4. Beyond speed: transport policymaking in a complex world

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INTRODUCTION

Traditionally, the field of mobility research has a strong focus on engineering the logistics of the transport process, on optimising the movement of things or people (Banister, 2001). That focus is also recognisable in the work of researchers for public policymaking. Although policy research on mobility has shifted over time (see Jones, 2014), a focus on accessibility (Morris et al. 1979) has been a mainstay of research (see also Banister and Berechman, 2000). Accessibility is about the size of the set of places someone can potentially get themselves or goods to within a given time. Increasing speed is an important factor in extending that set of potentiality of possible locations to reach, for example through the provision of motorways or railways. Next to speed, connectedness allows for better accessibility through denser networks, especially those of higher speed, like motorways and railways. As the per-day travel time of an average person has stayed largely the same through time (the so-called BREVER-law) (Priemus et al. 2001), the number of places that could be reached in that amount of time has grown dramatically through speed and connectedness, leading to longer daily commutes and trips, and further travel and trade.

The focus on these values (speed and connectedness) frames mobility as transport: the moving of people or goods through space, generally on an unmoving fixed asset (infrastructure) in the form of a network, often using a moving vehicle (for propulsion and direction) on that fixed asset, sometimes bought from someone else in the form of a transport service. The frame invites clever optimisations (see, for example Magnanti and Wong, 1984) within that frame. In that, this frame puts the purpose of the trip aside, despite transport being a derived demand (Rodrigue, 2006) while this purpose is where the real value of most trips comes from.

For that transport frame, infrastructure is a key element (Divall and Revill, 2005). To deliver speed and connectedness, the transport infrastructure network has a layered character. Dense networks connect people and places to the transport system (footpath in front of your door), and wider networks provide high-speed links (motorway, high-speed rail line, airlines) through space, simply because the network cannot be designed for both speed and connectedness. Vehicles add a second characteristic that can be optimised. There is a certain number of vehicles on the road or rail that maximises flow and capacity: a certain number of seats or tons or cubic metres available in a time period (Van Twist and Veeneman, 1999, 413–418) on different layers. These layers represent markets for space:

- Load the market of capacity for people and goods in vehicles (think crowded public transport or policies on high-occupancy vehicles);
- Traffic market of capacity for vehicles on infrastructure (think congestion on the road or policies on road pricing);

- Transport market of capacity on various infrastructures (think mode choices of goods transport policies on modal shift);
- Functional spatial use markets triggering transport demand (think the concentration of or policies on urban planning).

In those different markets, various private and public providers play their roles, and prices are set on various transactions that distribute capacity, adding the aspect of costs (think train tickets, gas prices, toll levels), as a further element to optimise for and as an aspect to regulate.

The policy narrative for mobility in many Western countries has long been one of optimisation for these three key aspects of transport: speed, capacity and costs for accessibility. Putting accessibility as the (likely) core value of the transport system has prompted policymakers to think about accessibility facilitation policies, like capacity provision (for example, infrastructure development), modal shifts (for example, the promotion of public transport), temporal shifts (for example, congestion pricing), or containment policies regarding negative effects (like emission regulation and noise barriers), shielding transport from more restrictive policies. Paradoxically, even though better accessibility was the point of many policies, induced demand led to many new infrastructures clogging up swiftly again, negating the long-term improvement of accessibility (Naess, Nicolaisen and Strand, 2012).

There are innovative examples of policy research where the optimisations have shifted focus from speed, capacity and cost and added factors to the equations, such as CO_2 emissions (see Zhang, Wiegmans and Tavassy, 2013) or safety (Young et al. 2014). Several authors point to the need for broader or more integrated perspectives. Litman (2007) promotes widening the set of indicators to review and design for. Nijkamp and Blaas (1994) point to the need for transport planning to be a multi-agency, multi-sectoral, multi-modal process that must balance and engage with a wide range of interests, issues and policy arenas. Still, institutions and tools emphasise speed, capacity and cost (see Van Wee and Roeser, 2013, 744, and Thoresson, this volume, on cost-benefit analysis).

So, in the development of transport policies, the engineering and economic rationales have played a central role, with accessibility being a key argument and speed, density, capacity and pricing being the main variables in the tools used for optimisation. Already in 1981, Hutchinson claimed that the analysis techniques that policymakers used had problems linking to the more complex elements of the spatial system. Banister (2019, 127–142) reiterates the limitation of the analyses for transport planning with the hope that new tools would provide ways forward. Martens et al. (2012) state that social justice is not really a part of transport planning practices. Kębłowski and Bassens (2018) emphasise that the link between the social and the spatial role of transport is under-represented in the field of transport studies for policy. These views challenge the premise of 'accessibility is good' and highlight that this approach has delivered many less favourable outcomes.

In other words, the framing of the mobility system in transportation science, dominated by engineering and economics, externalises many societal processes and, indeed, societal values (see also Vickerman, 2008, 75). This transport framing is strengthened by the mature modelling and optimisation approaches of these fields, focusing on transport optimisation (see, for example, Van Wee and Tavasszy, 2008). Classic policy analysis approaches further strengthen the frame by requiring a clear problem definition: if accessibility is the problem, the classic policy cycle locks in on that (Annema et al. 2007, 128–130), rather than linking the problem to its wider issues, causes and outcomes. These downsides are acknowledged but get their

own policies and tools, resulting in many relatively disconnected instruments devised and implemented separately to counter the downsides of policies aimed at more accessibility. This fragmentation has put policy packaging (for example, Givoni 2014) on the agenda.

This introduces us to the main tension in this article. Mobility policies of governments around the globe have focused on 'facilitating transport' as the core challenge. Providing accessibility and dealing with congestion are widely treated as core goals. This is to be expected when the institutionalised focus is on the transport system, rather than on its wider place and role in society. As the downsides of (growing) transport were discovered over time, they were treated as side-effects, externalities, to be mitigated. However, the core of transport facilitation was hardly challenged. This led to a mishmash of policies, institutions, services and infrastructures, related to the core and the side-effects of transport. This mishmash triggered the thinking on policy packaging to solve the messiness as the next question. At the core seems to be the problem that the complexity of the role of transport in society, and indeed its value, has been neglected with wide acceptance of the 'more accessibility is better' mantra. More and more, the interconnectedness of the transport system with broader society and the inherent complexity[1] of that relation is creeping up on policymakers and researchers without a clear idea of how to deal with it.

COMPLEX SYSTEMS

From the 1990s onwards, a complex systems approach was added as an alternative perspective to dealing with policy problems (see, for example, Bai et al. 2010). Evermore, it became clear that looking at transport as a separate system with a simplified view of interactions with its environment missed key relations of the transport system with the wider context. Arguably, the widening of the view around transport started in a limited way, with the growing realisation that transport wasn't safe, which was triggered by growing numbers of casualties as traffic grew and became faster.

Unsafety is still largely treated as a 'within-system' effect, as accidents and their harmful effects mostly occur on the road, on the railways and in the sky. Hence, most policymakers look at it through a transport system lens, with accessibility as the essential value and unsafety a side effect whose mitigation should not hamper.

However, in some countries, advocacy around major cases (like the Stop de Kindermoord protests in the Netherlands (Reid 2017)), and *Unsafe at Any Speed* (Steinzor 2015) drove policy interventions regulating safety and refocused engineers in many countries (some more than others) to embrace safety as an important input factor for their designs of infrastructure and vehicles, in a rather technocratic approach. That can be seen as a widening of the frame around transport and accessibility. We could call this a one-problem-at-a-time approach.

Also, disruptions driven by innovators can change the frame (see Geels 2004) and lead to the introduction of new optimisations, as we saw with the role of Tesla in changing vehicle technology and mainstreaming the electric car. This provided a stronger coupling of energy networks and mobility networks, beyond the well-developed systems for the provision of fuel for transport. Even more than with safety, the full extent of the societal effects (on, for example, the loads on the grid) was not seen as a problem of the transport sector. We could call this a not-my-problem approach.

Both the advocacy for safety and disruptions on the grid can be seen as major increases in complexity for policymaking in transport, by adding additional within-system variables to optimise for (safety) or link systems (power grid) in the cognitive representation of a wider system-of-systems. It deepens and widens the frame around the problem of transport.

After the deepening shift towards the inclusion of safety, it became ever clearer that outside of the core transport system, or outside of the many modal parts of that transport system, more negative effects of transport occurred for people living with the transport system (Banister 2002, 1–15). In addition to safety, transport provided more negative externalities: acid rain, lead poisoning, noise pollution, eutrophication, carbon emissions, health issues and more. Like with safety, policymakers started to include these effects as secondary aspects in the decision-making on infrastructures or regulation of infrastructures and vehicles, in ways not harming the core values of transport. Accessibility, the potentiality of travel, is still a key driver of a great deal of decision-making in transport, often expressed in the expected effects on the economy (Rietveld 1994).

The transport system has many more relations to systems in the space it allows travel through, warranting a widening of the perspective on the system, an increase in the complexity of the system, and a system-of-systems perspective in (and beyond) transport. The switch to electric propulsion increases the dependence on electricity production and distribution networks. The dependence on fossil fuels has been related to various wars and now seems superceded by the dependence on rare earth minerals. The focus on facilitating mobility for accessibility has put high financial pressure on many governments, limiting their possibilities in other policy fields. Additionally, the system of mobility is linked to other systems in many ways, beyond energy, space, financial and material resources.

And those links with other systems are dynamic. When the transport sector aims at limiting the CO_2 emissions of transportation, looking to electric-powered vehicles is an obvious way forward. However, whether that is a feasible option depends highly on the ongoing developments in electricity infrastructures, electricity production, and other sectors wanting to limit their emissions (Tuttle and Baldick 2012). Complexity is not just a static perspective of interlinked elements (or even systems in themselves) with poorly understood interdependencies, but especially in times of transitions, it has the character of dynamically interdependent systems.

The growing awareness of this complexity, of systems being connected and interdependent, has emerged in a world that is highly organised along the borders of earlier system definitions. As stated earlier, systems are institutionalised in ministries, disciplines, sectors, technologies, models and more. It has become increasingly clear that the transport system boundaries (strengthened by the successful and valuable work of those within the transport sector) have had major effects outside those bounds, both good and bad. And now policymakers are asked to address those negative effects, but with the boundaries deeply institutionalised in academia, policy, media and culture.

GOVERNANCE IN THE COMPLEX WORLD OF TRANSPORT

Framing a system is necessary for policymaking in a complex world, as it is impossible to develop policies without a focus, and transport and accessibility represent a powerful way of framing. That framing drives the design of solutions with a specific problem perspective,

limiting the analysis to manageable sizes and optimising for specific values. However, this also has its problems as frames deemphasise other parts of reality that are linked to the framed perspective.[2] When these links between the frame and the rest of reality prove to be relevant or even problematic later in time, the frame has already been institutionalised and sometimes literally set in stone in the ways mentioned before. Policy making on these links can best be described as add-ons, and deeper change proves hard. This is how we can look at transport policy, with an institutionalised frame looking at flow on infrastructure, optimising speed, capacity and costs and discovering all kinds of effects like climate change over the decades.

The general use of framing as 'transport,' rather than mobility or even liveability, drives the focus of the development of that system. In that line of reasoning, if congestion occurs, transport is hampered. Most stakeholders (politicians, media, policymakers, voters, researchers and more) have accepted that frame over the last decades: congestion is the main problem. So, as the use of transport infrastructures grows to congested levels, the argument within the transport frame is that there is clearly a lack of infrastructure to provide that accessibility to all through transport. When more is built, it can be used more. This focus on the internal trend drives a cycle that is vicious or virtuous, depending on whether you take the perspective of the frame or not.

Three counterexamples using different frames can illustrate how the frame works. First, the transport frame is built on the idea that accessibility is the ability to reach many kinds of jobs, shops, schools and other services by going quickly. A different frame could focus on providing jobs, shops and schools closer to home through spatial planning and the spread of services. This changes the frame around accessibility from transport to spatial distribution. Second, from the transport frame it follows that congestion is a problem, with the transport flow slowing down and travellers (or mostly commuters during peak hours) as the victims. A different frame can point to peak-hour travellers as the perpetrators, creating a problem for themselves by choosing to travel during the peak hours on known busy roads. This shifts the solutions towards, for example, the spread of work and school hours. Third, the transport frame puts the flow as the central problem, while one could argue that the more prominent problems related to mobility are those where the victim and perpetrator are not the same, such as through the health and environmental effects of transport on people outside the transport system. This recasts the problem away from accessibility to for example, health.

As the examples make clear, an institutionalised transport frame distributes outcomes unequally among different actors. In some countries, not being able to own a car is a basis for a severe setback in possibilities in life (See Zivarts and Ray, in this volume). This is true because transport policies emphasise the potentialities of the car owner in terms of accessibility. A further reduction of congestion does nothing for those who cannot own a car. The accessibility that they experience, the job options they can reach, the houses they can live in, and the possible activities they can undertake are not expanded by the reduction of congestion. We see this challenge in growing debates around transport justice (Martens 2016).

Also, when casting the net wider, including other modes, we see the transport frame still focuses on the flow of people through space (car and train), as opposed to the focus on the quality of the space for people to be in that space. Here we see how the scale of governance (national vs local) matters, with larger scale jurisdictions (countries) emphasising quality of flow on networks, and smaller scale jurisdictions (municipalities) emphasising quality of place in an (urban) environment (Veeneman and Mulley, 2018). The literature also shows alternative frames, such as user-centric urban planning. This is often linked with governance

perspectives that are aimed at more participative governance (see, for example, Booth and Richardson, 2001). This is generally applied at a more local level, where stakeholders can be identified that can join in the decision-making.

This transport frame manifests itself in the long term in infrastructures and institutions. Institutions are those organisational and legal frameworks with slow rates of change (Williamson 1998), from highway agencies to transport law (see also Stead 2008). Infrastructure is also slow to change (see also Struiksma et al. 2008) as once the infrastructure is built, space and flows form around it, strengthening the role of the infrastructure. With that slow change, the transport frame is going nowhere fast.

EXPANDING THE FRAME BEYOND TRANSPORT

There is an ongoing awareness in many ways that the narrow frame around transport is a problem, from the role of externalities in economics, policy packaging, and participative policymaking to system-of-systems thinking. When looking through this lens, a broader view emerges, away from a narrow transport and accessibility-orientated frame. That broader view could further be developed in policymaking and research disciplines.

The first level, one we still see in transport decision-making in many countries, is separating negative externalities from the transport frame while making key transport decisions, such as investment in new infrastructures. The transport frame is kept intact, supported by its institutionalisation in law, financing, policy arenas, research arenas, etc. Negative externalities are recognised, but the link between more accessibility and those negative effects is neglected. Separate policies might exist against negative externalities (for example, emission limits for vehicles or noise barriers) but play a limited role when key decisions on transport policy or infrastructures are made (Veeneman et al. 2009).

One level up is also used regularly: connecting negative externalities. In this case, decision-making is still orientated around the transport frame. It is kept intact, and policies still optimise for transport accessibility, but now possible negative externalities start playing a secondary role in key decisions like infrastructure investments. This can be done, for example, through cost-benefit analysis that starts including negative effects regulated separately (Geurs et al. 2009), after which some projects that are positive in terms of accessibility are rejected because of other values.

One level up again is a recasting of the frame: active advocacy or disruptive entrepreneurship forces a real change in the transport frame to include other real-world effects and mechanisms and a shift of core values in the optimisations throughout institutions, like in the examples mentioned earlier (Stop de Kindermoord, *Unsafe at Any Speed* and Tesla). The negative externalities are not seen as externalities anymore but are regarded as relevant aspects of the system that require a strong role in evaluating key decisions, like infrastructure investments. Transport is not alright if the infrastructure and the car are not much safer; the electric car is not a transport solution if green energy is not widely abundant. The frame to consider for the decision is cast much wider than the flow of transport**.**

One level up further in decision-making is a connecting of frames: more participative and incremental approaches to decision-making provide agency to more stakeholders with their respective frames around transport decisions. Here, various frames brought in by the stakeholders are connected, either on the level of the policymakers (Stead 2008) or on a wider

set of stakeholders through participative approaches (De Bruijn and Ten Heuvelhof 2010 or Cartenì et al. 2022). For example, the inhabitants of an area are involved in the redesign of their neighbourhood, with transport being just one of many aspects connected to that decision. See Table 4.1.

Table 4.1 further clarifies these levels. We can put them in a historical perspective, starting with the narrow focus on the value of transport in modern times, say around the 1960s in many Western countries. As the external effects of a narrow perspective on a transport system become clear, the further levels in Table 4.1 can be recognised in many policymakers' reactions. The second level makes policymaking somewhat more complex, as externalities are acknowledged. This level leads to separate regulation of vehicles and infrastructure to limit negative effects on stakeholders outside the transport system, without a real challenge to accessibility and flow of traffic. The third level is a real recasting of the frame. In that case, accessibility is challenged as the key value to optimise for. Safety and health, for example, can become key considerations that let infrastructure and vehicle design limit flow and speed, prioritise active modes and consequently limit accessibility. This is even more so for the fourth level; design optimisations are not about mobility and transport at all but about the aspects that relevant stakeholders introduce and co-design. We see this, for example, in participative (urban) spatial redevelopment (Kübler and Schwab 2007). Although this more integrative approach is arguably better, it is in itself not without problems (Bickerstaff and Walker 2005), as complexity also rises.

There are a few differences in how these levels of complexity are dealt with. From the first to the last, the role of stakeholders grows and widens the perspective on and beyond the transport system. The direct involvement in the decision-making of stakeholders outside of transport becomes stronger. Also, the more narrow top levels above provide a simpler frame that allows for focused transport-related policies, like congestion charging. As stated, the last level allows for integrative decision-making by including many stakeholders, but we see it generally limited to local environments. On larger geographical (or jurisdictional) scales, the approach of the last level suffers from the problem of representation (see also De Bruijn and Ten Heuvelhof, 2008). How can the richness of perspectives from all related stakeholders be best included in decision-making that touches so many of them? We see it work on transport solutions for a specific limited area, like a neighbourhood, a group of stakeholders, or university staff (see, for example, Akse et al, 2023). It seems that the complexity has to be reduced one way or another; when the geographic reach becomes wider, more stakeholders and views are relevant to be included, making it attractive or even necessary to base policy on a simplified or singular frame for general policies to the point of losing its relation to the complexity of reality.

From the perspective above, a frame is always related to a particular stakeholder's focus on a slice of reality and the related interests a stakeholder has. A narrow frame is selective in its stakeholders. Car drivers have a perspective on the world in which accessibility is indeed valued. However, living next to a busy street, accessibility is less important. When dealing with asthma, even less so. It is the strength of governance-related literature[3] to provide us with possible directions on how to effectively deal with the downsides of the narrow transport policy framework.

Table 4.1 Four levels broadening transport policy frames

Level	Transport frame	Externalities	Solutions	Governance	Perspective	Example
Separating externalities	Stable	Neglected in key transport decision-making	Internal transport optimisations	Internal stakeholders retain dominance	Transport system frame	Classic transport policy
Connecting externalities	Stable	Connected to transport decision-making	Internal transport optimisations regulated for external effects	External stakeholders drive regulation	Transport system frame connected across its boundary	Regulating vehicle emissions and infrastructure noise
Recasting a frame	Widening	Incorporated in transport decision-making	Wider optimisations	Some external stakeholders become internal stakeholders	Stakeholder involvement recasts frame beyond the transport system	Radical new policy and design approaches
Connecting frames	Connecting	Absorbed as core aspects of the decision-making	Contingent optimisations	Ad-hoc stakeholders arenas	Connecting multiple stakeholder frames in a spatial or integral perspective	Participative approaches

THE VECTOR TOWARDS A WIDER TRANSPORT GOVERNANCE

As policymakers have discovered over time, the limitations of the narrow transport frame and how transport is linked to a wide range of aspects of society, for good and bad, is complex. However, policy development is still often rooted in a narrow frame around the core value of transport, as stated earlier, through infrastructure and institutions that uphold that frame. Policymakers in the field, confronted with the problems of the narrow perspective and the downsides of the transport frame, might seek ways to widen the perspective more purposefully, for example, by using value frameworks such as the sustainable development goals (Brussel et al. 2019), the doughnut economy perspective (Raworth, 2017), or six capital view (Herath et al. 2021) in the decision-making process on transport (see Veeneman et al. 2021), or by making it more participative. This allows policymakers to cast a wider net and, as such, improve the quality of decisions beyond a transport frame. Here, seven elements that together form a vector to widen the perspective are presented, elements from problem definition to resolving trade-offs. These vector elements support the changing of the frame to shift further away from the narrow transport frame and embrace some of the complexity, as informed by governance literature. The goal is to provide ways forward for policymakers to move toward more governance that does more justice to real-world complexity. Table 4.2 below sums them up for transport-related decision-making.

As policymakers understand that optimising transport does not necessarily provide broad societal value, the search is for a vector of change towards better integration of transport decisions with wider societal needs. A first vector element can be to deemphasise the obvious problem of slowing traffic as the main problem related to transport and to reemphasise the provision of the value of transport in society, including the trade-offs on other aspects besides travel speed, on aspects occurring outside the transport network. This can be done in many ways, from different political foci, research approaches, news attention and more. One can think of refocusing away from the congestion problem by pointing at the responsibility of car drivers to avoid congestion, as the congested times and locations are generally quite predictable, and by recasting the problem of mobility as a contributor to livable cities and regions.
The second vector element links to the outlook that the problem perspective above triggers. In the narrow transport frame, there is a tendency to look at the trend of growth in demand for transport and take action to facilitate that trend. However, when the future presented is roads

Table 4.2 Seven vectors to broaden the transport frame in decision-making

Vector elements	From	Towards
1. Problem perspective	Quality of flow	Quality of life
2. Design focus	Design to facilitate historic trend	Design to realise a desired future
3. Scale of jurisdiction	Nation states and large regions	Small regions and local
4. Key values	Capacity, speed, costs	Stakeholder informed
5. Optimisation	End-state analysis driven	Increment learning driven
6. Analysis goal	Analysis to optimise the solution	Analysis to inform decision-making
7. Trade-off resolving	Analysing	Politicising

and rails everywhere, it does not provide an attractive future. A desirable future for a region will include transport, but only as part of and conditioned by a wider idea of the future state of a region. Recasting the focus on that desired future and requiring transport choices to support that could widen the frame. This would mean that, for example, spatial planning decisions would trump transport decisions, with the required institutional and governance changes to support that. Obviously, that focus requires different tools from classic transport models, like long-term scenario planning.

The third vector element asks for decentralisation of decision-making on transport. As stated earlier, many of the more integrative approaches require strong stakeholder involvement, which is simply more manageable and less prone to representation problems on a local or regional level, compared to a national or even transnational level. Obviously, (trans)national flows still create local and regional value. Hence, it is not just about a shift to more decentralisation (based on subsidiarity) but also a linking of decision-making in larger-scale jurisdictions (with a stronger focus on flow) to smaller-scale jurisdictions in ways that overcome the classic power asymmetry in that relationship.

The fourth vector element consists of the key values that play a role in decision-making, as well as in policy research. The focus on speed, capacity, and costs that support the narrow transport frame should be widened. Earlier, this article mentioned the more disjointed and integrated ways in which this can be done. Additionally, the values to be included could be informed by value frameworks such as the sustainable development goals, the doughnut economy, or the six capital perspective. However, whenever possible (depending on other vector elements), stakeholders should play a major role in determining the key values for decision-making. That also means that research for transport decision-making changes focus.

The fifth vector element focuses on that research. The narrow frame for transport decision-making allowed very high-quality analytical optimisations, but only for this limited set of optimisation parameters. Many researchers have been working on these logistical optimisations that describe optimised end-states. However, as new value frameworks come forward or stakeholders introduce additional essential key values, including these is a challenge for researchers. In a complex world, the end-state is hardly ever stable, and incrementalism and learning are more realistic optimisation strategies. The role of the researcher in relation to policy processes changes from disjointed objective generic optimisation towards connected intersubjective customised informing of the stakeholders, see Table 4.3 below.

The sixth vector element emphasises the role of analysis beyond the goal of the analysis. The analytical optimisation approaches can be carried out relatively disjointedly. Supporting

Table 4.3 The differences in research for transport-related decision-making in transport and societal frames

Narrow transport frame	Broad societal frame
An objective perspective on transport reality	Intersubjective perspective on broader reality
Generalise for the academic community	Customise for societal community
Disjointed from the decision-making process	Intertwined with the decision-making process
Few values (speed, capacity, costs)	Multiple values (stakeholders informed)
Prescribing to the decision-making process	Informing the decision-making process

decision-making with analytical models and design-orientated research that allow for a wider and more flexible set of values is a far more involved way of doing research, generally pointed to as transdisciplinary. If the perspective is to be broadened, research will have to follow decision-making more, rather than decision-making following the research. Research should be funded in ways that support that involvement and facilitation.

The seventh and last vector element focuses on how decision-making is dealt with from various perspectives of stakeholders and the trade-offs that will occur when integrating the different values that the various stakeholders deem important into a shared solution. Trade-offs start playing a more important role when the shift is made towards a wider set of values. As we expect that every road extension has a health effect, the trade-off between accessibility and health is much more than a multi-criteria analysis where a few stakeholders may vote on the weight of criteria. Only through real politicising, i.e., debating and deciding on the options given the real value of minutes of travel time saved vs a better, longer, and healthier life, can the trade-off be explicit, rather than hidden in an analysis.

These vector elements all embrace the complex reality of decision-making. That complexity is linked to both (De Bruijn and Herder 2009) the system complexity that characterises transport (De Bruijn and Herder 2009), and to the actor complexity, where the same system is viewed differently by different stakeholders, who experience different slices of reality, value different aspects around transport decisions, and respond to the dynamics that occur in all these aspects.

CONCLUSION

There is a paradigm shift ongoing in the field of transport and mobility (Akse et al. 2021), with a growing understanding of the limitations of the narrow focus on transport flow, capacity, speed and costs in policymaking around infrastructure and transport policy, and the limited links that policymakers are making to other fields, to get to more integrated policies. That shift is ongoing and reflected in the steps described at the start of this chapter, from focus accessibility, via including externalities, to greater roles for stakeholders of many kinds.

As we discover that the effects of transport in the world go way beyond better accessibility and are often problematic, the need arises to move this forward, to move in a different direction, and to follow a different vector. However, how to transition towards new ways of decision-making is not clear, with many proposed changes like participative approaches, system-of-system perspectives, policy packaging and more. All have their problems, and the way forward from all this literature is not obvious yet. In addition, the existing institutional and infrastructural structures strengthen the existing narrow frame in (research for) policymaking and research.

This chapter emphasises seven vectors that could lead us out of the narrow perspective. It does this not by emphasising a specific policy approach that could replace the existing paradigm, it brings together various possible changes that together inform us of the way that change could go and sketches the vector of change.

Transport is important for our modern societies. Transport is so important that it has the potential to make us like King Midas, giving transport a golden shine in policymaking, without keeping an eye on what we as societies need from it and besides it. Policymakers seem to see that challenge. The next step is helping them broaden their view.

NOTES

1. Complexity is the characteristic of a system that ultimately makes it poorly understood by those who want to intervene. Several factors play a role: understanding is simpler with fewer parts and fewer interactions. As a system has more parts and more interactions, the complexity grows (compare transport in a village to transport in a metropolis). Uniqueness and newness of parts and interactions also limit understanding, as how they function in the system has not been learnt yet. It is important to understand there is both an epistemological and ontological backdrop to this. Systems are constructs helpful for those who want to intervene. Simplification helps understanding, but reality is inherently complex.
2. A key thinker on how this works is obviously Foucault, showing how the cultural alignment of stakeholders gives power to certain lines of reasoning.
3. Governance has many different and shifting definitions in literature. For this chapter, we focus on the rulesets for multiple stakeholders on how to make decisions among them that are embedded in culture, institutions, contracts and mutual agreements (see also Veeneman 2021).

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