

# Spatial economic dynamics and transport project appraisal

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## Introduction

A flexible DSM of Australia

Illustrative application

Conclusions



# Conventional approach

- ▶ Conventional four-step transport models are the workhorse for major project appraisal.
- ▶ Strategic transport models (STMs) for Australian metros are long established.
  1. Trip generation
  2. Trip distribution
  3. Mode choice
  4. Trip assignment
- ▶ User benefits aggregated up over OD pairs, purposes, modes.
- ▶ But a fundamental limitation of scope:
  - ▶ Exogenous land uses (counts of residents, jobs, students, etc.).





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## Details of the period equilibria

- ▶ Labour, product and housing markets in equilibrium.
- ▶ Labour is supplied by occupational workers who make costly commutes from their place of residence.
- ▶ Firms in different sectors produce goods or services using labour, land, capital and intermediates.
- ▶ Goods and services are traded between regions with iceberg trade/travel costs.
- ▶ Housing services are untraded and require no labour input.
- ▶ In the simulation presented, land and capital are fixed, sector-specific factors.



# SEQ implementation: occupations and industries

- ▶ 43 occupations in core database (ANZSCO Sub-Major Groups)
- ▶ Aggregated to 3 occupations for this implementation
  - ▶ White collar
  - ▶ Pink collar
  - ▶ Blue collar
- ▶ 19 industries in core database (ANZSIC Divisions) plus housing
- ▶ In this implementation
  - ▶ Goods
  - ▶ Business services
  - ▶ Transport and public services
  - ▶ Consumer services
  - ▶ Housing



Introduction

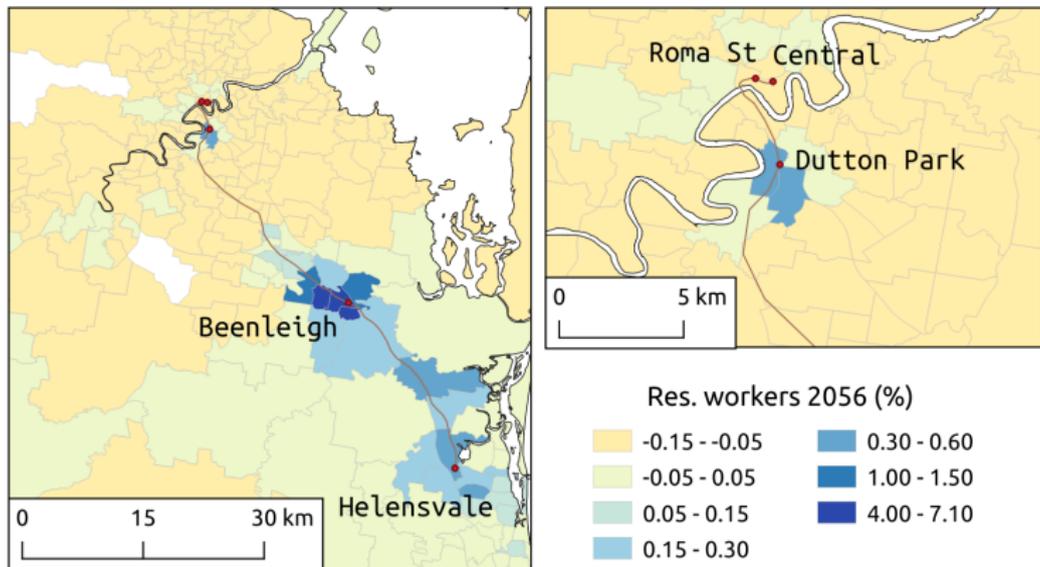
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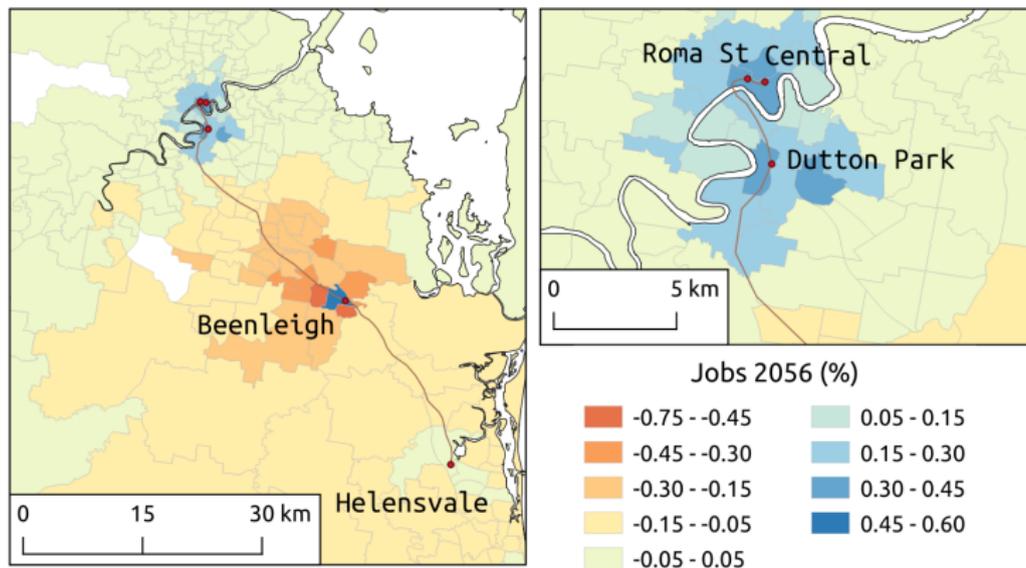


## Residents change (vs base) in 2056



Gains are heavily concentrated around Beenleigh station.

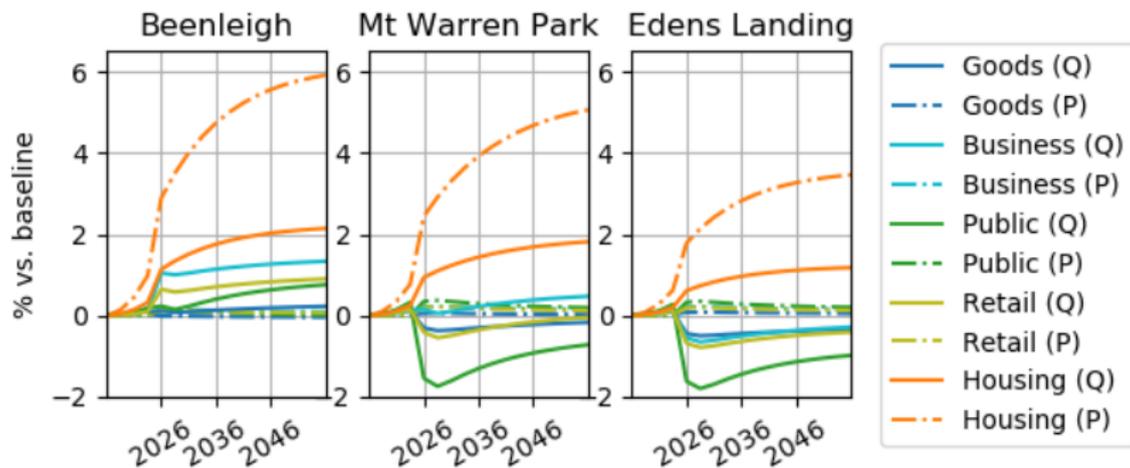
# Jobs change (vs base) in 2056



Job gains reflect strong net flow of commuters into Brisbane CBD.

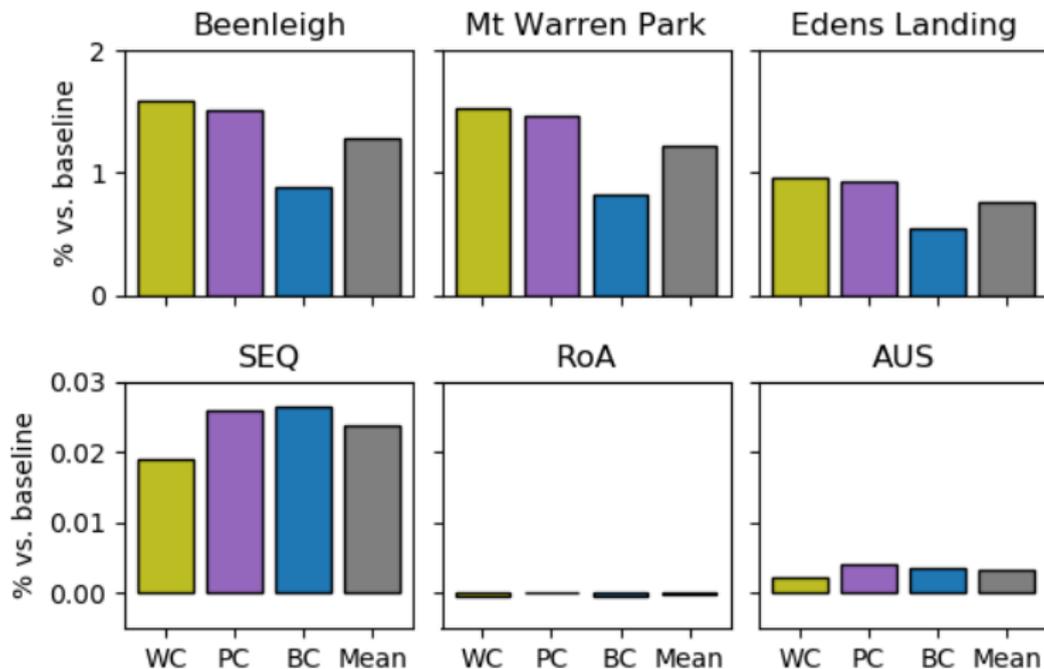


# Sector output and price changes around Beenleigh station

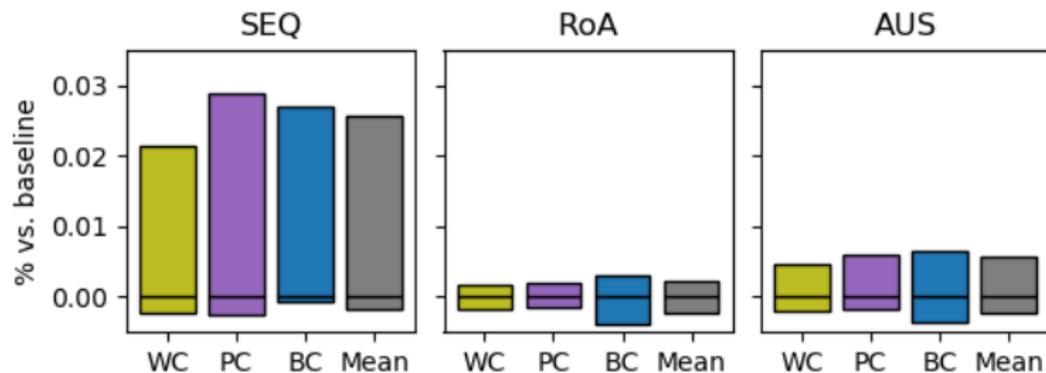


- ▶ Industry output changes relatively small.
- ▶ Housing larger, but strong price effect.

# Welfare: local and regional effects



# Welfare: expenditures versus transport benefits





# Conclusions

- ▶ DSMs provide an ideal framework for economic appraisal of transport projects, explicitly representing
  - ▶ Generalised travel and freight cost savings
  - ▶ CapEx, O&M over time, place
  - ▶ Funding
- ▶ Wide range of outputs
  - ▶ Model-consistent welfare effects
  - ▶ Local land use and other economic impacts
  - ▶ Regional and macroeconomic indicators, e.g. GSP/GDP
- ▶ Could link to an STM via land use and transport cost changes

