

# Access and land use: a brief exploration

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## **Ralph Chapman**



New apartment block, old house and green space in central Wellington (corner of Abel Smith Street and Karo Drive).

December 2017. Photo credit: Ralph Chapman

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## Access and land use: a brief exploration

Ralph Chapman

## **Executive summary**

In this exploratory 'thinkpiece', I examine access from various angles, and consider how valuable a concept it is in considering the urban environment today and in future. I consider aspects of the land use planning system under New Zealand's built environment planning legislation, from the perspective of urban economics and sustainability. I focus on *urban* accessibility issues because the vast majority of New Zealanders live in cities and towns, and the challenges of ensuring access are rather different in cities.

Thinking in terms of accessibility rather than mobility can help significantly in shifting the focus away from narrow concepts such as travel time savings generated by transport investment, and instead envisaging a city that delivers what citizens increasingly want, in terms of environmentally sustainable access to jobs, amenities and a quality lifestyle, while reducing dependence on the private motor vehicle. Rapidly developing innovations such as digital access, and aspects of the sharing economy, can assist.

We can have some optimism that cities can become more sustainable and at the same time improve their quality of life, to include enhanced accessibility for citizens, even if that process is incremental. Such an urban transformation will require changes to our planning and land use regulatory system to deliberately support accessibility, as well as adaptiveness and sustainability. Technology change will increase mobility – but it is not clear that we will necessarily benefit from more mobility.<sup>1</sup> In our future cities, accessibility may be more valued than mobility. In terms of necessary regulatory change, further efforts to integrate transport and urban planning through changes to the relevant legislation should be considered, principally to support intensification and land use mixing, critical ingredients for future cities. In addition, change is warranted to allow elected members of local government and planners increased powers to pursue in a purposeful way improvements to the urban built environment in the public interest, while not giving them carte blanche to override widely accepted private property conventions.

The future of the sustainable, accessible, creative city is one in which there is priority for walking and cycling, a concentration of development around public transport accessible locations and therefore a reduced need to travel (particularly by car), together with quality housing in locations with easy access to jobs, local services and facilities, so that people who must travel do not need to go excessively long distances. This vision requires us to be discriminating in how we regulate land use – there is a good case for regulation to help provide public goods (including public transport) and support the public realm, but a weak case for other sorts of regulation (such as minimum parking requirements). Lastly, it is helpful to see the city as an evolving arena where there is scope for community experimentation as we incrementally shift away from car dependence, and try out different ways to increase and enhance inner city living and active travel.

<sup>&</sup>lt;sup>1</sup> As has been pointed out, 'Transportation policies should *limit* access and mobility when doing so preserves valuable social or environmental amenities.' (emphasis added): Litman, T., (2017) Evaluating Accessibility for Transport Planning: Measuring People's Ability to Reach Desired Goods and Activities. Victoria Transport Policy Institute, Victoria, B.C., p.50.

## Preamble

In this paper I explore the concept of 'access' and its cousin, accessibility,<sup>2</sup> and address the extent to which the notion of access – including both digital and physical (transport) access – is built into the land-use planning system today, and might be better incorporated into land use planning over the coming decade.

I write this paper using an economics and sustainability framework. I identify some notable aspects of the current land use RMA system under the Resource Management Act 1991, New Zealand's primary planning legislation, but this is viewed from the perspective of urban economics and sustainability.<sup>3</sup> My focus is on *urban* accessibility issues because the vast majority of New Zealanders live in cities and towns, and the challenges of ensuring access are rather different, and more acute, in cities.

My treatment of digital access in this paper is brief – I address some of the more salient questions, but do not have the space to open up matters only tangentially connected with physical access. More work on this is warranted: for example, how digital access is changing might be addressed as a separate research exercise for a university postgraduate student interested in the links between new digital technologies and the nature of access and communication, not just within cities, but between cities, rural areas and other parts of the globe, in what Rifkin (2000) has called the new age of access.

## Introduction

Cities are all about access – access to ideas, jobs, goods, and services, and to other valued determinants of the quality of life, such as cultural facilities and public amenities. Real estate agents have thought about this in terms of 'location' since, traditionally, a good location gave easy access. But while the value of key locations exhibits stability, preferences for location are not fixed, and the evolution of technologies and social practices means that locations and the access they afford are subject to change as well.

Transport comes into this by providing a means to gain access from afar – in effect, it enhances certain types of mobility to expand access. For example, even if a household wishes to live near jobs and amenities in a city centre, and uses active transport, it might settle for living in a middle suburb with lower housing costs if the transport connections available there are viewed as high quality and affordable. Digital communication goes further than transport in enhancing access by orders of magnitude, but at the cost of limiting the quality of the interaction (losing interactive bandwidth). The experience of being 'present' through forms of digital communication remains poorer than being there in person. Virtual reality technology is likely to take e-communication a step closer to simulating being there in person, but cannot yet convincingly mimic all its aspects.

The distinguishing characteristic of digital communication is that access is not geographically contingent: one can reach other people irrespective of where one is located, if an adequate digital link is available. While digital communication is becoming more important for many interpersonal and business transactions, there remain many others for which it is not a substitute for on-the-spot interaction and, for this reason, accessibility by physical transport remains paramount in our current

 <sup>&</sup>lt;sup>2</sup> I take *accessibility* to mean a condition that facilitates *access*. In many but *not* all uses, the two words are synonymous.
 <sup>3</sup> Sustainability is defined as encompassing the interaction of economic, social, environmental and cultural dimensions of well-being, today and in the future.

society. This will almost certainly be the case over at least the coming decade, but it would be foolish to be confident about this into further decades.

Accessibility, then, is traditionally an attribute of a given piece of land, and the land's proximity to amenities of various sorts, including transport infrastructure. At the level of the individual decision maker, realised locational choices involve trade-offs between accessibility and other property attributes. Valued attributes of the land and neighbourhood reflect not only what is on the land (e.g. building and neighbourhood characteristics such as dwelling type and surrounding dwelling types), but also social practice. And individual trade-offs between accessibility and other factors are constrained by affordability, reflecting in part how people in the property market attach value to particular property attributes. How businesses and households themselves make these tradeoffs is diverse, with some people valuing a central location for easy access to cetain amenities, with others valuing a suburban location for other amenities such as private green space, and greater affordability.

This is not just a matter of property prices but also transport functionality and costs (Dodge, 2017), which arise out of political as much as technocratic decisions on matters such as highway investment (Filion, 2015). Moreover, people's locational and housing choices have to reflect what is currently available. In a changing world, the supply of certain bundles of attributes (e.g. centrally located large apartments or townhouses without a carpark) may not keep up with changing household preferences.

In the rest of this paper I focus on the following themes:

- a. The higher order significance of access vis-a-vis mobility: access is a more fundamental goal than mobility, and transport and urban land use policies need to be cognisant of this.
   Framing policy in terms of mobility concepts such as reduced travel time is simplistic and needs to be reconsidered.
- b. Accessibility, urban form and sustainability: accessibility is a goal that, compared with mobility, is better aligned with the goal of sustainability. Land use planning to shape urban form can play an important role in supporting accessibility, especially if transport and land use policy and planning are well integrated. An important sub-theme here is how and to what extent the concept of accessibility is or can be built into New Zealand's land use planning system.
- c. **Seeing accessibility in terms of an urban system**: accessibility is only one goal among many held by stakeholders in the evolving urban system. While high expectations of improving accessibility can be frustrated by urban system complexity and unintended consequences, policy experimentation and adaptive learning provide a hopeful and realistic way forward.

## Access and mobility

Transportation is the machine for mobility.... cities are the machine for accessibility. — Levinson et al. (2005)

In economic terms, mobility is a 'derived demand': mobility is valued because it can provide access. But access can also be provided *without* mobility. If access can be provided without mobility, as for example with housing adjacent to employment, it will tend to be preferred. In short, improved access can reasonably be assumed to benefit society, but improving mobility is only one way to achieve it. Access and mobility should not be confused. One expert notes that '[a]ccess is the ultimate goal of most transportation' (Litman, 2003). Another way of framing this is to see accessibility as a higher order social goal than mobility. Internationally, urban transport policy specialists have increasingly accepted this orientation (Bongardt et al., 2010). The Asian Development Bank, for example, in channeling investment flows, has being trying to move thinking away from a car based transport model for developing Asian cities for a decade now, partly because of cost considerations and partly to achieve lower levels of air pollution and carbon emissions (Leather and the Clean Air Initiative for Asian Cities Center Team, 2009). Its approach is based on accessibility, demand management and land use policy. Accessibility underpins shorter journeys and shifting travel to public transport, as well as improving the efficiency of all forms of transport (Banister, 2011, p.1544).

The prominent place of accessibility has also been recognised in the hierarchy of 'Avoid, Shift, Improve' applied to making transport less costly and more 'sustainable' (Fulton et al., 2013; IEA, 2012, p.423). The top of this hierarchy is avoiding trips by improving access. Avoiding trips relies on a high quality of accessibility through proximity, and land use planning and design that provides for compact development and shorter trips, which improve or maintain accessibility while accommodating urban population growth and economic development.<sup>4</sup> It is argued that it is usually of lower cost and more sustainable to make arrangements to avoid a trip entirely, or minimise it, than to make it more efficient. It is likewise more cost-effective to shift a given trip to a more efficient mode; and at the bottom of the hierarchy is the option of improving the efficiency of the mode being used.

Historically, tension has arisen between the 'paradigm' of mobility based on motor vehicles, which require much more space to operate (Rode et al., 2014), and the paradigm of urban design and access based on proximity. It is difficult to make these two conceptions of urban design compatible, and – in many countries – a car based mobility paradigm has incrementally undermined and often deliberately displaced a proximity based paradigm (Jacobs, 2004).

#### Accessibility, time savings and efficiency

The desire to think beyond mobility and engage with accessibility has been a growing thread within the community of transport scholars, partly because transport investments such as highway building appear to be encountering diminishing returns (Pickford, 2013) and because of the limited capacity of many local governments to afford the urban infrastructure investments associated with continuing urban expansion.<sup>5</sup> It has been increasingly recognised that much road building supports urban sprawl and, more fundamentally, that the framing of the central objective of investing in road transport as 'achieving travel time savings' – for example through easing congestion on commutes into bigger cities – is potentially misleading. This goal has been questioned by heterodox transport experts (Cervero, 2011; Metz, 2008), who have instead emphasised that people and societies value access more than mobility. As Cervero has put it:

...any assessment of prospective transport investment projects should give at least as much attention to estimated impacts on accessibility as to travel-time savings. (Cervero, 2011, p.1).

Cervero also makes the more fundamental point that:

Framing the objective as making cities more accessible versus more mobile prompts a paradigmatic shift in planning, elevating land-use management and information

<sup>&</sup>lt;sup>4</sup> The Wellington Regional Land Transport Strategy, for example, includes in its vision that 'People will need to travel less because they have access to excellent telecommunications, local job opportunities and live closer to their main destinations for work and play.' Greater Wellington Regional Council, (2010) Wellington Regional Land Transport Strategy 2010-40. Approved September 2010. GWRC, Wellington.(p.2)

<sup>&</sup>lt;sup>5</sup> For an analysis of comparative costs of infrastructure for denser and less dense settlements, and a review of the literature on this, see Adams, M., Chapman, R. (2016) Do denser urban areas save on infrastructure? Evidence from New Zealand territorial authorities. Policy Quarterly 12, 63-70.

technologies as bona fide tools for managing traffic flows and mitigating traffic congestion. (p.16)

Put another way, asking questions about accessibility in the New Zealand context raises further, wider questions about the sort of cities New Zealanders want, and whether they would prefer a more planned and compact city or a less planned and sprawling one. Essentially, investing in new highways on the periphery of cities simply expands the footprint of the city, providing access to a wider urban periphery, rather than reducing travel time. This raises potentially uncomfortable issues about rethinking the value to society of investment in urban mobility and, more broadly, whether investing in particular sorts of mobility – especially road capacity – may create a less sustainable urban form than if more investment is made in accessibility-oriented infrastructure instead (Filion, 2015, p.636). I relate this theme to urban planning below.

A related problem is the use of the word *efficiency* in the context of transport investment. Transport gains may be expressed as efficiency, but it is all too easy to assume that transport efficiency equates with journey speed. An example is:

In areas where land use regulation promotes high-density residential development, there may be increased pressure to lower speed limits and develop pedestrian areas. This might reduce the efficiency of through routes by increasing travel time and congestion. (Webb Henderson, 2015, p.6)

As Jane Jacobs, the iconoclastic observer of urban planning and transport, has pointed out, efficiency needs to take into account not just the interests of vehicle users during the high speed portion of their trip but all residents' journey times and convenience (Jacobs, 2004). A highway through a city or a one-way road system may raise vehicle speeds but may necessitate more circuitous routes for many people to reach their destinations, and reduce the safety and convenience of delivery and access. A highway through the centre of a city (e.g. the Wellington bypass) may create ongoing severance and nuisance damages to one group of stakeholders while advantaging another. Similarly, 'dispersed suburbanism' (Filion, 2015) may have created reasonable accessibility for car travellers, but at the expense of other citizens, in particular cyclists and pedestrians. In addition, dispersed suburbanism may not even efficiently enhance agglomeration:

*Facilities that are surrounded by surface parking, and are thereby inimical to pedestrian access, do not lend themselves to the creation of economies of agglomeration.* (Filion, 2015, p.635)

In short, then, transport system investments may sometimes fail to contribute to efficiency and, in addition, may be impossible to assess in terms of net benefits (i.e. benefits less costs), given that distributional issues arise which cost-benefit analysis cannot adequately deal with (Rose-Ackerman, 2010).

Ultimately, mobility and access are social and economic goals which reflect human heterogeneity and cultural expectations. Policies therefore need to be careful about whose quality of life they enhance and whose they diminish. There are significant or major distributional implications of most transport investments and land use decisions. In other words, an important question is: 'transport and/or accessibility for whom, and for what?' This question applies particularly to major infrastructure choices such as highway investments which shape the evolution of cities over decades to centuries.

#### Digital access and mobility

New digital communication technologies such as the internet, and the network acccess it provides, are starting to change the way people feel about where they live, at a subjective level, and about how they do business and keep in touch, in an objective sense. For example, it is much easier to establish and run a global digitally based business with clients in many countries, from a base in a New Zealand city today, than it was 20 years ago.

Some futurists such as Jeremy Rifkin see the period we are entering as the 'age of access' (Rifkin, 2000). In doing so, he is underlining that: (a) the new information technology radically reduces transaction costs for the distribution of many goods, such as music, film and literature; (b) access providers and users linked through a network become 'more important than buyers and sellers'; (c) access is becoming more important than ownership (e.g. with car sharing); and (d) concepts, ideas, images and intellectual capital in general are the emerging items of value within the new economy, increaasingly dominated by cultural rather than industrial production. However, it is not clear how fast this new economy will emerge, and to what extent it will replace the more material, ownerhsipbased, largely industrial economy that is dominant today.

Working from home, for example, is becoming more feasible for many occupations, as is on-line shopping, on-line use of services such as banking. and so on. All of these digitally based practices are likely to reduce to some extent the need for the use of transport, substituting easy digital access instead. A recent Australian report noted that 'younger people are already questioning the need to own a car' due partly to the availability of improved alternative modes (Digital Australia, 2017, p.8), and this echoes a similar emerging pattern of declining car driver's licence figures among young people in New Zealand (Curran, 2014).

But it would be wise to be cautious about claims, such as those made by Digital Australia, of a 'transformational change in the transport strategy in cities, heavily influenced by the shift in consumer thinking about how they get around.' For example, they identify that among 18-34 year olds in Australia, 22% have used a ride sharing app (Digital Australia, 2017, p.38), but this may not represent a significant transport mode change as such. Its implications for access and mobility remain unclear as yet. Early research suggests that some digitally based services such as car sharing may be more suited to inner city living, but this is not likely to be widely taken up in practice for some time in New Zealand cities, and in any case is likely to be less popular in low density suburbs (Sobiecki, 2017). More sophisticated digital technologies such as use of autonomous vehicles in relatively 'controlled' environments could impact mobility and access in a variety of ways but, again, estimates of this technology being around 10-20 years away seem optimistic given the regulatory and liability issues that need to be resolved. Similarly, there is a rather breathless, uncritical tone – and arguably an undue focus on road travel – in some prognostications of an intelligent transport network, e.g.:

The real catalyst for a step change in overall mobility might come when vehicle-to-network connectivity enables modelling that frees up road capacity. Imagine a future where the network "self-solves" the minute-by-minute mobility needs of the population by guiding each journey to its destination in the most efficient and safe way. (Digital Australia, 2017, p.41)

What remains unclear, as technologies and practices evolve, is the extent to which complementary practices or changes in behaviour occur to offset some of the transport saving benefits of digital access. For example, greater working from home may cause people to locate further from the city centre in some cases, as they feel the need to travel into work less often. Also, reduced local shopping may be accompanied by more intercity or international travel for shopping (and related) activity. Automated vehicles may also encourage living further out, but this is by no means certain. More research is needed in these areas as practices develop.

## Accessibility, urban form and sustainability

I now turn to the question of how improving accessibility can be motivated by the desire to enhance the sustainability of transport and (urban) lifestyles, and how the need to reduce carbon emissions, including in the transport sector, is aligned with such a desire. I also explore how the New Zealand land use planning framework appears to be very limited in its awareness of these needs and trends, but – despite this – how change might be facilitated.

### International thinking on accessibility, land use and travel

There has been a strong growth of interest in the international literature in the question of the demand for travel on the one hand, and land use, which is closely associated with urban form, on the other. Historically, the growth in demand for travel was either viewed as a good in iself, associated as it was with urban and economic growth, or certainly not as a negative. Similarly, few disadvantages were seen in the expansion of cities, other than the increasing direct cost of extended travel and the sacrifice of some peripheral land.

But this perspective was, in retrospect, partly a reflection of the low cost of energy, and a low cost of land, at least in sparsely populated countries such as the USA, Canada, Australia and New Zealand. Typically downplayed were the costs of increasing road transport in terms of land consumption, pollution (air, water and noise), carbon emissions, accidents and even congestion where roading development led to increased traffic in city centres.

It has become clear, from both intra- and inter-city comparisons, that 'higher density, transitoriented cities have lower per-capita transport energy use' (Rickwood et al., 2008). Today, with higher energy costs and greater concerns about energy security, as well as increasing anxiety (now among a majority of New Zealanders) about transport-related emissions, there is a credible case that government policy can and should lean against over-investing in roading infrastructure as a form of transport system expansion leading to lower density urban form. This is especially the case while transport activity is still (almost everywhere in New Zealand) supported by fossil fuel combustion, and may continue to be significantly fossil fuelled over the period to 2050.<sup>6</sup> In economic terms, land transport systems are likely to have expanded too much because road use has been free at the point of consumption – consumers do not experience the full costs of road driving when they decide whether or not to 'take the car' – and, consequently, have pushed for excessive road expansion through the political process.

A new 'urban paradigm' widely advocated in Europe, for example by Banister (2011) and by the OECD (2012), emphasises *access* by walking, cycling and public transport, in cities of appropriate scale, linked in a polycentric network:

...urban forms ...would keep average trip lengths to below the thresholds required for maximum use of cycle and walk modes... [and] permit high levels of innovative services and public transport priority, so that the need to use the car would be minimised....[Through clear] planning strategies, cities would be designed at the personal scale to allow both high quality accessibility and a high quality environment. The intention is ...to design cities of such quality and at a suitable scale that people would not need to have a car. (p.1541)

Such formulations accept that an element of urban expansion may be needed in some rapidly growing cities, but argue that it should be carefully managed, with an emphasis on avoiding creating the need for long trips, and instead focusing on compactness, land use mixing, and preference given

<sup>&</sup>lt;sup>6</sup> This remains the case despite recent positive announcements in various countries about phasing out production of fossil fuel driven vehicles by 2025-2040.

to development along public transport accessible corridors and near highly public transport accessible interchanges where densities would be substantially higher.

### Accessibility and carbon emissions

The scale of the climate change problem 'has been totally underestimated' (Banister, 2011, p.1538). So has the case for reducing emissions through changes in urban form (but see Chapman, 2008; Ewing et al., 2007). However, in recent years establishment organisations such as the International Energy Agency have awoken to the link between urban form, the demand for travel, and the level of emissions, with the corollary that moving to a more sustainable urban form, especially in growing cities, can help reduce emissions:

...if urban areas grow "smartly", the demand for travel could be 10% to 20% lower than if the urban areas grow in a more haphazard manner (e.g. due to shorter trips). (IEA, 2012, p.445)

This remark reflects the IEA's emphasis on the importance of moderating energy use but, more particularly, the need to reduce  $CO_2$  emissions in order to achieve a '2 degrees of warming scenario' (2DS). The IEA has argued that transport can (and should) reduce emissons of carbon dioxide, given the urgency of the climate change problem. Notably, it does not accept the conclusion, commonly reached in New Zealand, that urban form can be set aside as a mitigation measure simply because new technologies, such as electric vehicles, will reduce emissions more cost-effectively (New Zealand Productivity Commission, 2017, p.277). Like most informed analysts today, IEA writers are aware that the urgency of carbon mitigation requires 'all hands to the pump' – evident opportunities to cut carbon should be taken.

The IEA's statement was made with an awareness of the large potential for technological change – such as the take-up of electric vehicles – to reduce fossil energy use and carbon emissions. That is, it is an assessment of the potential of urban areas to reduce emissions on top of reductions achieved through changes in technology, fuels, and other means.

Since the IEA made this statement in 2012, the mitigation goal of keeping global warming below 2 degrees of warming goal has been more explicitly articulated, and has become even more urgent, as the target of the 2015 Paris Climate Agreement. The Paris Agreement goal actually entails staying *'well* below' 2°C of warming, and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels.<sup>7</sup>

The Intergovernmental Panel on Climate Change (the IPCC) has similarly argued that improved access (physically or with ICT) can play a complementary role to better transport in reducing emissions:

Direct (tank-to-wheel) GHG emissions from passenger and freight transport can be reduced by [...inter alia] avoiding journeys where possible — by, for example, densifying urban landscapes, sourcing localized products, internet shopping, restructuring freight logistics systems, and utilizing advanced information and communication technologies (ICT)

and

<sup>&</sup>lt;sup>7</sup> This is a considerably more difficult task than aiming loosely at around 2 degrees and likely overshooting, as current global pledges are estimated to imply. According to Climate Action Tracker, the national mitigation contributions now associated with the Paris Agreement would lead to a median warming of around 2.7°C by 2100 (a full range of 2.2- 3.4°C), which means there is [only] a likely chance of holding warming below 3°C; temperature would continue to rise after 2100: Climate Action Tracker, (2015) Paris Agreement: near-term actions do not match long term purpose – but stage is set to ramp up climate action. Climate Analytics, Ecofys, PIK and New Climate Institute Berlin.

Over the medium-term (up to 2030) to long-term (to 2050 and beyond), urban (re)development and investments in new infrastructure, linked with integrated urban planning, transit-oriented development and more compact urban form that supports cycling and walking can all lead to modal shifts. Such mitigation measures could evolve to possibly reduce GHG intensity by 20 – 50% below 2010 baseline by 2050. (Sims R. et al., 2014, p.603).

There are many other analyses of urban form and transport emissions which point in the same direction. One of the most comprehensive explorations in the last five years has been the New Climate Economy initiative (Global Commission on the Economy and Climate, 2015; The Global Commission on the Economy and Climate, 2014), which has produced a number of supporting papers from LSE Cities, including analyses of urban form and economic growth, encompassing issues of accessibility (Floater et al., 2014; Rode et al., 2014). The analysis, mainly based on 40 cities, concludes in favour of compact, mixed land use cities enhancing accessibility:

...well-managed cities in high income countries could continue to concentrate national economic growth, through re-densification and the roll out of innovative infrastructure and technologies. However, poorly managed urban growth is likely to have substantial economic costs. Urban sprawl, poor public transport infrastructure and a lack of basic services... can hinder accessibility and mobility, increase air pollution and exacerbate urban poverty, reducing the economic benefits of urban concentrations and increasing costs. This growth pathway also tends to lead to unnecessary greenhouse gas emissions, social exclusion and a range of other environmental and social costs. (Floater et al., 2014, pp.1,2)

The New Climate Economy's '3C' model of a well managed city emphasises compactness, connected infrastructure and coordinated governance, where compactness in particular entails:

...managed expansion and/or urban retrofitting that encourages higher densities, contiguous development, functionally and socially mixed neighbourhoods, walkable and human-scale local urban environments, the redevelopment of existing brownfield sites and provision of green spaces.(ibid, p.2)

Usefully summing up these arguments and their significance, the Global Commission on the Economy and Climate (2014) makes the critical point that it is vital to avoid lock-in to dispersed urban form in the next few decades:

How urban planners shape urban form and long-lived infrastructure in these coming few years will largely determine whether the world gets locked into a traditional model... or moves onto a better path, with more compact, connected and liveable cities, greater productivity and reduced climate risk. (p.41).

#### Accessibility, land use planning and health

As well as having impacts on carbon emissions, land use planning which accommodates urban expansion is likely to lead to negative *health* effects, largely through discouraging walking and cycling in favour of the sedentary act of driving or travelling as a car passenger, and more passive time spent in vehicles, leaving less time for physical activity. UK researcher Barton asserts that 'many studies show an unequivocal relationship between accessibility (in terms of time and distance) to local facilities, and the propensity to walk (Barton, 2009).

More recently, the UN Sustainable Development Goals emphasise the interaction between transport, accessibility and urban sustainability and resilience (Nilsson et al., 2017). Goal 11 of the SDGs is 'Resilient Cities.', and the following text summarises just one interaction between transport

(as an important aspect of cities) and health and well-being (SDG 3), with an associated policy option for addressing this interaction (Howden-Chapman et al., 2017, p.109):

Key interaction: Compact cities with well designed public transport, cycling and walking networks enable reduced car use and contribute to reductions in carbon emissions and reduce exposure to air pollution.

Policy option: Promote policies for compact, accessible mixed-land use urban development in order to reduce car dependence and carbon intensity of urban transport and encourage physical activity.

When New Zealand once more focuses on the very large cost implications of sedentary lifestyles and obesity, and starts to reframe policies to address these health consequences through purposeful urban land use and transport planning, we can expect that addressing the interactions between urban accessibility and health will start to generate valuable health and well-being benefits (Newman and Matan, 2012; WHO, 2011).

#### Accessibility in land use planning in New Zealand

A significant question I now address is how and to what extent the concept of accessibility is built into New Zealand's land use planning system. Essentially, accessibility is under-developed as a notion within the legislation, with a consequence that central government, sometimes with the support but more often against the opposition of local government planners, has made a problematic choice to expand cities as the preferred 'solution' to urban development, including to meet the need for housing. It is likely that many planners in New Zealand's larger cities would have preferred to focus on accessibility and sustainability.

To begin with, accessibility itself is not evident in any aspect of the legislation (the Resource Management Act 1991) guiding land use planning in New Zealand. The term simply does not show up meaningfully in that law, although it did make a debut recently in the preamble to a National Policy Statement (NPS) under the RMA on Urban Development Capacity (Minister for the Environment, 2016, p.3). By contrast, there are various cross-references in the RMA to transport and the Land Transport Management and Maritime Transport Acts. There is no hint, except in the NPS, that enhanced access might be provided by land use planning itself as opposed to transport. This suggests that the notion that accessibility is a possible goal of urban (or other land use) planning was a minority view among the drafters and subsequent administrators of the RMA. It is likely that transport was seen as essentially the (only) realistic means of providing access, given what was known about New Zealanders' housing, neighbourhood and transport preferences, and that shaping urban form so as to favour accessibility, rather than relying only on mobility, was an idea that has gained currency only well after the RMA came into effect.

However, the lack of focus on accessibility in the RMA does not mean that there has been no interest at all in providing enhanced land use accessibility within planning processes in New Zealand. Instead, this goal has been expressed in other ways, especially more recently. A notable example is the Auckland Spatial Plan. In the development of that (non-statutory) Plan, central government engaged actively with Auckland Council, noting that labour market accessibility was an important concern related to urban form, and that 'Auckland's growth [had] compromised accessibility' (Government of New Zealand, 2011 (March), p.2). The Plan itself adopted a 'well connected and accessible Auckland' as one of seven desired outcomes. It attempted to achieve its liveable city

vision through measures which included 'increasing the proportion of people living within walking distance of frequent public transport'.<sup>8</sup>

However, much of the plan (especially the desire for 70% of development to occur as infill, with 30% greenfield development) ran against the inclinations of central government and significant local interests in status quo land use policies. Imran and Pearce (2015) point to a conflict between its agenda and central government's, together with factors such as flaws in process, weak land use policies and giving public transport projects lower priority than catch-up roading projects. The subsequent development of the Unitary Plan placed considerable weight on residential development at well connected transport nodes, in the face of significant local resistance to intensification in a number of parts of Auckland.<sup>9</sup>

While accessibility is a concern of local planners, and to a limited extent is reflected in quiet corners of statutory documents such as Greater Wellington's Regional Policy Statement<sup>10</sup>, it is perhaps paradoxical that councils such as Auckland Council and Wellington City Council cannot advance it easily, given the constraints embedded in the RMA. The RMA is essentially permissive – it gives individuals and local communities considerable autonomy to do what they wish, even to ignore high level strategic goals of the wider community, subject only to meeting the regulatory constraints under the Act, and its bottom lines set out in s.5, which essentially emphasise avoiding, remedying or mitigating (local) adverse effects. In this respect, the RMA operates not as outcome driven but local interest driven, more aligned with the market and immediately affected communities, rather than driven by broader planning outcomes, or aspirations such as enhanced accessibility. Thus, when a council seeks to shape its district's development in a particular direction, such as to emphasise sustainable transport, it is likely to struggle to deal with, let alone overcome, the individual, local community and local business interests and preferences validated under the Act.

This is evident, for example, in strategic land management planning initiatives such as the development of the Porirua Northern Growth Area. Despite Porirua City Council articulating a high level set of structure plan outcomes centring around 'sustainable, integrated, and coordinated urban and rural development' (Reid, 2015, p.61), the RMA based process led inexorably towards a private vehicle-intensive sprawling suburban outcome. This effectively excluded the option of public transport-oriented development that would give access to Wellington through exploiting Porirua's existing rail link, in favour of a car-oriented subdivision pattern strung along State Highway One, an outcome more consistent with the interests of existing residents, and land developers who had already made land banking investments (Reid, 2015).

In practice, the RMA tends to operate in a way which, while not explicitly aligned with sprawling urban development patterns in New Zealand, nevertheless tends in practice to favour an extensive (status quo) form of development.<sup>11</sup> My reading is that this is due largely to its emphasis on private property 'rights' – a socially constructed institution – supported by an implicit belief in the 'wisdom'

<sup>&</sup>lt;sup>8</sup> The Local Government Act 2002 (s11A) includes pubic transport services provision as a core council function.
<sup>9</sup> Interestingly, in the several years during which the Auckland Unitary Plan proceeded to finality, there was a notable softening in the Government's emphasis on greenfield expansion. It now appears more disposed to controlled urban intensification.
<sup>10</sup> See Objective 22 of chapter 3 of GWRC (2013) Regional Policy Statement for the Wellington region.

<sup>&</sup>lt;sup>10</sup> See Objective 22 of chapter 3 of GWRC (2013) Regional Policy Statement for the Wellington region. Wellington: Greater Wellington Regional Council, <u>http://www.gw.govt.nz/assets/Plans--Publications/Regional-Policy-Statement/RPS-Full-Document.pdf</u>

<sup>&</sup>lt;sup>11</sup> While the 2017 National Policy Statement on urban development capacity acknowledges that cities need to go up as well as out, it does not address the reality that outward development tends to be easier than intensification given the multiple barriers to the latter, and the facilitation of sprawl by highway building.

of markets, rather than collective strategic planning goals, combined with the political leverage of local interest groups resisting intensification within cities.<sup>12</sup>

Some commentators have asserted that a risk of land use planning has been the 'driving of investment policy...by an overly narrow environmental perspective.' (Webb Henderson, 2015, p.3). This in my view is a misreading of what urban planners have sought to do, which arguably has been to give balanced consideration to meeting the desires and needs of community stakeholder interests, and the binding constraints of the RMA, including the bottom lines of Part 2 of the Act (including local environmental protection). But planners have in practice often failed to protect the environment or the long-term broader community interest when it comes to land use planning because the cumulative adverse effects of widespread peripheral urban sprawl, including its damaging effects on health and the environment (as mentioned above), have not been overwhelmingly clear until the path of development has been locked in. This problem has largely derived from the nature of the RMA.<sup>13</sup>

In principle, if accessibility was clearly privileged in urban land use planning at a regional or national level, within the framework of the RMA, for example through an explicit National Policy Statement focused around improving accessibility, then not only would RMA planners have to take it more clearly into account but transport decision makers would also have to take it into account in their actions under the Land Transport Management Act (LTMA). The LTMA requires that NZTA's national land transport programe and regional transport committees take into account any regional (or national) policy statements or plans.<sup>14</sup> But given the lack of focus on accessibility at present under the RMA, it is possible that a half hearted attempt to emphasise it could be legally challenged. This suggests that a substantive review of this aspect of the RMA would be more fruitful.

Whatever changes are made to recognise accessibility as a goal, and whatever the encouragement to intensification and land use flexibility that can be embodied in the RMA and district plans, it has to be acknowledged that significant changes to urban intensity and land use mix may take decades to realise (Chapman, 2008, p.94). This does not mean, however, that these changes are not worth making.

## The New Zealand debate over planning and urban land use

In New Zealand, refreshed attention has been given to the debate over planning, urban form and transport system investment with the Productivity Commission's work (Chapman and Dodge, 2016; NZPC, 2017). This debate has arisen partly because of a need to ensure an adequate housing supply, but it also recognises urgent concerns such as climate change mitigation (MfE, 2016, p.31). While this debate has focussed on infrastructure and housing supply, it has also touched on the questions of mobility and accessibility.

The Productivity Commission justifiably notes that planning policies have constrained access to housing and jobs in both Australian and New Zealand cities:

<sup>&</sup>lt;sup>12</sup> My thanks to Ian Stewart for the observation that a difficulty for intensification is that New Zealand's existing housing patterns together with a general market preference for stand-alone single storey dwellings mean that many existing titles will not accommodate an additional dwelling and still comply with current rules around matters such as set-backs and parking.

<sup>&</sup>lt;sup>13</sup> It is not clear whether the 2005 amendment to the RMA (s.30) focusing on requiring regional councils to be 'responsible for the strategic integration of infrastructure with land use through objectives, policies and methods' is having much effect.

<sup>&</sup>lt;sup>14</sup> See sections 14 and 19B.

The high price of housing in Australian cities is due to land-use policies that prevent intensification of the historic suburbs surrounding the city centre. Intensification in these suburbs would increase the supply of housing closer into the CBD, lower prices and provide access to more productive jobs in the CBD. Auckland faces a similar problem. (p. 34).

At the same time, the Commission notes that New Zealand cities have struggled to attain the more compact form that they seek, and largely ascribes this to existing property owners opposing intensification, and traditional public preference for larger, stand alone houses away from the city centre.<sup>15</sup> They underemphasise, in my view, the role of transport arterial construction which has encouraged sprawl, and the planning controls imposed under district plans which have limited intensification and land use mixing.

The Commission's prescriptions place weight on an unfettered market in land development. For example, in discussing access to employment opportunities, it argues that 'land use regulation can contribute by minimising barriers to development in established suburbs and areas close to existing transport networks.' (p.208). There is merit in this, when some prescriptive types of regulation such as height limits, setbacks and minimum parking requirements are considered.<sup>16</sup> Nevertheless, wholesale deregulation is problematic for a number of reasons, including where communities are not able to strategically influence their pattern of development in the face of developer pressure which risks significantly reducing amenity.<sup>17</sup>

A better solution – much as the Auckland Unitary Plan is attempting – is likely to be to relax planning constraints on intensification around urban transport nodes and along public transport corridors, and allow greater land use mixing in such locations, while at the same time discouraging or limiting the outward development that will increase car dependency. The Commission argues against prescriptive constraints, but the end result of such a stance could well be an urban area with a very sprawling form and a high level of land consumption, in which access is limited (especially for those on low incomes) by the large travel distances involved, and by the likely high levels of congestion associated with the motor vehicle based transport system supporting it (Cervero, 2011, p.10).

## Seeing accessibility in terms of an urban system

A final important and connected theme of this paper is that while improving accessibility is one goal of an urban system, this goal needs to be approached with realism: it is only one goal nested within a network of linked goals, each of which is (politically) contested. Mobility must remain a goal, for example, alongside accessibility: the question is not one of accessibility replacing mobility, but of reaching a more acceptable and sustainable mix.

Cities are complex systems, and accordingly have multiple objectives sought by multiple stakeholders who interact in complex ways as cities evolve (Chapman et al., 2016). Some

 <sup>&</sup>lt;sup>15</sup> For an exploration of household preferences and how they are changing, see Howden-Chapman, P., Hamer-Adams, A., Randal, E., Chapman, R., Salmon, G., (2015) A Survey of Sentiments about Cities, in: Early, L.,
 Howden-Chapman, P., Russell, M. (Eds.), Drivers of Urban Change. Steele Roberts Aotearoa, Wellington.
 <sup>16</sup> For example, setback requirements have inhibited the development of perimeter block design in our cities, although a 2017 RMA amendment may prove valuable in allowing neighbours to contract out of setback constraints: <a href="https://www.greaterauckland.org.nz/2017/08/29/legalising-perimeter-block-housing/">https://www.greaterauckland.org.nz/2017/08/29/legalising-perimeter-block-housing/</a>. And height limits are one form of restriction that appears to contribute to the increasing costs of housing in New Zealand cities: see Lees, K., (2017) Quantifying the impact of land use regulation: Evidence from New Zealand. Report for Superu, Ministerial Social Sector Research Fund. Sense Partners and Superu, Wellington.

<sup>&</sup>lt;sup>17</sup> The flooding of Houston in 2017 represents an example of the problems arising with very light regulation of the land market, allowing residential building in 100-year flood zones, for instance.

stakeholders may seek a quiet suburban life, others may see office development as their goal, while others may be concerned with a more dynamic and diverse residential neighbourhood. One implication is that some stakeholders will resist change as the city develops – they may behave in such a way as to frustrate improved accessibility to centrally located amenities, for example, as the demand for housing grows. The Independent Hearings Panel on Auckland's Unitary Plan heard much from those opposing intensification of some suburbs, while others sought to permit this intensification, particularly at transport nodes and on key corridors. In this respect, the interests of a prosperous middle class set of aging baby boomers with preferences for car based mobility even within the central city may conflict with the interests of younger groups wanting access to reasonably priced, more centrally located amenities, within a city environment favouring active and public transport.

Accordingly, much urban planning and the work of local government is about conflict resolution, some of which relates to access. For example, a district plan may seek to maintain local prosperity and dynamism while also providing for social inclusion and equality of opportunity across the community. But in parts of several large or rapidly growing New Zealand cities, including Auckland and Queenstown, communities are become increasingly segregated and stratified by income, with implications for accessibility, transport costs and mode choices, employment and inclusion (McKim, 2014; Morrison, 2011). As more low paid service workers are relegated to outer suburbs and less desirable areas (including areas with more physical risks such as flooding), we can expect to see significant long-term challenges associated with maintaining reasonable equity in accessibility.

In considering how cities evolve as systems, it is necessary to view transport and land use as a twoway interaction, with incipient land use changes justifying additional transport investments, and transport infrastructure leading to changes in land use (Dravitzki et al., 2010). In a systems sense, this interaction involves strong balancing or reinforcing feedbacks. Governments (central and local) can influence the direction of change, but they are far from the only actors – for example, the business sector (including land developers) and society (and not just those participating formally) also exert major influence. The development of a city reflects interactions between government, business and other stakeholders, and many of these stakeholders have interests which are slow to change, as already noted. These interests are reflected in patterns of investment in transport infrastructure and particular land uses which have been laid down over decades, so that a high degree of path dependency and capital lock-in charactertises urban form. Consequently, as urban development and governance play out over time, in a co-evolutionary way, change becomes more costly – making it even more vital that, at moments of strategic spatial planning, the planners make wise calls.

It is also wise to be cautious in assuming that single policies or interventions can succeed in delivering enhanced accessibility outcomes. In practice, the behaviour of diverse urban players is too non-linear, and the incentives and pressures are too diverse to generate simple, predictable outcomes. A more realistic stance is that only incremental progress is likely to be made, and that solutions, specifically those involving changes in land use and transport infrastructure, or technology, are likely to have to be incremental, as well as creative, experimental and adaptive.

Adaptive management has particular merits given two things: first that technological and social change is to a great extent uncertain or unpredictable; and seond, that urban development decisions are essentially irreversible. For example, once a decision is made to expand a city at the periphery, the land conversion involved is irreversible – in practice, it cannot be reconverted to rural land or market gardens. The alternative course, of intensification, is relatively speaking reversible: a later decision could if necessary be made to depart from intensification and instead develop at the periphery. Under adaptive management, or 'real options' analysis, reversible decisions are generally preferred in a situation of uncertainty: the better strategy is generally to take a more adaptable course, and to reconsider options once better information, for example on urban transport

technologies or demographic change, and system performance, can be brought to the table. The other key aspect of adaptive management is not to focus in the planning stages on a 'most likely' future but to find an approach that is acceptably robust across a range of alternative futures (Marchau et al., 2008).

The context, as noted above, is that urban system governance in New Zealand, as in most western countries, is currently attempting to steer towards sustainability and greater resilience, under pressure from voters concerned about environment degradation, social stress, and housing affordability, not to mention economic competitiveness (Chapman et al., 2016). So there is a balance to be struck, which acknowledges the strong need for change, but is realistic enough to accept that it will be incremental. In Geels' terms (Geels et al., 2015), most actors within the New Zealand political constituency appear to favour something short of revolutionary change.

Geels' analysis is that the direction of change in most rich world urban systems appears to be largely a contest between those who emphasise technological change ('reformists') and those who emphasise the potential for incremental and reflexive but a reasonably rapid transition towards greater sustainability (supporters of 'reconfiguration'). Geels and colleagues argue that bringing about reconfiguration probably requires a new policy style which is 'self-consciously experimentalist ...and adaptive in the face of unpredictable dynamics and unintended consequences.'(Geels et al., 2015, p.9)

One interesting example of experimentation in leading western cities is the intention to make parts of these cities car-free, mainly focusing on the reduction of private car use and promotion of active travel in city centres (Nieuwenhuijsen and Khreis, 2016). Other aims include reduction in air pollution, noise, and temperatures, but also reductions in space needed for carparking, and increases in inner city living, with better access to local green space. The value of health benefits from active travel is particularly salient (Lee et al., 2012). As these experiments play out, effects on domains such as motor vehicle traffic densities and flows, and the nature and location of employment activity, will be important to assess.

Alongside car-free areas, it seems likely that many cities will be experimenting with change in a number of mobility and accessbility related policy measures, such as congestion charges, and planning changes to allow more land use mixing and intensification.<sup>18</sup> An example of such experimentation is that in Seoul, Korea, where an inner city motorway was removed, lifting property values and causing traffic to 'vanish'. According to Robert Cervero,

...property markets placed a higher premium on neighborhood quality, livability, and public amenities than mobility or swiftness of movement. Seoul's experience also demonstrate that the withdrawal of road capacity matched by stepped-up public-transport services can yield net welfare benefits. (Cervero, 2011, p.10)

<sup>&</sup>lt;sup>18</sup> Geels et al (p.6) point to: the following changes within a reconfiguration context: '...a transition

towards a reconfigured system with the following elements (Banister, 2008; Geels, 2012; Spurling and McMeekin, 2015): (a) cars with alternative power sources (battery-electric vehicles, biofuels, hydrogen fuel cells), (b) new fuel or charging infrastructures, (c) congestion charges in urban settings and tolls for motorways, which would privatize road access, (d) reduced car use, because of high oil prices (e.g. Peak oil), high carbon taxes, congestion charges and parking tariffs, (e) changes in vehicle ownership (as this becomes more expensive) towards car sharing, car-rental and car-pooling schemes, (f) modal shift towards trains, trams, buses and cycling, (g) more developed public transport modes can eventually be linked into integrated transport systems with better modal connections.

## Conclusion

In this 'thinkpiece', I have examined access from various angles, and considered how fertile a concept it is in considering the urban environment today and in future. I conclude that thinking in terms of accessibility rather than mobility can help significantly in realising a city that delivers what many people want, in terms of environmentally sustainable access to jobs, amenities and a quality lifestyle, while increasingly freeing them from dependency on the private motor vehicle. Rapidly developing innovations such as digital access, and aspects of the sharing economy, may well help.<sup>19</sup>

Nevertheless, we should not be naïve in how we envisage the future of our cities. As just noted, cities and their embedded infrastructure and habits evolve slowly and in complex, non-linear ways, and urban political change is unpredictable. There are certainly strong forces maintaining the status quo. At the same time, our cities – and indeed our nations – are in a race against time to adapt our ways of life to a pattern that is more environmentally sustainable (Chapman, 2015).

Writers such as Conlon et al. (2011) argue that the way (and extent to which) cities have adapted in past decades shows that they can and may adapt at a similar pace in future. They see the necessary changes in cities as a 'rapid evolution [that] must increase affordable housing choices, availability of jobs, transportation options, and, ultimately, community quality.' (Conlon et al., 2011, p.46) Reid Ewing tells a similar story of steady urban reconfiguration and adaptation in *Growing Cooler* (Ewing et al., 2007). So we can have some optimism that cities can change to be both more sustainable and at the same time maintain a good quality of life, including reasonable accessibility for citizens in future decades, even if that process will probably be incremental.

Incremental urban transformation will require changes to our planning and land use regulatory system to support accessibility, as well as adaptiveness and sustainability. Technology change will likely take care of mobility – it is not clear we need to worry about more of it. In terms of necessary regulatory change, further efforts to integrate transport and urban planning through changes to the relevant legislation should be considered, principally to support intensification and land use mixing, critical ingredients for future cities. In addition, change is needed in my view to allow elected members of local government and planners increased powers to pursue in a purposeful way improvements to the urban built environment in the public interest, while not giving them carte blanche to override widely accepted private property conventions. The exact nature of what urban development agency powers are necessary is an important one, but is beyond the scope of this paper to consider.

The future of the sustainable, accessible, creative city is one in which there is priority for walking and cycling, a concentration of development around public transport accessible locations and therefore a reduced need to travel (particularly by car), together with quality housing that provides easy access to jobs, local services and facilities, so that people who must travel do not need to go excessively long distances. This vision requires us to be discriminating in how we regulate land use – there is a good case for regulation to help provide public goods (including public transport) and support the public realm, but a weak case for other sorts of regulation (such as minimum parking requirements).<sup>20</sup> Lastly, we have to see the city as an evolving arena where there is scope for

<sup>&</sup>lt;sup>19</sup> The take-up of electric vehicles may assist this trend, through reduced noise and air pollution in inner city areas increasing the attraction of living in such areas, which are of course more generally 'accessible'.

<sup>&</sup>lt;sup>20</sup> An IEA report on cities has stated: 'There are various ways to improve urban transport energy efficiency. For example, cities with high private vehicle travel activity can promote shifts to non-motorised transport (*e.g.* bicycles and walking) and public transport modes. They can also require higher vehicle fuel-economy standards

community experimentation as we incrementally shift away from car dependence, and try out different ways to increase and enhance city centre living and active travel.

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