Are you really going to drive today?

… and can we change your mind?

Congestion costs you!

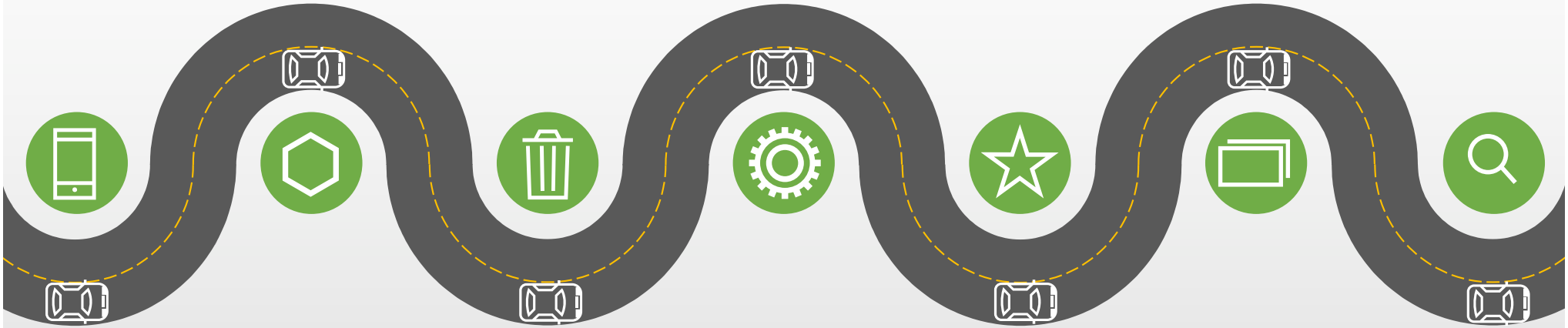
- Lost time
- Increased stress
- Less time for exercise

Governments want to reduce:

- Accident related costs
- Need for expensive road upgrades
- Overall productivity losses

Data to drive better decisions exists!

- Weather, event, roadworks etc. correlate with road travel times



Comparative modelling:

- Direct economic costs are compelling
- Analysis using the NSW Human Services Outcomes framework shows deeper benefits

We can show you

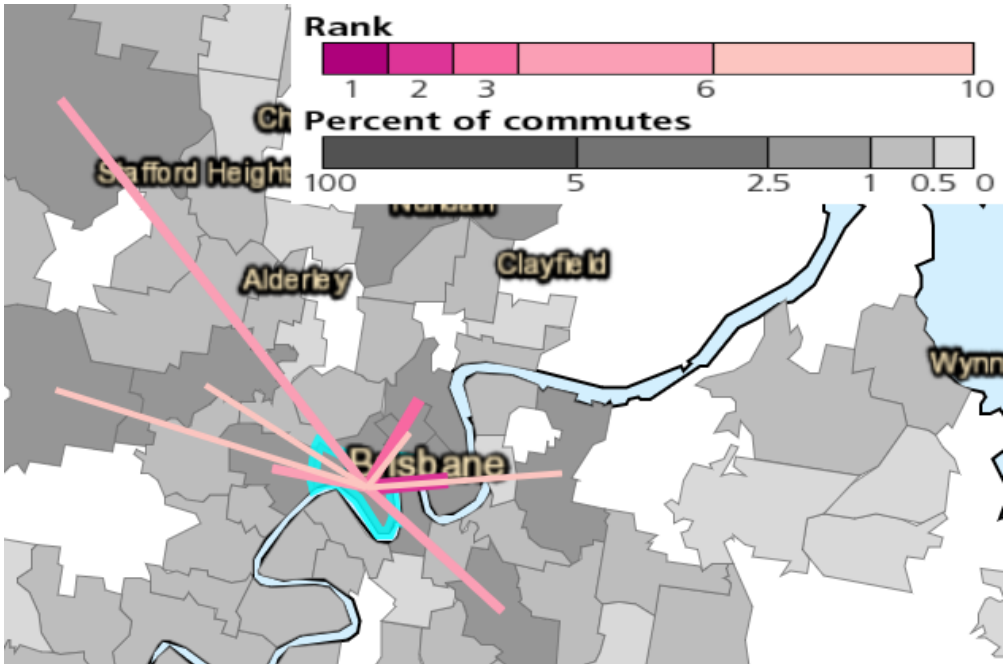
- Advantages of alternative options - economic and other
- An example of how a government program could incentivise behavioural change

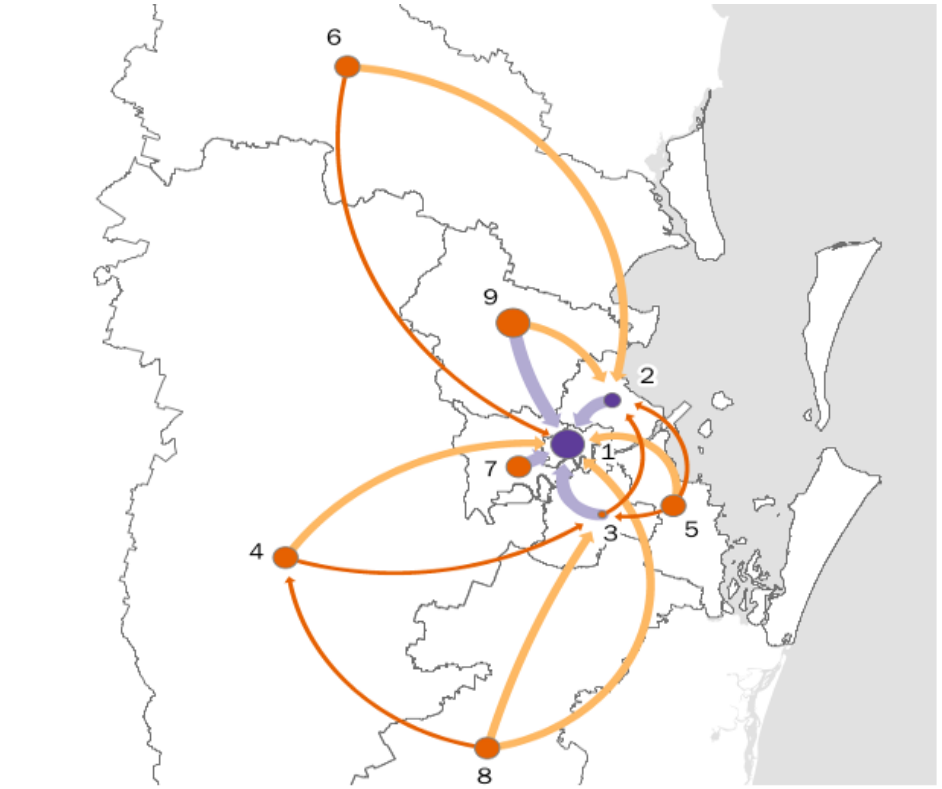
Key Brisbane commutes analysed

- ✓ Analyse key **car routes** to Brisbane CBD
- ✓ Identify **Train/Bus/Cycle alternatives**
- ✓ On peak congestion days **the alternatives are faster**
- ✓ Rainy days are a useful **predictor of congestion**

Identifying busy routes using ABS data

- Mapping data from ABS, NPSR, Esri, © OpenStreetMap contributors, HERE and Garmin
- ABS page: Census of Population and Housing: Commuting to Work - More Stories from the Census, 2016





Greater Brisbane

1. Brisbane Inner City
2. North
3. South
4. Ipswich
5. East
6. Moreton Bay - North
7. West
8. Logan - Beaudesert
9. Moreton Bay - South

Net flow (count)

- 5,000 to 10,000
- 10,000 to 20,000
- 20,000 to 40,000
- greater than 40,000

Net effect (count)

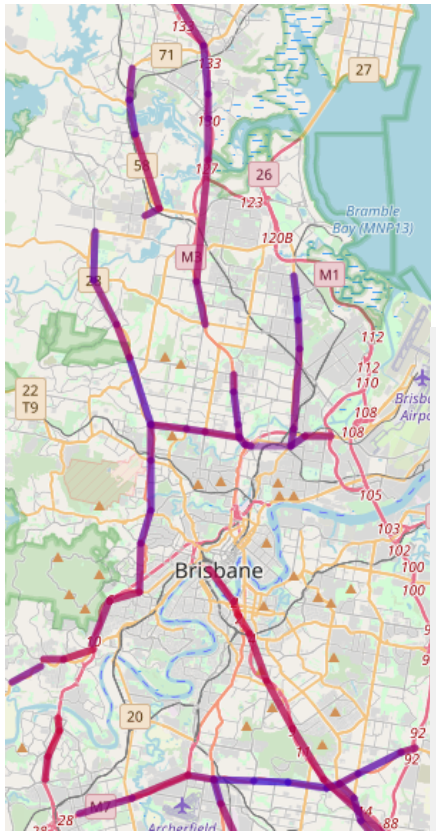
(gains)	(losses)
5,000 to 10,000	5,000 to 10,000
10,000 to 20,000	10,000 to 20,000
20,000 to 40,000	20,000 to 40,000
greater than 40,000	greater than 40,000

Source: Australian Bureau of Statistics, 2016 Census of Population and Housing

Construct a map of travel time ‘skew’

- Download [Priority Route Bluetooth Travel Times](https://data.gov.au/dataset/ds-qld-5263cbd5-e569-4dc6-84b1-ad5e55fc9d1f/details?q=travel%20time) from https://data.gov.au/dataset/ds-qld-5263cbd5-e569-4dc6-84b1-ad5e55fc9d1f/details?q=travel%20time
- Construct R model to project a visualisation of ‘skew’ in travel times onto an OpenStreetMaps © map of Brisbane

Red routes tend to have high spikes in travel time compared to blue routes



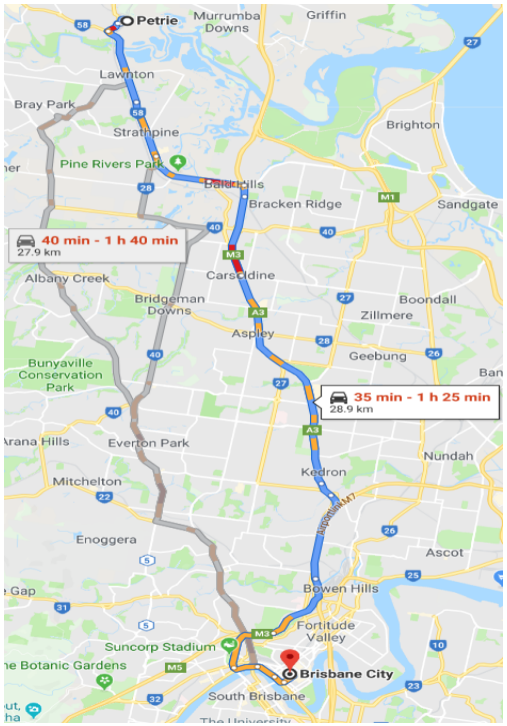

```
20   str_pad(brisRain$Day,
21
22 routeTravelTimes$date
23
24 rainTravelTimes <- ful
25
26 routes <- routeTravelT
27   gather("key", "value
28   dplyr::mutate(key =
29   dplyr::group_by(key)
30   dplyr::summarise(val
31                    rat
32
33 coords <- routeDefs %>
34   dplyr::mutate(key =
35
36 routes <- full_join(ro
37
38 # for (name in names(r
```

Select 3 actual routes suggested by Google Maps ©

High volume (ABS data), high skew for travel times (QLD Govt data)

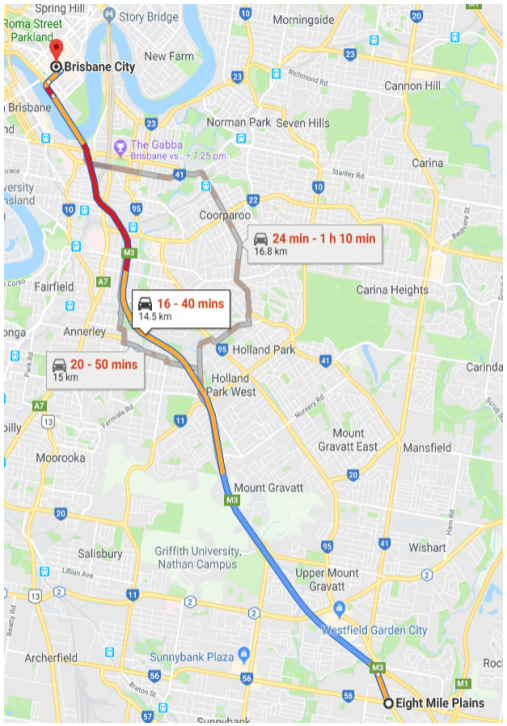
Petrie to Brisbane:

- Estimated **35 min – 1 h 25 min**



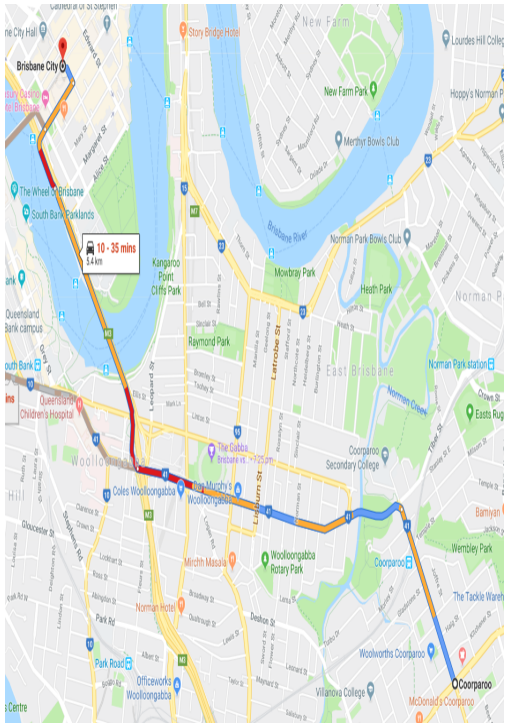
Eight Mile Plains to Brisbane:

- Estimated **16 min – 40 min**



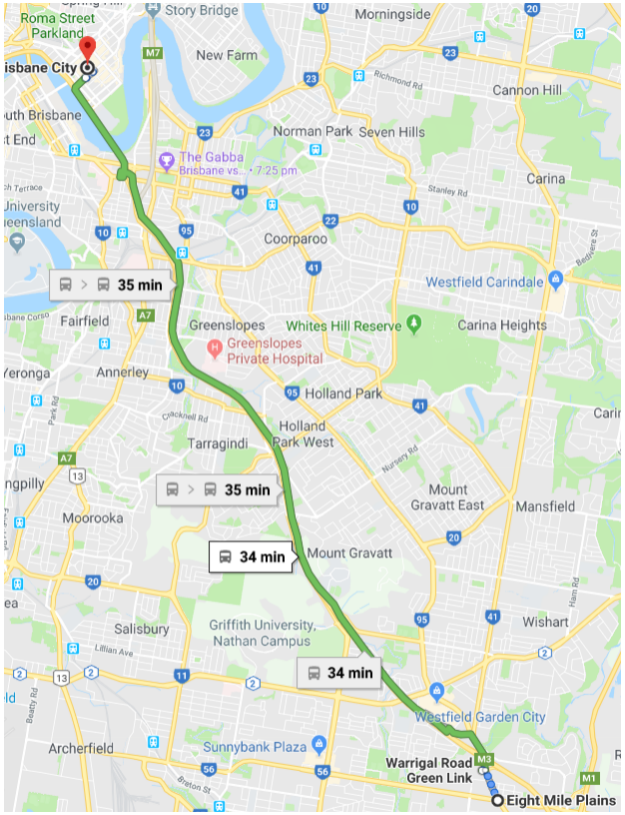
Coorparoo to Brisbane:

- Estimated **10 min – 35 min**

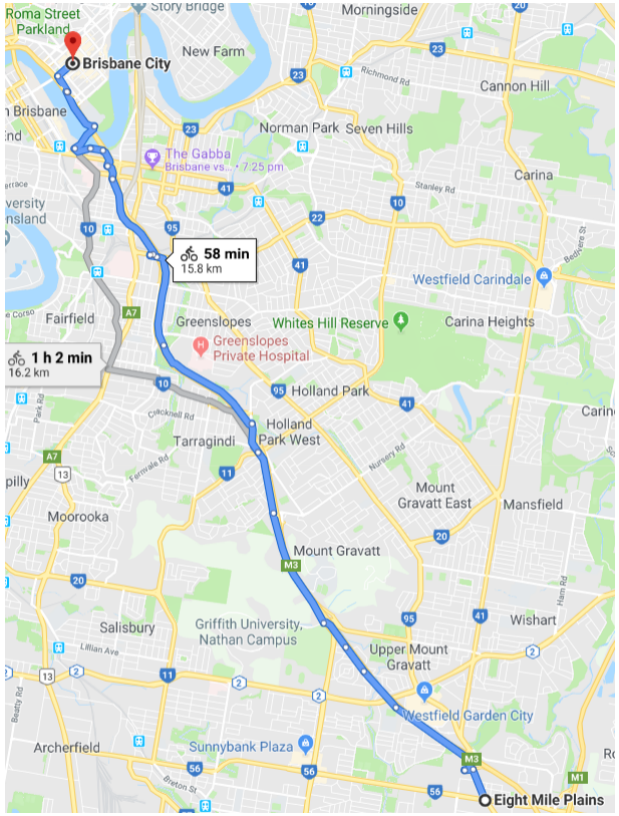


Record travel times from Google Maps © 3 routes x 3 ways

Train



Cycling



Petrie:

- Train: 41 min
- Cycling: 1 h 33 min
- Car 35 min – 1 h 25 min

Eight Mile Plains:

- Train: 34 min
- Cycling: 58 min
- Car 16 min – 40 min

Coorparoo:

- Train: 20 min
- Cycling: 25 min
- Car 10 min – 35 min

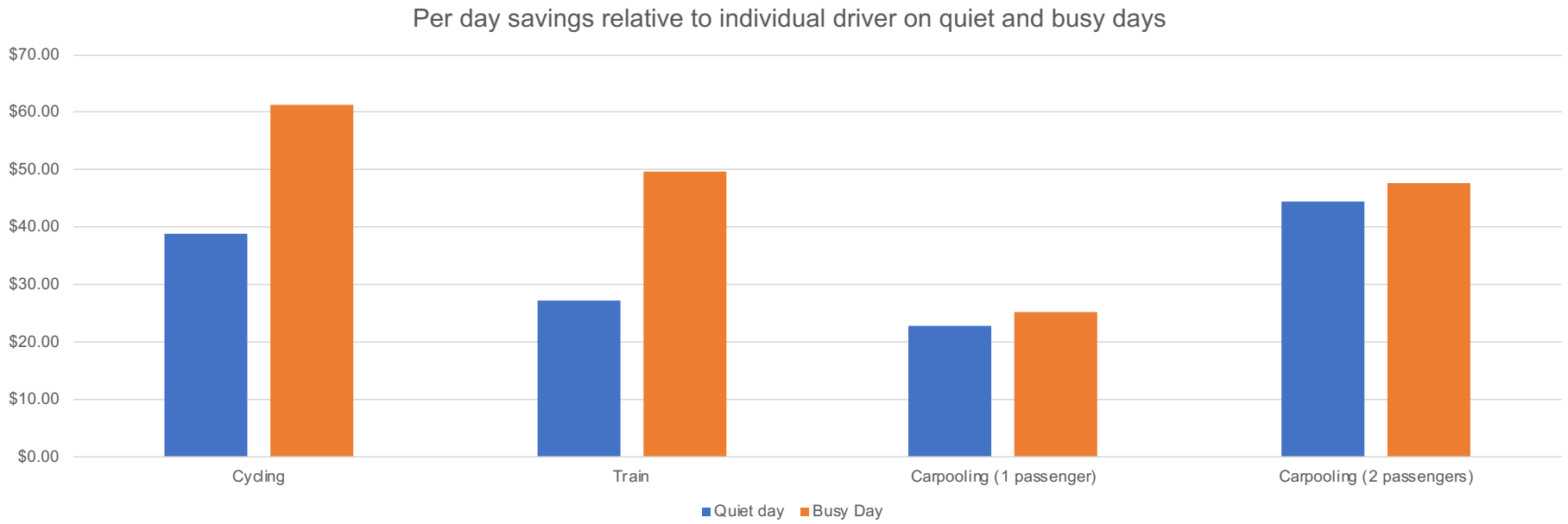
Now do you really want to drive when it's busy? Let's check the numbers …

There is a significant potential saving!

- ✓ Commuting by car is fastest **but** only in the best case scenario for all routes
- ✓ However, **the train is always the same speed** and beats the car significantly during peak congestion
- ✓ In our shortest selected route, **cycling is faster** than the car during peak congestion*

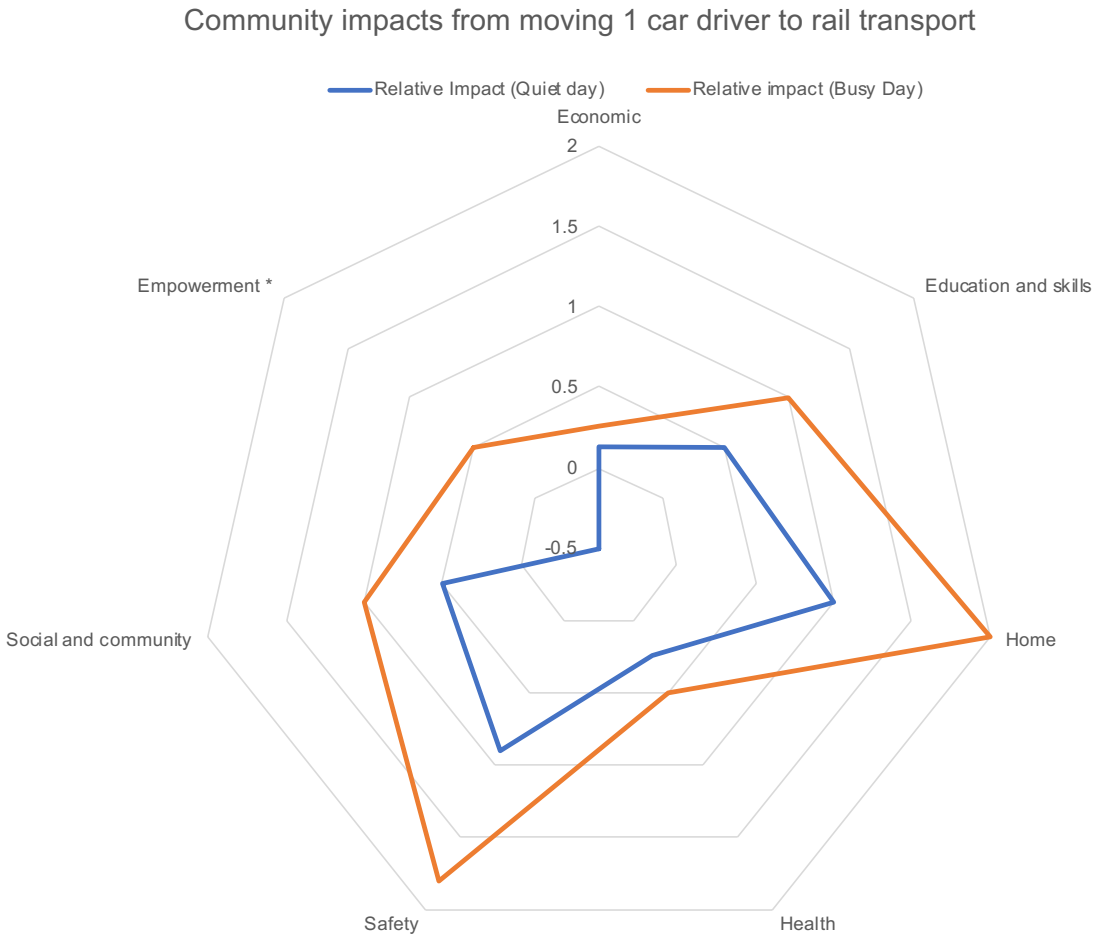
* Google Maps assumes 10 mph which is considered a conservative estimate for fit cyclists : https://www.ilovebicycling.com/how-accurate-are-google-maps-cycling-directions/

Switching single occupant car use to alternatives



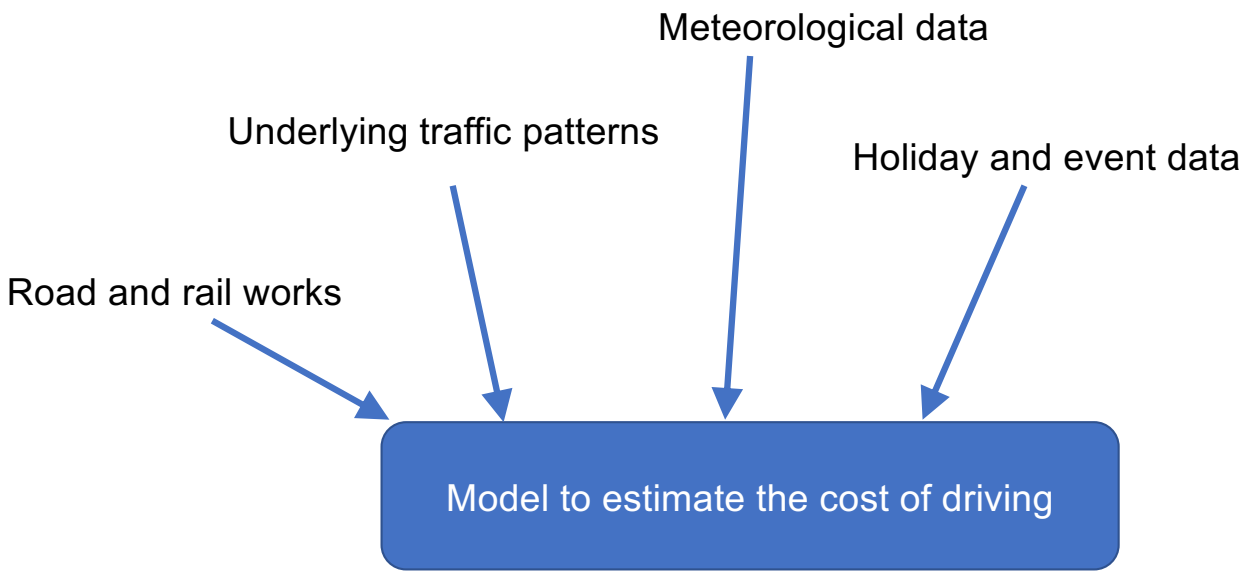
“Congestion impacts per reduced car km range between 4.4 and 151.4 cents with an average of 46.2 cents. The highest valuations are associated with “A” roads in Greater London and also for “heavy congestion” in the Melbourne, Australia context” - from Evaluating the congestion reduction impacts of public transport – a comparative assessment : https://www.atrf.info/papers/2008/2008_Aftabuzzaman_Currie_Sarvi.pdf

NSW Human Services Outcomes Framework



* Note Empowerment was manually estimated to be higher when switching to rail results in a halving of commute time

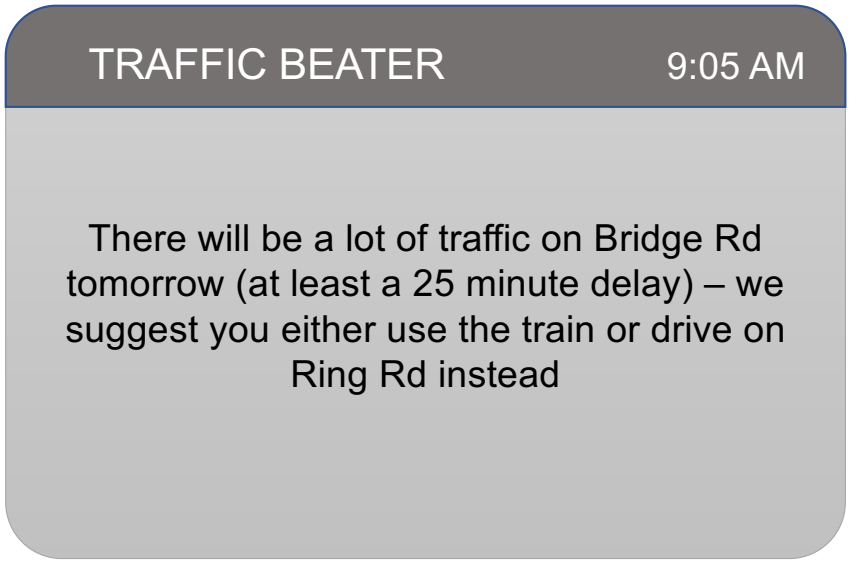
Architecture part 1 – traffic model



Architecture part 2 – user model

- Uses the benefit of car removal/rerouting estimate from part 1
- Works out the most cost-effective way to either remove or reroute congestion
- This is a multi-pronged strategy that is tailored to:
  - The individual (what options/incentives are likely to work)
  - Their route (what other route or transport modalities are available)
  - Their neighbourhood (are they connected with others who might share)
  - The specifics of traffic patterns affecting their commute

Level 1 nudges (individual)



Level 1 nudges (individual)

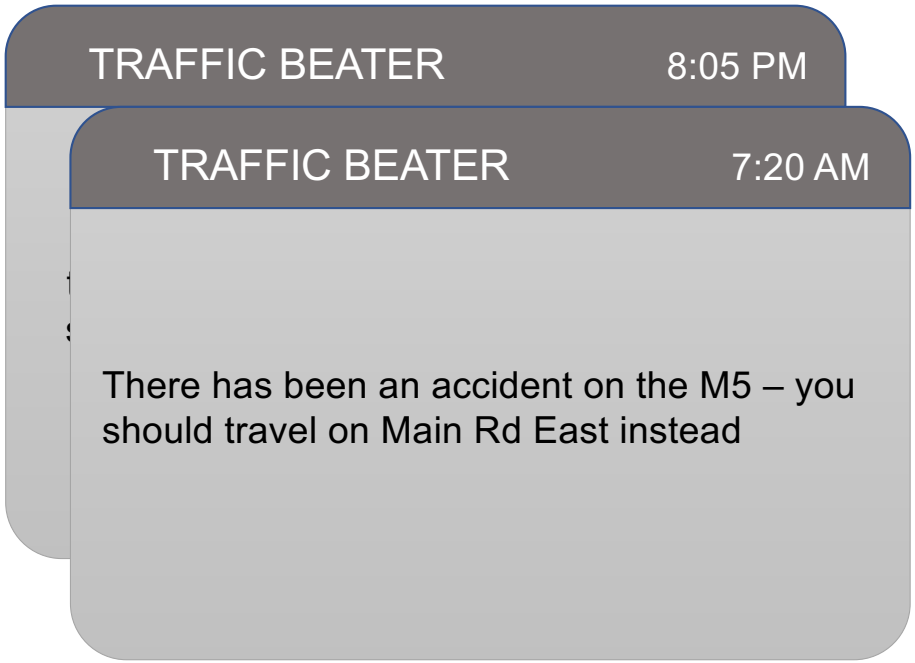
TRAFFIC BEATER 8:05 PM

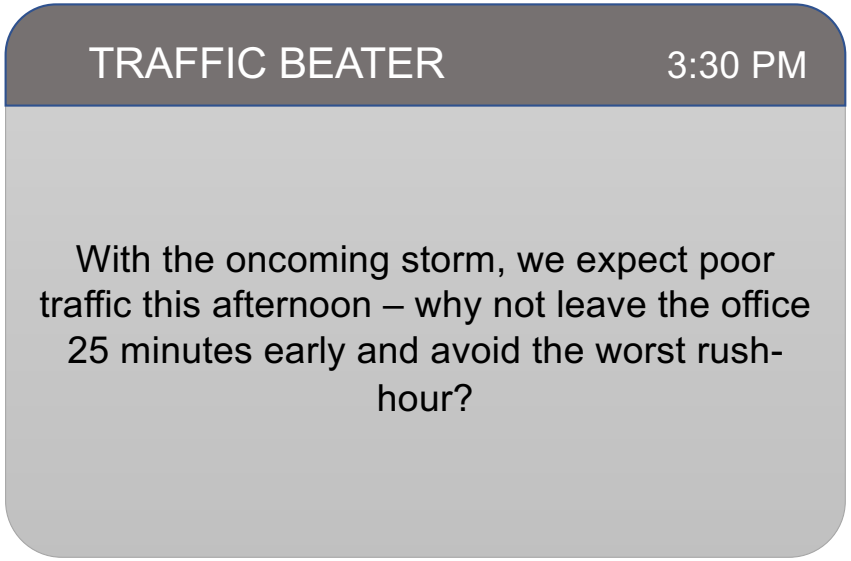
There will be a lot of traffic on Bridge Rd tomorrow (at least a 25 minute delay) – we suggest you either use the train or drive on Ring Rd instead

TRAFFIC BEATER 3:30 PM

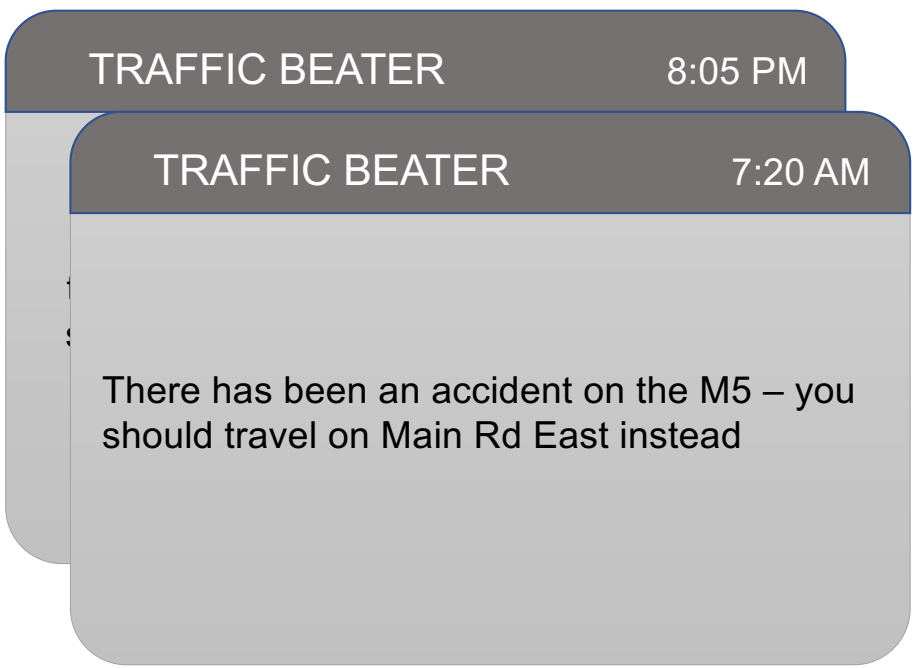
With the oncoming storm, we expect poor traffic this afternoon – why not leave the office 25 minutes early and avoid the worst rush-hour?

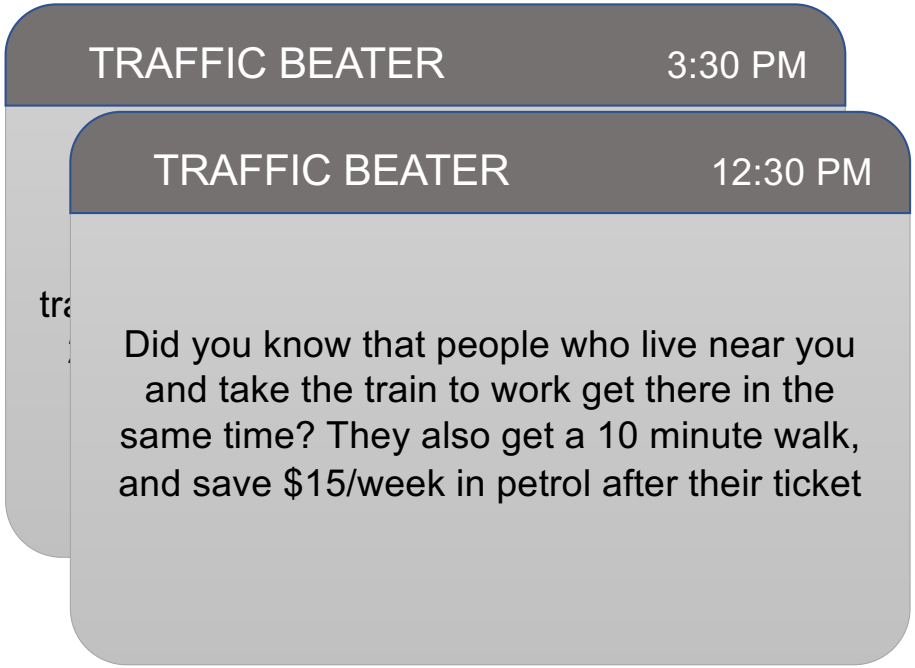
Level 1 nudges (individual)





Level 1 nudges (individual)

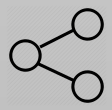




Level 2 nudges (social)

TRAFFIC BEATER 2:20 PM

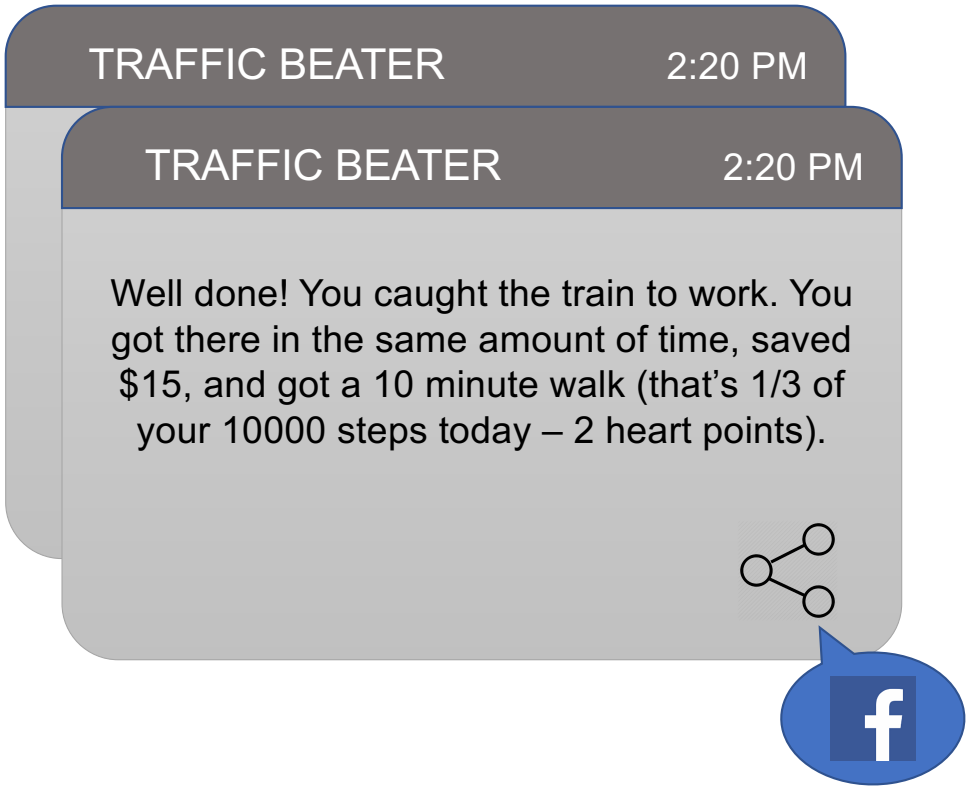
Your neighbour Joan has said she wants to carpool/train/cycle to work tomorrow – why don't you join her?

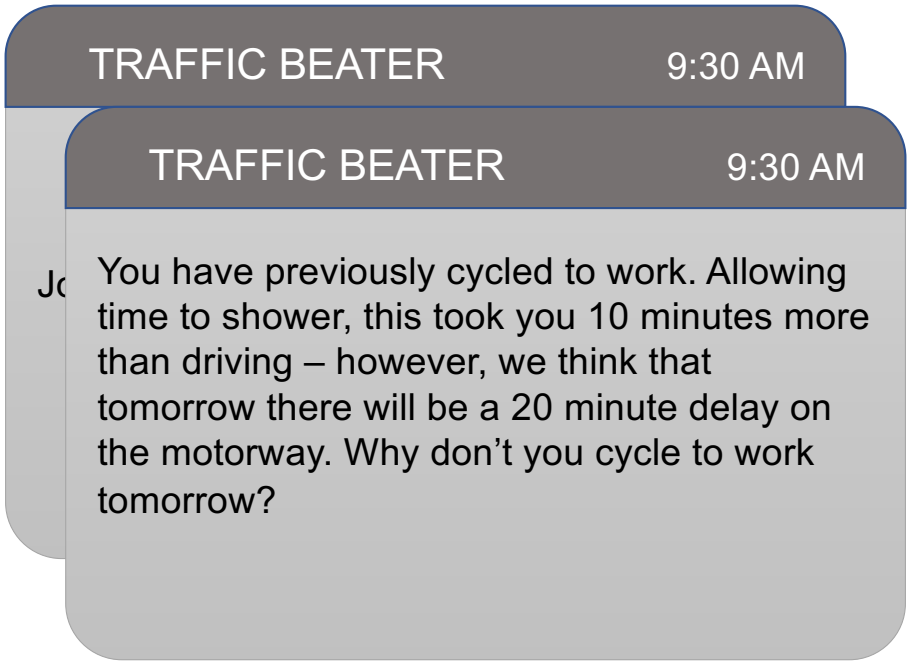


TRAFFIC BEATER 9:30 AM

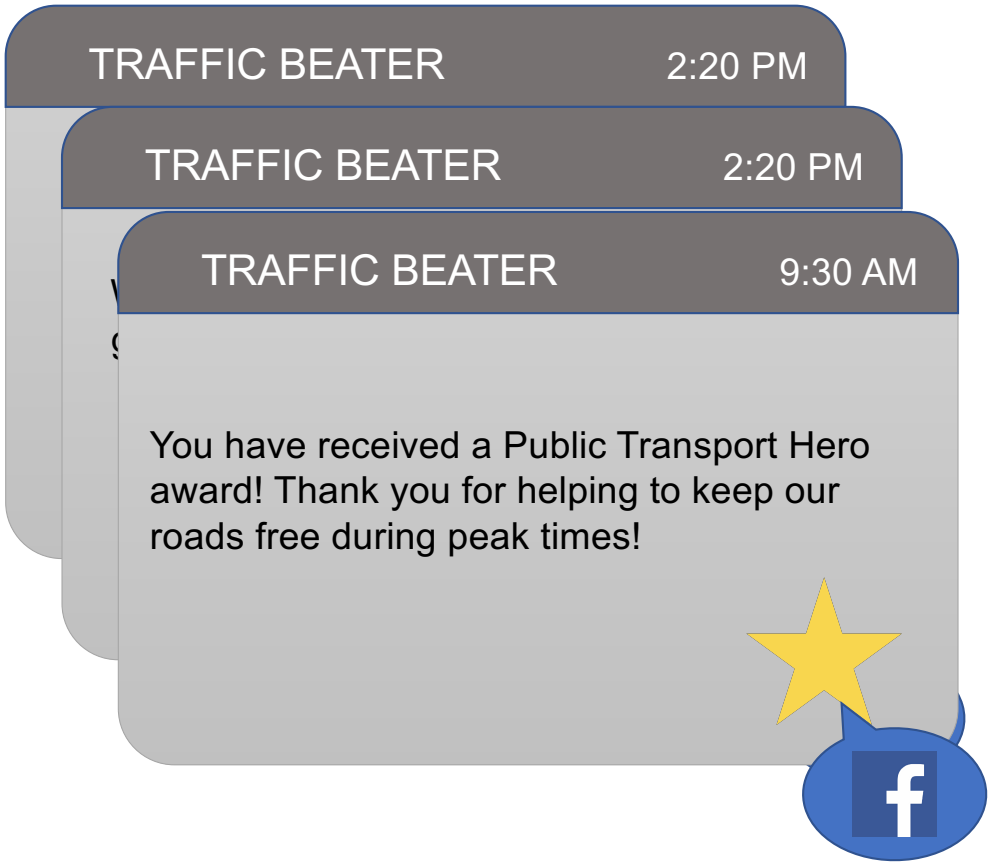
Joan rated you as a 5 star travel companion!

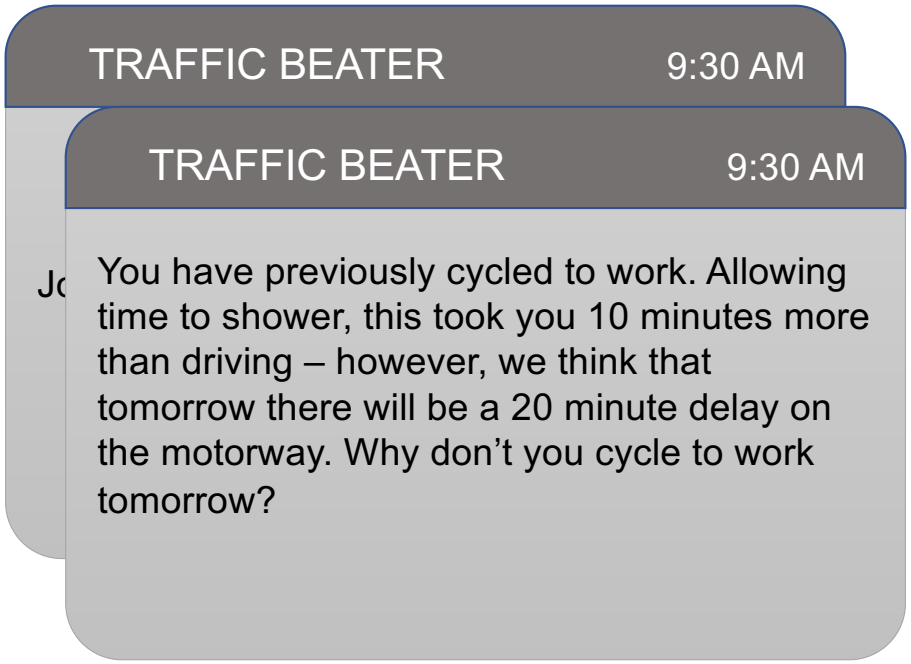
Level 2 nudges (social)





Level 2 nudges (social)

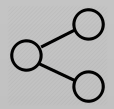




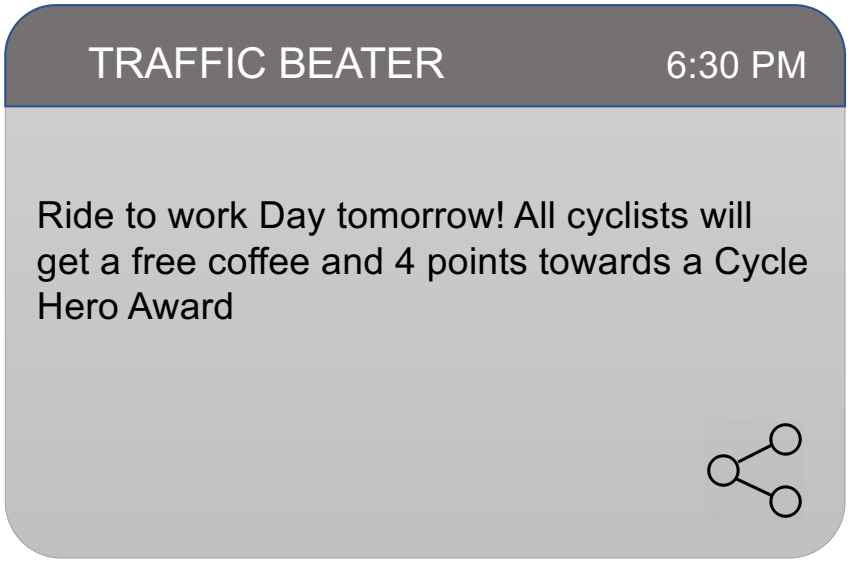
Level 2 nudges (social)

TRAFFIC BEATER 6:30 PM

There are emergency train signalling works tomorrow. we expect car traffic to be delayed up to 60 minutes – we recommend replacement buses (you can take the E35, 417, or N88 to work). If you need to drive, please help reduce the traffic load by carpooling. Rach, Ali, and Mitchell are all looking to share.



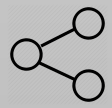
Level 2 nudges (social)



Level 2 nudges

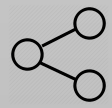
TRAFFIC BEATER 6:30 PM

Ride to work Day tomorrow! All cyclists will get a free coffee and 4 points towards a Cycle Hero Award

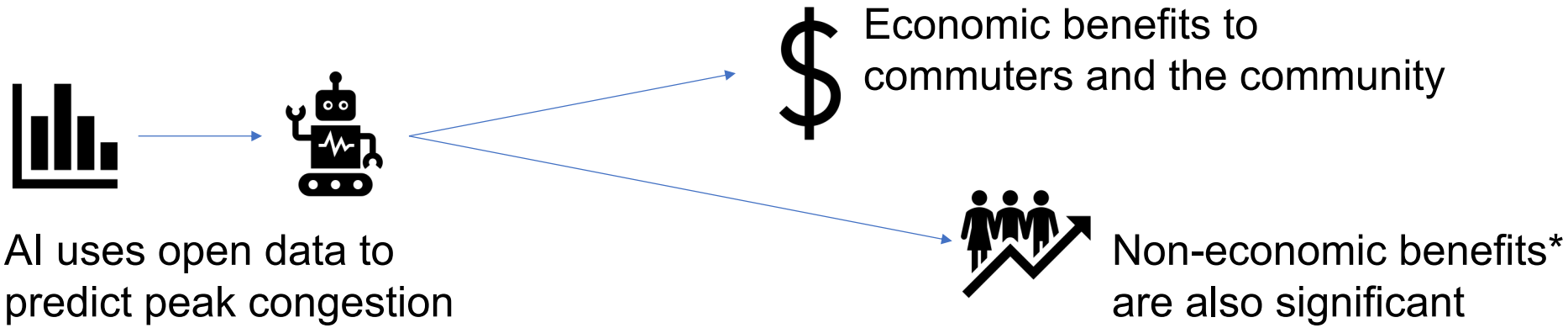


TRAFFIC BEATER 6:30 PM

You are a Cycling Hero – receive 15% off your next purchase at the *Local Cycle Shop*



“Open Data can drive predictive models to guide behavioural nudges with associated economic and other benefits”



* NSW Human Services Outcomes framework