

Applying **NUDGE THEORY** to walking

Designing behavioural
interventions to
promote walking





This paper was written by Alice Woodruff, Director of Active City, to support the development and implementation of the Change to Walking Program, an initiative of Victoria Walks and VicHealth.

© Victoria Walks Inc. Registration No. A0052693U
Level 7, 225 Bourke Street, Melbourne VIC 3000
P: 03 9662 3975
E: info@victoriawalks.org.au
www.victoriawalks.org.au

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1. Introduction

Through its Change to Walking program, VicHealth, together with Victoria Walks, sought to apply behavioural insights to determine if 'nudges' would prompt increases in walking for transport.

The Change to Walking program funded five councils in Victoria to trial behavioural interventions during 2016 to increase walking to schools, workplaces, a public transport hub and a community hub.

The field of behavioural science that can inform behaviour change interventions is immense. This paper provides a snapshot of key behaviour change methods and presents examples of interventions used to increase walking for transport and physical activity. It focuses on recent applications of 'nudge theory' by the UK Government's Behavioural Insights Team (BIT) in relation to walking, and includes considerations for project design and delivery of local-level interventions.

Travel behaviour change concepts and interventions are still relatively new work areas for many councils in Australia. This paper introduces some concepts and models of behaviour change as background for councils designing local interventions. The results of the Change to Walking program are contained in a separate report.

2. Nudge theory and behaviour change

Thaler and Sunstein (2008) described behavioural nudges as the practice of influencing choice by changing the manner in which options are presented to people but without restricting any options or significantly changing their economic incentives (Quigley 2013).

Thaler and Sunstein talk about this as changing people's 'choice architecture'. To count as a 'nudge' the behavioural intervention must be easy and cheap and it should not be mandated. Providing incentives and prompts to walk to work are nudges, but removing parking access is not, because it constrains choice and is forcing a change in behaviour.

'Nudge theory' has been incorporated into public policy by governments around the world to improve service responses such as rates of tax returns and payment of parking fines.

Nudges have also been applied to the health sector. For example, reducing missed outpatient appointments by sending advance text messages that note the public cost of missed appointments. Another example is increasing healthy eating choices in canteens by the prominent location of healthier options, or setting them as the default for side dishes (a salad instead of chips) with less healthy options still available.

Walking is a 'lifestyle' health behaviour so 'nudge style' interventions within the health sector are the most relevant examples to look at when considering their application to the Change to Walking program.

3. Behavioural Insights Team's approach

The UK Government's Behavioural Insights Team (BIT) has developed models to help guide practitioners in designing more effective behaviour change interventions. Nudge theory strongly informs these models. Its 2010 'MindSpace' model was a distillation of behavioural science insights into a "practical checklist" of some of the most 'robust influences on behaviour' (Quigley 2013) to improve program design.

BIT more recently simplified MindSpace into the action-oriented 'EAST framework', which focuses on techniques that make change 'Easy, Attractive, Social and Timely'. The EAST framework is summarised in this table.

Behavioural Insights Team's EAST framework

Make it easy	<ul style="list-style-type: none"> • Use the power of defaults – making people opt out rather than opt in • Reduce the 'hassle factor' of taking up a service • Simplify messages (to reduce errors and grow response rates)
Make it attractive	<ul style="list-style-type: none"> • Attract attention (use of salience, personalising information) • Design rewards and sanctions to maximum effect (use of lotteries, scarcity, gamifying activities)
Make it social	<ul style="list-style-type: none"> • Show that most people perform the behaviour you are seeking • Use the power of networks (reciprocity and mutual support) • Encourage people to make a commitment to others
Make it timely	<ul style="list-style-type: none"> • Prompt people when they are likely to be most receptive • Consider the immediate costs and benefits • Help people plan their response to events (goal-setting, breaking down complex goals into small steps)

These nudge principles and approaches are valuable insights for making behaviour change interventions more effective. They could be used to facilitate specific physical activity behaviours, but without an overall model for assessing how they might be applied it can be difficult for non-behavioural science practitioners to identify which principles are most relevant or useful to improve an intervention.

BIT recognises this issue noting in its paper *EAST: four simple ways to apply behavioural insights* that these tools cannot be applied in isolation from the nature and context of the problem. Designing a behaviour change intervention requires:

Defining the outcome: identifying exactly what behaviour/s are to be influenced; how they can be measured; how large a change would make it worthwhile; and over what time period.

Understanding the context: assessing the situations and people involved and thinking about it from their perspective.

Trialling and evaluating: interventions may consist of two or more variations, to trial what might work best. There is a strong emphasis on evaluation to understand what is and is not effective. Often control groups or sites are used to measure the relative impact of an intervention.

It is **not wise to cherry pick behavioural insights and apply them without first considering the context and specific behaviours** that you wish to influence. It is also important to test, learn and refine the intervention.

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4. Defining a behaviour and a response

Break down larger goals and complex behaviours, such as 'getting more people walking' into simpler, specific actions that respond to the problem. There could be multiple specific problems that are identified within a general problem; each of these would have a corresponding behaviour response. Some examples follow.

General problem / understand the context	Specific problem (one example of the range that could be identified)	Behaviour response to this problem
<p>Problem: Reduce demand for parking at a train station.</p> <ul style="list-style-type: none"> Investigate who is parking and why. Consider where are the opportunities for changes in behaviour. 	<p>People who live within 800 metres and currently drive to the station.</p>	<p>People who live within 800 metres of the station walk to the station at least three times a week.</p>
<p>Problem: Employees are sedentary at work.</p> <ul style="list-style-type: none"> Investigate who, when, where and how people can be more active at work. 	<p>Managers regularly drive to attend meetings with a client nearby.</p>	<p>Managers regularly walk to the nearby client meetings.</p>

5. Strategies to achieve desired response

The next step is to identify behavioural strategies that encourage the identified response.

Rather than coming up with a 'catch all' response to a general problem, such as a poster in the tea room encouraging employees to "walk more each day", an effective intervention would focus on how to facilitate desired behaviours, employing a behavioural model and applying 'nudges' to make it effective.

An intervention may address more than one specific behaviour. Travel plans are examples of 'umbrella interventions' that attempt to support different behaviour responses to reduce private car travel to a destination (behavioural responses might include some people choosing to cycle to work, or walk more for business trips, or increased use of teleconferencing).

For the workplace example in the table above, some nudges to facilitate the desired behaviour could include:

- **Make it easy:** demonstrate door-to-door walk times are close to or less than the time it takes to book a work car, collect the keys, drive, find a car park and walk from the car into the client office.
- **Make it timely:** when an employee makes a car booking send a prompt to ask whether walking is an option instead.
- **Make it social:** build social norms by promoting the behaviour of senior managers who regularly walk to their meetings.

6. Applying nudges in the health sector – behavioural models

The Behavioural Insights Team's (BIT) most recent work in the health sector is useful in considering how behavioural insights can apply to encouraging walking behaviours. While it mostly focuses on behavioural interventions within public health institutions (such as reducing error rates on dispensing prescriptions), it also considers the application of behavioural insights to broader health-related lifestyle behaviours such as smoking cessation, healthy eating and physical activity.

In the 2016 publication *Making the Change: Behavioural Factors in Person - and Community-Centred Approaches for Health and Wellbeing* BIT explains that a (new or changed) lifestyle behaviour requires three main components:

Capability	<ul style="list-style-type: none">• Knowledge and skills, including perseverance.
Opportunity	<ul style="list-style-type: none">• All the factors that lie outside the individual that prompt the behaviour or make it possible.
Motivation	<ul style="list-style-type: none">• Conscious goals and decision-making as well as habits and emotional responses.



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This behavioural model is an application of Michie's 2011 behaviour change wheel model for designing behaviour change interventions (www.behaviourchangewheel.com). The wheel model is useful in scoping lifestyle behaviour interventions.

There are quite a few models in use by researchers and consultants to support the design of behaviour change interventions. BJ Fogg's Behaviour Model (www.behaviormodel.org/) focuses first on carefully defining the specific behaviours to influence, then considering a person's ability (their physical ability and the environmental context), and then their motivation and behavioural triggers in order to shape an intervention to change behaviour.

The BIT paper presents findings from applied health research. It notes that each of the three components of 'capability', 'opportunity' and 'motivation' in turn have several factors that can improve participation in positive lifestyle behaviours (i.e. they are useful in interventions to encourage walking). Some of these factors overlap with the EAST framework but there are additional factors relating to opportunity and motivation that are relevant to walking behaviour change interventions, described in the following table.

Behavioural insights for health interventions		
Opportunity	Removing friction costs	Small increases in the effort ('friction costs') required to perform a behaviour can make a surprisingly large difference to whether that behaviour takes place.
	Social connections	Social networks within communities enable reciprocity and knowledge sharing and support. They also help to reinforce positive social norms.
Motivation	Intrinsic motivation	Intrinsic motivation relates to our personal values and what each person finds inherently satisfying. It generally drives longer term behaviour change. Understanding intrinsic motivations can help frame appropriate messages. Extrinsic motivation comes from a desire for an external reward or to avoid punishment. This can be a motivational tool (e.g. through gamification) but generally has a shorter-term impact.
	Goal-setting and feedback	Achieving a goal requires motivation. Setting a realistic goal, breaking it down into manageable chunks and receiving timely feedback along the way, can make it more likely that a person will get started and stay on track to realise their goal. Focusing on 'small steps' rather than significant changes and using coaching techniques are effective.

7. Behavioural insights and walking

Walking behaviours are more complex than behaviours targeted in most nudge-style interventions to date. Walking is influenced by many external environmental factors as well as interests and personal motivations, both our own and in relation to the people around us.

This complexity will most likely require going beyond adjustments to 'choice architecture' where people are passive participants (they don't really know they are being influenced) to apply more interactive nudges, which directly engage people. This may include applying behavioural insights for health interventions described above; using the supportive techniques of social connections, building motivation and using goal setting and feedback techniques.

A systematic review of behaviour change techniques used to promote walking and cycling by Bird et al (2013) found the following techniques influenced a statistically significant change in walking behaviour. Effective interventions most often employed multiple behaviour change techniques.

Behaviour change technique	Examples
Prompt self-monitoring	Use pedometers to track steps. 'Hands up' surveys to monitor self in relation to other students' school travel mode.
Prompt intention formation	Using 'if-then' strategies that support the behaviour and help manage setbacks or specific situations. Such as 'if I am late and can't walk all the way to work, then I will get off the tram two stops early to walk the last part.'
Provide instruction	Prepare specific, door-to-door walking times and directions to key business meeting locations.
Prompt specific goal setting	Personalised journey plans are developed face-to-face to enable a conversation about how the plan will be put in place, including setting a specific goal to trial the plan by a certain date and what is required to achieve the goal.



8. Related behaviour change examples

Examples of behaviour change projects that relate to walking and physical activity are set out in the following table, with the main behavioural insights or strategies summarised.

It is important to note that very few behaviour change interventions, outside academic research trials, have been adequately evaluated (including many in the following table). A number of projects have shown positive results in process evaluation (such as participation rates) but may not have reliable outcome measures. Even for those interventions with effective evaluations, it is not possible to separate out the impact of specific techniques or individual nudges.

A key lesson for behaviour change projects is to ensure that evaluation is a central component of any project design and intervention.

Project	Description	Evaluation	Behavioural insights
Liverpool Hospital workplace travel plan, NSW South West Primary Health Care Service	Workplace travel plan for 3,000 staff aimed to reduce private car trips to work. Multiple interventions undertaken, with a focus on personalised journey planning, end of trip facilities, subsidised public transport tickets. Events and active travel campaigns. Delivered over three years.	Evaluated outcomes (statistically significant) using travel survey data: 5% reduction in car trips and associated increase in walking and cycling trips.	Providing timely and relevant information and making it easy through personalised journey plans. Face-to-face journey planning enabled some coaching of participants. Active travel days helped to build social connections.
Your Move Cockburn, WA Department of Transport and Department of Sport and Recreation	Large-scale intervention (10,000 households) delivered over six months. People received tailored resources, including location-specific bus timetables for each household and incentives plus up to three coaching calls.	Evaluated against a control group: effective increases in physical activity, average daily increase of 12 minutes/ per person per day.	Individual coaching and goal setting to get people started; to encourage intrinsic motivation; to help set specific actions; and to identify support people to maintain new behaviours. Used social networks as support and motivation (through community events, social media). Prompts used in follow up phone/email reminders. Made it easy by providing relevant information about local groups and services.

Project	Description	Evaluation	Behavioural insights
Geelong Active City, Healthy Together Geelong, City of Greater Geelong	1,200 employees and 1,000 residents engaged to become more physically active, including use of active travel. Large-scale intervention delivered over 12 months. Phone-based coaching intervention supported by referrals to local services and facilities.	Evaluation against a control group: 8.6 minute increase in average daily activity (20% increase in activity). 40% of people choosing more walking (for exercise).	High participation rates by using opt-out (every employee invited to participate). Coaching and goal setting to get people started and to set specific actions; identified intrinsic motivation. Used social networks as support
Try Walking, City of Boroondara	Focusing on the Camberwell activity centre, residents were encouraged to replace short driving trips with walking. Residents logged their walking journeys on a smartphone app. The app measured changes in walking activity following infrastructure upgrades in key locations.	Evaluation: 140 people participated; 88% walked more often and 64% drove less. Significant increases in walking on upgraded streets.	Prompted self-monitoring and goal setting by recording walking information. Received timely feedback on walking distances and times. Wayfinding and capital works reduced 'friction costs' of walking by making it more direct, informative and pleasant.
Greenlight Project, City of Port Phillip	Increasing pedestrian signal phasing and reducing waiting times to improve safety. Aimed to reduce unsafe crossings on red lights and provide additional crossing time, benefitting people at a slower walking pace (important for children, people with disabilities and older people). Sub-goal to increase walking trips by making local walking easier.	Project evaluation showed safety improvements. Supported related behaviour change projects of walking school bus.	Nudge approach in adjusting the local context to make it easier to walk. Reduced hassle of multi-stage crossings for more people. Removed barrier for those unable to cross within allocated time. Automatic phasing of pedestrian green light reduces 'friction cost' of walking.
Love Living Local, City of Darebin	Project focused on reducing car use for local trips to neighbourhood centres. Had a wide audience and was well received within the community. Utilised a broad range of behaviour change interventions focusing on shopping trips. Delivered over three years.	Process evaluation, no outcome evaluation data available. Unable to determine whether there were measurable increases in walking.	Footpath stencils (prompts), pedestrian wayfinding (prompts and timely information, also building social norms), newsletters to residents, kits for new tenants provided to real estate agents, a 'Transport Café' stall (relevant and timely information). Strategies for making walking easier included an incentive-based home delivery service for groceries so that people didn't need to drive to the local market.

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Project	Description	Evaluation	Behavioural insights
Workplace pedometer programs (systematic review)	This systemic review found pedometer programs in workplaces were most often used to increase physical activity and facilitate increased choice of walking over non-active travel. Pedometer programs are usually team-based or have some element of competition (achieving daily step counts, individual and team goals). Programs were delivered over short periods of time (less than a month is optimal) and in conjunction with other measures.	Systematic review (Freak-Poli et al 2013) found programs were not effectively evaluated to assess physical activity outcomes.	Builds self-efficacy by ease of tracking progress. Provides tangible and timely feedback, enables goal-setting and gamification as a team-based campaign. Regular prompt.
Hounslow: making the most of life changes, London Borough of Hounslow	London Borough targeted families with children commencing school several months prior to the school year to get families to plan for active travel to school instead of driving. Once school started, the follow up campaign offered incentives.	No evaluation of impact.	Timely: targeted message when people are most receptive at a key change in life. Personalised advice. Gamifying engagement through competition to increase motivation and participation.
Piano stairs, Stockholm and Melbourne examples	This novel approach has been trialled in a number of locations. In Stockholm, Metro station stairs covered in 'piano keys' that played as people walked up the stairs to encourage people to walk instead of using the escalator. (This was only a one-day intervention and unlikely to result in sustained changes in behaviour). A similar project was implemented for a week on stairs at Southern Cross Station in Melbourne.	66% more people used the stairs on the day the piano stairs were installed. No extended intervention or evaluation of ongoing changes in behaviour. No evaluation or impact study has been published.	Prompts and fun make stairs the preferred choice but no measure of how long this would last. Could be incorporated as one component of a follow-on campaign.

9. Designing behavioural interventions – key findings

Awareness raising does not equal behaviour change. Simple approaches of advertising to raise awareness, such as posters and pamphlets about “walking to the shops will save you money on parking” are unlikely to be effective in influencing people’s travel choices.

The learning from this review is that projects need to target specific walking behaviours, within a local context (of people and place), which will then define the target participants of a project. From there, behavioural insights (nudges) can be applied to shape an effective intervention.

Key considerations in designing behavioural interventions are:

- **Applying an effective behavioural model will strengthen project design:** it will help analyse issues, respond to the local context (people and place), identify participants and influence specific behaviours. (Section 6 of this report).
- **Evaluation must be central to program design:** real-world testing and learning builds understanding of what works in different settings with different participants. Program design needs to include a robust evaluation framework.
- **The timing of delivery may impact on outcomes.** Many project examples reviewed here were delivered over one or more years. Very short term interventions are less likely to effect lasting changes in behaviour and are at greater risk of being derailed by external factors (such as weather or stakeholders).
- **Interventions are likely to involve direct engagement with people,** rather than exclusively focusing on passive participants being influenced by nudge-style changes to their surroundings. Nudge-style interventions that could alter the design and physical cues of a local area to promote walking, such as the Greenlight project, would strongly support other behaviour change techniques.

• **Effective interventions use multiple techniques and are likely to include some form of:**

- **Personalised engagement:** either through face to face, online or phone conversations or interactions. These help to build relationships and local relevance/connections to support walking and may incorporate goal-setting.
 - **Personalised advice/information:** such as personalised journey planning or very tailored information that applies behavioural insights in conveying messages.
 - **Incentives or gamification:** using campaigns and challenges to build motivation and participation.
- **Behaviour change concepts and interventions are still relatively new work areas for many councils.** Past projects have often had limited or no outcome evaluation. For these reasons, councils are likely to need direct support and capacity building in shaping suitable projects to encourage walking.



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Victoria Walks: Level 7, 225 Bourke Street, Melbourne VIC 3000

P: 03 9662 3975 E: info@victoriawalks.org.au W: www.victoriawalks.org.au