NZIER
NEW ZEALAND INSTITUTE OF ECONOMIC RESEARCH

What difference can a day make?

Scoping the effects of a four-day commute

NZIER report to AA Research Foundation

AA ResearchFoundation

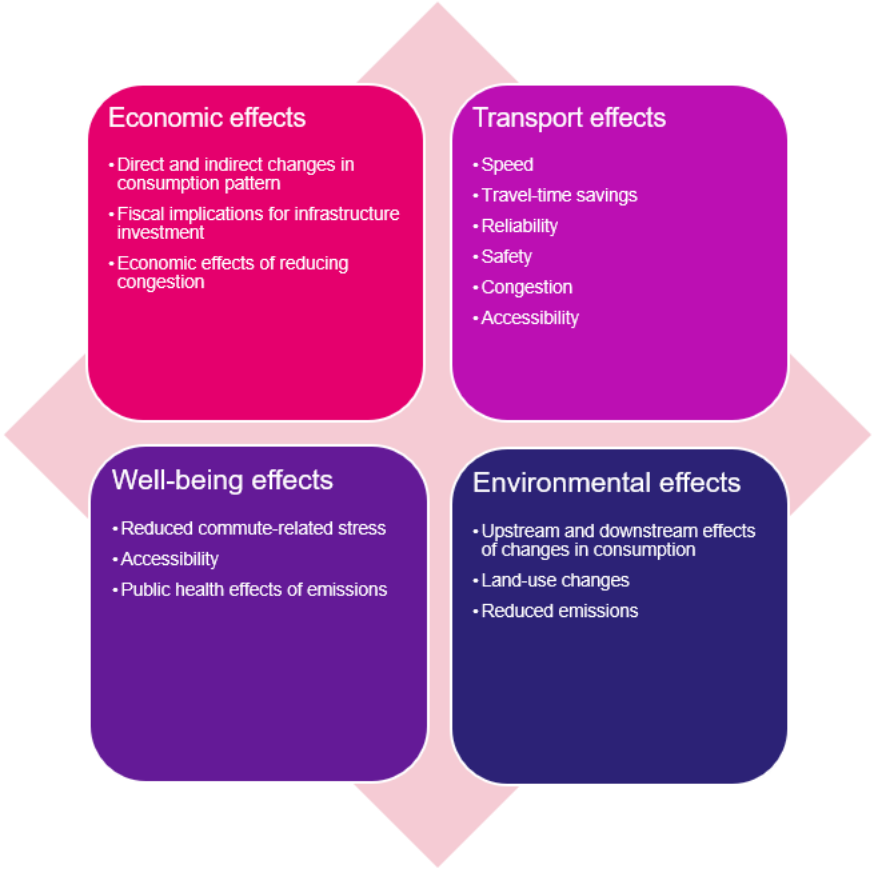
Research Question

- Potential benefits of a 4-day commute(1 day WFH), including:
  - road safety (any effect?)
  - carbon emissions (less or more? How much?)
  - productivity (including congestion and workforce)
  - overall economy (where does the money go?)

- Start with Auckland – biggest potential gains

AA ResearchFoundation

Research Question



Source: NZIER

AA ResearchFoundation

Lit Review Findings (pre-covid)

- Workplace productivity of working from home results are mixed
  - distraction matters wherever you work
  - home office setup can be a factor
- Health gains from less commute stress/fatigue
  - Congestion associated with less sleep
- Environmental gains of less travel are well understood

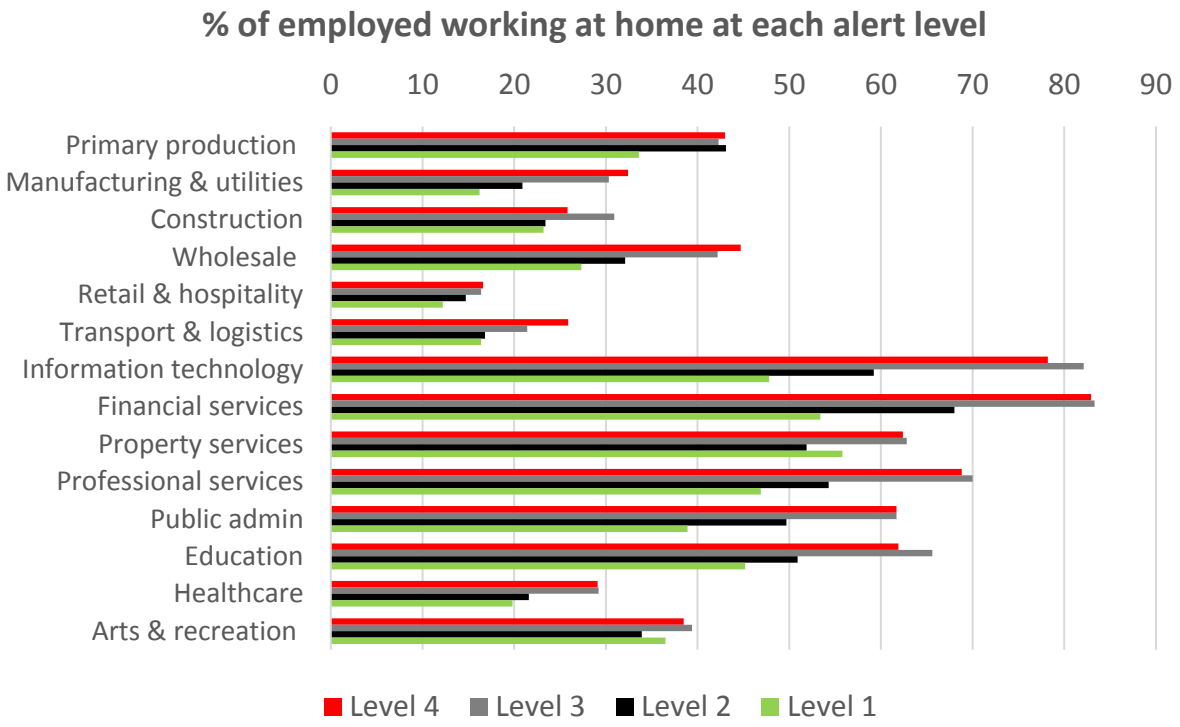
Lit Review Findings (pre-covid)

- Systematic reviews of the environmental effects of WFH find:
  - Most studies find an environmental improvement overall
  - Important to capture substitution effects to avoid overstating it

    (e.g do people travel to suburban cafes instead of urban ones when WFH)
- Long term land-use implications
  - Not strictly in scope but WFH or suburban hubs would have radical implications for urban design and public transport.

AA ResearchFoundation

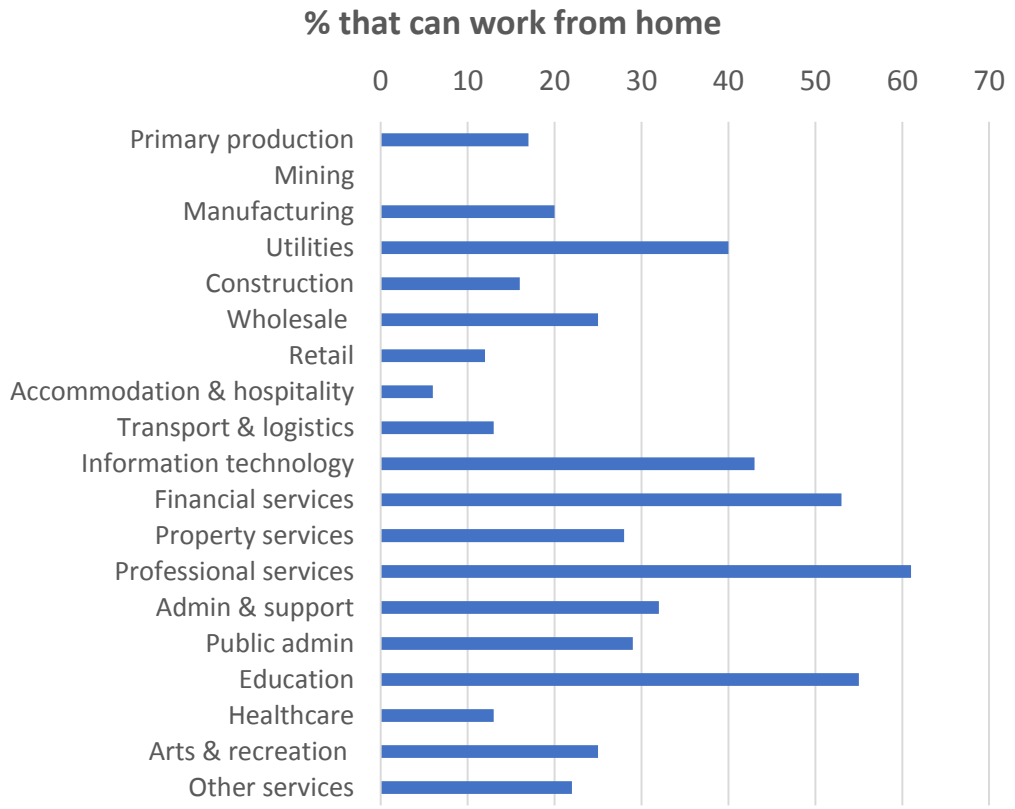
Post Covid Data



- 29% of workers still WFH part of the week even as NZ moved to Alert Level 1
- In line with NZTA data showing public transport patronage not back up to pre-COVID levels
- NZTA literature scan also shows people globally are staying away from public transport, mainly from fear of infection
- Too early to tell whether these are permanent changes for WFH, or from fear of infection

AA ResearchFoundation

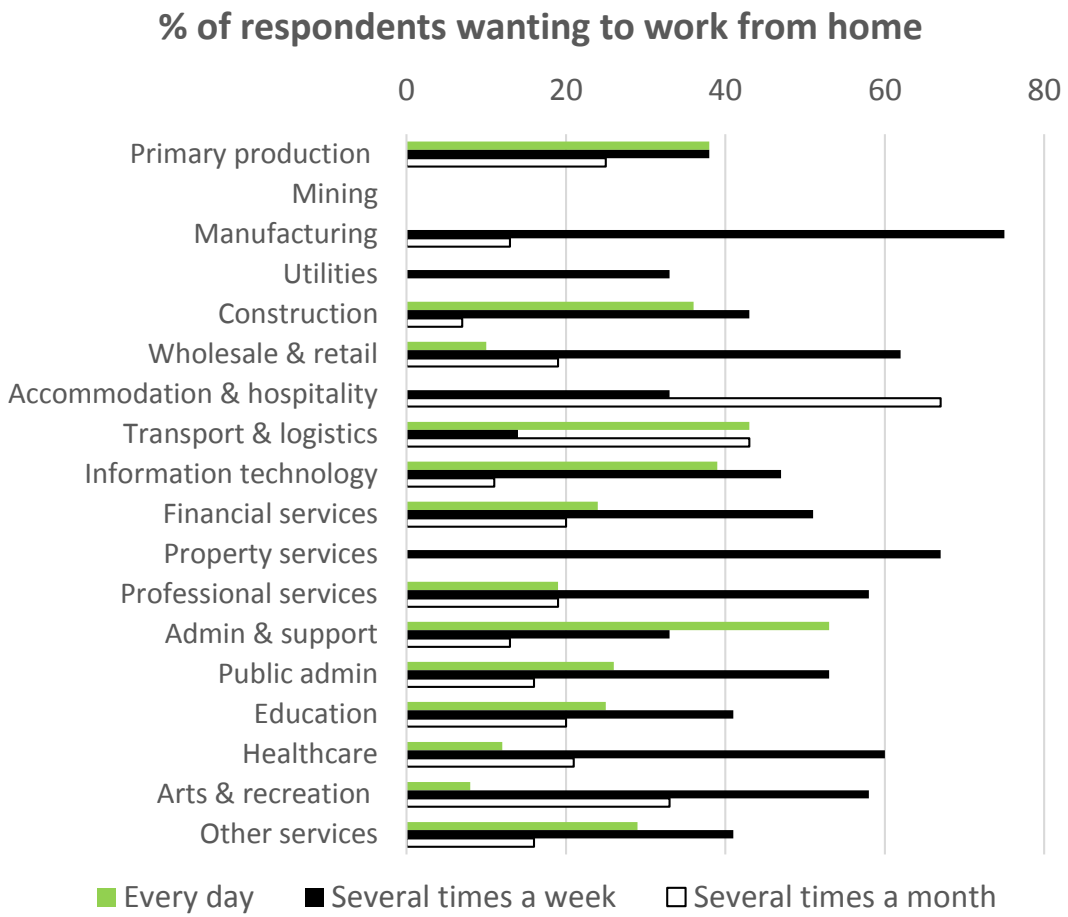
Post Covid Data



- Analysis by the Ministry of Business, Innovation & Employment (MBIE) on the proportion of the Auckland workforce in each industry that can work from home provides an upper bound for which to assess the ability of the workforce to shift to a 4-day commute week.
- We can think of this as the upper bound scenario – all workers who can will WFH one day a week, with no other travel on that 5th day

AA ResearchFoundation

Post Covid Data



- Research undertaken by the University of Otago looking at the effects of working from home during the lockdown in New Zealand indicate that 89% of those surveyed would like to continue working from home at least part of the week
- We can also supplement with our own survey on working behaviour: expect to WFH, other travel that workers will do on 5th day

AA ResearchFoundation

Proposed Research Plan

- **Three Scenarios**
- Scenarios rely on survey work to determine proportions

1) **All** those that can work from home do so 1 day a week, and do not undertake any further travel – (**Best case scenario**)

2) **Some** proportion work from home 1 day a week, and do not undertake any other travel – (**Second-best scenario**)

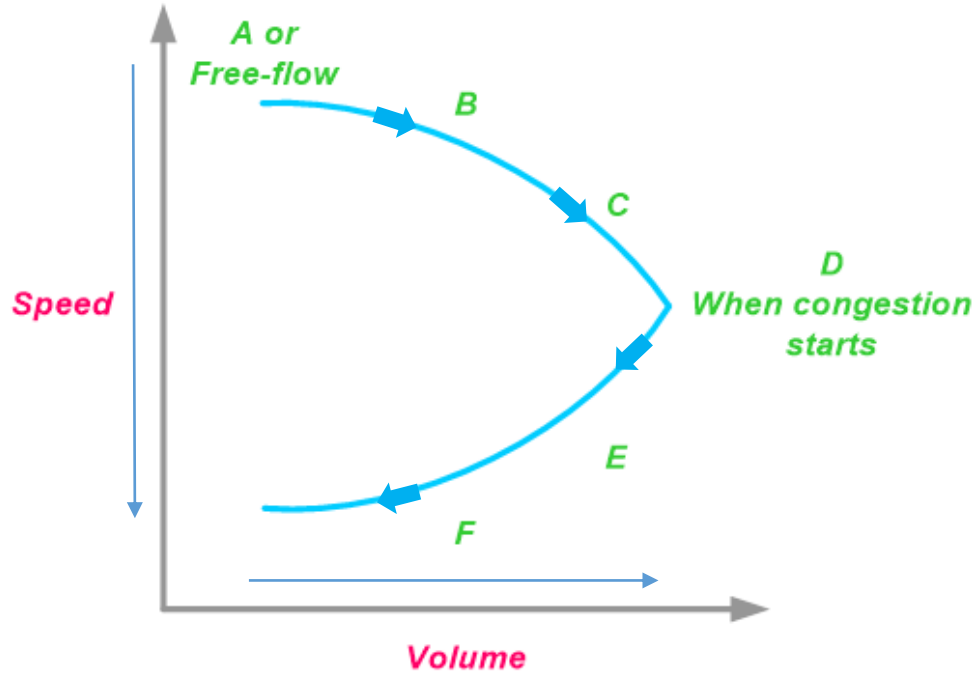
3)Some proportion work from home 1 day a week, and **some** proportion don't commute but undertake other travel – (**Mixed scenario**)

AA ResearchFoundation

Proposed Research Plan

- Network Effects – How Long it Lasts

Level of Service (speed) as volume starts to exceed capacity



Change in volume over time

Source: NZIER

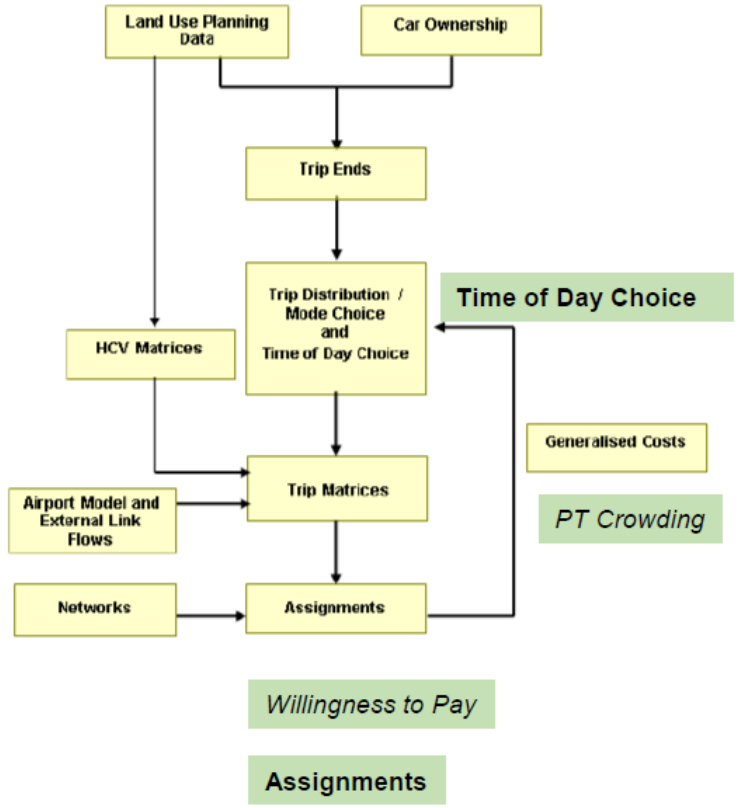
- Work with AT to understand what the scenarios mean for LOS – one year after implementation
- **In the long run**, the Auckland traffic network will gravitate towards **LOS D**, as transport demand will adjust to capacity
  - People travel more given reduced travelling times
  - Households and businesses locate elsewhere as reduced travelling times provide more options

- The outstanding issue is how long the benefits for the economy persist before the Auckland traffic network moves towards **LOS D**
- This means it is more useful to assess where on the LOS curve the different scenarios will be after one year:
  - most of the benefits of any changes to the transport system are captured in the first year
  - also means that we can assume 1) that there is no mode shift, and 2) transport behaviour, such as the location of businesses and households in response to lower travelling times, does not change.

AA ResearchFoundation

Proposed Research Plan

- Network Effects – Macro Strategic Model



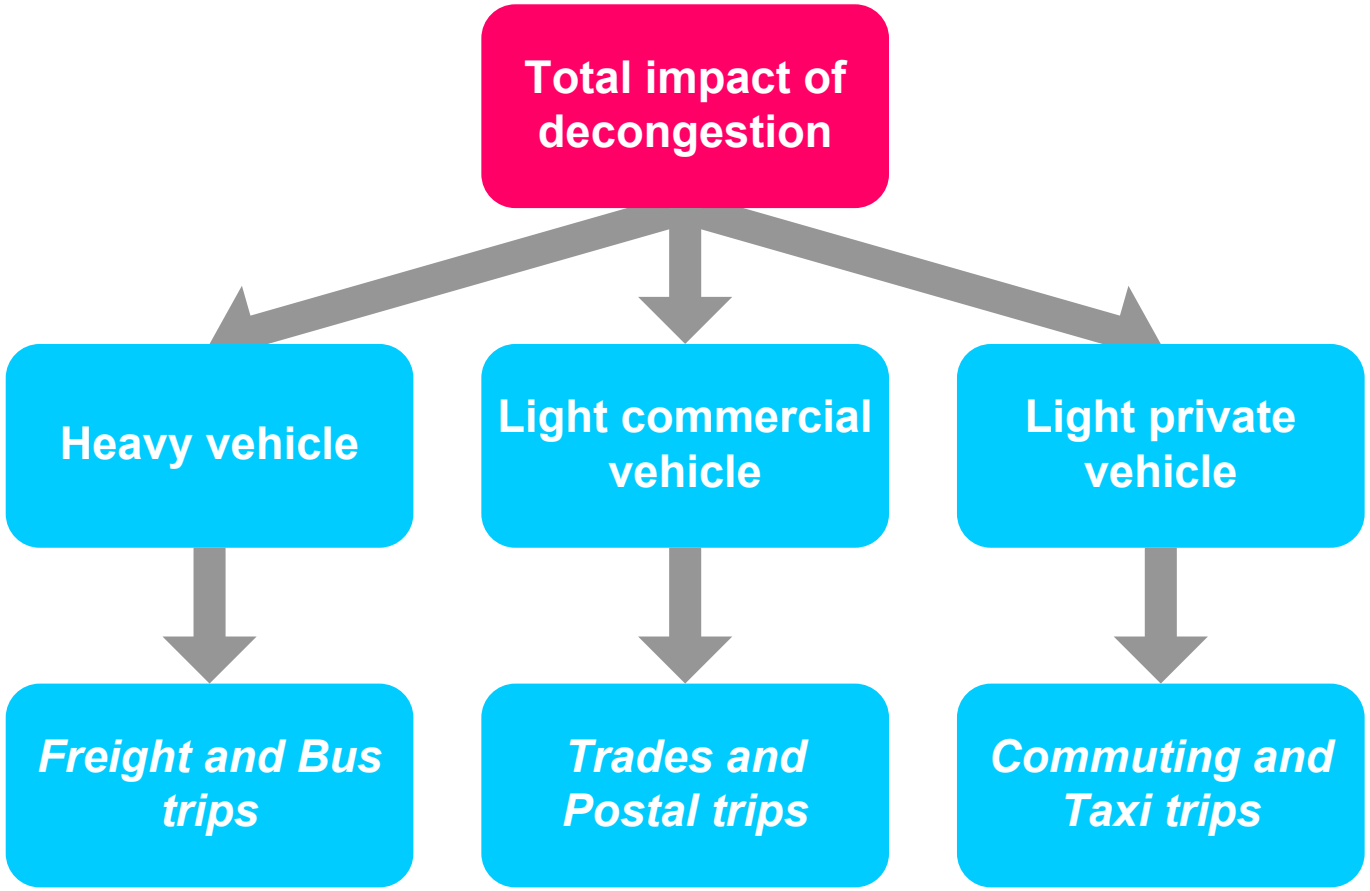
The Auckland Forecasting Centre runs The Macro Strategic Model to assess the overall shape of congestion

We would work with the Auckland Forecasting Centre (AFC) to obtain the following outputs from the MSM, which will form inputs into our economic modelling. We assess the impact as the difference between the 5-day commute week LOS and the new LOS one year after the shift to a 4-day commute week under the scenario being modelled.

AA ResearchFoundation

Proposed Research Plan

- Network Effects – How much decongestion



- We decompose Auckland traffic volumes into three vehicle types which act as proxy for productivity gains from the traffic network for the following groups of road users:

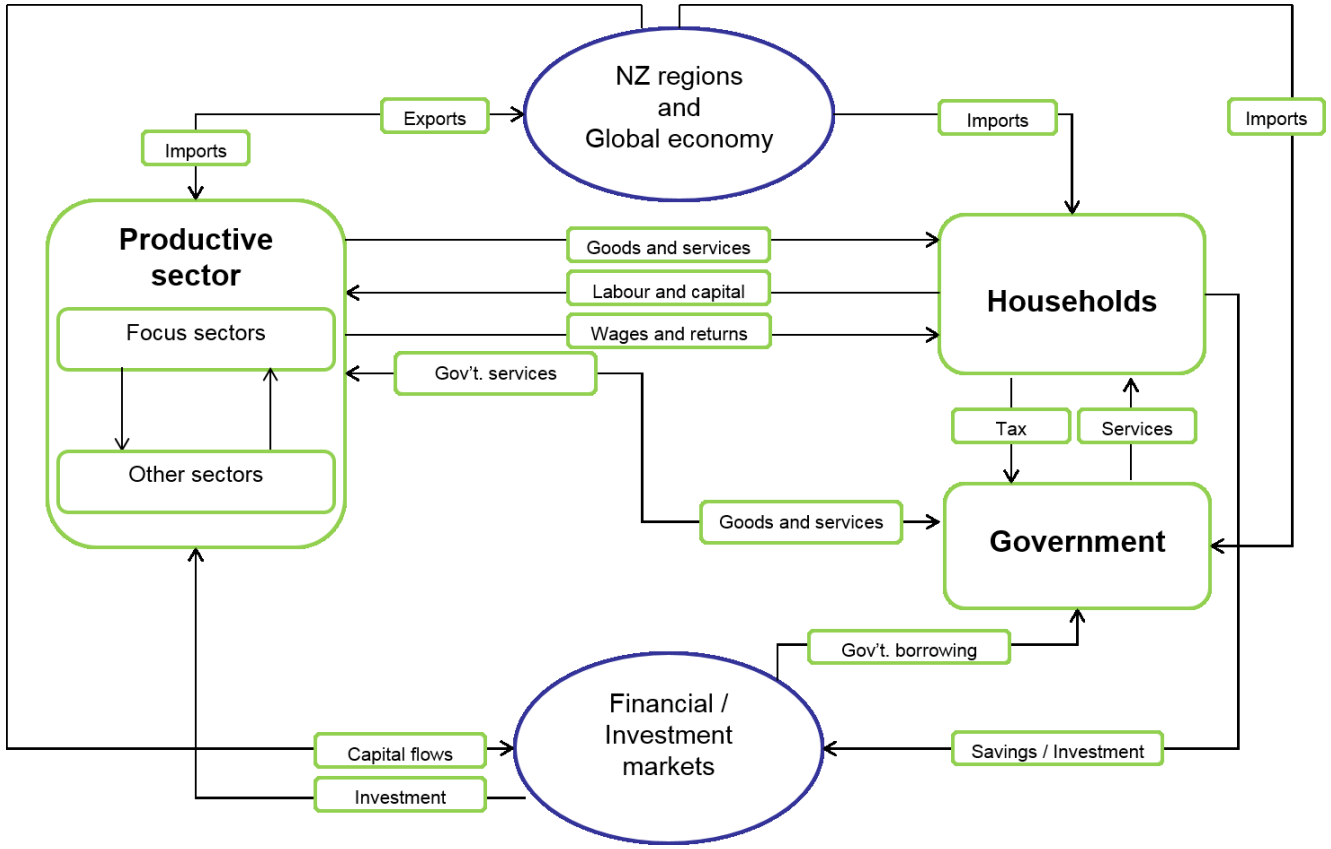
- Freight (heavy vehicles)
- Trades and postal services (light commercial vehicles)
- Commuters (light private vehicles)
- Business trips (light private vehicles)

- Personal commuters make up the largest group of road users of the four, and freight the smallest in terms of numbers, but the effects of congestion on freight are far-reaching along supply chains.
- Can also model emission effects from impacts on network

AA ResearchFoundation

Proposed Research Plan

- Economic Effects – From decongestion and WFH



NZIER's Computable General Equilibrium Model of the whole economy takes input from the Auckland Forecasting Centre's traffic model to determine where the money goes during a change.

The economic benefits we estimate with our CGE modelling include:

- Direct productivity benefits
- Labour market response – increased labour supply from reduced travel times, and increase in wages from increased productivity
- Downstream benefits – such as increased household spending from higher wages.

The social benefits include:

- Travel time savings – the value commuters put on their time
- Reduced emissions – as a result of reduced travel
- Scheduling – increased certainty when planning trips.

AA ResearchFoundation

Proposed Research Plan

- Timeframe

Action	Deliverable	Estimated time required
Develop assumptions for scenarios	Short memo outlining the assumptions underpinning the 3 scenarios for a 4-day commute week.	3 weeks
Working with AFC to translate scenarios to LOS	Short memo on what the scenarios mean for LOS of the Auckland transport network.	[3 weeks – dependent on AFC's capacity]
MSM modelling outputs for the LOS scenarios	Summary of MSM modelling outputs	[3 weeks – dependent on AFC's capacity]
Translate MSM modelling outputs into productivity shocks for CGE modelling	Development of productivity shocks	3 weeks
CGE modelling of downstream impact	Short memo summarising economic benefits	4 weeks
Estimate other benefits	Draft report summarising all the findings	2 weeks
Drafting and reporting	Final report and presentation	4 weeks

Source: NZIER

AA ResearchFoundation


ResearchFoundation