Path Dependence: A framework for understanding barriers to active transport implementation in Canberra

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Abstract

Currently a significant percentage of trips in Australia are for distances that could be undertaken by cycling or walking. Challenges to shifting to increased levels of active transport (walking and cycling) are explored through the lens of path dependence. Path dependence provides a theoretical framework in which the implementation of active transport in Australian cities can be understood.

Path dependence originates in economic theory but is increasingly being used in other fields to provide a framework for research. It is defined as a series of events which determine a particular course by reinforcing the use of a particular technology. It is not used to predict outcomes, but to assist reflection and analysis of policy settings and identify further opportunities for governance, policy and practice that will support stated policy ambitions to achieve increased walking and cycling.

Active transport implementation has been explored through the case study Canberra, utilising path dependence to understand the historical policy framework, current day setting and future opportunities.

1 Introduction

Cities depend on their transport systems for the mobility of people, goods and information. Australian cities are highly dependent on automobiles for urban transport, especially within their extensive suburban zones. The dispersed structure of Australian cities has contributed to environments where transport for suburban residents is predominantly car dependent. This may be exacerbated by limited access to public transport or infrequent public transport that is not timely enough to provide an adequate alternative to car-based travel. In these environments, people have become accustomed to using their vehicles for the majority of trips. Even trips that are within walking or cycling distance are typically taken by car, reflecting people's habitual dependence on car based travel and urban environments not well-designed for active transport.

Present day active transport implementation challenges are considered through the case study of Canberra. Similar to other Australian cities, Canberra is heavily car dependent, particularly for the journey to work and designed predominantly around car travel. Active transport (walking and cycling) for the journey to work in Canberra is higher than any other Australian capital city. Despite this, a significant mode shift to

walking and cycling is proving challenging to achieve. Active transport implementation is explored through the lens of path dependence, considering the historical policy context and present day situation.

2 Path dependence theory and transport systems

Transport systems are bound in long-term infrastructure and organisational settings, this can mean changes do not necessarily occur rapidly, even where there may be a clear impetus or need to.

Compared to many western European and south east Asian countries, Australia's transport mode split is heavily dominated by private car use. Over 50 per cent of car trips in Australia are for a distance of less than 5 kilometres (Fishman, Washington & Haworth 2012). As such there is an identifiable opportunity to convert more of these trips to walking and cycling to reduce transport related greenhouse gas emissions.

2.1 Theoretical framework of path dependence

Path dependence is a theoretical framework, originating in economic theory (Arthur 1988) used to explain how a particular technology can gain an advantage over another, based on chance events (Low et al. 2009). This can result in self-reinforcing mechanisms that ensure one type of product prevails, even where better alternatives exist. The theory of path dependence can be extended to the discussion of institutions and, organisations and the development of policy.

Path dependency has been utilised as a framework for understanding the implementation of active transport. Path dependence provides a useful framework for institutional, policy and infrastructure analysis as it seeks to understand present day issues within the historical framework.

2.2 Elements and phases of path dependence

The following three elements of path dependence are of particular relevance due to their application to urban planning and active transport (Low & Astle 2009).

1) **Technical path dependence** - where '"the physical form of a city can be shaped by the dependence on a particular form of transport" (Low & Astle 2009, p.48). This applies to Australian cities where land use planning has been significantly influenced by the car, allowing the proliferation of low-density suburbs that encourage car use and limit walking and cycling (Hensley, Mateo-Baiano & Minnery 2014).
2) **Institutional path dependence** - Margalit (2013) identifies the urban regime as 'coalitions between politicians, city officials and bureaucrats, investors, constructors and the urban elite' while Pflieger *et al*. (2009) identifies a coalition of actors rooted in long-term cooperation.
3) **Discursive path dependence** – exemplified through 'storylines' used within organisations to explain and identify problems or issues that a policy or plan is trying to address. Storylines also identify the range of solutions available to address the problem, are self-reinforcing and often used by organisational leaders to justify a particular path or direction (Low & Astle 2009).

Path dependency is described as occurring in three phases:

1) **Preformation phase** – characterised as a broad scope of action, where choices cannot be predicted, but are influenced by prior events or initial conditions
2) **Formation phase** – where an organisation path starts to evolve as the range of strategic options narrows
3) **Lock-in phase** – where a further constriction emerges that causes the organisation to lose its flexibility (Akykldiz et al. 2012).

Two primary components to explore path dependent policies as defined by Arthur (1988) are: the history of selection, or 'critical juncture', when events unfold to develop a particular 'path', and the 'reinforcing period' or 'lock-in' when forces stabilise the 'path' according to choices made early on. These phases of path dependence are used as the basis for analysis of the relevant historical policy framework.

Unlike previous studies, this research extends path dependence theory to analysis of active transport implementation which traditionally has not been considered part of the urban transport network.

2.3 Research Design

This research interrogates the impact of discursive and technical path dependence on active transport. Firstly, by analysing the historical policy settings to identify key themes and 'storylines' that have influenced transport and land use including built form outcomes. Discursive path dependence is explored further in the current day setting through interviews undertaken with 'active transport influencers.' Interviewees were selected through a purposive sampling technique based on their ability to influence active transport implementation. In total, 34 people were interviewed representing a range of organisations and professional affiliations.

Technical path dependence was also analysed with consideration of how the established physical form of the city has been shaped by transport and its influence on current day travel patterns.

3 Path Dependence in Transport and Urban Policy

Key policy documents shaping transport policy and land use were identified based on advice from local practitioners and additional research. This identified 13 policy documents from 1960 through to 2016 (see Table 1 below).

Table 1: Key Transport Policy and Land Use Documents Canberra

Year	Policy Document
1961	Canberra Area Transportation Study
1965	The Future Canberra
1967	Canberra Land Use and Transport Study
1970	Tomorrow's Canberra (The Y-Plan)
1989	Territory Plan
1989	National Capital Plan
2004	Sustainable Transport Plan

2004	Canberra Spatial Plan
2006	Griffin Legacy Amendments to National Capital Plan
2012	Transport for Canberra
2012	ACT Planning Strategy
2015	Active Travel Framework
2016	Revised National Capital Plan

Early policy documents from 1960 to 1970 exhibit a clear preference for the reduction of traffic congestion as a key policy aim. This dominant storyline is reinforced in subsequent policy and used as a key element for the city structure that continued as the base for development through to the early 2000s.

Not only were these policies significant but they became reinforced in the emerging physical structure of the city. The most enduring legacy of this era was the metropolitan structure plan (from the Future Canberra) which became known as the Y-Plan. This structure plan was developed to guide Canberra's future planning and was based largely around the premise of easy car travel and accessibility.

4 Results

Research findings demonstrate that path dependence impacts on current day policy aspirations for active transport. Discursive path dependence can be a powerful force in shaping policy, practice and practitioner views. For several decades through the second half of the 20th century, transport and urban policy in Canberra was shaped by a view of the urban transport network being largely designed and constructed to facilitate ease of car travel.

Discursive path dependence has contributed to technical path dependence and reinforced a metropolitan framework focused on facilitating car travel. Signs of the potential for critical junctures in both discursive and technical path dependence emerged in the mid 1970s with the construction of Canberra's cycle network commencing, together with new institutional arrangements and improved efficiencies in bus services. This appeared to temporarily redirect urban transport towards increased cycling and public transport uptake, however these gains were not prolonged due to a return to the dominant discourse, such that the policy and development focus on alleviating traffic congestion and facilitating ease of car travel remained.

After the year 2000, incremental changes and pathway junctures in discursive path dependence have appeared as a result of new policy dialogue that recognises walking and cycling as part of the urban transport network. It may still be too premature to identify these as critical junctures however it would appear that there has been a noticeable shift.

Physical elements such as the arterial road network and established mechanisms in funding and regulations still tend to prioritise car travel and road investment. A recognised critical juncture in this established priority for transport infrastructure investment is light rail in Canberra. There is considerable expectation amongst active transport influencers that light rail together with increased investment in active transport will contribute to increased rates of both active transport and public transport use. These expectations may not be realised if other elements contributing to car-

focused path dependence are not rectified, this includes funding priorities that match policy expectations, genuine integration between transport and land use planning and policy alignment to remove implementation gaps.

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