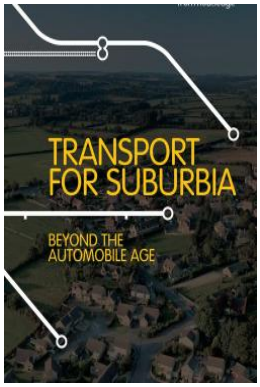
1. Essential Reading



Transport for Suburbia: Beyond the Automobile Age, by Paul Mess

By Javier Caletrío (Sociologue)
27 March 2025

Can suburbia avoid car dependence? Can low-density areas enjoy first-rate public transport? Is the electric car the main option for reducing transport-related carbon emissions in the dispersed city? In Transport for Suburbia Paul Mees argues that we can have excellent public transport systems that entice people away from the private car. The key is to develop networks that allow easy transfers at key intersections. Achieving this 'network effect' requires, among other things, a strong central public transport organisation.

For more than three decades transport planning scholars have argued that urban form – the way urban areas are designed, laid out and built – determines travel patterns, and that suburban population and employment densities cannot support viable public transport. The compact city, the argument goes, is therefore a precondition for sustainable public transport.

In Transport for Suburbia the late Australian transport planner Paul Mees contested this received wisdom and asked questions that are as relevant today as when the book was published fifteen years ago: If the compact city is a precondition for sustainable transport, what do you do with existing suburbia and other low-density areas? Can changes in urban form realistically happen within a timeframe compatible with the Paris Agreement reduction targets? Are population and employment densities actually the main factors determining the way people travel in cities?

An outspoken advocate of public transport, Mees argued that the prominent role given to density in urban planning debates reflects a lack of imagination from academics who have noted the social and environmental costs of car dependence but have failed to offer a feasible alternative. It reflects also a lack of courage from civil servants and politicians to respond to citizens' desires and aspirations to enjoy high-quality public transport as a viable, attractive alternative to the car.

Mees argued that the public transport ‘problem’ is easier to solve than many assume if we pay attention not so much to what most academics have written about the topic, but to what practising urban planners have developed in cities as diverse as Zürich, Curitiba, Vancouver and Ottawa. These cities have discovered or are prefiguring key aspects of what Mees calls ‘the network effect’. The network effect ‘occurs when public transport imitates the flexibility of the car by knitting different routes and modes into a single, multimodal network’, ‘making transfers between different routes near effortless’. [1] These transfer-based networks enable multidirectional and multidestination travel, mimicking the flexibility of ‘go anywhere, anytime’ of the car. Mees argued that density does have an effect, but rather than waiting to reach impossibly high levels of population and employment densities to make public transport viable, cities should instead spend money and organisational capacity on building a transport system that actually works. In examining the experiences of cities that have developed key aspects of the network effect, Mees seeks to provide an optimistic answer to the problem of public transport. The aim of the book is to offer guidance to planners and citizens on planning a network.

A public intellectual devoted to fighting car dependency

Paul Mees (1961 – 2013) was a prominent Australian urban and transport planner who taught at the School of Environmental Planning at the University of Melbourne and the Royal Melbourne Institute of Technology. His first book, A Very Public Solution: Transport in the Dispersed City (2000), is a comparative study of transport policies in Melbourne and Toronto over fifty years, and prefigures the main argument developed in Transport for Suburbia. Before becoming an academic Mees started a career in law and was known as a vigorous advocate of public transport, a lifelong passion that informed his research. Mees posthumously received the Medal of the Order of Australia in 2014 for ‘service to public transport and urban planning as an academic and advocate for creating sustainable cities.’

Paul Mees devoted his life to fighting the idea that automobility has to be the dominant transport mode in our cities. Unlike other advocates of sustainable transport, however, Mees did not see the compact city as the main solution. Density, Mees argued, does matter, but its role in successful public transport systems has been overstated. Rather than low density being a barrier to providing public transport, Mees saw it as a rationalisation for inaction. He wondered why environmentalists see density (but not, for example, lack of funding and deregulation of public transport) as the problem and suggested that behind this celebration of the compact city there is a moral crusade against suburbs. This is no passing comment. Because low density is being used by lobbyists to argue for the continuation of road based agendas, environmentalists, Mees argued, are unintentionally providing support for unsustainable transport policies. The argument that densities many times greater than current levels are necessary before a shift from driving to public transit occurs is an argument for persevering with automobile dependence.

Activism informed by evidence

As a public intellectual heavily involved in transport politics, Mees sought evidence in the real world to aid its activism. An urban imaginary without evidence, he observed, is neither possible nor desirable. Much of his efforts went into examining two core assumptions underlying the idea of the compact city: that density determines the choice

of transport mode, and that viable public transport cannot be operated effectively below a density threshold variously estimated at 30 to 100 persons per hectare. Mees contested these assumptions through his method of ‘bland empiricism’, relying on two remarkably simple sources of evidence: publicly available and regularly-produced state census and comparative analysis of real world public transport success stories.

Regarding the often cited minimum density threshold for viable public transport [2], Mees searched for the origins of this figure and found multiple layers of citations ultimately going back to a single source, the Chicago Area Study (CATS) of 1956. ‘The CATS analysis’, Mees argued, ‘erroneously attributed poor suburban public transport to low densities, when the real causes were failures of planning and policy.’ [3] These figures became gospel and were then routinely cited in discussions of sustainable transport. [4]

Mees also examined more recent studies by Peter Newman and Jeff Kenworthy whose work on the role of urban density in energy consumption has provided the dominant intellectual and scientific basis for environmental critique of automobile dominance. [5] Mees argued that the Newman-Kenworthy data contained errors in the estimation of urban densities. ‘When these [errors] are corrected, the results reveal only a very weak correlation between density and public transport use, and no correlation at all with walking and cycling.’ [6] Mees regarded the standard way of calculating density based on administrative boundaries as a poor indicator of real density. He suggested that density metrics should instead be based on area of urbanised land and should distinguish between residential and non-residential land. He also suggested that when comparing densities of different cities it is important to use consistent definitions.

Moreover, the comparative analysis of public transport success stories showed, according to Mees, that the relative attractiveness of different, competing transport modes seems to influence modal choice more than differences in density. A shift from driving towards transit seems to be shaped primarily by the convenience of a public transport system offering multidirectional and multidestination travel. Mees argued that cities that adopted a network planning approach significantly outperformed those that adopted a direct route approach (with numerous, infrequent lines).

The response from Newman and Kenworthy

Mees’ argument that there is a ‘density delusion’ in much planning policy prompted a response by Newman and Kenworthy [7] who argued that Mees had used their data selectively and was neglecting the bigger picture. They accused Mees of creating doubt in the minds of policy makers, giving them an excuse to give free range to urban sprawl. Newman and Kenworthy contended that the viability of transit depended on both density and service levels:

> The value of providing better services without waiting for density increases is incontrovertible. (…) Perth electric rail system, developed over the period from 1988 up to now, clearly shows the capacity of rail modes to provide superior faster services which people will flock to even from low density areas provided the stations are fed properly with access modes. Use of Perth’s rail system has exploded from 7 million passengers a year in 1992 to nearly 60 million in 2010. [8] But the value in increasing services whilst also increasing density is a far more powerful case. The evidence is available and the argument can be understood by anyone – the more people who have the chance to access a transit service,

> the more chance you have of them using the service. There is a scale and density factor that operates to enhance and multiply whatever operational advantage can be provided. [9]

Newman and Kenworthy's vision is one of a polycentric city whose centres experience real density increases, and are connected by high levels of transit service. This would provide 'the framework for the low density suburbs to have the necessary public transport base for their future viability and resilience'. 'Density and services together', Newman and Kenworthy argued, 'form an indivisible partnership to help make this kind of city.' In their response to Mees, they outlined their shared ground and noted that:

> It is therefore not without some genuine pain and regret to be found in conflict with someone who we fundamentally see more as more of a colleague than a detractor, but nonetheless having to defend our own work. We believe that there is genuine basis for harmonising the issue of density with that of transit service and quality factors so that work can continue on addressing the big picture … making cities more liveable, sustainable, fairer and resilient places. [10]

Mees' illness prevented him from responding to Newman and Kenworthy before he died in 2013.

Density and transport in the IPCC reports on mitigation

Mees sought to unveil what he regarded as the fragility of the argument for the 'impossibility' of high-quality suburban public transport. He saw this as a necessary step for transforming policy making, from the day-to-day workings of civil servants in small cities to the policy recommendations of influential international organisations such as the United Nations' Intergovernmental Panel on Climate Change (IPCC). Three years after the influential 2007 IPCC's Fourth Assessment Report, Mees wrote:

> The (IPCC) Synthesis Report focuses on regulatory reforms such as carbon trading schemes and financial incentives, and contains few direct mentions of transport. This reflects the cautious tone of the report from the Transport Working Group, which expressly excluded changes in mode share from its estimate of potential emissions reductions. The omission is the result of a lack of agreement about the potential for mode shift: 'Providing public transport systems … and promoting non-motorised transport can contribute to GHG mitigation. However, local conditions determine how much transport can be shifted to less energy intensive modes.' The problem is our old friend density. The potential for mode shift is 'strongly influenced by the density and spatial structure of the built environment', but 'densities are decreasing everywhere'. [11]

The IPCC's cautious stance towards the potential for mode shift is accompanied by an emphasis on 'clean energy vehicles', an unsurprising fact, Mees contended, considering the expertise and institutional commitments of the members of the IPCC Transport Working Group:

> Support for the technical fix is not confined to lazy governments. As we have seen, even the Transport Group of the IPCC emphasizes technological solutions while being reluctant to commit on mode shift. This reflects the composition of

> the working group itself: the coordinating authors were a Brazilian engineer specialising in biofuels and a Japanese researcher working on the Toyota R&D laboratory on ‘clean energy vehicles’; the other 15 contributors to the report had similar backgrounds. Apparently, nobody was appointed with expertise in multimodal transport planning, despite the ample evidence of the potential for mode shift available just outside the front door of the IPCC offices in Geneva. [12]

In subsequent IPCC Assessment Reports published in 2015 and 2022 we find this same emphasis on the compact city and electric vehicles, reflecting the fact that in both documents Peter Newman has been a lead author for transport. [13] The Sixth Assessment Report (2022) argues that implementing urban form changes such as increasing the density of cities to reduce travel demand is ‘a major way’ to influence greenhouse gas emissions and could cut urban transport emissions by one quarter by 2050, mainly through impact in rapidly growing cities. The rationale here is that because urban infrastructures (such as out-of-town shopping centres and residential areas) have a long lifespan, the wrong interventions could trap people into energy-intensive practices such as driving. Therefore avoiding new urban sprawl is a necessary decarbonisation condition. Dispersed and low-density housing distantly located from jobs is portrayed as an obstacle for creating alternative mobility options. For existing low-density urban areas the report recommends creating local hubs (of housing, commerce, jobs, leisure activities), using available land to build rail-based transit and relying on shared or pooled mobility to offer on-demand mobility in suburbs and for connecting with transit. The mitigation potential of public transport is conditional on the creation of urban density, and increases in urban density are in turn seen as requiring investment in public transport. [14]

The IPCC Sixth Assessment Report on mitigation contains comparatively little on public transport. It does emphasise electric vehicles, noting that ‘While reductions in demand for travel and changes in mode choice can contribute to reducing GHG emissions from the transport sector, cars are likely to continue to play a prominent role. As a result, improving the performance of cars will be crucial for the decarbonisation of the transport sector.’ It adds that electric vehicles powered by ‘low emissions electricity offer the greatest low carbon potential for land-based transport, on a life cycle basis’. [15]

Mees agreed that urban sprawl should be avoided, favoured the clustering of suburban activities into sub-centres and was cautious about the mitigation potential of electric vehicles considering that, at the time of writing, low-carbon electricity was less widely available than it is today. He was nonetheless concerned about the many negative impacts of automobility in cities and it is not difficult to imagine that he would have disagreed with the emphasis on electric vehicles from the IPCC. Mees’ imaginary of the ideal city was one structured by public transport.

The network effect

Conventional transport provision in many Australian, American and British cities often consists of a bundle of competing, separate and uncoordinated lines offering a direct route between origin and destination, each one servicing a small submarket (e.g. residential area to central business district). While each of these services may be most convenient for a particular segment of users, it is of little use to the majority of potential customers. This tailor-made public transport system often has low frequencies, low occupancies and high emission costs per passenger. It is also less suited to adapt to changes in travel demand. A main purpose of maintaining unconnected routes is to

eliminate transfers which are seen as a barrier to increasing the number of users. This demand-oriented model is often associated with a deregulation approach to public transport.

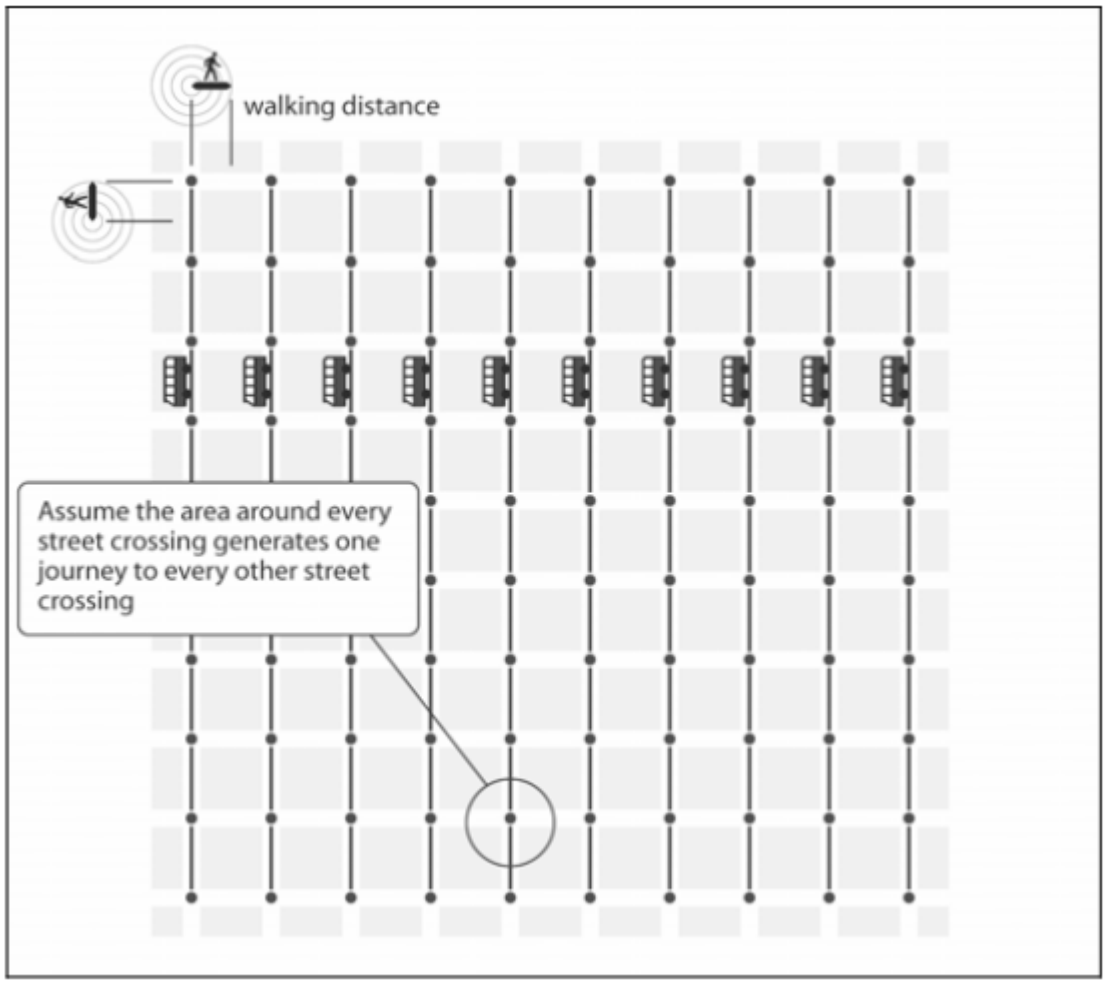
The kind of supply-oriented, public transport proposed by Mees is a transfer-based, multimodal system, a planned and integrated network of services covering the whole region and intended for everyone. Transfers are central to the network effect, and rather than being a barrier they are seen as an opportunity. Transfers create a network out of what would otherwise be a collection of individual routes, allowing passengers to travel to any part of the city on a multi-modal ticket (free interchange between lines, modes and operators).

Simplicity is a key feature of the public transport network as it has to be easily understood by users. There are fewer frequent lines and passenger flows are concentrated into specific major corridors with the same stopping patterns at all times (high frequencies and stable timetables most of the day, week and year). These backbone routes connecting important travel origins and destinations are crossed by feeder lines originating from places with fewer users. Ideally a well designed network would connect all areas of a region with a single transfer which is a cost-effective way of increasing ridership.

Mees created the stylized model of Squareville to illustrate the workings of the network effect.

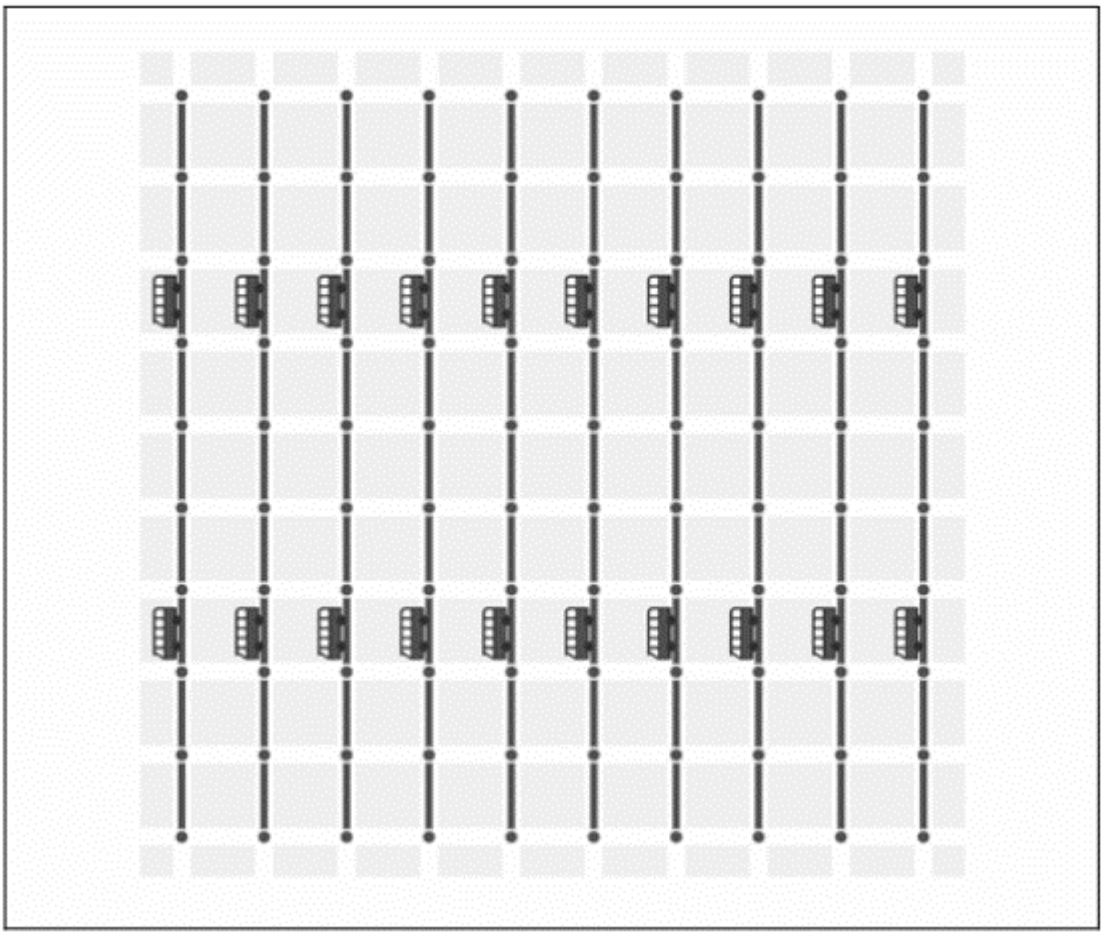
“Squareville” with ten bus lines running north–south

Source: Nielsen et al. (2005). Adapted from Mees (2000). [16]



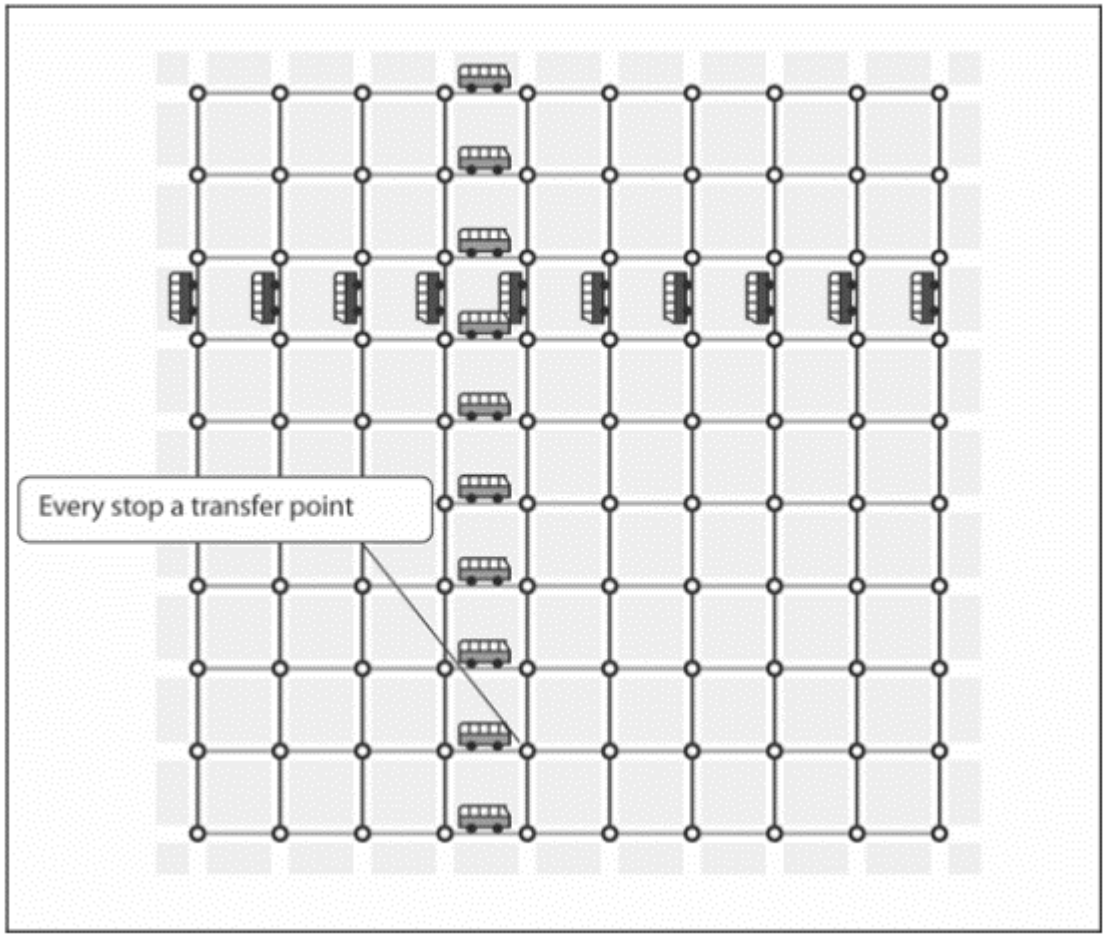
The hypothetical city of “Squareville” has a grid-iron street pattern. The streets are well suited for a bus service since they are 800 meters apart. “Squareville” is a homogeneous city with a travel demand that is entirely dispersed. Assume the area around each of the city’s street crossings generates one journey to every other street crossing; 9900 trips per day in total. For the whole of “Squareville”, the ten bus lines can only serve 900 trips in the city, which is less than 10 percent of the total trips of 9900. Assume that the public transport service presently attracts one-third of the journeys it can theoretically serve. This gives 300 trips per day by public transport, which is a modal share across the whole city of only 3 percent.

“Squareville” with ten bus lines running north–south, double frequencies on all lines



Imagine that services on the existing bus lines are doubled in order to make more people in “Squareville” to use public transport. According to traditional transport demand modelling the elasticity of demand might be assumed to be some 0.5. This means that a 100 percent increase in service will produce a 50 percent increase in demand. The result will be 450 public transport trips per day and a modal share of 4.5 percent. Since the operational costs are likely to increase by more than 50 percent, the cost-recovery through fares is likely to fall.

Squareville with twenty bus lines running north-south and east-west



Imagine that the extra operating resources instead were used to run ten new bus lines in the east-west direction, as shown in figure 4. This would create a grid network of twenty lines. The number of trips that are directly served would double to 1800; the 900 initial north-south journeys and the 900 new east-west journeys that can be made without transferring between lines. But if passengers are willing to transfer, then all 9900 trips between all blocks can be served by this network; 1800 directly and 8100 by transferring. Assume that the modal share for journeys involving a transfer is half of that for direct journeys, i.e. one-sixth of these trips that can be attracted to public transport. This gives a total number of 1950 public transport trips per day (1800/3 + 8100/6). The modal share has increased dramatically from 3 to 20 percent.

This gives a theoretical elasticity of demand that is 5.5, rather than the traditional figure of 0.5. Increased revenue from the fares should more than cover the extra costs of operation and vehicle occupation would rise. We will by no means claim that this ten-fold increase in demand is a figure to be found in the real world. Nevertheless, it illustrates the significance of the network effect for public transport demand; if at least some of the theoretical potential is exploitable in a real situation.

A public authority controlling tactical planning

In Mees' stylized network system demand is evenly distributed, but real cities have routes and periods which are more profitable than others. In order to create a functioning network all routes must run at high standards, at all times, including the feeder routes (those connecting areas with smaller populations to higher-demand, more profitable main lines). Effective networks are planned and managed by a public agency that prioritises

service quality and guarantees cross-subsidies from busy radial trunk lines to routes servicing more dispersed demand.

The need for a public agency does not mean that the service has to be wholly public. Fully public or fully private transits are the exception everywhere in the world. All systems are a mix of state and private. The question is what tasks are best performed publicly, and which function best privately. Mees distinguished three operational levels. The strategic level is where system objectives are set. The tactical level is where objectives are translated into system-wide service strategies (e.g. designing networks, coordinating timetables, selecting appropriate modes). The operational level is where tactical planning is translated into day-to-day operations (e.g. hiring and scheduling crews, collecting fares, maintaining equipment).

Mees argued that for a public transport system to be able to compete with the car, it is essential that the public agency controls the tactical planning necessary to provide an integrated network of routes and services. This means having jurisdiction over the entire urban area rather than just the central municipality, and having control over finances, allowing the pooling of revenue and permitting cross subsidies (which enable routes and services with lower patronage to remain operative). In addition to this a successful public agency must operate in a favourable policy landscape characterised by the coupling of incentives for public transport and disincentives for the car. The planning of a network requires both policies to develop and improve public transport and policies to discourage the use of automobiles (such as reducing parking space, lower speed limits, Ultra-Low Emission Zones).

Setting clear system objectives is also crucial. Mees recommended starting with setting targets for economic growth and regional land use. With this broader picture in sight, it is easier for planners to narrow down the set of targets for mode shift (e.g. what increased levels of public transport use and what reduction levels of car use are feasible and desirable in a territory by a specific date). These targets need to be supported with appropriate institutions and resources which will vary according to the specific governance context in each city or region. Mees took Zürich Transport Alliance as the institutional model to imitate.

Final remarks

Mees was inspired by the belief that transport systems fundamentally shape the prospects of the liveable city, and the foundations of a decent and sustainable city should be public interest. The public city Mees envisaged was one in which a well-informed and active citizenship engages with all levels of institutions where decisions affecting the city are made. His role as a public intellectual was to ensure that deliberation about the good city is not unnecessarily restricted or influenced by arbitrary or ill-informed opinions on what policy options are deemed to be feasible or unfeasible. Mees' vigorous defense of public transport and his critique of accepted urban planning wisdom sought to avoid prematurely shutting down the conversation about alternatives to the car-centric city.

Mees makes a persuasive argument about the need to find solutions that work with technologies that already exist and within a timeframe compatible with the Paris Agreement reduction targets. Anyone concerned about the prominent role currently granted to electric cars in transport and climate policy would find Mees' book a timely and original contribution to the debate.

Notes

1 Mees (2010, p.8).

2 See, for example, Rudlin, D. and Falk, N. (1999) Building the 21st Century Home. Oxford: Architectural Press.

3 Mees, P. (2009) The Density Delusion? Urban Form and Sustainable Transport in Australian, Canadian and US Cities. World Transport Policy & Practice, 15 (2), 29-39.

4 In the book Mees pays particular attention to English cities which, despite having similar or higher densities to other European cities (which are case studies for successful public transport), have lower public transport mode shares.

5 See, for example: Newman, P. and Kenworthy, J. (2015) The End of Automobile Dependence: How Cities are Moving Beyond Car-Based Planning. Washington: Island Press. Newman, P. and Kenworthy, J. (2006) Urban design to reduce automobile dependence. Opolis 2 (1), 35-52.

6 Mees, P. (2009) The Density Delusion? Urban Form and Sustainable Transport in Australian, Canadian and US Cities. World Transport Policy & Practice, 15 (2), 29-39. Mees, P. (2009) Density and transport mode choice in Australian, Candian and US cities. Proceedings of the 32nd Australasian transport research forum (ATRF).

7 Newman, P. and Kenworthy, J. (2011) The density multiplier: A response to Mees, World Transport Policy and Practice, vol. 17, no. 1, pp. 32-45.

8 In an interview for ABC Radio in April 2022 Peter Newman gave a figure of 70 million. https://www.abc.net.au/listen/programs/perth-mornings/peter-newman-future-of-transport/13829800

9 Newman and Kenworthy (2011, p41).

10 Newman and Kenworthy (2011, p42-43).

11 Mees (2010, p. 39).

12 Mees (2010, pp41-42).

13 In an interview for Radio Perth on 22 April 2022, just after the publication of the IPCC AR6 Peter Newman said: ‘Our report is very hopeful. It does shows that solar batteries and electric vehicles combined are now cheaper than any other kind of fossil fuel option, so when you put that together, it is a very hopeful vision of the future.’ (…) ‘… those places that have solar (energy) and electric vehicles are places that people are going to want to live in and work and there’s going to be lots of jobs in the future.’ In the interview Newman also notes the importance of active and public transport. https://www.abc.net.au/listen/programs/perth-mornings/peter-newman-future-of-transport/13829800

14 This point is emphasised in Newman and Kenworthy’s book The End of Automobile Dependence: How Cities Are Moving beyond Car-Based Planning (2015): ‘In response to the question of whether increased density alone is enough, we say that public transit improvements are also needed–but the two go together, they are totally intertwined’ (p174).

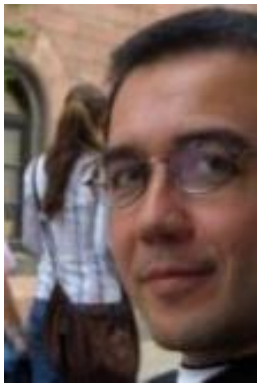
15 IPCC (2022, p1061).

16 Nielsen, G. (2005) HiTrans Best Practice Guide 2: Public Transport – Planning the Networks, EU North Sea Region / Rogaland County Council, Oslo.

Mobility

For the Mobile Lives Forum, mobility is understood as the process of how individuals travel across distances in order to deploy through time and space the activities that make up their lifestyles. These travel practices are embedded in socio-technical systems, produced by transport and communication industries and techniques, and by normative discourses on these practices, with considerable social, environmental and spatial impacts.

En savoir plus x



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