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## Original Research

# Effects of a workplace travel plan intervention encouraging active travel to work: outcomes from a three-year time-series study

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## ABSTRACT

**Objective:** To evaluate the effects of a three-year workplace travel plan intervention on increasing active travel to work.

**Study design:** A time-series study with staff was conducted in 2011 ( $n = 804$ ), 2012 ( $n = 904$ ), 2013 ( $n = 872$ ) and 2014 ( $n = 687$ ).

**Methods:** A travel plan was implemented at a large, outer-suburban worksite in Sydney, Australia. Implementation was assessed by reviewing annual reports including travel plan actions and their status. Annual cross-sectional on-line surveys assessed primary outcomes which included change in the proportion of staff travelling to work via active modes. Multivariate logistic regression was used to adjust for confounders.

**Results:** Strategies to encourage active travel were partially implemented. An average survey response rate was 23% ( $n = 817$ ). The proportion of staff travelling actively to work increased by 4%–6% across intervention years compared to the baseline, and this increase was significant in 2012 ( $P = 0.04$ ) and 2013 ( $P = 0.003$ ). Compared to baseline, after adjusting for distances staff lived from work staff had 33% (95% CI 1%–74%) greater odds of travelling to work via active modes in 2012, and 50% (95% CI 15%–96%) greater odds in 2013. There was no evidence of change in physical activity levels.

**Conclusions:** A workplace travel plan which only included strategies to encourage active travel to work achieved small but significant increases in active travel. Workplace travel plans appear to be a promising way to increase active travel to work.

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## Introduction

Walking and cycling are healthier than car driving and are promoted as active travel.<sup>1</sup> Public transport can be considered as active travel when access and egress walking contributes to physical activity that is significant to population guidelines for physical activity for health.<sup>2–4</sup> Epidemiological research suggests reducing car driving and increasing active travel for commuting results in overall increased physical activity,<sup>5</sup> is associated with decreased body weight and reduced risk of myocardial infarction in both cross-sectional and longitudinal studies.<sup>4–16</sup>

Promoting active travel, and promoting alternatives to driving cars to destinations via travel planning, are considered promising approaches to encouraging physical activity and reducing traffic congestion.<sup>17–24</sup> The work setting is a logical place to promote active travel since in many countries the majority of adults work,<sup>25</sup> and a large proportion of journeys to work are made by private motor vehicles.<sup>26,27</sup> Workplace travel plans, also referred to as transportation demand management plans in North America and mobility management plans in Europe,<sup>28</sup> aim to promote active and sustainable forms of transport and reduce driving private motor vehicles to work. Travel plans are a site-based delivery mechanism for transport management options.<sup>29</sup>

Research on the effect of workplace travel plans for increasing active travel and decreasing driving to work is not conclusive. A Cochrane review of organisational travel plans for improving health identified only 17 studies, five of which were conducted in workplaces.<sup>30,31</sup> These workplace studies investigated the effectiveness of single actions within travel plans, rather than an overall travel plan. A recently published systematic review of the effect of active travel interventions conducted in work settings on driving to work identified 12 controlled and longitudinal studies,<sup>18</sup> one of which was a workplace travel plan intervention which achieved a 42% decrease in driving alone at the intervention site and a 5% decrease at the control site. The review calls for more published intervention research on workplace travel plans.<sup>32</sup>

Given workplace travel plans show promise for increasing active travel to work, they deserve attention from researchers, practitioners and policy makers. More published evaluations will assist development, implementation and evaluation of individual travel plans, and also inform decisions on potential policy and regulatory support for broad adoption by medium and large organisations. The purpose of this study is to present the main outcomes from the evaluation of a three-year workplace travel plan intervention.

## Methods

### Design

The study design for evaluation of the travel plan intervention was a time-series study without control. Between the baseline survey conducted in 2011 and 2014, four annual cross-sectional on-line surveys were used to assess changes in outcomes.

### Setting and context

#### *The south-west Sydney growth centre*

Liverpool Hospital is located in an outer metropolitan area which is a major 'growth centre' in south-west Sydney, Australia. This principal referral teaching hospital is a large workplace which employed almost 3900 staff by September 2014. Liverpool Hospital required a travel plan as a condition of a major re-development completed in 2012.

#### *Walking, cycling and public transport*

Most of the area within a 10 km radius of the hospital is flat. Although the off-road cycling network in the area was extensive, apart from the route to the north along the railway, there were significant gaps in the cycling network in the immediate surrounds of the hospital. Fig. 1 shows a transport access guide. The Hospital was well serviced by heavy rail, with two stations within 10–15 min easy walking distance. Hospital staff also had access to an extensive bus network.

#### *Staff parking for private motor vehicles*

In 2011, 800 car spaces were available for approximately 3200 staff on-site, with significant parking overspill in the roads surrounding the hospital and on the hospital campus. The hospital re-development increased parking to over 1600 car spaces for approximately 3900 staff by early 2013. Parking for staff was charged at below market rates for the surrounding area and remained stable, creating a financial incentive to drive to work. All parking infrastructure was owned by the hospital, and parking was managed via a waiting list that did not prioritise parking based on need.

### Intervention

The Liverpool Hospital Travel Plan 2011–2014 was developed to contribute to the transport objectives of the Liverpool Hospital Sustainability Taskforce. It aimed to promote active forms of transport and decrease the proportion of staff driving to work by 10% by 2014. The intervention was underpinned by theories including stages of change theory for actions aimed at individuals, and capacity building and organisational change theory for actions aimed at the organisation. It employed a mix of strategies including policy (e.g. completing a parking management study to inform a new parking policy, public transport ticket salary deduction/sacrifice schemes), infrastructure (e.g. provision of end of trip facilities, marking of carpooling spaces in staff car park) and behaviour change (e.g. cycling and walking programs).<sup>33</sup>

The plan was developed by a working group led by the Health Promotion Service and supported by a senior transport consultant between May and December 2011. It followed typical stages of travel planning as shown in Table 1, and the development of the plan involved a needs assessment, gaining commitment from senior management and strategy development. The needs assessment included five activities: identifying organisational level barriers and enablers for travel planning, auditing the transport and physical environment of the hospital, a staff travel survey, analysis of the distance all staff live from work and interviews with hospital managers. Details of the travel plans development are

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