geographies of the car occur at different scales ranging from the feeling of the individual body within the car, to the familial and sociable settings of car use, to … regional and national car cultures … Cars will not easily be given up just (!) because they are dangerous to health and life, environmentally destructive, based on unsustainable energy consumption, and damaging to public life and civic space. Too many people find them too comfortable, enjoyable, exciting…. They are deeply embedded in ways of life, networks of friendship and sociality, and moral commitments to family and care for others.
>
> (Sheller 2004, 236)

The mobilities paradigm enables understanding of these complex reality-constituting dynamics and the ways in which they cut across different scales and material, cultural, and social dimensions, linking the movement, blocked movement, and immobilities of capital, products, resources, people, and ideas. A mobilities lens suggests that we should reject as inadequate approaches that seek to present choice as the solution without also questioning how such choice could really transition away from the deeply embedded lock-in conditions that we face.

**Unlocking Dependence and Inequality**

The influence that fossil fuel industries, aviation, automotive, and shipping corporations wield may seem, and indeed be, Machiavellian. But these industries, too, are locked in. They create and depend on the societal dependence described above, because their business models are "based on long investment cycles, large scales of operations, major investments, and incremental process innovation" (Mah 2023, 145). Petrochemical production "is locked into vast infrastructures of integrated petrochemical and refinery complexes, oil and gas pipelines, and logistical networks" (Mah 2023, 145, see also Mattioli *et al*. 2020). These are the arteries of wider socio-technical and cultural mobility systems, and the fact that these systems comprise so much more than fossil fuel, planes, cars, ships, or containers means that we need to not just change the energy that fuels them, or the technology, or undo human "behaviour" and choices, but unlock dynamics of dependence and change the systems.

This is very hard to do, in part because systemic socio-cultural, economic, and material processes are, in actor network theory vocabulary, actively "purified" or "invisibilised" in everyday ontologies. Mike Michael uses the example of road rage to show how this works. Public debates often reduce road rage to a weakness in human nature or culture, making invisible "the contributory role of the car itself", the way it insulates and cocoons, and its character as a technology that "can become too complicated, too fast, for our nervous system", when, actually, they all play an important role (Michael 2001, 64). Car-dependence is similarly often simplistically presented as a matter of individual choice, when it is also, significantly, the product of systemic processes. Mattioli *et al*. (2020, 12) show that spaces "physically designed for cars", including roads, parking lots, shopping malls, business parks, and suburbs, "reinforce car culture, not as a neutral preference, but through spatial coercion" made invisible through the normalisation and global spread of such land-use patterns. The 2008 global financial crisis revealed such systemic entanglements, when residents locked into car-dependence in American suburbs miles distant from employment sites became "collateral for new transnational circuits of parasitic mortgage debt, investment and speculation" (Scott 2011, 306). Exploitative debt practices, "refined in America's racially marginalized inner cities" had spread into "the vast, white middle-class terrain of Sunbelt suburbs" (Scott 2011, 306), and, in the crush of the financial crisis, many suburbanites impoverished by unemployment and spiralling mortgage costs lost their homes. Since then, inequality has soared in the United States as well as within and between countries elsewhere, with the year 2023 marking the first time in 25 years that poverty has increased globally (Oxfam 2023, 7). The COVID-19 pandemic once again foregrounded the ongoing exposure of the poorer parts of society to mobile risk. In the UK, just over half of the population never worked from home during the pandemic, and those who continued to go to work were more likely to live in peripheral areas, be on lower incomes, and be more car-dependent (Anable and Marsden 2022). Current planning processes and relationships

leave cities and communities around the world "dependent on oil and petrochemical production" and facing bitter jobs-versus-environment "struggles for environmental justice in polluted fenceline communities" (Mah 2023, 145–146). These struggles are linked to the *long duree* of colonial history: "Our contemporary unsustainable mobilities fundamentally rest on colonial, neocolonial, and neoliberal forms of power that embed racial injustice into global mobility systems and uneven energy infrastructures" (Sheller 2021, 51). Multiple pasts, presents, and futures entangle in ways that discount the safety of future generations, and in Chapter 4, we explore the complex temporalities of sustainable mobilities to leverage capacity for change.

Policies designed for decarbonising transport can exacerbate inequalities at local and global scales. For example, low-emission zone charges and fuel taxes often disproportionally burden those who can least afford it – car-dependent self-employed delivery drivers, tradespeople, rural workers, or farmers; and the production of electric vehicle batteries incurs high ecological, economic, social, and health costs for people in countries where mining for raw materials takes place (Henderson 2020; Keil and Steinberger 2024). In Chapter 5, we examine the relational and inequitable multiscalar dynamics and unanticipated consequences of futures made with a focus on "now here".

The mobilities paradigm supports analyses of such relational interdependencies and:

> enables the development of a mobile ontology which not only tracks the effects of inequalities in mobility across various connected sites and scales, but also shows how justice itself is … not a once-and-for-all state or a series of abstract conditions that must be met, but is a process of emergent relationships in which the interplay of diverse (im)mobilities forms a foundational part.
>
> (Sheller 2018, 42)

As a paradigm shift in Thomas Kuhn's sense, a mobilities analytical orientation enables new ways of seeing social and material realities in the making, as well as opening up new avenues for changing these dynamics. From its inception, awareness of the performative, planetary, and political character of mobilities has inspired a normative approach, turning attention to how im|mobilities could be designed differently (Jensen and Lanng 2016; Hefner *et al.* 2024), or how the very processes, politics, and relationships of producing im|-mobile realities could be changed. We are particularly interested in changing energy-intensive forms of surface transport because these mobilities generate 75% of $CO_2$ emissions (Figure 1.2). But air travel and shipping also require attention. Taking a mobilities perspective, we explore systemic dynamics and draw out that the challenge is not just to undo "behaviour", but the system.

However, mobilities research also shows that unlocking dependence on high-carbon mobilities is not just an engineering or design problem. In his book *What is the future?*, John Urry cites the futurologist, engineer, designer,

and inventor Buckminster Fuller, who observed that "You never change anything by fighting the existing reality. To change something, build a new model that makes the existing model obsolete" (Urry 2016, 78). But actually, "building" a new system is impossible; new systems can only grow organically when the right processes synchronise, as they did, for example, when mobile phones rapidly became an essential part of everyday life. To engender such an organic transformation, to make it equitable, and to anticipate and address unanticipated consequences at the scale and speed required, we need a sense of crisis. But such a sense of environmental and equity crisis is actively suppressed.

## The Zombie Spirit of Capitalism

In a study of capitalism in France, Luc Boltanski and Eve Chiapello show that social critique can actually strengthen and renew the "spirit" of capitalism by providing incentives for reform whilst stymying radical change. In response to critiques of inequality, for example, practical adjustments, such as debt relief, can be mobilised (Boltanski and Chiapello 2007). They can diffuse resistance and keep the neoliberal system functioning. The 2008 financial crisis, for example, inspired stronger regulation and accountability in the banking sector, reining in the worst excesses at the time, changing the form capitalism takes, but not its nature. During the COVID-19 pandemic, governments funded furloughed workers and supported some of the sectors most seriously affected, such as hospitality and public transport. Green New Deal policies today similarly recommend exemptions and financial support to make a neoliberal decarbonisation of transport more equitable (Energy Saving Trust and Green Alliance 2023), whilst calls for industry standards to mitigate environmental and social impacts of cobalt mining are similarly motivated (World Economic Forum 2020). It is this capacity for "spiritual" renewal that makes capitalism extraordinarily resilient, even though "it is an absurd system" – promising "the good life" of autonomous freedom and wealth whilst depriving wage-earners of "ownership of the fruits of their labour and the possibility of pursuing a working life free of subordination", all the while yoking capitalists "to an interminable, insatiable process" of growth by circulating capital into investment (Boltanski and Chiapello 2007, 7), inevitably overshooting Earth system limits.

The perpetually delayed gratification of neoliberal capitalism is, paradoxically, an enormously powerful incentive. As a system "singularly lacking in justification" (Boltanski and Chiapello 2007, 7), capitalism must continuously re-generate ideology "to succeed in engaging the people who are indispensable", including investors, producers, and consumers (Boltanski and Chiapello 2007, 24). Hugely powerful memes, from "growth" and "competition" to "development", are designed to evoke associations of "attractive, exciting life prospects", "guarantees of security and moral reasons for people to do what they do", as well as fictitious collective benefits of poverty reduction (Boltanski and Chiapello 2007, 24) and sustainability. These narratives leverage support, and they are hypermobile. Indeed, Aihwa Ong characterises neoliberalism as a

"mobile technology" that has spread across the globe, adapting with great agility to vastly different contexts, from liberal democracies to authoritarian states (Ong 2007). This ideology and practice are both extraordinarily mobile and sticky, permeating everything from economic relations and markets to people's sense of self and social relations. It captures our imagination, persuading us to imagine "ourselves as essentially isolated, lonely, competitive economic agents. It relies on us imagining that the system is the natural expression of human nature, or that it is too powerful to be changed" (Haiven 2014, 7). Diagnosing the critical role that such ideological im|mobilities play, Ong shows how neoliberal ideas have naturalised as "common sense" forms of extraction and accumulation by dispossession that devour the commons and the very basis for life. Absorbing everything in their path – "public utilities ('let's privatize it!'), the counterculture ('let's brand it!') …, the new spirit of capitalism … feeds off the energy of its adversaries like a parasite" (Butler and Loacker 2022, 1). It is critical to be aware of these dangers of co-optation because the forward-hurtling momentum of the zombie spirit of capitalism carries more than just ecological destruction at its core.

As Polanyi observed in 1944, "to allow the market mechanism to be the sole director of the fate of human beings and their natural environment … would result in the demolition of society" (Polanyi 1944, 73). Now, Thomas Piketty shows that, like ecological overshoot, increasing inequality is an integral structural feature of capitalism (Piketty 2017, 597). He charts how world wars, the Great Depression, and major crises that made millions destitute in the past have periodically inspired efforts to close the gap between rich and poor. But, he argues, beyond such major and abrupt crises, the most effective peaceful policy "for avoiding an endless inegalitarian spiral … would be a progressive global tax on capital" (Piketty 2017, 597), including "confiscatory tax rates on incomes deemed to be indecent (and economically useless)" (Piketty 2017, 600). Incredibly, now that they have become the engine room of the mobile technology of neoliberalism and growth, the United States and Britain actually pioneered such radical taxes "of income or inheritance at a rate of 70–80 percent" in between the world wars of the early 20th century (Piketty 2017, 668). The main aim was to disincentivise incomes and large estates that had come to be seen "as socially unacceptable and economically unproductive" (Piketty 2017, 668). Now, powerful arguments for a similarly deep socio-economic transformation are emerging with new economic theories that replace a focus on economic growth measured through gross domestic product (GDP) with a focus on human growth and "prosperity in a flourishing web of life", for example through doughnut economics, where distributive and regenerative economic activity takes place within a safe and just space bounded by an ecological ceiling and a social foundation (Raworth 2017, 240). Broader frameworks for degrowth, post-growth, or sufficiency economics, and post-development set out how redefining ideas of the good life, development, growth, and wealth can enable sustainable resource and energy use (Kallis *et al*. 2018; O'Neill *et al*. 2018; Kothari *et al*. 2019; Cattaneo *et al*. 2022; Kallis 2023).

Some such alternative ways of (literally translated) living well or *buen vivir* (Chuji, Rengifo and Gudynas 2019) already exist, and they could leverage wider transformation.

## Im|mobilities of *Buen Vivir*

*Buen vivir* is a practice, worldview, epistemology, ontopolitics, and ethic that emerges from Indigenous communities, centred on interdependence and cooperative relations amongst living beings. It is one of many concepts that capture indigenous knowledges and discourses that have long been marginalised. Similar concepts in Latin America include *sumak kawsay* (Kichwa), *suma qamaña* (Aymara) (Acosta and Abarca 2018), *ubuntu*, which emphasises "the southern African value of human mutuality", and *swaraj* from India, which is "centred on self-reliance and self-governance" (Kothari *et al.* 2019, xxviii). Even "some elements of Aristotle's 'good life' can be retrieved in this collective effort to (re) construct a puzzle of elements supportive of new ways of organising life" (Acosta 2017, 33). These ways are new in the sense that they "break with the paradigm of progress, and its stepson development" (p.29), but they are sometimes ancient, realised, and scalable "nowtopia", not remote fantasies. They are practised in myriad places and forms. Whilst many of these ways of life are practised by "communities that have not been fully absorbed by capitalist modernity, … even in other areas, not directly linked to the indigenous world, harmonious opportunities of communal life are built among its members and with nature" (Acosta 2017, 32). *Buen vivir* is not one unified blueprint for living well, but an emergent plural practice that is embedded in many pasts and presents. Recognition that "indigenous worlds, in a broad sense, have been victims of colonial conquest as a process of exploitation and repression, which is impactful until this day" is critical (Acosta 2017, 32). But this is a source of energy and "Good Living consists, therefore, in a task of (re)construction" (Acosta 2017, 32). Some of the fundamental elements that multiply into forms of *buen vivir* include:

- Rejection of linear conceptions of life – of "underdevelopment and development, a dichotomy across which people and countries should move" (Acosta 2017, 34).
- Recognition of a need for radical change: as a socio-bio-centric vision, *buen vivir* rejects "the anthropocentric logic of the dominant capitalist civilisation and of the different forms of socialism that have actually been implemented" and recognises that "there is a need to overcome the capitalist "civilisation of inequality" … a civilisation that is essentially predatory and exploitative. As a consequence, *buen vivir* proposes a change of civilisation" (Acosta and Abarca 2018, 133–134).
- A commitment to present and future as well as ancestral obligations and wisdoms through practical "nowtopia" where "Good Living does neither consist of a mere invitation to go back in time … Nor can it become a type of religion" (Acosta 2017, 34).

- Appreciation of difference and plurality – *buen vivir* is multiple, adaptive – it "does not deny the existence of conflicts and contradictions" (Acosta 2017, 34), in fact, it nurtures diverse perspectives and dialogue.
- Non-anthropocentric dedication to dignity and interdependence – *buen vivir* ways of life "overcome the dominant anthropocentric visions and accept that life either is dignified for all beings or is not dignified at all" (Acosta 2017, 35).

There is little discussion specifically about im|mobilities of *buen vivir*, and in the remainder of this book, we seek to contour some of them. A good starting point is resonances with **banua*, an ancient Austronesian concept that, like *buen vivir*, describes an interdependent ontology of "fertile, life-providing land, where a society (or part of a society) develops in mutual custodianship with the ancestors" (Dartoen 2014, 2). But, arising from seafaring societies, *banua also eloquently articulates a mobile ontology "connecting people, ancestors, stars, canoes and other vessels, ocean, islands and continents" (Suliman *et al*. 2019, 300). Such concepts can create "a cultural scaffold for past, present and future (im)mobilities" and "an orientation for thinking about Anthropocene (im)mobilities" (Suliman *et al*. 2019, 300), where transport is understood in the context of wider im|mobilities.

On many counts, they enable a better life than the "good life" of hypermobile neoliberalism. Most modern societies have come to depend on "their capacity to increase economic and technical efficiency and material wealth" through what Rosa calls "dynamic stabilisation", a way of pacifying "social conflicts by providing employment and social security" and fostering "the privatisation of the good life" (Rosa and Henning 2017, 2). This addictive, self-perpetuating modern logic of dynamic stabilisation through hypermobile accumulation, expansion, progress, and growth is not only unsustainable, but also creates a "steady struggle" that leaves people "'trapped' on treadmills … which foster constant dissatisfaction" (Rosa and Henning 2017, 7). In contrast, *buen vivir* provides a "mode of stabilisation [that] is … adaptive; [where] growth, acceleration and innovations can and do occur, but they are either accidental or adaptive, i.e. they are reactions to changes in the environment" (Rosa and Henning 2017, 5). *Buen Vivir* and its adaptive stabilisation "makes possible the subordination of economic objectives to ecological criteria, human dignity, and social justice" (Walton, Eldridge and Oji 2022, 62). It holds solutions to the crises of ecological overshoot and inequality, specifically with a view to reducing the impact of transport, by redefining what mobilities mean and are for. In a powerful critique of high-carbon mobility systems, Cass and Manderscheid construct a vision of an "autonomobility system" centred not on machine but on *human* autonomy, "freedom-focused, environmentally sustainable *and* socially just" (Cass and Manderscheid 2020, 103). They "provocatively posit [this] autonomobility as an ideal for mobility studies and activism rather than the more standard goals of accessibility, equity or justice" (Calarco 2023, 81). Their autonomy is a relational freedom of self-determination and from compulsions of either mobility or immobility, which enables "the mutual flourishing of

individuals *and* collectives" (ibid.). Calarco's *Reflections on Roadkill* (2023) push Cass and Manderscheid "to expand the future imaginary" to all living beings (Calarco 2023, 85). Such critiques show how societal innovation could shape mobilities of *buen vivir*, or what one might call "doughnut mobilities".[1] Some researchers focus on the promise of such new forms of mobile life, suggesting, for example, that a cycling-based autonomobility or "Vélomobility" system could mount a comprehensive "challenge to the political underpinnings of automobility" (Cox 2023, 265). Indeed, Cox argues, "Vélomobility is to degrowth as automobility is to growth" (Cox 2023, 265). Echoing Whitelegg, Cox argues that leaving the car behind is a positive change, not a "shrinkage in a growth society", because "to reduce distance travelled is not to urge confinement" (Cox 2023, 273). Vélomobility can encompass pedal-powered vehicles of many kinds. It is not accessible for all, but cycling can be "part of a technological commons that facilitates conviviality not alienation", and enable a reshaping of "spaces of travel as spaces of communication, not just corridors of movement" (Cox 2023, 274). Cycling enables autonomy, sensory enrichment, sociability, connection to nature, and self-reliance. Cox's Vélomobility is one of a growing set of calls for mobility and climate justice beyond climate coloniality (Sheller 2018, 2023; Cook and Butz 2020) and non-anthropocentric mobility systems (Hodgetts and Lorimer 2020; Calarco 2023), as well as approaches of commoning mobility (Sheller 2018; Nikolaeva *et al*. 2019; Adey *et al*. 2023), and democratic reflections on "what mobility is for" (Cass and Manderscheid 2020, 106). As we discuss in Chapter 6, a growing number of initiatives now seek to operationalise degrowth in urban planning (Cattaneo *et al*. 2022; Kaika *et al*. 2023; Kębłowski 2023). However, this is an epochal civilisational challenge because it requires, as we discuss in Chapter 7, ways of thinking differently, a change in how we understand what it means to be human and how societies organise themselves, resisting the strategies of a Goliath complex of fossil fuel, automobile, and aeromobility industries. This is a fight against almighty odds.

**Slow Violence, and Culture War**

Ecuador and Bolivia are leading the way, having adopted *buen vivir* into their constitutions to defend citizens and environments against exploitation. Equitable access to mobility plays a major role, and Quito's Line One Metro is celebrated as a success (World Bank 2024). However, close examination shows that improvements are highly variable (Quezada Larriva *et al*. 2023), and the project is "linked to … sustainable development, which would allow real estate speculation", where often "sustainability is only used as a theory of the real estate sector through instruments and public policies to benefit its profitability and development" (Calva 2022, 56, 67, translation with Deepl). Such co-optation means that still, "Unfortunately, in practice, the governments of these countries are inspired by the very logics of developmentalism in their administrations, notions that are very distant from the Good Living" (Acosta 2017, 33). Some observers argue that the concept of *buen vivir* has become an

"empty signifier, allowing for its instrumentalization", continuing "efforts to promote … development to the GDP" logic of the global economy (Domínguez, Caria and León 2017, 133). At the grassroots end of *buen vivir*, the confluence of the many lived examples, too, is troubled by the zombie spirit of capitalism. In a world where poverty and exclusion mean that more and more people are "left behind", a "precariat", suspended in "cruel optimism" and subjected to "slow violence", seems closed to the promise of good living and sufficiency, complicit in co-optation. In this book, we argue that there is a need to recognise these impediments and build new not only physical, but also ideological, policy, and communicative mobilities to enable a transition away from zombie capitalism and towards transformative *buen vivir*. We need to move away from automobility, but not see this as a reference case against which alternative futures are therefore viewed as a loss – instead, we need to enable recognition of the different character and benefits of *buen vivir*. This requires a better understanding of, as Julia Steinberger puts it, "what we are up against" (Steinberger 2024), not just in terms of state and corporate power, but also cultural attachment to dysfunctional interpretations of values.

For many people stuck in poverty and social immobility, a paradoxical attachment to conditions of exploitation develops in pursuit of a "good" life defined by dynamic stabilisation: a never-ending quest for more money, more cars, holidays, consumption, more "freedom" to choose to consume and travel more. The relation is cruel, because, for most, that good life remains forever beyond reach. It is a mirage, a promise perpetually postponed to the next generation. Paradoxically, the desire for this good life becomes "an obstacle to … flourishing" (Berlant 2011, 1). It never comes, but the promise binds billions of people into exploitative conditions and actually deprives them of freedom, health, happiness, and well-being. Environmental justice studies have long highlighted how environmental risks intersect with these dynamics, disproportionately immobilising and exposing whole communities (such as the fence-line communities neighbouring waste disposal sites) in line with intersectional structural dynamics of racism, poverty, gender, and other forms of discrimination, creating human and ecological "sacrifice zones" (Nixon 2011; Bullard 2019; Mah 2023). This amounts to "slow violence", "a violence that occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all" (Nixon 2011 2). But deprivation and environmental destruction now mean that "entire *populations* are subjected to it, rendered expendable, not just particular, localized communities and spaces" (Pellow 2017, 17, emphasis in original). Climate change is a threat multiplier that exacerbates and spreads this slow violence on a global scale by mobilising and immobilising people in various ways.

376 million people have been displaced by climate disasters since 2008, and in 2022, 84% of refugees and asylum seekers fled from highly climate-vulnerable countries (Apap and Harju 2022; UNHCR 2024a). More than "410 million people could be at risk from rising sea levels by 2100" (World Economic Forum 2024), and whole island communities already have to plan relocation because

sea-level rises are taking their homelands (McMichael and Katonivualiku 2020). The number of refugees has tripled in the last decade (UNHCR 2024b). But the picture is complex. Migration is a historically normal expression of human autonomy, and pathologising it with apocalyptic climate migration narratives is misleading (Bettini 2013; Boas *et al*. 2019). Fifty-eight per cent of forcibly displaced people stay within their own country (UNHCR 2024a) or find sanctuary in the 22 countries that experience climate change most severely. These are countries "already fragile due to poverty and insecurity" that "will find it particularly challenging to adapt to the effects of climate change (UNHCR 2024a, 31). This requires frameworks for human mobility based on concepts of collective security and solidarity (Andrasko 2022). Yet, in many nations in the Minority World or Global North, alarmist immigration rhetoric is articulated in response to such im|mobilities and the ethical, social, and political challenges that arise from them. "Expendable" or "left-behind" populations in the rich minority world (are encouraged to) perceive immigration as an existential threat. From his ethnographic studies with transnational Lebanese and White racists, Ghassan Hage recounts a powerful story that illustrates some of the dynamics behind this:

> The story begins with the 'established'/White person owning a nice car and the immigrant 'outsider' who has just moved into the neighbourhood buying themselves a motorbike. Some time after settling, … the immigrant neighbour buys a car ….
>
> (Hage 2009, 3)

This sparks conflict. Hage's participant observations reveal feelings of resentment amongst the established/White residents, not of the

> ownership of the car itself (since they already own a better one) but the [social] mobility implied in the move from a motorbike to a car at a time when they feel that they have remained stuck where they are.
>
> (Hage 2009, 3)

The immigrant's "existential mobility" is construed as an affront to the "sense of community among those who are stuck 'waiting out' the crisis", suggesting "an unwillingness to be part of the community of the stuck" or "left behind". Culture-war mobilisation of xenophobia and conspiracy beliefs fan such fires, but, echoing Hage's findings, it is not the poorest who fuel the fire. Adam-Troian *et al* show that subjective experiences of precarity are most consequential, and:

> votes for populist movements or candidates … tend to be more prevalent among the lower middle class whose earnings and available income may be higher than that of the lower-classes, but who struggle to deal with the financial requirements of their relatively 'more wealthy' lifestyle (e.g. paying mortgages vs. social housing rent).
>
> (Adam-Troian *et al*. 2023, 141)

This is true, even if populist politics is against their own interests.

Inglehart and Norris see hope for solidarity amongst the diverse groups affected by precarity, because "[i]n the long run, growing economic inequality is likely to bring a resurgence of mass support for government intervention—even though, for now, mass solidarity and resistance is held in check by emotionally-hot cultural issues" (Inglehart and Norris 2017, 451. We are less optimistic because these are often not naturally contested issues, but deliberately *made* divisive by actors with a stake in keeping the zombie spirit of neoliberal capitalism alive. Divisive narratives sap humanitarian ethics and civility, and bolster a rise of anti-democratic "post-politics" or "anti-politics" (Arendt 1968), where, under a permanent sense of "existential" crisis, civil apathy, polarisation, and desperation divide and disrupt, complicating climate governance. The worst impacts are often felt by those contributing least to climate change, whilst for well-off citizens of wealthy countries, it is difficult to connect their holiday flights and driving habits with culturally and/or spatially distant poverty and global breakdown, as we set out in Chapter 5, mediated through the narrative of capitalist development. Indeed, support for the "Stop the Boats" campaign invented by the UK Conservative government, and fanned by the far-right Reform Party, constitutes an example of the highly divisive denial of humanity and responsibility for the wider climate risk which our mobile lifestyles generate. The election of Donald Trump in the US takes such trends to a geopolitical and planetary level. As we argue further in Chapters 4 and 5, the damage to other environments, other people, and other places being affected now and baked into the future by "us" here now has to be part of the discussion on the imperative for change today.

## Changing Mobilities

"Governments, in aggregate, still plan to produce more than double the amount of fossil fuels in 2030 than would be consistent with limiting warming to 1.5°C" (UNEP 2023), and in this book, we seek to better understand why there is such a deadlock and how to overcome it. We focus mainly on change in surface transport mobilities, seen through the lens of our research in the UK and through a review of a wide range of initiatives, studies, and theories. We took this broad-ranging approach to contextualise understandings arising from our own research. We map key directions in which transport mobility systems *are* actually changing, evaluate what is standing in the way of adequate and positive change, and explore opportunities for transformation. We argue that whilst national and international governance is failing and technocratic innovation "solutionism" is entrenching hypermobility, already occurring changes in an emerging mobile "undercommons" – a growing global-local assemblage of transformational initiatives – are changing mobilities from the inside out. They are a powerful engine of change, not only enabling more sustainable mobilities, but also new mobile ideologies and politics. They experiment with ways of overcoming the destructive social, economic, and political market ideologies

that made the first *Great Transformation* and its great acceleration into the Anthropocene possible (Polanyi 1944; Steffen *et al*. 2015). They enact examples of human flourishing in a web of life, developing a pluriverse of prefigurative post-growth mobility systems for *buen vivir*. These islands of systemic change are increasingly networked to exchange ideas and strategies, cooperate, and coordinate. Their confluence is a new opening for new frames of reference for human flourishing in social, economic, and ecological interdependence. But appreciation of what mobility could and should mean in a flourishing web of life needs to spread, develop, and translate into action much faster and much more widely to reduce and prevent overshoots, and adapt to the consequences of the damage that has already been done. In this book, we connect an assessment of how radically and rapidly mobility systems *need to* change, specifically to address climate change (one of two "core boundaries" for a liveable Earth (Richardson *et al*. 2023) with an exploration of the diverse ways in which mobility systems *are* changing, and how this could be amplified.

### *Our Mobile Methodology*

We have been trying to change mobilities for years and have found our own capacities wanting, as well as those of many stakeholders we have worked with – policymakers, communities, civil society actors, and local authorities in the UK. To bootstrap greater capacity, we have invented, developed, adapted, and deployed what we view as mobile methods.

This book is based on systematic reflection and synthesis of research we have undertaken individually and jointly in a series of collaborative projects between 2011 and 2024. Building on my work on creative futuring and mobile methods in a series of collaborative design projects focussed on developing mobile and digital technologies with professionals in landscape architecture, healthcare, and emergency and disaster response, I (Monika) worked together with Carlos López-Galviz, Nick Dunne, Lynne Pearce, and Nicola Spurling to adapt Ruth Levitas' idea of utopia as method to examine people's hopes, fears, and dreams about mobility (Levitas 2013; López-Galviz, Büscher and Freudendal-Pedersen 2020). We organised a series of futuring events that invited researchers and members of the public to create a "mobile utopia" by bringing or making "utopian everyday objects" and telling their story, along with a series of *Mobile Utopia Experiments*, where groups experimented with making alternative mobility futures inhabitable and reflect on their desirability and unintended consequences (Büscher 2017).

In 2011, Greg began a series of projects looking at what we could learn from studying moments of disruptive change. This was both about how society adapted and reconfigured its practices and mobility patterns and about how the policy system responded (Marsden 2024). It revealed the importance of recognising ongoing processes of change, such as the long-term decline in trips made and the reduction in miles driven in high-income groups in particular. However, it also confronts some very difficult-to-shift institutional inertia,

which serves to deny these possibilities and lock in the status quo. The work developed further through the DEMAND Centre, where a joint grouping of practitioners and academics was established to explore these trends and what they tell us about the potential for change – the Commission on Travel Demand (Marsden *et al*. 2018). Again, the challenges of accepting the potential for change to meet the demands of our climate targets emerged. This resulted in a shared project, *DecarboN8*, which brought together a network of academics, including both authors, to decarbonise surface transport in the North of England, funded by the UK Engineering and Physical Science Research Council in 2019. From a period where almost no local authorities had transport and climate strategies, we conducted work to support the development of, and reflection on, the strategies which emerged, including through 15 pump-priming projects. In-depth studies of "Cumbria 2037 Mobility Futures" and "Bridging the Gap" explored how some of these ideas might transform planning and delivery processes (Büscher *et al*. 2022, Mitchell 2023*)*. The work resulted in a framework and methodology for societal readiness assessment (SoRA), which challenges the logics of technology-led solutions, technology readiness, and user acceptance as the route to understanding change possibilities (Büscher and Cronshaw 2022; Büscher *et al*. 2023).

In the collaborative Gridding Equitable Urban Futures in Areas of Transition project (GREAT 2019–2023), Monika and Carlos López-Galviz collaborated with colleagues in Cali, Colombia, and Havana, Cuba, whose work with communities in "informal" or popular neighbourhoods helped to develop a methodology of "public labs". These are public spaces and processes that nurture experimental production of inhabitable pockets of just sustainability futures, as well as dialogue within the communities and with policymakers, urban planners, and politicians. They adapted and renamed the method "Populabs", which highlights the fact that these laboratories are driven by the inhabitants of popular neighbourhoods (Gallego Méndez *et al*. 2023).

We call these methods mobile not just because they often involve literally going along with participants. In resonance with reflections on mobile methods, we certainly do not think that mobile methods are unique to mobilities research or always novel, or that they allow superior access to an independent lived mobile reality (Laurier 2010; Merriman 2014; Spinney 2015). On the contrary, our methods are deliberately designed to mobilise people, mobilise futures, move experimentally and imaginatively into futures to evaluate them, and move into contexts where decisions are made and change those processes. We deliberately make our methods mobile in this sense to counter the methods of the mobile technology of neoliberalism. Within a mobile ontology, methods of knowledge production need to be collaborative, and it is important to recognise that methods do not just reveal realities, they *make* realities in intra-action with all participating entities – people, environments, technologies, ideologies, and more (Barad 2007; Jensen and Lanng 2016; Davidson 2021). This is a powerful tool to counter the petrochemical and mobilities industries' war-like efforts to perpetuate dynamic stabilisation.

Ultimately, our work has intertwined to create a new five-year collaborative project, INFUZE (Inspiring Futures for Zero Carbon Mobility 2024–2029). The project asks what would need to change for a city such as Leeds to be a place you could live in without needing to own a car. It starts from the considerations synthesised in this book, taking a co-design approach and drawing on the work on futuring and SoRA as a foundation for its generative thinking. It directly challenges the assumption that the start point of future strategies is one based around individual ownership of cars and the system of automobility that flows out from that. As such, it does not place the solution in a frame of individual behaviour change but asks how a city would function if it were not based around individual car ownership. And it asks people to co-design the answers. We build towards a discussion as to how such approaches could be transformative in Chapters 7 and 8.

### *A Note on the Making of the Book and its Structure*

We have both spent many years in collaborative action research to change mobility systems, but our approaches differ. Greg's background in transport governance has inspired close scrutiny of change trajectories and policy, whilst Monika's engagement in mobile methods has produced new ways of critically facilitating creative futuring, constructive dissent, and co-creation. Since our paths converged in the DecarboN8 project in 2019, we have discussed "changing mobilities" – what needs changing and how to do it. Our perspectives differ in useful ways, and this book presents insights from our collaborative research and discussions, reflects on what we have been able to make happen, and draws out what we see as critical actions for the future. In the process of writing, we found that rather than trying to speak in one voice, we can use the creative frictions between our different perspectives and approaches to deepen the analysis. To do so, we have carried our dialogue into the structure of the book and each individual chapter.

Chapter 2 addresses how to be radical – reviewing different perspectives on radical and rapid change. Chapter 3 reflects on why we travel and, therefore, what needs radical transformation. Chapter 4 focusses our attention on rapid change and addresses questions of time. In Chapter 5, we move to space and relationality by exploring change at different scales. Chapter 6 begins to put together modes of change with a discussion of different forms of action in what we refer to as the mobile undercommons. Chapter 7 explores why change is seen as difficult and problematic within decision-making systems today and offers insights into ways to overcome these long-standing barriers. Chapter 8 describes mobile methods and approaches we have developed to facilitate thinking and, importantly, acting differently, before we conclude with Chapter 9.

## Note

1 We thank Keith Mitchell for inspiring the idea of doughnut mobilities in the context of our collaboration on the Stantec *Bridging the Gap* report (Mitchell 2023).

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# 2 How to Be Radical?

In 1972, the authors of the Club of Rome Limits to Growth report revealed that "rapid, radical redressment of the present unbalanced and dangerously deteriorating world situation is the primary task facing humanity" (Meadows *et al*. 1972, 193). Half a century later, this call has become a "broken record" (UNEP 2023), drowned out by a cacophony of voices demanding growth. Unlike the Trojans who ignored Cassandra's warnings, we are aware of existential danger: surveys show that "More than half of people globally said they were more worried about climate change now than [in 2023], and four out of five want their countries to strengthen commitments to address climate change" (UNDP 2024). But many *still* gladly accept the horse. It carries not just the abstract ideologies of neoliberal fossil-fuel capitalism, modernity, or technocratic scientism that see the root causes as "fixable" within business as usual, but also insurance companies, banks, the military, and billionaires like Amazon's owner, Jeff Bezos, or Australian mining heiress Angela Bennett, who actively fund academic research. Deception is practised skilfully at many levels, capturing governments along with the *zeitgeist*. In 2021, the KPMG Group, one of the top four accounting firms in the world, asked what the modelling tools used by the original Club of Rome team would reveal now. Using data available in 2019, they found that the methods used in the 70s had remarkably accurately predicted collapse for many systemic variables of world population, food and industrial production, health and education, non-renewable natural resources, and pollution (Figure 2.1, Earth4All 2023).

Business as usual aligned "most closely with observed data", and still indicates "a halt in welfare, food, and industrial production over the next decade or so" (Herrington 2021, 614). Herrington is part of Earth for All's Transformational Economics Commission, where researchers supported by – amongst others – the Angela Bennett Foundation and the Ford Foundation through Partners for a New Economy – have further developed the models to track how "for 50 years, since The Limits to Growth report and the 1972 UN Stockholm summit, the world has ignored the risk of system collapse" (https://earth4all.life/the-science/).

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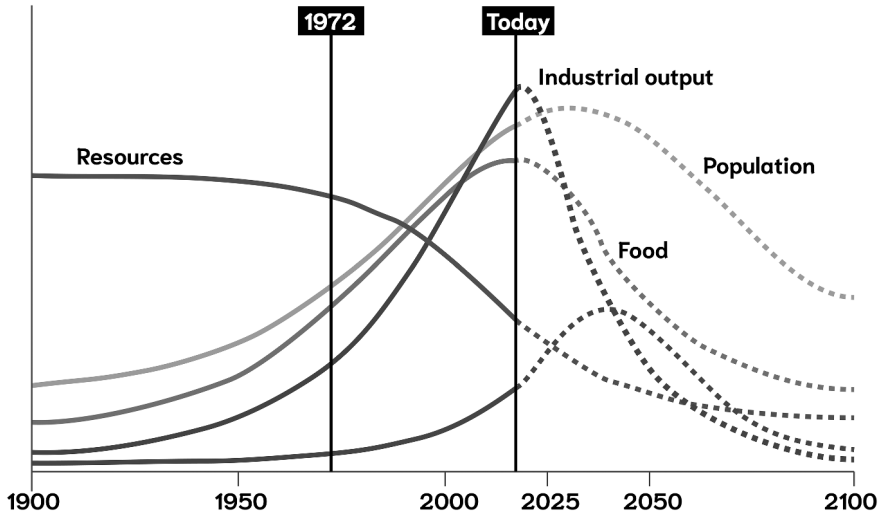


*Figure 2.1* Stylised synthesis visualisation of major trends adapted from Limits to Growth, 1972.

*Source:* https://earth4all.life/the-science/, https://earth4all.life/the-book/, https://earth4all.life.

The original study envisaged several scenarios, tipping points, and timelines, including "Comprehensive Technology", which envisaged technological innovation significantly above historical averages, and "Stabilized World", which added a radical change in societal priorities and values. Herrington's update inspired a more comprehensive analysis in *Earth for All: A Survival Guide for* Humanity (Dixson-Declève *et al*. 2022). Drawing on Kate Raworth's doughnut economics, the authors argue that turnarounds on five major challenges (inequality, energy, food, poverty, and empowerment) could enable "radical shifts" to "close the loop on an extractive economic system and make it not just circulatory but also regenerative" (Dixson-Declève *et al*. 2022, 164). However, the "solutions" proposed rely on technological and ecomodernist measures, considering, for example, that in transport "the potential for radical systemic efficiency is vast" (Dixson-Declève *et al*. 2022, 133). Indeed, on close reading, instructions for how *not* to be radical pepper the *Survival Guide's* search for redress. The penultimate chapter, for example, entitled "From 'Winner Takes All' Capitalism to Earth4All Economies" elaborates on the importance of the commons for a new economics, but fails to acknowledge research on post-development and degrowth. Instead, it coins a new term: "We call it a transformational wellbeing economics" (Dixson-Declève *et al*. 2022, 164).

For groups developing and operationalising degrowth into spatial planning, being silently co-opted like this is no surprise. In their introduction to a special issue of the *Urban Studies Journal*, Maria Kaika and colleagues showcase examples of how cities and communities are developing a pragmatic and

"radical spatial degrowth agenda in the face of the climate emergency", and reflect on a long history of co-optation:

> The contemporary C40 Cities network mobilises a rhetoric that can be interpreted as a co-optation of degrowth principles … the Thriving Cities Initiative downscales the Doughnut to city level in Philadelphia, Barcelona, and Amsterdam (Doughnut Economics Action Lab [DEAL] 2020). It remains to be seen whether these 'watered down' versions of degrowth will lead to transformative change or will simply facilitate the continuation of business as usual.
>
> (Kaika *et al*. 2023, 1203)

When half a century of warnings about the "unbalanced and dangerously deteriorating world situation" (Meadows *et al*. 1972, 193) have failed to bring about sufficiently radical and rapid change, including changes to how and how much we travel (Marsden and Anable 2021), we need to ask: Why? What needs to change? This chapter seeks ways to bring about radical change. It explores different perspectives on how to be radical, and we argue that multiscalar heuristics of transition are a powerful starting point, but no match to the complexities and the inherent momentum of a modern mobile risk society to "win itself to death" (Kesselring 2024, 8). As powerful actors with vested interests proliferate doubt and uncertainty, water down transformational approaches, and fan a "radical war" around business as usual, we agree with Natasha Lennard and Xiye Bastida that we need better certainties (Lennard 2022; Donald 2024; Outrage and Optimism 2024). These are not necessarily radically new but have the potential to be radically transformative.

## Transition Through Radical Innovation

A broad and diverse assemblage of activists, designers, and scholars has developed visions of sustainable mobility "transition" towards low-carbon lifestyles. Their ideas of "radical" vary, but one of the most dominant lines of argument focusses on innovation. For example, the Critical Mass movement forming in 1990s San Francisco, when small groups of workers started riding together as a "commute clot" to claim a safe space on major roads, has developed into an international self-organised monthly gathering where sometimes thousands of cyclists take over roads, cycling slowly and handing out leaflets, asserting "We are not blocking traffic, we are traffic!" (Furness 2010, 299, in Popan 2020, 108). It is an example of how social innovation and "the very act of collective riding in a safe space (especially one created by that very collectivity) creates new possibilities of political imagination" (Cox 2023a, 210). Through their "performative critique of motorized traffic" (Furness 2010, 299, in Popan 2020, 108), the movement does, in fact, do more than radically challenge political imagination. It is "an accomplished bicycle utopia or a 'nowtopia'" that concretely enacts transition and the social space that mobilities at the speed of

a bicycle would create (Illich 1973; Popan 2020; Cox 2023b). The Transition Movement "embodies a radical transformation" with more comprehensive ambitions (Hopkins 2018, n.p.). It is based on inclusive democratic processes designed to develop and nurture sustainability through cultural innovation at the community level, and "While mobility is not foremost among their concerns, their general philosophical orientation is towards relocalization … [including] dramatically reduced mobilities of food, energy, capital and materials as well as people" (Adey *et al*. 2023, 29). These examples of radical activist and localist lived utopia prefigure alternative futures, but they are also dependent on issue-based advocates and advocate groups, as well as enthusiastic participants; they lack coherence and influence.

Broader transition research has helped position such issue- or community-driven efforts to deepen understanding and leverage momentum. The multi-level perspective (MLP), in particular, has provided a unique perspective on radical change for more than two decades (Geels 2002; Geels and Turnheim 2022). In a review of debates within this field, Geels and his colleagues Geels *et al*. (2018) tie radical change to "radical innovation [that] is about creating new sociotechnical systems" that align across multiple levels (p. 32). The MLP recognises the entangled nature of energy and transport systems and distinguishes three interconnected levels. Firstly, the current system constitutes a sociotechnical "regime" where tangible elements such as road infrastructures, land-use, consumption patterns, and supply chains are "reproduced by actors and social groups, whose perceptions and actions are shaped by rules and institutions, such as shared meanings, … rules of thumb, routines and social norms" (Geels *et al*. 2018, 26). At this level, innovators, policymakers, and governments face lock-ins of path dependency, sunk investments, regulatory measures, social norms, and cultures. As a result, innovation at this level is mostly incremental, developing existing capabilities. More radical change can arise from the second level, where actors like Critical Mass or the Transition Movement, but also independent Non-Governmental Organisations, researchers, municipalities, and corporations or businesses have greater capacity to think "out of the box". They can conceive and develop radical innovations, including new technologies (e.g. electric vehicles (EV) or smart mobility), innovations in business models (e.g. platforms to support car clubs, or EV as energy storage), as well as social innovations (e.g. new mobility practices or services), and combined innovations. However, according to the MLP, many of these "radical novelties initially have poor price/performance characteristics", and require support related to "applications, geographical areas, markets" through "subsidised programs" that "act as 'incubation rooms' – called 'niches' – which protect novelties against mainstream market selection" (Geels *et al*. 2018, 26). An "exogenous environment beyond the direct influence of niche and regime actors" constitutes a third level that can enable, but also constrain, or even undermine regime and niche-level innovation through changes in "cultural preferences, demographics, and macro-political developments, or through short-term shocks such as macro-economic recessions and oil shocks" (Geels

*et al*. 2018, 26). Geels *et al*. (2018) also identify three non-linear phases of emergence, diffusion, and impact, where the radical-ness of innovation becomes increasingly more difficult to sustain. The protection of niches, for example, can enable the emergence of radical ideas, but development and diffusion "almost inevitably entails some 'mainstreaming' and weakening of the radical aspects of the innovation" (Geels *et al*. 2018, 27), and the impact of innovations may engender rebound effects where, for example, EV are cheaper to run, enabling users to afford larger vehicles and drive more, eliminating emission savings, or creating congestion, and quality of life washback.

Three interconnected lines of critique of the MLP have inspired the development of the perspective. The first highlights the disproportionate focus on technology and markets, when "transitioning to new technologies is insufficient and perhaps unnecessary" (Adey *et al*. 2023, 33), and the focus on market performance betrays a far-from-radical alignment with economic growth and ecomodernist conceptions of change that seek to fit even social innovation into market-economy frames (Biely and Chakori 2024). A second line of critique shows that separating out political and social justice issues into an "exogenous" landscape means that power is treated in a mechanistic way. Where the MLP does address power, it "remains defined in relatively technocratic terms as something that actors use or have" (Davidson 2021, 28). But power is relational, emergent, and performative of the very mobility systems that the MLP seeks to change, making it critical to ask who wins and who loses, and how exploitation or exclusion operate across different scales and levels. Tyfield (2014) shows, for example, that China is strategically driving electrification of transport to become the "next Detroit" within an expanding global EV market, but the process engenders "new social distinctions, exclusions and (violent) disciplinary techniques" (Tyfield 2014, 590). Similar dynamics apply to autonomous vehicles and markets (Büscher and Yu 2024). Thirdly, critics argue that the MLP naturalises established elite-driven and paternalistic conceptions of innovation, where entrepreneurs initiate radical innovations, supported by investors and policymakers, and social acceptance or societal readiness is conceived as a matter of prospective "users" realising the power of these innovations – perhaps needing education or nudging. This is embedded in powerful standards measuring "Technology Readiness Levels", a dynamic we analyse in Chapter 8, because it neglects to ask how ready these innovations really are *for* society or how good (Büscher *et al*. 2023), and passes over the potential of grassroots social innovation.

## Expanding the Scope of "Radical"

Many researchers are tackling these critiques to expand the radical scope of innovation. Adey *et al*. (2023), for example, argue that it is important to look beyond technology to address what mobility means to people. How "mobility is valued" is often lost when "traditional forms of transport geography and some streams of MLP" treat "mobility as a measurable variable to be appropriately

manipulated and engineered" (Adey *et al*. 2023, 36). In contrast, mobilities research "insists on recognizing that the ways in which we move, our mobile practices, are filled with significance and laden with power" (Adey *et al*. 2023, 36). A particularly strong example of this is the authors' critique of discourses of scarcity. Scarcities of road space "are a consequence not of lacking infrastructure but of presumptions about the value of particular mobilities above others" (Adey *et al*. 2023, 125), expressively illustrated by Fabián Todorović Karmelić for the Mexican Institute for Transport and Development Policy (ITDP) (Figure 2.2).

Walking, cycling, social interaction, and children's play *could* find space in our streets, and the fact that it does not is the outcome of social and political choices. The role of mobility in constituting social and political realities "has not been critically reassessed at a societal level" meaning that "reducing mobility of goods and people remains a 'taboo' subject within neoliberal growth paradigms and ecological modernization approaches" (Adey *et al*. 2023, 126). To resolve this, Adey *et al*. elaborate on ideas of radical transformation through mobility justice and commoning.

Mobility justice is about far more than "equitable distribution of accessibility", which "is not enough for a radical transformation", because "it 'does not recognize the underlying wider politics of uneven mobilities', for instance by taking for granted equal participation in decision making and treating space as a neutral 'container'" (Sheller 2018, cited in Adey *et al*. 2023, 124). Commoning mobility can produce more equitable politics and realities. It involves "a set of processual relations through which … [mobility] becomes common"

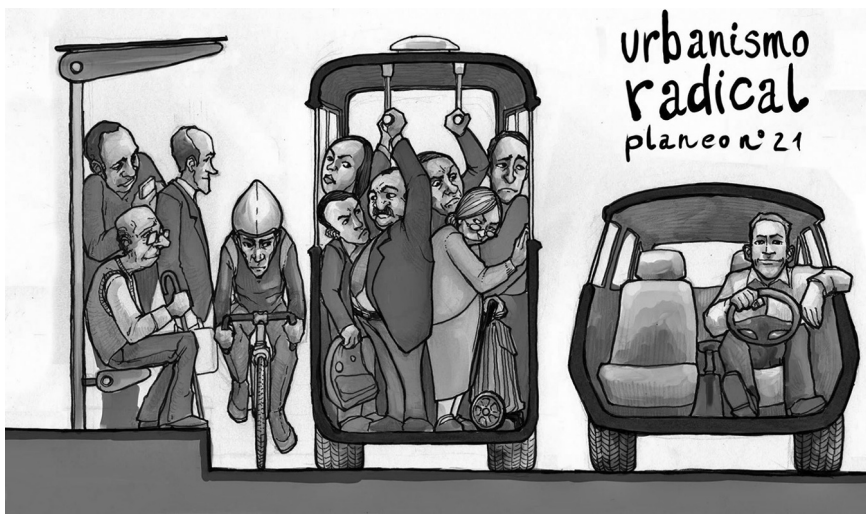


*Figure 2.2* Scarcity of mobility space is an effect of political choices.

*Source:* Cover of Planeo Magazine N°21 "Urbanismo Radical" (Planeo Magazine 2015). Illustration by Fabián Todorović Karmelić.

(Adey *et al*. 2023, 130), which challenges discourses of scarcity. A mobile commons starts with "the availability of means to move safely and freely about the community with minimal impediment or inconvenience" (O'Boyle 2010, 59, cited in Adey *et al*. 2023, 130, but creates a new politics of mobility and space, where "small-scale, localized endeavours such as community-owned transport and social enterprises running transportation services as common infrastructure" can produce different spatial and social realities (Adey *et al*. 2023, 131). This more politically radical mobility transition entails

> communal decision-making practices, openness to new forms of perceiving the right to mobility as well as the right to immobility (the right not to be displaced), the awareness of the social production of mobility and the power relations inherent in it, as well as a commitment to creating equity and working in the interest of the public good, contested as it may be.
>
> (Adey *et al*. 2023, 132)

These lines of analysis expand the MLP's systemic focus by considering the possibilities of radical *social* and *political* innovation that challenge neoliberal ideologies of growth.

Analysis of the diffusion of low-carbon mobility innovations further widens these ideas. Geels and Turnheim (2022) develop the MLP to recognise a dialectic relationship between "external landscape pressures and bottom-up niche pressures [that] help destabilise the existing system", and posit a "fourth phase, [where] diffusing innovations replace the existing system, trigger more radical wider system reconfigurations, and become settled in a new status quo" (Geels and Turnheim 2022, 11). To address power in such processes of reconfiguration, Loorbach *et al*. (2021) are developing experimental transition governance approaches that "catalyze, accelerate and empower a transition to just, sustainable mobility by bringing together actors already contribut[ing] to it on a small scale" (Loorbach *et al*. 2021, 5). This is a way of addressing power not just as something that different actors use or have (more or less of), but as a relational effect of the very processes of pursuing transition. In their application of an experimental approach in Rotterdam, it "created a context within which different actors from niche and regime together converged on a shared radical ambition" (p. 8). Transition and mobilities researchers are also highlighting the importance of context and place for understanding radicalness (Schwanen 2015; Smeds 2021):

> In many Danish, Dutch and German cities, … there is now a decade-long tradition and sometimes dominance of … transport deemed environmentally sustainable – rail, bus, also cycling – which complicate the distinction between regime and niche …. Many cycling-related, … or intermodal transport innovations cannot be considered radical in those cities, although they might be labeled [sic] as such in other geographical contexts.
>
> (Schwanen 2015, 7089)

But the relationship between power, place, socio-political order, and mobility is co-constitutive, and studies like Tyfield's research on China show that "landscape" forces are not external, but "of central importance in understanding the potential for transition" (Tyfield 2014, 592). Indeed, through analyses like the above, landscape is "transformed from being a theoretical problem, a gap or blind spot to be addressed in good time, to the key question" for any framework (Tyfield 2014, 592). Just as auto-, aero-, and cargo-mobilities have become destructively co-constitutive of, and interdependent with, the new spirit of capitalism, transition has to address what kind of new socio-economic and political forms are or should be enacted in system transition. With growing understanding of the need for systemic, but also place-based, and nuanced forms of radicalness, it is becoming clear that to mobilise radical transformation widely enough to matter, innovation at the landscape level is needed. Brömmelstroet *et al*. (2022), for example, suggest that a participatory and democratic "collective search for new narratives" about mobility is pivotal (p. 2). Drawing on Donella Meadows' framework of leverage points, they argue that shallow interventions relying on technological innovations, subsidies, taxes, or standards must be complemented with interventions at "deep leverage points" such as the goals of the system and the mindsets or paradigms out of which the system arises. The authors suggest four potential seeds for new mobility narratives derived from social and sensory experiences of mobility, the social interaction and connection that mobility affords, "mobility as a commons rather than an individual right", and "mobility as unnecessity", where the burdens of (hyper-)mobility and the pleasures of localisation and immobility come to the fore (Brömmelstroet *et al*. 2022, 6). These seeds are "carefully selected as potentially amongst the most radical 'challengers' to the dominant mobility narrative" from a Western perspective, which must be extended with perspectives from across the globe (Brömmelstroet *et al*. 2022, 8).

Resonating with these more ontologically and politically radical perspectives on transition, degrowth approaches to urban transport planning are emerging, using, for example, the fare-free public transport (Kębłowski 2023) and Vélomobility (Cox 2023b), which we describe in the introduction. These approaches do question the ontopolitics of mobility by asking "what is mobility for?" (Cass and Manderscheid 2020) and explore how urban planning and "mobilities design" could be done differently to support more sustainable mobile lives (Jensen and Lanng 2016; Jensen, Lassen and Gøtzsche Lange 2019; Kesselring and Freudendal-Pedersen 2021; Hefner *et al*. 2024). Many of these approaches champion community and grassroots participation. However, engagement is all too often low on the ladder of participation (Arnstein 1969, Figure 2.3), working with policymakers more towards paternalistic consultation rather than genuinely enfranchising ownership. As a result, some potential participants now refuse the "tyranny of participation" (Cooke and Kothari 2001).

Of course, transition thinking came from a tradition that was not trying to radically transform existing systems, but to transition to a more sustainable

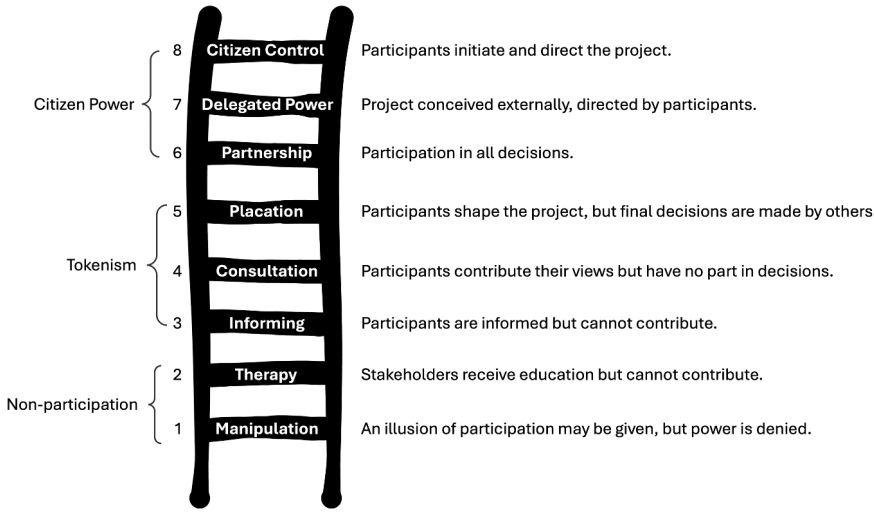


*Figure 2.3* Arnstein's ladder of participation.

*Source:* Adapted from Hart, Roger 1992 Wikimedia Creative Commons Attribution-Share Alike 4.0 International. https://commons.wikimedia.org/wiki/File:Ladder_of_participation-Hart.svg.

form. In that sense, it feels ill-equipped to understand the need for and possible processes towards more comprehensive transformation. But transitions research does provide powerful analytical leverage on many aspects of change – specifically on how it needs protected niches and ways to align changes across a range of levels, registers, domains, and the importance of nurturing creativity. Multilevel transition perspectives also enable recognition of the challenges of gathering momentum for change, and of the fact that to make something new, some of the old needs to be unmade. To succeed, actors may have to rearrange or elbow out existing actors, resist co-optation, or leverage it for radical purposes. The MLP on transition, therefore, offers something interesting. However, some analysts push for more explicitly radical conceptions of, and approaches to, change. From metamorphosis to ruination and collapse, these play out within the context of the "mobile risk society".

## Radical Social Change in the Mobile Risk Society

The continued expansion and acceleration of mobilities has allowed modern societies to develop, and come to depend upon, "highly sophisticated and powerful infrastructures of speed, flow, connectivity" in tightly coupled complex systems (Freudendal-Pedersen and Kesselring 2021, 83). Tightly coupled systems are prone to "normal accidents", that is, system failures that are inevitable but unpredictable, where processes cannot be turned off, "failed parts cannot be isolated from other parts", and "recovery from the initial disturbance is not possible, it will spread quickly and irretrievably for at least

some time" (Perrow 1999, 4). Moreover, "for a time, it is not known what the problem really is" (Perrow 1999, 5). Perrow was concerned with nuclear power stations, airports, and chemical plants, and his observations were part of a radical epistemic shift in understanding the role of risk in modern societies. Ulrich Beck observed that the "manufactured uncertainties" of modernity create novel dangers and tip whole societies, institutions, and publics into a new state:

> This state of 'radical indeterminacy' is characterized by not-knowing and reproduces multiple problems for human security: 'we live in a world that has to make decisions concerning its future under the conditions of manufactured, self-inflicted insecurity' (Beck 1999: 8). Building on this argument, Beck … argu[es] that the problem of nichtwissen [non-knowledge] is emblematic of the modern epoch … and this can be connected to declining public trust in institutional systems.
>
> (Mythen and Walklate 2016, 408)

Increased mobility and tourism foster social mobility, global consumption, and cosmopolitan exchange, but also create new risks, inequalities, and divisions. This has created a "mobile risk society" where unintended consequences and feedback loops intensify, and modernity essentially "wins itself to death" (Kesselring 2024, 8). Climate change is the most existential risk, but there are many others. Globally, around 1.19 million people die every year in road traffic crashes, the leading cause of death for children and young adults (WHO 2023). Traffic-related air pollution with particles of less than 2.5 microns in diameter ($PM_{2.5}$) has been linked to harmful effects on animals and humans, including respiratory problems, infertility, and Alzheimer's disease (Liu *et al*. 2019; Christensen *et al*. 2024), and microplastics from road run-off are found everywhere, from the Arctic to every human testicle (Carrington 2024). Im|mobilities drive planetary urbanisation, where the consequences of human activity now touch:

> even spaces that lie well beyond the traditional city cores and suburban peripheries – from transoceanic shipping lanes, transcontinental highway and railway networks, and worldwide communications infrastructures to alpine and coastal tourist enclaves, "nature" parks, offshore financial centres, agro-industrial catchment zones and erstwhile "natural" spaces such as the world's oceans, deserts, jungles, mountain ranges, tundra, and atmosphere.
>
> (Brenner and Schmid 2012, 13)

"Progress" boomerangs back on itself, so to speak. The harms that result are the "normal accidents" of the mobile risk society, and they challenge the inherently linear assumption of transition.

***Metamorphosis, Ruination, or Collapse?***

Some analysts are turning to more radical concepts to overcome the shortcomings of change conceived as a matter of transition. In his final book, *The Metamorphosis of the World: How Climate Change is Transforming Our Concept of the World*, Beck (Beck 2016) suggests that "we live in a world that is not just changing, it is metamorphosing" (p. 2). For Beck, aiming for transition is "nothing more than an attempt to recreate" the modern ideology of certainty, progress, control, and growth (Mårald and Priebe 2021, 7). It implies that "some things change but others remain the same" (Mårald and Priebe 2021, 3). Metamorphosis, in contrast, dissolves the old and allows new, categorically different life to emerge. It implies "epochal change of worldviews" (Mårald and Priebe 2021, 5). Key to this is an ontology where the constitutive role of im|mobilities is recognised (Tyfield and Blok 2016, 629). Resonating with Urry's call to transcend sedentary concepts of nation-state societies (Urry 2000), Beck calls for a Copernican-scale paradigm shift that spells the end of "methodological nationalism", which assumes "the turning of the world around the nation" (Beck 2016, 6). He advocates instead, a "methodological cosmopolitanism", which recognises how nations are constituted in and "turning around the world at risk" where the "metaphysics" of the world is changing (Beck 2016, 6).

To change mobility systems, it is not enough to encourage innovators and markets, change regimes, and landscapes at the national level. Global or planetary relational approaches are needed. Beck draws on Franz Kafka's novella *The Metamorphosis*, an allegory of the isolation of individuals in the modern age. In the story, the main protagonist transforms into an insect. However, the main transformation "is the inversion of the family hierarchy, which is initiated through the sudden transformation of its breadwinner" (Mårald and Priebe 2021, 8). Like Kafka, Beck seeks to illuminate that for the societal metamorphosis needed to address climate change, "the most fundamental change is likely to happen where it is least expected, and it is, primarily, a change of relations" (Mårald and Priebe 2021, 8). Kafka's novel is dark, but the metaphor of metamorphosis is intrinsically optimistic, evoking visions of a "butterfly" society emerging from the transformation. Two other metaphors elaborate relational ideas of change in more ambivalent ways.

The first, ruination, is powerfully elaborated in Anna Lowenhaupt Tsing's book *The Mushroom at the End of the World* (Tsing 2015). Tsing's ethnographic research traces how the history of capitalism

> has inspired investors to imbue both people and things with alienation, that is, the ability to stand alone, as if the entanglements of living did not matter. Through alienation, people and things become mobile assets; they can be removed from their life worlds in distance-defying transport to be exchanged with other assets from other life worlds, elsewhere. … Alienation obviates living-space entanglement.
>
> (Tsing 2015, 5)

Her study follows Matsutake mushrooms growing in the ruins of commercial tree plantations left behind by loggers, as well as the people foraging, selling, distributing, buying, and eating them. She finds that in the cracks of alienation, interdependencies of human and non-human carve new life from the ruins of capitalism:

> Imagine 'first nature' to mean ecological relations (including humans) and 'second nature' to refer to capitalist transformations of the environment. … 'third nature,' … [is] what manages to live despite capitalism.
>
> (Tsing 2015, viii)

Understanding this third nature is important because precarity "once seemed the fate of the less fortunate. Now it seems that all our lives are precarious" (Tsing 2015, 2). Caught in this "global state of precarity, we don't have choices other than looking for life in this ruin" (Tsing 2015, 6). Tsing poetically captures the existential import of this condition: "Precarity is that here and now in which pasts may not lead to futures" (Tsing 2015, 61). It "is a globally coordinated phenomenon" (Tsing 2015, 205), where timber logging, construction booms, mushroom delicacy culture in Japan, war, poverty, and migration, the pine forests left over from commercial forestry in the United States, and the ecology of Matsutake mushrooms are linked through complex social, value exchange, transport, and freight logistics networks. The mushroom gatherers, buyers, and consumers are at opposite ends of the social scale and the world, exemplifying simultaneously universal alienation and inequality. But Tsing also shows how people and mushrooms make good lives in the ruins of capitalism. Ruination, she argues, is a process that reveals a hopeful "latent commons" with relations "that might be mobilized in common cause" (Tsing 2015, 135). These relations weave solidarity. They are latent, because "while ubiquitous, we rarely notice them … they are undeveloped", but "they bubble with unrealized possibilities" (Tsing 2015, 255). These possibilities are not straightforwardly edenic, but ambivalent – recognition of interdependence can connect people, plants, animals, soil, and atmosphere for good sustainable lives, but "we can't hope for harmony", as even functioning commons "are not good for everyone" (Tsing 2015, 255). Tsing's insistence that capitalism and its consequences will prevail seems far removed from Beck's hopeful break from the old through metamorphosis, but her focus on the activations of "latent commons" in the ruins of capitalism can powerfully enrich ideas of mobile commoning. Sheller (2023), for example, uses Tsing's ideas to develop awareness of how climate coloniality continues to influence the production of inequalities. She explores the latent commons as rich with opportunities for changing mobilities, connecting indigenous knowledge and practices with the "many people [who] are reclaiming their relation to land, seeds, water, and soil through food sovereignty, agroecology, and #LandBack movements, which entail diverse mobilities and 'transmotions' as much as place-making" (Sheller 2023, 441). These insights into how alienation has made people and things footloose, but has not eradicated their capacity for convivial (re)connection, hold inspiration for sustainable transport mobilities.

***Im|mobilities of Collapse***

On the face of it, collapse is an even darker notion, a discourse of despair. It is an inherently mobile concept, evoking visions of tumbling structures, things falling apart at dramatic speeds, with the collapsing twin towers of 9/11 a paradigmatic example etched on many people's minds. French politician and member of the European Green Party, Yves Cochet, characterises collapse as "a process at the end of which basic needs (water, food, housing, clothing, energy, etc.) can no longer be provided [at a reasonable cost] to a majority of the population by services under legal supervision" (p.2). As we have argued, the experience of such a process would be highly variable. According to Servigne and Stevens (2020), collapse is not a distant prospect, but a reality here and now. It is possible to chart im|mobilities of collapse, perhaps the hallmarks of an emerging "mobile collapse society".

The English Lake District National Park – most well-known through the romantic imagery of its landscape of hills, lakes, sheep, small towns, and villages – is home to around 40,000 people. They host around 18.1 million tourists every year, which brings income but also problems. In a visioning workshop with residents, youth climate groups, members of the local authorities, the National Park Authority, and NGO, participants asked "What happens if we do nothing?". The discussion charted the already unfolding collapse, documented by a live cartoonist (Figure 2.4).

The participants summarised their analysis for a journal of the event – *Cumbria 2037: Decarbonising Mobility Futures*:

> Climate change is already causing problems in the Lake District. From the devastation of Storm Desmond to melting tarmac on public roads during the 2022 heatwave. Cumbria is car dependent and becoming more so during the cost-of-living crisis where fuel and car maintenance are becoming hard to afford for most households. We are not investing sufficiently in things that will help us towards sustainable and cheaper travel like walking, cycling and buses. There are currently proposals to build new roads in the County, but the roads we already have are not being maintained. If we do nothing, public transport will decline more – making life harder for some of the most deprived communities in the region (in West Cumbria around 25% of households don't have access to a car). A lack of public transport will make it harder for anyone to access the Lake District in anything other than a car. If we do nothing, Cumbria will become less attractive to visitors, tourism businesses will become less viable and local businesses will experience staffing problems as staff can't get to jobs. The vibrancy and viability of communities will further decline as they become ever-more car dependent.
>
> (Büscher *et al.* 2022, 3)

Climate change amplifies inequality, the dangers of driving, being driven, competition for road space, and damage to health and mental health in ways that are veiled by imaginaries of automobile freedom. The slow violence of

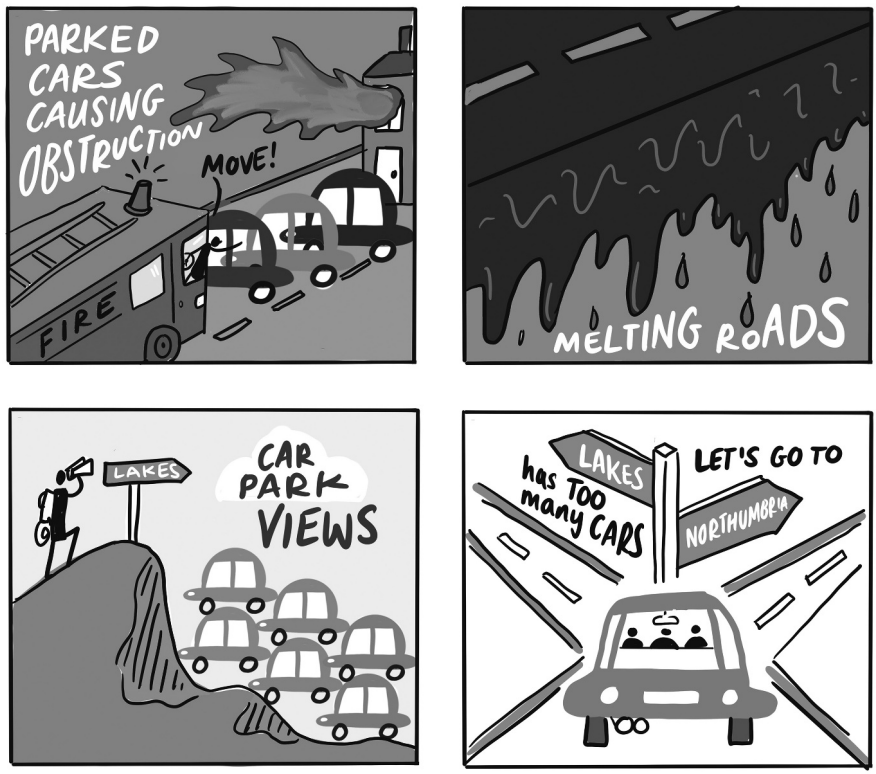


*Figure 2.4* A visualisation of a "do nothing" future discussed at Cumbria 2037: Decarbonising Mobility Futures.

Images by Nifty Fox Creative at DecarboN8 project Workshop 2022, CC-BY 4.0.

automobility is pervasive: "Through crashes, pollution, resource extraction, and climate change, automobility has reached – and worsened the health of – nearly every person on the planet" (Miner *et al*. 2024, 4). However, "car harm has grown to be so ubiquitous that it is socially constructed as normal, accidental, or inevitable" (Miner *et al*. 2024, 3). It is also insidiously systemic. Car dependence and shortage of housing near jobs that sustain a good life ironically play a critical role in vehicular homelessness, a phenomenon studied most closely in the United States, where it has been rising steeply. In the area around Seattle, the number of people living in their vehicles "has risen by 2,858% over 20 years" (Robbins 2023, n.p.). The fact that "People living in their vehicles are often new to homelessness, and [include] those with jobs, assets, and money saved in the bank" is an indicator of how precarity or the collapse of social certainties is spreading (Robbins 2023, n.p.). Many municipalities respond with prohibitions against overnight parking, displacing rather than addressing the problem.

Aeromobilities similarly exacerbate inequalities of collapse. Despite the risks of melting runways and re-routing due to extreme weather, aviation is set for future growth. But not everyone will be able to fly. Gössling and Humpe (2020) find that

> close to 90% of the world population does not fly in a given year, and of those flying, shares of in-between 11.0% and 26.5% have reported just one trip per year … On the other side of the flyer spectrum, very frequent fliers have reported to make 300 trips per year (i.e. some 600 flights).

that is, almost daily flights (p. 7). Graham and Marvin's observations of urban elites using helicopters to leapfrog the favelas in Latin American cities were perhaps an early sign not just of splintering urbanism (2001), but a splintering Earth, with spatial apartheid that holds expendable populations surface-bound, whilst the "percentile of the most frequent fliers – at most 1% of the world population – likely accounts for more than half of the total emissions from passenger air travel" (Gössling and Humpe 2020, 1). Some of the largest emissions are not even counted, including emissions from private jets (Gössling and Humpe 2020). Between 2020 and 2023, "European private jets emitted a total of 5.3 m tonnes of $CO_2$", and on average every billionaire emits "over a million times more than … someone in the bottom 90% of humanity" (Oxfam 2023). Inequality is also a characteristic of collapse in shipping, where "[a]mong the many possessions of billionaires, large 'superyachts' are by far the largest producers of greenhouse gases" (Barros and Wilk 2021, 319). Barros and Wilk (2021) detail these emissions for 20 of the world's richest billionaires, and a synthesis by Oxfam shows how – in many cases – these emissions, enormous as they are, are dwarfed by mobilities of finance (Figure 2.5).

Analyses of cargo shipping highlight that collapse is reflexive: as climate change has opened the Northern Sea Route along Russia's northern coastline, inviting more traffic, this has, in turn, exacerbated the risks of rising temperatures and pollution (Savitzky 2016). Collapse expands the "world of 'volatility, uncertainty, complexity, and ambiguity' (VUCA)" that the petrochemical industry as a whole positions itself in (Mah 2023, 29). VUCA is "a concept that was first advanced by the US military to describe post–Cold War contexts, but that has since become a twenty-first-century management buzzword" (Mah 2023, 29). The container backlogs of the COVID-19 pandemic, the blockage of the Suez Canal caused by the container ship *Ever Given* running aground, and ongoing wars and conflicts affecting the Red Sea area have changed business and supply chain management. "Just in time models" – the business standard for many decades, due to their highly efficient and lean capacity to deliver goods just when and where they are needed – are becoming too risky, and experts recommend a shift "toward a 'just in case' (JIC) model instead, which involves maintaining buffer inventory and excess production capacity" (Schwenk 2023, n.p.).

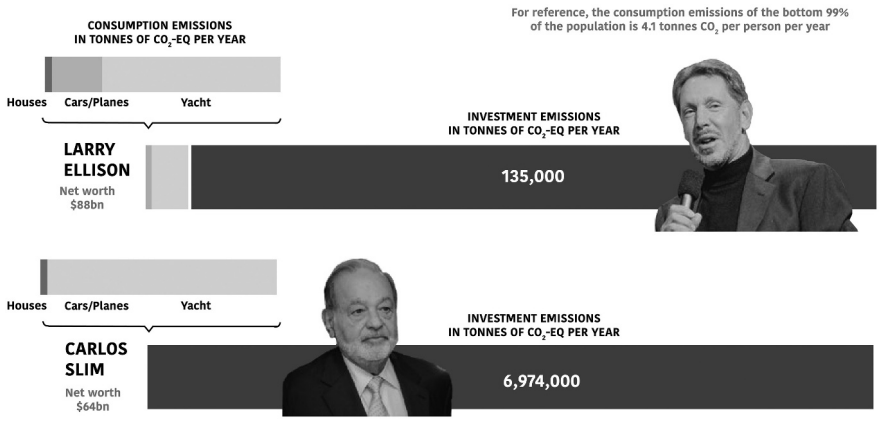


*Figure 2.5* Consumption and investment emissions – examples of two billionaires.

Source: Oxfam, Barros and Wild (2023). Reproduced with permission from Oxfam 2023, xvi.

The material "Climate Equality: A planet for the 99% - Ashfaq Khalfan, Astrid Nilsson Lewis, Carlos Aguilar, Jacqueline Persson, Max Lawson, Nafkote Dabi, Safa Jayoussi, Sunil Acharya Contributing authors: Ana Caistor Arendar, Alex Maitland, Anthony Kamanda, Iñigo Macías Aymar, Jonas Gielfeldt, Ruizhen Ma - 20/11/2023 (Figure ES.4 on page xvi)" is adapted by the publisher with the permission of Oxfam, Oxfam House, John Smith Drive, Cowley, Oxford OX4 2JY UK www.oxfam.org.uk. Oxfam does not necessarily endorse any text or activities that accompany the materials, nor has it approved the adapted text.

But im|mobilities of collapse also harbour hope. Adaptive mobilities arise in communities affected by extreme weather, where sometimes radically changing mobilities are necessary without warning. Stefanie Sodero (2022) observed what she calls "climate routing" when she studied Canadian and Newfoundland communities affected by Hurricanes Juan (2003) and Igor (2010):

> In the marine sector, weather routing involves optimizing the course of a ship in relation to environmental conditions, such as wind and waves. …This mobility practice offers lessons that, if transferred to a consciousness of … climate change, could transform contemporary mobility.
>
> (Sodero 2022, 159)

When dominant mobilities were disrupted during and in the aftermath of the storms, "alternate mobilities emerged, including helicopters, boats, and buses. Unused infrastructure was activated, such as old cabin roads and logging bridges" (Sodero 2022, 29). Seeing this as an example of Beck's emancipatory catastrophism, she argues that re-discovery of such latent mobile commons also enables re-discovery of interdependence or how "environmental dynamics … need to be considered in lockstep with human mobility" (Sodero 2022, 187). Her "ecological approach to mobilities" puts awareness of interdependence at the heart of "climate routing" towards more sustainable mobilities.

More ambiguous forms of im|mobilities of collapse are found in survivalism. It is beyond the scope of this book to comprehensively map these, but a brief list reveals stark inequalities and divisive politics:

- *Survival migration* of those pushed beyond survival in places where *The Uninhabitable Earth* (Wallace-Wells 2019) is reality now. Many are forced into extremely dangerous routes or the limbo of humanitarian camps to survive (Betts 2013; Woodworth 2024).
- *Elite survivalists*: Growing numbers of rich and super-rich individuals invest in safe-rooms, land, and property in areas less likely to be affected by climate change, such as New Zealand. They circumvent immigration procedures by obtaining citizenship through special programmes designed to attract wealthy investors. Some keep private jets on standby to escape to secret luxury bunkers, only accessible to those who know their GPS coordinates and entry codes (Katz-Rosene and Szwarc 2022).
- *Cosmic Transhumanism*: Billionaires like Elon Musk circumvent democratic deliberation of major science and technology projects to invest in space travel and terraforming other planets, pursuing "an 'extraplanetary imaginary' that yokes together commitments to technological progress, libertarian desires of [market-based] human freedom, and a means to escape or evade risks and dangers that stem in the main from global capitalism" (Tutton 2021, 435). Tutton describes these as "cruel utopias". Elon Musk's grasp for political influence, supporting, and sometimes financing far-right, anti-immigrant, populist individuals and parties in Italy, the UK, Argentina, and Germany seems designed to realise them (Ulmer and Levy 2024; Le Monde 2025).
- *Retrenchment Survivalism* of often middle-class "preppers", seeking to isolate themselves from danger through retreat into fortified sustainable homes, cultivating skills of farming, hunting, and surrounding themselves with like-minded communities, relying on SUVs and motorbikes (Katz-Rosene and Szwarc 2022).
- *Communitarian Survivalism* of individuals and groups seeking resilience in community (Katz-Rosene and Szwarc 2022), inspired by localism and transition (Hopkins 2019), and deep adaptation (Bendell 2023).

These contours of a mobile collapse society show that collapse is uneven, cumulative, and it cascades wider and wider effects. One of these effects is the long "war" (Mah 2023) describes, which is both a cause and a symptom of collapse as it turns radical.

**Radical War**

For Warren Buffett, one of the twentieth century's most successful investors, "There is class warfare, all right, but it's my class, the rich class, that's making war, and we're winning" (Urry 2014, 1). Over the last decade, this victory has been consolidated:

> Radical War is the immediate and ongoing interaction between connected technologies, human participants and the politics of violence. … This form of war is no longer primarily at the behest and control of nation-states. The principal actors include technologists, the professionals of violence, non-state actors, corporate organisations and the connected mass of users of digital and social media. War is no longer about compelling enemies to do the will of the state. … Radical War is 'radical' in that it distorts perceptions of the relationship between media, the military and war's political effects. … Radical War is 'war' in that it is concerned with political violence; often with unforeseen outcomes.
>
> (Ford and Hoskins 2022, 21)

In relation to mobilities and ecological overshoot, radical war is waged on several fronts.

Some of the most powerful manipulators operate through partisan groups like the Net-zero Scrutiny Group in the UK (Atkins 2022), which is linked to the Global Warming Policy Foundation, which, in turn, is in receipt of "more than half a million dollars through a fund linked to the controversial billionaire Koch brothers" in the United States (Bychawski 2022, n.p.). They mobilise mis- and disinformation to curb climate action, and the influence of vested interest lobbying is visible even in seemingly positive policy programmes, such as the US Inflation Reduction Act of 2022, which allocates $369bn to reduce greenhouse gas emissions, but also grants concessions that benefit fossil fuel companies and harm communities (Lakhani 2022). The individuals and groups involved have a global hold on the future, networked as they are through the Atlas Network, an organisation that connects neoliberal thinktanks across the world (Westervelt and Dembicki 2023).

Westervelt and Dembicki trace the flows of this influence through an example. When youth protesters of the group *Last Generation* slow-walked and "obstructed streets in an effort to draw attention to the German government's inaction on climate" in 2023, media coverage showed how "a young woman, with her hand glued to a road was ripped off the road by her hair; a young man was run over by a truck driver; a passer-by punched the protestors and was cheered on" (Westervelt and Dembicki 2023, n.p.). Slow marches and protests using public streets have a long history, from suffragettes to civil rights and anti-war protests. In Germany, as in many other countries, the same streets are also blocked by farmers, slowing down their tractors to protest against climate policies that affect their livelihoods and profits. "Not a single farmer was punched in the face or dragged off the road by their hair", and Westervelt and Dembicki ask, "What was making everyone so irate about Last Generation?" (Westervelt and Dembicki 2023, n.p.).

They reveal disturbing connections to the Atlas network, highlighting how a liberal politician whipped up rage by agitating to criminalise Last Generation. His campaign gained traction when he "started a think tank – The Prometheus

Institute – and he plugged that think tank into … the Atlas Network". Atlas network members "are in regular contact with each other, sharing ideas, tips, and strategies" to mobilise neoliberal policies, turn publics against climate activists, and criminalise climate action:

> What's happened in Germany – public rhetoric vilifying activists, which the media then picks up and amplifies and, ultimately, the criminalization of those activists – is a pattern we've seen play out in multiple countries. … [the] strategy is spreading easily across borders thanks in no small part to the Atlas Network.
>
> (Westervelt and Dembicki 2023, n.p.)

This work by journalists and activists echoes studies by science and technology scholars who have traced "ghost management" – a secretive set of "systematic behind-the-scene … strategies to shape knowledge, ideas and narratives …, to influence experts by nurturing conflicts of interest, to capture regulation and policymakers, and to shape media and culture in ways that allow for maximizing earning-capacity" (Sismondo 2007, 2018; Gagnon 2021, 63). Gagnon and Sismondo focus on the pharmaceutical industry, but authors like Oreskes and Conway (2010), Supran, Rahmstorf and Oreskes (2023) document very similar practices in the tobacco and fossil fuel industry.

As Táíwò (2022, 10) shows, "elite capture" "is not a conspiracy. It's bigger than cynical appropriations, opportunism, or the moral successes or failures of any individual or group. It is a kind of system behavior". However, the arsenal of disruptive strategies amassed by the rich class is immense. If the Atlas network is a war propaganda infrastructure, Investor State Dispute Settlements (ISDS) have been turned into a minefield to stop climate action. ISDS allows corporations to demand that states that implement environmental protection compensate companies for lost profits. The top ten initiators of claims are based in high-income countries, with the United States and the United Kingdom leading. The fossil fuel industry "is the most litigious industry", closely followed by the automotive industry (Di Salvatore 2021, iii). Their claims can be ruinous. Ecuador, for example, was ordered "to pay the U.S. oil company Occidental over USD 1.5 billion, one of the largest amounts a state had ever been ordered to pay" (IISD 2024, n.p.). The country's government showed that the claim "represented almost 9% of Ecuador's 2012 annual budget, 59% of its annual education budget, and 135% of the country's annual healthcare budget" (IISD 2024, n.p.). The country decided to leave the international treaties that enable such arbitration, only to find that even after leaving, they would be under these obligations for another 20 years. The effect is crippling. In a Special Rapporteur's report on human rights for the United Nations, David R. Boyd finds that "These cases create regulatory chill" (Boyd 2023, 2) and prevent change of business-as-usual mobilities, pitting a Goliath of fossil-fuel capitalism against humanity and nature as David. However, insurgent resistance is gathering.

***A Radical Flank***

Andreas Malm observes how the climate movement has developed over three cycles, starting with "climate camps: tent cities serving as festivals of prefigurative living and learning and bases for mass action against some nearby point source of emissions – an airport, a coal-fired power plant, a financial district" (Malm 2021, 12). A second cycle started when the United Nations Framework Convention on Climate Change (UNFCCC)'s Conference of the Parties (COP) in Copenhagen failed to achieve a global agreement. Protests against major pipeline projects such as Keystone XL, moving oil from Canada's tar sands to refineries on the US Gulf coast, were spurred on by the experience of extreme weather, such as Hurricane Sandy. Indigenous communities and climate activists were joined by hitherto unpoliticised citizens in mass protests, reaching 400,000 in the People's Climate March in 2014. There was little impact, and when Trump became President the first time, one of his first actions was to leave the Paris Climate Accord. Greta Thunberg's Fridays for Future' school strikes inspired the third cycle with global uprisings. From 1.5 million on the streets on 15th March 2019, in "what might have been the largest coordinated youth protest in history" (Malm 2021, 16), confluence with Extinction Rebellion saw 4 million out in 4,500 locations in September 2019. The "movement now appeared to make a qualitative leap into a mass phenomenon" (Malm 2021, 18), and Greta Thunberg's speech at the UN Climate meeting was galvanising:

> her face nearly burst with tears of rage: 'How dare you! You have stolen my childhood with your empty words. And yet I'm one of the lucky ones. People are suffering. People are dying … Young people are starting to understand your betrayal. The eyes of all future generations are upon you. And if you choose to fail us I say we will never forgive you … change is coming, whether you like it or not'.
>
> (cited in Malm 2021, 18)

However, the escalation has made it clear that "the ruling classes really will not be talked into action" (Malm 2021, 18). Increasingly numerous social resistance cycles have accumulated only "'small wins' – a gas pipeline cancelled here, a coal plant scrapped there …. But so far, the movement has stopped short of one mode of action: offensive (or for that matter defensive) physical force" (Malm 2021, 20). Malm argues that definitions of radical action bound by a commitment to non-violence are based on a blinkered history of social movements. Drawing on an analysis of the catalytic role violence has played in past struggles, for example, in the fight against slavery, the Suffragette "votes for women" campaign, the American civil rights movement, or the South African anti-apartheid movement, Malm asks: "When do we conclude that the time has come to also try something different? When do we start physically attacking the things that consume our planet and destroy them …?" (Malm 2021, 7).

He argues that "To be 'radical', after all, means aiming at the roots of troubles; to be radical in the chronic emergency is to aim at the ecological roots of perpetual disaster" (cited in Mah 2023:100). Mah reads this as a rallying call for "nothing short of 'war' against 'fossil capital'" (Mah 2023:100). Malm does enlist warlike discourse in his argument for violence, suggesting that strategically targeted violence can bring about transformative climate action. But he also suggests that it is not a war to be won through violence, and he proposes a pincer movement that combines pressure from a moderate wing of activists focussed on demanding change from governments, corporations, and publics with a more "radical flank" of actors prepared to use violence. A "positive radical flank effect" would see "the latter stoke up the crisis to breaking-point, [while] the former offer a way out" (Malm 2021, 120). But what would constitute a radical way out, and can we find it without violence?

**We Need Better Certainties**

Ulrich Beck argued that "Poverty is hierarchical, smog is democratic" (Beck 1992, 36). However, there is no universal "we" when it comes to responsibilities for, or experiences of, ecological overshoot. Ethnicity, colour, gender, age, sexuality, and other diversities amplify inequality, creating complex intersectional slow violence. A universal "we" can gloss over these dynamics. And yet, we argue that it is important to also understand the impact of ecological overshoot in terms of a collective "we".

The main reasons we appeal to collective solidarity between living beings are onto-political and moral. We are interdependent, and the processes and structures that harm the dispossessed, marginalised, oppressed, young, and yet unborn generations "are not only bad for some of us, they are bad for all of us" (Halberstam 2013, 10–11). In *Men in Dark Times*, Hannah Arendt delineates an idea of human solidarity that anticipates contemporary debates:

> The unity of mankind and its solidarity cannot consist in a universal agreement upon one religion, or one philosophy, or one form of government, but in the faith that the manifold points to a Oneness which diversity conceals and reveals at the same time.
>
> (Arendt 1993, 90)

More recently, Arturo Escobar's pluriversal politics suggests that, from such recognition of diversity in one-ness, a new respect for interdependence, many different realities, and rationalities arises. It means that "another world is possible", "a world where many worlds fit, or the pluriverse", and with this, "another possible is possible", widening the imagination (Escobar 2020, 9). Similar aims used to reside (albeit in a more limited way) in the European commitment to "unity in diversity".

Conceiving of ourselves as a collective "we" capable of responding with respect for interdependence, diversity, and equity, it may be possible to imagine

and make mobility systems that overcome capitalist realism's crisis of imagination. But so far, approaches to change – from transition to collapse – have focussed on means for change – scaling up technological niche innovation in EV and smart technology, promoting fare-free public transport, active mobility, or wider social change that enables degrowth, mobility justice, slow, shared, or commoning mobility. They are all focussed on responding to an overarching, all-pervasive rise in uncertainty and precarity in a mobile world in crisis. Of course, this is well motivated by the analysis that underpins these approaches. However, their focus on uncertainty is also a weakness. In an incisive Wittgensteinian analysis of the proliferation of (talk about) uncertainties, Natasha Lennard notes how it has turned into a distraction, another tool in the radical war winners' arsenal:

> Talk of 'uncertain times' *works*. It hits the right mark for enough people … But to speak of 'times' is, of course, an expedient way *not* to speak about people, as if the historic contingencies of pandemic death, poverty, disenfranchisement, border regimes and climate change devastation were happening to everyone in the same way, all at once; in these *times*, all are victims, so none can be villains. … Behind the endless talk of uncertainty, we risk failing to attend to what is held certain – and it is contemporary certainties, rather than the uncertainty allegedly defining our moment, that give me cause for concern.
>
> (Lennard 2022, n.p., emphasis in original)

We will discuss the temporal dimension of this dynamic in Chapter 4. Here we focus on Lennard's response: a call for better certainties. This is a search inherent in all the frameworks from transition to collapse, especially in attempts to operationalise mobility justice, a mobile commons, and degrowth, but it could be stronger.

Critiques of the MLP are designed to push deep leverage points. Many of the researchers' and activists' search for new narratives contrasts powerfully with the "don't rock the boat" ecomodernism of technocratic innovation-led transition. But the momentum of change inherent in transition is reformist, focussed on reconfiguration, keeping most of the elements of current ways of life. War destroys and requires rebuilding, but proponents of a warlike approach to change are vague about the building blocks of the new, whilst prefiguration makes island futures around candidate new certainties of mobility justice, mobile commons, and degrowth, in ways that are inhabitable, but cut off.

These limitations have given rise to calls for more revolutionary abolitionist approaches. Drawing on Ranganathan and Bratman (2019), Mimi Sheller eloquently captures how this could not only broaden narratives, but also transform im|mobilities systemically:

> The question is not just one of climate adaptation or resilience, as it is so often framed in current mainstream policy agendas, but climate justice and climate debt …: where, when and how should major contributors to

> climate-related loss and damages pay for rebuilding, reparations, and restitution? … abolitionist climate justice calls for an antiracist humanist approach … that is 'attentive to the interconnected spheres that were – and are – necessary to achieve unfinished Black emancipation after the end of slavery' and therefore 'demands attention to historical reparations and intersectional processes that are not solely associated with climate – things like housing, policing, and food security' (Ranganathan and Bratman 2019, n.p.). And, we might add, things like mobile commoning and ethics of care.
>
> (Sheller 2023, 439)

Following Harney and Moten (2013), Davidson (2021, 35) shows how such abolitionist climate justice should address the injustices inherent in the *long duree* of slow violence of ecological overshoot and – critically – "distinguish between the abolition of slavery and the 'abolition of a society that could have … slavery'". Aiming for the latter is necessary, she argues, because "radical mobility calls for the abolition of societies in which the configuration of (im)mobility is a technique and expression of systemic oppression" (Davidson 2021, 35). Abolition is thus aimed at transforming the existing social and political system. The surest route is to make the existing system unacceptable (Williams 1961). This would enable social tipping towards transformation and metamorphosis (Otto *et al*. 2020), but how could it be done?

Authors like Davies argue that radical change beyond (or perhaps better, alongside) reformist-revolutionary binaries must anchor itself in transformationist prefigurative initiatives that drive radical change by bringing alternatives to life. He charts how, through collaboration and coordination on platforms like the Global Tapestry of Alternatives (Davies 2024), they are exchanging knowledge and tactics, and building critical mass momentum. The Transition Movement (Hopkins 2019) and The Climate Majority Project (Read, Kavanagh and Bell 2019) are other examples. According to David Holmgren, co-creator of the concept of permaculture, such a confluence could aid the radical change Davidson describes: "if 10 per cent of the population of the industrialized countries managed to fully engage in local resilience initiatives outside the monetary system", it would result in "systemic boycott" strong enough to immobilise the neoliberal machine (Servigne and Stevens 2020, 172). Lennard summarises how Wittgenstein "describes certainty as forming 'the riverbed' of our thoughts – the channels through which doubting and learning and knowing can flow … [However,] riverbeds shift" (Lennard 2022, no pagination). Prefiguring futures, growing pluriversal majorities, and actively supporting confluence can materially, experimentally, and democratically make better certainties and shift the flow of change – undercutting elite capture and their radical war. Despite deep path dependencies, there is "nothing inevitable or natural" about mobility systems, and many of the "routes not taken" could lead to better futures (López Galviz 2019, 256). This is not just a hope, but an integral feature of the existing nowtopia of *buen vivir*.

In an interview, Xiye Bastida, an activist and ecology scholar from the Otomi-Toltec indigenous community in Central Mexico, explains how scientific understanding of ecological interdependence is converging with indigenous knowledge:

> now is a period of transformation for all of the beings of the earth and humanity. … indigenous communities …[are] not only keeping knowledge for ourselves and our descendants but for the world. … waiting … that the West is open to receiving that knowledge, … we don't want you to necessarily do ceremony like us, we don't want you to dress like us, to eat like us. We want you to **think** like us, we want you to **feel** like us, we want you to **understand** like us, … Western science has taken all of these years to be able to communicate how nature is all interconnected with us, so now we have the planetary boundaries framework, we understand that everything is interconnected scientifically. But indigenous peoples had that in our DNA, in our memory, and so I do feel that two worlds are coming back together, and it's because one was very disconnected, and humanity has understood that disconnection doesn't work, because it creates a lot of violence, it creates a lot of pain, and it creates uncertainty.
>
> (Outrage and Optimism 2024, 00:08:12)

She reflects on the importance of good certainties. Indigenous communities:

> had been living in cycles of certainty. We knew what was coming. We knew when our harvesting was going to be. We knew when the rain was going to come. And living in certainty is so powerful, because then you can be sure of what you're handing down to future generations. But now we don't know. And I think humanity as a whole wants to go back to certainty and back to security. And that can only come from honouring ancestral knowledge.
>
> (Outrage and Optimism 2024, 00:08:52)

We are embedded in these debates, looking for a radical approach to strategically change the system from within, and we argue that the application of mobile methods can contribute to a more concerted effort to build better certainties. The mobile technology of neoliberalism is so powerful because its proponents have a strategic advantage. They have accumulated an arsenal of methods of destruction that turn their ideologies of growth, development, and hypermobility into prerequisites for a good life and into common sense certainties, whilst dissolving all else into uncertainty, undermining trust in institutions of science, public media, democracy, politics, and governance, continuously anticipating, adapting, and innovating, with enormous resources. They can keep the spirit of capitalism going against challenges from science, policy, innovation, and social movements, and spread into new contexts, translating ideology into material form, standards, networks, and infrastructures

that railroad particular mobility futures and foreclose others, for example, through electric SUV that claim road space or technology readiness levels that neglect to consider how ready, and "good", technologies are *for* society (see Chapter 8). To increase traction for radically reformist, revolutionary, and transformationist change, more strategic, collaborative, creative-constructive, agile, and mobile counter-methods are needed; methods that can change how and what we come to see as certain, normal, socially acceptable, valuable, and desirable mobility futures, however contested this may be. This is not a matter of inventing and engineering a new model, but of growing one.

## Concluding Thoughts

For decades, transdisciplinary analysis has made it clear that radical societal transformation is needed to avoid social, economic, and political collapse from massive ecological overshoot. Embedded in a context of co-optation and "radical war", transport and mobilities studies have generated many definitions of "radical". Answers to the question "How to be radical?" often focus on means – EV and smart technology, fare-free public transport, active mobility, or social change that promotes slow, shared, or commoning mobility. Where there is discussion of how to enable radical change, it is focussed on broad heuristics such as transition and mobility justice, metamorphosis, collapse, degrowth, abolition, or an ethics of care, each emphasising different aspects. But "How to be radical?" is also, importantly, a practical question. In this chapter, we have used a selective review of perspectives to deepen our capacity to be practically radical. One important insight is that amid growing climate chaos, global society must become collapse-ready. Environmental, economic, social, and political collapse is already unfolding in reality. Figure 1.1 in the Introduction visualises how plausible such interpretations are in view of the scale of emission reductions required. Figure 2.1 at the start of this chapter maps trajectories of collapse onto these steep pathways to decarbonise. To us, these trajectories suggest that the time when entirely managed solutions seemed plausible has passed. The scale of the emissions reductions and their rapidity mean it will be disruptive, and rapid change is needed if policy is to deliver on this. If it does not deliver, then life will be disrupted in very different ways as we face the consequences of inaction. So, at the same time as we reduce emissions to mitigate climate change, we must also strengthen practices of adaptation. But disruption, change, need, and capacity for adaptation are unevenly distributed, as we will discuss in Chapter 5. Before we do so, it is critical to find a deeper understanding of why and how our mobility systems have assumed the shape they have.

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# 3 What Moves Us?

In this chapter, we explore why we travel. This is critical to any understanding of the prospects of a shift away from our currently unsustainable patterns of living to some other, more sustainable and equitable future. The field of transport studies has been dominated by engineering- and economics-based analysis of travel. As an engineering undergraduate, I (Greg) learnt that travel demand was represented by a weight on a beam, behaved like a fluid in a pipe, or should be seen as a volume to be designed for. As I moved into transport planning, I was taught that travel demand was a result of technology and prosperity and that choice was the result of trade-offs in quality and price. Much of my career has been spent reflecting on how the amount, the timing, the location, or the blend of travel demand has caused problems. Sometimes too much mobility causes problems (car-based congestion and poor urban air quality), and sometimes too little (low levels of active travel and obesity or socially excluded communities). As we now face the climate crisis, the analysis paints a stark picture – there are no pathways to meet our net zero commitments in developed countries that do not reduce the amount we travel, change the mix of ways in which we travel, and shift to zero emission transport (Gota *et al*. 2019). All within 30, 25, or 20 years. The clock ticks with every passing year of inaction, and as it does, the dial for how quickly or how deeply change is required gets turned up. Current estimates in the UK are for at least a 20% reduction in traffic levels compared to 2019 by 2030 (Hopkinson *et al*. 2021). Cities conduct similar analyses and conclude that more than 30% reductions in car travel are necessary. I have even heard of levels of 80% or more. Yet there is no mandate for change of this scale, no experience of how we can achieve this, and no evidence that this is actually something that governments are acting to deliver, even those that recognise its necessity (CCC 2024).

Those are the scientific facts if we continue with our business-as-usual model of how we move around. However, these facts point to the need to create futures that are radically different from the past, where societies and economies have been based on planning for the continuous growth of travel demand (ITF 2023). So, how is this shift being dealt with? If we look at how the mobility problem is framed, then we find the language of "reductions in trips" or "reductions in car kilometres" or "car kilometres per capita". This will be achieved

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through "travel demand management" (Litman 2024), which is a curiously comforting managerial term when you consider the drastic changes that science is revealing as necessary. Sometimes we can place our hope in people "avoiding unnecessary journeys" (e.g. Newcastle City Council 2024), which implies some agreed handbook of travel necessity, which, if only we all read it, would help. This language seeks to subtly depoliticise the problem that we face, that, overall, society is moving too much by heavily fossil fuel-intensive means and needs to do less. However, it is some parts of society that are creating these burdens more than others, with increasing income linked to more mobility in an almost linear fashion (Büchs *et al*. 2023 and Figure 3.1). In the same way that wealthier citizens choose to live in areas of better air quality and yet drive through other communities and add to their burdens, the problem of carbon emissions is not evenly distributed and needs to be understood as relational (Sheller 2017). What do we really mean by a 20% reduction in kilometres? Does it mean a 40% reduction by the highest mileage drivers and none by the lowest mileage group? What types of journeys are in and out of scope? Here we get to the nub of the problem. What is counted in transport policy is how much we move. In order to intervene in what is a hugely complex set of travel patterns, we need to move beyond how much and focus on who moves, why we move, what the distribution of that movement is across society, and what a socially equitable outcome looks like that we are working towards (Schwanen 2019).

Of course, this sounds like a grandiose aim, and it is not simple. To illustrate, consider the "low hanging fruit" of tackling what is often referred to as "discretionary travel" (Chen and Mokhtarian 2006). Table 3.1 shows a division between "maintenance" and "discretionary" activities set out by Chen and Mokhtarian as derived from time use diaries.

Recreation, exercise, visiting friends and family, and religious services are all listed as discretionary. As we saw during the pandemic, society was asked to refrain from almost all of these activities for short-term public health necessity, but it has undoubtedly had negative impacts on levels of isolation (Hwang *et al*. 2020), early years language development (Imboden, Sobczak and Griffin 2022), and domestic violence (Kourti *et al*. 2023). A lack of physical exercise (a discretionary category) is associated with lower cognitive function, a great risk of trips and falls amongst older people, increased heart disease, and obesity (NHS 2023). In the worst-performing region of the UK, almost half of adults do not meet the basic minimum aerobic exercise norms. In the best performing region, this is still nearly 30% (NHS 2023). We can also reflect on the apparently discretionary trip to a café on holiday as one person's leisure trip, which is fundamental to the business that serves the drinks.

The mobilities literature has identified the problems with the flat ontology of much of the transport literature – where the experience of travel is treated as a blank space that people travel "through" (Sheller 2018). A mobilities analytical orientation also brings to the fore the lived experiences of journeys, the way in which space is experienced differently by different groups (Faist 2013). It also takes a relational approach where the use of space by one group or form

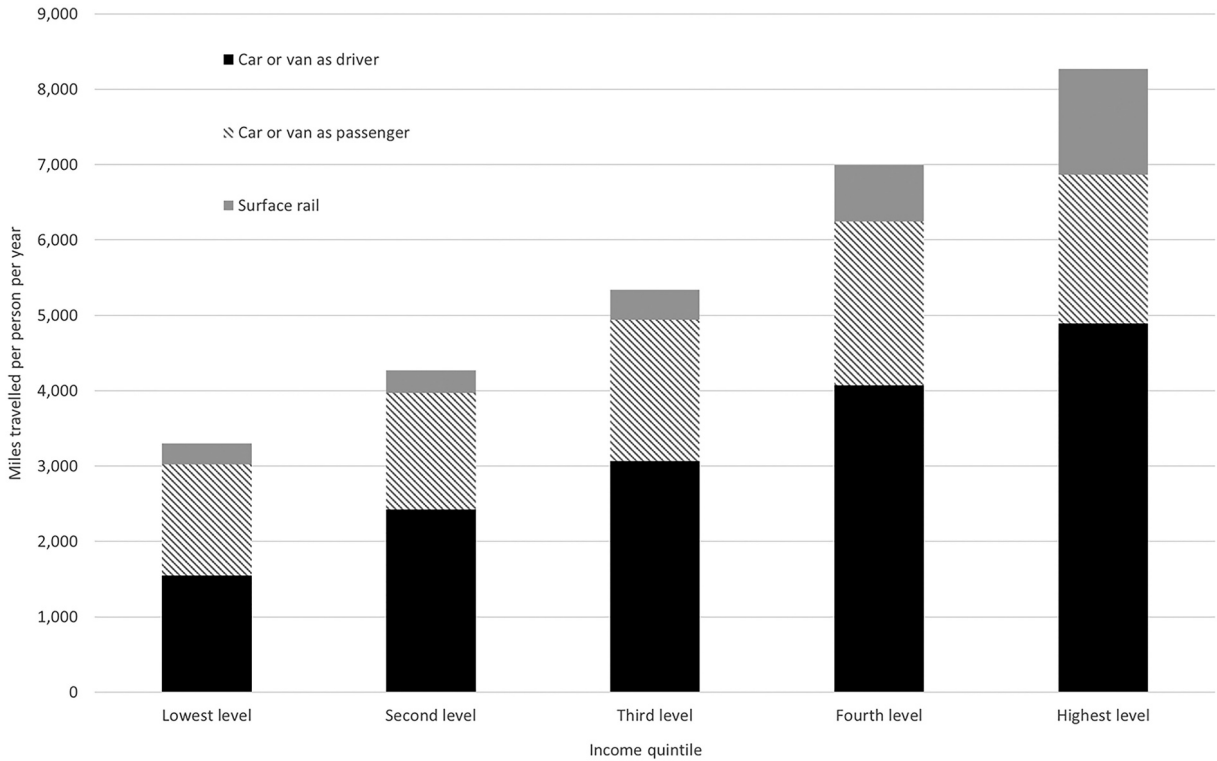


*Figure 3.1* Distance travelled by income quintile in the UK (data from NTS0705).

*Source:* Own elaboration.

*Table 3.1* List of activities classified as maintenance and discretionary

| *Maintenance* | *Discretionary activities* |
|---|---|
| Shopping | Recreation/rest |
| Meals/preparation | Recreation/play |
| Sleep | Amusement at home |
| Day care/after-school care | Visiting |
| Personal service | Entertainment |
| Medical service | Religion/civic services |
| Professional business | Civic/volunteer services |
| HH/personal service | Amusement outside the home |
| HH/maintenance chores | Hobbies |
| HH/obligation and family care | Exercise/athletics |
| Sick/ill | Computer |
| Waiting | Get ready |
| Morning routine | |
| Evening routine | |
| Get ready | |
| Hygiene | |
| Diary | |

(Adapted from Chen and Mokhtarian 2006, 229).

of transport by definition creates scarcities for others, and shapes the extent to which other groups or users can use the space (Sheller 2018). What comes to be seen as normal is made through the everyday practices of people and the establishment, over time, placing the car at the heart of those practices. This, in turn, changes business models, planning decisions, and social norms (Urry 2004; Walker, Tapp and Davis 2023) such that unwinding from the car is not just a matter of individual choice, but a question of real systemic change. Cass and Manderscheid's call for autonomobility problematises "compulsions to be mobile in order to reconcile the connected environmental and justice dimensions of 'sustainable' mobility" (Cass and Manderscheid 2020, 103). They sketch a "vision of a freedom-focused, environmentally sustainable and socially just mobility regime … [that] entails both a right to move and a right not to" (Cass and Manderscheid 2020, 103). This requires changing focus to place more emphasis "on 'what mobility is for', with the mode of travel used being less relevant than achieving functionings" (Cass and Manderscheid 2020, 106).

Seen in such terms, the managerial "travel demand management" logic is lacking. How our cities and towns work is about deeply political and distributional questions of competition for space and whose interests are best equipped to establish their rights (Marsden, Docherty and Dowling 2020). If we are to achieve a fundamental transformation in how much we travel, then we need to recognise that this remaking will be contested and embrace the fact that social conflict and debate are part of radical change, as they always have been. Again, with recourse to Bulkeley (2019), this cannot be "planned" and "delivered" to reach a destination but is something which requires us to experience, learn, and

respond en route. Transforming mobility systems to support different ways of living, therefore, demands that we understand much more about why people travel and why they don't, where they travel and where they won't, and who stands to win and lose from the redistribution of rights, funds, and practices.

## Perspectives on Why Travel?

In their excellent edited volume, Niblett and Beuret (2021) bring together a broad range of contributors to reflect on the different origins of thinking that help us to understand why we travel. Whilst largely grounded in Western experiences, the breadth of perspectives is nonetheless both interesting and important to anyone thinking about the system they are intervening in. Pasternak (2021), for example, explores the biological roots of understanding our travel behaviour, including how curiosity drove migration and how this in turn contributed to mental development. There are connections between our evolutionary development to bipeds, our ways of walking, and our need for active travel to sustain a healthy body. Hiss (2021) reflects that our history of migrating and moving spans tens of thousands of years, whereas the lifestyles most people currently live, based around one point of residence, are comparatively new (see also Leary 2023). Travel, it is argued, is something which we think about and which can be beneficial to our mental state. Ghassan Hage's ethnographic studies on transnational Lebanese migration and white racism provide insight into how such "existential mobility" has found its way into cultural meanings, language, and practices (see Chapter 1). For many cultures, a good life is a life that "is going somewhere", whereas its opposite, existential immobility or "stuckedness" is to be avoided (Hage 2009). Hiss (2021) further reflects on modern phenomena such as jet lag, where our travel puts us out of kilter with our surroundings. Not all forms of travel are associated with better mental well-being. Clark *et al.* (2020, 2777), who used data from a panel survey in the UK over a six-year period, found that "longer commute times are associated with lower job and leisure time satisfaction, increased strain and poorer mental health". How commuting is done was found to matter, with walking commutes contributing to better subjective well-being. Working from home was found to be linked to better job satisfaction and leisure time satisfaction. The relationships between how much and how we travel are complex and also unevenly distributed across income groups and gender, in part because travel is intrinsically linked to how we live our daily lives and, in part, because the lived experience of journeys is different. Kuznets (2021) discusses religion and travel, including spiritual enlightenment and pilgrimage, all of which would be labelled as "discretionary" in the usual transport policy parlance.

Beuret and Hall (2021) explore the sociology of travel in a more general sense, considering the role of social identity formation, including gender, and how we express ourselves differently across the life course and as escape (including migration). Mattioli and Scheiner (2022) show that the travel of

migrant workers is quite distinct from that of nationals, with lower car travel but a greater propensity to fly. Whilst this changes over generations, the broader social networks are still generative of high-carbon travel, and this reflects the wider colonial histories of different places. Travel is an occupation too, with recent literature reflecting on what it means to be a driver or rider and to be servicing the needs of people or businesses, and what it is necessary for society to ignore or marginalise in order to support consumption practices at the price points determined to be acceptable (Hopkins *et al*. 2024 and Gregory, 2020). Undoubtedly, travel is an indicator for social mobility, with literature exploring the life of hypermobile elites at one end of the spectrum (Birtchnell and Caletrío 2013; Gretzel 2022) and the exclusionary and detrimental impacts of immobility for many (Uteng 2009; Zhang, Zhao and Tong 2022). Tourism is a mobile practice that stretches across the spectrum and now reaches the most remote places, with contradictory effects of "learning to be global" (Molz 2017), overtourism (Romão, Domènech and Nijkamp 2023), and a share of 8% of the world's carbon emissions (Khatib 2023). Finally, but importantly, Niblett (2021) discusses philosophy and travel and explores issues such as the establishment of rights to free movement.

Within the plethora of perspectives on why we travel, one discipline has come to dominate the transport landscape: economics. Dillon and Jan (2021, 78) describe their reflection on the economics of travel as "taking a more objective view on why people choose to travel". They suggest that people make decisions within a set of constraints, which include time budgets and financial budgets, as well as being conditioned by what we need to do (e.g. working hours, schooling, and sleeping). The notion of deciding to travel only when the financial and time costs of making a trip are less than the value derived from the activity sits at the heart of most countries' assessments of the value of investing in transport systems (Mackie, Worsley and Eliasson 2014). Choice experiments, which assess how people trade off attributes such as journey time, cost, and comfort, are easily relatable. Anyone who has looked at taking a coach, a train, a bus, or walking has made such trade-offs, and transportation planning has developed sophisticated methods to seek to identify the relative value people place on these attributes and use them as a basis for planning decisions (Aloulou 2018). Economics is based on trying to understand, through valuation, the trade-offs in choices about how we decide to travel. Those trade-offs can be different for different people, societies, and can change over time – although economics does not provide a basis for explaining how that happens. Economics also tends to flatten context from the decision-making data collection process in order to manage the number of variables being considered (and the difficulty of doing this). As Sheller (2018, 23) writes, "when transport is an isolated matter of efficient movement, it becomes disconnected from wider meanings of streets, neighbourhoods and communities… CBA [cost-benefit analysis] also presumes that space is an empty background that transport infrastructure simply moves through".

We could go on with the list of different perspectives that could inform why we travel. However, the key points that we need to take from this dive into this issue are that:

- the purposes for which we travel are diverse
- the motivations for why we travel are complex
- the experiences of different people moving through space are different
- the nature of travel, what is taken to be normal, and what people have a right to change over time (and can be changed).

It seems clear to us that some of the reasons that the managerial approach to travel demand management has not worked are revealed by reflecting on this broader set of concerns. First, given the analytical tools that are currently deployed, it is necessary to take a reductionist approach to these issues, whether that is compressing journey purposes into fewer, larger (and ultimately more heterogeneous) groups, approximating motivations by willingness to pay, or taking the nature of travel today to be reflective of society's preferences rather than reproducing or multiplying its inequities. It also reflects, rather than challenges, the market-led push for increasingly unsustainable levels of choice in different aspects of our lives. If we allow our more reductionist analytical toolbox to be the driver of policy, then we will run up against the social reality of choices that are systemically coerced (Mattioli *et al.* 2020). Rueben Smeed advocated road pricing in 1964, and there are countless expositions of how important this could be to economies – yet there are hardly any examples around the world (Glaister 2014). If arguably the most important economic policy in transport cannot gain traction over nearly seven decades, then can we really expect the answer to the climate crisis to emerge from "better carbon pricing" alone in the next two decades? Economics represents only a small part of the palette of critical issues that explain the complex interactions between transport and society (Sheller 2018).

Second is the piecemeal approach to tackling how we travel by changing restrictions by time of day or location. This cuts across a wide range of journeys and circumstances that are far more complex than is generally understood by the planning community, particularly given how limited data collection processes usually are. These approaches typically fail to address how the tasks that are disrupted by the interventions are then reconfigured. In their pioneering work on "disappearing traffic" after road or bridge closures, Cairns, Atkins and Goodwin (2002) found a median traffic reduction of 10%, even after the route was reopened. Some of this was attributed to finding more local opportunities and changing routines, but it was recognised that how activities were reconfigured was hard to trace, and it could equally be that trips simply went elsewhere, not in the locality (Melia and Calvert 2023). There are some positive examples that can be found. The decades-long investments in the urban realm and cycling and walking infrastructure in Copenhagen, the cities of the Netherlands, and more recently Ghent, Oslo, London, and Paris, for example,

have transformed the balance between active travel and motorised transport. However, we would argue that these examples all have broader visions for the type of society and city in which people will live, rather than being about which community or road has what intervention on it. We also, in Chapter 5, caution against just seeing the urban investment in isolation from the wider relationship between transport and society – as the overall emissions levels of many of these economies are worse than those which have less enlightened visions for their cities.

Changing mobilities, then, is about more than just managing the transport system and the demand on it. It is about understanding how to enable society to live a good low-carbon lifestyle and what the role of movement is in sustaining that. Sheller (2018) suggests that, in moving beyond just looking at transportation metrics and valuations, we should take a broader view of what is at stake. Is it "health, or racial justice, or ecological well-being?" (Sheller 2018, 29). She also raises the question as to who is the arbiter of these decisions. In transport, the arbiter is sometimes taken to be the technocracy through its tightly inscribed decision-making rules (Mackie, Worsley and Eliasson 2014) and "technology readiness levels" (Büscher *et al*. 2023), although this hides the politics of the choices that get considered in the first place (Marsden *et al*. 2011). There is also a temptation to fold discussions of change into "what policies?" and "which institutions?", which diminishes the role of social movements and more bottom-up processes and practices. No policy was established to reduce the likelihood of younger people taking up driving – but this has happened at a scale which impacts travel patterns far more than the many transport policies which are the focus of most of the policy discourse on change. There is no "Department of Slow Tourism". Change can be generated in many different ways.

In reviewing the different perspectives on change here, we do not make a case that there is any one academic discipline that provides a complete understanding of the problem, nor of how to design solutions to it. There is, however, a need for less hubris and more openness to multiple perspectives in working out what part of the toolbox is best used where in thinking through this wicked problem and taking action – a discussion we develop further in Chapters 7 and 8. The current approach will not deliver the change required.

## Undoing Automobility?

John Urry (2004), in his writing on the system of "automobility", identified how the car has become central to a system of interconnected social conventions, patterns of living, and material systems which it has served to reconfigure in time and space. Having reconfigured those elements and their connectedness, the system becomes self-sustaining and difficult to change. These elements include the car as an object of status, a part of culture, a complex of roads, filling stations (or charge points), automotive sales, and repair industries, and supply chains that cross the globe. We must add fossil-fuel

capitalism and its lobbying machine, who themselves are locked-in to extraction and circulation of capital through the "dictatorship of financial markets" (Urry 2014, 62). Critically, the car has helped to create complex time-space interactions which – it currently seems – only it can service. The demands it makes on space "subordinate" other forms of transport, with buses caught in congestion and pedestrians waiting at crossings and held behind guard rails. Urry (2004) argues that such systems are self-reinforcing and have built up over decades (e.g. the dominance of out-of-town box retail parks, decentralised hospitals, and drive-thru restaurants) and so undoing automobility, whilst not impossible, requires a systemic approach rather than hoping that piecemeal interventions can somehow unmake this decades-long process.

Urry's insights are reflected in the data across developed countries, although there remains substantial variation in levels of car ownership, car use, and resource use per capita, which suggests that different flavours of automobility have developed through different policies and different attitudes to the car and its role across countries. Some of these differences can be seen through the car ownership levels shown in Figure 3.2. However, it is certainly possible to still see rapid growth in car ownership in emerging and rapidly growing economies, and there are already chronic environmental challenges, in particular in megacities, which simply cannot accommodate such trends (Marlier *et al*. 2016). Yet, there are concerted efforts underway to expand dependence on fossil fuels and automobility. Like Philip Morris International and other major tobacco industry corporations who "sought to make up for declining markets in high-income countries by expanding into LMICs" or low- and middle-income countries (Patterson and Gill 2019, 1112), free-market supporters, the fossil-fuel and automotive industries are using neoliberal think tanks and the Atlas Network to support deregulation, charter cities, free economic zones and expansion of transport infrastructures, for example, in rapidly urbanising Africa. Instead of supporting clear opportunities for skipping fossil fuels in favour of renewable energy-driven development, their efforts are succeeding in keeping countries "following the Global North's fossil intensive path, influenced by liberalization processes which appear to solidify the FF[Fossil-Fuel]-based energy systems" (Heras and Gupta 2024, 16). However, as Urry wrote in 2004 (p. 27), the dominance of the car is "neither socially desirable nor inevitable".

One of the challenges to breaking the inevitability of increased car ownership and use is to recognise such a future as possible. Our current policymaking toolbox does not allow us to do this, at least not in the UK. In fact, it does the opposite. Car ownership is forecast on the basis of income, which is forecast to rise. In lockstep with ownership, car use is forecast on the basis of, amongst other factors, disposable income, car availability, the cost of travel by different modes of transport, the accessibility of different destinations by each form of transport, and congestion. The coefficients in the models are based on evidence from previous decades and recalibrated to take account of new understanding about values of travel time, sensitivity to prices, or reliability. The future is inscribed by the past.

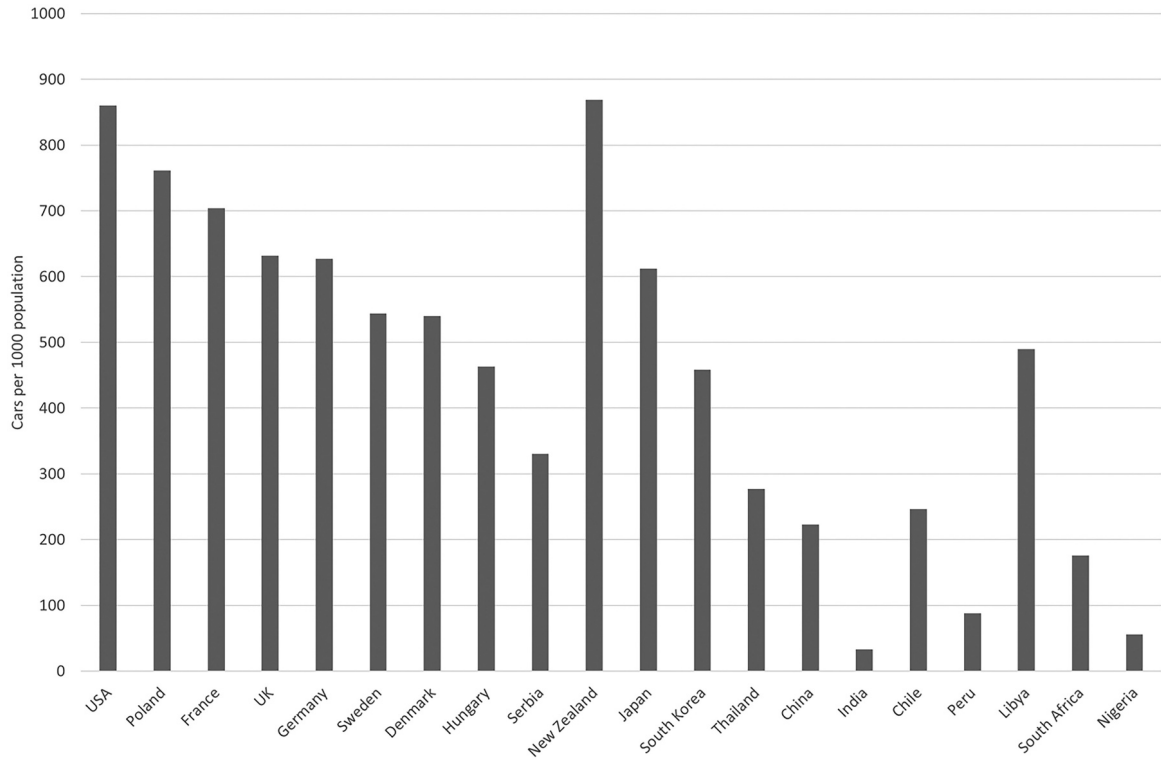


*Figure 3.2* Car ownership across a sample of countries (data source: visualcapitalist.com) .

*Source:* Own elaboration.

Of course, such forecasts could well be performative. Should we wish to see that kind of trajectory continue, then the policy environment can facilitate it, and so the cycle continues. However, there is a tendency to overestimate the likelihood of trend continuation and underthink what is happening in travel demand. The processes which Urry described in the making of automobility, such as suburbanisation and fragmentation, have already happened. There have also been wider social shifts, such as greater equality in labour market participation or greater car ownership in older age, which are, whilst still ongoing, much less influential than they were in the periods when car traffic growth was unquestioned. The modelling tools that inform strategic policymaking are, as Sheller (2018) describes it, still operating with a blank societal canvas.

In 2018, a group of academics and practitioners commissioned a series of hearings to explore changing travel demand patterns (Marsden *et al.* 2018). Despite the continued projections for road traffic growth, the Commission on Travel Demand found that, per head of population, the amount the UK population travelled by car had been in decline for 20 years. It is also the case that the number of trips that people make on average has fallen. What was more startling was that the distance driven had fallen most in the highest income group (Figure 3.3) – suggesting that it was no longer the case that income was driving the growth in travel demand. Between 2002 and 2019, there were small average annual increases in miles driven by the lowest 40% income groups in the population of around 100 miles per person. By contrast, the wealthiest group had reduced its mileage by over 1800 miles, or just over a quarter. The impacts of COVID-19 seem to have further impacted travel, with the highest income groups reducing the most, by nearly 600 miles per annum compared to 100–200 miles for the lowest income groups. This reflects, to some extent, the degree to which wealthier people have been able to continue to work from home (Anable and Marsden 2021).

So, despite falling annual driving rates, road traffic was still continuing to rise, yet this was driven by population growth amongst working-age people – not a relationship between income growth or a desire to drive more. The evidence found that the only group that was travelling more than previous generations were over 65s (Headicar 2018), and this was true across the country. Other age groups were travelling less in every part of England, and this was more pronounced in major cities. The trends that explained this were greater urbanised living amongst younger people, where owning a car was less necessary; delaying having children; more people entering higher education, as well as shifts to online shopping and virtual accessing of services (Marsden *et al.* 2018). In short, the nature of what we do as a society is on the move, the make-up of what moves us is changing, and the importance of the car has been in decline. These trends are also reported in a range of other countries (Kuhnimhof, Zumkeller and Chlond 2013), although the extent to which this signals an end to the regime of automobility remains contested (Bastian, Börjesson and Eliasson 2016).

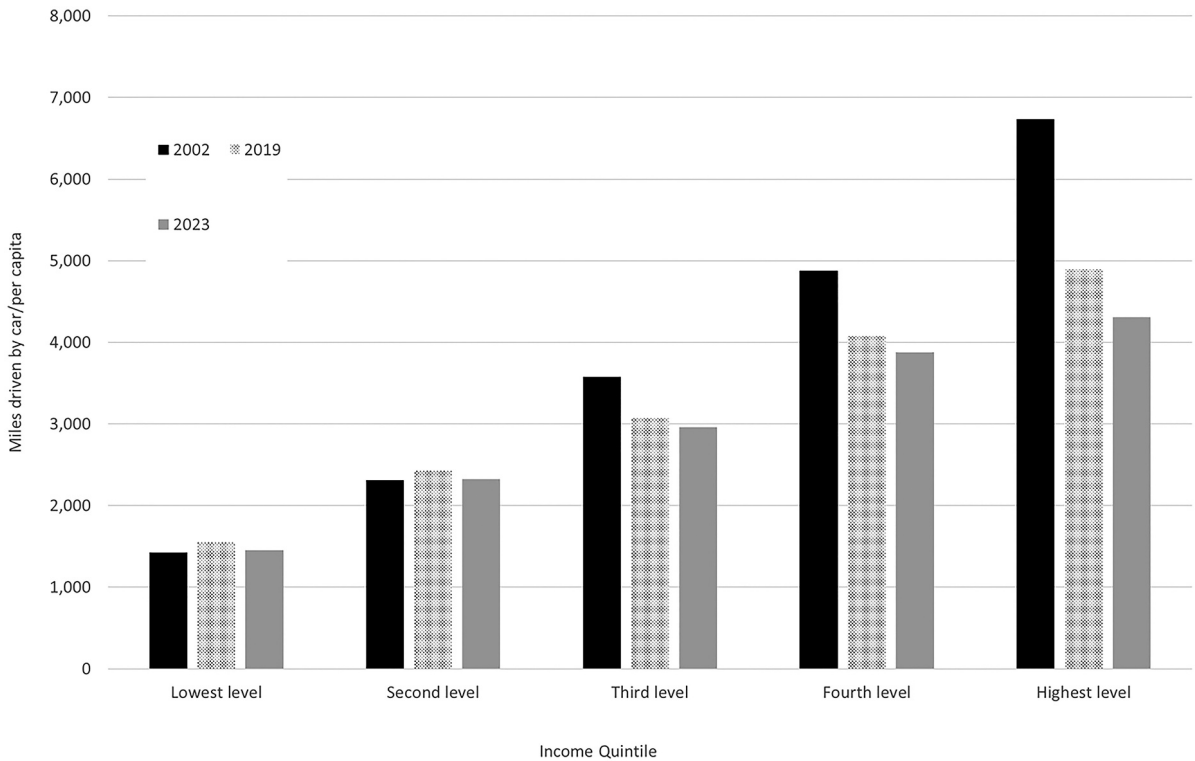


*Figure 3.3* Decline in miles driven per capita by income group in the UK (Data from NTS0705).

Source: Own elaboration.

The response to the apparent change in the role of the car was for the Department for Transport in the UK to develop a set of travel demand scenarios which incorporated some of the recently observed evidence in its 2018 round of traffic forecasts. One of seven scenarios was entitled "Extrapolated trip rates" and was a continuation of the decline in trip rates that had been observed in recent years, right through to 2050. This contrasted with other scenarios, which assumed trip rates stayed at 2016 levels. The report suggests that research which had been commissioned to explore why trip rates were changing "was unable to provide an explanation for the reduction in average trip rates over time, leading to significant uncertainty about the future trajectory of trip rates" (DfT 2018, 39). So, despite trip rates for different journey purposes being quite fundamental to the way in which future travel demand is projected, it appears that transport planning proceeds without a real understanding as to why they are changing. It is interesting to consider whether we would be happy with medical practice continuing to advance on the basis of such uncertainty?

Marsden and Docherty (2013) argued that there was already sufficient evidence in different parts of the economy and everyday life to suggest that alternative travel demand futures are developing, for example, in retirement and in early adulthood. They are marginalised in policy discourse because there is lots of churn within the economy and they are unevenly distributed across society and globally. It is easier, in policy terms, not to recognise these changes. However, if policymakers wanted to look for examples of ways in which society is unmaking its relationship with automobility, there are opportunities to build on (Marsden, Docherty and Dowling 2020). If they recognised them, policymakers could seek to accelerate those that supported more socially equitable and sustainable goals and tackle those that did not.

The response to the COVID-19 pandemic produced a wealth of studies and policy documents, which took the lockdowns to be a moment of reflection, where the impacts of our mobility-dependent lifestyles were suddenly put into stark relief by a requirement not to travel. Empty roads, a right to exercise, and a need to stay local provided an unprecedented exposure to almost car-free streets and plane-free skies. However, this was only possible by stopping much of what constituted everyday life. Here, too, the experiences that people had were very unevenly distributed. Around half of the population in the UK had to continue to commute to work after the initial lockdown, and the majority of these were lower-income workers with jobs in less accessible sites who were more car dependent (Freudendal-Pedersen and Kesselring 2021; Anable and Marsden 2021). The shelf stackers, the warehouse workers, those in the food industry, and healthcare workers had to go to work. As did the drivers of goods vehicles, many more of which were required as there was a ballooning of online shopping to replace the trips people were not allowed to make. The risk in society was transferred to "key workers" who are not the ones who necessarily benefit from high pay, and the choice to work from home. This was an inequitable time and one that reinforced some inequalities, with the wealthiest most likely to benefit financially over the period (Batty, Deeken, and Volz 2021). But

more than this, the promise of radical change, which was seen in the early weeks of the pandemic, with the assembly of temporary bike lanes and footways, disappeared over time to a large degree. As activities were allowed to return, so too has the travel associated with them. Virtualisation of work and business travel has resulted in some reductions in traffic, particularly during the peak hours and on weekdays (DfT 2024). However, we can also see a rise in light van deliveries, which means traffic levels are above pre-pandemic levels overall (DfT 2024). Cutting traffic is difficult.

One of the defining features of the COVID-19 pandemic was the extent to which large parts of society engaged with virtual substitution to enable activities to continue to some extent. There was a major acceleration of remote business working practices, schooling, shopping, exercising, and connecting with family and friends. Businesses shifted their operating models to online provision, and new types of activities opened up online. Whilst the initial surge of online shopping dropped back somewhat, and virtual substitution can lead to more travel long term because it creates new social obligations for face-to-face meetings (Urry 2002), it is clear that the pandemic has changed how we in the UK blend our online and physical activities in ways which will not "return to normal" but which have perhaps accelerated a pathway that we were on already. So, planning for an increased blend of online activities and physical travel together seems more necessary than when first identified more than 20 years ago (Lyons *et al*. 2002). The latest incarnation of this thinking is "Triple Access Planning" which blends physical connectivity, virtual connectivity, and spatial accessibility (e.g. through local co-working spaces) to try to achieve a more equitable and sustainable blend of activities (Lyons *et al*. 2024). Triple access planning also suggests paying attention to the local freight implications of shifts between physical and virtual activities. It is also important to recognise that the digital turn can lead to global outsourcing of manufacturing or back office functions, putting wider labour and community rights in peril or creating new environmental impacts with greater global flows of people, goods, and information. Planning that embeds the realities of the virtual and mobile interface is a step forward. However, triple access planning still needs to grapple further with multiscalar issues of time and space we identify in Chapters 4 and 5, and it is yet to be demonstrated to really challenge automobility and the structural inequalities we identify.

Marsden and Docherty (2025) conducted five sets of interviews with 20 key decision makers across the transport system throughout the pandemic to understand how the pandemic impacted their worldviews. Practitioners held views which argued both that fundamental shifts had occurred and that nothing had really changed the business case for the transport schemes they were promoting. Interestingly, whilst there were disagreements between participants, there were also participants who were internally inconsistent – flipping between recognising radical change and stasis. What struck us most, however, was the distance between what happened in the transport sector and the changes in the wider economy, which transport planners are not well connected to (and vice versa).

As one of the respondents said, "nobody thinks about transport, except transport planners, who don't think about anything else". Interviewees reflected on the early, almost zealous ambition to put in temporary cycling infrastructure to change the way society moves. The pace and scale of change, though, were extremely modest and clearly insufficient to overthrow the wider dominance of the car in society. Some cities have used the infrastructure changes they made as a catalyst to wider change, but this has been largely shown to be in places that already had a plan to do this, like Paris, Bogotá, Glasgow, and Leicester (Kehlbacher *et al*. 2023; Marsden and Docherty 2025). Equally, there are examples of retrenchment and removal of schemes and even national kickback against such measures (DfT 2023, and see also Chapter 6). Some of the behavioural changes that have sustained beyond COVID-19 are important. They have challenged beliefs about commuting trips and flexibility, for example. There are also important learnings to be had from what people missed (such as spontaneity and socialising) and what they went back to (such as large-scale events and group activities). COVID-19 was the largest "shock" to mobility patterns in a lifetime. This did not deliver a radical change to transport outcomes, largely because of the dependencies that have been built in as automobility has developed, and which cannot easily be unpicked. This suggests that we need to think about an ongoing undoing of auto-, aero-, and cargo-mobility and not look for single, simple solutions. The challenge that we face, and attempt to address in this book, is that a steady undoing of automobility is not transformative and will result in society facing much greater exposure to the risks of catastrophic breakdown. Is it possible to act quickly and at scale in a system that has been resistant to such an approach? We develop our perspective on this further as we move to discuss how to think differently (Chapter 7) and act differently (Chapter 8).

## Concluding Thoughts

In this chapter, we have set out the case for an opening up of the understanding of why we travel. We explained why the current paradigms that dominate rational planning help perpetuate business as usual, reinforce existing inequalities, and offer no model for radical change. They serve to reinforce the system of automobility, which Urry and others have described. As we demonstrated with the example of the lack of understanding of changing trip rates in the UK, it is not that mobility patterns are not changing; we just have failed to care and understand why. That is quite an incredible statement, given the centrality of mobility to society, and perhaps reflects the vested interests that are aligned with the promotion of unfettered growth in travel. Sheller (2017) also suggests that the lack of a clear ontology of movement means that we can treat space as an empty background through which transport moves. This serves to depoliticise travel demand management (in theory) and leaves us in a position where the only change that we can accept or justify is marginal (in reality). The language of transport takes us away from understanding why we travel, and lacunae of understanding are reinforced by the technical tools which surround them.

If we are to find a way forward that enables us to meet our climate obligations, then we have to understand the systems we are intervening in. Change is happening anyway. Are there opportunities to steer it for the better? There are multiple perspectives and insights into why we travel. If we don't pay attention to this, then we will end up playing "whack-a-mole" where our treatments simply shift the problem elsewhere. We need to understand that changing mobilities is social change and that any discussion of a fair transition has to address the existing inequalities as well as avoid developing future ones. It is, therefore, also deeply political. In some senses, this is a hopeful appeal. The majority of emissions are generated by a minority of the population, both within countries and globally. It is not impossible to imagine reconfiguring the way we live and move to afford more people more opportunities. This would, though, need to address over-consumption and the reality that the mobility system that serves the wealthy does not, and never could, work for everyone. There is not enough space or enough resources for that to be possible. Most politicians tread carefully in this territory, if they enter at all. But perhaps they should. After all, engaging in why we travel seems like a better way to approach improving people's access to the things they need than hovering in the background talking about "unnecessary journeys" and "travel demand management".

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# 4 A Question of Time

On 5th March 2024, 12 of 22 members of the Subcommission of Quarternary Stratigraphy rejected evidence to demarcate the Anthropocene as a geological epoch. The argument centred on the speed and degree of impact caused by human activity on the parameters that define the Holocene. Those who voted "No" argued that humans, like beavers and other species, have always shaped their environments. A paper co-authored by Erle Ellis, one of the commentators who supported the no-vote, describes the Anthropocene as an "Event, not an Epoch" (Gibbard *et al*. 2022, 395). Ellis argues that human activity has impacted the Earth for a million or more years, intensifying with the start of the Holocene some 10,000 years ago. He explains that the Subcommission rejected the Anthropocene proposal, "because its recent date and shallow depth are too narrow to encompass the deeper evidence of human-caused planetary change" (Ellis, quoted in Waters *et al*. 2024, n.p.). When one considers that the usual margin of error in demarcating geological epochs is 1000s of years, a period of 71 years (going back to 1952, the year that the members of the Anthropocene Working Group proposed as the start of the Anthropocene), the objection seems reasonable. However, when this period is one in which "the Earth system had crossed a threshold into a new normal", the shortness of time is an argument *for* declaring a new epoch (Barnosky and Hannibal 2024).

Waters *et al*. reflect on a visualisation produced by Ellis and his colleagues that links the geological timeline with a history of human activity from the use of fire through agriculture and urbanisation to the emission of $CO_2$, suggesting various markers for an Anthropocene "Event" (Gibbard *et al*. 2022). These include $CH_4$ emissions from agriculture 5000 years ago and lead pollution from mining 3000–2000 years ago. Waters *et al*. note that the visualisation effectively "summarises the changes caused by human activity … But what is lost … is any sense of the quantified rate and magnitude of change" (Waters *et al*. 2024, n.p.). "Looking at it, you'd wonder what all the fuss is about", and Waters *et al*. contrast the image with a graphic that adds a y-axis to chart the pace and scale of change, focussing on $CO_2$, methane, nitrous oxide emissions, and global mean surface temperature (Waters *et al*. 2024, n.p., Figure 4.1).

The "hockey-stick" visible at the suggested start of the Anthropocene reflects the "Great Acceleration" starting around 1950, first described in 2005

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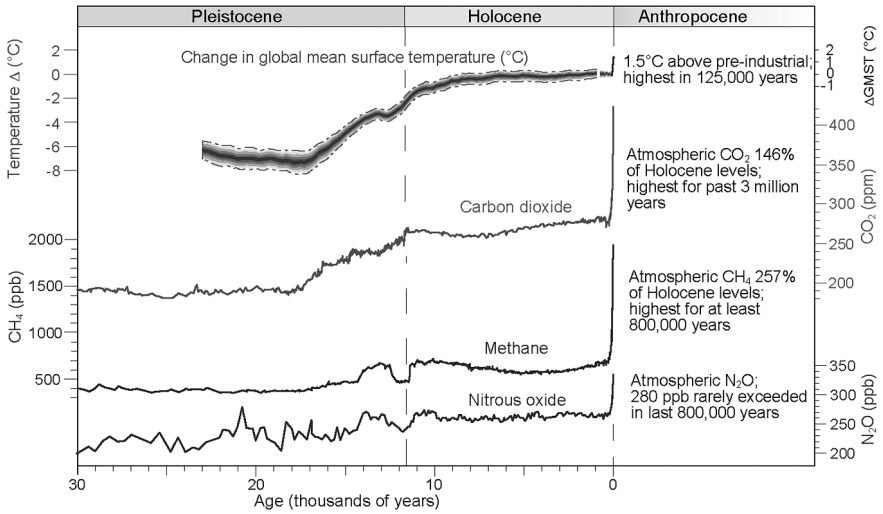


*Figure 4.1* Global atmospheric concentrations from ice core records of greenhouse gases (carbon dioxide, methane, and nitrous oxide) and global temperature over the past 30,000 years. There is a sharp, unprecedented uptick in values in the Anthropocene.

*Source:* Zalasiewicz et al. 2024.

by Will Steffen in a series of graphs charting 12 socio-economic trends, including transport, telecommunications, and international tourism as well as the myriad im|mobilities of finance, chemicals, goods, water, and carbon, and 12 Earth system trends (Steffen *et al*. 2005, 2015). The sharp increases in activity, mirrored by spiking pressures on all Earth Systems, powerfully visualise a temporal category mistake in Ellis and his colleagues' argument. The basis for declaring the Anthropocene as a new geological era is not *that* humans shape their environments, but the speed and scale of that process, which has tipped multiple Earth systems beyond the planetary boundaries that defined the Holocene (Figure 4.2). Transgressing these boundaries constitutes an existential threat, because for humans, the Holocene is "the only Earth system state civilizations have historically known" (Richardson *et al*. 2023, 2).

Transport contributes considerably to the transgression of Earth system boundaries. Most significantly, transport has generated 24% of the global $CO_2$ emissions, which are a major cause of climate change. From an average of "1 car for every 71 people on earth" in 1926 (1 for every 6 in the United States "compared to 1 for every 530 people in Brazil" (Eaglin 2024, 3)), numbers roughly doubled every 10 years after the Second World War to reach 500 million in 1986 (Lavrinc 2012). Today, there are 1.4 billion cars – one for every 5.5 humans (Bonnici and Stevens 2024), and Sperling and Gordon's prediction of 2 billion cars by 2030 seems to hold, as does their verdict that "The risk of disaster is unacceptably high" (2009, 2). A key attraction of the car is that it

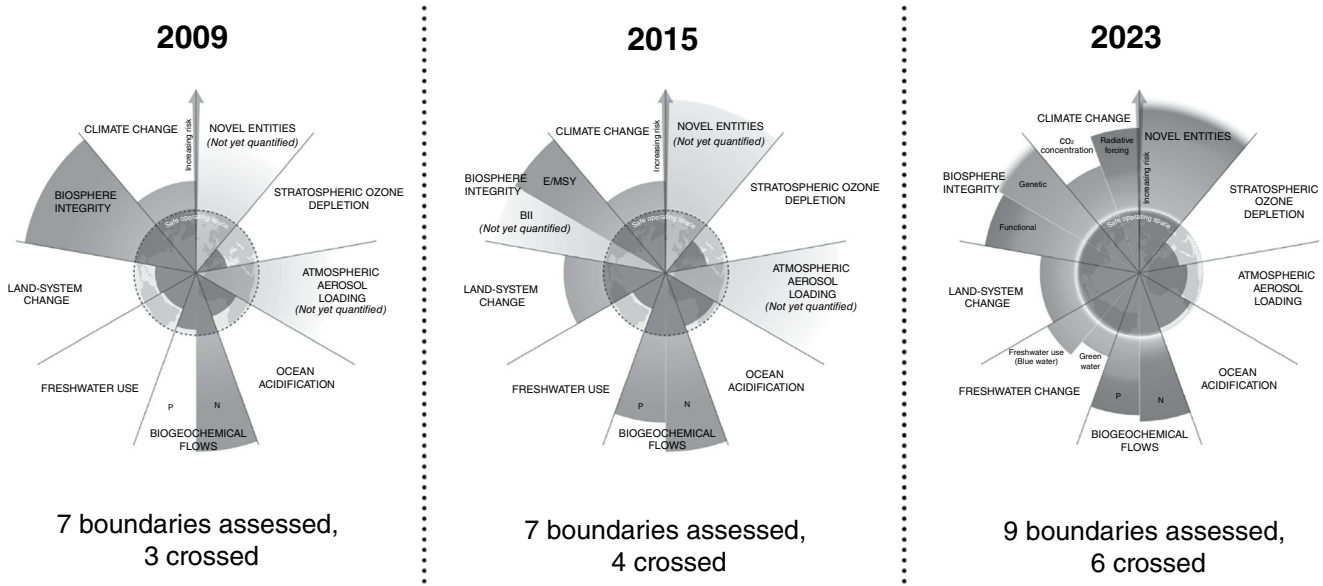


*Figure 4.2* Azote for Stockholm Resilience Centre, based on analysis in Richardson *et al*. (2023).

*Source:* Stockholm Resilience Centre.

promises flexibility and reduction in travel time, along with the comfort of a private "cocoon" space. Dominant cultural narratives "where increasing speed is directly linked to saving time – and thus productivity" suggest that individuals rationally seek to spend as little time as possible in transit (González Villamizar 2023, 63). As we have seen in Chapter 3, these assumptions of travel time as at best "useless", a cost to reduce, have shaped mobility planning for more than a century. It has led to what Mikael Colville-Andersen (2018) refers to as "the arrogance of space", where the car takes up a disproportionate amount of space compared to its actual share amongst modes of travel. This includes cars that are parked (an average 95% of the time), because regulations often specify around four parking spaces per car (Shoup 2021). In this way, vast areas of public space are made permanently inaccessible to people and nature. And, as the number of cars has gone up, and "the maxim of profit steers the [automotive] industry towards [ever larger] SUVs" (Keil and Steinberger 2024, 104), an Australian government report finds that now SUVs account for "more than 50% of new vehicles sold", a trend that devours space and has "the potential to offset any reduction in emissions … from fuel efficiency improvements and the increased adoption of electric vehicles" (Karp 2024, n.p.). Ironically, economic analyses show that people now spend more "unproductive" time in their cars: New York, Mexico City, London, Paris, and Chicago are the most congested cities in the world on the INRIX Global Traffic Scorecard, with the average driver in the UK losing "61 hours due to traffic jams in 2023" and congestion costing the UK "nearly £7.5 billion" (Pishue 2024, 19). Yet, socio-cultural and political choices to grant the car priority translate into perceptions that, despite delays and congestion, automobile travel time is shorter, more flexible, and qualitatively better. As a result, whilst the business of time in the transportation industries is to sell seconds, minutes, or hours that people can allegedly save by choosing the car over other forms of transport, these are the same seconds, minutes, and hours that tick by as we pass further into dangerous planetary conditions.

Transport also contributes to overshoot in other ways: an estimated 35% of microplastic novel entities that enter water courses, oceans, and the food chain, some taking thousands of years to decompose, come from "tyres and road markings" (Miner *et al.* 2024, 11). Consumerism and its just-in-time supply chains have grown from the debt-financed consumption in 1920s America (Higgs 2014) to a hypermobile US$5 trillion market in developing countries alone (World Bank 2024), making shipping a major contributor to ocean acidification (Hassellöv, Turner, Lauer, Corbett 2013). In some open ocean regions, vessel intensity is now so high that shipping routes are etched into the oceans as continuous tracks when marine traffic is plotted (Halpern *et al.* 2015). Finally, biosphere integrity is threatened by the inadvertent spreading of the world's flora and fauna, zoonotic diseases, and disease-bearing organisms through air and sea travel and the movement of cargo. We are, in effect, "reassembling the world into one enormous supercontinent – … [a] New Pangaea" (Kolbert 2014, 208). But most of these epochal im|mobile contributions to

overshoot are "invisibilised" in everyday life (Michael 2001), supporting industry and investor interests in the perpetuation of business as usual. As a result, at the same time that we are anticipating climate and ecological breakdown, we are also seeing "Global growth … expected to stabilise and then pick up" (OECD 2024, 23), and many national governments pulling out all the stops to further economic growth.

Members of the Anthropocene Working Group argue that "With the recent vote, the gatekeepers of geological time have disregarded evidence of hundreds of peer-reviewed studies, claiming that the Anthropocene is a relative term that can't be pinned down" (Barnosky and Hannibal 2024, n.p.). Of course, one can label something and still take no action, just as one cannot label it and still take action. What is more, alternative terms such as "Capitalocene" might better capture the causes of the crisis, as they highlight the role of capitalism and climate coloniality (Haraway 2016; Sheller 2023), and reveal how structural inequalities are still deepening. But not marking how the Great Acceleration has come to destabilise Earth systems allows the consequences of overconsumption and inequities to be marginalised, as time continues to march on. "Concepts of time are concepts of history", said Niklas Luhmann (1998, 63, cited in Damianos 2024, n.p.). Some commentators on the Subcommission of Quaternary Stratigraphy's refusal to acknowledge the Anthropocene as a new geological epoch argue that the Anthropocene Working Group, which proposed it, had "overseen the positioning of geological observation as political" (Damianos 2024, n.p.). But this is another category mistake. Epistemology, politics, ethics, ontology, fact, and value are inseparably entangled and intra-act in the continuous production of realities (Barad 2007; Latour 2008; Jasanoff and Simmet 2017). The row exemplifies that articulation of a sense of crisis is inevitably political, "a question of a specific situation in which participants come to treat actual occasions as either ordinary or exceptional" (Vollmer 2013, 18). To characterise the present as ordinary is a political act with consequences, and in this chapter, we review the importance of the politics of time. We argue that, if the urgency to change mobilities were to really be recognised, it would trigger different responses to those we observe. Starting with a stocktake of precipitous temporalities and attempts to steer away from them, we then explore key elements of harmful temporal dynamics of overshoot – the futurism of technocratic solutions and the way in which political timings generate a groundhog-day policymaking tragedy. This leads to consideration of how "the future is now" (Urry 2016, 7) from the perspectives of planning and social movements. We conclude by considering temporalities of changing mobilities for good.

## From the Precipice

> Imagine you're in a canoe floating down a river and you hear a noise on the horizon and see mist, …The tipping point is not when you go over the waterfall. It is when you can no longer get to the shore.
>
> (James White, author of *Abrupt Climate Change*, cited in Grossman 2018, n.p.)

Climate change may seem to be a slow crisis in the sense that the emissions that cause present levels of warming have accumulated since the start of the Industrial Revolution. But it is complex rather than slow, with tipping points, or thresholds where "small quantitative changes in the system trigger a non-linear change process that is driven by system-internal feedback mechanisms and inevitably leads to a qualitatively different state of the system, which is often irreversible" (Milkoreit *et al.* 2018, 9). Once a tipping point has been passed, change can be rapid, inevitable, and unstoppable, and it can be radical.

Climatic tipping points, such as the self-reinforcing melting of the West Antarctic and Greenland ice sheets or wider permafrost areas, add significant uncertainty to models of global warming, affecting the ranges around pathways (Figure 4.3). Pathways for decarbonisation are habitually depicted as precipitous lines along a linear timeline, where historic emissions and current trends create a need for steep emission reductions, as in the projections shown in Figure 1.1 in the Introduction. Figure 2.1 in Chapter 2 places these reductions in a context of declining resources, industrial outputs, food, and population that informs narratives of ruination and collapse. Figure 4.3 maps onto

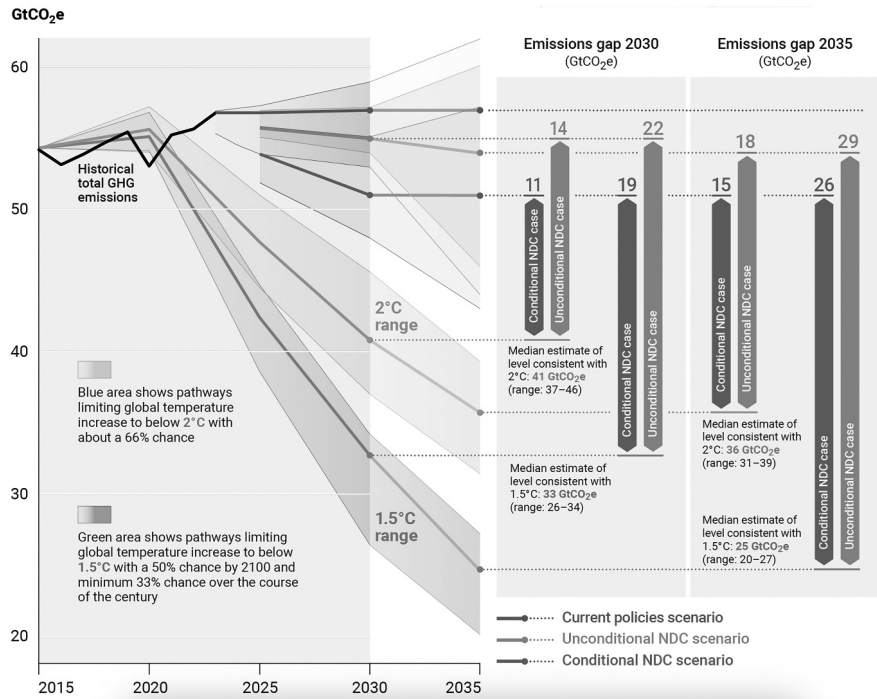


*Figure 4.3* Global GHG emissions under different scenarios and the emissions gap in 2030 and 2035.

*Source:* UNEP 2024, XVI.

this a yawning gap between required emission reductions and current policies, showing how current policies overshoot the cliff edge like Wile E. Coyote chasing Roadrunner in the Looney Tunes.

Most of the impact will not be felt by national leaders in power today, whose median age is 62 (Pew Research Centre 2024), but depending on the actions they take and enable, future generations will experience more or less warming.

However, as we have shown in Chapter 3, policymakers are not the only source of change. Mobility systems have changed radically before. The year 1894, for example, saw London, like many cities in the world, confront "a crisis of epic proportions":

> The "Horse Manure Crisis", as it was termed by The Times that year, struck fear into the hearts of Londoners … "In fifty years, every street in London will be buried under nine feet of manure." Such a conclusion seemed reasonable – after all, cities of this kind had never existed before and they appeared to be unsustainable. Even an urban studies conference convened specifically to discuss the issue some four years later, failed to arrive at any solutions.
>
> (Bastani 2019, 60)

Dennis and Urry (2009) narrate the materialisation of the automobility system from this point. But what is next now? Whilst Bastani focusses on the role of technologies like artificial intelligence, autonomous vehicles, and robotics, predicting "fully automated luxury communism" in his book of the same title, Otto *et al*. consider how social movements like #FridaysForFuture are "causing 'irritations' in personal worldviews" that "might be changing peoples' norms and values" (2020, 2361). As we approach the precipice, it seems that there are lifelines emerging from social, cultural, economical, and political sources, but few and far between.

Malene Freudendal-Pedersen documents how difficult it is to envisage alternative mobility systems. She traces how, faced with the "enormous task" of reconciling the unsustainability of automobility with the systemic deadlocks of high-carbon mobile lives, people use effectively self-harming "structural stories" to manage the cognitive dissonance (Freudendal-Pedersen 2016). These are often life-course stories that conjure the inevitability of automobility as an immovable certainty, such as "When you have children, you need a car". A structural story is "used to make an apparent rationale behind … the choices we make in everyday life, and functions as a guide for specific actions" (Freudendal-Pedersen 2016, 34). The most powerful structural story – relentlessly advertised – suggests that "more mobility gives more freedom" and flexibility (Freudendal-Pedersen 2016, 42). In a world dominated by "independent decontextualized rationalized time" (Urry 2007, 98) and time-space compression (Harvey 1992), "society has murdered time" or the lived time of embodied experience in place (Lefebvre 1991, 96). Freudendal-Pedersen shows that this

contributes to a dehumanising acceleration and fragmentation of time that ironically traps people deeper into automobility. Rushing between work, home, consumption, relationships, leisure, and "making memories", people cram more and more activities into their lives. Through physical mobility and mobile communications, a precious "[i]nstantaneity is given to the individual", but it carries a "violence of time" as "urgency imposes itself" (Aubert 2008, 26, translated with DeepL.com). Detailing modern hypermobile pathologies from mental health issues to obesity, Aubert argues that "they think they are abolishing time, but they also find themselves tied to the immediate. … galvanised by urgency, almost 'shot up' by it, with the feeling that they can 'own time'" just as they also "find themselves sucked into a vortex that deprives them" (Aubert 2008, 26, translated with DeepL.com). Mobility has a paradoxical role in this, on the one hand enabling the frantic "stacking" of activities, on the other providing a healing cocoon, a precious moment of time-out, where "in our insistence … to achieve all, the slow down and the installation of in-betweens is something that happens in everyday life mobilities" (Freudendal-Pedersen 2016, 97) – poignantly predominantly in the car, and often in traffic jams! It is in this logic that 100 km commutes make perverse sense both as a means to fit career and rural living into an ideal "good life", whilst also providing a semblance of time-out from the rat-race in places like Denmark. Public transport is seen as inflexible, unreliable, and crowded, denying such respite.

But some structural stories break through the ideology. When Freudendal-Pedersen asked her participants which mode of transport made them feel most free, their responses suggest that structures of feeling close to Cass and Manderscheid's (2020) autonomobility are also forged in everyday discourse:

> … if I sit in rush-hour traffic in the car, then I'm not free, I feel more free when I bike past all of them.
>
> (Freudendal-Pedersen 2016, 73)

> It is, for sure, community which creates freedom.
>
> (Freudendal-Pedersen 2016, 84)

Freudendal-Pedersen acknowledges that these alternative stories are "the exception rather than the rule" (Freudendal-Pedersen 2016, 84). However, she argues that applied mobilities research can create "communities where social learning is possible" (Freudendal-Pedersen 2016, 139), and a connection to lived time can be revived. In our own creative workshops with over a hundred members of rural communities and young people, civil society organisations, and local authorities in North West England, many expressed a sense of urgency. For example, a group of government agency policymakers, non-governmental organisations, and independent transport consultants from Cumbria agreed that:

> We are in a mess. In Cumbria 47% of greenhouse gas emissions from Cumbria's residents and visitors relate to transport. We need key decision makers, organisations, and individuals to consider now how we might re-imagine the role transport plays in our lives, rather than leaving the problem for future generations, by which time it will be too late.
>
> (Büscher *et al*. 2022, 2)

The wider the gap between action required and policies implemented, the more obvious the burdening not just of abstract future generations, but ones' own communities, children, and grandchildren. Approaching the precipice, more and more people experience temporalities of collapse, tipping, metamorphosis, ruination, and transformation, which prompts alternative imaginaries.

The enshrinement of *buen vivir* principles into the constitutions of Ecuador in 2008 and Bolivia (2009), and the Brundtland definition of sustainability in the Welsh Future Generations Act (2015) are examples of attempts to change the certainties of (amongst other things) transport planning, and reach safer shores. Making *buen vivir* a constitutional commitment has translated into major mobility infrastructure investment. The Line One Metro de Quito (PLMQ) in Ecuador, for example, has created 15 stations across the length of the city, a total of 22 km linking "population centers and promising end to end travel in … about a third of the current average travel time" (Atha 2021, 1–2). It is said to realise the ideas of *buen vivir* "as it not only improves economic conditions in the city for residents, but also contributes to cleaner air, a healthier environment, and stronger communities" (Atha 2021, 43). The degree to which *buen vivir* principles actually establish new certainties through such projects is highly contested, with some authors arguing that "At the government level", the concept of *buen vivir* "has been compromised by being ranked below demands for concentrating power and disciplining societies, while capitalism has been modernised" (Acosta 2017, 4). Nevertheless, Acosta argues, *buen vivir* principles are "highly subversive" (Acosta 2017, 4), conjuring hopeful futures through a prefiguratively lived "nowtopia" of good living. His reasoning resonates with David Harvey's "spaces of hope" where "By seeking to trade on values of authenticity, locality, history, culture, collective memories and tradition [those who co-opt them] open a space for political thought and action within which socialist alternatives can be both devised and pursued" (Harvey 2002, 109). *Buen vivir* principles are not necessarily socialist: they break "both with the anthropocentric view of capitalism as the dominant civilisation and with the different manifestations of socialism to date" (Acosta 2017, 1). Acosta finds that *buen vivir* is well-matched with degrowth, but whilst "degrowth is a 'missile word', destructive, not constructive, … *Buen Vivir* is constructive at its core" (Acosta 2017, 6). 10,000 miles away, driven by kindred ambitions to encourage constructive change, Jane Davidson, Wales' minister for environment and sustainability proposed a new Act that would

> require the Welsh Government and all its public services to 'deliver' sustainable development; that it would be audited in the same way as all public services; that Welsh Government would also be accountable under the Act and that there would be an independent Commissioner who would be a critical friend but with powers to hold all the authorities to account.
>
> (Davidson 2020, 25)

This new Welsh Act for the Well-being of Future Generations is said to be the world's first statutory legislation to protect the interests of future generations (Future Generations Commissioner for Wales 2022), and it was a "a watershed moment for Wales", because "Law is different to policy. Law … requires delivery" (Davidson 2020, 26). With the Act, the Brundtland definition of a sustainable way of life as designed "to ensure that the needs of the present are met without compromising the ability of future generations to meet their own needs" (Brundtland Report, cited in Davidson 2020, 47) became a guiding principle for all public policies, including transport policies. It has enabled "a culture change across public services" and, in a major move against the managed solutions of predict and provide transport planning focussed on travel time reduction, it "has led to the scrapping of the M4 relief road in favour of an investment in public transport and active travel" (Future Generations Commissioner for Wales 2024, n.p.). Similar critiques to the co-optation of *buen vivir* suggest that the Future Generations Act is un-enforceable, merely "'aspirational' or 'symbolic'", a "'law without legal effect'" (Stokes and Smyth 2024, 6). The danger of being co-opted to cherry-pick and adapt capitalist notions of sustainability and growth is indeed high. In their response to the UK Climate Change Committee's (CCC) 2023 progress report on reducing emissions in Wales, for example, the Welsh government (2023) accepts suggestions to utilise Sustainable Aviation Fuels, and to "Set out a strategy to support a just transition" by stating commitment to the principles of the Well-being of Future Generations Act, but neglects to develop "a strategy for managing airport expansion and aviation demand, and does not have a plan for ensuring Cardiff Airport is prepared for sector decarbonisation" (CCC 2023, 22). However, Stokes and Smyth (2024) echo Harvey and Acosta when they counter such critiques with an appeal to the power of the Future Generations Act to underpin hope. They suggest that through its institutionalisation of culture change, "The Act might be better imagined not in isolation but rather across time" where its "integration of new ways of working, new processes, and new priorities, and … the legitimizing effects of these new frames of conduct" can power change (Stokes and Smyth 2024, 16). But the speed of this constructive change from within seems too slow to reach safe shores. It is throttled by technocratic futurism and a "groundhog day" effect of political short-termism and manipulation.

**Technocratic Futurism**

In a conversation on planetary boundaries and fairness, climate scientists Kevin Anderson and Johan Rockström discuss how placing hope in technocratic solutions effectively amounts to a theft of time. The exchange is worth citing at length:

*Kevin:* … 'negative emission technologies' … are technologies that really don't exist at scale. There are a few incredibly small pilot schemes out there, that … collectively, [capture] just a few million tonnes, compared with the 41 billion tonnes that we're emitting [annually, globally]. And yet, as far as I'm aware, with very few exceptions, the IAM [the IPCC's Integrated Assessment Models] rely on these technologies at huge levels of hundreds of billions of tonnes for 1.5°C, for 2°C, and … for a lot of the 2.5°C and 3°C scenarios, …. I mean, the impacts are terrible, so we don't want to go there.

*Johan:* No.

*Kevin:* … we are playing them out as a way that allows us to maintain a sort of … 'green-washed' business as usual…. [or] do you think I'm overplaying that?

*Johan:* … I would agree with you. How it plays out in the high temperature scenarios, … it's not interesting, because we don't want to go there. Because that's just a kind of a disastrous future. But, you know, for the 1.5°C pathway, you're absolutely right. There are something like 110 modelling runs … that can hold the 1.5°C line. … And these are the ones that have very optimistic assumptions … So they talk of very low population growth … equity … food system transformation. And also assumptions on keeping nature intact. So they have very, very optimistic storylines. But they still cannot achieve 1.5°C without turning up the negative emission technologies. So we've come to a point where we have consumed … We've simply failed so much for such a long time. … just kicking the can down the road for so many decades that the carbon budget can only exist thanks to assumptions of negative emission technologies. … we have no evidence that we can scale it to the level of the 5 to 10 billion tonnes of carbon dioxide equivalent per year that is assumed …

*Kevin:* Which is very similar to the amount the oceans absorb.

*Johan:* Exactly. It's at that scale. So it's just enormous volumes. But … if you just run the models without the negative emission technologies instead, then the pace of decarbonization suddenly flips over from anything realistic to be completely unrealistic. So I've come to the conclusion that, you know, … What's the highest mitigation pace we can think of in the world economy? Well, anything above two per cent per year of reductions is what we would normally call 'revolution pace'. The Green Revolution's increased food yields of rice and

maize were two percent per year. Two per cent per year is non-linear. It's a doubling in one generation. It's big. Two per cent per year is a really rapid pace. And we're increasing emissions today between one and two per cent per year. Now, to reduce emissions even in the global model runs we have, with … overly optimistic negative emission technologies – assume[s] mitigation pathways, as you know, between five and seven per cent per year. So that is three times revolution pace, at the current modelling runs. If you take away negative emission technologies, you would exceed ten per cent very rapidly. You would be more [at] ten to 15%…. That's not revolution, that is a complete disruption of the global economy. It's like a pace that is beyond … You would be in a complete global Marshall Plan. It's a war zone agenda.

*Kevin:* This is what I find interesting here, because you're saying that's what we would be in. But actually, I think, … and I'm quite careful here about .. the 'we' – it's a particular group of us … Our choice to fail over the last 30 years has brought us to this position. And a way out of that, a way out of the Marshall Plan, is to say we can have these negative emissions. I think we need to say that, okay that's one way … – if they work. Another way … is the Marshall Plan. … (Johan Rockström Interview | Planetary boundaries, 'negative emissions', mitigation models & fairness 2023 29"–34")

The current carbon budget – "the total amount of $CO_2$ scientists estimate can be put into the atmosphere" to prevent warming above 1.5°C (Anderson 2023, n.p.) is ca 200Gt of $CO_2$, and for 2°C it is 950Gt (at a 67% likelihood of success, Mercator Research Institute 2024). At the current rate of global emissions (1,337 tonnes/s), those budgets will be depleted in 4.5 years for 1.5°C and 22 years for 2°C. Of course, these "clean" figures gloss over hugely complex differences and already occurring consequences (Israel and Sachs 2012; Welsh and Wynne 2013). But they starkly capture how "We've simply failed so much for such a long time", and continue to do so. When Rockström states that "the carbon budget can only exist thanks to assumptions of negative emission technologies", he concedes that even the most optimistic scenarios of "greening" business as usual are "academic gymnastics that have nothing to do with reality" (Rockström 2019, cited in Anderson 2023, n.p.). The reductions needed exceed the pace of previous societal revolutions like the Green Revolution to the point where what is actually required is a "complete disruption of the global economy" and/or a "Marshall Plan", a "war zone agenda". The frank exchange reveals how even the International Panel on Climate Change is embroiled in temporal "smoke and mirrors" strategies to avoid communicating these truths to politicians and the public (Anderson 2023). Bursting the bubble of – at best – unproven "negative emissions technologies" may "suddenly flip the pace of decarbonization over from anything realistic to be completely unrealistic". But banking on these technologies and "greenwashed business as usual" not only denies that climate change impacts are already here, perpetuates,

and even deepens global inequities, but it is also a form of temporal dispossession. It does not merely discount the future but effectively steals time from current and future generations. Stealing time is, to put it bluntly, equivalent to taking quality of life and even life itself from those already exposed to the effects of climate change and future generations, sacrificing them to "a disastrous future". For Anderson, this creates an urgent need to communicate how imperative the design and implementation of "a Marshall Plan" is, requiring some of "us" to face that

> The question now is, will we high-consuming few make (voluntarily or by force) the fundamental changes needed for decarbonisation in a timely and organised manner? Or will we fight to maintain our privileges and let the rapidly changing climate do it, chaotically and brutally, for us?
>
> (Anderson 2023, n.p.)

Faced with such difficult choices, scientists are highly incentivised to search for solutions that appear to buy time. The academic literature on decarbonising transport is dominated by studies that explore the potential of technocratic solutions, from electric and autonomous vehicles to "sustainable aviation fuels". The willingness to engage in such academic gymnastics readily amplifies political temptations to deny the urgency of radical action in "these uncertain times", trapping societies in a groundhog day scenario.

## Groundhog Day

With short democratic election cycles, many uncertainties affect politicians' willingness to commit to anything but ambitious net zero goals and "sustainable" development of capitalist growth (Willis 2020). On the one hand, politicians know radical reform is necessary: "we know what to do, but we don't know how to get re-elected once we have done it" (Jean-Claude Juncker, Prime Minister of Luxembourg and President of the Eurogroup, *The Economist* 2007, 4). This creates obstacles to change within nations and globally, prompting some analysts to look beyond democratic forms of governance and others for deeper democratisation of climate governance (Willis 2020). Willis' analysis of the crisis of "carbon democracy" recognises that politicians, and even rich corporate lobbyists who seek to perpetuate business as usual, are locked into capitalist realism.

Levin *et al*. call this a "policy-making tragedy" where policymakers allow themselves to become trapped by short-term horizons, "even when the catastrophic implications of doing so are far greater than any real or perceived consequences of inaction" (Levin *et al*. 2012, 124). Such short-term political horizons have led to misleading long-term promises. Claims to make economies "net zero by 2050" are an example. As Anderson, Broderick and Stoddard (2020) point out, the claim to net zero and the date set have no scientific basis. What matters is the cumulative amount of carbon put into the

atmosphere during the period concerned. However, it is proving relatively easy for politicians to keep the longer-term goals and abandon the necessary interim commitments with impunity, as happened with the recent Scottish Government 2030 target, which had been ahead of the wider UK position (CCC 2024).

Research in environmental accounting is producing important new analytical insight into the dynamics that allow organisations and governments to position the environmental crisis as a "nonurgent crisis" in this way, despite mounting evidence. Tregidga and Laine (2022) compare how accounting practices and public communication campaigns during the COVID-19 crisis allowed utterly unprecedented societal change under high levels of uncertainty, whilst the ecological crisis is subject to discourses of delay. Indicators used to convey the extent of the threat from COVID-19 meant that "economic considerations and budgetary control, usually the forefront of state politics" temporarily lost "their hegemonic status as the primary factor behind decisions …. Cities, regions and entire countries … [were] put under lockdown", entire economic sectors "shut down, or placed under massive health and safety restrictions" (Tregidga and Laine 2022, 3). Tregidga and Laine argue that the combination of short-term conventional economic accounting and long-term environmental accounting has failed to produce the "type of information [that] can trigger major and disruptive decisions" (Tregidga and Laine 2022, 3), and suggest reframing the crisis in terms of more short-term environmental indicators. During the COVID-19 pandemic, "a small number of short-term health-related figures, such as new positive cases, hospitalizations, deaths and the [Reproduction or] R0-rate … [were critical in] driving massive and transformative policy decisions, with dramatic changes to social and economic life" (Tregidga and Laine 2022, 9). The authors ask what equivalent short-term indicators could be used to force the urgency and scale of response needed to address the climate and ecological crisis, and what kind of positive "environmental accounting numbers would serve in creating positive hope in societies in a similar way that the figures of vaccinations and vaccination rates convey[ed]" during the pandemic (Tregidga and Laine 2022, 9). A key element in their argument is the incompatibility of linear models of "steady economic progress" and the non-linear dynamics of ecological tipping, where ecological systems "may appear to be resilient and strong, but once a specific tipping point or ecological threshold is reached they can suddenly become highly unstable, lose capacity to regenerate, and end up … collapsing" (Tregidga and Laine 2022, 9). Transforming the relationship between human, economic, and ecological temporalities through finding new ways of environmental accounting in this way is a powerful approach. Visualising the over 5 million excess human deaths from fossil-fuel-related air pollution (Lelieveld *et al*. 2023) and "the biodiversity loss, extinction crisis, … patterns of defaunation that attend hypermobile ways of life" (Calarco 2023, 87) could be useful. Although, as we will see later (Chapters 6 and 8), it is necessary to take critique and action well beyond more powerful indicators.

Smoke and mirrors invocations of time in politics can also work the other way. Local authorities have been setting ever more ambitious targets for zero emissions transport or economies at ever shorter time periods. Harstaad (2020, 65) suggests that this lacks realism and represents instead "exercises in vanity" helping "politicians to be seen to be doing something when actually they are not". This, it is argued (Verlinghieri *et al*. 2024), is due to the hollowing out of local government such that competing for funding is the main way to take forward any form of climate action, even when that is acknowledged to be insufficient. Here, recognition of urgency is necessary to invoke legitimate claims to resources. However, as the time at which stated zero carbon goals are approached, and the gap between emissions and aspiration widens, it seems likely that the timescales will get pushed back with blame shifted upwards or outwards (Bache *et al*. 2014).

As we explore further in Chapter 7, the recognition of a wider social desire to see action on climate change has not yet been translated into a clear commitment to tackle the necessary system transformations that this implies. What progress has been seen to date has often focussed on the hard-to-notice changes, such as the repurposing or renewing of power generation technologies. Now that we approach questions of travel demand reduction, including lower levels of driving or re-distribution of access to air travel, as well as diet, progress seems to stall. Proponents of neoliberal market ideologies and other vested interests in the fossil fuel industry amplify political inertia. Their climate delay messages are absorbed and circulated by billions of people, and, increasingly, mis- and disinformation is also spread through online "bots" – algorithms that can autonomously simultaneously read content, generate, post, like, and re-post messages on social media, appearing to originate from genuine accounts. They can generate flare-ups of misinformation perfectly timed to cast doubt on, or mask, the most disturbing facts emerging from COP meetings or UN reports, and manipulate public opinion around elections. In a study of climate change denial on Twitter, Marlow *et al*. find that "suspected bots were responsible for approximately 25% of original tweets" (Marlow, Miller, and Roberts 2021). During COP27 in 2022, #climatescam denialism unaccountably topped Twitter charts, "despite data that shows more activity and engagement on other hashtags such as #ClimateEmergency" (King 2023); and in 2023 COP28 was overshadowed by a proliferation of false accounts vigorously supporting anti-regulatory discourse and the UAE presidency of the climate summit by Sultan Al Jaber, Chief Executive of Abu Dhabi National Oil Company, diverting attention from critical analysis of how vested interests perpetuate fossil fuel profits (Carrington 2023).

This "misinformation machine" carries literally deadly communicative energy, sweeping along a populist "base" and drowning out other voices (Ruths 2019). Growing numbers of individuals and communities have to deal with immediate personal emergencies, from finding the money to travel to earn a living to dealing with the floods, droughts, heatwaves, or storms of a changed climate. The urgent task of "putting out the fires" of personal hardship detracts

attention from the burning planet. "Disasters that unfold in extraordinary and sudden time disrupt life in a shocking way" and "demand more attention tha[n] slower threats, especially when experienced by a vulnerable population whose lives have been punctuated by disastrous events" (Hernández 2022, 10). "Over time, this results in a perception of risk that is attuned to extraordinary events, while minimizing the dangers" of slower crises (Hernández 2022, 2). Lamb *et al*. argue that discourses of delay are so compelling because they often short-circuit legitimate short-term concerns. In the absence of systemic change and truthful public climate crisis communication, low-emission areas, for example, can impact on low-income groups and some retailers (i-Sala 2024; Tarriño-Ortiz *et al*. 2023). In France, the "yellow vests" have repeatedly caused disruption in response to policies of fuel duty rises, exemplifying this dynamic.

The challenge is heightened at a global level, where complex climate justice issues arise around long-term historical responsibilities for environmental degradation, dispossession, human mobility, and geopolitics. Different parts of the world are facing more or less severe impacts of climate breakdown over time. What might not yet feel catastrophic in Northern Europe is already existential for parts of South-East Asia. In Pakistan, ranked as the eighth most vulnerable country to climate change globally, more than a quarter of the 33 million people affected by the 2022 floods have slid into poverty. To adapt, "many rural communities face displacement and are forced (or choose) to migrate to cities or other regions in pursuit of alternative livelihoods" (UNDRR Prevention Web 2024, n.p.). In June 2023, an estimated 500 refugees from Pakistan, Afghanistan, Syria, and Egypt drowned when their boat sank, adding to the 30,356 refugees who have died or gone missing in the Mediterranean since 2014, according to the International Organization for Migration (IOM)'s Missing Migrants Project data (Smith 2023; International Organization for Migration 2024). Amongst these tragedies, conspiracy theories circulate on social media, and anti-immigration riots in the UK use inflammatory slogans introduced by the conservative UK government. Treating such conspiracy beliefs merely as irrational individual delusions neglects the powerful and deliberate manipulation of temporalities of the multiple crises people face. We look more closely at strategies of boxing off "here" from "there" in Chapter 5 because time and urgency are different in different contexts and places.

Critically, across different contexts and places, it is often assumed that lack of action from policy elites will come without social consequence, and this is the message that discourses of delay perpetuate. However, analyses of ruination and collapse, and growing, largely disorganised pressures for adaptation, suggest otherwise. Does this mean change is now just a matter of time?

## Only a Matter of Time?

The constitutional implementation of *buen vivir* principles in Ecuador and Bolivia, and the Future Generations Act in Wales, could be a sign that the limitations of policies like "travel demand management" are being recognised,

and dysfunctional certainties are being replaced. Maybe we are approaching a social tipping point, that is, a "point when a certain belief, behavior, or technology, spreads from a minor tendency to a major practice" (Otto *et al*. 2020, 2356). Surveys indicate global escalation of concern: 43% of people under 35 expect to be displaced from their homes as a result of climate change at some point in the next 25 years (IPSOS 2022). Such high levels of concern in a world where the extraordinary has become ordinary could suggest that change is just a matter of time.

According to Andreas Malm, policy inertia could be sitting on a tinderbox of growing social unrest. His analysis of the power of a radical flank for climate and social justice movements ironically turns the mechanism of the "Overton Window" against the very neoliberal ideology it was designed to spread, a point highlighted by Amy Westervelt and Pasha Bell on Rachel Donald's Planet Critical Podcast (Donald 2024a, 41:44, Donald 2024b, 38:48, see also Krznaric 2024). Joseph Overton, senior vice president of the neoliberal Mackinac Centre, observed how public acceptance of previously unacceptable neoliberal policy shifted when advocates on the extreme edges articulated radical new policies, whilst more moderate voices remained in the centre ground. This approach was strategically harnessed to shift the window of political acceptability for radical neoliberal policies from "unthinkable" to "popular". The more extreme and radical the policies on the edges, the more acceptance opens up for those in the centre ground to shift towards these more radical ideas.

Aside from ethical objections to such manipulation, it is unclear to us whether this dynamic holds genuine promise for changing mobilities for good. Climate Science Fiction authors are beginning to explore the role of violent resistance, with Stanley Robinson (2020), for example, imagining how eco-terrorist attacks on private air travel would intersect with the work of an intergovernmental *Ministry for the Future*, but the prospect is deeply dystopian. However, we should not take it for granted that within the increasingly turbulent context of living under climate change as a condition, different movements might shift to the forefront of the debate on the back of events (either climate-related or of their own making). The last round of large-scale climate social movements resulted in four countries (the UK, France, Ireland, and Canada) and thousands of cities and municipalities declaring a climate emergency. Yet, the UK, France, Ireland, and Canada, along with many other countries, continue to fund and expand fossil fuel extraction and high-carbon mobility systems (Farand 2019; Harvey 2024). The next uprising of social movements might protest against the lack of delivery. If this seems far-fetched or in some sense overly "hopeful", then it is worth reflecting on the successful court case brought by older women in Switzerland who argued that their human rights were violated because the lack of action by the Swiss Government would impact them through the health risks of overheating. In the UK, the UK's net zero strategy has been deemed unlawful in two consecutive years, because of the lack of clarity about the risk of non-delivery on policies. Raising the stakes to a global scale, at the time of writing, the International Court of

Justice has heard evidence from 99 countries and dozens of organisations to provide an advisory opinion on the obligation of states in respect of climate change. According to expert analysts, the judges may issue an ambitious advisory "saying that, yes, states cause climate change, it is a breach of international law, and therefore states are obligated to pay financial compensation and cessation of all these harmful activities" (Derler in Ridgwell 2024, n.p.). Whilst the politics of today might be about delay and kicking ambition into the long grass, it could quickly turn to a scramble to action.

***Moving Beyond Managed Solutions***

Echoing a graffiti from 1968 Paris (Anderson 2016), John Urry states "the future is now" (Urry 2016, 7). Like us, he asks, "who or what owns the future"? (Urry 2016, 7), and in view of pervasive elite capture, suggests that a new kind of planning is needed to move beyond managed solutions:

> thinking futures is a way of bringing back a way of planning, but under a new name. Issues are now so big and wicked that there has to be some planning of futures. But what is involved here cannot be termed 'planning' since that has become an ideologically contaminated term from the era of organized capitalism and social democracy.
>
> (Urry 2016, 15)

One of the hallmarks of new planning approaches is an acknowledgement that climate change is a wicked problem – extremely complex, ill-defined, and dependent on "elusive political judgment for resolution" (Rittel and Webber 1973, 160). Recognition of the wicked nature of environmental and technological risk has informed a commitment to precaution, assuming that "Under conditions of grave uncertainty, … we ought to play safe rather than engage in avoidable risks" (Read 2024, 1), and since the Bergen Declaration in 2002, Sustainable Development "policies must be based on the precautionary principle" (Read 2024, 12). Climate change is also no longer in the future, but now here. That means that mitigation must be accompanied by adaptation, and fundamentally,

> our understanding of climate change needs to shift from that of a problem that needs solutions to a condition that is constituted through specific forms of socio-spatial relation and in turn constitutes the politics, ethics and meaning of particular socio-spatial orderings, from the citizen to the city, the community to the corporation.
>
> (Bulkeley 2019, 3)

Thus, whilst we have to foreground urgency, and we have to be radical, we must also be modest about what can be done. This resonates with a wisdom that already challenged the hubris of modern control at the start of the Great Acceleration.

***"Muddling Through" and Other Ways of Staying with the Trouble***

Lindblom argued that governance inevitably entails "muddling through" because rational planning "assumes intellectual capacities and sources of information that men [sic] simply do not possess" (Lindblom 1959, 80). The discussion above shows that it is not just a lack of information and intellectual capacities, but a lack of social, societal, and political capacities, methods, and institutional structures to juggle the complexity, the entanglement of fact and value, risks and vulnerabilities, equitably and democratically.

Haraway's more recent neologism of response-ability provides further leverage. For her, response-ability combines a set of skills to "stay with the trouble" of science-society entanglements, which "requires learning to be truly present, not as a vanishing pivot between awful or edenic pasts and apocalyptic or salvific futures, but as mortal [beings] entwined in myriad unfinished configurations of places, times, matters, meanings" (Haraway 2016, 1). It demands a respectful mode of listening and responding to others, to "hold in regard, to respond, to look back reciprocally, to notice, to pay attention, to have courteous regard for, to esteem" (Haraway 2008, 19). It provides an orientation for imagining low-carbon mobility futures together in regard of diversity, allowing appreciation of the fact that that, in Escobar's terms "another possible is possible" (Escobar 2020).

In resonance with eco-feminist thought, Sheila Jasanoff calls the methods needed "Technologies of Humility", "or better yet institutionalized habits of thought, that try to come to grips with the ragged fringes of human understanding – the unknown, the uncertain, the ambiguous, and the uncontrollable" (Jasanoff 2007, 227). Technologies of humility enable this, firstly, by encouraging ongoing reflection on the temporal, spatial, and social *framing* of risk considerations, which can help avoid exclusion and invisibilised injustices, such as the consequences of delayed climate action for those impacted already and future generations. Secondly, technologies of humility invite participation in the consideration of *vulnerability*. An example could be the involvement of residents in areas surrounding planned low-traffic neighbourhoods, which would enable consideration of unanticipated consequences of traffic displacement, congestion, and air pollution. Jasanoff's third technology of humility is concerned with *distribution*. This encourages deeper and more wide-ranging reflection on the ripple effects of science, engineering, and innovation, bringing into view, for example, the scale of extractive destruction that would be needed to electrify automobility to deliver relevant carbon reductions. Finally, she suggests a focus on *learning* as a way to move beyond monocausal explanations and find ways for collective reflection and civic deliberation of complex challenges.

Such a new understanding that the troubles of modernity are caused by its addictions to progress, control, growth, and hypermobility also prompts reflections on how planning can improve life under the condition of ecological overshoot. A critical part of this is to recognise that climate action requires a situated process starting from the middle of the challenge, not detached from

it. It is impossible to know the future. Many unanticipated and surprising consequences, for example, of the creation of low-traffic neighbourhoods or 20 mph speed restrictions, are unknowable until we try to implement them. Matthias Gross argues that current planning seeks to suppress this uncertainty by seeking to predict, prevent, and manage unanticipated consequences, in effect trying to act "in spite of uncertainties" (Gross 2010, 3–5). But this only proliferates problems. He suggests that we could more "effectively react to what cannot be avoided" and creatively cope with uncertainties and surprises, which "is fundamentally different from predicting and preventing them" (Gross 2010, 3–5). To do so, he elaborates a particular form of experimentation as "an effective strategy for sensing surprise", where successful experiments are "deliberately arranged to generate surprises. … [and] mindful openness to surprises can help turn unexpected events – including potentially threatening ones – into experimental practices or learning" (Gross 2010, 3–5). This is a paradigm shift for planning.

Technologies of humility, combined with a sense of response-ability and an approach to experimentation as a way of learning, can augment human capabilities of situating ourselves in the flow of things and steer us towards safer shores as we act on climate change. These methods, sensitivities, and approaches can generate not just more information from more perspectives, but also new participatory modes of taking action. This is about what we do in the here and now. The juxtaposition of needing to hold in view the long-term precautionary principle, and the social, economic, political, and ecological consequences of radical action without being paralysed not to act, does mean that this is about finding a way to work with complexity. It is not simple, but finding ways through is an existential task. We elaborate our thoughts on pathways in Chapter 7, "Thinking Differently", and explore how to translate them into action in Chapter 8.

## Concluding Thoughts

Reducing time spent travelling has been at the heart of planning for transport for a century or more. In this chapter, we have reviewed the importance of time and, in particular, the urgency to act which, we suggest, were it to really be recognised, would trigger different responses to those we observe.

Changing mobility systems for climate change mitigation whilst adapting to more extreme weather is – like many, if not all, modern social policy problems – a "wicked problem", requiring a precautionary approach. However, discourses of delay have turned this principle, designed to protect ecological integrity, on its head. The protection of libertarian values and neoliberal "certainties" of ever-increasing mobility positions growing demand as linked to prosperity through economic growth, and decarbonising as a matter of technocratic innovation. The inaction that these dysfunctional certainties allow creates the disastrous futures that are emerging from scientific analysis and that are – variably but increasingly – already encountered here and now.

Having explored the complex temporalities of sustainable mobilities to leverage capacity for change, we ask ourselves what deep time futures could look like. What comes after the Anthropocene? Will future archaeologists discover rewilded public boulevards that are habitats for animals and people? Will geologists choose life-centred symbiotic design (Borthwick, Tomitsch and Gaughwin 2022) as an isochronic marker for the start of the Post-Anthropocene, or geo-engineering? Could the post-Anthropocene literally be post-human, or will the Mad Max geopolitical warlordism that Urry delineates undo values of humanity? Over the last decade or so, the intolerable risks documented in successive IPCC and UN reports, and the rise of environmental movements, have inspired high ambitions for net zero. They seemed to recognise the climate emergency and the fact that "the future is now" (Urry 2016, 7). But action has been slow, and in 2022 the United Nations' Environment Programme warned that the window for action to keep global warming at or under 1.5°C was closing (UNEP 2022). Two years later, current policies are on course to allow global warming to rise to 3.1°C (UNEP 2024). A 1.5°C pathway

> is still technically possible. …[But] we would need global mobilization on a scale and pace never seen before. Many will say this is impossible. But to focus solely on whether it is possible misses one crucial point: the transformation to net-zero economies must happen, and the sooner this global transformation begins the better. Every fraction of a degree avoided counts in terms of lives saved, economies protected, damages avoided, biodiversity conserved and the ability to rapidly bring down any temperature overshoot.
>
> (UNEP 2024, XI)

Mobilities of collapse and ruination are not an end. The condition of precarity and uncertainty that we are in also creates a substrate for latent commons, renewal, and new certainties. It is far from clear that this will lead to positive transformation and better certainties. But it could. Discourses of delay create despair and prompt defeatist survivalism (Katz-Rosene and Szwarc 2022), leading some to bunker down, others to conjure planetary evacuation (Adey 2022), transhumanist singularity or terraforming, but as we discuss in Chapter 6, at the same time, living creatively in the ruins of capitalism also inspires discourses of desire and determination, and opportunities for sustainable mobilities that address inequalities and remake society, perhaps civilisation.

We need to see our impacts as part of a long sweep of planetary history and future. Nonetheless, we also need to recognise that we are at a critical juncture in transition. The next two decades will be critical to understanding our impacts – in the UK, that covers four to five electoral cycles and so could be seen to give time for governments and publics to delay (again). However, if we zoom out, this is a momentous instant where inaction could set off a much bigger and longer-term chain of irreversible impacts, whilst acting could leverage change for good. When politicians try to argue that there is time, that what

is happening is not out of the ordinary, and can be dealt with by a managed process, they are wrong. Some do see the urgency to act and the need to combine mitigation and adaptation – impacts are here and getting worse. Their hands are being tied. As this chapter has shown, science is inevitably political, but within a framework of modernist scientism, powerful actors with vested interests and politicians can use that accusation as a pretext to cherry-pick, dilute, or even ignore science. But beyond scientism, scientific methods show that Earth systems are declaring a planetary emergency. Time is running out to avoid climatic tipping points.

We argue that the machinery of delay is currently winning. But that could change, and quickly. Malm's suggestion that violent struggle is an inevitable part of change is frightening. Our view is that it must be better to face the problem and act than deny it and wait to see what unfolds. And this leads us to explore how to unlock change.

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# 5 Now Here

In Chapter 4, we problematised questions of time and how the case for action now is constructed by historic patterns and distribution of consumption. The arguments over responsibility for climate mitigation and for loss and damage reparations are not so much about the science of carbon in the atmosphere but more about the political decisions that are reached over how to reconcile burden sharing and action (Anderson, Broderick and Stoddard 2020). The answers depend on the allocation of historic emissions (time) by country (space) as well as the agreement that is reached on the minimum feasible level of global warming, which prescribes the pace of future mitigation. Whilst much is made of "following the science" and "science-led targets", the reality is that these choices are political, and how they are resolved has implications not just at a national and international scale but also at a local scale, all influenced through the global reach of multinational corporations.

To illustrate, for domestic transport, according to data from the World Resources Institute[1], ten countries represented more than half of global transport emissions in 2014 (including the United States, China, Russia, India, Brazil, Japan, and Germany). The Maldives, one of the areas most at risk from sea level rise, produced 1.18 Mt of $CO_2$ in 2019, just 0.07% of that of the United States. So, when carbon reduction policies are in discussion "here", they are about not just a duty to protect "here" but also the "here" of other parts of the world's population. However, a sense of distance is seen to be part of a deliberate strategy to depoliticise climate justice and limit the perceived need for action by governments (Chatterton, Featherstone and Routledge 2013). But even where a genuine commitment to a just transition is present, it is very difficult. Very few decarbonisation plans address just transition in their targets (Ternes, Marsden and Harrison 2024). To our knowledge, even those that do are reduced to acknowledging that there are significant implications and "that this responsibility should be recognized and quantified in the future" (Anderson, Stoddard and Schrage 2017, 13). Blame shifting to other arenas and other countries (Lamb *et al*. 2020) can significantly impede climate action. Bulkeley, Edwards and Fuller (2014, 31) suggest that it is critical that the discussion is about "recognition as well as rights and responsibilities", whilst Sheller (2023, 438) shows that "techno-modernization cannot address the

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underlying coloniality of climate racism and the harm it has caused, hence cannot bring about the necessary transformation of the Anthropocene". We take the position that recognition is more than a rhetorical acknowledgement; it is also a moral requirement to act, and that action implies social and political change. It is at the international and national levels that we must start.

**International and National – Responsibilities and Recognition**

It is important to explore the stance that is taken on social justice "now, here". When we explore total emissions burdens by country, we fold in size and population, but on a per capita basis and in international comparison, things can look quite different. In 2019, for example, the United States recorded 5.3 tonnes of $CO_2$ per capita, Germany 1.93 tonnes, with China and India reporting 0.67 and 0.23 tonnes respectively. The need for more developed and more polluting economies to act first and to move further was established in work on contraction and convergence more than three decades ago (Meyer 1999). However, high per capita emissions are the result of highly carbon-intensive consumption patterns. Whilst it is typically acknowledged that to address these patterns to keep in line with carbon budgets requires a combination of technology and demand shift to address high consumption (Barrett *et al.* 2022), it is the former that tends to win out in the policy arena in transport (Marsden and Schwanen 2024).

Addressing high per capita emissions burdens also requires recognising the structural inequalities that exist both internationally and within countries (see Chapter 3). The lack of recognition of the current injustices is a significant barrier to meaningful action (Bulkeley, Edwards and Fuller 2014). Nowhere is the misalignment between actions and emissions more evident than with global aviation. Lee *et al.* (2021) find that passenger air travel is responsible for 3.5% of global warming. The International Energy Agency suggests that "aviation accounts for a relatively small share of global emissions" (IEA 2024, n.p.). However, if we apply a justice lens, that statement unravels. Globally, it is estimated that 50% of emissions from flying come from just 1% of the population, with only between 2% and 4% of the global population taking any flights in 2018 (Gössling and Humpe 2020). Such inequalities exist within countries, too. In the UK, for example, less than 10% of flights are taken by the lowest income quintile in a year, whereas this is around 40% for the highest income quintile (Büchs and Mattioli 2021). The super-rich are even more greedy consumers of the planet's carrying capacity, with private jets in Europe putting more carbon into the atmosphere each year than the Maldives (Khalfan *et al.* 2023). The relative position of people within a country and between countries is not well understood or is deliberately marginalised in debates on carbon reduction. The right to fly abroad on a family holiday from the UK has been normalised, for example, by exempting children under 16 from Air Passenger Duty (HMTreasury 2016). Such a right is obviously relatively recently established if we look at holidaying trends within the UK, and there

are many other countries in the world where a foreign holiday by plane would still just be the preserve of the elite. In invoking arguments about the "right to fly", what is really being said is that wealthier people should not compromise on current practices, which are taken to represent a good quality of life. Unspoken is the implication that, if it is a right, then all societies across the globe should be able to replicate this, despite the impossibility of such an outcome in climate terms. By failing to recognise the true implications of the problem, partial debates about "rights to fly" can be invoked and stoked by the powerful lobby groups that surround, in this case, the airline industry (Griggs and Howarth 2016).

The introduction to this chapter began with a reflection on the politics of the choices around the allocation of responsibility for emission reductions and loss and damage between countries. This is what occupies the weeks of negotiations at the annual UNFCCC Convention of the Parties (or COP). It is necessary to accept that the basis for global climate agreements is that which is signed up to by signatory countries, and that the accounting regime for emissions is filed, and the action plans are agreed on a country-by-country basis. This provides a connection to the political mandate, which is essential to the legitimacy of the agreements. However, in an era of globalisation and planetary environmental change, it provides a further opportunity for obfuscation and blame shifting on what counts and, therefore, what actions are legitimised in different places. The UK, for example, has recorded a drop in territorial emissions of 49% since 1990 (ONS 2023). When the consumption of all goods and services is taken into account, which attributes emissions from the production of goods produced in other countries but consumed in the UK, the fall is reduced to 36% over the same period (ONS 2023). The UK has exported a quarter of its emission savings, largely to economies with much higher carbon intensity of production (so the net savings to the planet will be less than 36%). It is necessary to define boundaries, relations, and responsibilities. However, the act of doing so is political and renders some things as "within scope" and some things as "outwith scope".

Turning back to surface transport, the question of scope is critical. In the UK, the Department for Transport is responsible for policies that shape how much the public travels by different modes of transport. Whilst it does not set fuel duty policy (the Treasury sets this) or housing policy (the remit of the Housing and Local Communities Department), it is responsible for making the case for new infrastructure and for deciding on the case for subsidies for different forms of transport. In the period from 1990 to 2019, just prior to the Coronavirus pandemic (2019), no reduction in emissions from domestic surface transport was achieved (BEIS 2022). Any improvements in fuel efficiency in new cars were offset by growth in travel demand and vehicle size. To go from zero progress to zero emissions in the space of just over two decades is a formidable challenge. To do so requires a mix of policies which reduce how much we travel by car (and possibly van and HGV movements) as well as switching from petrol and diesel powered vehicles to, largely, electric mobility (Gota *et al.*

2019; Lefevre *et al*. 2021). The analysis has consistently shown this from the time of the first legislated 80% carbon emission reduction goal in 2012 (Anable *et al*. 2012, Brand, Anable and Morton 2019; CCC 2020a; Marsden 2023). In July 2021, the UK Department for Transport published its first decarbonisation plan for transport (DfT 2021). In it, a wide range of potential policy pathways were set out (Figure 5.1). Some of the options went further and faster than even the Climate Change Committee (CCC), the government's advisory body, had set out. They included scope for absolute travel demand reductions of 581 billion car miles (14%) relative to the "core projections" between 2022 and 2037. However, there was never a clear policy commitment to tackle how we travel, rather than what technologies power our vehicles. By the end of 2023, almost all of the travel demand management policies had been quietly abandoned, or worse, publicly attacked by the then Prime Minister (Sunak 2023). Policies such as localising facilities, car sharing, and travelling less for unessential journeys were abandoned as "drivers feel under attack" (DfT 2023, n.p.). As the government of that time had been in power or a power-sharing government since 2011, evoking the language of "attack" is not just radical war rhetoric, but also a reflection of a lack of clear direction in its own thinking. As part of this hardening of stance, the Government explicitly stated that it was planning for more traffic growth in every realistic scenario and would look to provide the infrastructure necessary to do so (DfT 2024b).

In early 2024, the Department for Transport went further by emphasising its focus on the legislation, which phases out the sale of fossil fuel vehicles by 2035, and directly stating that

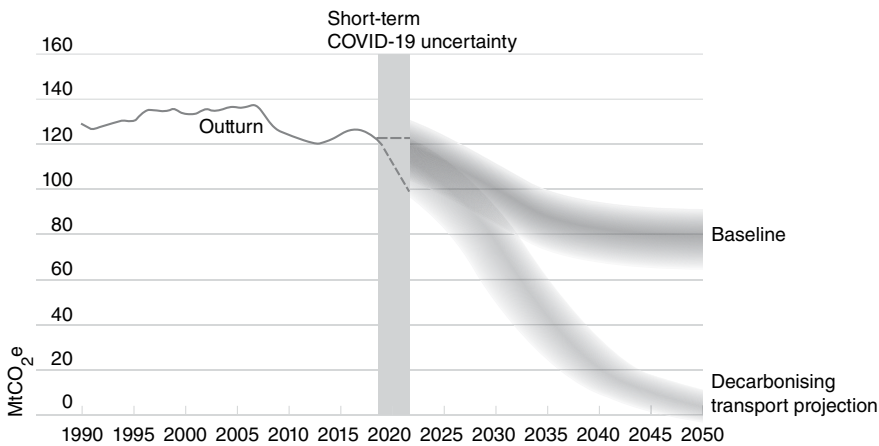


*Figure 5.1* Domestic transport GHG emission projections from the UK Transport Decarbonisation Plan.

*Source:* Marsden (2023, 7), based on Figure 2, page 45 in DfT (2021).

> It is not the policy of government to reduce demand for travel. People should enjoy fair access to jobs, education, health, shopping, recreation, friends and family, and government wants to facilitate that, not restrict it. The government is addressing carbon emissions from road transport through the measures announced in the Transport Decarbonisation Plan 2021, primarily the transition to electric vehicles (EVs).
>
> (DfT 2024a, 8)

However necessary the phase out of fossil fuel vehicles is, the policy neatly sidesteps the questions of the quantity of vehicles, wider implications for travel behaviour, and the whole-life environmental burdens of electrifying vehicles (alongside electrifying pretty much every other aspect of daily life, such as heating). Indeed, without any evidence to support it, the recent guidance for approving major infrastructure projects now claims that "Effective operation and optimisation of both the SRN [the major road network including motorways] and the local road network are essential to achieve the outcomes set by the Transport Decarbonisation Plan" (DfT 2024b, 25).

In evoking this response, the Department for Transport has relocated responsibility for emissions reduction in a number of ways:

1) To other parts of the economy. Despite in 2021 setting out its plan for decarbonising transport and suggesting that all local authorities should set targets consistent with their contribution to the net zero agenda, the Department for Transport has recently stated that there are no sectoral, regional or local targets (DfT 2024b) and so, the only reason to decline a major project would be if it meant the whole-economy carbon target would be missed. Transport can continue its poor performance, provided each decision is small relative to the whole economy (which seems inevitable) and provided other parts of the economy can somehow backfill the gap. It is worth noting that, across the whole economy, 71% of policy ambition has been assessed to be either unidentified or assessed as at risk by the CCC (2023).
2) To other parts of the world. As noted above, consumption-based emissions are falling more slowly than territorial emissions. An important part of this problem is that the UK only counts the emissions for the vehicle manufacturing process, which takes place on UK shores. As Remme *et al*. (2023, 323) state, "EVs come from somewhere (which entails extraction and heavy material transport), exist somewhere (which means occupying limited public space and shaping spatial planning), and go somewhere (which implies end-of-life arrangements and limited material salvage)". Issues such as labour market exploitation, land-grabs, environmental scarring, and ground and water source pollution are clearly identified in EV supply chains (Schlosser 2020; Bonelli and Dorador 2021, IEA 2022). Writing from their perspective on Norway, a global leader in EV adoption, Remme *et al*. (2023) suggest that these issues are necessarily marginalised by the green socio-technical imaginaries that are fundamental to countries in the Global North, which are seeking to perpetuate current ways of life.

3) To future generations. By adopting a strategy that fails to address carbon reduction in line with the pathway defined as necessary by the CCC, the Government is, in all probability, pushing greater global warming onto future generations. It is also creating the conditions for a worsening of the performance of the mobility system and the distribution of access it affords. Its own projections (DfT 2022) suggest that, with business-as-usual policies, congestion will get even worse with an electric-only fleet as the cost of motoring will fall relative to fossil fuels. This will further undermine public transport and contribute to the continuing cycle of decline in alternatives to the car (FoE 2023) and further open up the accessibility gap between car and non-car owning households.

Despite all of the scrutiny of the CCC and the potential legislative power of the Climate Change Act (2008), it appears that the UK Parliament is currently unable or unwilling to effectively scrutinise and hold the Government to account. It is only legal proceedings brought by environmental groups or freedom of information requests that have been able to make the Government show its real assumptions and, often, these have been found wanting (Marsden 2023).

Why is this the policy pathway being pursued, not just in the UK, but across most countries with high levels of car use? Short-run politics and lobbying by the car industry certainly play a major role. The transition from petrol to electric cars is slow and, for the most part, no one is being asked to give anything up. Quite the opposite, incentives for purchase, charge point installation, cheap overnight electricity, and sometimes parking and bus lane use are offered (Sovacool *et al*. 2019). There is no need for "now here" to be challenged, providing we only think about the very short run of now, and we only look "here" (on our doorstep). As set out above, there is no recognition of the extractive mining practices necessary to perpetuate the automobility system. Nor is there recognition of the extent to which such a transition will fail to address the current injustices in our transport systems. A recent review of local, regional, and national transport strategies in the UK showed fairness to be missing from considerations of decarbonisation (Ternes, Marsden and Harrison 2024). Even an accepted policy, such as electrifying the car fleet, ignores distributional injustices, with those who have off-street parking and solar panels able to charge at one-tenth of the cost of someone relying on an on-street charger.[2] New injustices are already being written in. Alternative approaches, even those that do not tackle demand growth but reduce resource use, such as downsizing our vehicles and adopting new innovative light vehicle platforms (ITF 2023), are eschewed. Competing visions are pushed aside so that the vision for the new "now-here" can continue to work well for the more privileged for whom today's "now-here" works best. So, we are yet to see a divergence in policy at a national scale. What then of more localised action?

**Local Action: A New Hope?**

All change happens somewhere, and it is situated in a local context as well as a national and international one. The local scale has been recognised as critical to a range of environmental problems and, therefore, a site for solutions. This goes back to histories of water and sanitation through pollution from factories in the Industrial Revolution to the problems caused by road traffic in recent decades. The Brundtland Report in 1987 identified the important role of cities in tackling wider global challenges (Harald Fuhr, Hickmann and Kern 2018). Some local governments have been at the forefront of the climate agenda even in the absence of national requirements (Salon, Murphy and Sciara 2014). There are different perspectives as to why the local scale matters. Salon, Murphy and Sciara (2014, 67) suggest that "The motives for local climate action often came from within communities and include both tangible local co-benefits of action, as well as the concept that climate action is the 'right thing' to do". It connects governance with activism, including the Transition Movement (Hopkins 2019). Local concerns and co-benefits can connect through what Mah calls "multiscalar activism", where scaling sideways or horizontally can strengthen climate action. "Ella's law" is an example. When 9-year-old Ella Adoo Kissi-Debrah died from asthma in 2013, her mother Rosamund campaigned tirelessly to have air pollution from traffic emissions on south-east London's South Circular Road recognised as a cause. An inquiry finally led to air pollution being recorded on her death certificate. Rosamund Adoo Kissi-Debrah has since become a leading campaigner and politician, fighting along with others to enshrine "the right to breathe clean air as a basic human right" in UK law (also referred to as "Ella's law", Sabin 2024). But as flash asthma events increase with climate change, public health activists and scientists are campaigning to recognise clean air as a "collective responsibility" that links public health and climate change (Kenner 2018). London Mayor Sadiq Khan's implementation of Ultra Low Emission Zones is one of several examples where a confluence of clean air, public health, and climate activism, legal action, and political will has translated into positive results. Since 2016, London's air has improved: "preliminary figures indicate London's annual $NO_2$ levels were lowest on record in 2023 – lower even than [during the] first year of COVID-19 lockdowns", and the capital now has "the largest zero-emission bus fleet in western Europe" (London City Hall 2024, n.p.). In Paris and Barcelona, similar efforts take a different form, focussed on 15 min city and superblock concepts (De Boeck 2021).

Gudde *et al*. (2021, 3) argue that "Local authorities hold a particular and wide-ranging sphere of influence in shaping energy planning and carbon reduction in their localities for the long term". The rise of cities in addressing the climate problem has been supported by the founding of transnational networks such as ICLEI and C40, such that cities are shaping national and international agendas and resource allocations (Betshill and Bulkeley 2004),

although their effectiveness is difficult to establish (Bansard, Pattberg and Widerberg 2017), and may involve co-optation of more radical ideas (Kaika *et al*. 2023). However, a city or local authority-driven approach can be very powerful, and in recent work, the UK CCC estimated that local authorities were critical actors in the decarbonisation agenda, being directly responsible or having influence over around a third of carbon emissions in their areas (CCC 2020b). Kronsell and Mukhtar-Landgren (2018, 988) identify "three functional roles for the municipality… promoter, enabler and partner" and suggest that whilst the structural conditions for local government are getting more difficult, they still have a critical role to play because of their legitimacy, resources and trusted role as a convener. Figure 5.1 shows an even broader view of the types of influence that local authorities have (Figure 5.2).

So, we take it as read that the local is an important domain of action and that, as part of this, local authorities are important actors in local climate action either directly or indirectly. "Now-here" is strongly dependent on and constituted by local action. It is important to separate this assessment from the burgeoning literature about whether local authorities are acting sufficiently ambitiously, behaving responsibly, and are being given the resources and

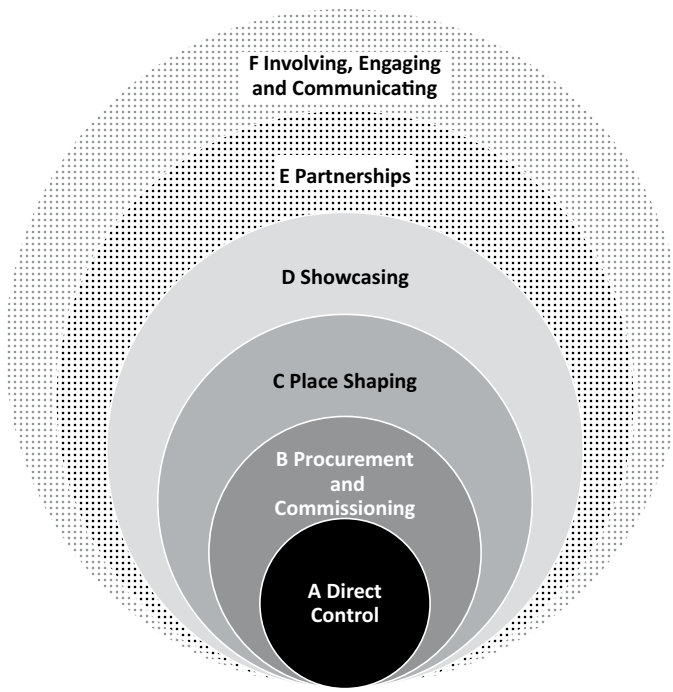


*Figure 5.2* How Local authorities control and influence emissions (Adapted from Coxcoon and Roberts 2020) .

*Source:* Own elaboration.

powers to maximise their potential role. We briefly review these critiques because they matter. In the same way that answers do not rest solely at a national or international scale, neither do they sit entirely at a local level, and it is partly the lack of clarity about the interconnectivity across scales that allows political blame-shifting narratives to operate (Bache *et al.* 2014).

First, we should consider ambition. Cities around the world have acted on the climate emergency, in many cases in advance of national governments (such as Copenhagen and San Francisco). They have made bold commitments to reach zero emissions, 22 years sooner than the national government, in the case of Nottingham in the UK. But the reality of implementation can be mixed. Haarstaad (2020, 65) suggests that the declaration of ambitious dates for zero emission targets can be likened to "exercises in vanity", and Kaika *et al.* (2023, 1203) wonder whether some of the rhetoric promulgated should be "interpreted as a co-optation of degrowth principles". A recent review of UK local authority climate action plans found a patchwork of ambition and an even greater mix of accounting, accountability, and action plans to take responsibility to meet the targets set (Gudde *et al.* 2021), but the UK is not alone in this (Bassett and Shandas 2010). There exists a spectrum of views as to why this happens (e.g. intra-city competition) and whether this is a bad thing (are the targets aspirational, motivational, or delusional?). Nonetheless, they reflect pressure on local authorities to do, or at the very least to be seen to do, something to tackle the climate crisis. The local is an important political arena in this regard (Willis 2020).

A second important theme is resources. Two decades ago, Bulkeley and Kern (2006, 2251) identified the importance of being able to assemble and deliver programmes of action and "having staff resource dedicated to this task, a resource which is not available in the majority of local authorities". More recently, Verlinghieri *et al.* (2024) explored the transport climate strategies of two "leading" local authorities in England. They found that the hollowing out of local government that followed the global financial crisis, which was subsequently worsened through COVID-19, meant that climate action plans were deliberately established as bidding documents and that strategy was now driven by where competition funding could be sourced. The inability of many smaller to medium-sized cities to compete for access to the limited funding available has been identified as a major problem (Harald Fuhr, Hickmann and Kern 2018). In transport in particular, much of the emphasis has been on big cities, which have traditionally dominated the primary policy agendas of congestion and air quality. However, per capita carbon emissions are typically lowest in the middle of larger cities, and it is the suburbs, peri-urban areas, small towns, and rural areas that have the highest emissions and fewest options (Fitzpatrick 2021). Resources are constrained everywhere, but the distribution has already contributed to the uneven social conditions that we see. If we only follow "now-here" in the places where change is happening, then we will learn important lessons, but we also risk missing large areas of countries and parts of the population where "now-here" is less able to cut through and make the case for change.

Finally, there is what Angelo and Wachsmuth (2015) refer to as the issue of "methodological cityism". The problem of only accounting for territorial emissions rather than consumption emissions, which we raised at a national scale, is, they identify, amplified significantly at a local scale. Marsden and Anable (2021) show that, for passenger transport, whilst 65% of trips are under five miles in length in the UK, this corresponds to only 18% of miles travelled. By contrast, they find that fewer than 3% of journeys are over 35 miles in length, but they correspond to 35% of the distance travelled. Examination of local authority accounting suggests that it may only include the journeys made within a local authority or, sometimes, by its residents. There are huge imbalances in commuting flows between authorities. Tourism does not map to this kind of accounting at all well, either. Some local authorities have partial ownership of airports, such as in Manchester in the UK. There is a clear contradiction between a zero-emission goal for local transport, whilst also supporting the expansion of flights at the airport. If local authorities focus only on those journeys over which they have the most direct influence, then they will not be tackling the bigger part of the carbon problem. This does not diminish the importance of acting on short journeys. Examples such as Copenhagen, Amsterdam, Ghent, and Paris have shown how consistent planning and radical roadspace reallocation to active travel can make a difference to travel behaviour and, therefore, emissions. But this is just one part of the problem of changing mobilities. The per capita emissions from transport in Denmark, the Netherlands, Belgium, and France are shown in Table 5.1 alongside those of the UK, where cycling levels are the lowest. For comparison, German per capita $CO_2$ emissions from transport in 2016 were 1,995 kg of $CO_2$, more than three times China's 614 kg of $CO_2$ and almost double the global average of 1,050 kg of $CO_2$ (IEA 2018). Local change is important, but it has to be seen within the wider context of whole system change. Indeed, the risk of not doing so is to attribute radical climate action to locally visible actions, which enable less sustainable practices to persist.

Managing emissions on the basis of arbitrary local authority boundaries, drawn up decades before climate change was a perceived risk, is very limiting.

*Table 5.1* Comparison of per capita domestic transport emissions in Europe in 2019

| *Country* | *Per capita $CO_2$ emissions from transport (tonnes)*[a] | *Privately owned bikes as the main mode of transport*[b] |
|---|---|---|
| Denmark | 2.08 | 12% |
| France | 1.95 | 3% |
| Belgium | 2.17 | 12% |
| Netherlands | 1.74 | 41% |
| UK | 1.77 | 2% |

[a] https://ourworldindata.org/grapher/per-capita-co2-transport?time=2019.
[b] Eurobarometer – reported https://www.euronews.com/next/2023/09/19/cycling-in-europe-which-countries-and-cities-are-the-most-and-least-bicycle-friendly.

Journeys between areas are sometimes on roads managed by the local authorities and sometimes by a national agency on the motorway network. Either way, journeys start and end in a local authority area, and so there is some responsibility to understand why people are travelling where they do if there is to be a meaningful set of interventions to change this. We understand surprisingly little about such trends at a local scale in the UK, as the National Travel Survey can, at best, be broken down to a regional sample. And the UK is relatively data-rich in its national travel statistics.

There are also highly technocratic approaches that overpromise and underdeliver "solutions" with intelligent and automated transport, such as Masdar, Santiago, or Tianjin Ecocity (Caprotti 2020; Adey *et al*. 2023; Jirón *et al*. 2021). Moreover, representatives of thinktanks and networks linked to the neoliberal Atlas network, like the Director of the Centre for African Prosperity and member of the Charter Cities Institute, Magatte Wade, are promoting Start-up or Charter Cities, where regulatory frameworks, including environmental regulations, are suspended (Wade 2023; Charter Cities Institute, n.d.).

The limitations we see for passenger transport are even more important for freight. Whilst there has been significant attention on "last-mile" deliveries through measures such as e-cargo bikes, the last-mile is only one part of much deeper logistics supply chains which extend well beyond urban influence (Birtchnell, Savitzky and Urry 2015, Haarstaad, Rosales and Shresthra 2024). Focussing just on how goods are delivered also does not address questions around whether our patterns of consumption are commensurate with our climate ambitions (Haarstaad, Rosales and Shresthra 2024).

So, if the local is important and yet the nature of action at the local scale is so challenging to identify, how should we move forward?

## Experimentation and Multiscalar Thinking

The first part of the move forward is to go beyond seeing climate change as a problem to be tackled by policy and society (Bulkeley 2019). In her article on how human geography has treated the problem of climate change, Bulkeley is critical of the separation of policy from the everyday lived experience. She argues that this places climate change as somehow external, as something which can be "addressed" through plans. This is exactly what we see in the transport domain. Rather than a transport strategy for the UK, we have a separate decarbonisation plan. The message is that life can carry on, but there will be some decarbonisation policies that will be enacted. This, then, is divorced from the lived reality (which is itself highly context specific). In the UK, the outcry at shortages of peppers when crops fail in Spain, or the rise in the price of olives when wildfires decimate crops (as happened in Greece in 2024), are often disconnected from climate change and from what further warming might mean. Increasingly powerful storms raise climate change as a concern, but this falls away as the weather turns back to a more typical pattern, for now. Bulkeley (2019, 3) argues that there is a need to shift from seeing climate as a problem to

seeing it as a condition. In doing so, we pay attention to "the politics, ethics and meaning of particular socio-spatial orderings, from the citizen to the city, the community to the corporation". It means that we stop talking in terms of "solving the problem", as we are really only impacting on how much worse things will get, and turn our focus to new means of action and adaptation which embed the realities of living with it, both "now-here" and "now-there".

As we have seen in Chapter 2, such a line of argument opens a window for more holistic approaches to innovation and experimentation across a wide range of spaces, but always connected to the local context. The literature on experimentation for climate change might offer a way forward, connecting as it does, the potential for radical new ways of doing things and the ecosystems of actors that are essential to do things differently. Kronsell and Mukhtar-Landgren (2018, 988) reviewed literature on 50 urban living laboratory experiments as a subset of urban experimentation initiatives to suggest that "cities can be innovative sites for climate politics", and there is some evidence that "city-based experiments can be scaled up and transferred to other contexts and eventually generate a broader system change".

Experimentation has been critiqued for generating "premium spaces of ambition" which are not representative of the systemic change required (Verlinghieri *et al*. 2024) and for being limited by the special governance conditions which are required to sustain the experiments but which do not fit with post-experimental mainstreaming (Aparicio 2020; Oldbury and Isaksson 2022). Such concerns should not be overlooked. However, Bulkeley argues that experimentation

> represents a significant and potentially paradigm-shifting break with established norms and practices concerning the nature of the climate problem. Fundamentally, this line of thought means that it may neither be possible nor even desirable to abandon experimentation and to return to more centralized, controlled, and 'certain' responses for it is from within the difficulties of governing a climate-changing world through this paradigm that experimentation has arisen in the first place. The vital task is instead to understand the politics and possibilities of experimentation for progressive and just urban sustainability.
>
> (Bulkeley 2023, 1)

So, if we accept that we are in a constant state of adaptation and change in response to previously unexperienced levels of global warming, then we must look to innovation and experimentation to help find a livable pathway through these challenges. This must, as we argued in Chapter 2, enable a careful, but radical search for, and definition of, "better certainties". Changing mobilities is, then, about recognising that now-here is only possible by perpetuating a set of unsustainable and inequitable practices. These practices cannot, and will not, be solved by the continuation of the planning paradigm, which helped to generate, sustain, and extend them in the first place (see Chapter 7).

But, whilst this is a call to action for local, multiscalar, and connected experimentation and social innovation, such approaches are not a guaranteed recipe for success. As this chapter has set out, boxing off issues as somehow local or niche is not transformative. It can only work if we pay attention to experimentation at the many scales that matter and to the interaction between actions at different scales. Marsden and Anable argue for a multiscalar approach that pays attention to budget coherence, accounting coherence, and policy coherence. Mah (2023) argues for multiscalar activism that makes the most of the political possibility for "experimental intervention in a world that exceeds human powers of attunement, explanation, prediction, mastery, or control" (Connolly, cited in Mah 2023, 22), and Harald Fuhr, Hickmann and Kern (2018, 1) suggest that in taking a more multiscalar approach more attention is given to "upscaling" so that it is not always presumed that international and national conventions and top-downism will deliver effective action and joining up. In Chapter 6, we add to this consideration of scaling out and scaling deep (Moore, Riddell and Vocisano 2015). Most importantly, scaling means recognising the legitimacy of various forms of local action and the demands that might result from that at national and international scales.

## Concluding Thoughts

This chapter has argued that we need a new way of thinking about "now-here" and new ways of working towards change. In dividing the chapter up into international, national, and then local, we have deliberately chosen to play with the apparently clear dividing lines between responsibilities for climate change allocated on the basis of voting rights. Whilst some international organising mechanism has to exist, and it is the one that the climate emergency will play out under, we have shown that in a globalised system of consumption and provision, there is no "now-here" without a "now-there". Commitments to decarbonisation and wider fairness and sustainability agendas have to be relational and multiscalar if we are to avoid boxing off actions and claiming visible progress "here" and now at the cost of invisible costs "there" and in the future.

However, can we meaningfully invoke all scales of policy in making decisions? Surely this will lead to paralysis by analysis or develop another set of fault lines and arguments about responsibility. We argue that the heart of the issue is developing a shared recognition of the nature of climate change. It will be politically difficult to move beyond the current problem framing, where the promise of a "managed solution" is on offer (Bulkeley 2019). However, we contend that, as the consequences of warming worsen, it will be equally untenable to pretend that the "managed solution" is working, or at least working in ways that deliver more socially equitable outcomes. Recognition that climate change is a condition and not just a problem seems critical to engaging the whole of society in understanding that it is inculcated in the outcomes, whether through action or inaction.

We identify a need to move beyond siloes and boundaries to more connected, porous, agile, and adaptive systems of knowledge exchange if we are to avoid myopic and manipulated solutions. Coupled with this would be a willingness to support the movement of resources and powers up, down, and across policy systems to where the promise looks greatest. Citizens, consumers, and companies might see opportunities for innovation, but this cannot be seen as bottom-up alone. National governments are information-rich and understand the complexity of systems of provision in ways that most citizens or local authorities will not. It remains to be seen whether such a shift can be effected. However, where governments are incapable or quite wilful in their actions to overlook these wider questions and mislead or obfuscate their real intentions, then it is the role of advocacy groups, academics and progressive political parties, independent public media, and the legislative system to challenge this.

If there is greater honesty about the trade-offs that are really at play, then we suggest that it is for society to help innovate and provide the ways forward that work for it. Marsden (2023) set out the scale of the behaviour change gap that current English transport policies were creating. It amounted to ten consecutive years' worth of adaptation of the scale seen in the first year of the COVID-19 lockdowns if we continue to pursue business as usual in how the transport system works. The "now-here" thinking on offer today does not provide an alternative vision that works for people, and it is already being rejected by politicians as a result (Marsden and Schwanen 2024). So, we need a new "now-here" which, we argue, comes through experimentation. As Bulkeley posits, such experiments will not deliver "a solution", and places will not be universally better, nor universally worse, but different. Of course, some stand to lose from such transitions, just as some stand to gain more from them. What is rarely acknowledged, as we show in the example of transport policy in England, business as usual also has a set of winners and losers. With existing thinking, these are, by and large, the same winners and losers as before, only the gaps widen. The winners are resourced both financially and with social capital that the losers lack, and so their voices can be heard shouting louder in arguing for stasis rather than change or for particular models of change which avoid compromises to their lifestyles.

But we should not confuse noise with support. Citizens' Assemblies provide support for policies which national politicians then find difficult to adopt (Sandover, Moseley and Devine-Wright 2021). Surveys show support for transport interventions which are far more pro-public transport and active travel than is ever acknowledged in policy (Frost and Singer Hobbs 2024). At the same time that innovations in the creation of low traffic neighbourhoods were being attacked by the UK government, studies continued to show that support generally outweighed dissatisfaction (Ipsos 2024). All policy changes have winners and losers, and that is why co-design is so important rather than dropping solutions onto people and communities and hoping they work (Büscher *et al.* 2023). Experimentation means listening to a diversity of voices and positions. In arguing for greater and more radical experimentation, we also reflect that

there are already many examples of changes that could work in multiple locations and which can spread. School streets – where traffic management orders restrict access to motorised vehicles, in effect creating a pedestrian and cycle-only zone – are one good example of a concept which can be permanent or temporary, moved and tailored to fit in lots of circumstances (Clarke 2022). We explore further what it would mean to take experimentation and the upscaling of social innovation seriously in Chapters 7 and 8.

Many countries have developed into hypermobile societies with complex systems of automobility, aeromobility, and cargo mobility (Urry 2004; Cwerner, Kesselring and Urry 2008; Birtchnell, Savitzky and Urry 2015). This did not happen overnight, and it continues to evolve as the car dominates everyday life, annual holiday flights, and global consumer goods are assumed indispensable for a good life (Walker, Tapp and Davis 2022). We cannot uninvent the car, plane, or cargo ship, and all they have done to the spatial distribution and complex patterning of daily life. Our new "now-here" has to evolve into a different way of living rather than imagining that we can go back to a "then-here" as some kind of nostalgic solution, or jump into a new system designed by innovators for society to accept. The "climate emergency" or "climate crisis" provides a vital mandate to act, but our responses require us to rethink social practices, infrastructure provision, and service patterns, which are closely interwoven over decades. It is not easy, and it will not be done through changes to the transport system alone. However, it implicates everyone and everywhere in an ongoing search for a better way of living "now-here".

## Notes

1 https://www.wri.org/insights/everything-you-need-know-about-fastest-growing-source-global-emissions-transport and https://www.climatewatchdata.org/ghg-emissions
2 https://www.zap-map.com/ev-stats/charging-price-index

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# 6 A Mobile Undercommons

According to the IPCC, 40%–70% of the transformation required to address climate change could come from social change (IPCC 2022b, 44). This and the fact that "employing social justice as an orienting principle can increase the political feasibility of low-carbon policies" (IPCC, 2022a, 114) should place experimentation with alternative mobilities that is happening at the grassroots level at the vanguard of change. Moreover, many of these initiatives recognise that the structures that harm the dispossessed, marginalised, oppressed, and young harm all of us, prefiguring systemic change from within. There are few examples of effective convergence between activist- and community-led mobility experiments and international, national, and local efforts to decarbonise transport, but there is great potential. In this chapter, we explore how, alongside the binary of reformist and revolutionary social movements, and failing international, national, and local governance, a transformationist experimental mobilisation of alternatives is taking shape at the grassroots level.

Across very different societies, and divisions of class, wealth, ethnicity, and generational differences, people are forming an "undercommons", that is, an everyday practice of resistance from powerlessness, to bootstrap alternative forms of good living (Harney and Moten 2013).[1] For example, amongst China's youth, the enormous pressures of urbanisation, hypermobility, competitive education and work, and social mobility that promises wealth only for conspicuous consumption have inspired a stratified social movement that is based on immobility: tangping 躺平 or "lying flat" describes how both affluent young people, and poor rural-urban migrants – dispossessed of urban enfranchisement through their rural "hukou" (a place-based identity that denies them access to urban services) – reject the "majority norms of Chinese state capitalism" (Roulleau-Berger 2024, 221). This is a disillusioned stance, but it "produces critical thinking to create alternative communities" that refuse hypermobility as a strategy of "disalienation" (Roulleau-Berger 2024, 221). Members enact a desire for "wellbeing and good lives instead of always needing to produce more and work harder" (Korsnes 2023, 126). At the same time, in rich Global North cities, "as many as 200 million people are exploring 'simpler ways' of living" (Alexander and Gleeson 2020, 365), whilst over 160 insurgent organisations

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and networks in the Majority World or Global South are cooperating through "meta-networks" in a "process of dismantling most forms of hierarchies, assuming the principles of sufficiency, autonomy, non-violence, justice and equality, solidarity, and the caring of life and the Earth" (Global Tapestry of Alternatives 2020, n.p.). They constitute an undercommons in a self-organised process that draws energy from the disenfranchisements of neoliberalism. This may not enable escape from expendability – poverty still traps and immobilises the dispossessed. But as myriad networked pockets of lived alternative realities find confluence, traction grows for systemic change from within. Alternative mobilities are central to these nowtopias. As thousands of local jurisdictions, cities, local authorities, and municipalities have declared a climate emergency, scrambling to experiment, develop, and implement action plans, these transformative grassroots actions could be a powerful catalyst for change.

These initiatives sidestep capitalism along three vectors of change: refusal, solidarity, and study. We observe how these are practised in the formation of alternative mobility systems. This change is in resonance with Harney and Moten's notion of the "undercommons", described in the book *The Undercommons: Fugitive Planning & Black Study* (Harney and Moten 2013), and we explore how an emergent mobile undercommons is resisting the slow violence of the mobile technology of neoliberalism and shaping a "socially and ecologically pacified (world) society" (Blühdorn and Deflorian 2021, 260) through discourses of desire and determination. The "how" is of particular interest to us, and in seeking to delineate the contours of the mobile undercommons, we discuss links with debates on change that are anchored in recognition of pluriversal interdependence, and the importance of surprise and experimentation for *buen vivir*. We trace how by "weaving" alternatives, the mobile undercommons seems to hold potential for systemic change from the inside out – a pluriversal societal metamorphosis. The chapter concludes with a discussion of how mobile methods could increase the traction that emergent discourses of desire and determination provide for changing mobilities.

## Sidestepping Capitalist Realism

Three examples from a mushrooming gathering of transformative movements (some listed in an A-Z stretching over four pages in Kim Stanley Robinson's novel *The Ministry for the Future* (Stanley Robinson 2020, 445–449)) can be enlisted to delineate contours of an emerging mobile undercommons. Our choice is selective, focussed on gaining a sense of the potential for discourses of desire and determination and social tipping into a softer collapse. All three examples enact refusal, solidarity, and study, but the first, Barcelona's low traffic neighbourhoods or "superblocks", are based on a deep-rooted refusal of "immunological" urban policies designed to increase resilience, inclusion, and participation only to satisfy management indicators. The second, shared mobilities and a car club in rural north-east England, shows how solidarity and responsibility are both essential for, and nurtured by, commoning mobility,

whilst the third, the Global Tapestry of Alternatives (GTA), exemplifies the power of study, weaving together a diversity of perspectives in a pluriversal prefigurative mobilisation of knowledge and connection.

***Refusal***

The New Urban Agenda calls for "inclusive, safe, resilient and sustainable" cities – a vision that is hard to reject (United Nations 2017, 4). However, it relies on "old methodological tools (e.g. indicators), techno-managerial solutions (e.g. smart cities, and institutional frameworks of an ecological modernization paradigm" that is, in fact, a form of "immunology" that "vaccinates citizens and environments so that they can take larger doses of inequality and degradation in the future; it mediates the effects of global socio-environmental inequality, but it does little towards alleviating it" (Kaika 2017, 89). It is an(other) example of how development discourses foreclose genuine change that "wants not [just] the end of colonialism but the end of the standpoint from which colonialism makes sense" (Halberstam 2013, 8). Against the backdrop of countless examples documented in environmental justice studies, disaster sociology, and political ecology, Kaika charts how many of those at the receiving end of these schemes are coming together in resistance. She cites Tracie Washington's defence of Katrina and BP Oil Spill victims as a landmark articulation of the underlying insight:

> every time you say, 'Oh, they're resilient', [it actually] means you can do something else, [something] new to [my community]. … We were not born to be resilient; we are conditioned to be resilient. I don't want to be resilient …. [I want to] fix the things that [create the need for us to] be resilient [in the first place].
>
> Tracie Washington, President of the Louisiana Justice Institute, in (Kaika 2017, 95)

Increasing numbers of citizens and communities are refusing to be made more resilient, or to be "included, [made] safe or sustainable" and they "refuse to be part of monitoring exercises" that reduce real-world complexity to indicators that only confirm the efficacy of technocratic solutions for the perpetuation of a business as usual that works so well for the privileged (Kaika 2017, 98). "Instead, they demand equality; and they generate equality" (Kaika 2017, 98). One particularly interesting and powerful example of socially and environmentally regenerative refusal is the Spanish "Indignados" movement and the way its "school of politics" was translated by Barcelona's *En Comú* party in the implementation of low-traffic superblocks and mass tourism controls.

It is important to trace the roots of these systemic efforts to change mobilities to tipping points in the 2008 financial crisis, when the Spanish government, like many others, asked its citizens for resilience in the face of austerity policies. Long-term financialisation of the housing market, rising mortgage debts, and

increasingly precarious labour markets brought millions of people face-to-face with the slow violence of financialised capitalism (García-Lamarca and Kaika 2016). Hundreds of thousands of Spanish citizens who were unable to pay their mortgages were evicted from their homes. They organised and formed the "Platform for Mortgage Affected People" to legally challenge evictions, mobilise highly agile physical resistance and protests during actual evictions, publicising evidence of the often extremely harsh response by police and security forces, and occupied empty buildings to provide homes. The movement "establishes housing as an indisputable and undeniable right for all" and "does not accept the role of the state or banks as powerful authorities that can evict and subsequently "include" evicted citizens in discussions about housing" (García-Lamarca and Kaika 2016, 96). Housing "is not to be negotiated through consensus-building frameworks" (ibid.). If not granted, the right "is to be taken" (García-Lamarca and Kaika 2016, 96). The conflict escalated and engendered mobilisation of the 15M (million) or "Indignados" movement, rising up against "the country's growing inequality, political corruption, and high unemployment levels" (Barbas and Postill 2017, 646). The movement combined protests with a critique of mainstream media, which routinely renders poverty and its systemic causes invisible, along with "a panoply of initiatives aimed at empowering citizens through new, self-managed communicative practices and citizen media" (Barbas and Postill 2017, 647). The combination of political activism, communication, and pedagogy – inspired by Paolo Freire's pedagogy of the oppressed – enabled the emergence of a "school of politics", bringing people together in "a vast laboratory of civic thought and praxis with a clear pedagogical orientation constituted through online and offline communication processes" (Barbas and Postill 2017, 647).

Ada Colau, one of the founding members and the spokesperson for the Platform for People Affected by Mortgages, was elected mayor of Barcelona in 2015 in a resounding public electoral refusal of business as usual, demanding an alternative to neoliberal austerity politics and technocratic solutionism:

> Colau's election marked the first time in the city's history since the transition to democracy in 1978 that municipal elections were won by a non-traditional, grassroots-based political party, headed by a female leader who questioned real estate speculation, business-centered decisions, and the city's orientation toward a commercial, growth-oriented model of urban development.
>
> (Zografos *et al.* 2020, 7)

One of the things she and her party *Barcelona En Comú* found on taking power was an "Intelligent Superblock" smart city sustainable transport plan for the city, "with attention to energy production, better lighting and traffic lights controlled by sensors", based on corporate solutions (de Boeck 2021, 31). Along with ecologists, the new city council refused the underlying premise of the plans and returned to the original idea of superblocks as a key component in a

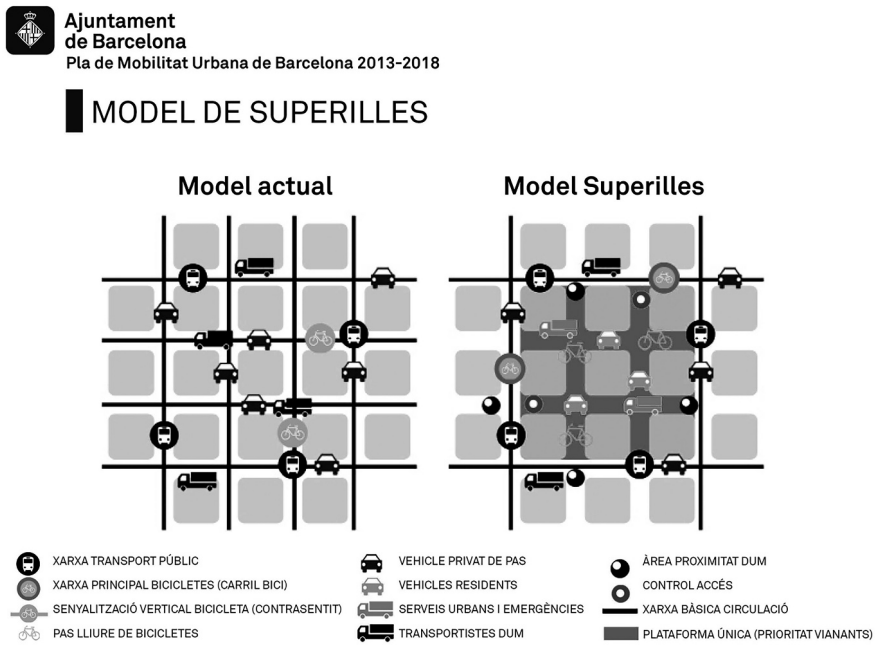


*Figure 6.1* Barcelona's superblock model, implemented in Poblenou and Sant Antoni.

*Source:* Ajuntament de Barcelona (City of Barcelona). https://ajuntament.barcelona.cat/ecologiaurbana/sites/default/files/PMU_Sintesi_Catala.pdf.

new paradigm of "ecosystemic urbanism" that sees the city as "a complex ecosystem, the most complex humanity has created" (Rueda 2019, 136). Recognising the urgency of urban transformation for sustainability, they set to work to engage citizens in a redefinition of the idea of "superblocks" (Figures 6.1–6.4).[2] The approach reclaims some of the roads within a block for people and nature, allowing only active travel at 10km/h. The reclaimed space is also designed for commerce, socialising, and literally green growth in flora and fauna.

With "the ambition to turn the dream into action in the short term", the council chose "tactical urbanism" (de Boeck 2021, 21, Figure 6.3) – ad hoc measures for reclaiming road space with paint, street furniture, plants in pots, and then semi-permanent large planters with trees. But the collaboration between residents, planners, and businesses chose to combine tactical implementations with a long-term strategy to adapt and translate these improvised designs into high-end implementations (Figure 6.4).

The plan envisaged the development of green axes and "33.4 ha of new pedestrian areas and 6.6 ha of urban green areas" (Nieuwenhuijsen *et al.* 2024, 3). The tactical rapid response is central to the co-creative public participation approach because it allows people to "imagine already today … what the future


*Figure 6.2* Barcelona's green axes plan for the Eixample District.

*Source:* Ajuntament de Barcelona (City of Barcelona). https://ajuntament.barcelona.cat/superilles/sites/default/files/mapa_eixample_concurs_web.pdf.


*Figure 6.3* Tactical urbanism ad hoc measures.

*Source:* Wikimedia Commons Superilla Poblenou – Carrer Almogàvers, Creative Commons Attribution-Share Alike 3.0 Unported.

*Figure 6.4* Tactical urbanism translated into streetscape, October 2024.

*Source:* Ajuntament de Barcelona (City of Barcelona). https://www.barcelona.cat/infobarcelona/en/tema/superilla-barcelona/project-to-turn-carrer-dels-almogavers-into-a-green-street-expanded_1257189.html.

might look like" (de Boeck 2021, 21), to live in it, experience it, experiment, and participate in decision-making.

The movement also did not turn its back on technology, but challenged technocratic smart city ideas. They argued that cities "must appropriate and run collective data on people, the environment, connected objects, public transport, and energy systems as commons" (Morozov and Bria 2018, 26) and designed public digital commons platforms to support participation. In 2016, Colau appointed Francesca Bria Chief Digital Technology and Innovation Officer for the city, and Bria proceeded to develop a unique digital transformation roadmap:

> The Barcelona strategy consists of engaging the city's ecosystem through … promoting the collective intelligence of citizens … Barcelona is betting on a new approach to data called 'city data commons', meaning to strike a New Social Pact on Data to make the most out of data, while guaranteeing data sovereignty and privacy. Data is a key city infrastructure, and can be used to reach better, faster, and more democratic decisions, incubate innovation, improve public services, and empower people. … Barcelona seeks to couple these opportunities with an ethical and responsible innovation strategy, preserving citizens' fundamental rights and information self-determination.
>
> (Morozov and Bria 2018,28)

The co-creative approach of mobilised citizens choosing a local government to facilitate experimentation with a new mobilities ecosystem has enabled a "large reduction in premature mortality due to reductions in air pollution, noise and heat and increase in green space and physical activity" (Nieuwenhuijsen *et al*. 2024, 5), and a drop in greenhouse gas emissions due to reduction of car traffic by around 17% (Castaño 2024). There has been an increase in public transport by bus by 15%, as well as in renewable energy, albeit "on a tiny scale for now" (de Boeck 2021, 70). Designers found that "policy-specific beliefs, emotions, perceived process legitimacy and institutional trust were strongly associated to acceptance" (Oltra *et al*. 2022, 1). A good example of policy mobilities (Temenos and McCann 2013), the approach is spreading to other cities. Nieuwenhuijsen *et al*. (2024) document that, like the majority of Spanish citizens who are in favour of "severely restricting" cars from city centres, citizens and planners in Vienna and Los Angeles have identified hundreds of neighbourhoods as suitable for becoming superblocks.

***Solidarity***

Where refusal opens up new spaces of hope, people can ease into interdependence and reciprocity. Growing efforts to facilitate commoning mobility show that commons "are not *things*, but social relations – of cooperation and solidarity … commons are not *givens* but processes" (Barbagallo *et al*. 2019, 6, cited in Sheller 2022, 32). In a report on shared mobility in the UK, the Commission on Travel Demand finds that "People already share their mobility today quite extensively. They used to share more, even in the recent past" (Marsden *et al*. 2019, 3). There is a significant amount of informal sharing and solidarity amongst friends, family, neighbours, and communities, including lifts to hospitals, car sharing, taking children, and fetching shopping, but "Public bodies collect little data on sharing and have demonstrated only passing interest" (Marsden *et al*. 2019, 3). There are a few policy efforts or investments to support shared mobility, for example, through mobility hubs or car clubs. The Commission on Travel Demand contrasts this "ambivalence to sharing … with the positivity and investment around automated vehicles", which has created a global market projected to reach nearly 115 billion US dollars in 2029, "despite manifestly more complex issues which arise from that transition" (Marsden *et al*. 2019, 3). Where there is interest in sharing, it is often focussed on commercial solutions. In fact, it is an integral part of the neoliberal lens to pretend that digital platforms somehow create new social potential, when often they are replicating what is there – and/or monetising it. The Commission points out that a reduction in the need for individualised car ownership is essential for decarbonisation, and that there is huge potential in shared mobility: a third of cars don't move at all on any given day, and the average car occupancy is 1.5 persons. There is plenty of scope to carry on travelling, with far fewer vehicle miles, if we were to take a more collaborative perspective. Interestingly, sharing is also vital for an integration of autonomous

mobilities: the UK Department for Transport's own "2018 Road Traffic Forecasts found that the difference between greater shared mobility in an automated future and more individualised mobility could be as much as 50% of current levels" (Marsden *et al*. 2019, 21). In other words, if autonomous vehicles were to be used for private travel, traffic levels (and congestion) could increase by 55%, whereas ride-sharing could reduce this increase to 5%.

With a view to challenging the structural embeddedness of individualised automobility, car clubs are a particularly powerful tool, supporting solidarity. The Commission on Travel Demand points out that car clubs currently often operate most effectively "in central urban areas where there is a sufficiently good complement of other transport options as well as density of user demand" (Marsden *et al*. 2019, 12). Inter-urban, peri-urban, and rural mobilities are more difficult to support. A successful example from North-East England can shed some light on the bootstrapping capacity of grassroots solidarity in a rural car club:

> Susan is the co-founder of the Derwent Valley Car Club based around the village of Blackhall Mill just outside Tyneside; only 11 miles south-west of Newcastle, but an hour by bus. The club has around 84 members who share five electric vehicles. But what sets this car club apart from more commercial competitors is its community focus: half of journeys are delivered by volunteers who take elderly and vulnerable neighbours on trips to the shops, and to see friends and family.
>
> (Walter 2024, n.p.)

The car club illustrates how mobilities, and commoning mobilities, are not just about transport or systemic relationality, but also about personal relationships and place. One of the users described her motivation for joining:

> She used to sing at a choir in the next village and used a taxi to get there and back. But one December the taxi never returned to pick her up, so she walked six miles home along a busy road with no streetlights.
>
> (Walter 2024, n.p.)

When she contacted the Derwent Valley Car Club, they

> paired her with a volunteer driver who was recently bereaved and wanted to meet more people. The two are now good friends, and when the choir lady said she had never been on holiday before, our volunteer took her on a trip to the coast.
>
> (Walter 2024, n.p.)

There are few studies of the effects of social isolation and loneliness, but recent research is beginning to show that they can be devastating, as well as adding significantly to healthcare costs: at least £40 million in Lancashire in the UK, and $6.7 billion in the United States (Lancashire County Council 2016;

Southerland *et al*. 2024). This is part of what drives the development of the Derwent Valley Car Club. But the solidarity of this initiative stretches beyond the local community, with a spin-off effort to summarise and share the insights, experiences, and practical tools created to support the Derwent Valley Car Club (such as a digital booking system) with other communities who are planning or experimenting to support shared mobilities through a car club. The "Car Club in a Box" concept shares a vision and values, along with resources. At the heart of the vision is a commitment to regard cars as neither the property of an individual nor an asset with a financial rate of return, but instead as a social asset that is part of forming and strengthening community bonds. It seems perverse to us that the current automobility system we have created focusses on individual ownership, individual charge point installation, own parking space, etc., all of which hugely inflate the cost of mobility to individuals and society. There are pro-social, more shared, and collaborative models of mobility which can also feed back into the community rather than seeing spending feed the international car manufacturing and financing markets so strongly.

Solidarity can be multiscalar, too. Developing an analysis of COVID-19, Kesselring argues that crisis conditions have the potential to foster the emergence of solidarity across "'world risk communities' (Beck 2009), where risks become irreducible, undeniable, and unavoidable on a global scale" (Kesselring 2024, 4). Populist and authoritarian politicians from Trump to Orban and Bolsonaro may be able to negate and lie about these risks, but they cannot escape the evidence of melting roads, cars swept away and piled high by floods, coastal erosion, devastating wildfires, illness, overcrowded emergency rooms, and excess deaths. As disruption becomes tangible, recognition of interdependence and *buen vivir* principles by global networks of social movements, as well as national governments like Ecuador, Bolivia, and Wales, sets conviviality against control, mastery, and separation from nature, making the latter less credible and acceptable, and increasing opportunities for refusal and community solidarity. Maximising these opportunities through "study" has become a strategic and networked effort.

***Study***

At the 2024 World Social Forum in Kathmandu, attended by over 50,000 delegates, the "Cars, Consumerism, and Capitalism" side event, organised by Digo Bikas Institute together with Carfree Cities Alliance,

> explored the deliberate promotion of car ownership by the car industry and its detrimental effects on the climate, environment, and society. Through an interactive workshop, participants reimagined spending priorities and discussed the benefits of car-free cities, emphasizing that another transport system is possible—one that restores environments and communities while addressing the climate crisis, pollution, and social isolation.
>
> (Niharika Mathema, personal communication)


*Figure 6.5* The Hadigaun Playborhood event by the Digo Bikas Institute.
*Source:* Shrestha and Mathema 2023, n.p.

The workshop showcased success stories, such as Hadigaun's experimental turn away from cars. Starting with a pilot car-free day on World Car-Free Day in 2023, the neighbourhood implemented a weekly "Playborhood" ban on cars (Figure 6.5), making it car-free "to create a neighborhood environment that fosters a sense of community and provides ample opportunities for children to engage in unstructured play" (Shrestha and Mathema 2023, n.p.).

The weekly playborhood enabled re-learning how vibrant streets and communities can be, engaging local businesses and cultural groups. The example is one of many shared in the "Carfree Cities Academy", a network that seeks to enable a global dialogue and hands-on learning. Webinars take "a deep dive into the particular story of the chosen city", and participants have the opportunity "to meet the protagonists who are champions of a local cause" (Shrestha and Mathema 2023, n.p.). Quarterly newsletters connect a global community to share examples and organise joint actions on occasions like World Bicycle Day, World Carfree Day, Earth Day, or the World Social Forum.

Since 2001, the World Social Forum has been "the most promising … space in which global civil-society groups can become better educated about one

another, learn more about the processes of neoliberal globalization, plan collective actions, and develop alternatives to the current world order" (Fisher and Ponniah 2003, 4). The Forum was deliberately designed as "an alternative to the neoliberal project represented by the World Economic Forum held annually in Davos, Switzerland" (Fisher and Ponniah 2003, 4). The Digo Bikas Institute and the Carfree Cities Academy are two of over 1,300 organisations participating in 2024. However, whilst the World Social Forum's "slogan of 'Another World is Possible' pointed to a politics of hope", it "has remained largely a forum for amplifying critiques of the dominant neoliberal order, rather than for amplifying and consolidating constructive counter-initiatives" (Kothari and Bajpai 2023, 2). Like Harney and Moten, Kothari and Bajpai reject notions of learning and change as a linear process of gathering information, analysing, critiquing, articulating, designing, and then realising alternatives. For them, study and change are an already existing alternative social world

> in which you start losing track of your debts and begin to see that the whole point is to lose track of them … for everyone to feel that she or he can contribute … where people take turns doing things for each other or for the others.
>
> (Harney and Moten 2013, 109)

Study in this sense of taking rights, including the right to a safe mobility commons, prefiguring alternative mobility systems, is the intellectual and social-material practice of the undercommons, enacted in every interaction:

> the undercommons is not a realm where we rebel and we create critique; it is not a place where we 'take arms against a sea of troubles/and by opposing end them.' Our goal – and the 'we' is always the right mode of address here – is not to end the troubles but to end the world that created those particular troubles as the ones that must be opposed.
>
> (Halberstam 2013, 9)

As members of the core team of the GTA, Kothari and Bajpai are weaving a meta-network which – to us – seems to have the potential to challenge the might of the Atlas network.

The GTA is a process of confluence between diverse communities and groups engaged in different forms of *buen vivir*. It is a kind of infrastructure for "scaling out", to deliberately adapt and replicate working alternatives, as well as spreading the underlying principles (Moore, Riddell and Vocisano 2015). The "network of networks" deliberately initiates alternative media and runs a website that platforms "weavers" – groups who share "assumptions about the current situation and a radical critique of patriarchy, capitalism, racism, colonialism, the nation-state domination and anthropocentrism that destroy the weave of life" and who "identify and weave 'alternatives'" (Global Tapestry of Alternatives 2022, n.p.). A dynamic web-portal combines description of

commitments and achievements with links and contact details for individuals, groups, and projects, crowdsourced maps, case studies, and resources for *buen vivir* (Kothari 2020). There are many related meta-networks, such as the Transition Network we discussed in Chapter 2, The Climate Majority Project, originating in the UK with a global perspective and a vision to "catalyse a mindset shift towards climate responsibility at all levels of society, that limits ecological harm, embraces adaptation and protects our planet for future generations"[3] (see also Read, Kavanagh and Bell 2024), the Rising Majority project, formed from the Movement for Black Lives in the United States,[4] the Deep Adaptation Forum, which has shaped the Extinction Rebellion movement (Bendell and Read 2021; Bendell 2023), and Planet Critical, a media community where study is supported by the journalist, founder, and host Rachel Donald.

These networks combine the refusal of the "one-world" mobile technology of neoliberalism and its suggestion that there is no alternative, with support for multiscalar solidarity, and horizontal mutual learning. This, in Davies' words, makes them examples of transformationist "approaches to world order transformation" defined by the fact that they "bypass established institutions rather than seeking their reform, seizure, or overthrow" (Davies 2024, 8). This is an example of scaling deep, that is, an effort to change "the beliefs, ideas, and narratives of dominant social structures", creating new certainties, and it distinguishes transformationist from reformist or revolutionary approaches (exemplified by the Multilevel Perspective on transition and Malm's radical flank). For "transformationists, the principal site of change is societal", and change is driven by seeking surprises through "processes of mutual exchange, learning, strategizing, and cooperation, ultimately envisaged as enabling pluriversal practices to flourish" (Davies 2024, 8). It enables and proceeds through the practical construction and connection of alternative forms of good mobile living. As such, it does not seek to attack the Atlas network's influence, which would be a mere tactical move in Michel De Certeau's sense (1984), but instead strategically nurtures societal metamorphosis.

## What We Are Up Against

Of course, as our discussion in previous chapters suggests, refusal of the mobile technology of neoliberal growth, solidarity, and study is met with strong opposition. It is helpful to sharpen our understanding of what we are up against further before trying to identify opportunities for supporting the mobile undercommons' struggle for metamorphosis through transformationist experimental mobilisation. For example, Barcelona is a city where motorised traffic has a 25% share of modes of transport but dominates 60% of public space (Nieuwenhuijsen 2020, 2). The implementation of the superblocks under Mayor Colau's *Barcelona En Comú* party has been participatory and responsive to neighbourhood and business concerns. But an "intense mobilization of the richest neighbourhoods" (Castaño 2024, n.p.) saw conservative candidate

Xavier Trias campaign against the superblocks in the 2023 mayoral elections. Barcelona's *En Comú* lost votes "in areas that did not experience any neighbourhood changes" and backed the socialist Jaume Collboni, who took over the reins in September 2023 (Nieuwenhuijsen *et al*. 2024, 8). But amongst Collboni's first actions as mayor was a costly removal of cycle lanes to solve a perceived "crisis" of car parking spaces (Burgen 2023). He, like so many other politicians and their lobbyists, exploits the fact that public "doubt or underestimation of the scale of benefits" from changing mobilities affects acceptance of low-traffic neighbourhoods and other systemic mobility changes (Nieuwenhuijsen *et al*. 2024, 8). In Britain, the two political parties that claim power in a first-past-the-post electoral system actively stoke culture wars with pro-car propaganda championing the rights of individual car and van drivers to gain votes. In the lead-up to the 2024 general election, a weakened Conservative Party rowed back on (their own) green policies such as a ban on new petrol- and diesel-powered cars and vans (Marsden and Schwanen 2024).

Such efforts to block refusal, undermine solidarity, and divert learning actively manipulate, or seek to benefit from the manipulation of, public perceptions of a poly-crisis to maintain the existing riverbed of neoliberal certainties. Merz *et al*. (2023) cite Edward Bernays, Sigmund Freud's nephew, who used his uncle's theories to support "the engineering of consent":

> The conscious and intelligent manipulation of the organized habits and opinions of the masses is an important element in democratic society. Those who manipulate this unseen mechanism of society constitute an invisible government which is the true ruling power of our country. We are governed, our minds are molded, our tastes formed, our ideas suggested, largely by men we have never heard of. – Edward Bernays, Propaganda, 1928 in.
>
> (Merz *et al*. 2023, 2)

Building on our analysis in previous chapters, this engineering is a central strategic method for keeping societies the world over "trapped in a system built to encourage growth and appetites that will end us" (Merz *et al*. 2023, 15). Governments are being harnessed – amongst others by fossil fuel and technology billionaires and networks – to protect this deadly dynamic to safeguard the vast profits tied to maintaining or even increasing high-carbon mobilities. Boeing's CEO, for example, sees the fact that over 80% of the world has never taken a flight as an opportunity for growth (Gurdus 2017). The Transport Africa Network invites investment in road and automotive infrastructure development from the "high-growth market businessman" to embed automobility in the rapid urbanisation of the continent (Transport Africa, no date). Meanwhile, US President Donald Trump and Elon Musk (whose Twitter takeover was supported with US$7bn by other billionaires (Milmo 2022)), are attacking European and other governments' decarbonisation strategies, telling the UK to "Open up the North Sea. Get rid of Windmills" (Williams 2024; Ambrose 2025, n.p.).

It is critical to acknowledge the systemic nature of these dynamics. The reasons for these manoeuvrings are actually "rational" within modern ideologies of neoliberal capitalism and economic growth. Modern ideas of humans as separate from, and in control of, nature are spread by one-world world-shaping metaphors of *homo economicus* – individualistic, rational, self-interested, and competitive (Raworth 2017) and *homo mobilis*, whose "*raison d'etre* … is globalized consumption … predicated on mobility that separates human from human and from ecological responsibility" (Beeman and Blenkinsop 2021, 166). They allow the 1% as well as many citizens who are relatively privileged in the Minority World or Global North to feel entitled to unlimited freedom to move, wealth, and social mobility as inalienable but exclusive rights, and to rationalise, normalise, and conceal inequality and ecological damage as inevitable collateral to human progress. As Polanyi painstakingly shows, this is a result of the *Great Transformation* to market ideology (Polanyi 1944). These destructive discourses also underpin the failure of governance. They turn social and environmental harm into tradeable externalities of extractive economic relations and mobile lifestyles, and allow manipulation of public perception and political systems. They fuel a powerful "ontopolitics of the Anthropocene" (Chandler 2018). Within this logic, the discourses of delay that Lamb *et al*. identify make perverse sense. Discourses of delay mobilise four major discursive strategies to postpone action on climate change:

(1) redirecting responsibility to individuals
(2) pushing for non-transformative solutions
(3) emphasising the downsides of action
(4) suggesting surrender.

These strategies perpetuate the ontopolitics of the Anthropocene and specifically prop up neoliberal business-as-usual mobilities. Through mobile media in the palms of our hands, these mobile canons are infectious, naturalising "capitalist realism" – the idea that, as Margaret Thatcher put it, "there is no alternative". Mobile media fulfil a central role, as countless swipes, likes, and clicks on mobile internet sites and apps thicken the "pervasive atmosphere" of capitalist realism, making it increasingly "impossible even to *imagine* a coherent alternative" (Ratta 2020), even when the effects are catastrophic.

These dynamics have created a crisis of imagination, which some analysts perceive as resulting from a lack:

> 'imaginary crisis' is the result of a deficit of social imagination. We find it easy to imagine apocalypse and disaster; or to imagine new generations of technology. But we find it much harder than in the past to imagine a better society a generation or more into the future.
>
> (Mulgan 2020, 3)

But the mobile undercommons shows that the imaginary crisis is absolutely not due to a deficit of social imagination, but caused by strategic suppression

and disenfranchisement of social imagination. There is no lack in "our actual ability to build alternative, more participatory and sustainable forms of organization and social life beyond capital/ism" (Butler and Loacker 2022, 10).

In their book *The Undercommons: Fugitive Planning and Black Study*, Harney and Moten describe ways of "fugitive" life and politics in Black communities, where those denied participation in society come together in critique, refusal, and prefigurative articulation of resistance, solidarity, and alternative social realities. They show a Black culture of "self-defense alloyed with self preservation", where "means of social reproduction" (p. 19) and resistance are claimed on the stoops of Harlem, but also in the gatherings at churches and residents' homes in the polluted neighbourhoods of Dixie (Bullard 2019), and Chicago's air-conditioned hair salons and shops, where the elderly and vulnerable could shelter during the deadly 1995 heatwave (Klinenberg 2015). Gathering, talking, planning, caring for each other, imagining and creating alternative social worlds on these stoops, in churches, homes, and shops are mobile methods in a "school of politics", where information circulates, and ordinary citizens "are rejecting traditional roles as 'beneficiaries' of institutional communication campaigns … [to] become active political actors who are able to generate their own processes of political pedagogy and communication" (Barbas and Postill 2017), engage in activities of living well, and the social reproduction of the conditions for living well through "the ceaseless experiment with the futurial presence of forms of life that make such activities possible" (Harney and Moten 2013, 75). By taking "recourse to self-possession in the face of dispossession (recourse in other words to politics)", they recognise that "there is nothing wrong with us" and "we owe each other everything" (Harney and Moten 2013, 17–20). United in dispossession, the undercommons have "got politics surrounded" (Harney and Moten 2013, 17–20).

"Urban transport policies and projects are part and parcel of growth-driven capitalism" (Kębłowski 2023, 1254), and all-too-often, attempts to change urban mobilities fall back on "sustainable mobility" ecomodernisation paradigms, which de-politicise critique of high carbon mobilities and focus on technocratic "solutions", foreclosing rather than enabling a substantive challenge to the way in which capitalism lingers – zombie-like – as "the impassable horizon of our times" (Garnier 2010, 127, cited in Enright 2016, 235). We must overcome this crisis of imagination to move on to deep leverage points. Confluence of alternative social imagination and societal renewal, can gain traction strong enough to replace the riverbed of dysfunctional certainties. The mobile undercommons is articulating discourses of desire and determination that shape new and better certainties as well as defining ways of carving these into the societal bedrock.

As an example, Kaika *et al*. (2023) provide a framework of five actions focussed on operationalising degrowth in urban planning: (1) grounding contemporary degrowth debates in historical and geographical contexts, (2) engaging planning and other institutions in folding degrowth practices into urbanisation and policies, (3) scaling up insurgent initiatives and other efforts

whilst counteracting co-optation and greenwashing, (4) developing the role of experts in "bringing degrowth principles into everyday urban practice" (Kaika *et al*. 2023, 1191), and (5) "greeting the elephant in the room" by "prefiguring how degrowth agendas can confront the diverse and unequal urban social relations and uneven outcomes in the Global North and South" (Kaika *et al*. 2023, 1204). In Chapters 7 and 8, we contribute to these efforts with a focus on mobilities and systemic change.

**Discourses of Desire and Determination**

In her 2004 analysis of the then-emergent "opportunities for new kinds of publics to assemble and gel momentarily", Mimi Sheller argued that a defining feature of "mobile publics" is their capacity to create "momentary stabilisations of collective identities as publics" and effect change (Sheller 2004, 50). When the Tunisian fruit vendor Mohammed Bouazizi self-immolated in protest of pauperisation and oppression under President Zine El Abidine Ben Ali in December 2010, his desperate act catalysed the "Arab Spring" uprisings of millions who suffered under authoritarian regimes. At the same time, anti-austerity protests erupted in Spain and Greece, and the global Occupy movement demanded justice and real democracy. Another world seemed possible.

However, early hopes for democratisation, more equitable and sustainable livelihoods raised by these uprisings were dashed, because – except for Tunisia – these mobilisations have ultimately left a bleak picture of increased repression, socio-economic uncertainty, inequality, and environmental destruction. In the wake of the mobile technology of neoliberalism, "left behind" populations in vastly different contexts have become expendable (Pellow 2017; Mah 2023). As we discussed in Chapter 3, as life-chances melt away for many, those in slightly better positions experience a heightened sense of precarity, resulting in civil apathy, polarisation, and desperation. It divides and disrupts, complicating climate governance. The climate movement's cycles of activism seem to have reached a similarly bleak point, where, amidst geopolitical tensions, climate action is less of a priority, repression is growing, and things look likely to get worse rather than, or before, they get better.

This trajectory is a challenge to received ideas of experimentation and escape from the "tyranny of participation", where top-down initiatives only invite people to "participate" when most decisions have already been made (Cooke and Kothari 2001). But the mobile undercommons reveals new pathways for a confluence of social imaginaries between activist transformationist movements, planning, and "ordinary people". The examples from Barcelona, the UK, and India show how transformationist experimental alternative mobility systems engage and benefit "ordinary people". How to mobilise such engagement further and higher up on Arnstein's ladder of participation (Arnstein 1969, Figure 2.3 in Chapter 2)?

Some analysts predict an eruption of civic mobilisation. Under increasingly tangible and severe climate impacts, reformist movements towards transition

will be co-opted, and revolutionary sabotage by a radical flank will face increasing repression. But harsh treatment of proponents of radical change will ignite public resentment and foster solidarity, making broad-based collective social uprisings inevitable (Fisher 2024a). Fisher professes to an oxymoronic "apocalyptic optimism" and expects an "Anthroshift" where

> The experience of worsening climate shocks, along with the social conflict that they will trigger will eventually lead to the universalization of the experience of risk across the population. The broadening generalized sense of risk will open windows of opportunity … that will lead to a reorientation of the ways in which social actors interrelate around the environment.
>
> (Fisher 2024b)

We would argue that alongside such a cumulative build-up of pressure, there is an evolution from mobile publics to a mobile undercommons, which gathers discourses of desire and determination. A deepening understanding of precarity as a shared condition of living in the ruins of capitalism, unfolding inside a global process of collapse (Tsing 2015; Servigne and Stevens 2020), seems to enable confluence. The "nowtopia" of refusal, solidarity, and study that we describe above appears as the tip of an iceberg of ways of life that facilitate what Abensour calls "the education of desire" (cited in Levitas 2013, 4), a growing awareness of how things could be otherwise that disrupts "the taken-for-granted nature of the present" and enables experiences of "an alternative configuration of needs, wants, and satisfactions", a new "understanding of what is necessary for human fulfilment", "broadening, deepening and raising … aspirations" (Levitas 2013, 4). In their book *The Future We Choose*, Christiana Figueres and Tom Rivett-Carnac, architects of the 2015 Paris Agreement, argue that the optimism inherent in such alternatives is not "soft, it is gritty" (Figueres and Rivett-Carnac 2020, 63), and they describe a sense of determination:

> When … our children, and their children, … ask us 'What did you do?' our answer cannot be that we did everything we could.
>
> It has to be more than that.
>
> There really is only one answer.
>
> **We did everything that was necessary**.
>
> So let us begin today to tell the story of how we did not balk at this seemingly insurmountable challenge, of how we were not defeated by the multiple setbacks we encountered. … of how we made the choice to pull away from the brink of peril, of how we took our responsibility seriously and did everything that was necessary to emerge from the crisis while rekindling our relationships with each other and with all the natural systems that enable human life on Earth.
>
> (Figueres and Rivett-Carnac 2020, 168)

This combination of desire and determination counters the strategies of the mobile technology of neoliberalism, powered by the Atlas network with transformationist mobile methods. Refusal, solidarity, and study are not just tactical choices or practices designed to temporarily disrupt the taken-for-granted business as usual, or create alternative ways of life on the margins; they are methodologies that reach deep into self-understanding and society, changing cultural mindsets and practices, mobilising social imagination and societal transformation. The mobile undercommons is taking rights. Like Rosa Parks, who refused to give up her seat to a white person on a segregated bus, triggering a seismic cultural unmasking of racial inequality as socially unacceptable, commoning mobilities in superblocks, car-clubs, and playborhoods unmasks the denial of safe, sustainable, and equitable mobility commons as socially unacceptable. Political manipulation and power that strategically seek to deny these rights to protect the enormous wealth of the few from extractive neoliberal fossil fuel capitalism is beginning to look obscene. The capacity to unmask in this way is a form of "scaling deep" into what Raymond Williams called societal "structures of feeling", where "durable change has been achieved only when people's hearts and minds, their values and cultural practices, and the quality of relationships they have, are transformed" (Moore, Riddell and Vocisano 2015, 74). At this juncture we note that the long civil rights struggle to translate Rosa Parks' claim into lived equality still continues today, and that success depends on infrastructures, including supportive social movements, but also democratic institutions, legal frameworks, human rights, rights for nature, respect for the rule of law, effective policy, planning, and implementation frameworks, regulation, standards, enforcement, public service media, and more. This is where research on mobile methods – ways to bypass or move into these infrastructural supports and shape them from the inside out – can enhance traction for the mobile undercommons, as we discuss further in Chapters 7 and 8.

## Concluding Thoughts

Discourses of desire and determination, of self-possession and autonomy, solidarity, and exchange map onto the multiscalar challenge of changing mobility systems in powerful ways. To lend sufficient traction to the undercommons' social imaginaries, lived alternatives, discourses of desire and determination, stronger, and perhaps new infrastructures of support are needed. However, we must be modest. An incisive historical analysis (Mosley 2013) shows how over a century of campaigning, scientific analysis, public information programmes, and social movements achieved little to ameliorate the deadly air pollution disaster of 19th- and 20th-century industrialisation. Only a disaster – the 1952 London Smog that killed almost 12,000 people – brought change. More than a decade ago, he argued that in the case of climate change, waiting for a disaster large enough to trigger change could be "too little, too late" (pp. 181–189). Inaction in the face of relentless and devastating climate-change-linked disasters affecting millions, in world-famous locations from Jakarta to Los Angeles,

costing $2tn globally over the past decade, seems to confirm such fears. But we must ask, "too late" for what? Every fraction of a degree shaved off projected warming trajectories will translate into lives saved, so every move towards doing what is necessary matters.

By "weaving" alternatives, the mobile undercommons seems to hold potential for systemic change from the inside out – a cosmopolitan, pluriversal societal metamorphosis, driven by irrepressible social imagination and solidarity. The discourses of desire and determination articulated by the mobile undercommons open up points of connection across the 99%. Environmental and social justice movements are important drivers of change, and reformist and revolutionary movements do nudge policy and governance, as we saw in the surge of declarations of climate emergency in 2019, and subsequent decarbonisation plans, as we discussed in Chapter 3, where we question "What moves us?". But their momentum is not enough. A transformation in social values as great as Polanyi's Great Transformation is needed; a seismic change in structures of feeling. The groundswell from the mobile undercommons could make the hypermobilities of the rich and their discourses of delay socially unacceptable and prefigure a *Gestalt* switch of perception. A critical part here is that alternative futures, and especially futures of *buen vivir* lived through refusal, solidarity, and study, must be recognised to have the same legitimacy as the standard futures which we are sold. They are often marked out as different, other, on the edge. We would argue that given the necessity for more radical social change in response to the climate crisis a simple first step would be to recognise their legitimacy as this will challenge a range of practices, assumptions and behaviours which underpin the status quo in a way which shows that the sky doesn't fall in if we accept the validity of alternative mobility systems lived in harmony with the web of life.

## Notes

1 Thanks to Kay McCann, who introduced me (Monika) to Harney and Moten's concept of the undercommons during a truly inspirational co-taught class at Lancaster University.
2 When granting permission for the reproduction of the images, the Department for Urbanisme, Transició Ecològica, Serveis Urbans i Habitatge at Barcelona City Council stressed that these are "past and finished projects … [the] Superilles/Superblocks was a project of the previous government team of the Barcelona City Council. In the current City Council, this project is no longer in force and has ended" (Personal Communication).
3 https://climatemajorityproject.com/what-we-stand-for/
4 https://therisingmajority.com/

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# 7 Thinking Differently

In 2019, climate activist Greta Thunberg spoke at the World Economic Forum in Davos. She chided world leaders that there was not enough openness about the scale of the climate problem and not enough action to tackle it:

> Adults keep saying: 'We owe it to the young people to give them hope.' But I don't want your hope. I don't want you to be hopeful. I want you to panic. I want you to feel the fear I feel every day. And then I want you to act.
>
> *I want you to act as you would in a crisis. I want you to act as if our house is on fire. Because it is*."
>
> (Thunberg 2019)

It is clear that, in the intervening years, transport policy is not acting as it would in a crisis. It has assessed the fire and decided that stopping it from burning quite so intensively would be a better option than putting it out. As we set out in Chapter 5, analysis shows that the pathway which the UK government, a putative leader in decarbonisation, is now projected to follow for transport leaves a gap in the required emissions reductions equivalent to ten consecutive years of pandemic-level traffic reduction. Instead of responding to the problem by rethinking the solutions on the table, it reframed the problem so that business as usual can persist (Marsden and Schwanen 2024).

In 2023, the UK Department for Transport (DfT) published a *Plan for Drivers* in which the Secretary of State states that "Cars' environmental impacts are often held up as a reason for anti-driver measures, but the shift to cleaner vehicles makes this increasingly unjustified. We can decarbonise and maintain our freedoms." (DfT 2023, 4). How is this possible, when their own analysis only two years previously acknowledged that it would not? Marsden and Schwanen (2024) suggest that pushing responsibility elsewhere in the economy and playing on the fact that most decision-makers and the public don't understand carbon budgets means that talking about "net-zero" in 2050 allows progress to seem like it is being made. The potential to adopt traffic reduction or even traffic stabilisation policies, which was hinted at in the midst of the pandemic (DfT 2021), has now been snuffed out. In more recent documents setting out the

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basis for deciding on major roads programmes, the DfT has sidestepped any sectoral responsibility for decarbonisation and removed the need to recognise local carbon budgets and action plans (previously a core commitment). It also includes statements such as "continued absolute traffic growth is likely under all scenarios" (DfT 2024a, 23) and "It is not the policy of government to reduce demand for travel" (DfT 2024b, 8) and "Given the range of non-planning policies aimed at decarbonising the transport system, government has determined that a net increase in operational carbon emissions is not, of itself, reason to prohibit the consenting of national network projects" (DfT 2024b, 63). Basically, there will be more travel demand, the government does not see this rise as negotiable, and any additional carbon as a result of building more roads to accommodate this is acceptable. There is a caveat in that should any road scheme threaten the achievement of the whole national carbon budget, then this would be grounds to reject it (DfT 2024b). This is akin to saying that a chocolate bar is an acceptable part of an overall diet, which indeed it could be. Unfortunately, around half of the rest of the diet plan is not on track (CCC 2023), and so, actually, the chocolate bar is part of a wider problem. These kinds of statistical manoeuvrings are all part of an intellectual mission to deflect, delay, and deny the need for change, all within carefully crafted and long-established institutional structures.

Such actions can be justified under the current decision-making paradigm because we evaluate the economic benefits of policies as being worthwhile relative to "doing nothing". So, allowing traffic to grow means that making interventions such as road or junction widening can save journey times and, therefore, an economic case can be made (Marsden *et al*. 2010). The logic slips, however, when having a policy that makes things worse more slowly is being sold to the public as one that is making things better. The *Plan for Drivers* states that "We will draw from the best in technological innovation to enable traffic to flow more smoothly and with fewer hold-ups" (DfT 2023, 5). Of course, all of the government's traffic projections show that things will get worse in congestion terms (DfT 2022), and there has never been a strategy that has been able to expand roads in order to actually cut such delays (Goodwin *et al*. 1991). People are being told a half-truth, at best, about what transport policy can do for them and what transport policy needs to do in order to meet its part of the emissions reduction burden. It is no surprise that transport is the sector that has made the least reduction over the past 30 years. We metaphorically and literally keep digging.

Worse than planning just for a continuation of business as usual, we also see politicians rowing back on changes that have been brought forward in response to the air quality crisis. The conservative UK government spoke out against the Ultra Low Emission Zone (ULEZ) brought forward by the (devolved!) London Mayor with Prime Minister Rishi Sunak stating that it was "an unnecessary tax" and "out of touch with the concerns of hard-working people" (Jackson 2023), when in fact, the campaign for Ella's law and studies of public perceptions of air quality find that large majorities, including deprived communities,

consider improving air quality "extremely important". In Bradford, 70% of the population supported implementation of clean air zones (Mehbratu *et al*. 2023), and early results in London suggest that the ULEZ has improved air quality across London without impacting traffic levels (GLA 2024). The UK government of the time also attacked planning initiatives that sought to make more local facilities reachable by active travel: "We will explore options to stop local councils using so-called '15-minute cities', such as in Oxford, to police people's lives" (DfT 2023, 4). It commissioned reviews of whether local authorities that have introduced low traffic neighbourhoods should continue to do so (Ipsos 2024). The low traffic neighbourhood debate is not simple, as it involves the redistribution of traffic flows across communities. However, it is worth reflecting on the attention that such measures receive relative to the lack of consultation (and disinformation) about the implications of higher traffic futures. The right to play out safely on the streets, for example, was common before the dominance of the private car, but was lost in the quiet automobile transition. No one asked. Certain rights and privileges clearly matter more than others.

There are, of course, bright spots of interventions which suggest a seriousness of intent from some national and local governments. The Future Generations Act in Wales (Chapter 4) has seen two important points of divergence emerge. One is a very different approach to determining the need for new road capacity, which puts the carbon case first (Welsh Government 2023). The second has been a shift to a default 20 mph speed limit in areas that previously were designated as 30 mph. The goals of the reform are to put safety first and to start to reclaim aspects of the environment from the high-speed car to speeds more compatible with active travel. This change has drawn ire from many quarters, with the largest petition ever submitted to the Welsh Parliament requiring a debate, which has subsequently led to a further review of the scheme (Welsh Parliament 2024). The UK government described the policy as "unwarranted" (DfT 2023). Again, however, the scheme is having the anticipated impacts on the ground, with a 2.4 mph reduction in average speed in urban areas (Agilysis 2024).[1] Stepping back, it would be difficult to find anyone outraged about the change who could tell you why 30 mph was ever the normal speed limit. So why then is a debate about 20 mph so challenging? This tells us something about the asymmetries of change (who shouts about their losses compared with who enjoys the upsides?) but also the importance of the expectations which people come to recognise. But the rights to the city are not, nor should they be, defined by what has only recently come to be "normal". A decision to set 30 mph was a decision made at one point in time, which reflected the conditions of that period. Smoking used to be legal in indoor settings, as was using a mobile phone whilst driving, and drink-driving limits were much higher than they are today. Norms can change, and policymakers and publics play a role in that.

If we are to create different futures, then we are going to have to think differently and act differently. However, as we have set out, the system of automobility has built up over decades, and there is a petrochemical industry on a war

footing (Mah 2023), and powerful people with strong vested interests in its perpetuation wield strong influence. Unpicking that requires concerted action across a range of areas if big change is to happen. A debate about 20 mph versus 30 mph on its own appears difficult and, whilst a massive policy implementation challenge, is just one small example of the kinds of changes that might be needed. Change requires recognition of the collective condition of climate change we are working to mitigate, as we adapt to it, so that debates about the pros and cons of different forms of action are not left to happen in a vacuum. Without recognition of the need for change, the case for change flounders and is attacked for appearing baseless. All the while, the house is on fire. And the fire spreads.

## Planning to Fail

Whilst we are being sold a rational plan for tackling the climate change problem, we are, in fact, planning to fail. A high-profile example in the UK is the decision by the Scottish government to abandon its target for a 75% reduction in emissions by 2030 (Keane 2024). It also has a target for a 20% reduction in kilometres driven by 2030, but was recently criticised by the Climate Change Committee for having no plan to deliver this (CCC 2024). That target, too, will disappear, we anticipate.

Had more significant action been taken on climate change earlier in the process, then the scale of the emissions reduction challenge would not be so steep, as Figure 1.1 in our Introduction shows. Kuriakose *et al.* (2022) suggest that emission reduction rates for UK local authorities could now be as much as 16% per annum. Transport is now the largest sector of emissions, and so there is an implication that it cannot cut its emissions slower than the average – unless we expect even higher rates from heating, waste, etc. As we saw in Chapter 4, we are at the point where the strategies that are being floated have unrealistically high technology adoption rates and behaviour change assumptions – well beyond anything which our current policy toolkit has ever delivered. As we identified above, this is leading to a pushing back of ambition or, in other words, placing greater climate adaptation realities onto other parts of the world and other generations. If tackling now-here is unpalatable, then it is critical to look at now-there and then-here to really evaluate the outcomes of such a position. It is not consequence-free.

Gössling and Cohen (2014) put forward a series of taboos (Table 7.1), which, they suggest, politicians and decision-makers simply refuse to recognise or discuss, which contribute to this stasis. They suggest that such "taboos remain largely ignored among EU policy makers because their discussion would violate 'order', i.e. harm specific interests within neoliberal governance structures and the societal foundations and structures of transport systems built on these" (Gössling and Cohen 2014, 197). If, nearly a decade ago, mitigation strategies lacked credibility, then, as the mitigation task has become more challenging, it seems clear that the credibility of the approaches

*Table 7.1* EU transport taboos

| | Taboo |
|---|---|
| 1 | Transport mitigation strategies lack credibility |
| 2 | The contribution to transport volumes is highly skewed to wealthier groups |
| 3 | Highly mobile and environmentally aware travellers will not reduce their mobility |
| 4 | A large share of transport is unrelated to specific transport needs |
| 5 | Market-based measures will affect, in particular, the less wealthy |
| 6 | Energy-intensive transport is the least taxed and the most subsidised |
| 7 | Lobbyism influences and waters down transport policy |
| 8 | Key issues in climate-sustainable transport systems remain ignored |
| 9 | Mobility consumption patterns represent the very fabric of contemporary services |
| 10 | Emerging societal structures are ignored |

*Source:* Adapted from Gössling and Cohen (2014).

proposed is further undermined. We have touched on many aspects of the taboos here, such as the dominance of emissions from the elite and the influence of lobby groups in closing off options. In this book, we argue that we have to address high consumption, and have to recognise potentially different ways of living (*buen vivir*) – but the taboos identify that it is hard to recognise or discuss this in policy. And so, business-as-usual thinking prevails.

There may, however, be real limits to stalling and prevarication as an approach, and that comes from the action of the public. On 9th April 2024, the European Court of Human Rights (ECtHR) set an important precedent in the *Verein KlimaSeniorinnen Schweiz and Others v. Switzerland* case. Bharadwaj (2024) summarises the outcomes of a case brought by a group representing older women in Switzerland who argued that the Swiss government's lack of action on climate change violated their human rights because of the health risks of excessive heat, which global warming was contributing to. Bharadwaj (2024, n.p.) observes that

> the Court states that Switzerland has a responsibility under the European Convention for Human Rights (ECHR) to combat climate change effectively to protect the human rights of their citizens – and as a result can be held accountable for inadequate climate policies and mitigation measures.

Clearly, such a ruling should have widespread implications for the actions and inactions of other countries. Whilst the Swiss case hinged significantly on the lack of a clear framework and commitments, failure to meet legislated goals was also part of the case. The UK government has twice had its net zero strategy deemed unlawful by the High Court for failings of transparency and risk communication (High Court 2024). As we have seen with the recent abandonment of the additional ambition set out by the Scottish Climate Change Act, the reality of delivery is now coming face-to-face with the constraints of the

carbon budgets. Whilst these are all important examples, some also prompting international court challenges (see Chapter 4), we believe it is misplaced to rely on legal recourse to settle new pathways to climate action. Legal cases are typically retrospective and do not undo inaction. They cast complainants as victims, focussing on damages. Tuck (cited in Mah 2023, 57) argues that:

> It is a powerful idea to think of all of us as litigators, putting the world on trial, but does it actually work? Do the material and political wins come through? And, most importantly, are the wins worth the long-term costs of thinking of ourselves as damaged?

Moreover, the climate targets and climate legislation could yet be torn up and rewritten; rather than the lack of action being the problem, it could be the legal framework that is blamed. The US's relationship with the Paris accord is testimony to that truth.

The issues in carbon accountability and transparency go well beyond the transport sector. However, it appears that transport is complicit in that. The fact that the UK national government's decarbonisation plan is far less ambitious than that set out by the Climate Change Committee just three years previously is a case in point. How is it that policymakers can crunch the numbers but keep coming to the conclusion that no path change is necessary? Gössling and Cohen's characterisation of taboos offers explanations of some of the important power and political dimensions explaining stasis. But how do the decision-making structures support this, and which taboos are increasingly being challenged, which continue to work, and why does this hold sway over more radical change?

**Business as Usual Fictions**

Transport planning is built around a notion of evaluating the actions of policy compared with a world in which no further policy intervention beyond committed policies exists, referred to as "business as usual" (Marsden and McDonald 2019). In many senses, business as usual is a wonderful fiction. Business as usual requires an ongoing stability in travel behaviours and technologies, and no substantial changes in exogenous factors over 60 years (the period over which economic project appraisal assessments are made). The "holding constant" of factors helps, in economic appraisal, with a clear comparison of "policy on" and "policy off", but there has never been a period of "holding constant", and the next period of 60 years is acknowledged to be one of huge uncertainty. Business as usual is at the heart of a fallacy that stops us from treating the climate emergency for what it is. As Goodwin (2024) points out, business as usual for transport will mean accounting for even greater impacts of global warming, which will set off a range of very uncertain trends and deleterious effects on the economy, society, as well as the additional pressures that extremes of weather bring to infrastructure. A recent paper in Nature

(Kotz, Levermann and Wenz 2024, 551) found that "the world economy is committed to an income reduction of 19% within the next 26 years independent of future emission choices". Rising temperatures and extremes of rainfall and heat impact on labour and agricultural productivity, health and labour outcomes, as well as direct costs from flood damages (Kotz, Levermann and Wenz 2024). The damage costs increase significantly beyond the middle of the century, depending on the future pathways chosen, with the argument being that mitigation now is cheaper than responding to more extreme damages in the future. All of this can sound divorced from the social reality of such impacts – but it will further accelerate mass displacement and, as we have discussed in Chapter 1, there is a need to develop frameworks for human mobility based on concepts of collective security and solidarity. The forecasts already identify that the poorest parts of the world will suffer losses in income of 25%–30%. Even countries in higher latitudes, such as the UK, will see declines of an estimated 10% (Kotz, Levermann, and Wenz 2024). Yet this future is not recognised in business-as-usual. Incomes continue to grow, car ownership grows, and the economy works as it always has done. This is a fallacy.

We return then to the managerialist approach of treating carbon emissions as a problem that can be solved. To achieve the levels of emissions reductions necessary to have a chance of staying within 1.5°C would require an approach to planning on a crisis footing (Kevin Anderson's Marshall Plan discussed in Chapter 4). Yet we still continue to persist with the planning paradigm and tools we have always used. Why does this persist? What are the alternatives? How can we find ways to move from the current paradigm to a new future?

In work undertaken in response to the COVID-19 pandemic (see also Chapter 3), Marsden and Docherty (2025) explored the response of UK policymakers to the pandemic. This is introduced here as the chapter reflects on what could be learnt from responses to a very immediate public health crisis to tell us about how decision-makers might react to a longer-term climate crisis. The answers were pretty startling in that, despite the massive shifts in travel behaviour, essentially, the same projects that were on the table before the pandemic were the ones that were there afterwards. There was an acceptance that there might be a reshuffling of the priorities in the queue for funding and a pushing back in time, but, broadly speaking, if a project was needed before, then it was needed now. It took a long time, it was argued, sometimes decades, to bring projects to fruition, and so abandonment was not high on the agenda. Particularly for those who had invested large parts of their career pushing them forward.

The infrastructure needs remained largely unchanged despite a recognition that why we travel and whether we choose to travel had fundamentally shifted for some work and business trips in the most valuable sectors of the economy, and an acceptance of the further shift away from bricks and mortar retail (Marsden and Docherty 2025). When these seeming contradictions were put to people, the systemic inertia suggested by Urry (2004) surfaced, with people arguing that they would not change their plans unless the DfT told them to

work with new assumptions – why would anyone jump first to abandon their project? There were also some hard-to-change professional logics about the investments being fundamental to how cities or economies worked, and this had been untouched by the pandemic or a belief that this was just a blip and that they would return to their previous state (Marsden and Docherty 2025). Coupled with this, there are powerful interests in the property sector who want to see office rents going back up, housing demand coming back to cities, or vehicle sales returning to the good old days, who are actively lobbying for a return to pre-pandemic practices (Kelly 2023). Rapid change connected to the pandemic was an opportunity in some respects, but it was also a threat to some vested interests. In amongst a public information campaign underpinned by highly effective indicators that enabled temporary systemic change (Tregidga and Laine 2022, Chapter 4), the policy system proved remarkably resilient to changing the narrative and practice from business as usual, despite recognising that society's needs were changing. The scale of behaviour change now needed if we are to realign with 1.5°C is of the order achieved during the first year of the pandemic (for ten consecutive years (Marsden and Schwanen 2024)), which coincided with a major shutdown of parts of the economy and limits on how activities were organised. Yet the policy response to this has not even been to embrace the elements that worked well and maximise their potential for climate reduction. In light of this, should we expect the climate crisis to stimulate change when the pandemic did not? As Gössling and Cohen (2014) suggest, the mitigation strategies being proposed are completely inconsistent with the scale of change needed, and this has been underlined by the pandemic. Yet, the climate crisis continues to not really be treated as a crisis but as just one amongst many policy problems which – it is assumed – can be solved through better planning or electrification. Indeed, it has become almost normalised now to participate in conferences and meetings where practitioners and academics suggest that it would be better to talk about the co-benefits of climate action than to focus on climate policy per se. This, to our minds, deliberately depoliticises or denies the urgency of action and moves us back into a more comfortable world of debating trade-offs between policy issues "now-here" at the peril of other nations and future generations.

## Governing Instability and Change

So where do we go from here? Ansell, Sørensen and Torfing (2023, 3) find that the "bureaucratic quest for stability and predictability is motivated by an interest in maintaining sovereign political leadership whilst simultaneously protecting citizens against arbitrary administrative decisions. Hence, stability is seen as inherently good, thus making instability and disorder a problem". Their argument, and that of others who write on change being short periods of intensive disruption and transformation followed by longer periods of stability (Hall 1993; Baumgartner, Jones and Mortnesen 2018), is that public policy wants there to be a steady state and for deviation to be a crisis or a particular

moment. The role of the government is to step in, steady the ship, and return to a stable and settled path. This, Ansell, Sørensen and Torfing (2023) argue, does not work in the face of multiple and ongoing crises, or indeed, when we understand climate change as a condition.

If we step away from the rational planning or public administration perspective on change, however, we can perhaps find other routes to understanding change and, perhaps therefore, to steering it differently. Graham (2010, 3) writes that

> studying moments when infrastructures cease to work as they normally do is perhaps the most powerful way of really penetrating and problematising those very normalities of flow and circulation to an extent where they can be subjected to critical scrutiny.

In the Icelandic ash cloud incident, which shut down much of European airspace for a few days in 2010, some businesses were exposed to how vulnerable they were to the degree of long-distance mobilities embedded in their ways of working, and supermarkets to the degree of airborne fresh food in their supply chains (Birtchnell and Büscher 2011). All of this information is known; it just is not revealed as important until things break down. Similarly, COVID-19 exposed major structural inequalities in the UK. Around half of working people never worked from home during the pandemic. These were overwhelmingly lower-income workers who had to continue to service the wider economy and, therefore, face the (health) costs of the commute, whilst the wealthier could work from home (Anable and Marsden 2021). The criticality of warehouse workers, food retailers, transport providers, and the healthcare sector emerged, but recognition of their importance very quickly disappeared as other issues rose up the agenda.

Understanding change during disruptions is important not just for what it reveals but for what it generates. Graham and Thrift (2007) suggest that the notion of some kind of "return to normal" is flawed and that "repair and maintenance is rather more significant than the practical models of the onflow of everyday life that have now become so significant in the social sciences and humanities" (2007, 3). Marsden (2024, 440) suggests that "What is experienced cannot be undone and so the adaptations which are made during disruptions have implications for future travel behaviour, location decisions, supply chain organisation, business models and so on". If we reflect back on the decades-long trend in the reductions in trip rates for varying journeys (Chapter 3), we can reinterpret this not as some form of economic loss, but as society innovating in how it does things. Our social life is on the move, but the extent to which this is recognised by policy is not so much.

Sociologist Hendrik Vollmer suggests that what is "disrupted" is the "coordination of activities and expectations" within a collective entity (Vollmer 2013, 2). We would argue that the climate crisis is already creating these conditions. The extent to which it is playing out varies depending on the extent to

which populations are exposed to climate risk, but the effects spill over. Phenomena such as flight shaming, sufficiency culture, or slow tourism, and the transition from "just-in-time" to "just-in-case" supply chains (Carolan 2023) are, in fact, part of changing sub-cultures of expectations. These examples point to ongoing work across society to innovate and develop new ways of living or adapting to change that are transformational in their own right in the sense delineated in Chapter 6. Some resonate more with the mobilities of *buen vivir* enacted by the pluriverse of initiatives in the mobile undercommons, others less. Governments and businesses can also act to change expectations and the conditions for the coordination of activities. The UK government's highly effective television campaign "Switch off Something – NOW!" launched in January 1974 to enrol the public in preventing blackouts during the energy crisis is an example (Newmarch 2020), as is, of course, the public crisis communication campaign that enabled temporary systemic change in response to the COVID-19 crisis (Tregidga and Laine 2022, Chapter 4). But currently, governments point to strategies whereby fossil fuel cars are simply replaced by electric ones. This does not create the conditions for change; on the contrary, it denies the necessity for change, despite the continued exposure of the economy to gridlock, extreme weather events, and, more recently, pandemics. Hypermobility and the expectation that "we can decarbonise and maintain our freedoms" (DfT 2023) represent a full-scale denial of the realities that we can increasingly identify and experience. They reinforce false expectations and, by implication, close off other paths of action.

Is ongoing change really so difficult for governments to face up to? Charles Lindblom's work on muddling through suggests perhaps not (Lindblom 1959, see also Chapter 4). Lindblom argues that, in contrast to grand strategic planning, politicians tend to advance on a decision-by-decision basis, with those decisions based on what they can agree on. Policies might be attractive to different parties for different reasons, and so change only organised around one grand narrative is, perhaps, naïve. It is also not the case that incremental decision-making is always slow. Lindblom (1979) argues that it can be rapid and it can also be accompanied by moments of bigger change. Marsden *et al.* (2014) suggest that what matters is the cumulative consistency of policies rather than whether they are incremental or from some comprehensive strategic plan (see Figure 7.1).

So, if we took seriously that we are in a condition of turbulence, and that comprehensive planning is not currently fit for purpose to deal with a crisis of this scale, we might want to think about a fast incremental approach. This would need an idea of where we are going (e.g. shaped by the carbon budgets), but it would enable decisions to progress which take us in the right direction on carbon and away from business-as-usual auto-, aero-, and cargo-mobilities. It would allow for adaptability, reflection, and change en route. This fits with Bulkeley's (2019) call for treating climate change as a condition and not a problem that will be solved. Of course, the likelihood of sufficient action being taken in a consistent manner would seem higher if we had a coherent long-term

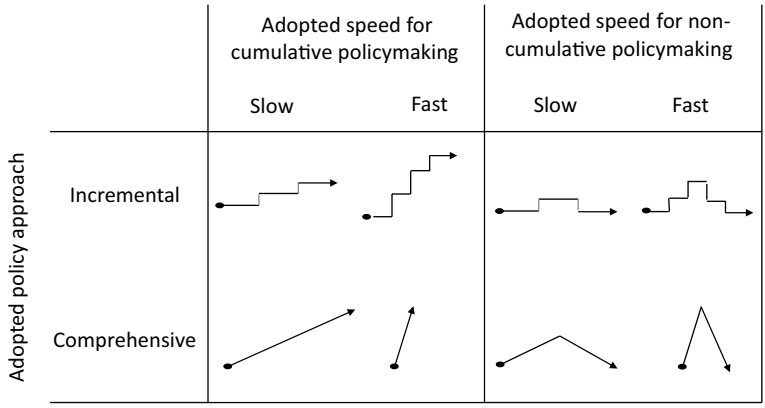


*Figure 7.1* A typology for policy change pathways.

*Source:* Own elaboration, adapted from Marsden *et al.* (2014).

vision. It would avoid the risk of taking effective short-term action, which then reveals a lack of scope for some changes that require longer time scales (e.g. a switch to EV combined with a failure to address changes to fuel infrastructure). It would ensure that the carbon budgets are kept in sight even as decisions unfold years out from them. However, the presence of a comprehensive planning framework does not guarantee coherent cumulative action. We can see, for example, money being spent on cycle lanes whilst fuel duty for petrol is reduced in real terms. We can see investment in zero-carbon ground fleets at airports whilst the airlines seek to expand the volumes of flights, with the help of reduced air passenger duty.

Ansell, Sørensen and Torfing (2023, 8) suggest that we need to move towards a more "robust governance" approach, which does not dichotomise change and stability;

> change cannot be conceived as simply reactive and incremental, designed to shore up the status quo, nor as disruptive in the sense of transforming the status quo to a new equilibrium. Instead, change is better imagined as proactive innovation to pre-empt disruption and/or as flexible adaptation that grasps the opportunities inherent in turbulence for promoting and revising governance practices.

In other words, in order to respond to the crises we face, processes of governance themselves need to adapt and incorporate change as part of the everyday. Rather than trying to act to protect our existing ways of doing things (and all of the structural inequalities that entails), we have to face up to the need for policy to recognise and embrace change. Change is always happening, and more is coming, whether or not our institutional toolkit recognises this or not.

**Concluding Thoughts**

If we reflect on Gössling and Cohen's list of transport taboos, it is easy to see why perpetuating business as usual might be attractive. It does not require facing up to the inadequacy of the mitigation plans that we have. It does not demand that the inequalities in the amount of travel in different parts of society are recognised or addressed. A recent review of the extent to which justice is included as a concern in transport and climate change strategies concludes that whilst differences between groups are identified, "there is no clear recognition of how these inequalities can be resolved and, worryingly, how new ones will be avoided under a rapidly changing and decarbonising transport system" (Ternes, Marsden and Harrison 2024, 1). It is difficult to see how different pathways can be mapped out if there is no acceptance of a need to act. If citizens are being told "don't worry, we have a plan" then why would there be a mass clamour for action?

Fundamentally, change on the scale required, and in the face of climate impacts, is political. Rebecca Willis argues that to address the challenges of climate change, we need to make issues more political, rather than retreating into technical siloes (Willis 2020). As set out in earlier chapters, mobilities research critiques the divorcing of transport from the real meanings and experiences afforded by mobility and of the current and historical injustices that have been generated. Addressing this demands changing im|mobilities and inequalities as part of any future. The implications of this are to embrace the way forward as a political struggle rather than prescribing the adoption of a better rational pathway. For sure, more and better consultation would help. Other options could always be considered. However, different winners and losers emerge. The question is whether we are prepared to acknowledge that there is no set of win-win outcomes (Kotz, Levermann and Wenz 2024). Some would see this as a defeatist statement, but transport policy has never really been about win-wins but has favoured a more mobile elite. It means facing up to the need to mitigate and adapt to climate change, not "solve it". There is a need for much deeper public engagement and a real sense of crisis, as we elaborate in Chapters 8 and 9.

As we set out in Chapters 5 and 6, there are lots of initiatives and places where alternative ways of living or responding to climate change are already being developed at international, national, and local levels. In Chapter 6, we showed how these initiatives are seeking confluence to join forces by themselves. But even as networks, they tend to exist in the shadow of governmental hierarchies in thrall to powerful lobbyists and the mobile technology of neoliberalism rather than being embraced by them. Activist scholars such as Paul Chatterton point to the need to join up these non-mainstream approaches with research to bridge the gap between the perceived exceptionalism of these developments and the civic opportunities that they really offer (Chatterton 2008, see also Mah 2023). One pathway forward has been to promote urban experimentation as a means of testing opportunities to do things differently (Bulkeley

2023). However, it is also the case that urban experimentation can operate as a fig leaf to disguise business as usual. The more radical and unusual elements of experimentation are allowed to exist in bespoke spaces or specific governance arrangements that do not permit scaling up and mainstreaming (Aparicio 2020; Berglund-Snodgrass 2022; Isaksson, Oldbury and Marsden 2022). Experimentation may also be a "trojan horse" for new technologies that are far from assured of offering a more sustainable set of outcomes (Smith, Marsden and Dickinson 2022).

Sierhuis, Bertolini and Van Winden (2024: 303) argue that if experiments are to be transformational, then it "requires revealing the existing power-relations and biases keeping the status quo in place and negotiability of radical alternatives". Bulkeley (2023: 1) echoes this by suggesting that rather than abandoning experimentation because of its current limitations, it is necessary to explore "the politics and possibilities of experimentation for progressive and just urban sustainability". But how to ensure traction and how to practice experimentation as a collective strategy for transformation? This is the focus of Chapter 8.

## Note

1 The goal of the scheme is to improve road safety and it can take three years to establish a clear statistical difference in trends. However, global research suggests that a 3 mph reduction in speed results in a 32% reduction in road deaths and a 25% reduction in serious injuries (Agilysis 2024).

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# 8 Acting Differently

We have touched upon some of the ways in which we, personally, have taken action to change mobility systems through our research in earlier chapters. This includes creative mobile utopia experiments and collaborative visioning workshops like "Cumbria 2037: Decarbonising Mobility Futures", designed to reveal the strength of public imagination (Chapter 4, Büscher 2017; Büscher *et al*. 2022). A freedom of information request by Greg uncovered a staggering "reverse gear" on government climate action in the UK, with a 72 percent reduction of the potential ambition for transport decarbonisation between the UK government's 2021 transport plans released before COP26 in Glasgow and revisions proposed in 2023 (Chapter 5, Marsden 2023); whilst the Commission for Travel Demand provides concrete insights into changing mobilities and policy recommendations based on expert scientific analysis in areas disregarded by captured governance (Chapter 6, Marsden *et al*. 2019).

We have also discussed many inspiring examples of grassroots actions designed to change mobility systems in Chapters 5 and 6. These are important, but niche actions, and much more needs to be done by more people, and by people in powerful positions. Having reflected on how the machinery of the mobile technology of neoliberal capitalism captures governments and publics alike, allowing "planning to fail" and propping up deadly business as usual auto-, aero-, and cargo-mobility systems, we not only understand better "what we are up against" (Steinberger 2024), but we can also see strategies to "force" change. Recognising that we cannot wholesale design alternative mobility systems a la Buckminster Fuller, we know that they must be grown organically through collective action. The groundswell of flourishing creative grassroots initiatives, driven by the refusal of neoliberal, patriarchal, colonial logics, solidarity, and confluence in a school of politics by a mobile undercommons, allows practices of study to reveal routes towards better certainties, social and climate justice, and mobilities of *buen vivir*. How can we improve their growing conditions and traction? This chapter delineates two methods we are developing – a societal readiness standard and adaptive experimentation. These are not the definitive answer, neither a beginning nor an end, but a contribution to the making of different mobility futures intended to provide deep leverage.

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Working – between us – some 30 years predominantly "from within" to inform and influence powerful actors, we have negotiated often difficult positions in relation to corporate innovation, government policy, activist, and non-governmental agencies, and diverse communities, trying to articulate critique in ways that are uncompromised, transformative, yet constructive. The few successes, many failures, and frustrations that pepper our experience have made us search for stronger methods to challenge the very DNA of business as usual and its seemingly indomitable capacity for shape-shifting persistence. This resonates strongly with Sheila Jasanoff's "Technologies of Humility", that is, "methods, or better yet, institutionalized habits of thought, that try to come to grips with … the unknown, the uncertain, the ambiguous, and the uncontrollable" (Jasanoff 2007, 227). In the first part of this chapter, we describe how Technology Readiness Assessment and its Technology Readiness Levels (TRL) have become a de facto standard that plays an often hidden but hugely powerful role in perpetuating business as usual. To challenge this, we have developed a framework for Societal Readiness Assessment (SoRA) and Societal Readiness Levels (SRL). This could be seen as something of a Trojan Horse because it carries a subversively different, adaptive, and iterative process into the heart of innovation and policy, one that is more participatory, experimental, and systemic. But we think of it instead as a "seedball" that combines seeds for alternative mobilities with a growing medium that allows them to take root and spread. It forces the evolution of a different process, rather than imposing one. In the second half of the chapter, we show how a broad-based adaptive experimental approach can grow from this, which is geared towards fast incremental change and more adaptive, collaborative, and robust governance that does not dichotomise change and stability and enables mobilities of *buen vivir*.

## Societal Readiness Assessment

As part of the DecarboN8 project, we established a "Stakeholder Reference Group" to bring different actors together to reflect on the design and implementation of decarbonisation policies. During discussions around urban innovations, one member commented on the outcomes of e-scooter trials taking place in UK cities at the time:

> There is strong focus on safety but not on issues such as surveillance, little leverage of the public sector, competition with subsidised bus services (and therefore use of public money) or indeed competition with other micromobility schemes that are offered via a concession in the region. The way and timing at which the trial was presented to local authorities did not allow sufficient time to consider such issues given that there were really tight timelines and the urgency/narrative of providing a viable alternative to public transport.
>
> (SoRA Experiment 13.11.2020)

They explained that commercial operators had been selected for the trial based on evidence of the viability of their technology and business models, but that they could not then be held to account or invited to redesign their scheme in response to social issues arising from the implementation, such as limited accessibility, nuisance parking, and irresponsible use. Such issues were seen as caused by a lack of societal readiness for the innovative solutions these operators could offer. This is a typical experience that is structurally embedded in the process of technocratic innovation for transition.

It hinges on deeply embedded standards of "Technology Readiness Assessment" and TRL, developed by NASA in the 1970s, which have become a widely adopted standard methodology for the evaluation of technological innovations. Figure 8.1 shows TRL increasing from an initial idea at TRL 1 to proven stability in mature and implemented commercial solutions at TRL 11.

Technology Readiness Levels (TRL) are used to assess the likely viability of technological innovations for purposes of investment and roll-out. Their use permeates national and international research funding agencies, political bodies, and think tanks like the International Energy Agency. The IPCC uses TRL to assess climate change mitigation technologies across all sectors, from agriculture to transport, but notes some difficulties in capturing applicability, manufacturability, or the readiness of organisations to implement proposed solutions.

In the wake of this technocratic standard, "societal readiness" has been construed as a public deficit. Science and technology are assumed to have the


*Figure 8.1* Technology readiness levels.

*Source:* Own elaboration, adapted and redrawn from IPCC AR6 and https://www.iea.org/reports/ccus-in-clean-energy-transitions/ccus-technology-innovation

solutions, and corporations and governments are presented as ready to deliver them. But the public (often reduced to consumers) are said to stand in the way, because they lack the understanding, or the will to "accept" these solutions. If the technology is seen as ready in this sense, then the question to be asked is what needs to happen to change levels of user acceptance. This railroads answers that focus on public education, nudging, and incentives (e.g. through taxation) to boost "societal readiness" and unblock progress.

However, as we and many others argue, many technologically "ready" "solutions" – from electric cars to negative emission technologies – are inadequate technological fixes (Henderson 2020), placebo solutions (Jirón *et al.* 2021), or worse, smoke and mirrors distractions (Anderson 2023). They disregard the complex socio-technical nature of auto-, aero-, and cargo-mobility systems we discuss in Chapters 1 and 3. Electric vehicles (EVs), for example, do not enable the level of decarbonisation required for a just transition; in fact, they can take away physical road space from walking and cycling and entrench the existing automobility system deeper. Technology-ready solutions are often not accept-*able* to society, because they are not effective when considering the scale and urgency of the climate emergency. They do not enable the emission reductions required. They can exacerbate inequalities when they are not affordable, create injustice in their supply chain, or generate an unacceptable level of undesirable, unanticipated consequences.

**Case Study: On-street Cable Gulley Charging for EVs**

In the UK, the pathway for future decarbonisation of transport includes a phase-out of sales of fossil fuel vehicles by 2035, with an anticipated switch to EVs. The design ideal was for vehicles to be parked off-street and charged from a charge point at the property. However, in some areas, as many as 40% of households live in a terraced house or have no off-street parking. A network of public charge points has been part-funded by the government to enable people to charge away from their homes, but they pay upwards of four times the price per Kilowatt Hour as those charging off-street at their home. This clearly raises some important equity issues. However, the technology of EVs is here, and so charging solutions are needed for this to be adopted at scale. Nottinghamshire County Council has been one of the first authorities to trial cable gully charging, where a shallow gully is cut in the pavement so a charge-capable cable can run underneath the footpath. A charge point is also subsidised and installed at the house. This resolves the social equity issue of who pays what for charging.

However, it opens up lots of other questions. First, the footpath is public, as is the highway. The homeowner becomes liable for the maintenance of the gully, and so we see a transfer of rights from just the public footpath to a semi-public-private footpath. Second, the website clearly states, "Having an EV cable channel installed does not guarantee parking outside your property as a dedicated parking bay outside the property won't be provided

as part of the trial" (NCC 2024). However, the legal position is not necessarily the same as the societal notion of rights to the street. By simply installing the equipment, the Council has signalled a right to charge at that location. This means that it has effectively removed the right to reallocate that space to other uses, such as widening the footway, planting green infrastructure, or adding cycle lanes. It is also far from clear that the owner of the cable will agree that other people have just as much right to park there as they do. True in theory, but in practice, it is about accessing something you have paid for. This approach is now under trial and is just one example of how automobility is tightening its grip. The loss of rights simply disappeared without consultation. The EV is technology-ready, the cable gully charge point solution is technology-ready, but are they societally ready?

Principles of *buen vivir* suggest making the resources for mobility more, not less, common, but how to embed such principles into innovation and policy? And how to do this in a way that enables cumulative policy consistency as part of fast incremental change? To develop societal capability for such system-wide transformation that is focussed on *buen vivir* principles, and especially social justice and sustainability, we need to turn the idea of readiness around from asking "How ready is society for (commercial) technical solutions?" to asking "How ready are social, socio-technical, political, economic, etc. solutions *for* society? How effective are they in decarbonising mobility? How easy are they to adopt? How good are they for society?". How do they enable a just transition? If more democracy is needed to make more opportunities visible and feasible (Willis 2020), how is this to be not just encouraged and supported, but "forced" by the growing medium for alternative mobilities?

Working with diverse stakeholders in the UK DecarboN8 project (https://decarbon8.org.uk/), we have developed a SoRA framework, methodology, and dashboard. This builds on mobilities research and critical service design in place-based transport decarbonisation (Büscher *et al*. 2023, Salinas 2022), and design thinking pedagogies for corporate leaders and sustainable communities (Newton and Huang 2020). SoRA is, on the face of it, as simple to use as TRL, and even complementary to it, an additional standard. But it is an active standard, enabling, even forcing, a more democratic and social innovation process. It uses an online reflective questionnaire to support iterative, creative-constructive assessment of how ready innovations in technology, policy, and/or social practice for transport decarbonisation are for society. It guides assessment across four key areas (Figure 8.2):

- **Carbon Reduction** – Maximising carbon reduction through reducing the use of carbon-intensive materials and enabling low-carbon practices, forcing accountability to carbon budgets.
- **Social Justice** – Embedding consideration of equity, inclusion, and fairness, engaging a wide range of stakeholders in the innovation's design and development.

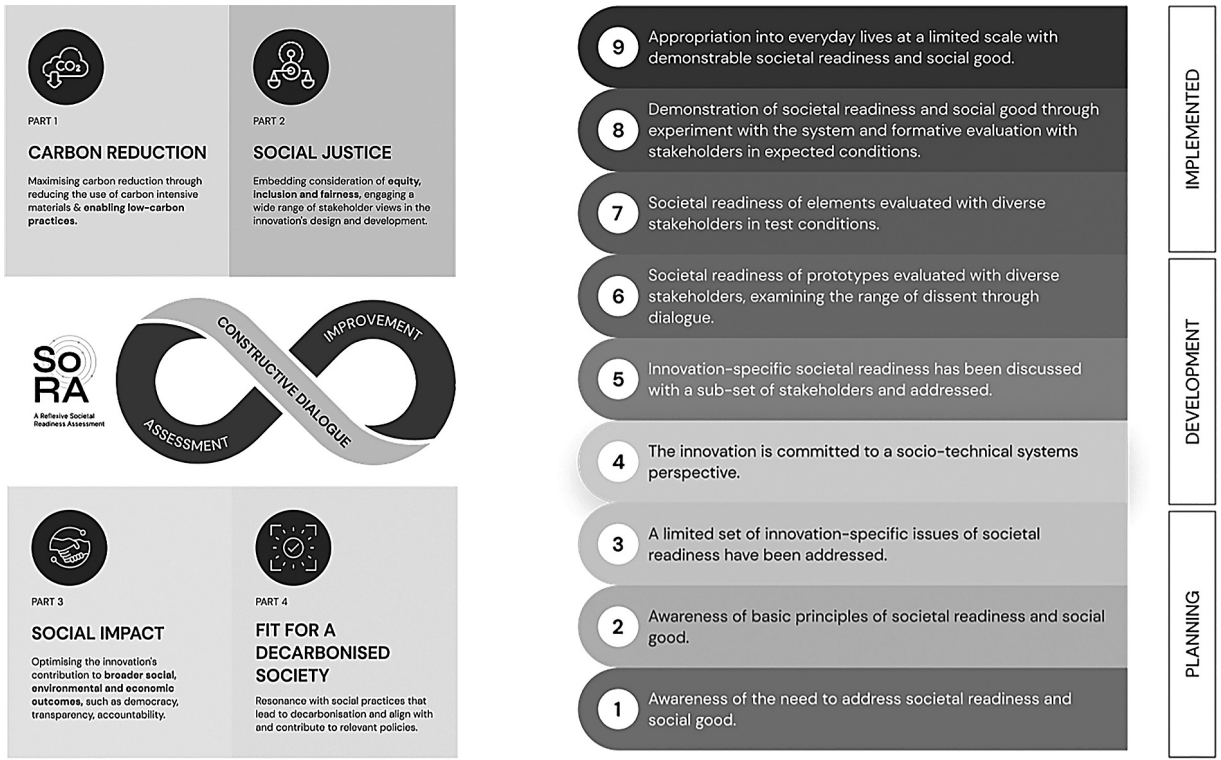


*Figure 8.2* The SoRA Societal Readiness Assessment process.

*Source: Own elaboration,* Büscher *et al*. (2023). We thank Nuri Kwon, Naomi Jacobs, and especially Maria Alejandra Lujan Escalante, Alistair Kirkbride, David Lund, Sofia Kallimasioti, Maitreyee Kshirsagar, Namita Manohar, Lara Salinas, Aya Takagi, and Richard Unwin for their contribution to the development of the Societal Readiness Assessment process and visualisations.

- **Social Impact** – Optimising the innovation's contribution to broader social, environmental, and economic outcomes, such as democracy, transparency, and accountability.
- **Fit for a Decarbonised Society** – Resonance with social practices that lead to rapid and radical decarbonisation, align with, and contribute to relevant policies.

SoRA invites diverse stakeholders to score projects at different stages in their development, from early ideas to experimental implementations, in terms of their readiness for society, and discuss differences in evaluations. Importantly, the aim of SoRA is to improve innovation as part of a participatory and iterative process. Nine "Societal Readiness Levels" (SRL) provide a guide, whilst a range of tools support constructive dialogue and collaborative design.

We have developed SoRA in collaboration with different stakeholders in the UK, including the UK's innovation accelerator for cities, transport, and place leadership, the Connected Places Catapult; the Zero Carbon Cumbria Partnership, which brings together more than 90 businesses, third sector organisations, and local authorities in the county of Cumbria; regional youth climate groups in Yorkshire, Humber, and Cumbria; the Copeland Climate Monitoring Group; the Carclub in a Box team; and Stantec, an international masterplanning and engineering firm. One of the participants from the Zero Carbon Cumbria Partnership synthesised why SoRA is valuable: "societal change harbours the opportunity for massive impact", but requires "complex conversations, because … societal readiness is about both society to be ready to integrate innovation into their lives and innovations to be ready (and good!) for society and the climate". This recognition of the need for complex conversations highlights the most critical aspect of our SoRA framework: assessment can and should be carried out by any party with an interest in a project, and their assessment should be addressed in future iterations of the design as part of a collaborative design dialogue. In our collaboration with Stantec, for example, an interdisciplinary group of transport planners and designers had developed novel methods for spatial analysis and production of master plans to reduce travel by car by 20% by 2030. They took existing "Digitally Distributed" (DD) and "Urban Zero Carbon" (UZC) visions promoted by a regional body, "Transport for the North", and adapted them to cover the emission reduction gap in existing travel demand management. A case study for a new development in the town of Bury, located on the edge of Manchester in the UK, served to test the methods for analysis and masterplanning. The designers themselves scored their ambitious master plans for alternative mobility futures quite high in terms of their societal readiness, but they were keen to use the SoRA approach to enter into dialogue with stakeholders. We invited members of Bury Council, as well as a small set of local residents and members of non-governmental groups, to attend a pilot workshop and carry out their own SoRA. The participants raised many concerns, and Stantec's designers used constructive dialogue techniques to learn from the participants' less positive assessment of their designs. They dedicate a whole chapter of reflections on

societal readiness in the final masterplan documentation, summarising insights as follows in the Executive Summary:

> Neither of these alternative futures [we designed] would provide a system of mobility that would be ready for adoption by society. Concerns about the DD+ [Transport for the North Digitally Distributed scenario, adjusted to achieve a 20% reduction in car travel] [not] providing for the many and complex journey destinations and purposes required, and about the nature of UZC+ [Urban Zero Carbon scenario, adjusted] urban living in a generally sub-urban environment would leave society anxious about its ability to thrive. Much work would need to be done to develop these visions into something capable of being embraced by society …. An iterative approach which treats community engagement and Societal Readiness Assessment as an integral part of the commercial, technical and operational assessment processes would need to be adopted to ensure the development of a shared vision of the future that could guide a vision-led planning and design process, and lead to the carbon outcomes envisaged.
>
> (Mitchell 2023, 3)

In some respects, both TRL and SoRA are carriers for ideological perspectives. Whilst TRL implicitly promotes the mobile technology of neoliberalism through a focus on progress, technology, and linear notions of science and innovation, SRL promotes a focus on decarbonisation, social justice, social impact, and future generations. But whilst TRL can "rubberstamp" innovations, SRL lead into a process of iterative, experimental, and participatory change, they are reflective, and a tool for formative evaluation, that is, evaluation designed to dialogically inspire improvement every time SoRA is being done by a party with an interest in the design. SoRA is designed to support those affected by change in challenging claims that high TRL or, indeed, high SRL claimed, for example, by a commercial developer, indicate that solutions are ready and good for them or society as a whole. This process of facilitating enactment of an open common stage offering equal voice and – importantly – dialogic accountability, is essential, because it fosters pluriversal dissent, whilst providing traction to social imagination. Standards can provide guide rails and accountability for innovation, and, as a candidate new standard, SoRA inscribes the "cumulative policy consistency" that Marsden *et al.* (2014) identify as a lever for scaling deep. Systemic, rapid, and radical change becomes more possible because SoRA forces alignment with carbon budgets, commitment to social justice, attention to unanticipated consequences and social impact, as well as consideration of future generations and adaptation to future contexts. SoRA fosters a practice of agonistic democratic engagement.

### *Beyond Consensus*

Consensus politics often constructs dissent as problematic, an expression of antagonistic, combative opposition, opening the doors to culture warmongering. However, *agonistic* democratic politics does not see those who hold

different views "as an enemy to be destroyed, but as an 'adversary', i.e., somebody whose ideas we combat but whose right to defend those ideas we do not put into question" (Mouffe 2000, cited in Brown 2009, 321). Following Mouffe and Ranciere, Brown and Tregidga (2017) place equality as a non-negotiable practice at the centre of politics. In their efforts to deepen democratic practices in Social and Environmental Accounting, they argue that within an "egalitarian logic, engagement is not a matter of having a formal status (e.g. as a citizen or 'legitimate stakeholder') that provides a basis from which to make claims" (Brown and Tregidga 2017, 14). Any person and, we would argue with Latour (1993), Calarco (2023), Tsing *et al.* (2021), Rodríguez Garavito (2024), and others, any non-human being has an equal right to make a claim. Imaginative laws, standards, institutionalised habits of thought and action are needed to enable "the (not so?) everyday *practices* of testing and verifying [that] equality". Anyone should have the right and the means to do this, and for their claim to have traction. Rosa Parks' actions and the public boycotts of transport companies that enforced segregation are an example of such self-enfranchisement, taking the right to speak, be heard, and have an impact as an equal. These actions were pivotal to the successes of the civil rights movement. Today, concerns voiced by environmental campaigners as well as opponents of EVs and low-emission zones – whether they are expressed by those mining rare earths under inhumane conditions or car enthusiasts arguing for their freedoms – are all-too-often not recognised as coming from "legitimate stakeholders" by those promoting these "solutions", yet these concerns highlight the destructive systemic lock-ins of automobility culture and should be addressed, not played for delay and profit, just as protests against fossil fuel expansion should be considered, not criminalised, dismissed, or exploited to stoke culture wars.

Recognising different perspectives and dissent on an equal basis in agonistic democratic dialogue actually opens the doors to more vibrant – and societally ready – innovation: To question electrification is often seen to question decarbonisation itself. However, if we recognise that all mobility needs to be zero carbon and the majority of that needs to be electric, then there are still huge questions of what and how? An electric Hummer SUV dwarfs the carbon emissions of a Microlino, for example. The International Transport Forum published a study looking at the role of e-bikes and other forms of powered light electric mobility innovations. They concluded that electricity demand could be 15% lower, and the battery capacity required for the vehicles could be one-third lower than current plans. Powered light EVs require less space, less charging infrastructure, are cheaper, more socially equitable, and could have safety benefits if they are adopted at scale. But without support for agonistic consideration of different perspectives and diverging views, the questions that we are allowed to engage with are being closed down rather than opened up. This is a great loss, because these are important, interesting differences that hold great potential for pluriversal alternative mobility systems.

SoRA is best understood as aiming to become an institutionalised standard to force planning as an agonistic, iterative, collaborative, experimental, adaptive practice, because it facilitates consideration of many different perspectives in

producing alternatives, including non-human and planetary perspectives through assessment of carbon emission reduction against carbon budgets. It is a mobile method in the sense that it moves deep into planning contexts, mobilises people affected, interested, or concerned, and creates routes for agonistic constructive dialogue, lending different voices traction. It is a practice and process that switches a path focussed on technocratic innovation to one that has broad-based participation and cumulative policy consistency towards decarbonisation aims. It could, of course, be improved, and we learn as we apply it through experimentation.

**Thoughts on Experimentation**

If then, there is a need to try path-breaking methods or, better, institutionalised habits of thinking and acting differently, and to recognise those interesting differences which already exist and which could form the building blocks for more radical system change, then how should we proceed? What does the experimental approach we set out as desirable in Chapter 7 to build alternative mobility systems – an approach that reveals, challenges, and transforms the power and politics of the existing system (Sierhuis, Bertolini and Van Winden 2024) – look like in practice? An experiment that we have co-designed and have begun to implement in the field in 2025 will illustrate our responses to these questions.

The project, INFUZE (Inspiring Futures for Zero Carbon Mobility), is a collaboration between academics at the University of Leeds, Lancaster University, and the Royal College of Art, and a range of diverse policy, commercial, and community actors around the city of Leeds. It starts from the premise that all of the talk about changing travel behaviour by improving alternatives to the car fails to address the issue at the heart of our system of automobility – that the transport system is now geared around mass individualised car ownership. Business models, the tax system, our land uses, cultural beliefs, and ways of doing things are all increasingly structured by this dependence. Travel behaviour change by addressing alternatives to the car without rethinking the role of the car is always, therefore, limited to the margins. To put this in context, in the UK, households spend almost £79bn on just owning, maintaining, and insuring cars each year, according to the Living Costs and Food Survey run by the Office for National Statistics (ONS 2023). This is three times the amount spent on moving cars and fourteen times what we spend on public transport fares. Owning a car is expensive, and once they are owned, the incentives are stacked towards using them. This is not an issue that can be addressed by marginal tweaks to the transport network or bus frequency.

The INFUZE project is a collaboration with local and national government, transport providers (both established (such as bus companies) and new mobility service providers (such as peer-to-peer sharing platforms)), and local community groups and stakeholders. The aim is to imagine what a city where you didn't need to own a car would look like. This means designing the kind of service packages that would mean people could access good quality, reliable, safe, healthy, and fun mobility options, which could form an alternative to individual car ownership. But for INFUZE, imagining also means trialling

change to understand if it really fits with the needs of different societal groups and places, and to discover surprising dynamics and unanticipated consequences to adapt the experiment in response. However, INFUZE cannot simply be an experiment to design an alternative set of transport options. If we can recognise how people are imagining, or get people to imagine, the conditions where they could find *buen vivir* without owning their own cars – what would need to change to make that transformation possible? This requires us to ask the deeper questions about what a city where you don't need to own a car would look like and how it would work. How would businesses organise themselves? Would events at arenas and festivals be organised differently? Would sports leagues work the same? Are there changes to childcare or schooling that might be made? What would a tax system look like that was not based on individual car ownership? How would journeys be priced differently to reward smaller vehicles or more heavily shared mobility services? What would happen to the space freed up, and who would decide? How would the changes made align with people's values? Would it be possible for local collectives to coordinate what services were available in their area? How would they do that practically? A city where you don't need to own a car is not the same as a city where you ask people to live without a car. It is one where all of the wider structural, social, and political issues are addressed as part of a process of designing – or, better, growing – an alternative future, for example, facilitated by SoRA. It means tackling the deep system leverage points as well as the surface leverage points (Meadows 1999). The debate, if such positive futures can be realised (albeit in experimental and temporary ways), is whether there is the collective will to make the changes necessary to move towards those futures across scales and actors, given the inertias we have exposed.

Our experience, as we enter the start-up phase for the project, is that this will prove to be challenging. It is partly challenging because people have experienced years, sometimes decades, of declines in public transport and a growth in car dependency. Talking about not owning a car, in the current framing of transport, is about relying on alternatives that are not fit for purpose, and which people have already rejected. We are trying to get people to think about a different future, not just a future that is without a car. Indeed, the very language of transport planning, as we discussed earlier, is often focussed on "reducing travel demand" or "travel demand management", which implies the loss of something. If only we could "get prices right", then things would be fixed (for those who could afford them). In developing the project, we have struggled with the vocabulary necessary to think about different futures. Talking about mobilities differently is a critical action, because it both un-makes existing certainties and makes new ones. The national travel survey categorises "non-car owning households", and we see literature about "living without a car" or "giving up the car" (Aguilera and Cacciari 2020; Moody *et al*. 2021). The present or future is defined by an absence of the car rather than a new something else. We have not yet elaborated a positive alternative vision to the current private car-based system of automobility. The im|mobilities of *buen vivir* emerging from mobilities research and the mobile undercommons – with their emphasis on

mobility justice, social and sensory experiences, the pleasures of place, social and human-nature interdependence, as well as the social interaction and (global) connection that mobility affords, the recognition of a right to immobility, the turn to mobility as a commons, and efforts to recognise and reduce burdens of "unnecessary" hypermobilities (e.g. Sheller 2018; Adey *et al*. 2023; Brömmelstroet *et al*. 2022; Cox 2023) – provide seeds. However, a new discourse cannot be imposed; it must emerge. This is why co-design sits at the heart of the work (Ebbesson 2022; Büscher *et al*. 2023), and where SoRA can facilitate a process towards more collaborative and pluriversal production of new mobility futures/systems. It is necessary to think differently, to aspire to an alternative which could be built if we organised, thought, and lived in new ways, and it is necessary to act differently for an ongoing undoing of business as usual auto-, aero-, and cargo-mobilities, combined with an ongoing adaptive making of alternative mobility systems – adaptive in both meanings of the word.

Is this too revolutionary to really have traction? This, we feel, depends on perspective. Almost a quarter of all households in the UK live without owning a car. This is particularly concentrated amongst the least well off, where affordability is a problem that can have very exclusionary impacts (Lucas 2004). However, "car-free living" is also concentrated in the middle of our largest cities amongst affluent groups. Here, parking is often difficult, and the density of activities and proximity to public transport services and car sharing schemes is such that people see owning a car as unnecessary or burdensome, and so living without your own car is a positive choice. However, we cannot all live in the centres of big cities, and we cannot quickly build out the public transport infrastructure of places like London and Paris in our smaller cities and towns (Tammaru, Sevtsuk and Witlox 2023). If we want to create change at scale, then we need solutions that can be tailored to work not just in the most expensive or elite parts of our cities. We cannot rely on the existing "new mobility" service providers to deliver that change for us, because they are bound by their own business logic, the goals of investors, the constraints of economies of scale, and the dominance of individual car ownership (Tammaru, Sevtsuk and Witlox 2023). It is important to state that the INFUZE experiment is not trying to create a moment of change for everyone, recognising the agonistic debate that exists. Rather, it is trying to find the places and citizens who are responsive and open to designing change and building something different. This is to recognise the power of diversity within our populations, and to build on aspects of the undercommons. It is the power of their lived experiences that might yet be transformational, showing that alternative pathways are not just possible, but desirable.

In creating positive alternative visions, it is necessary to confront the politics of the status quo. The £79bn spent on just owning, maintaining, and insuring cars is a tightly connected set of industries based around the idea of individual car ownership (Haines-Doran 2023). Any change to this is a threat to those who profit from business as usual, those who govern for stability, and generally

the "security" of capitalist realism. Any reconciliation of the transition of the current industrial structures to some new form of mobility system is deeply political. Part of this is a very widely distributed view, across the public, as to whether it is OK to intervene in notions of individualised ownership. There is a tranche of society for whom owning a car is part of their identity and who would reject the need to discuss post-individual car ownership futures (Sheller 2004; Anable 2005). Experimentation for change can only be transformational if it can succeed in addressing both the nature of the system change and how that system change could be brought about. It must necessarily build in constructive conflict as part of the process, recognising that at the heart of this are competing visions, outlooks, and outcomes. There will be winners and losers, but that is the case with business-as-usual planning, and this needs to be confronted as part of the discussion, too.

***Resetting Our Purpose***

We remain modest in our a priori assumptions about quite what can be unlocked by approaches such as those being taken in INFUZE. In particular, the levels of resource which go into supporting experimentation are a tiny fraction of a fragment of that which goes into supporting the status quo. However, by designing in recognition of the political and systemic change elements from day one, we aim to confront and build in the complex conversations that need to be had on the potential and appetite for change. Addressing the problem as a wider systemic change to a "city where you don't need to own a car" rather than an individual going "car free" keeps such questions up front. Many humans and non-humans have a stake. This is different in many respects from the kinds of projects funded by national innovation programmes, which are organised around innovations that are "close to market" based on high "Technology Readiness Levels". Here, in many senses, the whole argument of proximity to market suggests that the market conditions today are, broadly speaking, correct. To ask questions that fundamentally challenge the foundational logic of any part of the way the transport system is organised could create political difficulties for such funding agencies. This is why independence of research funding is so important in creating the space to have such debates, to evaluate change in relation to carbon budgets, the rights of future generations and nature, and to inform the production of new standards like SoRA, not as managerialist indicators, but as processes, or "institutionalized habits of thought" and action that drive change in recognition of "the unknown, the uncertain, the ambiguous, and the uncontrollable" (Jasanoff 2007, 227). However, the distance from immediate policy, which this implies, also creates a bigger bridge to cross when it comes to action. This, in turn, requires researchers to operate in a more political environment and to build in the realities of transformation to their work (Loorbach *et al*. 2021; Sierhuis, Bertolini and Van Winden 2024). It also requires researchers willing to recognise that their work on travel behaviour is political and to be willing to engage in the wild on this. More than

this, however, it requires funding bodies to commit to funding radical work which has the potential to impact policy in the short run (a difficult boundary for research funders to tread) and which is not always aligned with mainstream government innovation policy. Our approach to experimentation in the INFUZE project is mobile in this sense of moving into these wider systemic contexts of change, including planning practices (e.g. through SoRA), public services, business, local activism, and everyday life, sounding out and shaping desires for mobility futures, picking up on, generating, and lending traction to social imagination and determination. This is a more proactive approach that resonates with Tuck's critique of the self-victimisation of legal claims for damage. Tuck suggests that a "desire-based framework" that "focuses on 'survivance' and building alternative possibilities" provides more positive and generative momentum (cited in Mah 2023, 57), a momentum we believe adaptive experimentation can amplify.

However, we must also reflect that systemic solutions cannot just rely on experimentation, social innovation, or social movements. There are some big systemic issues to be addressed, and this also goes beyond tackling vested interests and political challenges. A real – Marshall Plan size – sense of crisis requires recognition of the depth and complexity of systemic change. For example, whatever we do to change consumption patterns, we will continue to rely on the movement of large volumes of freight. We will need to decide on the technological solutions to run freight services with zero carbon emissions, and there will need to be an infrastructure capable of supporting this. Similarly, deciding how much renewable fuel can be made and where in the economy that is best used is not the work of individual citizens or households, although that is not to say that citizens will not have valid views on how best to consider the trade-offs that have to be made. An equitable transformation requires unequal distribution of transformational burdens – carbon budgets and degrowth in the Minority World (or Global North) must accommodate the loss and damage, and the flourishing of the Majority World (or Global South). Our demand is not that the institutions of today stand aside; it is that they reset their purpose, the role of their knowledge versus other types of knowledge, and act with honesty and transparency about the risks of action and inaction. They must also foreground climate justice and who stands to win and lose through the choices being made, from the local to the international scale. It would be much more generative of policy ideas if our decision-makers were to lead on this rather than having to be taken to court to face the consequences of trying to hide the realities. This is not a trivial ask. It means acknowledging that "we haven't got this" and that the hunt for answers will mean different choices. It means facing up to the taboos. It means acknowledging that those people tasked with making policy are often part of the wealthy hypermobile group, who are a disproportionate part of the source of emissions. So far, the policy system has largely resisted this. One reason is a lack of capacity to deal with dissent creatively and constructively. Another

reason is a lack of acknowledgement of the depth of the crisis. SoRA and our approach to experimentation address both, but to be transformative, they, and similar methods, rely on a public sense of deep crisis.

**Acting with a Sense of Deep Crisis**

As we discussed in Chapter 7, changing mobilities requires public recognition of the severity of the collective condition of climate change and ecological overshoot so that debates, actions, and experiments are not left to happen in a vacuum. Critiques of inadequate action and inaction, and indicators that better capture the impact of short-term decisions on the depth of the crisis can aid such recognition, but they are not enough. The COVID-19 crisis did see powerful indicators used to trigger unprecedented global societal change, including social and economic system change (Tregidga and Laine 2022). However, as Marsden and Docherty (2025) show, that change was temporary and skin-deep, especially in the transport sector. It did not enable a long-term reframing of mobility policies, even when social practices of mobility were changing, many of them for good. In fact, the lockdowns, restrictions, and vaccination programmes of the COVID-19 crisis response have fed conspiracy theories and "Deep State phobia" (Tuters and Willaert 2022), making an adequate systemic response to the ecological crisis *more* difficult. It even allowed conspiracy discourse to enter government statements, with the UK Department for Transport denouncing 15-minute city concepts to support active travel as a way "to 'police people's lives" (DfT 2023, 4, Chapter 7). To head towards safer shores, a broad-based sense of deep crisis is needed, one that recognises the inherently destructive momentum of the mobile technology of neoliberalism. Our efforts to create standards of SoRA and an approach to adaptive societal experimentation are designed to support acting with such a sense of deep crisis in four ways.

Firstly, changing the processes of mobility innovations through SoRA and adaptive experimentation fights the ways in which a public sense of deep crisis is suppressed. The power and misinformation machine of vested interests is designed to prevent recognition of the depth of the crisis, because it means that rather than the notion of crisis applying to something external and "fixable" like "the environment, … crisis would more adequately apply to humanity, whose activities are transgressing the very planetary boundaries that are, in turn, endangering its safe operating space to thrive" (Larrinaga and Garcia-Torea 2022, 2). SoRA and adaptive experimentation measure innovations against their impact on the safe operating space through reference to carbon budgets and concepts of social justice. This enables a deeper understanding of, as well as action on, the systemic complexity of sustainable mobility systems. By facilitating agonistic democratic dialogue, our methods further reveal the need for equality, because they platform accounts of how different people and places are affected.

Secondly, our approaches allow hope to shape action. By requiring and facilitating collaborative design, SoRA, and adaptive experimentation simultaneously reveals the systemic nature of lock-in to a destructive business-as-usual, and the manipulation that allows it to persist. However, the fact that we are, in fact, building on a long history of socio-ecological experiments (Graeber and Wengrow 2021) suggests that a sense of humanity in deep crisis does not need to lead to despair. Instead, as it does in the mobile undercommons, it can spur discourses of desire and determination, and open up spaces of hope. SoRA and adaptive experimentation move into that space to augment the capacity to imagine and make alternatives, and enable recognition of their desirability and viability.

Thirdly, mobile methods like SoRA and adaptive experimentation enable acting with a sense of deep crisis by unmaking dysfunctional existing certainties. Conceiving of living without owning a car not as a loss, but as living in a city where such ownership is not necessary for *buen vivir* is an important step beyond the automobility system. The Bridging the Gap Urban Net-Zero living scenario already enacts this by envisaging reducing provision of car-parking spaces from 2 to 0.3 cars per home, along with the introduction of communal parking, shuttle services, and secure cycle parking to contribute to a 20% reduction of car travel in its case study setting, the town of Bury. For homeowners and developers alike, this is a major break with the taken-for-granted but unsustainable system dynamics. SoRA dialogue in the Bridging the Gap project allowed analysis of some of the reasons why such a change is difficult, necessary, but prone to being perceived as a loss. Families with children explained how their many journeys to and from work, school, sports venues, and other activities, often different for each child, required multiple cars and parking spaces. Reducing this dependence generates a

> requirement for local community and mobility services … [which] needs revenue funding early to enable services and behaviours to be established early. However, we don't yet have the planning tools that can deliver this effectively, and the commonly used commercial models make this hard to embrace by developers.
>
> (Mitchell 2023, 50)

Unmaking certainties of guaranteed private parking associated with housing disturbingly threatens to unravel whole social systems of work and family life, and developer profits that are deeply entangled with business-as-usual automobility, as well as challenging political dynamics. Between 2010 and 2023, for example, the UK property industry provided an estimated one-tenth of donations to the governing Conservative Party, and they were able to save billions thanks to government delays on low-carbon rules (Harvey and Horton 2023). By helping to bring such systemic problems to the surface, SoRA helps to make the way wealth can buy power socially and politically unacceptable, which provides traction for action on deep leverage points, including change in

"The goals of the system", and "The mindset or paradigm out of which the system … arises" which Meadows (1999, 3) identifies as the most effective levers for change.

Out of such change at deep cultural levels arises "The power to transcend paradigms" (Meadows 1999, 3). This is the fourth – and most important – way in which the mobile methods we describe can support action with a sense of deep crisis, because it widens the cracks in which alternatives can grow and provides traction to alternative mobilities that are growing in the mobile undercommons. SoRA changes the processes of innovation and integration of innovations into policy and planning. It expands the capacities of a self-selecting diversity of parties with an interest in claiming equality and taking rights to safe and sustainable mobile commons. It also changes the innovations themselves through iterative, participatory formative evaluation. Adaptive experimentation creates temporary and partial alternative mobility systems, ways to understand surprising effects, and adapt systemic experimental conditions. It moves beyond "one-size fits all" thinking, because it never really has fitted all. Critically, both methods reach deep into everyday life and practice, the coalface of changing mobilities. Change happens when the lived, unarticulated common understanding that underpins the quotidian re-production of the social character of an era changes, and cultural practices and meanings challenge the dominant order. SoRA and adaptive experimentation make space and growing conditions for this.

## Concluding Thoughts

This chapter has made our argument for acting differently. For us, acting differently is not a question of appealing to individuals to act differently. We have done that as researchers; we have studied others doing it, but it will not result in the kind of transformative change that the climate crisis requires, limited as it is to surface-level changes.

Transformative change needs to be built by thinking differently and by acting differently on deep leverage points. A public sense of deep crisis can be a positive force, because thinking and acting differently requires a change in the arrogance of policy, moving from being the custodians of knowledge and the managers of what gets discussed to being the facilitators of more inventive, equal, dissentful, and imaginative experimental processes. Chapter 7 develops our understanding of why business as usual tends to prevail and suggests experimentation as a way to escape the dead end. But we need ways to make the new certainties arising from experiments stick. This is where a critique of Technology Readiness standards and a systemic adaptive approach to experimentation can be useful, because they could help unmake existing certainties, make new and better ones, and nurture them towards societal metamorphosis. Our aim in this book, exemplified through the two methods and their combination described in this chapter, is to create, adapt, and mobilise methods or, better, institutionalised habits of thinking and acting differently, collectively

using and inventing processes to bootstrap response-ability, to break path dependencies, to generate surprises, enable transformation, and scale it out, up, and deep. The "how" and "why" of experimentation is crucial, if it is not to be symbolic or path-reinforcing rather than enabling systemic change.

There is precious little time left to shift planning approaches to these new ways of working. There are also, of course, risks in inviting more dissent into decision-making processes and in embracing change and uncertainty in a time of increasingly polarised politics. However, we are also clear that existing, "stable", business-as-usual approaches are planning to fail, hastening disastrous futures. We are living in a period of unprecedented climate breakdown, and as the work of scholars such as Harriet Bulkeley suggests, this is a condition to recognise, not just a problem to be solved. If we do not adapt our decision-making processes by choice, then they will be adapted by the new realities we face. The inability to adequately design for wider social good or to re-imagine *buen vivir* in different circumstances will pose even larger challenges to governments scrambling to maintain a veneer of normality. Dissent will be present, whether it is inside or outside the realm of decision-making.

Our approach, on first reading, is not perhaps as radical as some might demand. We recognise the need for technological innovation. However, we reject the idea that our futures can be defined by technology and ever more Machiavellian manipulations to make global society accept these "solutions". Societal innovation is already and is going to become more critical to adapting to living with climate change. New desired futures, new and better certainties and expectations, new forms of collaboration, and new ways of enabling future generations to thrive require the bringing together of citizens, politics, and technologies to reach alternative futures that are more equitable here, there, and in the future. This is, in fact, quite a radical departure from business as usual.

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# 9 Conclusion

## Changing Mobilities for Good

As the increasingly implausible emission mitigation curves of Chapter 1 show, we have likely run out of time to stay even within 1.5°C of warming. In this book, we have reflected on how urgently and radically mobility systems need to change, and the political nature of change. Chapters 1 and 2 reveal the scale of the changes required and introduce concepts from transition and mobilities research that provide some leverage on the complexity. Mobility systems are actually continuously changing, as Chapter 3 shows, but – captured by vested interests – governments and publics are often unaware of how existing changes and alternative mobilities could open up pathways to decarbonisation and change for the better. We have explored reasons for the many obstacles that stand in the way, and we have examined diverse attempts to overcome them. In this chapter, we draw together our assessment of where "we", that is, global humanity in its relational, pluriversal multitude, and interdependence seem to be headed, and where we could be headed if we – particularly those most responsible, and those with most power – tried harder to think and act differently.

### Where Are We Headed?

We are living in a time where planetary conditions will pass thresholds that have never been surpassed in the history of human civilisation (Chapter 4). We don't know where we are heading for sure, but we will be living with increasingly difficult and widespread impacts of climate change, and global society will have to adapt. Of course, societies all around the globe are already facing this reality as we set out in our Introduction. One of the great questions we face is whether we are going to recognise these global inequities and address them as part of a truly just social transformation, or whether we are, instead, going to pull up the drawbridge to defend a business-as-usual "now-here" as discussed in Chapter 5, which is creating disastrous futures.

A groundswell of alternative mobility futures is emerging from countless initiatives, and the growing mobile undercommons we describe in Chapter 6. Yet, both an adequately deep sense of crisis and recognition of the innovative potential arising from social imagination are suppressed. Our analysis and

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reflection on the current systemic dynamics and institutional arrangements for governing the mobility system in Chapter 7 further explain why we are where we are. The disciplinary boundaries that dominate transport foster a tight-knit trinity between technology, engineering, and economics as the owners of the problem framing and the solutions. This requires false imaginaries of stable futures, rational appraisal of alternatives in business as usual, and the othering of issues like global or even local social justice, as the evidence still suggests (Ternes, Marsden and Harrison 2024). We argue that the institutional setting, which has delivered no progress on decarbonising the transport sector for 30 years, is not able to recognise its shortcomings (and therefore also its strengths) and it will not offer a route forward. Unless the endemic nature of the problem can be recognised and responses can be broadened in scope, then the kinds of knowledge that might help produce different answers will be locked out.

The problem with pulling up the drawbridge is that it promises a world in which "now-here" works for everyone in the castle. However, our analysis shows that instead, what is being sold to people as the "solution" to climate change is in fact a set of narrowly defined options which perpetuate the hypermobility of the most wealthy, as well as their wealth. The options fail to address the problems of unsustainability, inequality, congestion, safety, and toxic particles, and fail to address our vulnerabilities to problems with the very extensive global supply chains, which underpin almost every aspect of daily life for the vast majority of people. The policies do not even deliver the carbon reductions which have been promised by governments, and so fall short even in their stated primary aim. We are, as we argue in Chapter 7, "planning to fail" (Marsden and Schwanen 2024), and yet somehow presenting this back to the public as the way forward.

The sense of urgency which the climate crisis engenders is being used to make some things imperative (e.g. production and sales of (ever larger) electric vehicles, investment in carbon capture), simultaneously allowing stasis or backsliding elsewhere. The proclaimed necessity to electrify all forms of motorised surface transport pre-supposes huge amounts of charge point infrastructure, which literally hardwires a continuation of the car-based system of mobility. The use of colossal amounts of energy to create synthetic aviation fuels to enable holidaying overseas becomes necessary, whilst the taxation of kerosene for flights remains off the table. In order for the overspill from a refusal to meaningfully engage with the demand for energy to move us around to persist, we also require fantastical levels of expensive carbon capture and storage to continue and expand our existing way of life, as we discuss in Chapter 4. All of these allow the continued extraction of fossil fuels and the promise of "jam tomorrow". The promises of carbon capture are based on technologies that do not exist at scale. Rather than preventing more emissions from going into the atmosphere now-here, they enable a continued rise in emissions. All of this is supported by a set of industrial interests that have knowingly suppressed recognition of the causes of climate change and the damage that it is causing people and the planet for decades. The range of interests lined

up to perpetuate business as usual is large and powerful, as we set out in Chapter 1. By contrast, shifts to more shared mobility are deemed too difficult or undesirable, even though they reflect conditions which we have had in living memory (Chapter 6). More localised holidaying remains an anathema – as if a flight and weekend break in Prague has been part of a bill of rights on which we were all brought up.

We suggest that the approach being adopted today is running out of credibility. Court cases have successfully challenged the inaction of governments that claim to be committed to change. As time ticks by, the gap between what is necessary and what has been delivered widens. At some point, a reckoning will follow, whether this is through legal challenges or in terms of deteriorating living conditions on the planet. Politically, this could entail backing away from targets, claiming success relative to other places (there is always somewhere, someone who will have done worse on some metric) or, in the worst case, a renouncement of the basis for such agreements in the first place. By attempting to preserve some semblance of the status quo in the short run, we risk closing off precious alternative pathways and options that still remain open to society.

All the while, the real crisis worsens. Like many governments, the approach taken in the UK only holds the legitimacy it does by not confronting the damages that it inflicts at home and elsewhere on the globe, be that through widening inequality, growing "expendable" populations, social conflict and anti-politics, extractive practices of rare minerals or loss and damage, and the export of manufacturing processes to countries with more polluting power systems with lower standards on labour. In this book, a focus on decarbonising surface transport with an analysis mainly rooted in our UK-based research recognises that these toxic wider dynamics are linked to "the coloniality of climate" (Sheller 2021, 50). "More just, equitable and sustainable futures call for more than decarbonization or low carbon transitions" (Sheller 2023, 433), and sustainable mobility futures are inextricably linked with "a future beyond coloniality, beyond the racial state, and beyond neocolonial forms of citizenship" (Sheller 2021, 51). Whilst we have been unable to develop this vision in depth, the geopolitically complex aspects of changing mobilities equitably and the need for a pluriversal "world where many worlds fit" (Zapatista, cited in Davies 2024, 9) are central to our thinking, as they underpin discourses of desire and determination.

There is no "castle keep" that insulates any country from the impacts of climate change. Whether it is global economic growth, mass migration, crop failure and starvation, infrastructure reparation costs, or disease, everywhere will be impacted by the climate crisis, whether directly or indirectly. The public will recognise that it is increasingly faced with consequences at odds with the narrative. What happens as a result is uncertain, but it is not necessary to cast one's mind too far back to recall the widespread global demonstrations demanding that governments recognise the climate emergency. Whilst there seems to be little public demand for radical action now, this could change.

We – particularly those most responsible and those with most power – need to do what is necessary. That is not just a moral obligation to "do the right thing" or "make the right choices", be that as citizens, scientists, corporations and businesses, transport planners, or politicians. It is a practical question. To collectively gain traction deep enough to carve a new riverbed of better certainties, we need tools, methods, standards, infrastructures, and technologies of humility in Jasanoff's terms (2007) or institutionalised mobile methods for thinking and acting differently. A big change in structures of feeling needs practical support. Our work on societal readiness assessment and adaptive experimentation contributes to the production and application of such support as we describe in Chapter 8. Given the depth of public concern about climate change, the ever more intensive experience of its effects, and the multitude of transformationist experimental alternative mobility futures, we see the potential for a groundswell of demand to address the consequences of inaction gathering. It is deflected and suppressed, but increased traction for the alternatives enacted by a multitude of initiatives and the mobile undercommons could bring the tectonic change in structures of feeling that is needed. Social tipping points could be at least as significant as those foretold by climate science in determining where things go next. Earth system and social tipping points are not independent of each other. The limits of policy paralysis and political brinkmanship might be being reached as more countries experience the devastating effects of climate change. In Valencia, more than one year's worth of rain fell in eight hours, resulting in the death of more than 220 people (Swallow 2024). Such tragedies play out every year in different ways across the globe and are becoming more intense (Tradowsky *et al.* 2023; Zachariah *et al.* 2023). When did it become normal to write this kind of summary? When will the demands for radical action, such as those following the London smogs, take hold? We suggest that a mobile undercommons of millions of people is looking for alternatives but is chained by lock-ins and suppressed in the shadows, even criminalised. Rather than stopping and reflecting on why people feel so impassioned that they have to protest for their futures, we see increasing law changes to take away the basis for this – be that in terms of rights to protest or legal commitments to emission-reductions, and to criminalise resistance. How can it be right that a government can fail twice to produce a legally binding climate strategy and face no consequences, whilst protesters face increased prosecution for raising the profile of the failure in the UK? "British police arrest environmental protesters at nearly three times the global average rate", making the UK world-leading "in cracking down on climate activism" (Gayle 2024, n.p.). Environmental defenders elsewhere fare even worse: between 2012 and 2022, 1,910 environmental activists were killed (Global Witness 2023, 10). When proponents of business as usual have to resort to such harsh treatment, the political struggle for equality, sustainability, and democracy needs strategic, practical support and institutionalised ways that force thinking and acting differently. This is what we seek to provide.

One thing seems clear to us. There is no "business as usual" ahead, and society and politics will feel the effects of living with the climate crisis and come to know it as a condition, rather than just one of many policy problems that technocrats will solve.

**Where Could We Be Headed?**

This book has addressed the question of what to do about transport to deal with the problem of the climate crisis. Much of the analytical effort to date has, necessarily, had to focus on the potential for action and the consequences of inaction. The size of the emission reduction gap remains an important topic as we grapple with how many years of emissions we have remaining and at what level we are eating our carbon budgets. However, this brings us to answers that tell us about the scale of what we need to stop doing. They don't paint a picture of what society will look like and how it will work and move in the future. We need to paint the picture of what is better and create that picture, not as expert inventors like Buckminster Fuller, but as gardeners or farmers who grow ecosystems that are shaped by the lived contributions of all involved. The "we" that is doing the imagining and making needs to look beyond now-here and act with respect for pluriversal multitude. How do we become such a response-able "we"? That is not a question that can be answered by philosophy and theory alone, or once and for all; it is a practical question of concrete social interaction and innovation, with agonistic democracy being a powerful process to facilitate it.

There is a critical need to recognise that the future of how we live cannot just be designed by the wealthiest in society. This means policy elites challenging themselves to not just think differently but to act differently. Recognition that we are planning to fail is essential, but must also be followed by strategically asking "and so what must change?" and "how do we change it?". We have set out a case for mobile methods for thinking and acting differently. These are methods which:

- Move into and across the different contexts where mobility systems are forged and mobilise traction for change.
- Recognise the growing mobile undercommons and recognise the diversity of needs, interests, and knowledges which must inform future design processes as important and legitimate sources of alternatives.
- Are based on a set of principles, such as those enshrined in *buen vivir* constitutional principles in Ecuador and Bolivia, and the Welsh Future Generations Act, which means that solutions address distributional concerns now-here but also across places and over time.
- Build methods and processes for consideration of societal readiness in the sense of enabling egalitarian contestation of what is good for individuals, society, and the planet.

- Embrace experimentation in ways that build in and confront the politics of change and create infrastructures for dissent as part of those processes (Sierhuis, Bertolini and Van Winden 2024, Büscher *et al*. 2023). Consensus is unlikely, but that does not preclude more radical action.
- A shift to seeing the response to the climate crisis as an ongoing condition with multiple decisions to be made over time under uncertainty. We suggest that rapid, incremental, and cumulatively consistent change will be necessary to support social change if this is to result in radical change and move beyond niches and "premium spaces of ambition" (Verlinghieri *et al*. 2024).

The book shows that, already, there is a range of innovative communities and initiatives that are making alternative mobility systems that would be more compatible with our climate change mitigation and adaptation goals. They create conditions for good living now and for future generations. The challenge is in policy recognising this and embracing such alternative ways of life without watering them down, even if it is different to (and perhaps not favourable for the continuation of) the financial elite. These examples exist despite the prevailing policy logic, not because of it. We argue that there is a need to go further, to purposefully experiment with methods to support and generate more such social imaginaries and innovations that allow people to live fulfilling lives (*buen vivir*) and stay within the Earth's environmental carrying capacity. We cannot just expect these to grow organically. To change mobilities rapidly enough to bend the emission reduction curve, we argue that development of mobile methods that target deep leverage points and help create traction for the emergence of better certainties is necessary, including standards, purpose-resetting narratives, and adaptive experimentation to trial and build or, better, co-create more shared and socially integrated mobility futures which can track to our climate commitments.

**Concluding Thoughts**

It seems we now live in a mobile collapse society, a reality with complex dystopian and utopian dimensions. On the one hand, it is characterised by further breakdown of mobilities and widening gaps between the hypermobile elites and the poor in terms of their responsibilities for, and experiences of, the crisis. But as "The richest 1 percent (77 million people) were responsible for 16 percent of global consumption emissions in 2019 —more than all car and road transport emissions" (Oxfam 2023, n.p.), and climate change could drive an additional "68 million to 135 million into poverty by 2030" (World Bank 2020, n.p.), vested interests network through the Atlas Network to intensify auto-, aero-, and cargo-mobilities. They stymie leapfrogging into net zero mobilities in the Global South and "flood the zone" with misinformation to promote an anti-politics of division. Splintering the collective imagination, this drains away values of humanity. On the other hand, collapse speeds up the undoing

of unsustainable ways of life and creates ruins as a substrate for new ways of living. Reconstruction, solidarity, civic mobilisation of alternatives can become a bedrock for new and better certainties. Collapse also reveals the cruel and obscene nature of the mobile technology of neoliberalism, and shows how expendable many of the products and services of the petrochemical and fossil fuel industries are (Mah 2023), including some mobilities. Collapse can help make hypermobilities, excessive wealth, and ecological destruction socially unacceptable, and reveal good autonomobile ways of living: *buen vivir*. It can accelerate social tipping and deep transformation. Importantly, the combination of refusal, solidarity, and study practised by the mobile undercommons could enable us to stop many of the things we really need to stop doing. Rather than live as expendable populations, we have the power to refuse, act in solidarity, and engage in everyday life as study, a collaborative school of politics.

Throughout the book, we have emphasised that the capacity to change mobilities hinges on mobile methods that enable and institutionalise new habits of thinking and acting. We have reflected on key debates in this space and our own efforts to develop societal readiness assessment as a new standard, and to find ways for adaptive societal experimentation to help carve new certainties from the lively and life-affirming social imagination of the mobile undercommons. Our argument builds out from the insight that patterns of im|mobilities constitute social and material realities in a process with many mechanisms for perpetuation, but also many openings for change. It is a political struggle.

We need a sense of deep crisis, but also a deep sense of good futures. We hope this book provides some scaffolding for recognising opportunities for creating such futures. We also hope that it enables researchers, progressive policymakers, radical flank activists, environmental defenders, and the mobile undercommons to recognise each other as connected islands where efforts of changing mobilities are part of a groundswell that change mobilities for good.

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