CHANGE TO WALKING 2017-2018

Program Outcomes Report

Testing 'nudges' to encourage walking for short transport trips

VicHealth™

Victoria walks

Contents

Our mission—**More people walking more every day.**

Our vision—**People walk whenever and wherever possible, within strong and vibrant communities, with resulting health benefits.**

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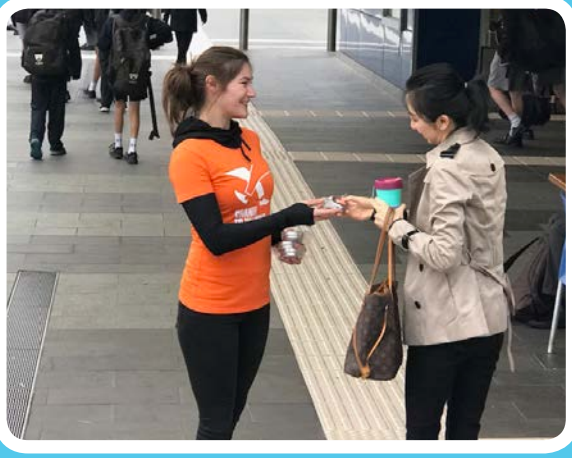
Executive Summary



Nudging with a reward for walking to the station

Change to Walking tested the effectiveness of specific 'nudges' to encourage walking for short trips to train stations and primary schools, over a six-week period between early May and late June 2018. The program was a pilot behaviour change initiative funded by VicHealth and delivered through Victoria Walks in five locations across Melbourne and regional Victoria.

A 'nudge' is a small change that can be made in a setting that influences people's behaviour. It applies insights from behavioural psychology and behavioural economics to encourage voluntary changes in people's choices or actions.

Change to Walking worked with Transport for Victoria, using a range of criteria, to select three metropolitan train stations for the program to target: Croydon, Mitcham and Ringwood, all in Melbourne's eastern suburbs.

It partnered with two schools, each engaged through their local council: Epping Views Primary School, in Melbourne's northern growth area within the City of Whittlesea; and Bourchier Street Primary School, in the City of Greater Shepparton, a regional city in central Victoria.

Train station approach and results

The train stations intervention focused on a series of posters displayed at prominent locations leading to each station. The posters included four different nudge messages to encourage walking behaviours. They were supported by a website providing journey planning advice. The program also handed out small 'rewards' to people who were walking to the station.

There was no measurable increase in walking among commuters who usually drive to the station as a total sample across the three locations, but results varied. Ringwood commuters did show a change towards walking, with a 5% increase in people walking all or part way to the station (from 27% to 32%), while walking to Croydon and Mitcham declined.

> People who usually walked to the station walked more often after Change to Walking. There was a 5% increase in walking frequency across all train stations.

This suggests that the program may have had a positive influence to maintain walking behaviours but limited value in encouraging new walking behaviours (except for Ringwood).

The relative success of the Ringwood project suggests there may be value in targeting stations that are more difficult to drive to or park at.

The onset of winter—less daylight and cooler, wet weather—was associated with the timing of the delivery of Change to Walking. Post-intervention survey results confirmed this had a strong influence, with 73% of those who were walking less blaming the cold. The increase in car travel at Mitcham and Croydon stations came from all active travel modes. This suggests that many people, whether they cycle, catch the bus or walk, shift to the most comfortable travel option when the weather deteriorates. Overall, however, walking remained relatively stable while cycling and catching the bus to the train station declined appreciably.

Delivering a program in spring and early autumn and with more active engagement with commuters is likely needed to assess results in differing seasons. A spring start might offer the best opportunity to establish walking to train stations as a habit, before the following winter.

The commuter survey results indicate that a substantial proportion of commuters may be receptive to changing their behaviour to walking, so there is value in further testing behavioural interventions.

Primary schools approach and results

The behavioural insights intervention for the primary school setting was based on engaging parents in an easy and risk reducing way to plan walking trips to school, to fit around their lifestyles and needs. It included a worksheet and map of local walking routes, marked by decals on the footpath. At the same time, the approach sought to engage the students through fun and using gamification, including daily tracking of active travel and weekly rewards.

> Across both schools walking, scooting and cycling increased from 26% to 35% as a result of Change to Walking. This is a 34% increase in active travel. It equates to 187 more children regularly walking, scooting and cycling to school.

Grade 1 and 2 students increased their walking (scooting/cycling) the most, by 21% and 17% respectively.

The program encouraged students who were either usually driven to school or walked to school to walk more often. Of the children who usually come by car (three or more days a week), 45% increased their frequency of walking. Of the children who usually walk (or scoot/cycle) to school, 84% walked more.

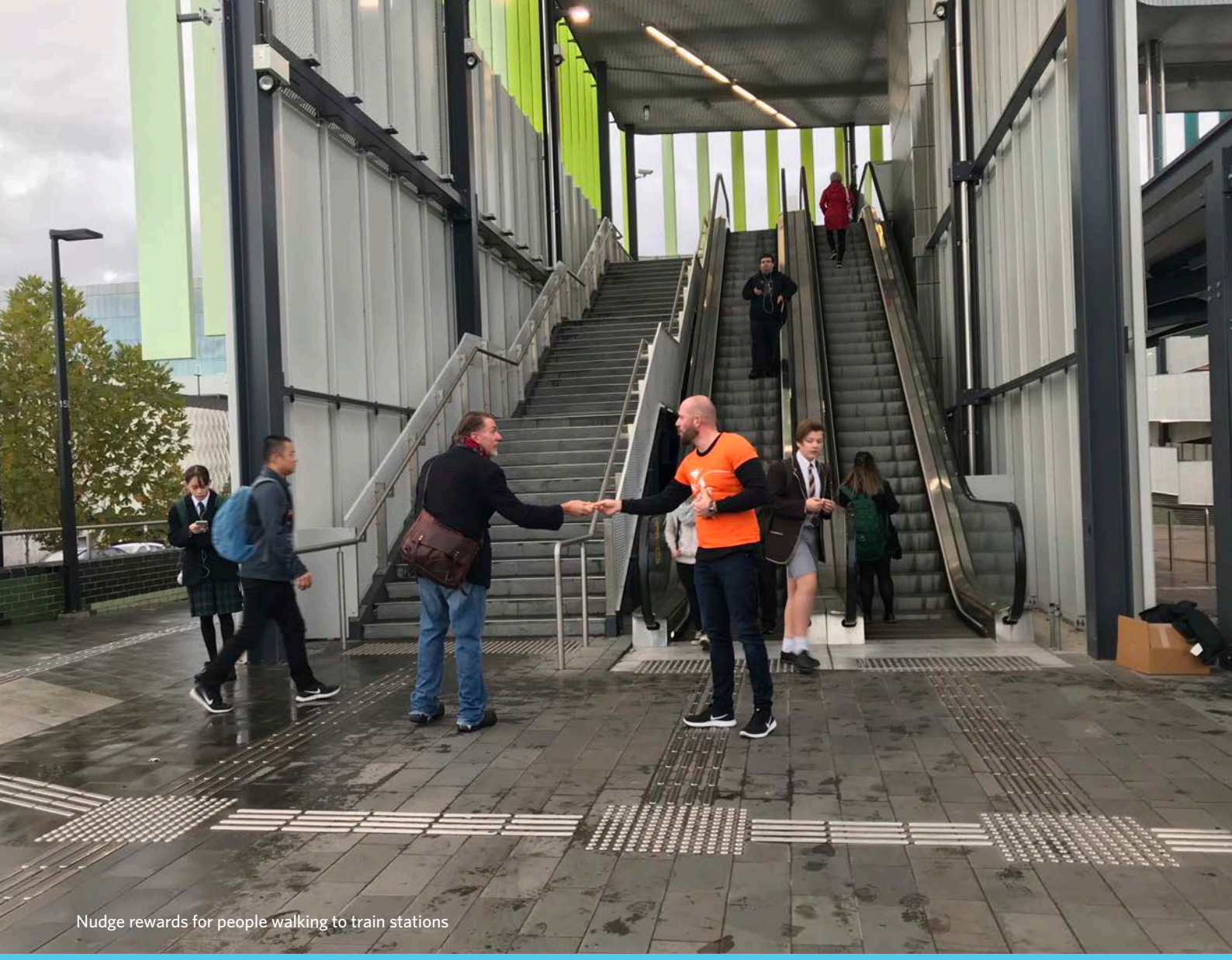
Four out of five children felt they were encouraged to walk by one or more of the Change to Walking elements (school gate sign, receiving a badge or stickers, seeing the footpath decals etc).

The response to specific elements varied significantly between the schools and by age. The clear message is that different elements ('nudges') affect different children, individually and in different locations. This suggests that continuing to use a range of elements is necessary to encourage notable changes across students within a school.

Some teachers at both schools leveraged the program in their teaching. For some older students, the program prompted conversations with their parents about independent travel. For other students the program changed how they travelled to locations other than school.

Walking story and art competition winners | Bourchier Street Primary

Nudge materials for schools



Nudge rewards for people walking to train stations

Conclusions

Change to Walking strongly influenced the behaviour of children who are usually driven to school, as well as increasing the frequency of walking for those who usually travel that way. Active nudge interventions supported by school community interactions and communications achieved strong outcomes in the schools setting.

The schools' results confirm that multiple program elements are needed to encourage active travel across age groups. Some elements are more influential than others and need to be supported by a combination of school and council-led activities.

Passive interventions—nudge messaging —were not enough to sway travel behaviour to train stations, in the face of other dominating influences of the weather and shorter daylight hours, although there was a 5% shift towards walking at Ringwood station.

Delivering a program in spring and early autumn and with more direct and active engagement with commuters is likely needed to achieve greater changes in walking behaviour.

Nudging people to walk for transport

Change to Walking tested the effectiveness of specific 'nudges' to encourage walking for short trips to train stations and primary schools, over a six-week period between early May and late June 2018. The program was a pilot behaviour change initiative funded by VicHealth and delivered through Victoria Walks in five locations across Melbourne and regional Victoria.

A 'nudge' is a small change that can be made in a setting that influences people's behaviour. It applies insights from behavioural psychology and behavioural economics to encourage voluntary changes in people's choices or actions.

Real-world testing and evaluation is essential to work out what 'nudges' are effective in different settings and with different participants. Change to Walking aimed to build on current evidence of behavioural insights[1] strategies, and build capacity to deliver behavioural interventions to improve physical activity outcomes.

Two settings, five locations

Change to Walking worked with Transport for Victoria, using a range of criteria, to select three metropolitan train stations—Croydon, Mitcham and Ringwood—in Melbourne's eastern suburbs.

It partnered with two schools, each engaged through their local council: Epping Views Primary School, in Melbourne's northern growth area within the City of Whittlesea; and Bourchier Street Primary School, in the City of Greater Shepparton, a regional city in central Victoria.

Nudges to encourage walking

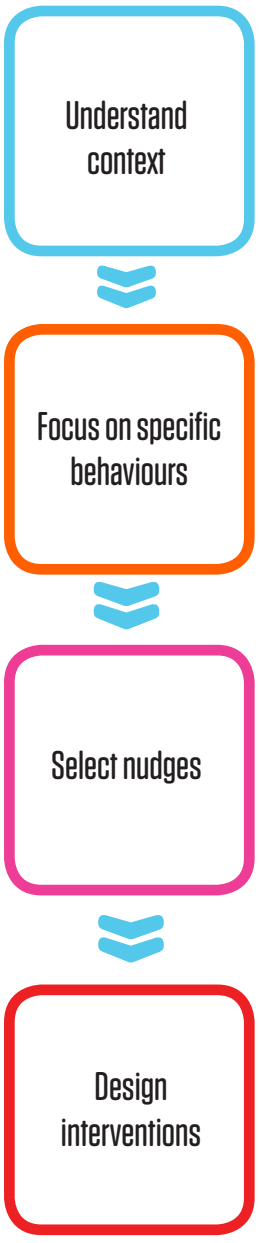
- An explanation of nudges and behavioural insights strategies, including those used to increase walking, are covered in Victoria Walks' report **Applying Nudge Theory to Walking: Designing Behavioural Interventions to Promote Walking[2].**
- It contains lessons from other behaviour change projects, and important information on behavioural insights to guide intervention design for walking.

Program design

Change to Walking 2017-18 built on the learning from the projects undertaken under the first program in 2016-17[3&4]. The program's behavioural interventions were developed using a rapid design process, which was loosely based on the Behaviour Change Design Framework[5] that combines behavioural science and design thinking.

Details of the Change to Walking program design process, delivery and evaluation, are included in the Change to Walking Program Process Summary at the end of this report. The design steps are simplified as: understand the context; focus on specific behaviours; then select nudges to test and design the interventions.

The program design started in September 2017, which included engaging with program stakeholders, identifying school partners and selecting locations. Being already close to the end of the school year meant the interventions could not start until early 2018. The programs were run concurrently (schools and train stations) and it was decided to focus on Term 2 of the school year (April to end of June 2018).



Selection of nudges

Walking for transport is a complex behaviour to influence. There will be a combination of personal, social and external (physical) factors influencing an individual's or family's travel choice. We know from research and past projects that a combination of behavioural strategies are needed to encourage walking for transport. What is not well understood is which ones are most influential.

Change to Walking selected several behavioural insights that were considered relevant to influencing people's choice for their travel to train stations and schools. Through the design process, these insights were used to identify a number of nudge elements (also referred to as program elements). These nudges were then delivered together over the six-week interventions. The program evaluation assessed their effectiveness in encouraging walking for short trips.

Train stations

Setting and context

Past Public Transport Victoria[6] surveys indicate that up to one third of people who drive or are driven to their local train station live within 800 metres (about a 10-minute walk away). This highlights the potential to shift some car travel to short walking trips.

Change to Walking worked with Transport for Victoria to identify suitable station locations. Public transport research also highlighted several behavioural considerations for the program, including that:

- people often significantly over-estimate how long it takes to walk somewhere (by up to 40%)
- a 15-minute walk time is reasonable if there is a high-frequency train service
- emphasis needs to be on making it easy.

The three train stations—Mitcham, Ringwood and Croydon—are in Melbourne's eastern suburbs, about 25-35km from the city centre. Ringwood is a major activity centre with a transport interchange and adjacent large shopping centre. The other two stations are smaller suburban stations in neighbourhood centres.

Nudges

The behavioural insights and nudges used to encourage people to walk to the train stations are summarised in Figure 1. The overarching approach for the train stations intervention was a series of posters using selected behavioural insights to frame messages to encourage walking behaviours. They were supported by a website providing journey planning advice. The program also handed out small 'rewards' to people who were walking to the station.

Train station posters

Train station selection criteria

- >3,000 people boarding each weekday
- High frequency peak-hour services
- Exclude any with disruptions during project (e.g. level crossing upgrades)
- RMIT research: walkability ranking of train stations
- Driver or car passenger to station >25%

Behavioural insights

Anchoring Bias
People rely on stories easily available in their memory to evaluate information in the present. Visceral and personal stories are particularly powerful.

Social Norms
Group and societal norms can be strong motivators. People tend to align their choice with those of a group they are a part of.

Loss aversion
We are more than twice as likely to respond to a loss as to a gain. People will go out of their way to avoid losses.

Surprise
People get more pleasure out of a surprise gain than an expected gain. Surprise can be used to capture people's attention and maintain their interest.

Planning the journey

Behavioural insights | All

NUDGE | Online content to support journey planning in response to nudge messages.

A Change to Walking website, promoted via train station posters.

Content included a summary of the program, benefits of walking, the nudge messaging; a simple journey planner to show walk time and route from home to the station; weather forecasts linked to journey planner.

Travel to the station

Behavioural insights | Surprise

NUDGE | Small random rewards distributed every two weeks for people who walked to the station.

Each reward included a note reading "Thanks for walking".

Rewards included healthy snack bar, container of peppermints and a branded Keep Cup.

Distributed at at the train station. Commuters were asked how they got to the station. Only people who walked received the gift.

At the station

Behavioural insights | All

NUDGE | A1 sized posters containing nudge messages 12-14 posters displayed at strategic locations near station entrances and adjacent car parks to capture the attention of mainly car drivers.

A rolling series of four posters were each displayed for ten days throughout the program.

Anchoring Bias - drawing on a personal story of a real train user who already walks.

Social Norms - aligning walking with perceptions of becoming fit and healthy.

Loss Aversion - emphasising what train users lose by not walking.

Surprise - based on a surprising benefit of walking short distances.

Figure 1 | Behavioural insights and nudge strategies for train stations

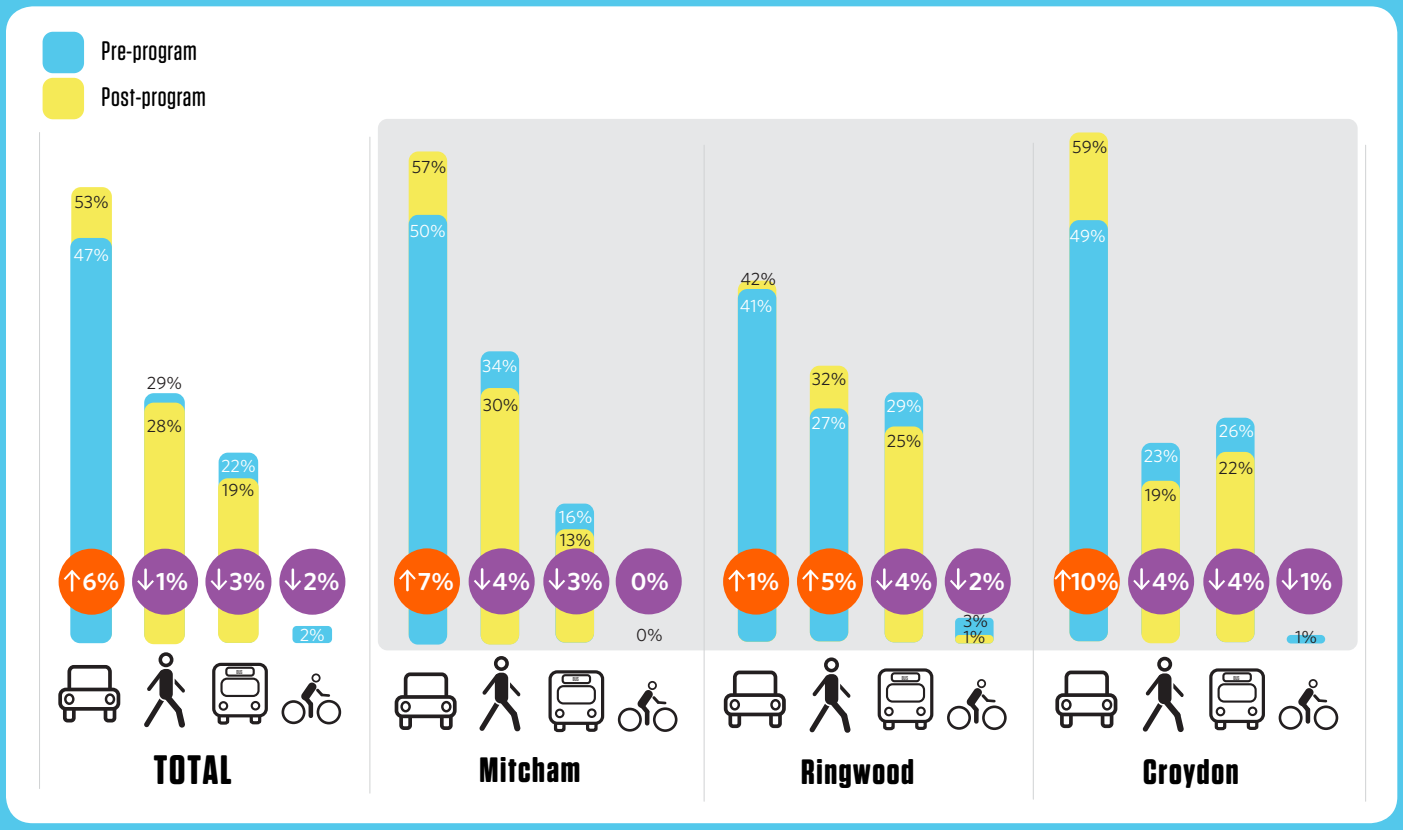


Figure 2 | Usual method of travel to the station before and after the program[7]

Circles show the change in total proportion of car travel, walking, bus travel and cycling to the station before and after the program.

Program participants

The train stations intervention was evaluated using before and after intercept surveys of commuters at the train stations. In total, almost 3,000 people completed the pre-program survey and about half that number completed the post-program survey[8].

The estimated target population was the portion of peak-period[9] commuters who usually drove or were driven to the station that were estimated to live within 800 metres of the station, refer to Table 1.

As travel distance from the station could not be accurately measured, in the survey commuters were asked to estimate their travel time door to door (including finding a car park). Categories of less than 10 minutes, 10-15 minutes and more than 15 minutes were used.

TRAIN STATION	MITCHAM	RINGWOOD	CROYDON	TOTAL
Total commuters in morning peak hours[10]	2,333 6:45–8:45 am	1,958 6:45–8.45 am	1,671 6:30–8:30 am	5,962
People who drive or are driven to the station[11]	49% 1,120	31% 607	51% 852	
Proportion of drivers/ car passengers estimated to live within 800 metres (35%)[12]	400	212	298	910

Table 1 | Estimate of morning peak hours commuters living within walking distance

Results

There was no measurable increase in walking among commuters who usually drive to the station as a total sample across the three locations. See Figure 2.

Ringwood commuters, however, did show a change towards walking, with a 5% increase in people walking all or part way to the station (from 27% to 32%). Significantly, this shift indicates a willingness among some commuters to change their travel behaviour (though it is not known whether the growth in walking was drawn from car, bus or cycling commuters).

Ringwood station is the largest and busiest activity centre with a good walking catchment and more parking restrictions, which may explain the lower driving mode share pre-program. Its better walking access and an increase in uncertainty around finding a car park may make some commuters more susceptible to change their transport decisions and consider walking.

The onset of winter—less daylight and cooler, wet weather—was associated with the timing of the delivery of Change to Walking. The increase in car travel at Mitcham and Croydon stations came from all active travel modes. This suggests that many people, whether they cycle, catch the bus or walk, shift to the most comfortable travel option when the weather deteriorates.

Walking mode share only dropped one percentage point, which is not statistically significant. Bus and cycling declined considerably more than walking. The program may have resulted in the level of walking remaining fairly constant compared to the other modes that typically involve exposure to the weather. The limited scale of the program meant the stations where the intervention took place were not able to be compared to 'control' stations, which may have experienced a greater shift to vehicle travel at the start of winter.

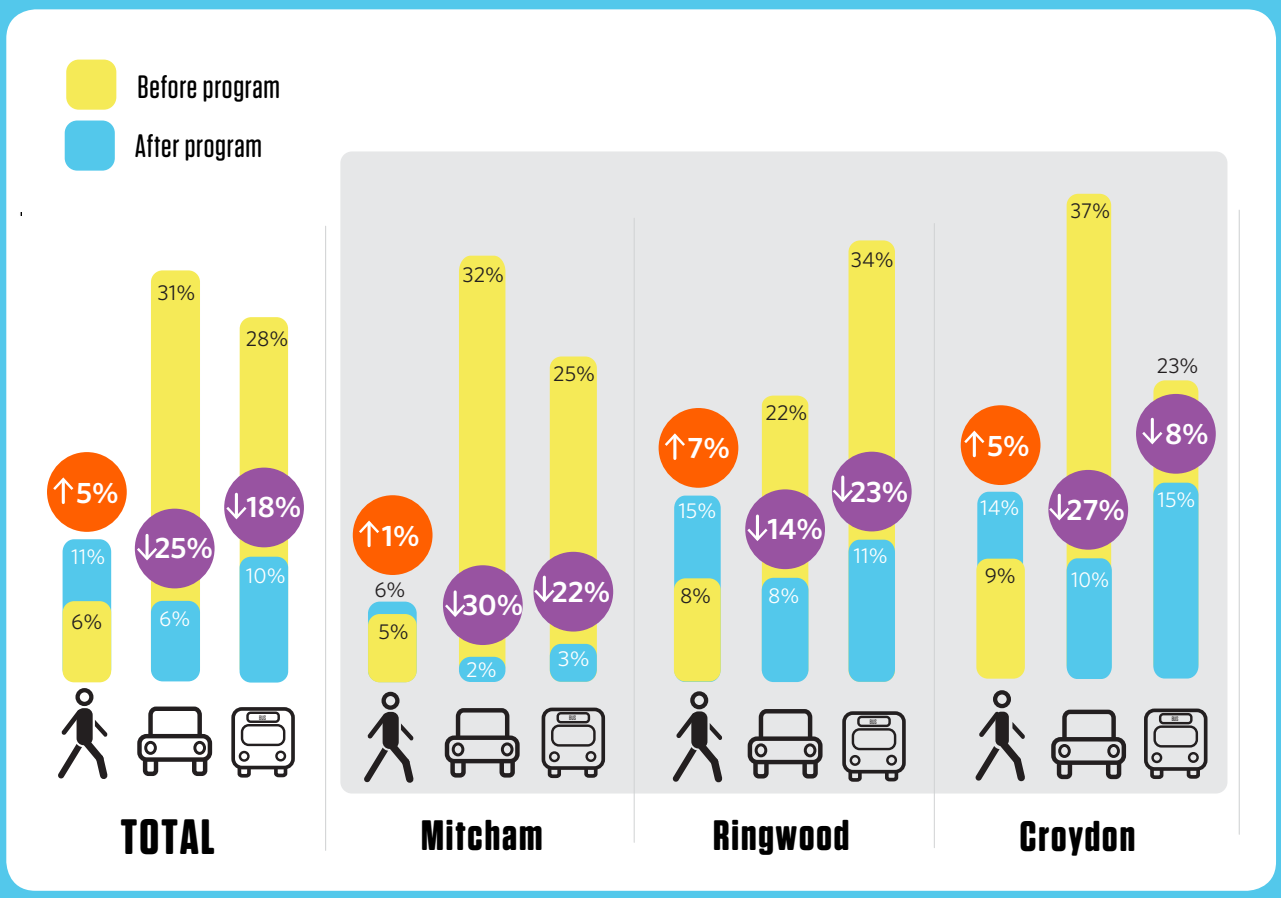


Figure 3 | Change in frequency of walking after the program of those people who sometimes walk to the station[13]

Circles show the change in frequency of walking to the station before and after the program for people who usually travel by car, walk, catch the bus or cycle to the station.

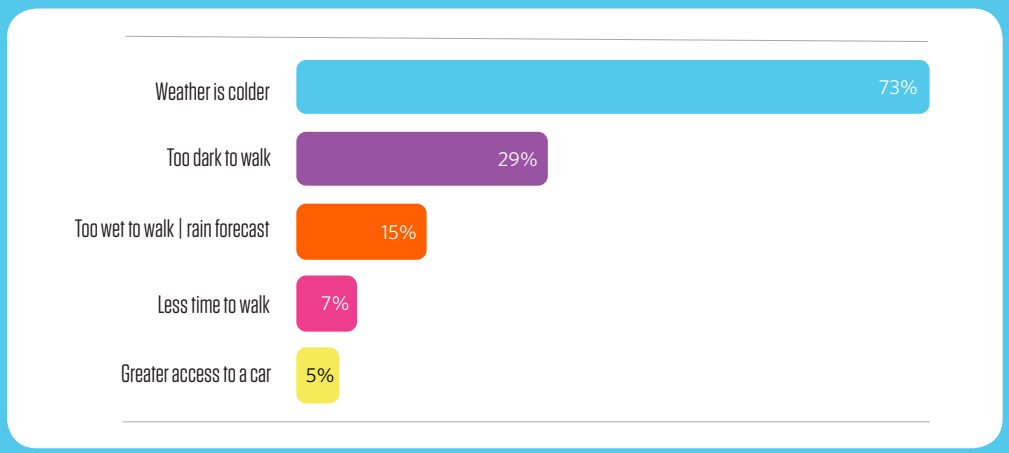


Figure 4 | Reasons for walking less often[14]

A substantial proportion of commuters (31%) who usually travel to the station by car had considered walking.

Reasons for walking less often to the station

Increase in walking frequency

People who usually walked to the station walked more often after Change to Walking. See Figure 3.

> There was a net 5% increase in walking frequency across all train stations, which represents a statistically significant increase ($p<0.05$). The greatest increase was at Ringwood, up net 7% and then Croydon, up net 5%.

People who usually drive or catch the bus but sometimes walk to the station were walking less often.

This suggests that the program may have had a positive influence to maintain walking behaviours but limited value in encouraging new walking behaviours (except at Ringwood). For some of these commuters there were big shifts towards driving more often, especially at Croydon. This had the wettest microclimate of the three stations during the program and is the least walkable of the three locations, which may account for more driving in inclement weather.

For those people who drive for less than 10 minutes to the station (the most likely group to be within walking distance), 39% overall had walked at some point. It was highest at Ringwood, with 46% and lowest at Croydon, at 33%. This again suggests Ringwood's more accessible urban form and greater parking challenges are key influences. A substantial proportion of commuters (31%) who usually travel to the station by car had considered walking.

In relation to particular 'nudges,' the posters at stations may have heightened awareness of the benefits of walking among a small proportion of commuters. Although very few participants (3%) who walked to the station recalled the posters, 55% provided reasons they were encouraged to walk that were consistent with the messages in two posters (43% mentioned walking was good for their health, 14% said it was easier than driving).

Of commuters who indicated that they are walking to the station or part of the way, 17% indicated that they had been offered a reward for walking when they got to the station.

Barriers to walking

54% of those who travel by car for less than 10 minutes perceive it as too far to walk, which is likely the case for people driving for a full 10 minutes, depending on congestion and travel speeds. Another 34% prefer the quicker option to drive.

> Post-program for people who usually walk but are walking less, 73% of people felt it was too cold, 29% felt it was too dark to walk, see Figure 4.

Results of Change to Walking at train stations

5% increase in people WALKING to Ringwood station

43% of regular walkers know that walking is good for their health

5% of regular walkers walking more often to all 3 stations

14% of people walking find it EASIER TO WALK than drive to the station

Potential for change

31% of people who usually drive to the station have considered walking

"I don't get time for other exercise but the walk to the station gives me 20 minutes of exercise each day."

— Tina Arora, Ringwood Station

Conclusions

The program was unable to overcome the impact of the changing seasons on travel behaviour. The weather, at the onset of winter with colder, shorter days and more rain was the dominant barrier to walking to the station, even for a short distance for existing walking commuters. It appears to have overriden the value derived from the passive Change to Walking interventions.

The limited success of the commuter program across the three locations indicates that a passive engagement using nudge messages has limited potential to shift short car trips to walking trips if faced with significant adverse background influences (in this case the weather). However, people who already walked to the station walked more often after Change to Walking and walking did not decline in the way that cycling and bus travel did. This suggests the program probably supported existing walking behaviours to be maintained during colder, wet weather.

Delivering a program in spring and early autumn and with more active engagement with commuters is likely needed. A spring start might offer the best opportunity to establish walking to train stations as a habit, before the following winter.

The relative success of the Ringwood project suggests there may be value in targeting stations that are more difficult to drive to or park at.

The dedicated website had limited value in contributing to behaviour change without more active strategies to direct people to the site. It would be worth testing alternative methods to utilise the journey planning tool to assess its use in encouraging walking for short transport trips.

> The commuter survey results indicate that a substantial proportion of commuters may be receptive to changing their behaviour to walking, so there is value in further testing behavioural interventions.

Tina Arora, Walking to Ringwood Station

Tina is studying to be a nurse. Her morning walk to the station gives her time to listen to music and just enjoy the fresh air before a busy day of study.

> "Walking to the station is actually quite peaceful" she says; a contrast to her intense hospital training.

Tina commutes from Ringwood station to the city four times a week to study and saw the positive Change to Walking messages.

She now walks more often to the station, having decided it would be the easiest way to build some exercise into her day.

Tina's noticed she's lost weight as a result of her walking commute. "I don't get time for other exercise but the walk to the station gives me 20 minutes of exercise each day."

Primary schools

Across Epping Views and Bourchier Street, 74% of children who are usually driven to school said they would prefer to walk, scoot or cycle.

Context

Through a council expression of interest process, Bourchier Street Primary School and Epping Views Primary School were selected, based on their best overall fit to the program's selection criteria.

Epping Views Primary School is in Melbourne's northern growth area within the City of Whittlesea. It has had a massive growth in student numbers in a decade (from 30 to 1,383), which has generated lots of traffic congestion around the school. The school has a very culturally diverse community, including many new migrants.

Bourchier Street Primary School is one of Shepparton's largest primary schools, with 615 students. It draws students from a large catchment but also has many students within walking distance. It also has a culturally diverse mix of students. It is flat and walkable but has some larger arterial roads to cross within the walking catchment. The town also experiences very hot summers and chilly winters.

Across Epping Views and Bourchier Street, 74% of children who are usually driven to school said they would prefer to walk, scoot or cycle. This confirmed that students would be receptive to a program encouraging active travel. Past projects and research identify that children living within 1km of school are most likely to walk to school but children up to 2km may still walk to school. This focused the schools program on walking catchments of up to 1.5km, with walking routes covering a 15 minute walk to school.

Nudges

The overarching theme for the intervention for the primary school setting was based on engaging parents in an easy and risk reducing way to plan walking trips to school, to fit around their lifestyles and needs. At the same time, the approach sought to engage the students through fun and using gamification with individual and shared rewards. Refer to Figure 5.

School selection criteria

- Minimum 400 students
- 50% within walking distance
- Road speed: 60km/hr or less
- Walkable catchment
- High traffic congestion at school
- Capacity to support project

"I used to just walk in the afternoons and then I started walking in the morning too"

— Grade 5 student | Bourchier Street Primary

Behavioural insights

Certainty Bias
An option that minimises risk, especially one that reduces risk to zero, will often be desirable. People go out of their way to avoid losses, and thus a safe option can be particularly compelling.

Social Norms
Group and societal norms can be strong motivators. People tend to align their choice with those of a group they are a part of.

Gamification
Make it attractive by designing rewards to maximum effect, such as 'gamifying' activities.

Surprise
People get more pleasure out of a surprise gain than an expected gain. Surprise can be used to capture people's attention and maintain their interest.

Planning the journey

Behavioural insights | Certainty bias and social norms

NUDGES | Change to Walking information pack for students to discuss with their parent/carer, which included:

- Letter from principal asking parents to pledge to walk one more day each week than they usually do
- Worksheet about the benefits of walking, including map with suggested walking routes and tips to plan a walk to school
- Fridge magnet as a positive prompt to walk, focusing on benefits
- Badge for each student, to build social norms.

Travel to school

Behavioural insights | Certainty bias and surprise

NUDGE | Fun and interesting footpath decals mark out 15-minute walking routes to school in locations where there are many students living close to the route.

Identifiable routes give families confidence that these are popular routes for children to walk to school.

Arrival at school

Behavioural insights | Social norms and gamification

NUDGES | Included:

- "We are a Walking School" sign displayed at each school gate with weekly tally of walking trips
- Wall chart for classes to record each day the number of children who used active travel to school. Highlights preferred active travel behaviours and builds competition
- Stickers as a reward for children who walked to school all or part of the way at least once a week. Gamifies the activity
- Notices and reminders in school newsletters over the program delivery period
- Story/art competition to highlight personal stories and positive experiences.

Figure 5 | Behavioural insights and nudge strategies for primary schools.

The program encouraged students who are usually driven to school to walk more often.

Evaluation

The schools' program was evaluated using online surveys for students and parents before and after the interventions. The student surveys were completed in class with teacher support, two weeks after the program finished. Questions focused on how students usually travelled[15] and whether they considered they were walking (cycling or scooting) more or less often since the start of Term 2. They were also asked about their reaction to the program materials. Both schools had very good completion rates for students (72% and 93%). Parent surveys were sent via email, school app and reminders sent on school social media.

Results

> Across both schools walking, scooting and cycling increased from 26% to 35% as a result of Change to Walking. This is a 34% increase in active travel. It equates to 187 more children regularly walking, scooting and cycling to school[16]. Refer to Figure 6.

This increase in active travel included statistically significant increases by school, gender and among Grade 1, Grade 2, Grade 3 and Grade 5 children. Grade 1 and 2 students increased their walking (scooting/cycling) the most, by 21% and 17% respectively. See Figure 7.

The program encouraged students who are usually driven to school to walk more often. Of the children who usually come by car (three or more days a week), 45% increased their frequency of walking. For example, some students who are driven five days a week may now walk to school once a week while continuing to be driven most of the time.

Of the children who usually walk (or scoot/cycle) to school (at least three days a week), 84% walked more, and for bus travellers, 60% increased their frequency of walking. There was some variation between the two schools, as seen in Figure 8. The program asked families to pledge to "walk (scoot or cycle) to school just one day more each week than they usually do". This pledge may have had some influence on the increases in frequency across all usual travel options.

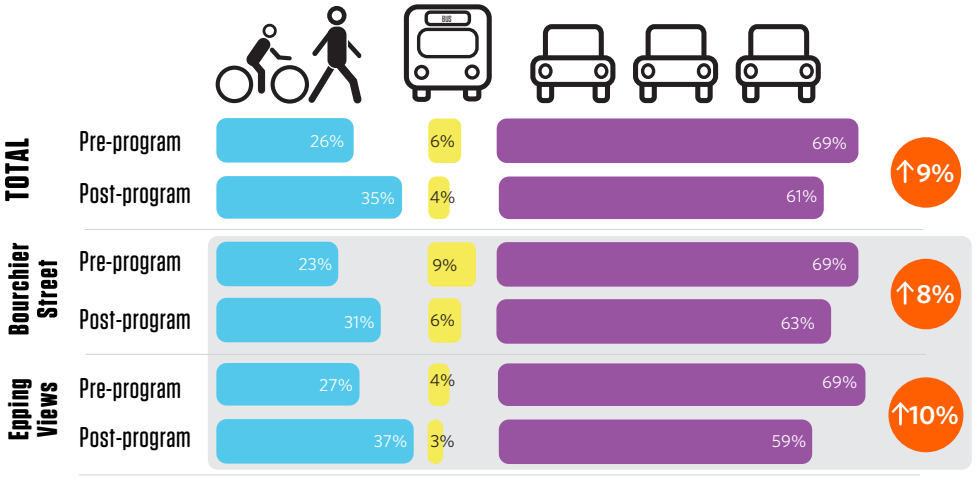


Figure 6 | Proportion of children travelling by active travel, bus and car to school before and after the program[17]

Blue shows children who are walking, scooting and cycling; yellow shows children catching the bus; purple shows children being driven to school. The increase in active travel after the program is shown in the circles.

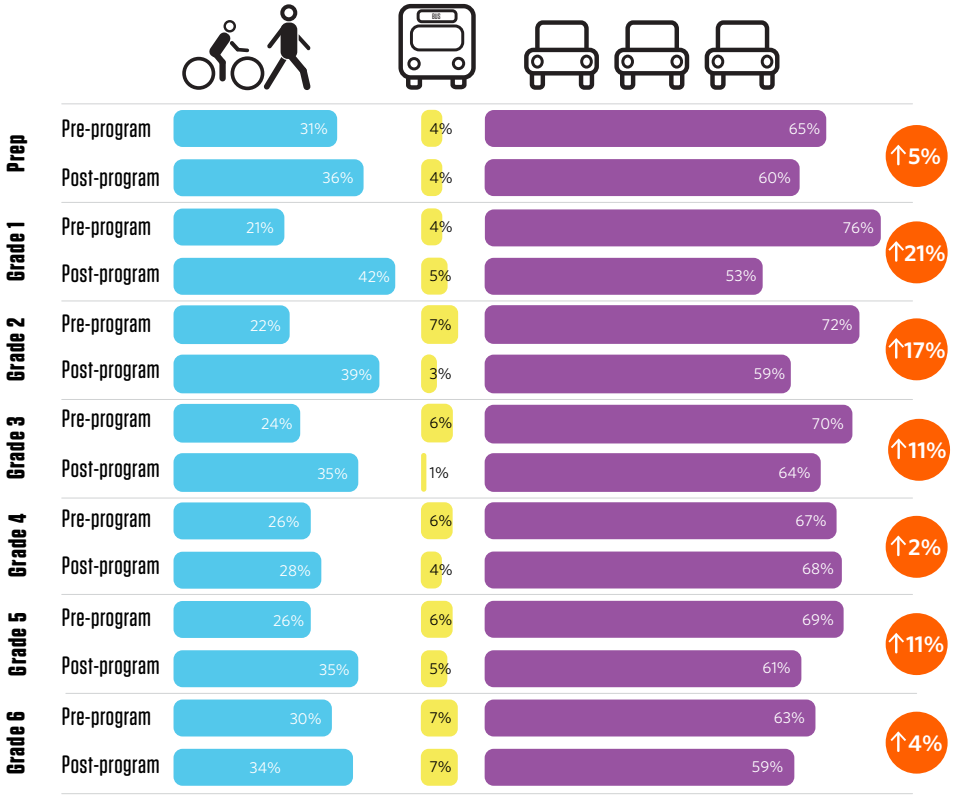


Figure 7 | Proportion of children, by grade, travelling by active travel, bus and car to school before and after the program[18]

Blue shows children who are walking, scooting and cycling; yellow shows children catching the bus; purple shows children being driven to school. The increase in active travel after the program is shown in the circles.

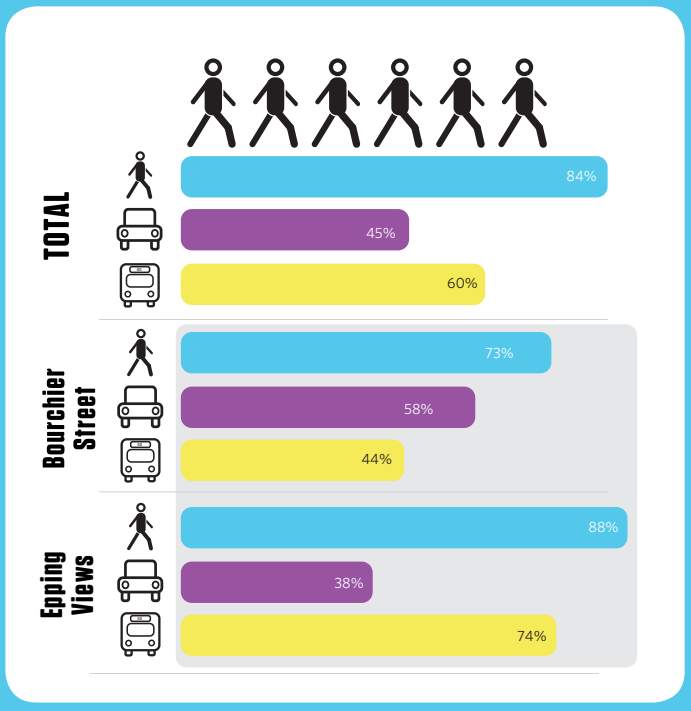
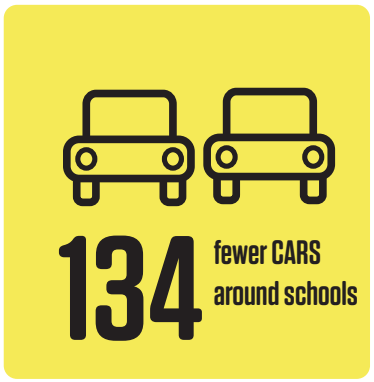
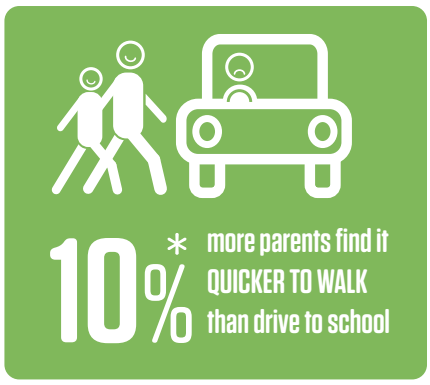


Figure 8 | Increase in frequency of walking after the program[19]

Of the children who usually come by car (three or more days a week), 45% increased their frequency of walking. For example, some students who are driven five days a week may now walk to school once a week while continuing to be driven most of the time. Of the children who usually walk (or scoot/cycle) to school (at least three days a week), 84% walked more, and for bus travellers, 60% increased their frequency of walking.

Results of Change to Walking at schools





* Epping Views only results

"I talked to my Grandma about which ways we can go to school. We bought a book and wrote what ways we walked."

— Grade 1 student | Bourchier Street Primary

Perceived barriers to walking by parents pre-program and post-program

There were some notable differences in parent perceptions among Epping Views Primary school parents/carers after the program[21].

While these changes in perception cannot be attributed to the program, their children's participation in Change to Walking may have had a positive influence on some parents' perceptions about walking:

- The proportion of parents/carers who indicated that their children were too young to walk to school dropped from 53% pre-program to 37% post-program
- Perceptions of it being quicker to drive and park rather than walk to school dropped from 20% to 10%.

In contrast, the proportion who considered the school to be too far away was relatively stable pre-program and post program, 49% and 47% respectively, which aligns with the unchanging physical barrier of the large school catchment, with many children living beyond walking distance. Refer to Figure 9.

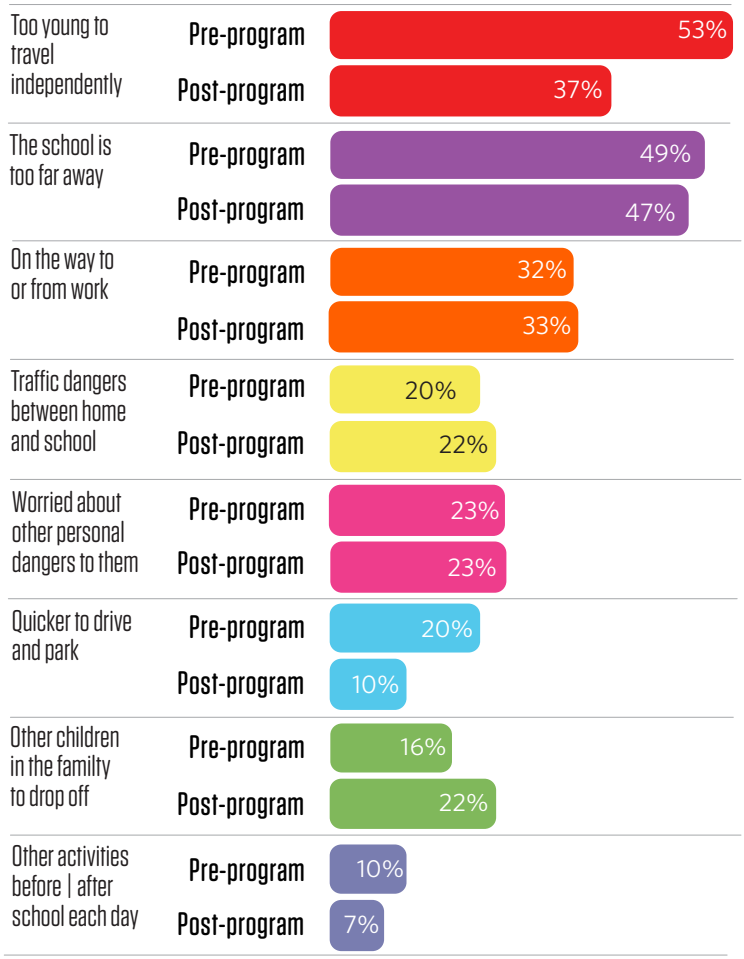


Figure 9 | Perceptions of barriers to walking from Epping Views parents[20]

"I felt proud of myself
[when I received a sticker]"
— Grade 2 student | Epping Views Primary

Influence of individual program elements

In the post-intervention survey, 81% of children felt they were encouraged to walk by one or more of the Change to Walking elements [such as the school gate sign, receiving a badge or stickers, seeing the footpath decals etc][22]. Refer to Figure 10.

The response to specific elements varied between the schools. The wallchart and decals on the footpath had a stronger impact on children at Bourchier Street, while more children at Epping View responded to receiving a badge and getting stickers in class. The different reactions to the wallchart could relate to whether they were promoted by individual teachers.

> The clear message is that different elements affect different children, individually and in different locations.

This suggests that continuing to use a range of nudges is necessary to encourage notable changes, and where feasible, design elements that respond to different age groups within a primary school.

Program materials: Grade 1s vs Grade 6s

Unsurprisingly, there were big variations in the reaction to program elements between age groups.

Table 2 compares Grade 1 and Grade 6 students' reactions to the most popular elements. Receiving stickers in class and the wallchart counting had strongest appeal for young students in Prep and Grade 1 and 2. Interest in stickers was very low by Grade 4, although receiving a badge continued to interest up to a third of students through to Grade 5. Weekly sticker rewards, however lost appeal from Grade 2 (36%) and was an incentive for less than 9% of students by Grade 6. Footpath decals had a greater appeal for older students (Grade 4-6).

Overall, by Grade 6, 40% of students identified as not being influenced by the materials (but may have been influenced by peer participation).

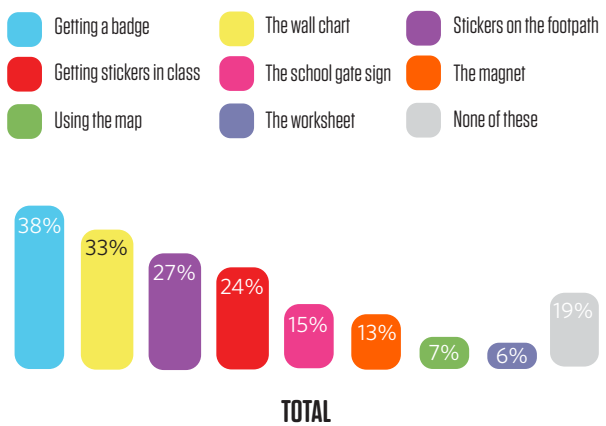


Figure 10 | Influence of individual program elements on encouraging active travel to school[23]

Program element (nudge) that encouraged active travel	Badge	Wallchart	Footpath decal	Stickers in class	No materials
Grade 1	51%	32%	27%	36%	7%
Grade 6	28%	17%	31%	9%	40%

Table 2 | Comparison of Grade 1 and Grade 6 students response to program elements

Student experiences

Some teachers at both schools leveraged the program in their teaching. Several classes used 'walking to school' as a theme for persuasive writing and interviews with friends. Other students were asked to calculate how many metres their home was from school and to go for a walk with a family member for homework.

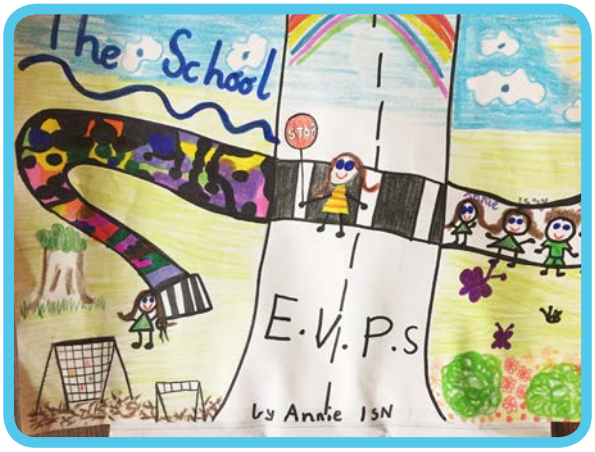
> For some older students, the program prompted conversations about independent travel, exploring how they could walk or catch the bus to school and planning their travel to high school next year.
>
> For other students the program changed how they travelled outside school, with a number commenting they now walk more at other times—"Mum used to drive us to the shops but now my brother and I walk."

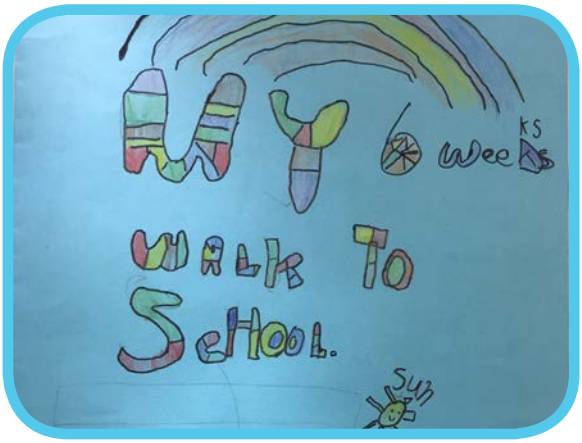
Many children shared stories of their active travel to school through the art and story competition, such as a student in Grade 1 at Epping Views: "We always stop and read the messages on the footpath. Sometimes kangaroos pop up on our walk to school."

Many have felt the benefits of more walking: "I have more time with my mum. Chit chat time." Commented a Grade 1 student at Epping Views. "My beep test improved [in PE] after I'd been walking more." Grade 4 student, Bourchier Street Primary. "I felt proud of myself [when I received a sticker]" Grade 2 student, Epping Views.

"When I was walking to school I told my friends to walk a bit more. I felt really proud of myself because I walked more than ever."

— Grade 1 Student | Bourchier Street





Students' Change to Walking artwork as part of the art and story competition

Conclusions

> The program strongly influenced the behaviour of children who are usually driven to school, as well as increasing the frequency of walking for those who usually travel that way.

Weather was less of a barrier to active travel in the schools' program; this may largely be a result of the more intensive behaviour change strategies applied in the schools to encourage walking.

In relation to program materials:

- Younger children respond favourably to small individual incentives such as badges and stickers, and such rewards can encourage them to change their behaviour
- Class based activities, such as counting the number of children who actively travel to school help collectively reinforce the desired behaviour to walk to school
- Marked walking routes with footpath stickers, and associated activities help identify "safe and good" walking routes for children and convey a message to parents that there are safe routes for their children to walk to school
- Competitions that reward children when they walk, cycle or scoot to school encourage children to walk.

Clearly identifiable programs such as Change to Walking help facilitate both child and parent-initiated conversations about walking between children and their parents. And by encouraging children to walk to school, some parents/carers are also encouraged to walk more as they accompany their child to school.

Conclusions and lessons learned

Active nudge interventions supported by school community interactions and communications achieved strong outcomes in the schools setting, with an overall 9% increase in the proportion of active travel to school (a 34% change in walking rates) across two primary schools.

Passive interventions—nudge messaging—were not enough to sway other dominating influences of the weather and shorter daylight hours on travel behaviour to train stations, although there was a 5% shift towards walking at Ringwood station.

The concept interventions identified at the co-design workshop strongly shaped the end designs. Elements were integrated where appropriate but often needed to be adapted or restricted to fit the program budget and time constraints. For example, there were several promising concepts that could not be implemented within this program, such as: themed walking groups to train stations, organised through social media; and an app to help plan and receive real-time information (such as weather updates) for the schools setting.

> The commuter survey results indicate that a substantial proportion of commuters may be receptive to changing their behaviour to walking, so there is value in further testing behavioural interventions. Delivering a program in spring and early autumn and with more direct and active engagement with commuters is likely needed.

Bourchier Street Primary continues to be a priority school for its council to work with on active travel to maintain active travel behaviours, as council focused its efforts on a smaller number of schools participating in Walk to School during October this year.

The program has strengthened Epping Views Primary's interaction and engagement with its local council. Together the council and school identified priority actions to continue to build on the program's positive change. These included: using the art/story competition as regular positive messages about active travel in school communications, continuing to promote active travel as the preferred travel option to all new families, establishing a student working group, and participating in a broader school/council active travel network. Council also leveraged the program results to support a TAC funding application to extend the selection and mapping of walking routes around schools.

"How to" guides[24] have been developed as one early outcome of the Change to Walking program learning. The guides focus on three program elements that students considered were most influential: badges/stickers; active travel classroom wallchart; and footpath decals. These resources are available to support local councils and others engaging with schools to encourage more active travel.

Program delivery approach

August 2017

VicHealth | Program Sponsor

- Identifies program outcomes
- Selects intervention settings: 3 train stations & primary schools
- Drafts program logic

Program outcomes

- Build on current evidence of behavioural insights approaches (selected nudge interventions) to influence walking for short trips to primary schools and train stations, including in regional and growth areas of Victoria and among disadvantaged groups that have lower walking participation rates
- Build sector capacity to deliver nudge interventions to influence behaviour change
- Translate and disseminate this evidence base to guide future policy and practice
- Develop this evidence base to help inform government policy and practice to promote walking

September-October 2017

Victoria Walks | Program Delivery & Evaluation

- Funding agreement with VicHealth
- Appoints program delivery team (practitioners in program design, management & evaluation)
- Prepares workplan and evaluation framework
- Engages with stakeholders
- Calls for expressions of interest from Councils

Early stakeholder engagement

Local councils: through an expression of interest process schools

Transport for Victoria: to discuss shared outcomes & provide research on train station locations; to connect with Public Transport for Victoria and Metro Trains (for project approvals)

October 2017

Short list schools and train station locations

Schools criteria

- Minimum 400 students
- 50% within walking distance
- Road speed: 60km/hr or less
- Walkable catchment
- School traffic issues
- Capacity to support project

Train station criteria

- >3,000 people boarding each weekday
- High frequency peak-hour services
- Exclude any with disruptions during project (e.g. level crossing upgrades)
- RMIT research: walkability ranking of train stations[25]
- Driver or car passenger to station >25%

End October 2017

Program logic workshop | VicHealth & Program Team

- Review and agree program logic
- Review and agree evaluation framework and criteria
- Select program locations (2 schools selected from 22 short-listed; 3 stations selected from 8 that met criteria)

Key evaluation questions

- Has the program encouraged more people to walk for short trips?
- How have the program learnings contributed to the evidence base of behavioural insights approaches to influence walking for short trips?
- How can the program outcomes be used to improve government policy and practice to promote walking?

November -December 2017

Context & design research | Program Team

- Primary research: discussions with school principals, local councils, public transport managers, site visits.
- Secondary research: desktop review of locations, research & planning reports, demographic profiles
- Literature review of nudge techniques
- Review and selection of nudges to test based on program contexts

Program design workshop | Program Team & User Experience/Design practitioners

- Journey mapping: identify opportunities to apply nudges pre-journey (planning), during, and on arrival (at station or school)
- Ideation of concept intervention elements within program constraints (budget, delivery timeframe, stakeholder interactions)

Finalise program design (Program Team)

- Refine intervention concepts into final design within program constraints for train station and schools
- Prepare content for program materials

February - April 2018

Program delivery and evaluation

Work with project partners

- Work with schools to prepare for delivery (teacher briefing session, regular contact with school coordinator, provide all content for communications)
- Work with councils to review and undertake safety audits of walking routes
- TfV, PTV, Metro Trains review of draft posters.
- Apply for permits from Metro Trains for poster installation at 3 stations and to conduct intercept surveys on platforms

Prepare program materials and events

- Develop strong Change to Walking visual identity for materials
- Identify walking routes
- Design and print program materials (website, corflute posters, worksheets, decals, badges, stickers, magnets, signs event T-shirts)
- Appoint sub-contractors to install footpath decals, run station events and source walker rewards

Program evaluation

- Prepare survey instruments (schools: student & parent online survey; train stations: intercept)
- Schools review draft surveys
- Appoint survey delivery sub-contractor for train station surveys
- Conduct surveys over two weeks at train stations and schools

May - July 2018

Change to Walking interventions

Delivered over 6 weeks at Epping Views Primary School (Melbourne) and Bourchier Street Primary School (Shepparton) and at three Melbourne train stations (Croydon, Ringwood and Eltham)

Program evaluation

- Post-intervention surveys at schools and train stations
- Student focus groups
- School stories/art competition
- Stakeholder interviews

August - November 2018

Change to Walking Reporting

Report on program outcomes. Share results with stakeholders, communicate outcomes and learning to local government and state government agencies and practitioners

Endnotes

1 For more information refer to *Applying Nudge Theory to Walking: Designing Behavioural Interventions to Promote Walking.*

2 As above.

3 *Change to Walking: using 'nudge' interventions to get more people walking.*

4 www.victoriawalks.org.au/Change-to-Walking/.

5 Developed by Jonathan Daly, Urban Behaviour Lab.

6 Reference provided by Transport for Victoria of 2012 Public Transport Victoria Origin Destination Survey, which was used to estimate that one third of people who drive or are driven to a station live within 800metres. This is an estimate across the whole of metropolitan Melbourne, which may be higher or lower for individual stations. It is also 'as the crow flies' which means the walkable distance may be further. The estimate originally quoted was 35%, which was used for Change to Walking's participant calculations. It was later clarified to be up to one third of people.

7 See details in Figure 2 table below.

8 The post-program sample size at all stations was about half that of the pre-program survey. The same number of interviewing hours were allowed for in both surveys, however the post-program interviews took longer to complete as they contained more questions.

9 Two hours in the morning with the highest boardings. This was the time when the program surveys were conducted.

10 Train station boardings data provided by Transport for Victoria.

11 Public transport 2016 Origin-Destination survey data provided by Transport for Victoria.

12 Refer to footnote 4.

13 See details in Figure 3 table below.

14 See details in Figure 4 table below.

15 Usually travelled' was defined as three or more days a week.

16 This would include a number of students who were driven part way to school and walked the rest. The walking routes were approximately 15-minute walks to enable 'park and walk' to be an option for children who lived beyond walking distance.

17 See details in Figure 6 table below.

18 See details in Figure 7 table below.

19 See details in Figure 8 table below.

20 See details in Figure 9 table below.

21 The sample size of parents who completed the post-program survey at Bourchier Street was too small to enable comparison between pre- and post-program perceptions.

22 The pledge to 'walk one day more each week than you usually do' was included on the principal's letter accompanying the worksheet and also on the class wall chart. This pledge was not surveyed as an individual program element.

23 See details in Figure 10 table below.

24 Available on Victoria Walks website www.victoriawalks.org.au.

25 Jeffrey, D (2017) *Understanding the Walkability of Melbourne's Train Stations: An Analysis of Station Typologies in Melbourne* (Minor Thesis) The University of Melbourne.

Sample sizes of survey results

Figure 2 | Usual method of travel to the station before and after the program

	Total	Mitcham	Ringwood	Croydon
Pre-pogram	2990	1229	970	791
Post-program	1564	647	450	467

Figure 3 | Change in frequency of walking after the program—Usually travel by... and sometimes walk all or part of the way

	Total	Mitcham	Ringwood	Croydon
Walk	431	196	143	92
Car	209	88	50	71
Bus	109	32	38	39

Figure 4 | Reasons for walking less often

Post program	124

Figure 6 | Proportion of children travelling by active travel, bus and car to school

	Total	Bourchier St	Epping Views
Pre-pogram	1584	571	1013
Post-program	1454	459	995

Figure 7 | Proportion of children, by grade, travelling by active travel, bus and car to school

	Total	Prep	Grade 1	Grade 2
Pre-pogram	1584	141	194	267
Post-program	1454	243	270	121
	Grade 3	Grade 4	Grade 5	Grade 6
Pre-pogram	252	221	283	226
Post-program	315	198	198	168

Figure 8 | Increase in frequency of walking after the program who usually travel by...

	Total	Bourchier St	Epping Views
Car	887	289	592
Walk,cycle, scoot	509	142	373
Bus	58	28	30
Total	1454	459	995

Figure 9 | Perceptions of barriers to walking from Epping Views parents

Pre-pogram	151
Post-program	95

Figure 10 | Influence of individual program elements on encouraging active travel to school

	Total	Bourchier St	Epping Views
Post-program	1454	459	995

Acknowledgements

Many people made valuable contributions to the successful design, delivery and evaluation of this program.

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