

Success stories: greenhouse reductions from transport policy change

Paul Mees and John Stone

April 2008

Australasian Centre for the Governance and Management of Urban Transport (GAMUT), The University of Melbourne, Victoria 3010, Australia (an initiative of the Volvo Research and Educational Foundations)



Success stories: greenhouse reductions from transport policy change

Background

It is surprising how little rigorous analysis there has been of the results of urban transport policy initiatives. Most commentators have been content to describe the initiatives: where their impacts are discussed, this is usually done without much serious use of data: for example, the 'analysis' of London congestion pricing that reported changes in car and bus trips, but omitted train travel. (see presentation by Mees at the Perth Garnaut Review forum on 19 Feb, 2008).

One result of this thinness of material is that there aren't many really solid, verified success stories on a large enough scale to be applicable to Australian policy.

Defining 'success'

Our definition here is where per capita car travel has been reduced in favour of more sustainable modes: high-occupancy public transport, walking or cycling.

Unfortunately, due to data problems we have had to settle in most cases for the slightly less rigorous definition of 'mode shift away from the car to more sustainable modes'.

On this definition, we can be confident about Zürich, Ottawa and Vancouver.

Zürich, Switzerland (pop. 1.3 million)

Car use is increasing in all European countries, as Mark McKenzie pointed out at the February forum, but the rate of increase is lowest in Switzerland (Pucher and Lefèvre 1996). The Canton (or state) of Zürich has the lowest rate of car use in the nation: the approximate mode share figures for trips within the Zürich region are 29% of trips by individual motorised transport, 52% by walking and cycling (mainly walking) and 18% by public transport.¹ These proportions can be contrasted with Melbourne, where according to the last major survey of general travel in 1994, 75% of trips were made by private car, with only 15% of trips by non-motorised forms of transport and 7% by public transport.² At the 2000 census, 32.2% of the canton's population used public transport to get to work, compared to 37.2% by car, compared with car shares in Australian cities ranging from 70% in Sydney to 82% in Adelaide (Mees et al. 2007). Importantly, Zürich is also the only Swiss region where the share of trips by car is actually falling – and has been since the 1990 census (ZVV website 2008).

Zürich is particularly significant because it's the wealthiest region in one of the wealthiest nations on earth, but also because the Canton as a whole is spatially dispersed, with around 1.3 million residents spread across 1729 square kilometres (Swiss Federal Statistics Office 2008). The Melbourne 'urban centre' covered 2153 square kilometres as at the 2006 census and housed 3.4 million people (ABS 2007).

The principal factors behind these results are (for details, see Mees 2000, ch. 5):

- the provision of an excellent-quality multi-destinational integrated public transport network serving the whole Canton, delivered by a single public agency, the ZVV;
- a virtual moratorium on major new roads in the City of Zürich (equivalent to our inner suburbs) for around three decades;
- implementation, in the late 1970s and 1980s, of a rigorous program of providing absolute on-street priority for trams and trunk bus routes in the City of Zürich. This program has been so successful that there is almost no difference between peak hour and late evening running times for trams.

¹ Calculated from the average number of trips by each form of transport reported from the 2005 Transport Microcensus (SFSO)

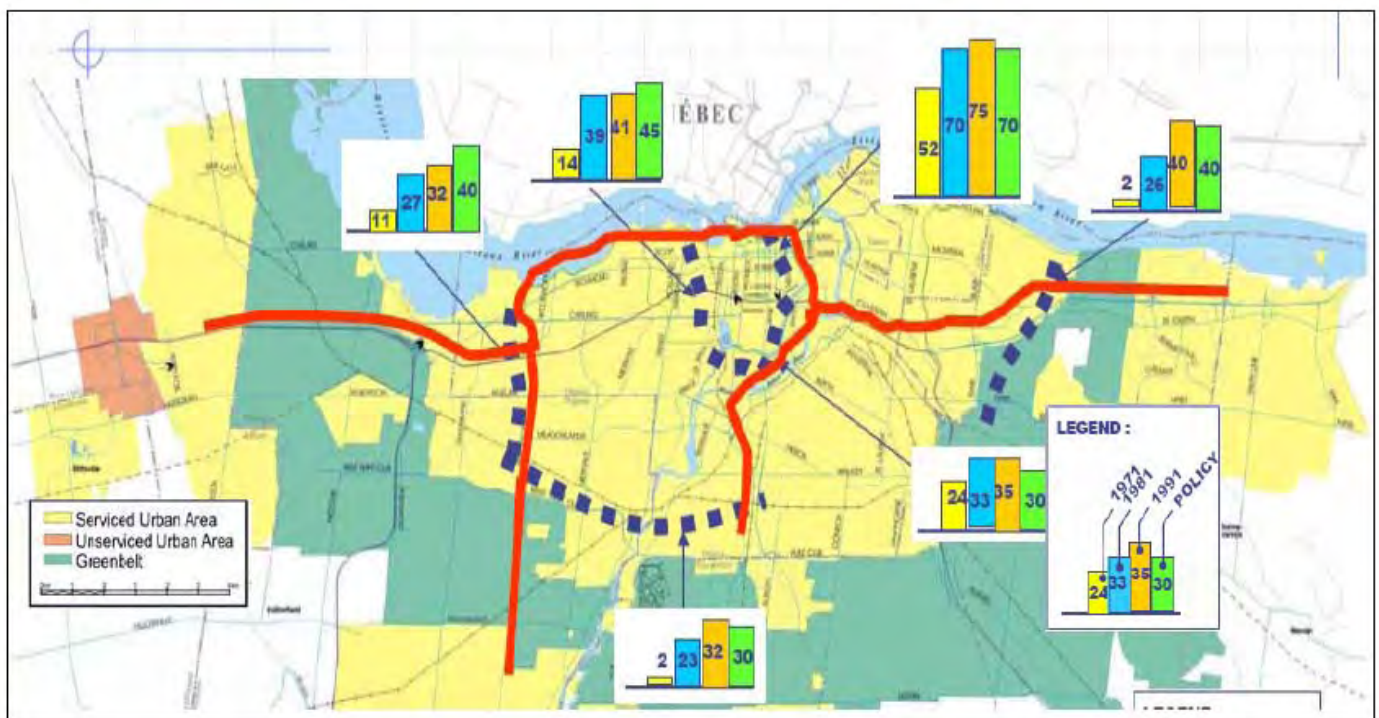
² Transport Research Centre, *Melbourne on the Move- a sampling of results from the 1994 Victorian Activity & Travel Survey*, Melbourne, 1996, p 12.

Ottawa, Canada (pop. 0.85 million/1.1 million)³

The 2006 Canadian census results, released in April this year, showed that Ottawa had the lowest rate of car driving for trips to work, at 60.4% of trips (Statistics Canada 2008). This figure is also lower than any Australian city, the lowest figure being Sydney, with 65% and the highest Adelaide, with 76% (Mees et al 2007).⁴

Although detailed comparisons are made difficult by the fact that the Canadian census has only included a question on the mode used for the journey to work since 1996, the key difference between Ottawa and Australian cities is that public transport's mode share is higher than in the early 1970s in Ottawa, but lower in all Australian cities.

Ottawa was a typical North American city in the early 1970s, in which the car completely dominated travel. Over the next decade, there was a substantial mode shift away from cars towards public transport: see figure below. Significantly, this shift occurred relatively rapidly and occurred before the City's extensive bus transitway network opened between 1983 and 1996 (Mees and Al-Dubikhi 2008). It involved little investment in infrastructure and no significant change to urban form.



Targeted vs. actual transit mode split at screenlines. (Hoffman 2008, p. 20)

³ The lower figure is for the City of Ottawa; the higher figure is for the larger region including Hull/Gatineau on the Quebec side of the Ottawa River. The figures used in the following side are for Ottawa proper only: Gatineau has pursued different transport policies.

⁴ The Canadian census figures combine car and truck drivers: we have adjusted the Australian figures reported in Mees et al (2007) for comparability, by adding 'truck' to 'car driver'.

The principal factors behind the mode shift are:

- a 'transit-first' policy that made public transit the priority for new infrastructure investment and major new roads a last resort; this resulted in the effective cancellation of most of the freeways that had been planned in the 1960s;
- restrictions on provision of CBD car parking, and an increase in charges for the remaining spaces;
- establishment of a single regional public transport agency to integrate routes, timetables and fares across the whole metropolitan area;
- provision of operating subsidies to enable the expansion of high-quality transit services into lower-density suburbs;
- less reliance on park-and-ride than in many cities, with passengers relying primarily on feeder bus services;
- on-street priority for trunk bus services, enabling transit to bypass sites of major traffic congestion.

Vancouver, Canada (pop. 2.1 million in 2006)

Vancouver was the only Canadian city in which the time taken for the average work journey declined between 1992 and 2005, even though it had the fastest rate of population growth over this period.

Vancouver built no major new roads between 1992 and 2005, and traffic congestion increased as it did everywhere else in Canada, so travel times should have increased had everything else remained constant. What seems to have happened is that slower road speeds were outweighed by shorter journeys arising from increases in self-containment, plus improvements in the speed of public transport.

	1992	1998	2005
	Minutes		
Canada total	54	59	63
Census metropolitan areas			
Toronto	68	76	79
Montreal	62	65	76
Vancouver	70	68	67
Ottawa-Gatineau	57	62	65
Calgary	52	64	66
Edmonton	50	58	62
Autre RMR/AR	44	50	53
Non RMR/Rural	44	50	54

Average travel time for making the round trip between home and workplace in Canadian cities
(Statistics Canada 2006, p. 15, table 1)

Between 1996 and 2006, the proportion of workers using transit in greater Vancouver rose from 14.5% to 16.5%, and the median commute distance fell from 7.6 kilometres in 2001 to 7.4 kilometres in 2006 (Statistics Canada website 2008).

Travel surveys by the regional planning authority conducts regular showed that between 1994 and 2004 there were modest increases in the share of trips made on foot (from 12.7 to 13.0 per cent) and by public transport (from 10.2 to 10.8 per cent; or from 12 to 13 per cent of motorised trips) and a corresponding small decline (from 76.2 to 75.2 per cent) in the automobile mode share. (See Al-Dubikhi 2007, p. 157)

Greater Vancouver has only one commuter freeway – the Trans Canada Highway – and this passes through the suburbs more than 6km from the downtown core. Road congestion is explicitly used as a policy lever to encourage mode shift to transit.

The region's transit system has an effective management structure and the operational focus is on providing service patterns that offer a competitive alternative to the car for travel to some suburban destinations as well as to the downtown core. Since 1986, when Vancouver's first rapid transit SkyTrain line was opened, there has been considerable investment in new rapid transit infrastructure and further expansion is planned.

Common features of successful cities

Urban transport policy packages in different cities vary, in content if not rhetoric, in the balance of incentives and disincentives that exist for both car and transit use.

A policy package made up of coordinated incentives for transit and disincentives for car use appears necessary to shift travel mode from cars to transit, and so make real gains in reducing transport greenhouse emissions. In addition, these coordinated transport policies must be linked to complementary policies for other physical and functional components of the city including housing and economic development.

Two other transport policy packages are commonly employed in western cities, but neither appears useful for achieving greenhouse emission reductions:

- First, cities can try to provide incentives for both cars and transit by investing heavily in both freeways and metro systems and providing subsidised car parking in their central core or at major regional centres or transit nodes. Transport systems of this type are difficult to integrate and that the outcome is generally a continued imbalance in mode share towards car travel but with greater subsidies required for each.
- Second, incentives are provided for cars while transit service declines. This policy package seldom explicitly pursued but is followed, de facto, in cities with no clearly agreed intermodal transport goals and where transit is given little real priority in planning or investment.

(This characterisation of urban transport policy packages is explained in detail in Vuchic's comprehensive text *Transportation for Livable Cities* (1999, pp. 239-248).)

Consistent application of policies that restrict car use and make alternatives more attractive, including "measures to support transit, travel by bicycle and by foot, [and] measures for environmentally-oriented spatial structures" (Bratzel 1999, p. 184) in five European cities and towns⁵ where car use has appears to have grown relatively slowly across the whole agglomeration and has been reduced or stabilised in the city core.

A further common factor observed in relatively successful cities appears to be the existence of strong public institutions for transit management that have:

- long-term political and public credibility built on project achievements
- a strong focus on '*network planning*'

Network planning is central to designing public transport services that can successfully offer a competitive alternative to the car. Its purpose is to create maximum flexibility for travellers by making it easy to transfer between different services or modes. It provides a basis for cost-effective operations and for prioritising capital investment in rolling stock and infrastructure to maximise patronage growth (Nielsen and Lange 2005).

⁵ These cities are Zürich and Basel in Switzerland; Amsterdam and Groningen in the Netherlands; and Freiburg in Germany

Perth

Perth is the best performing Australian city. It has seen a modest but consistent improvement in transit performance since early 1990s. The state government has recently moved to support for slow its urban freeway construction program, and its current planning processes are aimed at developing more extensive transit networks.

The operational changes in transit, particularly the development of new rail infrastructure and associated re-organisation of bus feeder services, have delivered political credibility to the more recent moves to re-direct the focus of transport and planning policy.

The public agency responsible for transit in Perth has established a strong focus on passenger service made apparent in design of ticketing systems, timetables, and uniform bus signage despite the introduction of multiple private bus operators.

References

- Al-Dubikhi, S 2007, *Exploring the Potential for Successful Public Transport in Riyadh*, PhD thesis, Department of Architecture, Building and Planning, University of Melbourne, Melbourne.
- Bratzel, S 1999, 'Conditions of success in sustainable urban transport policy: policy change in 'relatively successful' European cities', *Transport Reviews*, vol. 19, no. 2, pp. 177-190.
- Hoffman, A 2008, *Advanced Network Planning for Bus Rapid Transit*, US Dept. of Transportation, Federal Transit Administration (report FL-26-7104-4), Washington DC.
- Mees, P 2000, *A Very Public Solution: Transport in the Dispersed City*, Melbourne University Press, Melbourne.
- Mees, P, Sorupia, E & Stone, J 2007, *Travel to Work in Australian Capital Cities 1976-2006: an analysis of census data*, Australasian Centre for Governance and Management of Urban Transport Melbourne.
- Nielsen, G & Lange, T 2005, *HiTrans Best Practice Guide No. 2, Public Transport: Planning the Networks*, European Union, Interreg IIIB Stavanger, Norway.
- Pucher, J & Lefèvre, C 1996, *The Urban Transport Crisis in Europe and North America*, Macmillan, Basingstoke.
- Statistics Canada 2006, *The Time it Takes to Get to Work and Back*, Statistics Canada, Cat. 89-622-XIE, Ottawa.
- Vuchic, V R 1999, *Transportation for Livable Cities*, Rutgers University Press, New Brunswick, NJ.