

# Happy Birthday Induced Demand !

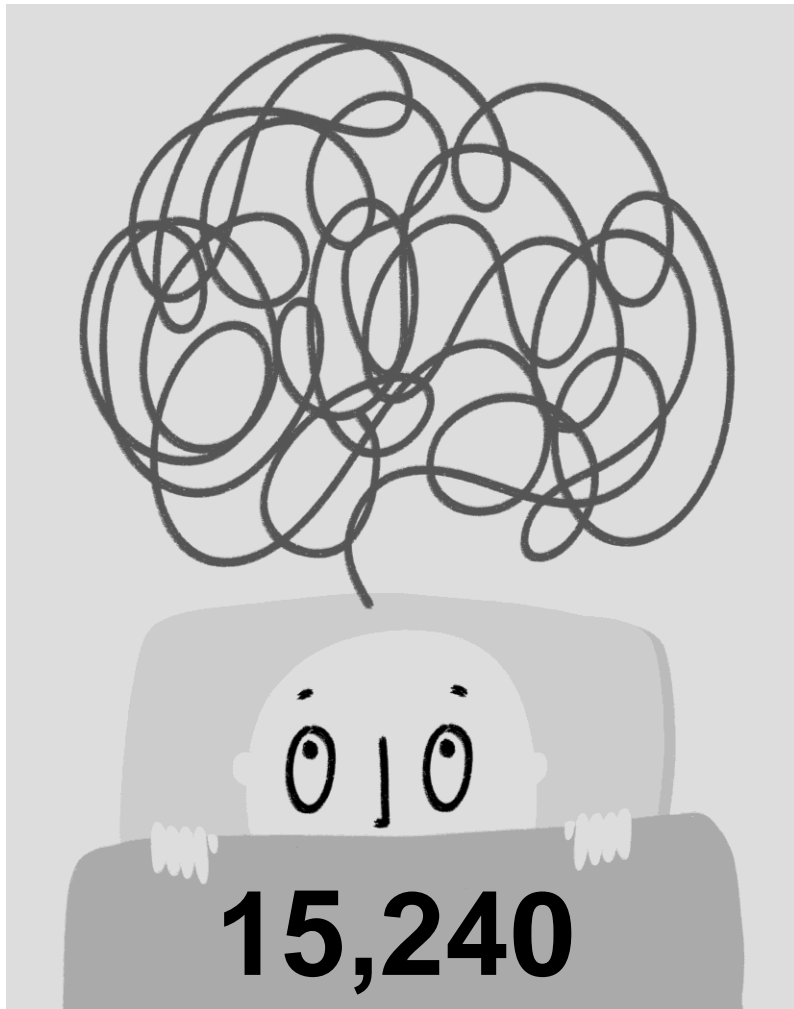
AITPM 27<sup>th</sup> March 2025

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**SHAPE**TRANSPORT



# Abstract



- There are 15,240 possible definitions of induced demand. No wonder it's confusing.
- It's 30 years since the term was introduced to the transport planning profession, and we've been grappling with it ever since.
- To mark the occasion, this paper explores the confusion surrounding induced demand, proposes 6 multiple choice questions that can help to hone your definition and challenges the widely held belief that it's bad.

# 1994 SACTRA report (264 pages)

Terms of reference:

*“...whether new or improved roads generate extra traffic over an above the growth in traffic which would be expected in the absence of any improvement to the road network”*

Key concepts:

- Induced trips
  - Induced traffic
- } not the same

<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/TR010044/TR010044-001678-sactra-1994-trunk-roads-traffic-report-unlocked.pdf>



## TRUNK ROADS AND THE GENERATION OF TRAFFIC

The Standing Advisory Committee  
on Trunk Road Assessment

Chairman : Mr D A Wood QC



# SACTRA

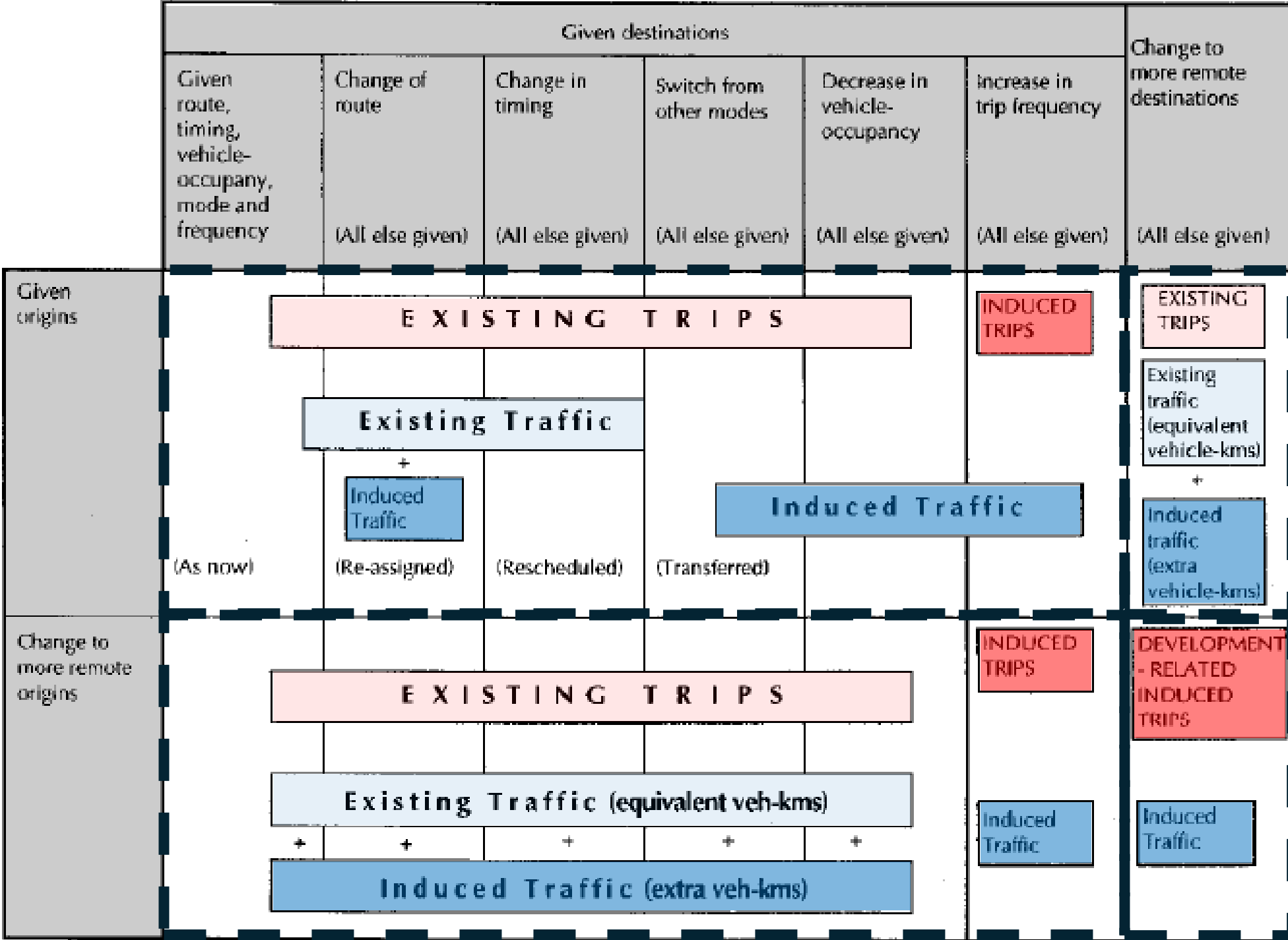
**Figure 3.1**  
*(daily person trips)*

	Given destinations						Change to more remote destinations
	Given route, timing, vehicle-occupany, mode and frequency	Change of route  (All else given)	Change in timing  (All else given)	Switch from other modes  (All else given)	Decrease in vehicle-occupancy  (All else given)	Increase in trip frequency  (All else given)	(All else given)
Given origins	<div> <div>EXISTING TRIPS</div> <div> <div>Existing Traffic</div> <div> <div>+</div> <div>Induced Traffic</div> </div> </div> <div> <div>(As now)</div> <div>(Re-assigned)</div> <div>(Rescheduled)</div> <div>(Transferred)</div> </div> </div>						<div>INDUCED TRIPS</div> <div>EXISTING TRIPS</div> <div>Existing traffic (equivalent vehicle-kms)</div> <div>+</div> <div>Induced traffic (extra vehicle-kms)</div>
Change to more remote origins	<div> <div>EXISTING TRIPS</div> <div>Existing Traffic (equivalent veh-kms)</div> <div> <div>+</div> <div>+</div> <div>+</div> <div>+</div> <div>+</div> </div> <div>Induced Traffic (extra veh-kms)</div> </div>						<div>INDUCED TRIPS</div> <div>DEVELOPMENT - RELATED INDUCED TRIPS</div> <div>Induced Traffic</div> <div>Induced Traffic</div>

# SACTRA

Figure 3.1  
(daily person trips)

- Existing trips
- Induced trips
- Existing traffic
- Induced traffic



SACTRA  
Figure 3.1  
(daily person trips)

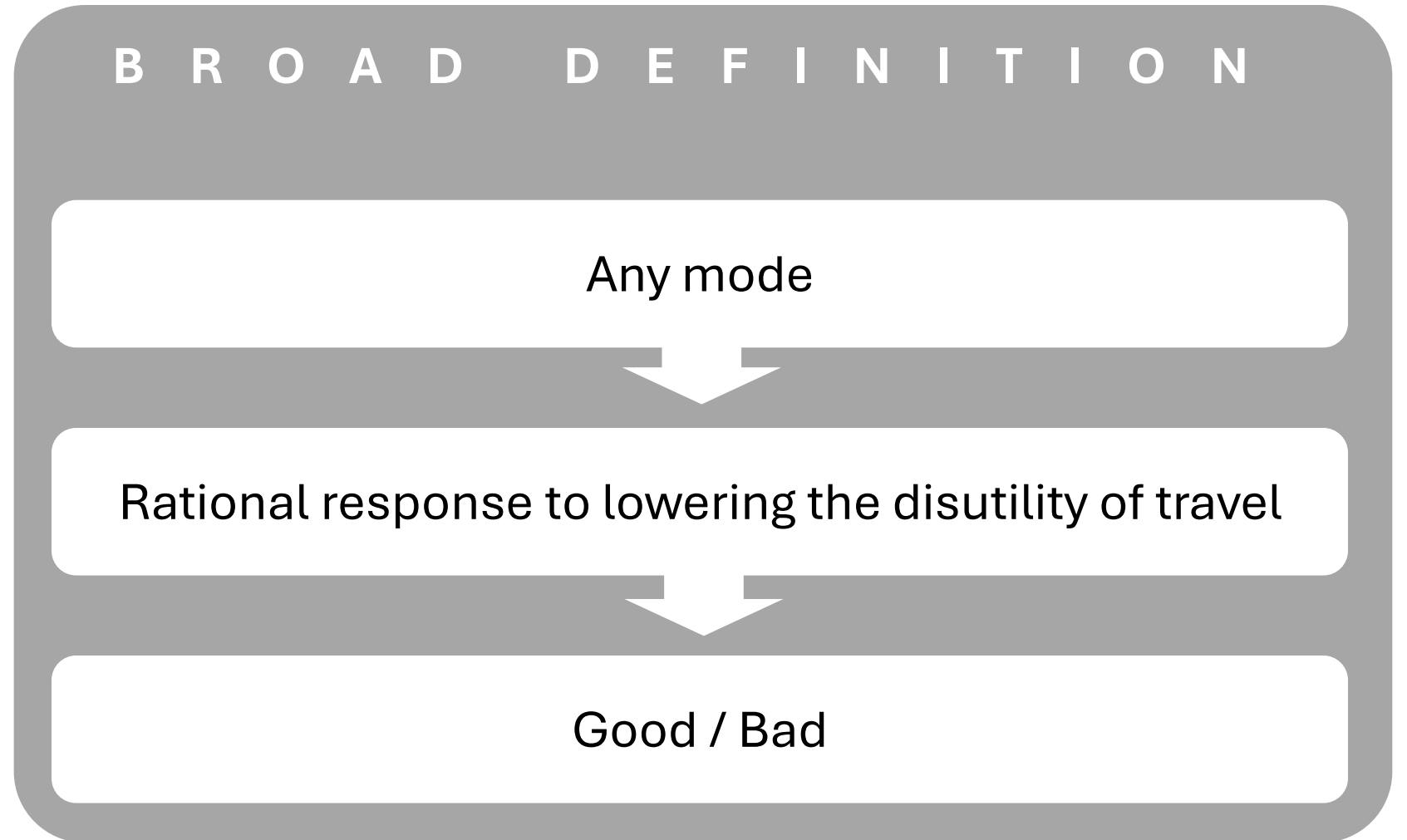
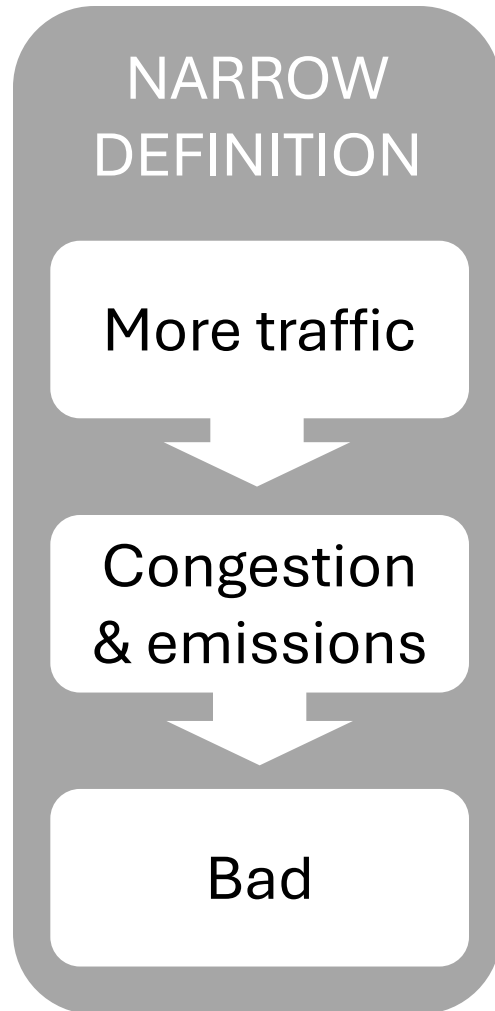
Induced trips

Induced traffic

	Given destinations						Change to more remote destinations
	Given route, timing, vehicle-occupancy, mode and frequency	Change of route (All else given)	Change in timing (All else given)	Switch from other modes (All else given)	Decrease in vehicle-occupancy (All else given)	Increase in trip frequency (All else given)	(All else given)
Given origins		Induced Traffic		Induced Traffic		INDUCED TRIPS	Induced traffic (extra vehicle-kms)
Change to more remote origins						INDUCED TRIPS	DEVELOPMENT-RELATED INDUCED TRIPS
	Induced Traffic (extra veh-kms)					Induced Traffic	Induced Traffic

# Why the bad rap?

It's all about the definition...



# Narrabeen Recreational Trail

**New section built  
in 2015 to form a  
continuous 8.5km  
loop around the  
lagoon**



Source: Grunseit et al (2019)

## Before & after study findings...

*Source: Grunseit et al (2019)*



280% more  
cyclists at  
established  
sections



340% more  
pedestrians at  
established  
sections



48% of previous  
trail users  
reported doing  
more physical  
activity



52% of cyclists  
and 72% of  
pedestrians  
travel to the trail  
by car

## What does this mean for induced demand?

1. A rare example where 'entirely new trips' have been quantified
2. Circular trips around the lagoon could not have been forecast using a conventional demand model
3. Induced demand can have a multi-modal dimension

# 6 dimensions of induced demand

Q1. Mode? (tick one)	
Motor vehicle (traffic)	<input type="checkbox"/>
Public transport	<input type="checkbox"/>
Bike	<input type="checkbox"/>
Walk	<input type="checkbox"/>
All modes	<input type="checkbox"/>

Q2. Time period? (tick one)	
Peak	<input type="checkbox"/>
All day	<input type="checkbox"/>

Q3. Source? (tick all that apply)	
Change route	<input type="checkbox"/>
Switch mode	<input type="checkbox"/>
Departure time	<input type="checkbox"/>
Vehicle occupancy	<input type="checkbox"/>
Different destination	<input type="checkbox"/>
New development	<input type="checkbox"/>
Entirely new trip	<input type="checkbox"/>

Q4. Subject? (tick one)	
Vehicles	<input type="checkbox"/>
Persons	<input type="checkbox"/>

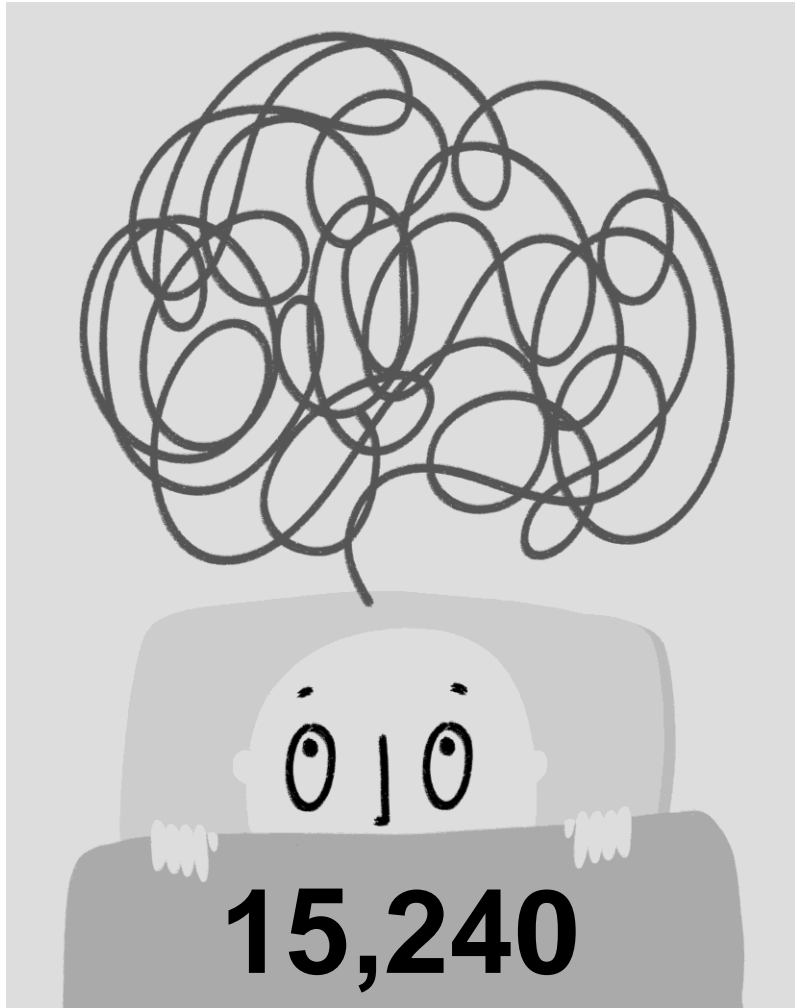
Q5. Metric? (tick one)	
Trips	<input type="checkbox"/>
Distance	<input type="checkbox"/>
Time	<input type="checkbox"/>

Q6. Spatial extent? (tick one)	
Local	<input type="checkbox"/>
City-wide	<input type="checkbox"/>

$$5 \times 2 \times 127 \times 2 \times 3 \times 2 = 15,240$$

**So, what is  
induced demand  
and how do we  
best define it?**

# Two practical definitions



1. **Pure induced demand** – entirely new daily trips (in addition to all the other demand responses)
2. **Quasi induced demand** – additional [insert mode] [insert spatial extent] [insert time period] due to [insert demand response(s)]

# Some examples

		Pure induced demand	Quasi induced demand		
Question	Answer	1	2	3	4
Q1. Mode? (tick one)	Motor vehicle (traffic)		✓	✓	
	Public transport				
	Bike				✓
	Walk				
	All modes	✓			
Q2. Time period? (tick one)	Peak		✓		
	All day	✓		✓	✓
Q3. Source? (tick all that apply)	Change route		✓	✓	
	Switch mode		✓	✓	✓
	Departure time		✓		
	Vehicle occupancy		✓	✓	
	Different destination		✓	✓	
	New development		✓	✓	
	Entirely new trip	✓	✓	✓	✓
Q4. Subject? (tick one)	Vehicles		✓	✓	
	Persons	✓			✓
Q5. Metric? (tick one)	Trips	✓	✓		
	Distance			✓	
	Time				✓
Q6. Spatial extent? (tick one)	Local		✓		✓
	City-wide	✓		✓	

# ***“Does the model consider induced demand?”***

– depends how it’s defined

<b>Demand response</b>	<b>Magnitude</b>	<b>Typically modelled?</b>
Change route	High	Yes
Switch mode	Low	Yes, in strategic models
Departure time	High	Yes, in operational traffic models
Vehicle occupancy	Low	Yes, in strategic models
Different destination	Med	Yes, in strategic models
New development	Med	Yes, in strategic models
Entirely new trip	Low	Not typically

*IMPORTANT: this is a ‘typical’ perspective – likely to be different on individual projects*

# Final thoughts

- Don't presume everyone shares your definition of induced demand
- Add the terms “pure” and “quasi” to qualify the type of induced demand
- Use the 6 multiple choice questions to reach a common understanding
- Be open to the idea induced demand isn't necessarily “bad”
- Link to paper:  
[https://australasiantransportresearchforum.org.au/wp-content/uploads/2025/02/ATRF2024\\_Resubmission\\_71.pdf](https://australasiantransportresearchforum.org.au/wp-content/uploads/2025/02/ATRF2024_Resubmission_71.pdf)