Why Isn't Australia a Cycling Mecca?

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Abstract

In theory, Australian cities are ideal for cycling. In view of their high potential, this study seeks to answer "why Australia is not a cycling mecca." This is an issue of importance in the current era of grave concern about climate change. The authors have sought input from professionals working in government and non-government organisations across five of the largest state capitals (Sydney, Melbourne, Brisbane, Perth, and Adelaide). The conceptual framework which guided the research considers the role of ideas, interests, and institutions in facilitating or preventing policy change in favour of cycling. In addition to identifying barriers, the study provides a set of recommendations on how to overcome those barriers.

Keywords: Cycling; Australian cities; barriers; ideas, interests, and institutions.

1. Introduction

The social benefits of cycling are many and well-documented (UN Environment 2016). Were cycling as widespread in Australia as in north-western Europe, health savings would amount to $227 million per annum; traffic congestion costs would be reduced by 64 million per annum, and reductions in greenhouse gas emissions would equate $9 million. These measurable benefits would be matched by intangible but as important gains in urban liveability (Bauman et al. 2008; Gatersleben and Haddad 2010; Garrard et al. 2012).

In theory, Australian cities are ideal for cycling. They have stable governments, substantial public resources, and increasingly health-conscious residents who tend to enjoy sports and the outdoors. While a few cities, such as Brisbane and Sydney are hilly, the topography barrier could be easily overcome through the use of electric bicycles. Australian city climates are very mild during most of the year – although cities do suffer from one or more heatwaves during summers, which preclude cycling for a few days. (Heatwaves are directly related to excessive driving and widespread use of concrete road pavement.)

Notwithstanding this high potential, in large cities bicycle travel does not capture a significant share of the daily trips in comparison to European counterparts. Overall,

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bicycle travel accounts for only 1% of daily trips. While urban sprawl, low densities, and land-use segregation might be largely responsible for low cycling rates in outer suburbs, inner cities have relatively low cycling rates too (Pojani et al. 2018a). Cycling is primarily viewed as a recreational activity. Moreover, those who engage in utilitarian cycling often belong in a niche group labelled "Lycra cyclist" in local parlance (Rissel et al. 2010; Pucher et al. 2011).

By contrast, in cold and rainy Netherlands and Denmark bicycle trip shares reach 27% and 18% respectively (Pucher et al. 2011). In those countries cycling is considered normal, and cyclists are not perceived as unusual or special in any way. Cycling infrastructure is awarded the same level of attention as other types of public services including water and electricity supply (Lovejoy and Handy 2012; Pucher and Buehler 2008; Tranter 2012).

Why Australian cities are not a cycling mecca - in the manner of Amsterdam or Copenhagen? This study seeks to answer this question, which is important in the current era of grave concern about climate change. The ultimate objective of the study is to compile a set of recommendations on how to overcome the barriers that have prevented Australia from becoming a world leader in urban cycling. So far, the discourse on barriers to utilitarian bicycle travel has been generated mainly from the users' perspective, and has centred on obstacles - both real and perceived - related to the natural and built environment. The effect of topography, weather, infrastructure, land-use, socio-economics and psychology has been studied in depth (Bauman et al. 2008; Daley and Rissel 2011; Koglin and Rye 2014).

While the perspective of cyclists is invaluable, there is little to be done from the bottom up to implement international best practice and to improve cycling conditions in cities – a few "guerrilla urbanism" attempts notwithstanding. If bicycle travel is to become a widespread form of transport, the discourse must include institutions, in particular local and state governments (Farla et al. 2010; Stough and Rietveld 2005; Banister 2005). To answer the research question, the authors sought input from professionals working in government and non-government organisations across five of the largest state capital cities in Australia (Sydney, Melbourne, Brisbane, Perth, and Adelaide).

The article is organised into five main sections. The first section provides an overview of the factors that are known to affect cycling rates. The second section sets forth the conceptual framework which guided the research. It discusses the role of ideas, interests, and institutions in facilitating or preventing policy change. The following sections introduce the case study settings and outline the study method, which employs a qualitative approach. The fifth section deals with the outcomes of the research, discussing identified barriers to cycling as a transport mode, whereas the reminder of the article proposes some strategies to overcome those barriers. It is likely that the findings of this study are not unique to Australian cities but apply in similar contexts, including much of the UK and the US.

2. Literature review: Factors affecting cycling

The following overview considers natural and built environment factors, socio-economic contexts, and psychological factors.

2.1 Natural environment factors and cycling

<u>Climate and weather</u>. The transport-weather relationship is complex, wherein inclement conditions can induce re-scheduling, re-routing, and cancellation (De Palma and Rochat 1999; Sabir et al. 2010; Cools, et al. 2010; Zanni and Ryley 2017; Miranda-Moreno and Nosal 2011). Cities with distinct seasons see major variations in cycling rates between summer and winter, with fewer people cycling during the colder and darker months. Temperature variations have an effect too, in particular among recreational cyclists with choice – although sensitivity to weather varies among regions. Both excessively high and excessively low temperatures deter cycling (Pucher and Buehler 2006; Brandenburg 2007). But generally, cyclists perceive cold temperatures to be more unpleasant than hot temperatures (Heinen et al. 2010; Nankervis 1999). The 'ideal' cycling temperature range is between 17°C and 33°C – although in cities with continental climates cycling occurs in much wider temperature ranges, e.g., -4°C to 40°C (Heinen et al. 2010; de Chardon 2017; Brandenburg 2007). More days of freezing temperatures per year are associated with lower levels of utilitarian cycling (Winters et al. 2007). Precipitation – rain and/or snow, or even the chance of precipitation – is among the most negative weather aspects, especially among women, recreational cyclists, and commuters who cycle in winter (Nosal and Miranda-Moreno 2012; Heinen et al. 2010; Winters et al. 2007; Nankervis 1999; Gebhart and Noland 2014; Corcoran et al. 2014). Strong wind and humidity are also deterrents to cycling (Rietveld and Daniel 2004; Nankervis 1999; de Chardon 2017; Corcoran et al. 2014).

<u>Topography</u>. Hilliness has a negative effect on cycling rates, especially among inexperienced cyclists (Heinen et al. 2010; Rietveld and Daniel 2004; Mateo-Babiano et al. 2016). Cyclists tend to choose routes to avoid steep gradients. Topography uninterrupted by harbours, bays, and rivers favours cycling by enabling more direct routes (Pucher et al. 2011; Vandenbulcke et al. 2011).

2.2 Built environment factors and cycling

<u>Infrastructure</u>. The availability and quality of cycling infrastructure is a determining factor in cycling rates – especially among women, children, and inexperienced cyclists (Krizek et al. 2009; Dill and Carr 2003; Nelson and Allen 1997; Mateo-Babiano et al. 2016). Cyclists prefer higher levels of separation from other traffic. For example, continuous and segregated paths are preferred to (patchy) curb side lanes, and their presence leads to higher cycling rates - which, in turn, support the construction of more cycling infrastructure (Dill and Carr 2003; Nelson and Allen 1997; Pucher et al. 2010; Pucher and Buehler 2006; de Chardon 2017; Vandenbulcke et al. 2011). One cross-sectional study of 43 UQ cities found that each additional mile of bicycle lane per square mile was associated with an increase of approximately 1% in the share of cycling commuters (Dill and Carr 2003). Narrower roads with fewer crossings and more pavement markings such as coloured lanes and bike boxes (advanced stop lines) are also preferred (Pucher et al. 2010; Reynolds et al. 2009). Separation from vehicular traffic, especially on major roads with higher traffic intensity and on intersections or roundabouts, imparts much higher levels of safety, both objectively and subjectively (Heinen et al. 2010; Reynolds et al. 2009; Krizek et al. 2009; Pucher and Buehler 2006). In addition to 'hard' cycling infrastructure, there is some evidence that visually appealing urban settings attract higher cycling rates (Heinen et al. 2010).

Mixed-uses. Generally, smaller distances between destinations result in higher shares of cycling as a commute mode, and regular cyclists tend to live closer to their work than other types of commuters (Heinen et al. 2010). The maximum acceptable distance varies by place and by gender (with women willing to cycle shorter distances than men). But generally, there is a strong market for trips less than 2.5 km and cycling rates decline after about 4 km (Krizek et al. 2009). Given that distance is a key factor, cycling rates are higher in (a) smaller and medium-sized cities, (b) cities with denser population and street network patterns, (c) inner city areas, as opposed to suburbs, and (d) fine-grained neighbourhoods (Heinen et al. 2010; Pucher and Buehler 2006; Pucher et al. 2011; Vandenbulcke et al. 2011; Saelens et al. 2003).

2.3 Socio-economic and psychological factors affecting cycling

Cycling rates are affected by a host of socio-economic characteristics, household structures, and urban composition (e.g., a high percentage of college students). In terms of gender, women are known to cycle less than men. The role of ethnicity is mixed: while individuals from impoverished minority groups might be forced to cycle because they lack car access, 'hip' white youth are increasingly adopting cycling as a lifestyle statement. Cycling is also affected by subjective attitudes and perceptions, social norms and cultural traditions, image and identity, habits and routines, physical fitness, security from crime, and traffic law enforcement levels (Willis et al. 2015; Heinen et al. 2010; Pucher and Buehler 2006; Pucher et al. 2010).

3. Conceptual framework: Ideas, interests, and institutions

As seen, many of the issues identified through the literature review above (such as weather, hilliness, and perceptions) are outside the purview of the public sector. Therefore, the authors have adopted a different conceptual framework, which considers the role of ideology, institutions, and interested in cycling policy. This conceptual framework has been adapted from an existing study (Pojani and Stead 2014). It is comprehensive and has been used extensively to explain how and why public policy is born, shaped, and transformed over time. In designing the present study, the authors found that this framework lent itself well to the systematic study of cycling policy. Ideas, interests, and institutions - the so-called 3Is - are discussed briefly below. In the interest of brevity, the original sources employed by Pojani and Stead (2014) to construct the framework have not been repeated here. The framework is graphically illustrated in Fig. 1.

3.1 Ideas

The role of ideas in affecting policy making and propelling the course of events re-emerged in the 1990s. This was due to novel features of policy making, including a focus on efficiency, credibility, and technocracy. The term "ideas" encompasses "norms" at a higher level of abstraction and "programs" at a lower level of abstraction. Norms (also called "paradigms" or "worldviews") are taken-for-granted values, attitudes, assumptions, and identities that policy makers have themselves, or presume the public will share (e.g., environmentalism, sustainability, individualism, globalism,

and equity). Norms provide an overarching understanding of how the world works. They vary significantly across countries and yield nationally-specific policy responses to common problems. Norms might be so solidly entrenched in the collective psyche that they override the self-interests of policy makers. They are difficult to break even when clearly ineffective. By contrast, programs are precise guidelines that specify how to solve particular policy problems, based on well-established norms. Examples in planning include zoning, pedestrianization, car-sharing, and "New Urbanism." According to some views, programs expressed in the simplest, clearest, easiest-to-understand, and strongest terms are the most likely to be implemented. Another position is that programs providing focal points around which policy makers can most easily build political coalitions are those more likely to be adopted (Pojani and Stead 2014).

3.2 Interests

While "rational" policy analysis is currently en vogue in advanced capitalist societies, policy scholars of every persuasion still agree that the pursuit of self-interest and group competition are pivotal in determining particular planning policy trajectories. Among the issues that are commonly perceived as deserving attention, the "agenda" is a list of items explicitly up for the active and serious consideration of authoritative decision makers. Groups must fiercely compete to gain and maintain space on this agenda, and to keep competing issues off it. In planning, some of the typical stakeholders who strive for attention include developers, landowners, construction companies, local residents, small business owners, transport companies, advocacy coalitions (e.g. environmentalists or the road lobby), and NGOs (i.e. representing cyclists). Generally, more powerful groups are in a better position to advance their problems on the agenda. Less powerful groups tend to be underrepresented and often remain quiescent. Power depends in large part on resources, but also on the ability to form coalitions, achieve visibility, persuade the public and the media, and induce mass sympathy for a certain cause. The status of the actors acting as "ambassadors" of certain issues (e.g., key politicians or experts with an authoritative claim to knowledge) affects the agenda setting (Pojani and Stead 2014).

3.3 Institutions

Institutions are the formal or informal procedures, routines, and conventions embedded in the organizational structure of the polity or the economy. More generally, they are socially devised constraints that filter ideas and shape the interaction of interest groups. The role and type of institutions in a city or country can be instrumental in influencing decision-making. However, there are at least three distinct analytical approaches that seek to elucidate the exact role of institutions in the determination of public policy outcomes. These include rational choice institutionalism, historical institutionalism, and sociological institutionalism. Rational choice institutionalism stems from the notion that particular institutions exist because they are the most efficient for the task at hand. Historical institutionalism supposes that institutions are embedded in the political landscape and that they are likely to persist over time and push development along a set of "paths." Sociological institutionalism assumes a world of institutions seeking to define and express their identity in socially and culturally appropriate ways, which enhance the legitimacy of the organization and its participants. In the case of urban planning research, historical and sociological institutionalisms are

the most relevant because these disciplines are strongly rooted in the contexts in which they operate. Cultural phenomena, habits, and traditions can help explain why cycling in some countries is more established and commands more resources (Pojani and Stead 2014).
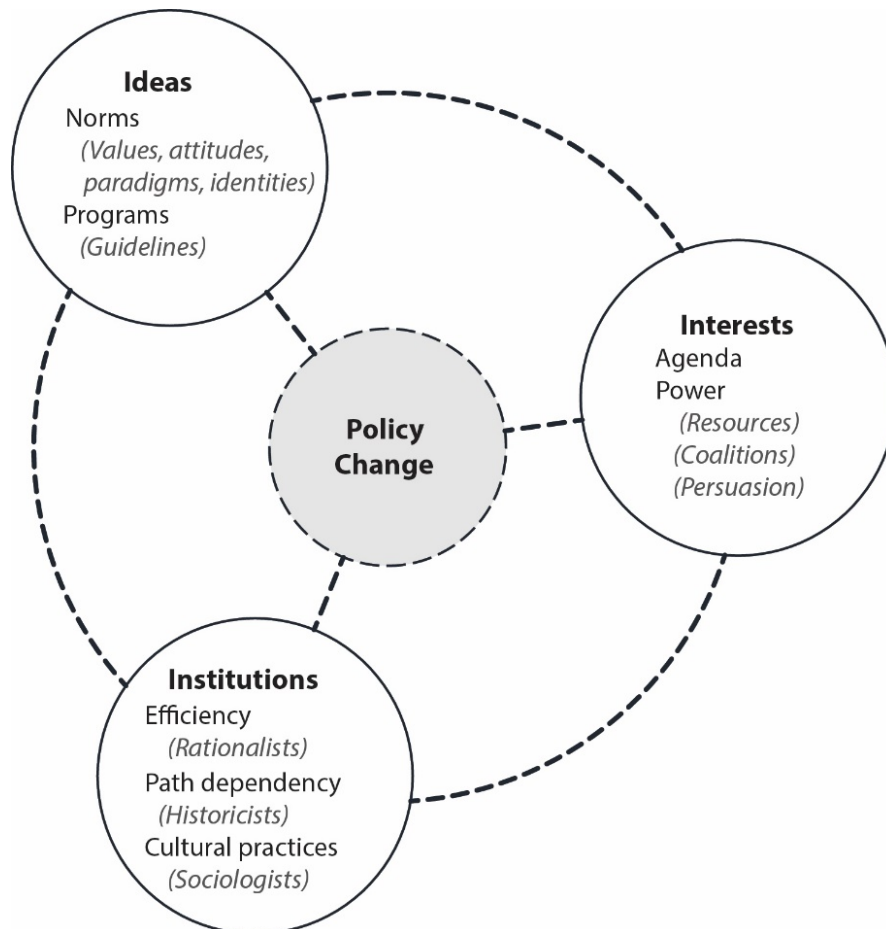

Figure 1: Theoretical framework.
Source: Adapted from Pojani and Stead (2014).

4. Case studies

This study focuses on the inner cities of the five largest state capitals in Australia: Sydney, Melbourne, Brisbane, Perth, and Adelaide. This choice was intentional: larger cities (and metropolitan regions) have much more dense and complex car traffic patterns and institutions which may hinder cycling, while bicycle use is arguably easier in smaller towns even where specialized infrastructure and institutional support are absent. At the same time, a focus on entire metropolitan areas is not realistic in Australia's context of low-density urban sprawl. At the metropolitan level, cycling rates are minuscule (Pojani et al. 2018a). However, the selected inner cities are large enough in terms of area size and population to warrant detailed study. The available data on the case studies is reported in Table 1.

Overall, the five capitals have relatively long commutes: Sydney's average is 15.0 km, Melbourne's is 14.6 km, Brisbane's is 14.9 km, Perth's is 14.9 km, and Adelaide's

is 12.4 km (BITRE 2015). Generally in Australian cities, employment - especially white-collar - is heavily clustered in CBDs (Burke et al. 2010; BITRE 2015). Consequently, inner ring residents in Sydney, Melbourne, Brisbane, Perth, and Adelaide have the shortest average commute distance (7-10 km), which is potentially cyclable (BITRE 2015). Moreover, road space is rather generous in Australian cities. In addition to a dense road network, current guidelines recommend traffic lane widths of 3.5 m as standard (Austroroads 2009), whereas older European and Asian cities encompass many examples where lane widths much narrower than 3.5 m operate satisfactorily, some down to 2.5 m (Bicycle Network 2010). Under these circumstances, cycling infrastructure could be easily accommodated in inner cities without major losses for the remaining travellers, including bus travellers.

Table 1: Characteristics of case study cities.

Inner city Traits	Sydney	Melbourne	Brisbane	Perth	Adelaide
Cycling modal share	2.6%	3.7%	2.6%	3.6%	3.3%
Geography	Inner cities*				
Area size (km^2)	11.6	15.9	13.5	43.5	77.5
Population	101,5	71,6	42,9	92,2	156,8
Population density (residents/km^2)	112.7	172.6	32.1	105.8	777.3
Road network density (km/km^2)	27.5	22.2	19.5	16.0	14.8

* Australian Census SA2s ("inner city" and adjacent).
Source: Australian Census Bureau.

5. Data and methodology

This study used a qualitative approach. To answer the research question, cycling experts working in government and non-government organisations across the five case studies were interviewed in depth on the barriers to bicycle travel in their respective cities. A total of 18 experts participated in semi-structured interviews. An effort was made to include in interviews at least one person from the local government, one from the state government, and one from a key NGO in each of the five case study cities. The interviews were conducted in person or by phone. Thirty questions based on the theoretical framework were used as a starting point but follow-up questions were asked as well. The interviews were recorded, transcribed, and then coded, based on grounded theory - an inductive methodology in which themes are derived from the data itself rather than determined a priory. The identified themes were cross-referenced with the existing literature (see Creswell 2009).

The findings are reported below. The discussion is structured in accordance with the conceptual framework set forth earlier - the 3Is. Some themes had already been established in the existing literature whereas others emerged anew.

6. Findings: Barriers to bicycle travel

6.1 Ideas

Four types of ideational barriers are explored below: cognitive aversion to cycling; attitudes such as NIMBYism and NOMS; the historical love affair with the car in Australia; and a lack of cycling programs.

Cognitive aversion to cycling

The existing literature suggests that cyclists and non-cyclists have completely different normative frameworks by which they perceive cycling, in particular commuter cycling. The present study confirms this finding. Those who, at least occasionally, cycle to work, tend to view bicycle travel as a low-cost, flexible, quick, healthy, enjoyable, and mode of transport. However, cyclists are only a tiny minority in Australia. By contrast, individuals who do not commute by bicycle - the overwhelming majority - imagine the barriers to this activity to be insurmountable (Heinen et al. 2010). While they might enjoy or accept cycling as a recreational pursuit, they tend to see commuter cycling as unsafe and strenuous, and/or attach many negative stereotypes to cyclists. Women and the elderly are particularly averse to cycling (Garrard 2003; Garrard et al. 2008; Daley and Rissel 2011).

A cognitive aversion to cycling affects perceptions of distance. Study participants reiterate a widespread belief that Australian cities are too spread out to make cycling practical, whereas in reality, in the inner cities (i.e., a 5-10 km rim from the CBDs) cycling could serve most of the needs of the local populations. In some cities, such as Sydney and Brisbane, a hilly topography constitutes a barrier for people with low physical fitness levels. In theory, this would be easily overcome through the use of electric or power-assisted bicycles. However, this technology has not penetrated the Australian market at a sufficient level yet and the price of electric bicycles remains high (starting at $1,500). Because norms are difficult to break, as noted, they greatly inhibit a transport mode change among the "non-cyclist" group (Pojani et al. 2016; Gatersleben and Haddad 2010; Daley and Rissel 2011; Heinen et al. 2010).

In the current planning environment in Australia, which is heavily focused on processes (i.e., public participation) rather than outcomes (e.g., reduction of emissions), public opinions which are perceived to be unfriendly to cycling preclude the adoption of programs in favour of this mode. A first step in the right direction would be an open recognition that, if Australian cities are to become more sustainable by embracing non-motorized travel, wide-ranging attitude and behavioural changes are necessary. Study participants note that, while many government strategies and plans call for increases in bicycle ridership, emphasis is rarely placed on behavioural change initiatives to achieve these goals. A call for behavioural change is seen as too politically risky. Moreover, advertising campaigns promoting bicycle travel often start with unappealing messages focused on negative, abstract, or bland aspects of driving such as climate or environmental harm rather than positive and validating aspects of cycling such as convenience, freedom, and enjoyment (Pojani et al. 2016). Partly as a result of poor promotional efforts, cycling remains a niche pursuit.

NIMBY and NOMS

Standard NIMBYism is another barrier to cycling in Australia (Park and Allaby 2016). This is exhibited by residents but also shop owners who fear that, with the instalment of cycling lanes, parking spaces in front of their business will be lost thus alienating patrons. A version of NIMBYism, coined by the study participants, is NOMS – an acronym that stands for "not on my street." NOMS describes a peculiar attitude among some Australians (albeit a minority), who ride bicycles and encourage the construction of cycling infrastructure and the adoption of pro-cycling policy in their city while at the same time resisting any such changes on "their" street. Another local form of NIMBYism is exhibited by cycling commuters who do not want their current routes to be altered to their detriment. This attitude is understandable given the scarce cycling infrastructure in Australian cities, and the low level of commitment toward this mode on part of the government. This leads cyclists to fight for the small infrastructural privileges that they have come to enjoy. They are fearful that, if a cycling lane is removed, it will be permanently lost rather than rerouted or replaced as promised.

Love affair with the car

Norms related to cycling have a close (inverse) relationship to norms related to driving. The latter is seen as a birthright of every Australian citizen. The historic love affair with the car transcends gender and age. The car is considered as a symbol of freedom, meaning, status, and autonomy. People expect door to door transportation to their destination, be it work- or leisure-related, and expect to easily find a parking spot at the end of their trip. Among the elderly, the revocation of a driver's licence is perceived as a loss of independence and even as a sure route to death (Tranter 2010; Redshaw 2006; Tranter 2010; Dowling 2000). According to the study participants, a subconscious thought among drivers is that bicycles are an illegitimate form of transport and "don't belong on our roads." The media often perpetrate this stigma, and programmatic ideas reflect and support car driving as the cemented norm.

Moreover, given more than fifty years of car-centred urban planning, most Australians have a practical need for a car for many trip purposes even if, for many, this has become expensive, time-consuming, and stressful. The realities of abundant on- and off -street parking and the ease of driving in and through cities on large roads and highways act as major inhibitors to change and challenge the necessity for bicycle infrastructure. A recent decision in most Australian states to allow cycling on sidewalks has made this mode safer and more attractive in some ways, but it has also reinforced the message that the roads belong to cars and it is preferable to inconvenience pedestrians over drivers. Because driving is normative while cycling is not, and the two modes are seen as antagonistic rather than complementary, it has been excessively difficult to adopt programs which favour cycling or deter driving (Pucher et al. 2011).

Lack of cycling programs

In countries where cycling is the norm - such as in north-western Europe and parts of Scandinavia - this mode has been supported by a variety of comprehensive programs - both direct and indirect. Direct programs include the provision of separate cycling lanes, free educational programs, bike-sharing schemes, end-of-trip facilities (e.g., showers),

and secure bicycle parking. Indirect programs involve prohibitive car-related fees and charges (petrol, licensing, parking, registration, and the like), as well as driver training on the benefits of, and approaches to, road sharing. In combination, those programs have created virtuous circles thereby making cycling irresistible (Pucher and Buehler 2008; Buehler and Pucher 2012; Pucher et al. 2010). Australian cities have begun implementing some programs along these lines but in a minimal and patchwork manner (Daley and Rissel 2011). As such, local programs have not led to the uptake of cycling by non-cyclists - although there is evidence of increased frequency in cycling among current cyclists (Rissel et al. 2010). A chicken-and-egg relationship exists between norms and programs. It is likely that aggressive pro-cycling programs are needed to break out of old norms and mental moulds. However, funding and support for those programs is not forthcoming because cycling is not seen as normative in Australian society.

6.2 Interests

Two types of barriers are explored below, which drive the political power and agenda away from cycling. These barriers include a lack of unity among cyclists themselves and a lack of political will among decision makers due to competing interests in transport planning.

Divided we cycle

"Cyclists" are by no means a unitary group. As noted, utilitarian cycling in Australia is dominated by younger, wealthier, and fitter men - the so-called "Lycra cyclists" (Rissel et al. 2010; Pucher et al. 2011). The study participants suggested that people in this group often have little to no preference for separate bicycle paths. Unfortunately, this category includes many male public sector employees themselves, who work in cycling units. When making decisions on cycling infrastructure, they tend to project their preferences, needs, and desires as seasoned and confident cyclists onto the population at large. They see commuters as a homogenous mass and fail to empathise with those who are at different stations in life - for example, a father who needs to ride with his child or a woman who needs to ride in work attire. Common attitudes are that "if it's good enough for me, then it's good enough for them" or "if I can cycle to work, then everyone else can." The fact that in the surveys for this study more than 70% of participants consider their city to be "cycling orientated" further highlights this issue. Prior studies have shown that the average female or low-income urban dweller in Australia has a completely different view on this matter, which indicates that such high levels of pride and optimism in the public sector are unwarranted (Daley and Rissel 2011; Bauman et al. 2008). But pro-cycling women and low socio-economic groups, as well as fringe "greenies," have little chance of advancing their interests on the agenda unless their power grows.

Competing interests

As of this writing, cycling remains relatively low on the political agenda. This mode is out-shadowed by other transport and land-use policy interests which have substantial and well-established backing (Bauman et al. 2008; Rissel et al. 2010). The principal

competing interest group is a very well-endowed car industry – and its customers (all the Australian motorists). Very large corporate interests, including road builders and road funders (i.e., certain banks), lobby government aggressively to ensure that there is a continuing supply of new road projects, which then consume most of the capital budget, leaving little for alternative transport. This approach continues despite multiple bankruptcies in recent years. Car sellers lobby the government too. While the Australian car manufacturing has experienced a demise, car purchases are still financially supported here.

Given a playing field tilted against bicycle transport, there is little political commitment to deliver cycling projects and programs. In some cases, there is even strong resistance to bicycle initiatives in government leadership. This is due to the fact that both elected and appointed decision-makers tend to work within their pre-determined priorities or political platforms and rarely vary path. Risk aversion prejudices them against trialling innovative solutions to problems. Moreover, often they are driven by personal opinions or pressures from key stakeholders uninterested in cycling. Many misunderstand the potential impact of cycling in their jurisdictions. Emotions, especially fear (of being removed from office), play a larger role in cycling-related policy than facts. For example, some politicians share shop owners' unsupported belief that loss of on-street parking or car lanes to accommodate a cycling path will damage the economic viability of businesses or the traffic flow along a road.

However, in some cities information is also scarce (see also Koglin and Rye 2014). For example, in the absence of citywide polls, it is unclear whether a majority of people have reservations about investments in world-class cycling infrastructure and programs or whether it is only a powerful minority. It is possible that, although motorists are in the majority in Australia, many are tired of the traffic delays, sedentary lifestyles, and financial costs associated with driving, and would be willing to switch to cycling, given the chance. Study participants suggest that, under these circumstances, the direction and championing of bicycle travel in cities has to come from both the top and the bottom, and has to be better informed by research rather than opinions. One interviewee offers: "It's not as simple as 'government just doesn't get it.' Everyone has to play a part. The conversation needs to switch from 'them vs. us' to a collaborative voice of 'we'."

6.3 Institutions

The institutional barriers to bicycle travel in Australia include complacent, inertia-ridden, complex, and uncoordinated institutions; lengthy bureaucratic procedures; short election cycles that do not allow politicians to champion radical changes; male-dominated institutions; dated technical and legal environments; and finally, resource limitations. These barriers are discussed below.

Complacency and inertia

Study participants identify path dependence, inertia, complacency, and risk-aversion in society and within government institutions as major barriers to change in favour of cycling. Government employees are forced to operate within the bounds of acceptable discourse - also known as the Overton window. Because the Australian democratic society is not united and proactive, as noted, it is difficult to obtain government approval for any contentious projects. Pre-emptive or preventative planning is rare.

Most planning activities are reactionary, in the sense that they try to alleviate problems, such as pollution and obesity, after they occur.

Study participants note that governments typically break free of ineffective paths and make the most progress during times of crisis, when conventional assumptions are called into question. Participants also suggest that Australian cities are indeed approaching a colossal transport crisis. Not only are they more congested than ever before, but also natural calamities common to Australia (heatwaves, fires, floods) are reaching unprecedented levels in terms of length, intensity, and damage caused, due in good part to emissions from the transport sector. These growing threats to the urban economies and even human life may act as a wakeup call to decision-makers, as well as the public at large.

Bureaucratic and uncoordinated setup

Even where goodwill exists within government institutions, their setup is often so complex and the procedures so bureaucratic that even the smallest intervention becomes a major ordeal. Horizontally, while some cities and states have dedicated (though small) cycling units, in others cycling-related tasks are spread among a variety of departments, which do not necessarily coordinate their efforts. Some of those departments may be dominated by planners with others dominated by engineers - two groups with historically opposite worldviews. According to the study participants, incohesion or even conflicts are common. Under these circumstances, months can go by before all approvals are obtained to complete tasks so small that a swift response could be expected - such as installing a few additional bicycle parking hoops on a city street.

Similarly, vertical coordination is poor. Approvals between levels of government are lengthy and convoluted. In theory, state governments are tasked with implementing the wider road network while local councils' role is to build or retrofit the finer grained street network. However, in fragmented metropolitan regions such as Sydney and Melbourne, state approval is required for any alteration to urban roads. This task division is problematic as, physically, cycling takes place in urban space and therefore municipalities are in a better position to deal with the issue. While the situation is better in consolidated regions such as Brisbane, overall a lack of autonomy accorded to local councils acts as a major barrier to better cycling policy and infrastructure. The problem is compounded by low budgetary transfers from state to local governments for cycling projects and programs. This is a common complaint among study participants who work at municipalities whereas participants from state governments firmly believe that sufficient funding is provided to the local level.

Short election cycles

As noted, all major Australian cities and states have cycling strategies and plans in place. However, many study participants find that goals and objectives contained therein are unrealistic, partly because they are not sufficiently specific (i.e., programmatic) and partly due to the short election cycles which hamper continuous progress, preclude any certainty in policy-making, and sometimes produce unexpected outcomes.

One participant offers the following example from practice, which, while undesirable, constitutes a best case scenario: A progressive state government comes to power. It

transfers a large amount of funding to a local council, which is earmarked for bicycle infrastructure, such as bikeways and streetscape improvements. The amount is significantly higher than what the cycling team is accustomed to and able to cope with. The decision is obviously politically driven and therefore all the available funding must be spent, and the project must be completed in its entirety before a change of government (e.g., within 2-3 years). As a consequence, the project is rushed forward, thus compromising design standards and diluting best practice guidelines. In a worst case scenario, no funding is received for cycling.

Male-dominated institutions

Historically, Australian institutions were made up of male employees, political seats were filled by men, and men were associated with political power (Bjarnegård 2013). This male dominance may explain Australia's failure to prioritize sustainability issues and its slow rate of progress in the cycling arena. Driving was originally seen as a stereotypically "male" mode of transport, and, therefore, the earliest forms of institutional transport planning sought to achieve the rapid movement of people and goods. This set the transport field into a path which prioritized public funding for roads, highways, and railways rather than slow modes, such as walking and cycling (Koglin and Rye 2014). This path has persisted into the present. Ageing decision makers tend to be conservative. Because roads supported the Australian economy in the past, they assume they will continue to do so in the future.

Although Australian institutions now employ women in large numbers, unfortunately the same is not evident in political seats. As social entities, planning institutions resist socially unacceptable actions to limit to one's "freedom" to fast travel - i.e., car travel (Pucher et al. 2011). However, there is some evidence that Australian city councils with a female majority lean more towards environmentally-friendly solutions than those with a male majority (Bjørnå 2012).

Dated regulatory environment

Dated federal, state, and local guidelines, standards, and laws related to cycling stifle innovation in Australia. National road standards, such as Austroads, focus on cars and are simply not inclusive of all transport modes. The current engineering design standards have many weaknesses. Australia lacks binding national standards for footpaths, bikeways, urban streets (as opposed to arterial roads), and public transport.

Revising intertwined national and state laws is so complex that a revolution is not likely to be forthcoming. Also, many states are conservative in the making of their legislation and wait to follow the lead of other states, which are perhaps seen as more progressive. However, incremental changes are considered when state governments are successfully lobbied by local governments and non-government agencies, or if a new law has proven successful elsewhere in Australia.

The situation is somewhat better at the urban level. However, here too standards and guidelines (for example, streetscape templates) typically do not include cyclists as inherent road users. Where they do, the most recent designs in bicycle infrastructure are not necessarily incorporated. Sometimes, new regulations are entirely counterproductive. For example, the helmet laws adopted in the 1990s, which added to the safety but also to the inconvenience of cyclists, led to large declines in cycling rates,

from which there has been little recovery (de Jong 2012; Robinson 2005). Helmet laws are a typical example of how cyclists are forced to bear the responsibility for their own safety. While many study participants believe that legal protections for cyclists are inadequate in their city and/or state, not all think that the enforcement of cyclists' rights to safety should be stricter. This could be due fear of a negative public or media backlash.

<u>Resource limitations</u>

There are four types of institutional resources which are too limited to properly support cycling: money, space, people, and information. Study participants insist that all are significant, but financial barriers are the most important. Given finite budgets, the majority of government spending goes towards "big ticket" items with major political interest and support - such as roads, highways, and tunnels. A belief that it is cheaper to provide roads than public or active transport is widespread among transport agencies, even though this has ceased to be true for at least a decade.

Brisbane and Sydney allocate a very small portion of their transport budget to cycling and walking (6-9%), and in Brisbane, the budget has slightly decreased in the current cycle. However, major positive change is under way in Sydney. In the 2019-2020 budget cycle, the Council has set aside nearly a quarter of its transport budget to active transport. By contrast, in the current cycle Melbourne is devoting more than half of its transport budget to 'footpaths and cycleway' projects. But here too, the allocated budget is projected to gradually decrease in coming years, to reach about 28% in the 2020-2021 cycle. Also, while the budget data is bundled, most of the funding appears to have been dedicated to footpaths rather than cycleways (Pojani et al. 2018b).

Most municipal councils receive little or no funding for cycling from federal or state governments (see Pojani et al. 2018b). For the most part, they have to use their internal revenues (often from parking fees and tickets) for this purpose. As a consequence, they face a major dilemma when the introduction of a new cycling lane requires the removal of a parking lane. A lack of coordination between projects increases financial pressures. For example, retrofitting an existing street to include a bicycle path is considerably less cost-effective than building a path into the project for a new road or residential development. But because cyclists are not seen as inherent road users, as noted, cycling paths are rarely incorporated into projects from inception. (By contrast, New Zealand recently decided to deliver the Auckland LRT project, the funds for which were obtained by deferring one single freeway project.)

In terms of space, more than fifty years of car-centric planning have left Australian cities with many perceived physical constraints to bicycle travel. Roads in the suburbs and even in CBDs are much wider than in older European cities, and could, in theory, easily allow for retrofitting, as noted. However, the concept that cars - both moving and parked - "own" the roads is ingrained in institutional thought. Accordingly, many study participants claim that limited road space is a constraint in creating cycling lanes and applying traffic calming devices in inner city suburbs.

On the positive side, all the study participants are confident in their knowledge of cycling best practice from around the world. However, they also relate that overall in Australia there is a shortage of professionals with adequate and well-rounded training in cycling policy, planning, and design. These skillsets are fragmented among planners, engineers, and other practitioners. Moreover, information and knowledge bottlenecks

exist from city to city. While individual professionals strive to keep in touch with their colleagues, there are no official and fluid information channels through which to share ideas or design standards. This may have to do with the vast scale of the continent, which precludes easy and inexpensive intercity travel. Face-to-face meetings among practitioners cannot be entirely replaced by internet and phone contact. A lack of exchange also stems from disagreement as to which person or organization in Australia has the ultimate and trustworthy cycling expertize. Under these circumstances, local councils must re-invent the wheel every time they tackle cycling within their jurisdiction. Different cities end up applying different standards thus incurring newcomer costs which could be avoided through better policy transfer efforts (Marsden and Stead 2011).

7.   Conclusion and recommendations: Overcoming barriers to bicycle travel

This study sought to provide as comprehensive a picture of barriers to bicycle travel in Australian cities as possible. Many of these barriers are shared by other cities internationally. Fig. 2 summarizes the foregoing findings.
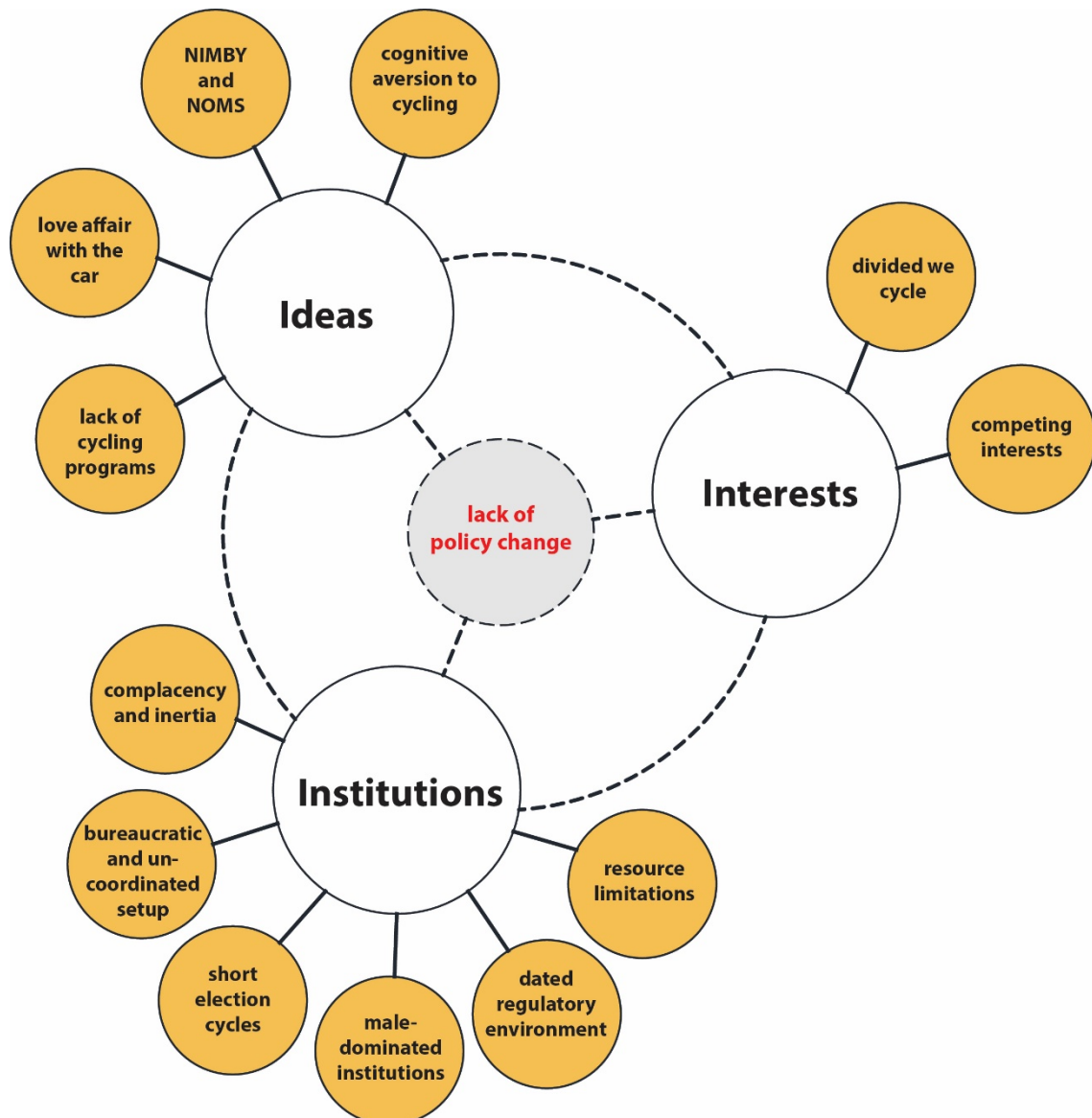
Figure 2: Barriers to bicycle travel in Australia.

A key question remains: How to overcome these barriers? Study participants highlight three areas of intervention: (a) making cycling a normal and integral part of transport planning; (b) securing strong political support for cycling, as well as unity and collaboration within the cycling community; and (c) increasing federal funding for bicycle transport, while at the same time allowing for more planning autonomy at the local level. These potential interventions are discussed below within the framework of ideas, interests, and institutions.

7.1 Ideas: the bicycle as standard

Cycling will remain a fringe movement until governments and planners treat cycling as an integral and normal part of transport and infrastructure planning. As long as the assumption holds that bicycling is an accessory to regular planning, it will forever be an optional road element or treated as an afterthought. Bicycle lanes and other measures (as appropriate by location) must be a standard element of approved street templates and

guidelines, just like car lanes, sidewalks, public trees, and utility lines. No new road should be built which does not cater to cyclists at a high standard. The retrofitting and upgrading of existing roads too should include provisions and consideration for bicycle travel. Nationally promoted, standardised traffic control and safety plans should incorporate cycling permanently. Cities should be required to become rigorous and consistent in pursuing a cycling agenda.

Of course, these recommendations cannot be implemented without public support. While Australian planners and cycling advocates have sufficient knowledge about sustainable transport solutions, they have not communicated those solutions to the public in a convincing way. The evidence that a switch to active transport is paramount to halt a climate catastrophe contradicts core values and preferences of the Australian people (such as the love affair with the car).

Several techniques and strategies on how to frame transport issues to "get messages across" hold potential. These have emerged from psychological research into how to motivate people and groups to adopt environmentally sustainable behaviours, how to inspire sustainability, how to help people overcome barriers, and how to encourage people to take effective action on climate change. The use of incentives, feedback, rewards, knowledge about stages of change, norms and modelling have all been researched in the context of promoting sustainable behaviours. While this research is not specific to cycling, the main insights that it has produced - listed below - might help transportation planners win a "cycling" majority (see APS 2017 for a library of resources):

- Stress the scientific consensus that climate change is caused by human behaviour. Highlight the major role of car transport in climate change. Make climate change here, now, and for sure. This helps counter people's tendencies to discount things that are distant in time and place.
- Use social norms to show that "it's normal to cycle" just as "it's normal to recycle" (the latter being rather common in Australia). Use local and trusted communicators that are "like me" - rather than distant experts - to talk about cycling.
- Activate intrinsic values ("bigger-than-self" values), that are more related to pro-environmental action. Use stories about positive change to leave people feeling hopeful and positive and showing the way to create a more just, equitable, and healthy world. Frame individuals' cycling behaviour as an informed choice between desirable and catastrophic outcomes.
- Frame cycling as a source of fun, pleasure, and wellbeing so that people are more inclined to participate.
- Rather than framing cycling as a transport issue (i.e., a highly technical one), appeal to identities. Build people's identity as someone who cares about the environment and takes action. Approach discussions about cycling by first mentioning things that popular audiences hold dear, such as safety, children, health, and the future. This way, members of the public can see evidence as important to their identity rather than contradictory to it.

7.2 Interests: political support and collaboration

To sway top-level politicians in favour of cycling, solid evidence is needed on the economic benefits of high-standard cycling infrastructure (i.e., networks of fully

segregated bicycle lanes and paths) in commercial and residential districts. Evidence is also needed on the impacts on businesses and households of removing traffic and parking lanes to accommodate bicycle infrastructure. Without these facts, no political cycling champions can emerge, and cycling policies are made in the dark, based on intuition. Not only do politicians need to be sympathetic to all stakeholders, including the cycling minority, but the latter need to become more united and be sympathetic to one another's plight. Persistence is necessary as there are many interests competing for transport funding. Consistence in messages to the public, and a non-antagonistic stance are also important. The traditional "them versus us" approach to planning must be overcome.

While a major transport revolution that overthrows car dominance is a distant dream, incremental changes are also desirable – though not ideal. Cycling advocates must capitalise on planned major transport projects by adding bicycle initiatives to the mix. While this approach can lead to successful small scale projects, it is also contrary to the cycling ethos of moving people away from cars.

7.3 Institutions: increased budgets, federal leadership, and local autonomy

The Australian federal government must firmly ground bicycles (and non-motorized modes in general) in its transport policy agenda and make funds available to localities, earmarked specifically for cycling. The most recent United Nations' recommendation is that 20% of transport funding be allocated to cycling (UN Environment 2016). Without a guaranteed stream of federal funding, independent of political winds, local councils will always be severely hampered in their efforts to deliver cycling programs. Funding should be allocated on the basis of realistic timeframes required to complete high-quality projects rather than be aligned with political cycles. Federal direction could take the form of an organisation such as British Cycling or a national version of West Cycle (a state-level organization based in Western Australia that represents the interests of cyclists).

On the planning side, local government departments must be accorded more autonomy to enact changes to the urban and transport space. They are much more familiar with users and site-specific design details than state or federal governments. Finally, outdated laws and regulations at the local, state, and federal levels must be identified and amended.

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