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AITPM, ITE, EA/TAS
Travel Post COVID-19 - Alternative views from leading academics
Thursday 8th October 2020

Long Term Travel Impacts of Covid-19 in Melbourne

Phase 1 and 2 Results – Overview of Key Findings

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Monash University, Australia

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GROUP OF EIGHT AUSTRALIA
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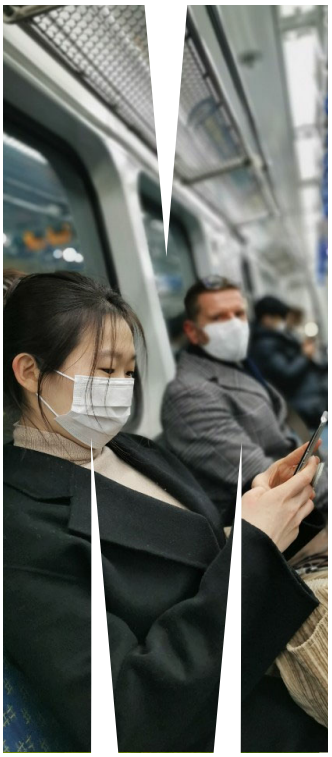

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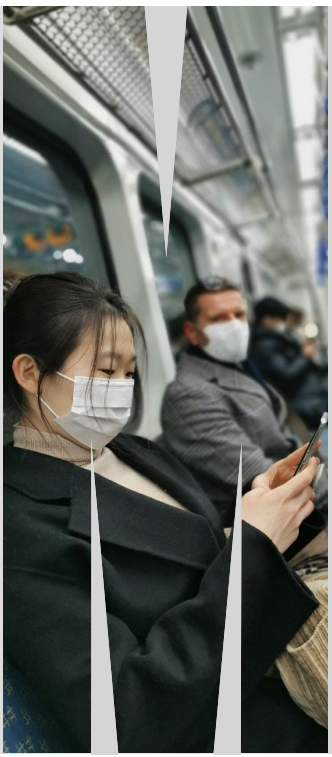
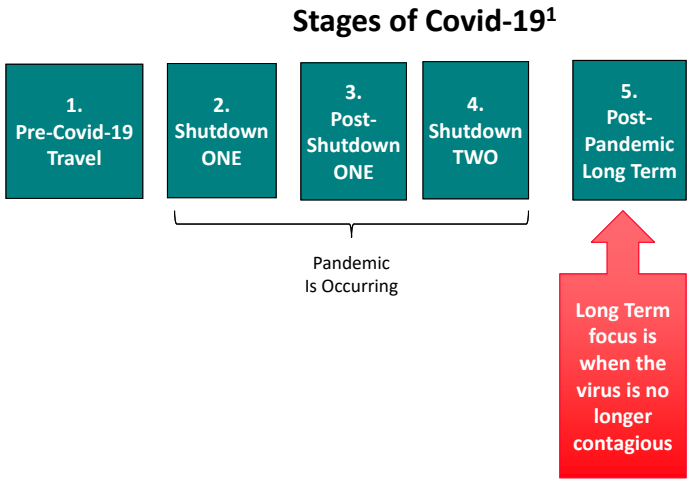
Agenda

- **Introduction**
- **Approach**
- **Evidence from past disruptions**
- **Qualitative interview findings**
- **Panel survey findings**
- **Transit ridership futures**
- **Next steps**

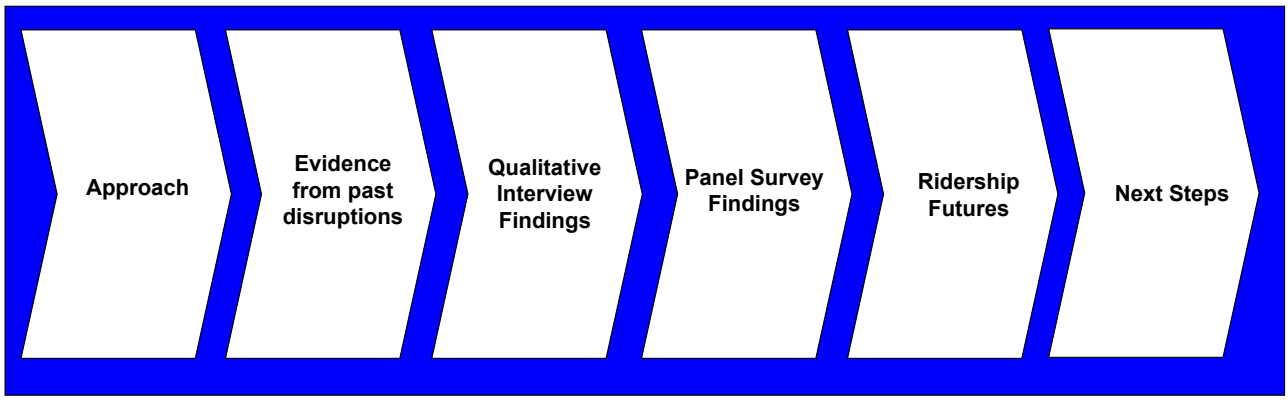


1. Project scope

- Objective:
  - Understand how C-19 has impacted travel including long term effects.
- Focus:
  - Melbourne, Australia



It is structured as follows;



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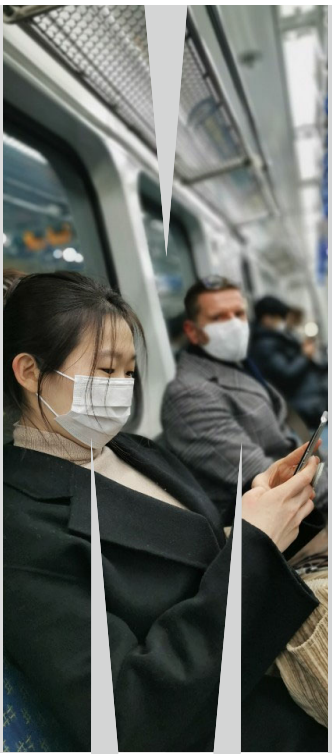


The research program reviews secondary evidence and undertakes two phases of primary research in the community focussing on self reported changes in travel

Research Plan – phases and tasks

Phase 1 – Research Context

1. Project Inception
2. Literature Review
3. Secondary Travel Data Impact Analysis
4. Future Travel Impact Forecasting Approach

Phase 2 – Shutdown Field Surveys

5. Qualitative Survey
6. Quantitative Online Panel Survey
7. Phase 2 Analysis and Reporting

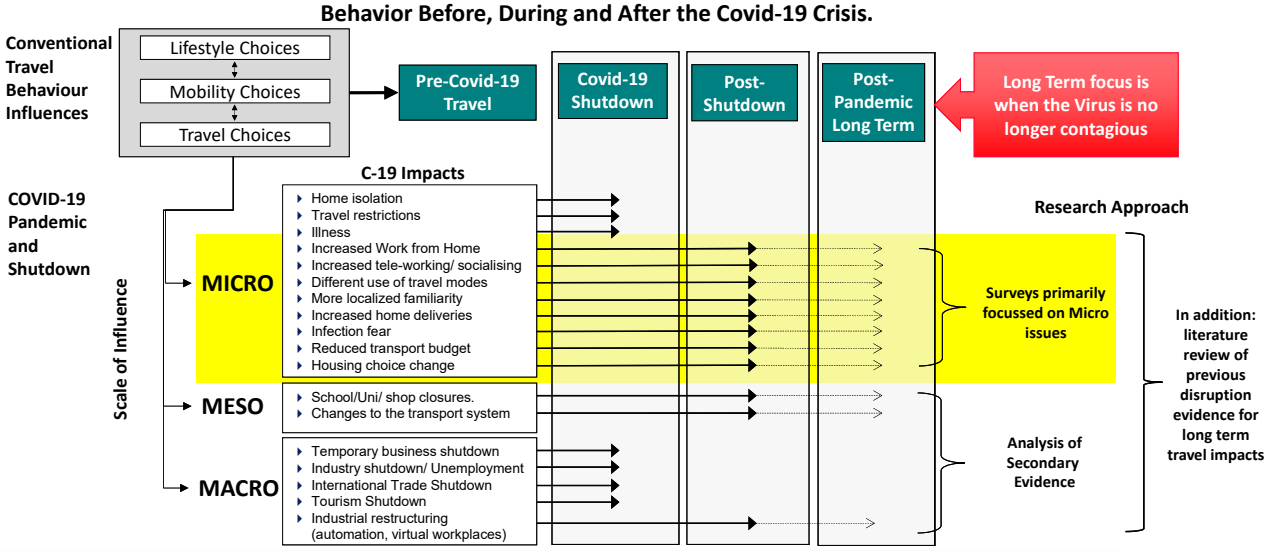
Completed

Phase 3 – Late Shutdown/Post Pandemic Field Surveys

8. Qualitative Survey
9. Quantitative Online Panel Survey
10. Phase 3 Analysis and Reporting

2. Framework

The 'Monash' Framework - An Integrated Framework of Factors Influencing Travel Behavior Before, During and After the Covid-19 Crisis.



Note: This framework is developed by the research team from a review of previous research literature and also from a workshop with staff from the Victorian Department of Transport

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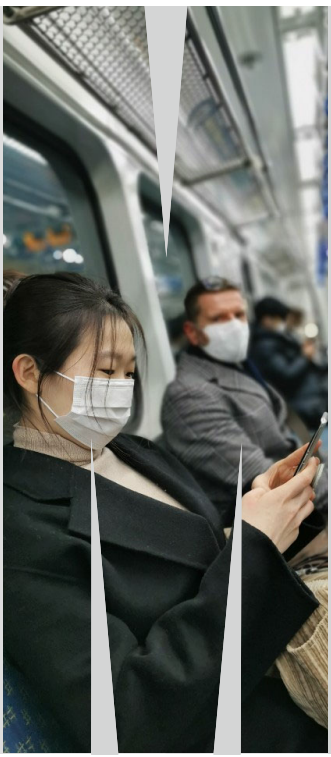

3. Evidence from past disruptions

Disruptions Explored in Travel Behaviour Research

Micro
Meso
Macro

	Personal health concerns	Security threats	Planned disruptions	Unplanned disruptions	Economic crisis
Examples:	SARS (2003) MERS (2012)	9/11 Terror attacks (2001) London, Madrid bombings 2005	Major events (London Olympics) Infrastructure works	Natural disasters Infrastructure fault Strikes	Global financial Crisis e.g. 2007
Key similarities:	• Fear/dread avoidance • Social distancing	• Fear/dread avoidance	• Availability of options changes • Encouragement to change travel	• Availability of options changes • Unknown duration	• Long duration • Macro/structural impacts • Reduced latent demand
Short Term Travel Impact	**-25%,-35%** reduction in Metro system travel	**-40%,-45%,-60%** reduction in rail travel	**-20% to -40%** reduction in base travel	**>90%** reduction in base travel during disasters	**-20%** reduction in selected transit systems
Long Term Travel Impact	**Zero Long-Term Impact** Rebound on average **28 days**	**Zero Long-Term Impact** rebounded maximum was **6 months**	TDM impact -6% after **2 months** Expect this effect to reduce over time	**No Long Term Impact** Mean time to return to normal is **7-10 days**	**No Long Term Impact** Mean time to recovery was **2 years**
Source:	Wang 2014, McKinsey & Co 2020a	McKinsey & Co 2020a	Parkes et al. 2016, Currie & Delbosc (2011)	Kontou et al 2017	McKinsey & Co 2020b

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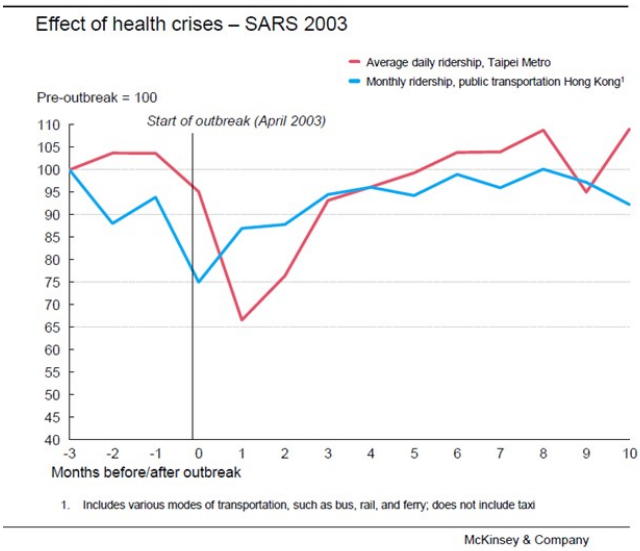
The most relevant is SARS in Asia; immediate impact was a 25%/35% decline in transit ridership; Post Pandemic, ridership returned to normal within 6 months



rebound on average took 28 days
Wang (2014)

Source: Wang, K-Y 2014, 'How Change of Public Transportation Usage Reveals Fear of the SARS Virus in a City: e89405', *PLoS ONE*, vol. 9, no. 3.

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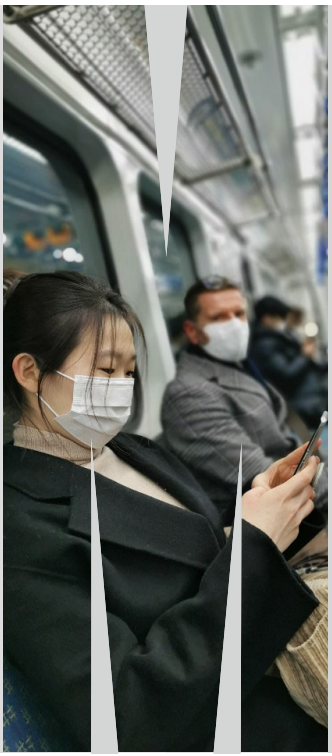

Online interviews explored personal experiences of Covid-19 on travel/activity and self reported expectations of long term impacts - for a sample frame designed to assure diversity/coverage

C-19 Travel Impacts – 1. Online Interview Survey – Shutdown Phase

- Objective:
  - provide qualitative detailed narratives of how C-19 shutdown has impacted the lives of respondents and to provide inputs to long term forecasting of impacts.
- Aims:
  a. Understand personal experiences of C-19 Shutdown on life, work and travel – notably differences between pre-shutdown and shutdown (in their words)
  b. Ask for respondents personal views on how life, work and travel might change in a post-C-19 shutdown – will anything have changed? (in their words)
  c. Explore specific issues which might affect long term travel with respondents (in their words)
- Approach
  - Targetted 18 interviews - 40 mins - online/by phone

Table 1 – Sample Frame – Online Interviews

	Regions of Melbourne								
Personal Income	Inner			Middle			Outer		
	Age			Age			Age		
	Low*	Medium	High	Low	Medium	High	Low	Medium	High
Low	1[2]	-	1	1[2]		1	1[2]		1
Medium	1	1[2]		1	1[2]		1	1[2]	
High		1	1[2]		1	1[2]		1	1[2]

*No surveys are undertaken of anyone aged under 18
[2]Respondents who used Public Transport in Melbourne equal to and also more frequently than 1-2 days a week

Completed in March/April 2020

4. Findings from Qualitative Interviews

C. Post - Pandemic

How do you expect what you do and how you get around will change when the virus has gone?

- Go back to normal
- No get back to normal
- Will drift back into same as we used to
- I'll travel by public transport again
- Not much change
- Go back to normal
- Go back to normal
- Just go back to normal
- It will all be the same; don't expect to change anything
- Will soon go back to how it was
- Expect it will go back to normal
- Go back to how it was before the virus came about

Note: Yellow boxes report specific answers from a respondent in their own words

Note:
(1) Monash – May 2020 Online Interview Survey
(2) Yellow boxes report specific answers from a respondent in their own words

4. Findings from Qualitative Interviews

D. Exploring Specific Long Term Impact Issues

Post Pandemic will you use public transport?

- Yes
- Yes
- Yes no problem with it
- Yes will use public transport
- Yes I would
- Im not scared to use public transport ; I use trams even now
- Yes
- See no reason why not; yes
- Yes I have no choice

D. Exploring Specific Long Term Impact Issues

Post Pandemic will you have concerns about infection on public transport?

Majority – No concern – some noted concern

- No more than usual; we have the annual flu concern but not a problem
- A little apprehensive but no not real concerns; have to have a bit of confidence when things go back; ill be careful; get a flu shot
- As long as risk has gone ill be ok

Note:
(1) Monash – May 2020 Online Interview Survey
(2) Yellow boxes report specific answers from a respondent in their own words

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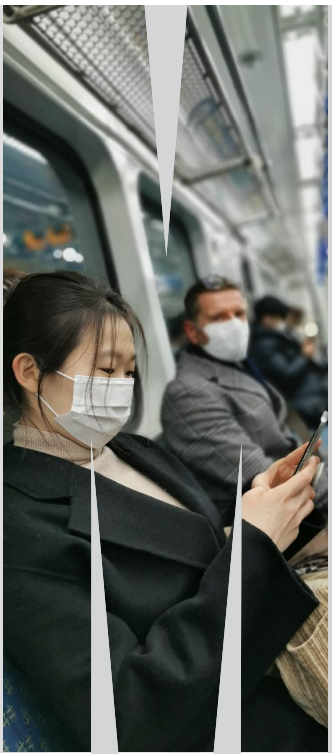

The online panel survey covers self reported travel by Covid period & Specific Issues affecting long term travel (from the Monash framework) – a sample frame is so results are representative

Online Panel Survey Questionnaire – Areas Covered

- 1. Pre - Shutdown
- 2. Shutdown One
- 3. Post – Shutdown One
- 4. Shutdown Two
- 5. Post – Pandemic

i. Employment
ii. Income
iii. Weekday activities
iv. Travel to Work and Study (Workers/Students)
v. Off Peak Travel (non Workers/Students)

D. Exploring Specific Long Term Impact Issues (The Monash Framework)

- Working from Home
- Tele-Video Conferencing
- Travel Modes
- Local Travel
- Home Deliveries/ Online Shopping
- Residual Public Transport Fear
- Impact of Lower Income
- Car Ownership/Use
- Residential Housing/Location

Sample Frame[1]

INNER MELBOURNE (n=700)

	Annual Personal Income , Before Tax				
	Nil Income	Less than	Between	More than	Total
Age Group	Target	Target	Target	Target	Total Target
18-29	53	96	83	16	248
30 - 44	12	43	86	79	220
45 and over	12	89	62	69	232
Total	**77**	**228**	**231**	**164**	**700**

MIDDLE MELBOURNE (n=700)

	Annual Personal Income , Before Tax				
					Total
Age Group	Target	Target	Target	Target	Total Target
18-35	37	73	92	36	238
36-54	17	43	87	90	237
55 and over	18	107	64	37	226
Total	**72**	**223**	**243**	**163**	**701**

OUTER MELBOURNE (n=700)

	Annual Personal Income , Before Tax				
	Nil Income	Less than	Between	More than	Total
Age Group	Target	Target	Target	Target	Total Target
18-35	26	87	97	24	234
36-53	15	64	101	56	236
54 and over	18	122	65	25	230
Total	**59**	**273**	**263**	**105**	**700**

GRAND TOTAL

	Annual Person Income, Before Tax				
	Nil Income	INCOME 1	INCOME 2	INCOME 3	Total
Age Group	Target	Target	Target	Target	Total Target
AGE GROUP 1	116	256	272	76	720
AGE GROUP 2	44	150	274	225	693
AGE GROUP 3	48	318	191	131	688
Total	**208**	**724**	**737**	**432**	**2101**

Note:
(1) Quotas in a sample aim to ensure representation of the community with respect to key/influential demographic and spatial criteria
(2) Statistical accuracy minimums are a sample of 600 to achieve a 95% confidence that any result is within 4% standard error.

The sample (n=2,176) has excellent coverage of age/income quota – By region (Inner, Middle, Outer) the sample exceeds the statistical accuracy minimums

Figure A1: Sample Frame Quota and Achieved Targets – 10 August Sample

INNER MELBOURNE (n=700)

	Annual Personal Income , Before Tax												Total		
	Nil Income			Less than $45,000			Between $45,000 and $98,000			More than $98,000					
Age Group	Target	Completed	%	Target	Completed	%	Target	Completed	%	Target	Completed	%	Total Target	Completed	%
18-29	53	54	102%	96	101	105%	83	87	105%	16	17	106%	248	259	104%
30 - 44	12	12	100%	43	45	105%	86	90	105%	79	83	105%	220	230	105%
45 and over	12	13	108%	89	82	92%	62	64	103%	69	68	99%	232	227	98%
Total	**77**	**79**	**103%**	**228**	**228**	**100%**	**231**	**241**	**104%**	**164**	**168**	**102%**	**700**	**716**	**102%**

MIDDLE MELBOURNE (n=700)

	Annual Personal Income , Before Tax												Total		
	Nil Income			Less than $37,000			Between $37,000 and $84,000			More than $84,000					
Age Group	Target	Completed	%	Target	Completed	%	Target	Completed	%	Target	Completed	%	Total Target	Completed	%
18-35	37	39	105%	73	77	105%	92	97	105%	36	38	106%	238	251	105%
36-54	17	17	100%	43	45	105%	87	91	105%	90	94	104%	237	247	104%
55 and over	18	18	100%	107	111	104%	64	64	100%	37	37	100%	226	230	102%
Total	**72**	**74**	**103%**	**223**	**233**	**104%**	**243**	**252**	**104%**	**163**	**169**	**104%**	**701**	**728**	**104%**

95

OUTER MELBOURNE (n=700)

	Annual Personal Income , Before Tax												Total		
	Nil Income			Less than $37,000			Between $37,000 and $84,000			More than $84,000					
Age Group	Target	Completed	%	Target	Completed	%	Target	Completed	%	Target	Completed	%	Total Target	Completed	%
18-35	26	27	104%	87	91	105%	97	102	105%	24	25	104%	234	245	105%
36-53	15	15	100%	64	67	105%	101	105	104%	56	59	105%	236	246	104%
54 and over	18	19	106%	122	128	105%	65	68	105%	25	26	104%	230	241	105%
Total	**59**	**61**	**103%**	**273**	**286**	**105%**	**263**	**275**	**105%**	**105**	**110**	**105%**	**700**	**732**	**105%**

GRAND TOTAL

	Annual Person Income, Before Tax												Total		
	Nil Income			INCOME 1			INCOME 2			INCOME 3					
Age Group	Target	Completed	%	Target	Completed	%	Target	Completed	%	Target	Completed	%	Total Target	Completed	%
AGE GROUP 1	116	120	103%	256	269	105%	272	286	105%	76	80	105%	720	755	105%
AGE GROUP 2	44	44	100%	150	157	105%	274	286	104%	225	236	105%	693	723	104%
AGE GROUP 3	48	50	104%	318	321	101%	191	196	103%	131	131	100%	688	698	101%
Total	**208**	**214**	**103%**	**724**	**747**	**103%**	**737**	**768**	**104%**	**432**	**447**	**103%**	**2101**	**2176**	**104%**

Note:
(1) Monash – July 2020 Online Panel Survey final sample vs quota targets
(2) Statistical accuracy minimums are a sample of 600 to achieve a 95% confidence that any result is within 4% standard error

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There was also interest in sampling of PT Users, Employed and CBD Workers - the sample also exceeds statistical accuracy minimums for all these non-Quota targets

Figure A2: Sample Non-Quota Targets and Achieved Sample

Q7: LAST YEAR, in 2019, HOW OFTEN did you typically use public transport?	Completed	% of total sample
6-7 days a week	170	8%
5 days a week	355	16%
3-4 days a week	280	13%
1-2 days a week	263	12%
Total	**1068**	**49%**

Q8. BEFORE the COVID 19 Outbreak, which of the following best describes what you did?	Completed	% of total sample
Employed full time	905	42%
Employed Part Time	329	15%
Employed casual	199	9%
Total	**1433**	**66%**

Q9 Before the COVID-19 outbreak, did you WORK in Melbourne CBD?	Completed	% of total sample
Yes	635	29%
Total	**635**	**29%**

Note:
(1) Monash – July 2020 Online Panel Survey final sample
(2) Statistical accuracy minimums are a sample of 600 to achieve a 95% confidence that any result is within 4% standard error
(3) About half the sample used PT in 2019; this is a very high number and might imply a sample biased towards public transport users; this is good for reliability of results regarding public transport but may imply high estimates of PT mode share in the results

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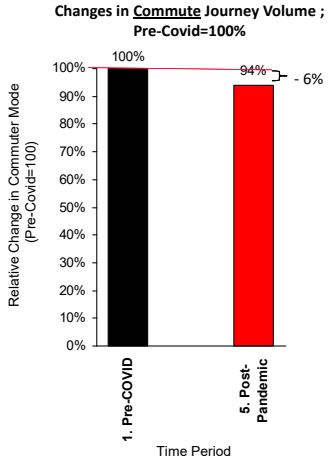
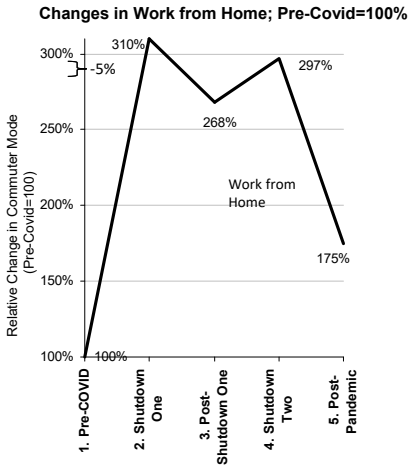
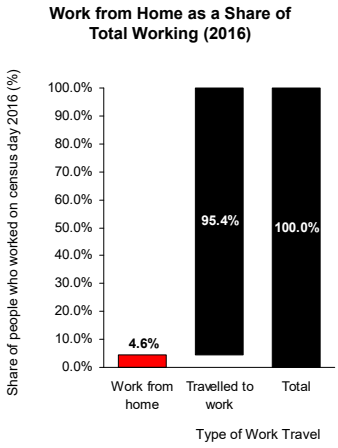
POST COVID total JTW travel declines by 6% - mainly due to increased WFH

Figure D2: Post-Covid Total Travel Reduction and Linked to WFH Growth

Peak-Related Travel







Note:
(1) Monash - August 2020 Online Panel –final sample - Self reported activity participation volume per week
(2) Weighted sample; representative of total Melbourne travel

Source:: Australian Bureau of Statistics, 2016 Census Journey to Work

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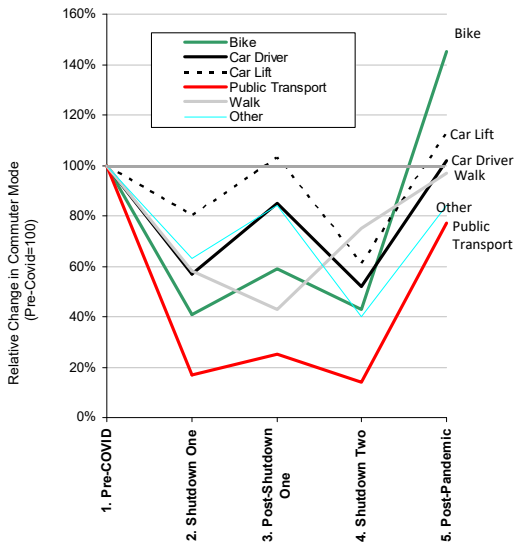
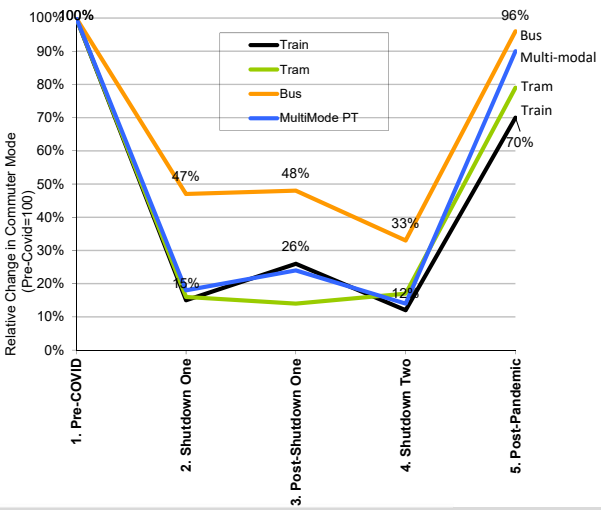
By Mode Post-Covid; JTW grows for Bike (+45%), Car Lift (+13%), Car Driving (+2%). Walking (-3%) PT ridership returns to 77% of Pre Covid Levels – rail more affected than Bus and Multimodal

Figure D5: Changes in Commute Journey Volume by Mode ; Pre-Covid=100%

Peak-Related Travel





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Note:
(1) Monash - August 2020 Online Panel – final sample - Self reported travel to work volume per week
(2) Weighted sample; representative of total Melbourne travel

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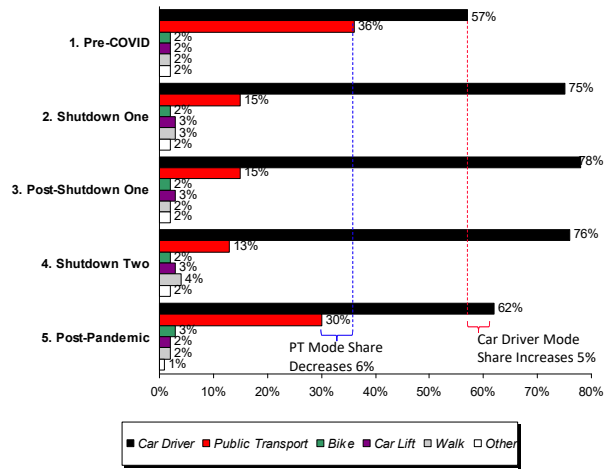
JTW mode share increases for car driving from 57% to 61%. PT mode share declines from 36% to 30%.

Figure D7: Changes in Commute Journey Share by Mode

Peak-Related Travel



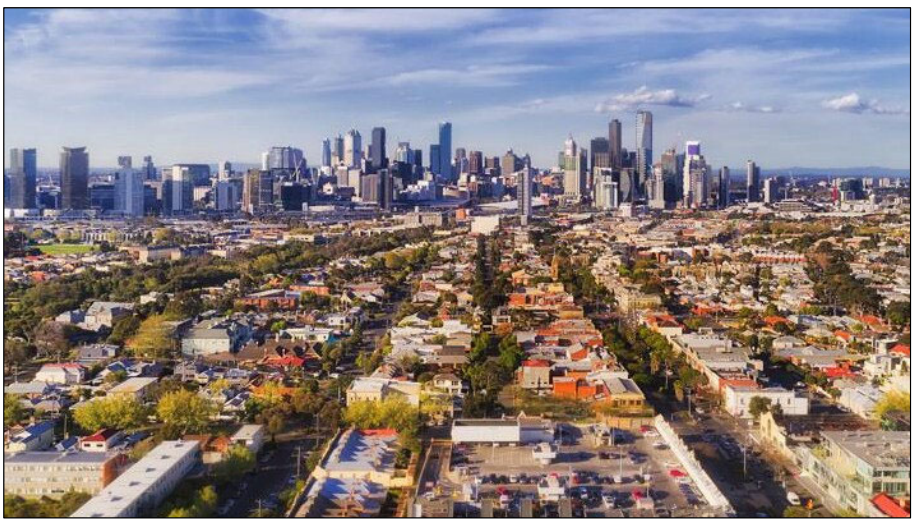
Key Points

- This is the relative SHARE of travel to work by MODE. It is the weighted sample (representative of all travel in Melbourne).
- Post Pandemic; major shifts are:
  - Increased car driving; the share of car driving to work will increase from 57% to 62%.
  - Decreased public transport use; although mode share recovers from a low of 13% (Shutdown Two) it returns to a share of 30% of journey to work, 6% below pre covid levels
  - Bike share increases from 2% to 3% post pandemic
- During the Pandemic (period 3, 4 and 5) car driving share of journey to work has consistently increased to represent 75-78% of all work travel.
- Public Transport travel declines to a share of between 13-15% of travel. Interesting it still represented the second most important means of travel to work after car driving; even during the pandemic.

Note:
(1) Monash - August 2020 Online Panel – final sample - Self reported travel to work volume per week
(2) Weighted sample; representative of total Melbourne travel

Melbourne CBD

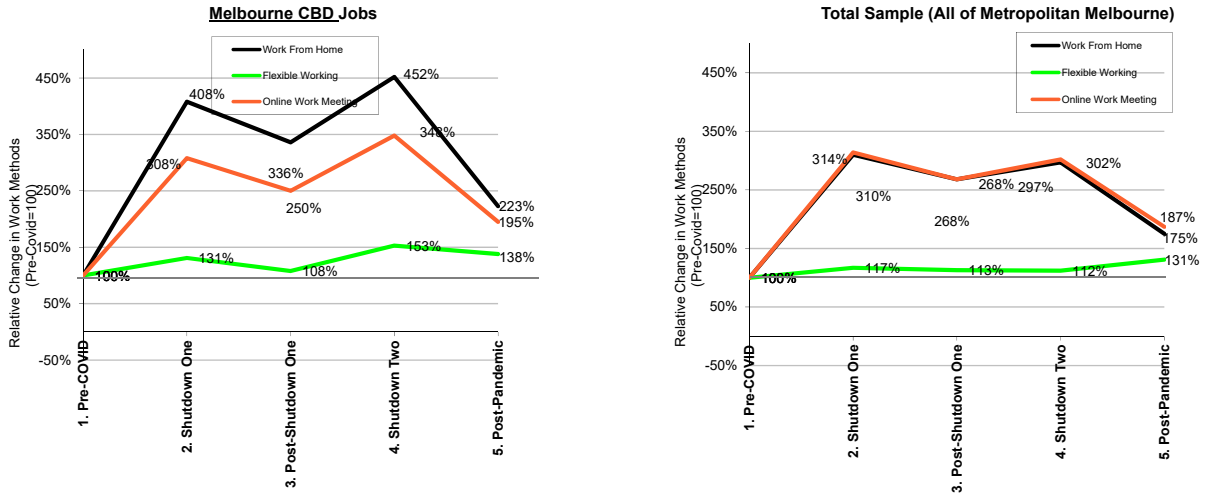
CBD Commuting



Work from Home is MUCH more common for CBD workers; Post Pandemic WFH is expected to more than double (+117%) compared to pre-covid, much higher than for Melb as a whole (+75%)

Figure F2: Changes in Alternative Work Methods ; Pre-Covid=100%

CBD Commuting



Note:
(1) Monash – August 2020 Online Panel Survey – final sample - Self reported activity participation volume per week (2) Weighted sample; representative of total Melbourne travel

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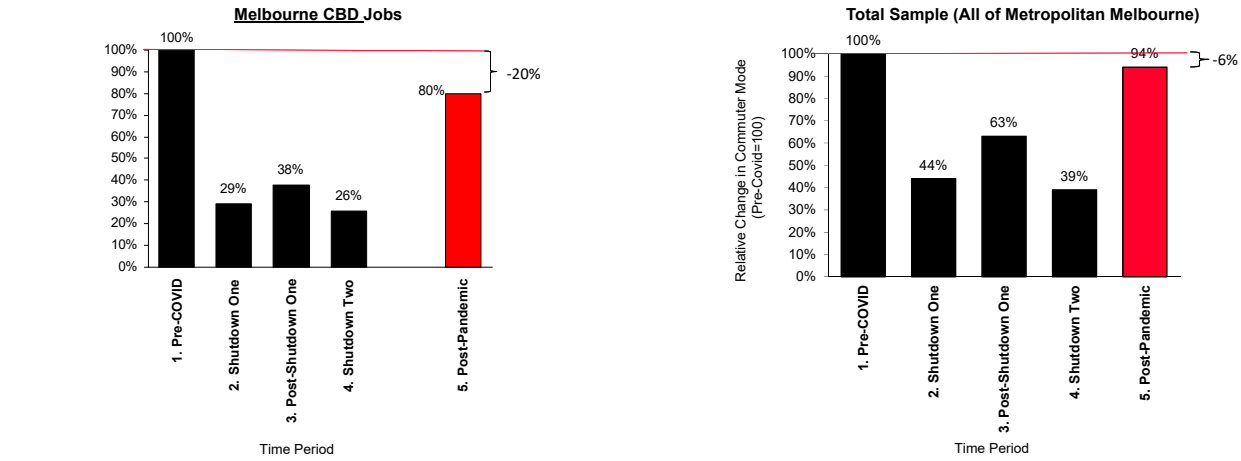
Respondents say CBD COMMUTE will reduce more than the rest of Melbourne; Post Pandemic a 20% decline in CBD COMMUTE is self estimated - much larger than for Melbourne as a whole (6%)

Figure F4: Changes in Commute Journey Volume ; Pre-Covid=100%

CBD Commuting



Note:
(1) Monash - August 2020 Online Panel – final sample - Self reported CBD travel to work volume per week
(2) Weighted sample; representative of total Melbourne travel

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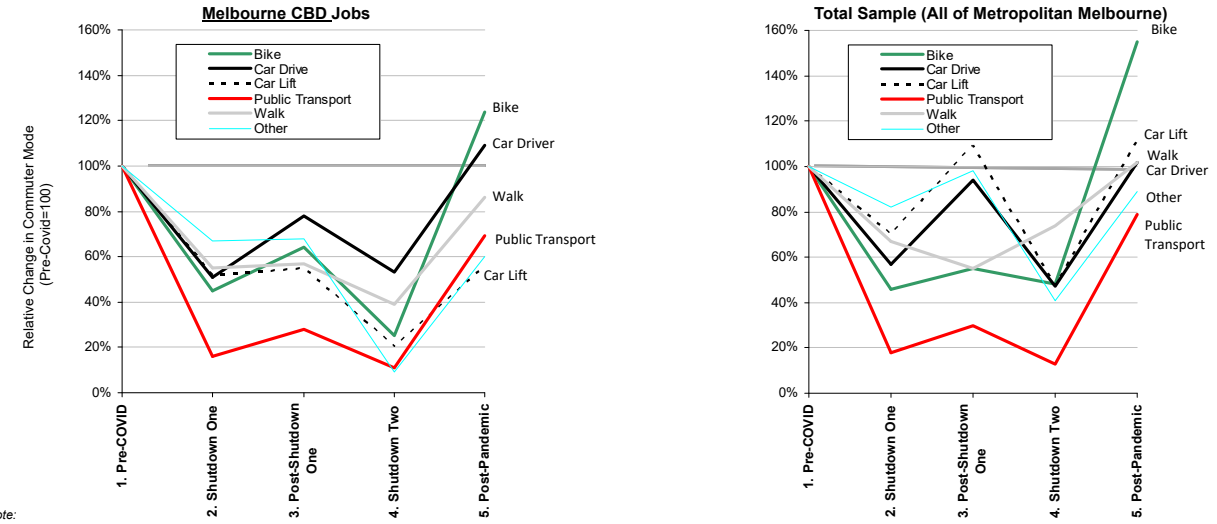
Post-Covid CBD COMMUTE grows for Bike (+24% Pre-Covid) & Car Driver (+9%). Car Lift (-44%) PT (-31%) & Walk (-14%) reduce. CBD modes decline more than Citywide; Car Driving growth is bigger

Figure F6: Changes in Commute Journey Volume by Mode ; Pre-Covid=100% CBD Commuting



Note:
(1) Monash – July 2020 Online Panel Survey – final sample - Self reported travel to work volume per week (2) Weighted sample; representative of total Melbourne travel

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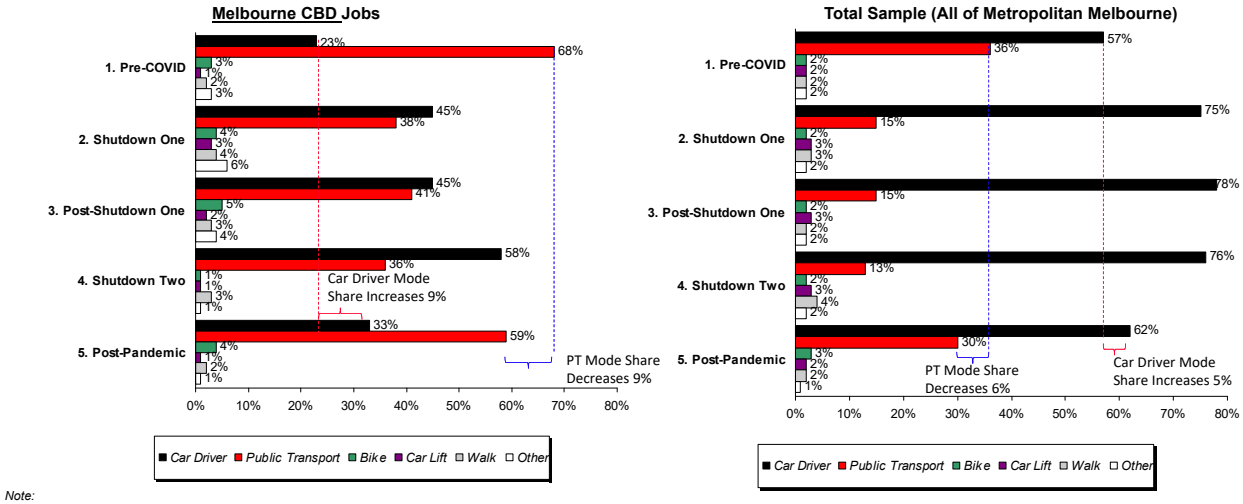
Post-Covid CBD COMMUTE mode share increases for car driving 23%-33%; PT CBD mode share declines 67%-59%. This CBD swing is similar but larger for the CBD than for Melbourne as a whole

Figure F8: Changes in CBD Commute Journey Share by Mode CBD Commuting



Note:
(1) Monash - August 2020 Online Panel –final sample - Self reported travel to work volume per week
(2) Weighted sample; representative of total Melbourne travel

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Public Transport Users

PT Users

Overcrowding & Infection Fear are top concerns for PT Users since the pandemic – these concerns increased in shutdown two

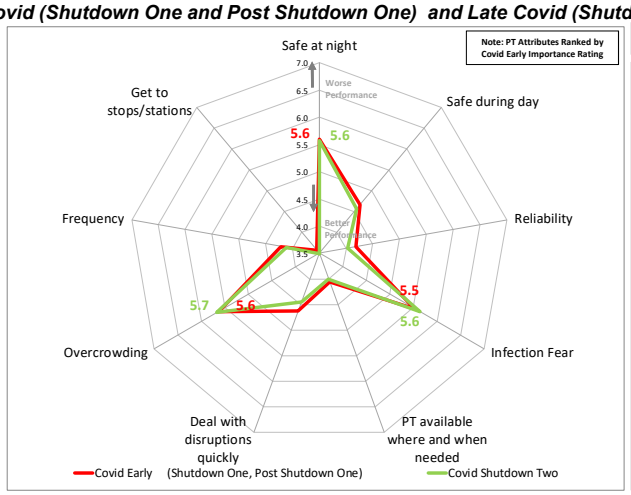
Figure C2: Pt User Attitudes to PT Issue IMPORTANCE

Early Covid (Shutdown One and Post Shutdown One) and Late Covid (Shutdown Two)

Attitudes/Perceptions

PERFORMANCE
Average Raw Stated Scores

Attribute (Ranked by Covid Early Importance)	Covid Early (Shutdown One, Post Shutdown One)	Covid Shutdown Two
Safe at night	5.6	5.6
Safe during day	4.7	4.6
Reliability	4.2	4.0
Infection Fear	5.5	5.6
PT available where and when need	4.1	4.0
Deal with disruptions quickly	4.6	4.5
Overcrowding	5.6	5.7
Frequency	4.2	4.1
Get to stops/stations	3.6	3.5
min	3.6	3.5
max	5.6	5.7



Key Points

- Covid Early - In terms of performance the biggest concerns are:
  - Overcrowding
  - Safety at Night (from assault/theft)
  - Infection fear
- Covid Late – these are still the top issues but there are small changes:
  - Overcrowding remains biggest concern but its rating is worse
  - Infection Fear becomes the second worst rated issue
  - Safety at Night is still a major concern but its performance is rated as slightly of a concern
- Other slight changes to shutdown two are:
  - Concern over the performance of safety during the day, reliability and dealing with disruptions are not as larger as they were in early shutdown
- Overall shifts between Coveid early and late are minor in scale

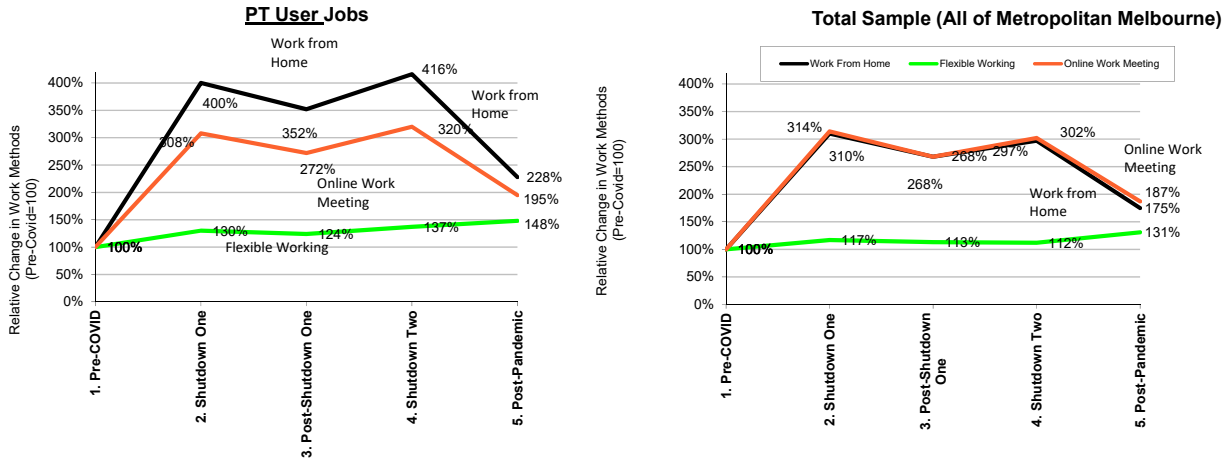
Note:
(1) Monash - August 2020 Online Panel – final sample - Self reported IMPORTANCE rating: 1-7; 7 = extremely Important, 1=Extremely unimportant (2) Weighted sample; representative of total Melbourne travel
(3) Spiral Plot uses approach from Currie G Delbosc A (2015) Variation in Perceptions of Urban Public Transport Performance Between International Cities Using Spiral Plot Analysis' TRANSPORTATION RESEARCH RECORD No. 2538 pages 54-64.

Work from Home is MUCH more common for PT Users; Post-Pandemic WFH is expected to more than double (+128%) compared to Pre-Covid for PT Users, much higher than for Melb (+75%)

Figure G2: Changes in Alternative Work Methods ; Pre-Covid=100%

PT User and Total Melbourne

PT Users



Note:

(1) Monash - August 2020 Online Panel –final sample - Self reported activity participation volume per week (2) Weighted sample; representative of total Melbourne travel

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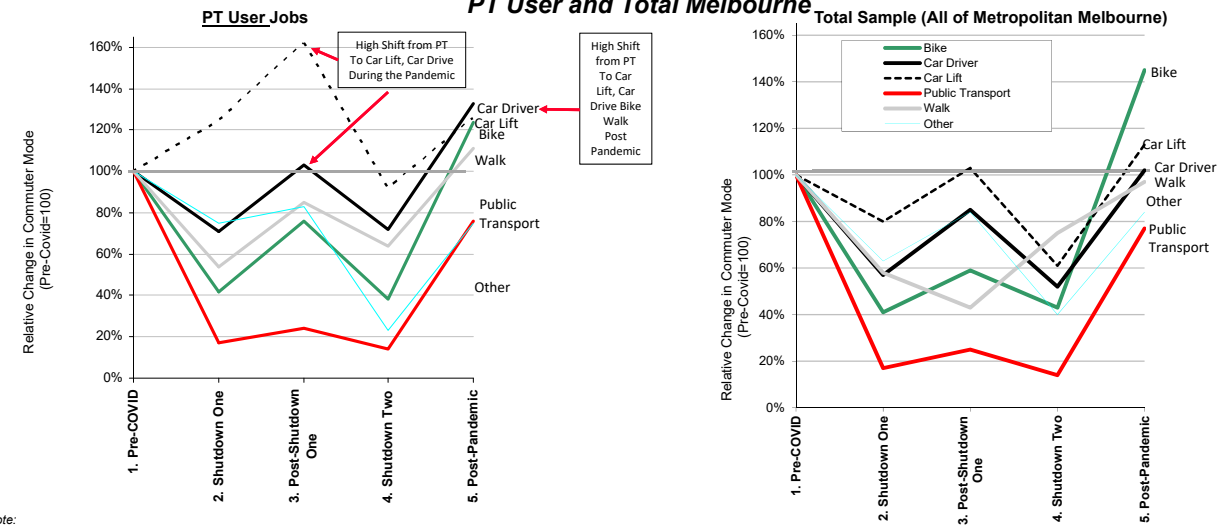
Post-Covid PT User COMMUTE increases for Car Driver (+33% pre-covid), Bike (+28%), Car Lift (+26%). PT declines (-22%). The shift to car use is higher for PT Users than Citywide

Figure G5: Changes in Commute Journey Volume by Mode ; Pre-Covid=100%

PT User and Total Melbourne

PT Users



Note:

(1) Monash - August 2020 Online Panel – final sample - Self reported travel to work volume per week (2) Weighted sample; representative of total Melbourne travel

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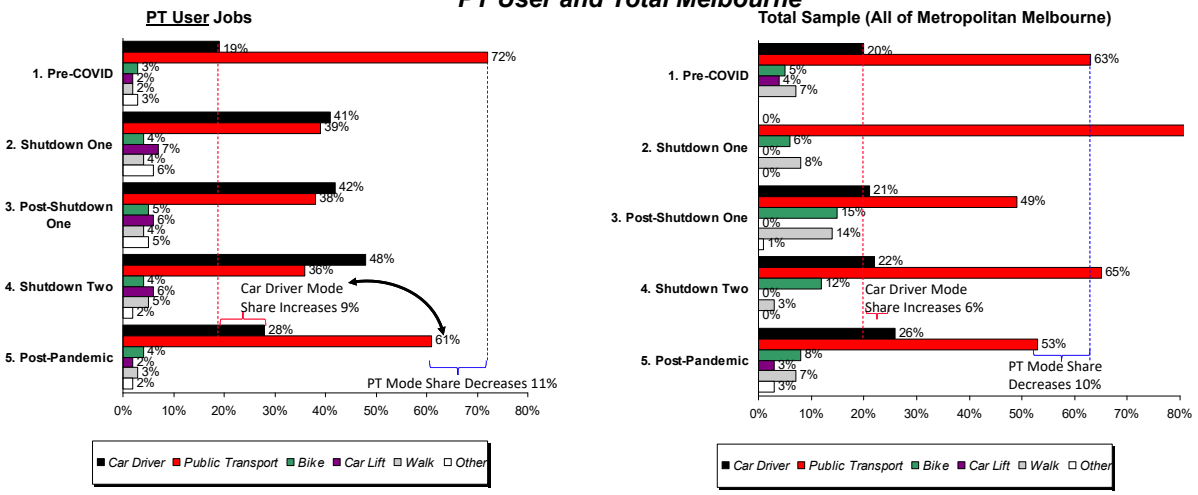
Post-Covid PT User COMMUTE mode share increases for car driving 19%-28%; PT User mode share declines 72%-61%. This swing is similar but larger for PT Users than for Melbourne as a whole

Figure G6: Changes in CBD Commute Journey Share by Mode
PT User and Total Melbourne

PT Users



Note:
(1) Monash - August 2020 Online Panel – final sample - Self reported travel to work volume per week
(2) Weighted sample; representative of total Melbourne travel

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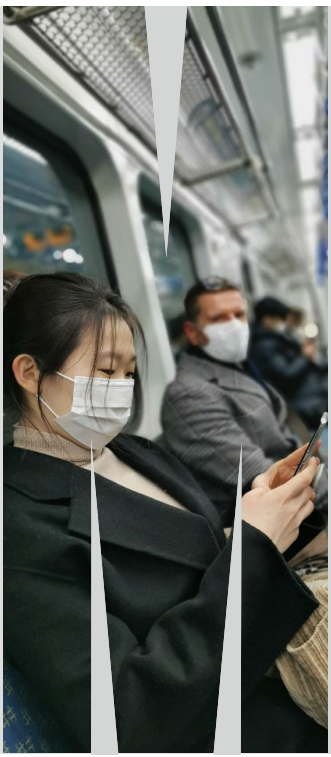
Agenda

- Introduction
- Approach
- Evidence from past disruptions
- Qualitative interview findings
- Panel survey findings
- **Transit ridership futures**
- Next steps



All evidence suggests a Post-Covid 0% to -5% total travel decline. Mode Shift evidence is mixed ranging from 0% to -6% total travel shift from PT to car; a max one-off absolute PT decline of ~20%.

Evidence of Post-Covid Travel Impacts

Previous Disruption Evidence - Long Term Travel Impacts

Consistent evidence total travel will decline by ~0%-<5%

Key Points

- Total Travel Volume - between 0% and 5% reduction in travel
- Travel Mode Shift – between 0% and 5% swing in travel between modes
- Previous Pandemics – zero long term impact on ridership – ridership returns within at most 6 months

Online Interview Survey (May 2020)

Key Points

- Total Travel Volume - Zero long term effect on travel
- Travel Mode Shift – Full return to public transport expected; some small desire to use active travel modes for health reasons if possible
- Recognition that infection fear is a major long term concern in using public transport

Self Reported (Estimated) Post-Covid Impacts

Market	TOTAL	PT	Car Drive	Car Lift	Walk	Bike
Change in Trip Volume (Post-Covid vs Pre-Covid)						
Peak Related						
Journey to Work	-6%	-23%	+2%	+13%	-3%	+45%
Journey to Study	-2%	-18%	+24%	+72%	+2%	+59%
Off Peak						
Off Peak	-25%	-41%	-17%	-21%	-24%	-19%
Post-Covid Mode Share (Change in Mode Share) Post-Covid vs Pre-Covid						
Peak Related						
Journey to Work		30% (-6%)	62% (+5%)	2% (+0%)	2% (+0%)	3% (+1%)
Journey to Study		53% (-11%)	26% (+6%)	3% (-1%)	7% (+0%)	8% (+3%)
Off Peak						
Off Peak		14% (-4%)	51% (+5%)	10% (+1%)	20% (+1%)	3% (+1%)

Off Peak Travel Decline – Inconsistent with Interview/ Disruption Evidence – *Causes worthy of further analysis*

Mode Shift from Transit to mainly car driving

Mode Shift From Public Transport to Mainly Car Driving – Inconsistent with Interview/ Disruption Evidence – scale is larger than previous evidence

When full return to work/activity occurs this will cause substantial traffic congestion notably in CBD areas where our evidence suggest this will be a bigger effect

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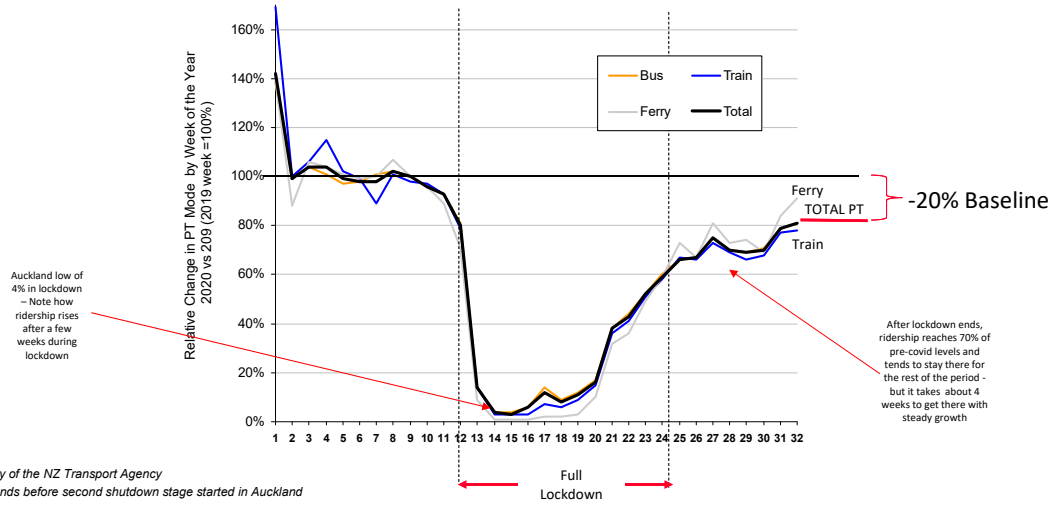
We note that Auckland Transport ; when Covid-19 was no longer an issue, demonstrated a 20% net PT ridership decline; consistent with our low-end est. for Post Covid in Melbourne of -20%

Changes in AUCKLAND TRANSPORT (NZ) Total Public Transport Travel by Mode by week - 2020 vs 2019; 2019 =100%



Note:

(1) Data curtesy of the NZ Transport Agency

(2) Note data ends before second shutdown stage started in Auckland

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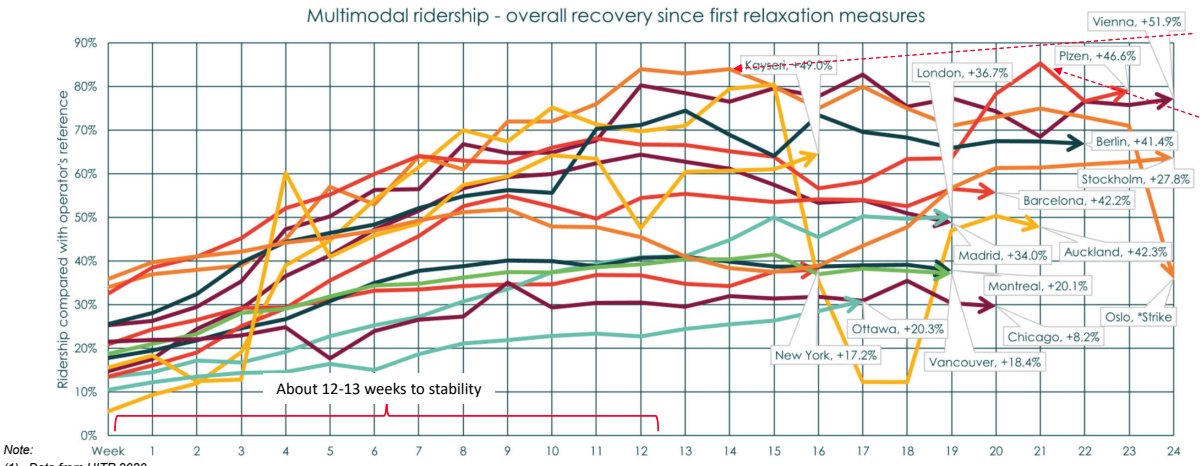
This trend matches a global city pattern of ridership return after shutdown; with a ~-20% level currently representing a general ceiling for ridership return

Changes in International City (Multi-modal) Public Transport Travel by Mode by week after Recovery (shutdown) - % relative to baseline (update 2-10-2020)



Note that Oslo achieves a -15% return ceiling

Note Plzen also achieves a -15% return ceiling but it's a small town 350k pop

Note:
(1) Data from UITP 2020
(2) Note includes Auckland Transport turn down after shutdown two returns
(3) The text tags with percentages after the city name appear to show the relative change in ridership after shutdowns finish

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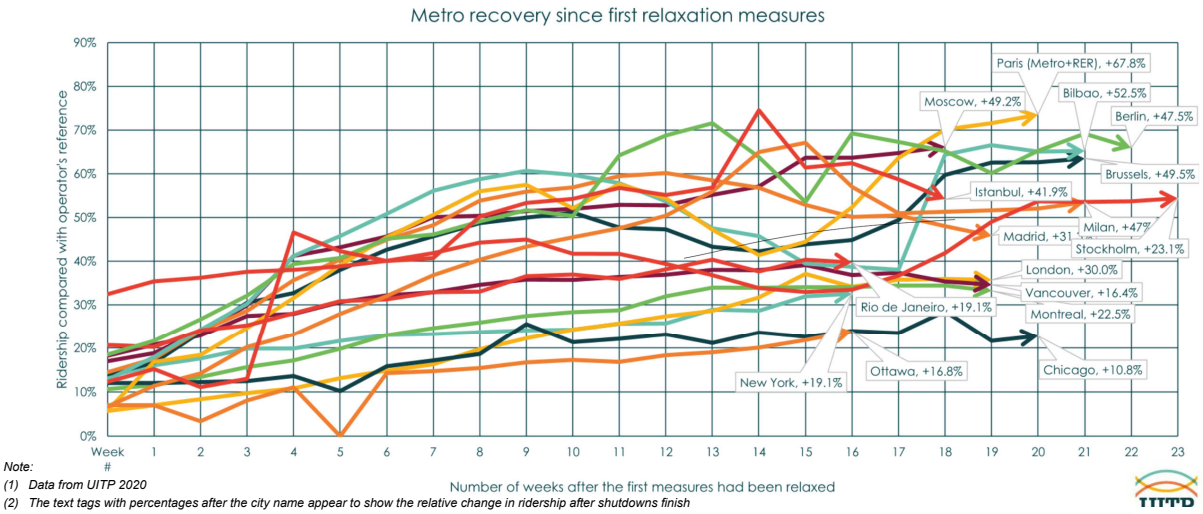
Interestingly Metro systems, with underground operations have a lower ceiling and return trajectory

Changes in International City (Metro) Public Transport Travel by Mode by week after Recovery (shutdown) - % relative to baseline (update 2-10-2020)



Note:
(1) Data from UITP 2020
(2) The text tags with percentages after the city name appear to show the relative change in ridership after shutdowns finish

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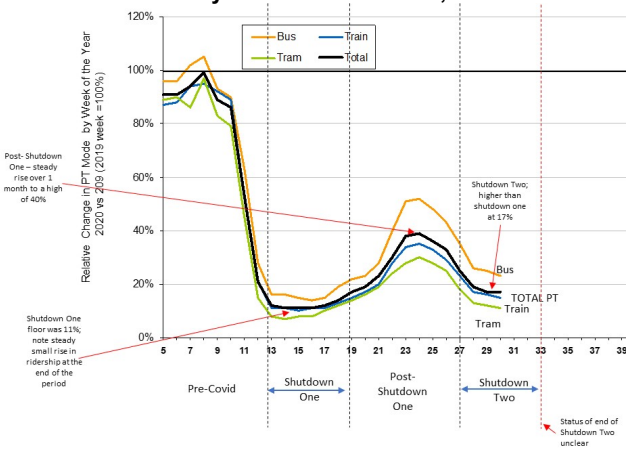
Melbourne & Sydney have a way to go and display interesting differences which will be explored in future research

Changes in MELBOURNE Total Public Transport Travel by Mode by week - 2020 vs 2019; 2019 =100%

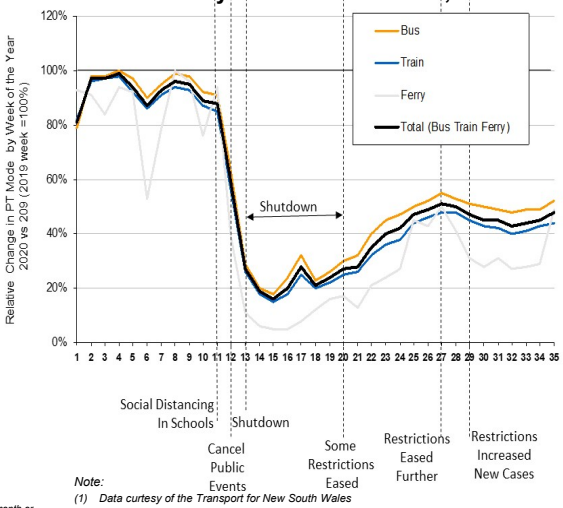


Note:

(1) Source: Department of transport 2020, Daily patronage estimates by mode, compared to baseline data , for February to July 2020

(2) Patronage baselines are based on monthly predictions for weekdays, Saturdays, Sundays and public holidays, derived from 2019 patronage est for the same month and with a year on year growth rate applied. Baselines do not reflect fluctuations in patronage that occur throughout each month or week.

Changes in Sydney Total Public Transport Travel by Mode by week - 2020 vs 2019; 2019 =100%



Note:

(1) Data curtesy of the Transport for New South Wales

(2) Note: Light Rail and Metro not included as significant new service introduced in 2019 distorting effects pre-post Covid 19

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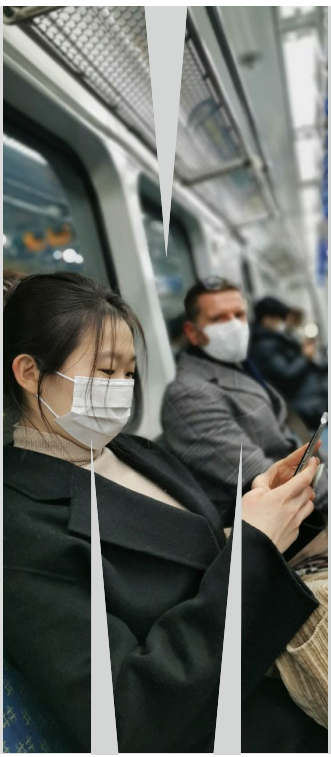


A number of additional analysis of the first Online Panel Survey are planned next; additional suggestions are welcome

Baseline Queries of the First Online Panel Survey

- New Analysis Questions/Areas to explore:
  - Isolation of factors resulting in PT use decline
  - Off peak travel decline is suggested – this is unexpected; why does it happen? How robust is this finding?

Analysis testing the robustness of user self-reported travel predictions

The (London 2012 Olympics) Transtheoretical Model Tests

- Parkes et al (2016) developed the Transtheoretical Model in research exploring long term travel impacts of the Summer Olympic Games on travel in London
- They found long term travel impacts related to the degree of adjustment to change each person had made.
- The Online Panel Survey included questions exploring this for Journey to Work. This analysis will adopt this approach to test self reported travel changes

The Transtheoretical Model

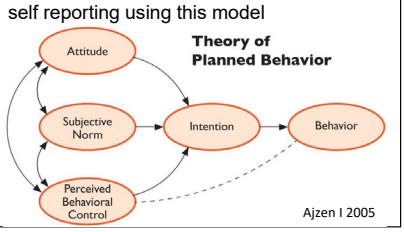
User Adjustment to Change – London 2012 Olympic Games

Pre-contemplation
Contemplation
Preparation
Action
Maintenance

(Parkes et al 2016, Prochaska and DiClemente 1982)

The Theory of Planned Behaviour and Working From Home

- Increased WFH is a notable impact of Covid-19
- The Theory of Planned Behaviour (TPB) is the most prolific tool used to understand travel behavior. It says behavior is a function of attitudes, norms, perceived control.
- We are a series of questions on these for WFH users and will check the robustness of self reporting using this model



In addition we must plan for Phase 3 of the research – a second round of interviews and a second Online Panel Survey scheduled for later as the Pandemic progresses (or ends)

Research Plan – phases and tasks – reporting and status

Completed

Phase 1 – Research Context

1. Project Inception
2. Literature Review
3. Secondary Travel Data Impact Analysis Future Travel Impact Forecasting Approach

Phase 2 – Shutdown Field Surveys

5. Qualitative Survey – Shutdown One.
6. Quantitative Online Panel Survey
7. Analysis and Reporting

Phase 3 – Late Shutdown/Post Pandemic Field Surveys

Up Next

8. Qualitative Survey
9. Quantitative Online Panel Survey
10. Phase 3 Analysis and Reporting

Scheduled for Late 2020/ Early 2021

Possible ADDITION topics to explore

- Explore reasons behind the large self reported post pandemic changes in off peak travel – factor/PCA causes
- Cross check/ calibrate self reported changes in travel against known changes – if necessary consider a sample adjustment to get a more accurate forecast
- Disaggregate analysis:
  - Inner, Middle, Outer, Age and Income
- Analyse results by health related impact measures (Factor/PCA analysis of differences)
- Factor analysis of factors influencing long term travel changes
- Focus on impacts on the disadvantaged

- **Do the project in other cities**

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twitter

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Researching Transit

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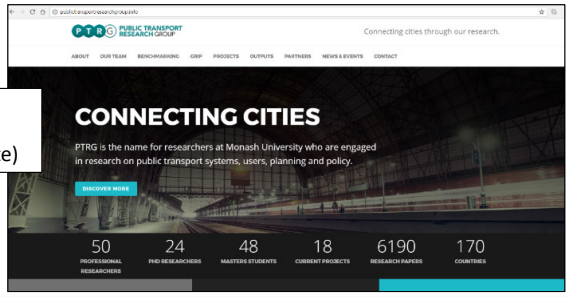
W: ptrg.info
(project has a webpage on this site)



RT5 – Long term impact of COVID-19 on Travel Behaviour

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