

From naifs to sophisticates: Awareness of self-nudges can reduce car usage

Waiyan LEONG

Chief Transport Economist/ Land Transport Authority, Singapore

Presentation at the Behavior, Energy & Climate Change Conference

Sacramento, CA

Nov 11 – 15 2023



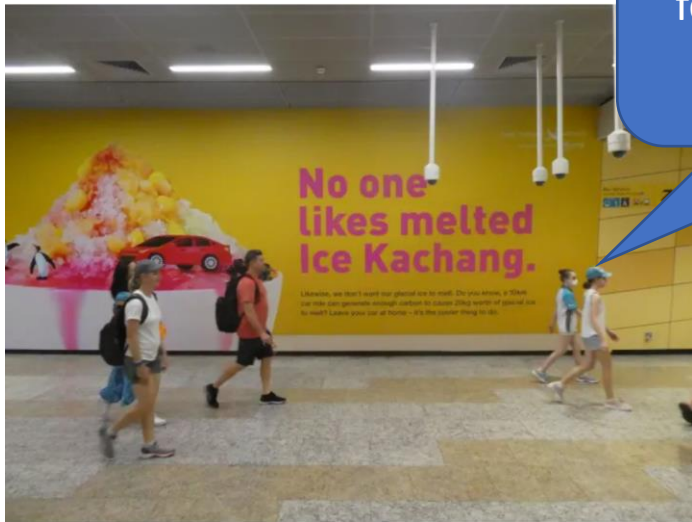
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Study Objectives

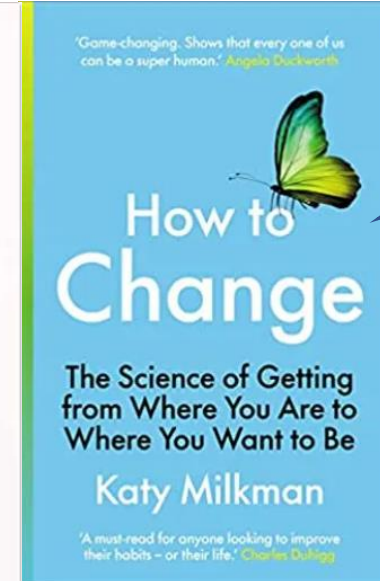
Main Objective

To examine if **exposure to nudge strategies (“how” to go car-lite)** leads to car use reduction, in the absence of any further financial incentive/disincentive

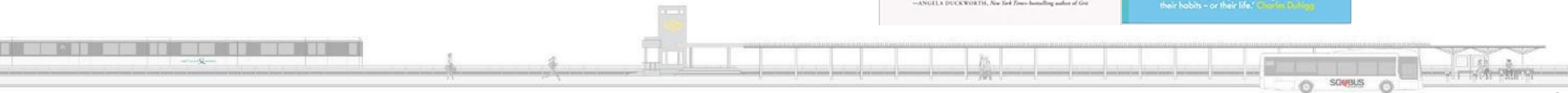
Ok, so you have convinced that I should be making fewer car trips ... but how do I start? It just seems so...impossible



Check out how behavioural science can help!



TLDR...



The Car-lite Intervention

A voluntary*, educational intervention on how to transition to a car-lite lifestyle, to complement the why

Plan

↓
Behavioural Principles
Planning

Commitment Strategies

Distance

↓
Behavioural Principles
Commitment devices
Friction

Celebrate

↓
Behavioural Principles
Repetition for habits
Gamification

* Pay-out of study incentive did not require drivers to act on any of these steps.



Week 1: Plan

“Fail to plan, plan to Fail”

Participants were asked to consider going car-lite and plan for 6 – 10 more car-free days over a 4-week period on a virtual calendar

Self-set and pre-assigned goals facilitate behavioural change
(McCalley & Midden, 2002)

“Ever wanted to try using your car less, but thought it was too difficult?”

PLANNING your car-free days helps. Try to plan for 6 – 10 car-free days (not counting any vacation days) over the next 4 weeks. **Check your email** (including your spam folder) to find a virtual calendar that you can use to plan your car-free days.

As the saying goes, “Fail to plan, plan to fail”!

Number of car free days
(don't count any planned overseas trips)

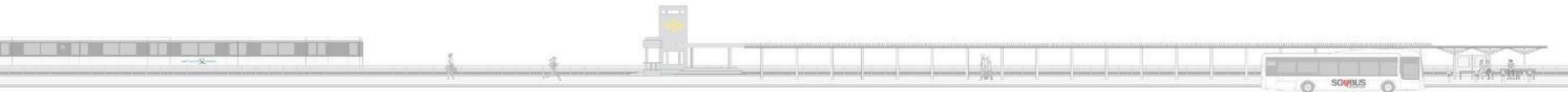
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Start planning! Click on any date to mark it "car-free".

Instructions

- 1) Click on the dates that you aim to go car-free, outside of planned overseas trips. Try to get at least 6-10 car-free days!
- 2) Save a picture of the calendar in a place you can easily access so it can serve as a reminder.

Mon	Tue	Wed	Thu	Fri	Sat	Sun
Jan						
02 <input type="checkbox"/>	03 <input type="checkbox"/>	04 <input type="checkbox"/>	05 <input type="checkbox"/>	06 <input type="checkbox"/>	07 <input type="checkbox"/>	08 <input type="checkbox"/>
09 <input type="checkbox"/>	10 <input type="checkbox"/>	11 <input type="checkbox"/>	12 <input type="checkbox"/>	13 <input type="checkbox"/>	14 <input type="checkbox"/>	15 <input type="checkbox"/>
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23 - CNY <input type="checkbox"/>	24 - CNY <input type="checkbox"/>	25 <input type="checkbox"/>	26 <input type="checkbox"/>	27 <input type="checkbox"/>	28 <input type="checkbox"/>	29 <input type="checkbox"/>



Week 2: Distance *“Freezing” your car or car keys*

We shared tips on how participants can make driving on pre-planned car-free days more difficult

Increased friction makes driving a less appetizing choice







Individuals who were aware of their self-control problems were willing to self-impose costly deadlines to overcome procrastination (Ariely & Wertenbroch, 2002)

“Been following your car-free plan? We know it’s not easy, so here’s a tip that could help. Find ways to **DISTANCE** yourself from your car or car keys!

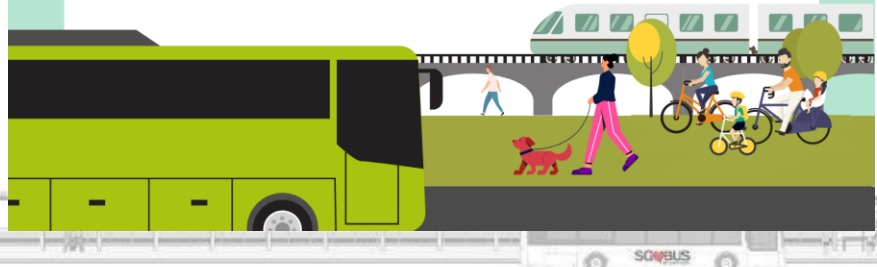
We have some suggestions on how you might choose to do it, but feel free to be as creative as you like, as long as it works for you.”

Distance yourself from the car

Try something from below that suits you

-  ★ Leave your keys in a hard-to-reach cupboard
-  ★ ★ Pass your car keys to a family member who won't drive
-  ★ ★ ★ Store your keys in a resealable bag in a bag of rice
-  ★ ★ ★ ★ Leave your car or car keys at work
-  ★ ★ ★ ★ ★ Park on the top floor of a carpark or somewhere further
-  ★ ★ ★ ★ ★ Keep your fuel tank at a quarter or lower

Or think of your own method to try



Week 3: Celebrate

“Success is a series of small wins”

To make going car-lite less of a chore,
we encourage participants to adopt habit-forming apps (e.g. Habitica)

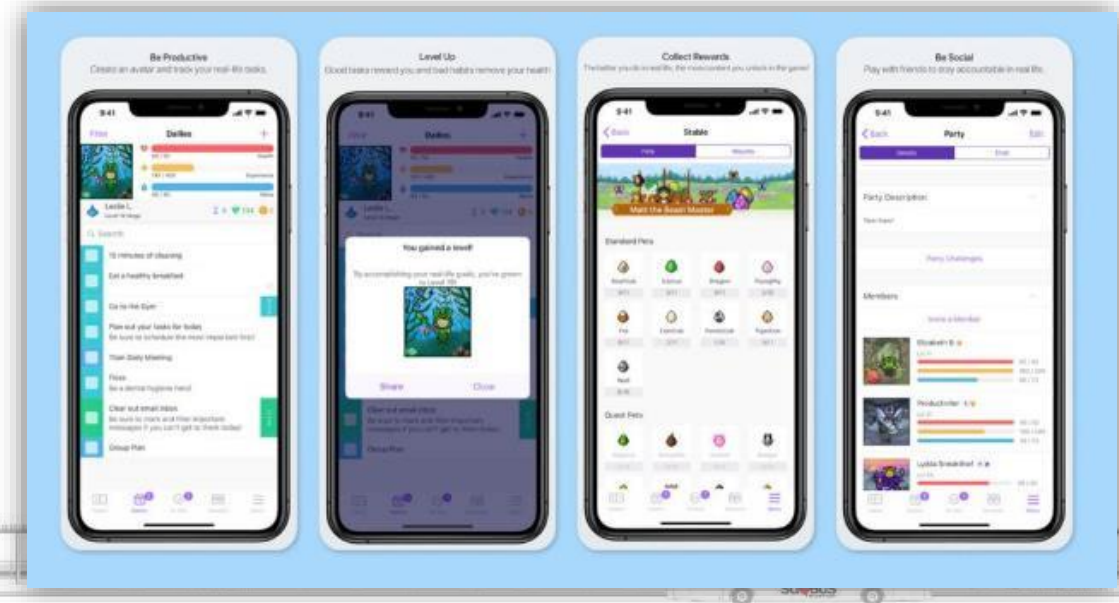
These apps employ gamification to motivate mundane or otherwise intrinsically painful activities

Users can track their progress, and earn immediate virtual rewards for completing goals

“Thinking of ways to stay motivated? **CELEBRATE** all your small wins!

It’s important to track your progress and give yourself a pat on the back whenever you reach milestones. Consider downloading a habit tracking app (try googling for “habit tracking apps”), or record your own progress by hand.

To reward yourself, imagine how you might celebrate with the money saved from taking public transport instead of driving. Each day you do not drive easily saves you \$30 (e.g., fuel, ERP, parking)!”



PDC Summary

"Over the past few weeks, you received several tips from us on **HOW** to go car-lite. We have summarised the techniques in this attached infographic.

We hope that you continue to put these into action even after our study ends. Make a resolution to go car-lite today!

Thank you for your participation in LTA's Research Study on Car Drivers.

Tips to lead a more car-lite lifestyle

Plan specific car-lite goals



Plans make your intentions more concrete. Set realistic targets and think about the obstacles you might have to face. Where possible, start a new routine (e.g., car-free Fridays).

Distance yourself from the car



Distance helps us overcome the temptation of driving. Find ways to make driving a bit more inconvenient, so that staying committed to a car-lite lifestyle becomes easier.

Celebrate the small wins

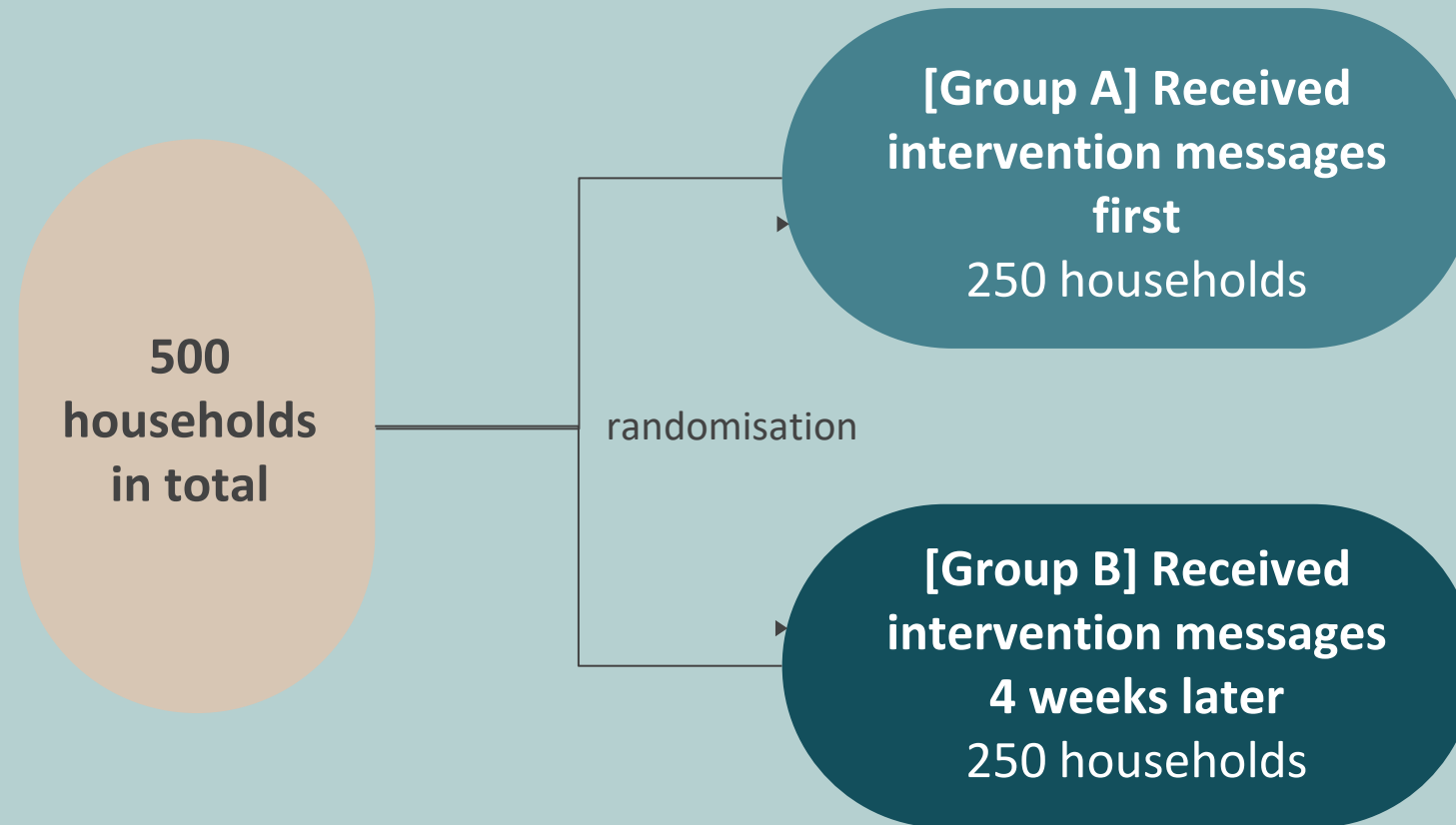


Track your car-lite accomplishments and celebrate them. Seeing how far you have come will motivate you to go further. Even if you started small, you should be proud that you even started.



Study Design

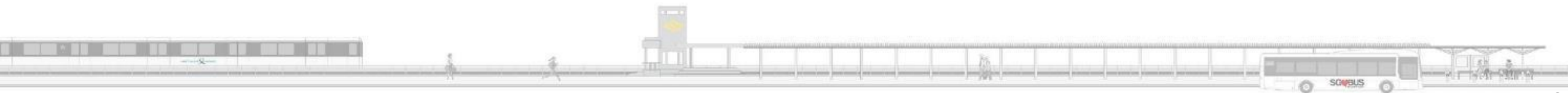
Randomized Controlled Trial (RCT)



With this design, we will be able to isolate the intervention effect by taking the difference in behaviour of the 2 groups during the 4-week delay period

Data Collection

Item type	Item
Behaviour	Home carpark entry and exits (In-vehicle unit number)
Individual Characteristics	Habit strength of driving, perceived accessibility without a car
	Self stage assessment



Self-Stage Assessment Scale

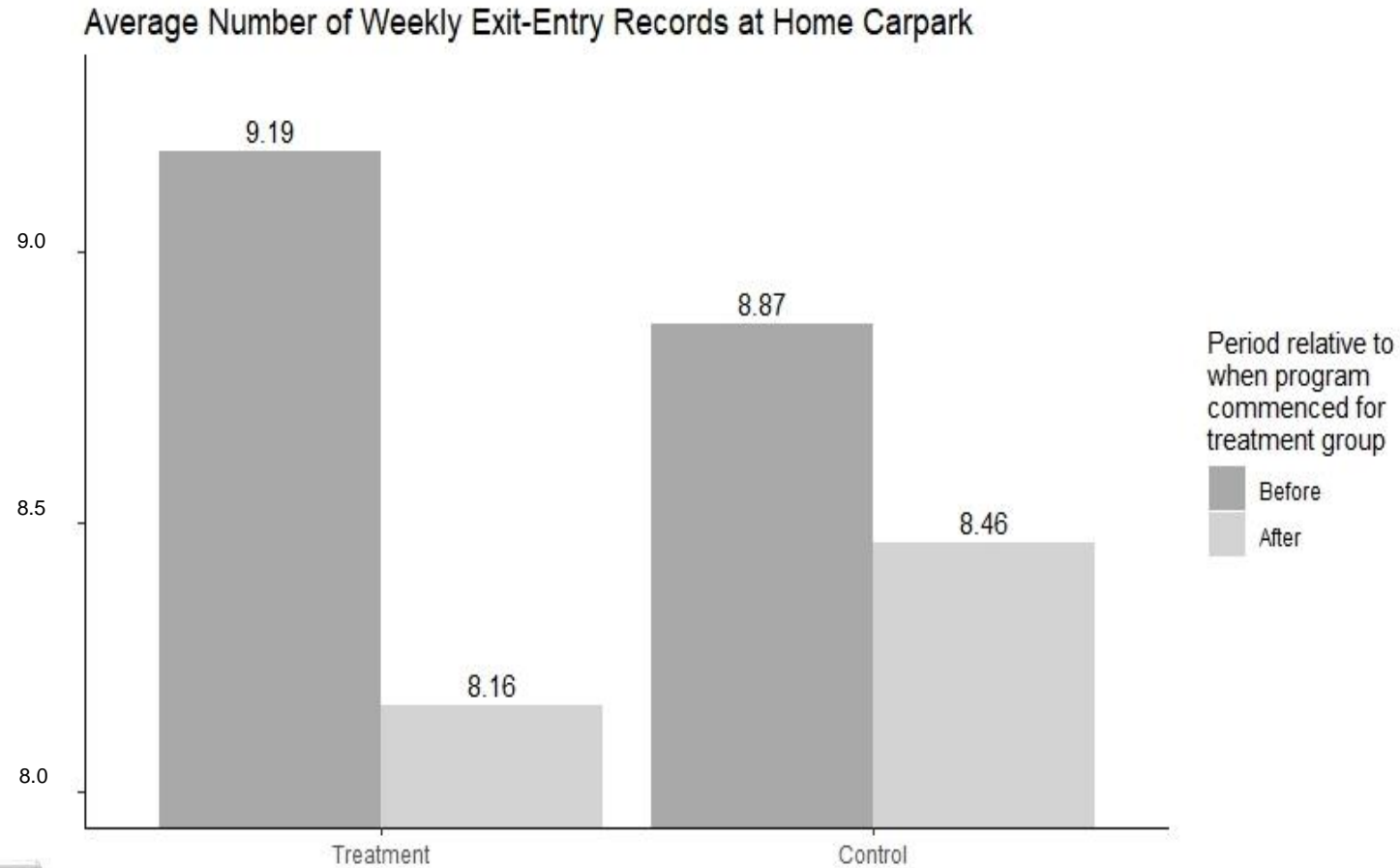
Which of the following statements best describes how you feel about your current level of car use for daily trips and whether you have any plans to try to reduce some or all of these car trips?

Please choose the statement that best fits your current situation.

Stage	Label	Option Text	N (%)	
1	Contented Car Captives	<u>I use the car for most of my trips.</u> I am happy with my current usage level and see no reason to reduce it.	171 (38%)	224 (49%)
2	Grudging Car Users	<u>I use the car for most of my trips.</u> I would like to reduce my current usage level but currently feel that it would be impossible for me to do so.	53 (12%)	
3	Perplexed Individuals	<u>I use the car for most of my trips.</u> I am currently thinking about changing some or all of these trips to non-car modes (i.e. public transport, walking, cycling, personal mobility devices), but at the moment I am unsure how I can replace these car trips, or when I should do so.	84 (19%)	229 (51%)
4	Procrastinators	<u>I use the car for most of my trips.</u> It is my aim to reduce my current usage level. I already know which trips I will replace and which alternative transport mode I will use, but, as of now, I have not made the change.	71 (16%)	
5	Car-lite practitioners	<u>I try to use non-car modes as much as possible,</u> because I am aware of the problems associated with car use, I will maintain or reduce my level of car use in the next few months.	74 (16%)	

Headline Result

For our more nudgable drivers, i.e. those in stages 2 to 5, the program reduced the average number of daily exits from their home carpark by ~0.6 times/week.



Note that vertical axis does not start from 0

Results from Generalised Poisson Regression

$$\text{No.}_{\text{dailyexits_homecarpark}}_{it} = \beta_0 + \beta_1 \text{GroupA}_i + \beta_2 \text{Intervention}_t + \beta_3 (\text{GroupA}_i \times \text{Intervention}_t)$$

Stage 2

	exp(beta)	std. error	p-value	sig
(Intercept)	1.378	0.062	0.000	***
GroupA	0.976	0.110	0.827	
Int	1.085	0.046	0.077	.
GroupA x Int	0.824	0.062	0.002	**

*** p < 0.001, ** p < 0.01, * p < 0.05, . p < 0.1

Stage 4

	exp(beta)	std. error	p-value	sig
(Intercept)	1.342	0.076	0.000	***
GroupA	1.002	0.102	0.982	
Int	0.997	0.037	0.932	
GroupA x Int	0.895	0.062	0.071	.

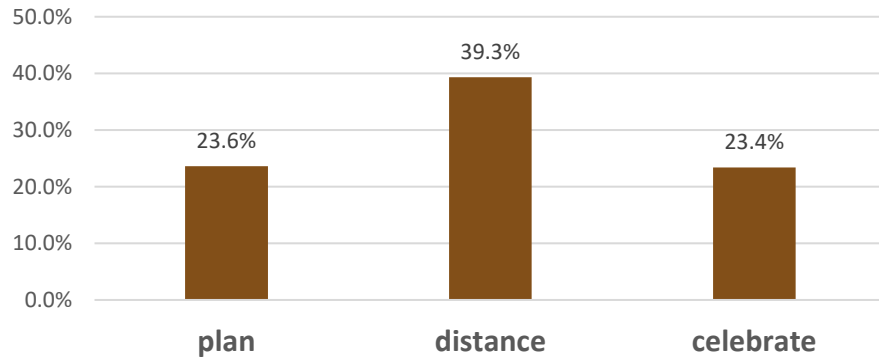
*** p < 0.001, ** p < 0.01, * p < 0.05, . p < 0.1

- The number of car trips during the intervention period (18 percentage points and 11 percentage points respectively) fell for Stage 2 and 4 participants. No effect was found for stages 3 and 5.

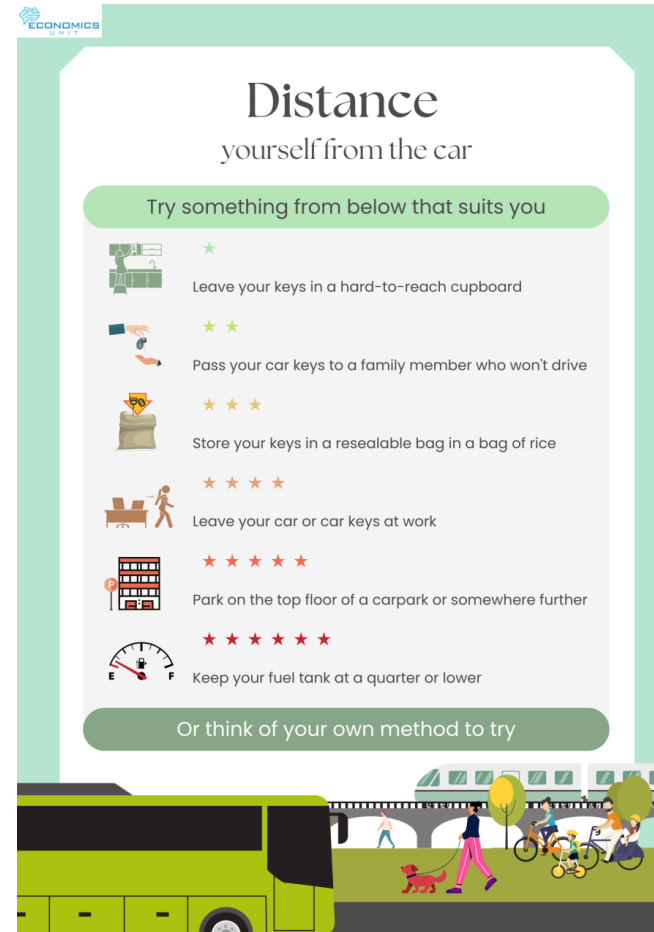
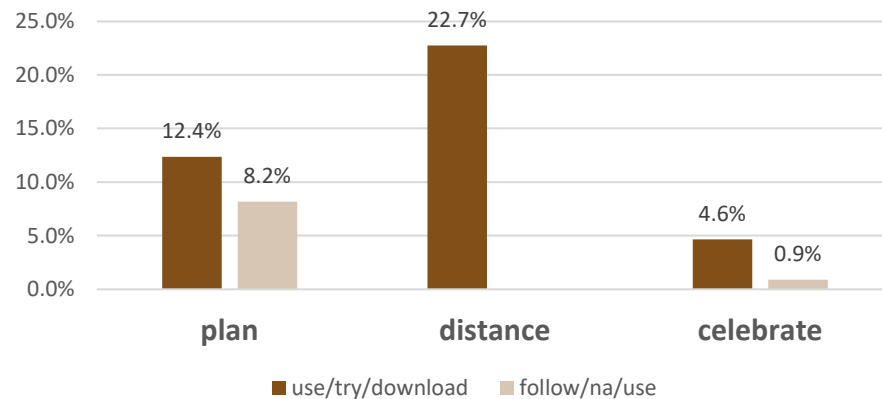


Intervention Well Received by Participants

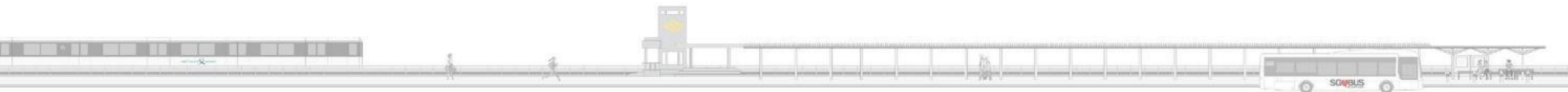
Usefulness rating (%) of various intervention components



Intervention take-up rate (%)

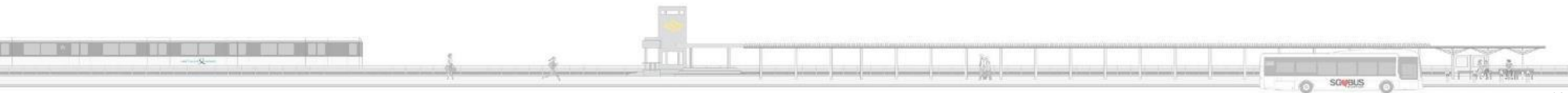


- Overall, participants thought that “Distance” is the most useful intervention. Distance is also the intervention with the highest self-reported take-up rate.
 - This could be due to the novelty of the “Distance” nudge and that the actions required are less cognitively demanding to execute.











Conclusions

- 1. An almost “cost-free” intervention like the PDC program shows substantial promise in complementing LTA’s existing approaches to reduce car use.**
 - Further benefit of these self nudges being translatable to other life domains like health and savings.
- 2. Some validation of the transtheoretical model of change (stage self-assessment) in identifying “nudge-able” segments of the population.**
 - The intervention is effective in reducing the car trips taken by “Grudging Car Users” and “Procrastinators”, but not the other segments.
- 3. A scale-up of the PDC program may require some effort on segmentation and archotyping to identify the nudgeables.**



Thank you.

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