The Business of Walking: The Relationship between Pedestrian Connectivity and Economic Productivity in Auckland's City Centre

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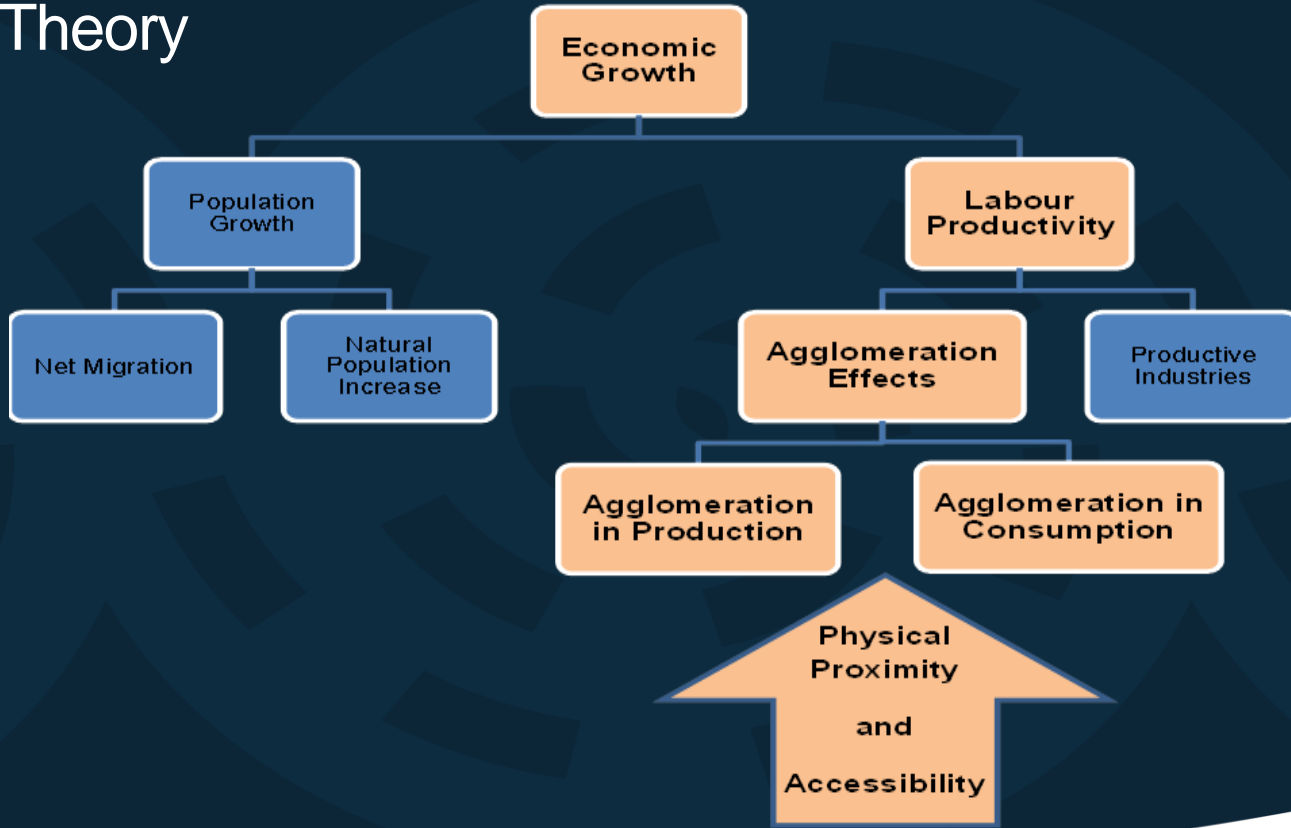**Auckland Council, RIMU**

Contents

Why this research was carried out?

- The city centre the economic heart of the Auckland region

- One of the several work streams to quantify the economic benefits of walking by Auckland Design Office

- To replicate, SGS (2014) methodology

Strategic directors:

- The Auckland Plan (2012)
- The City Centre Master Plan (2012)

Theory

Measure of Agglomeration Economies

$$EJD_i = \frac{E_i}{\left(\sqrt{Ai/\pi}\right)^\alpha} + \sum_j \frac{E_j}{d_{ij}^\alpha}$$

EJD_i = the effective job density of jobs in location i

E_i = employment in location i (origin)

E_j = employment in location j (destinations)

A_i = the land area of area i

$\sqrt{Ai/\pi}$ = an estimate of the average distance between jobs within area i

d_{ij} = walking distance between location i and location j (minutes)

α = distance decay = 1 in this analysis

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Analysis Steps

1. Defining the city centre, study area and other travel zones

2. Filling the data gaps

    - Developing a pedestrian network

    - Carrying out a census of businesses

3. Creating pedestrian travel time matrices

4. Measuring agglomeration effects: Effective Job Density (EJD)

5. Estimating labour productivity

6. Examining association between pedestrian connectivity and labour productivity
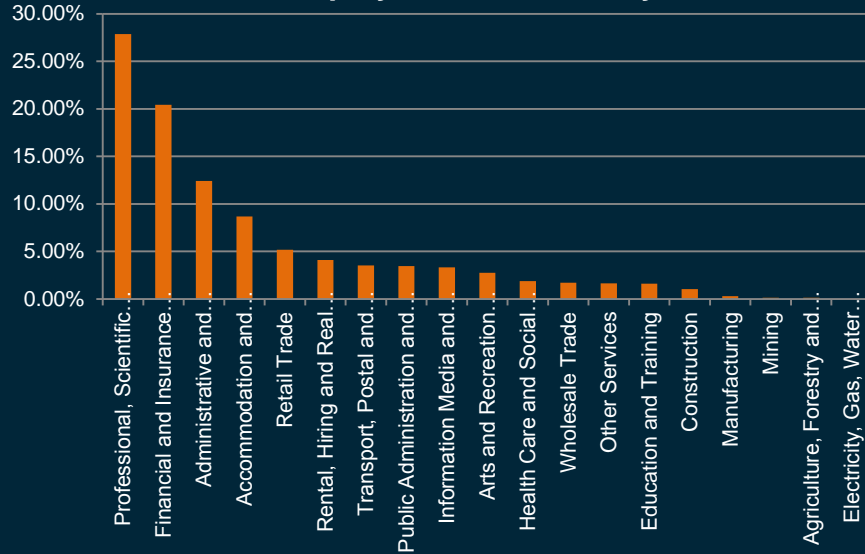
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City Centre, Study Area and Travel Zones

Employment Density

Knowledge Hub

Share of employment in the study area

Proportion of the city centre's employment in the study area
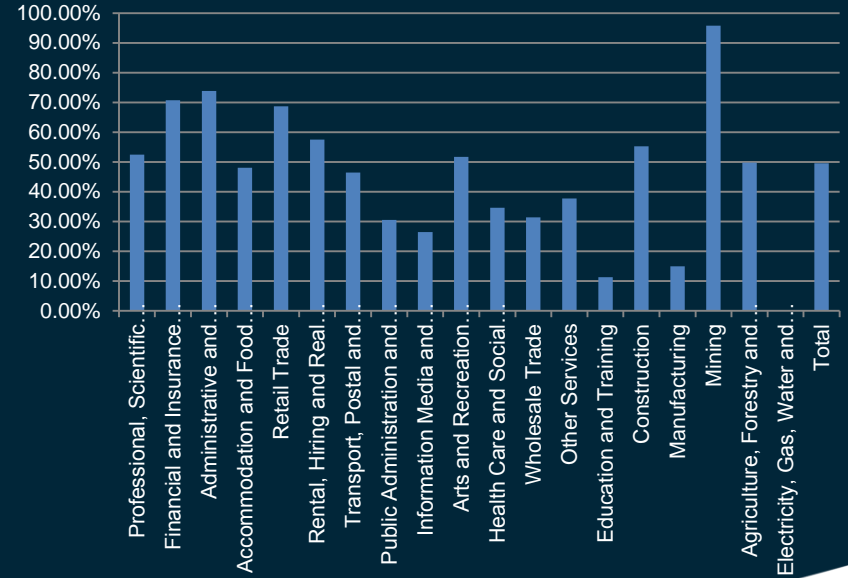
Pedestrian Network


Item	Average Speed (Km/h)
Footpath	5
Footway	4
Lane	4
Arcade	4
Steps	2
Shared	4
Lane	4
Controlled Crossings	
▪ Short	3
▪ Medium	2
▪ Long	1
Uncontrolled Crossings	
▪ Designated raised platforms	3
▪ Designated refuge islands	3
▪ Zebra crossings	3
▪ Designated straight crossings	3
▪ Uncontrolled intersections	3

Origins and Destinations

- 304 Buildings
- 408 Building entrances
- 259 Meshblocks centroids

Travel Time
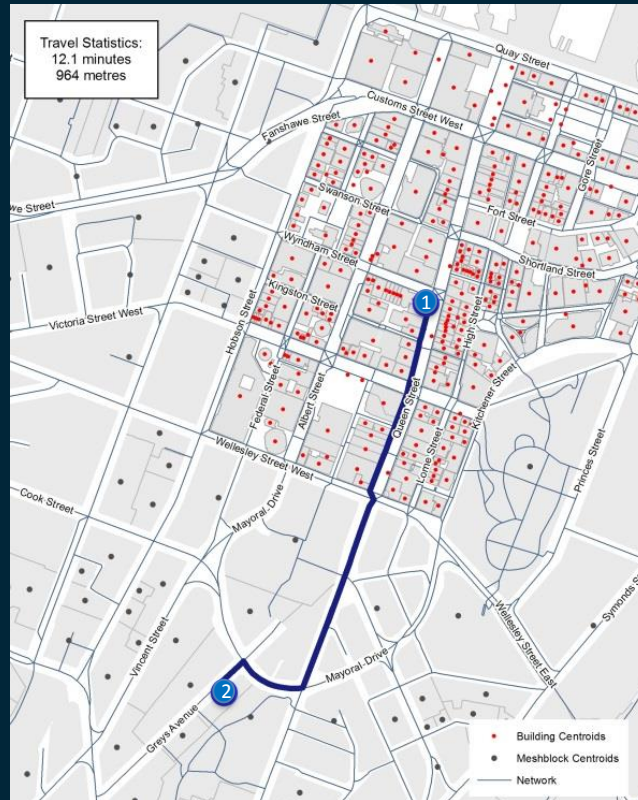
Travel Time Matrices

Displayed in seconds

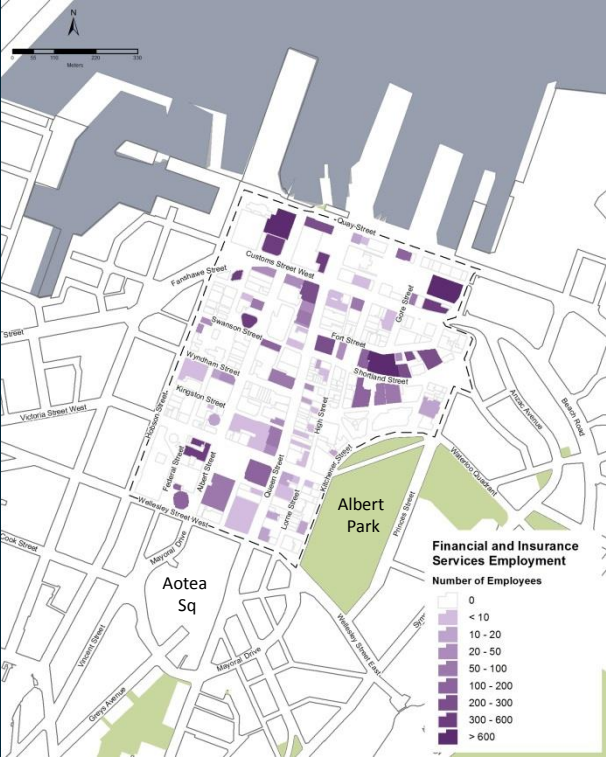| Building	Building 1	Building 2	Building 3…
Building 1	9.8	0.7	3.7
Building 2	0.0	10.4	7.7
Building 3	10.4	0.0	4.2
Building 4…	7.7	4.2	0.0

MB	411700	411900	412000…
Building 1	28.6	27.4	24.4
Building 2	19.7	18.5	15.5
Building 3	28.8	27.7	24.7
Building 4…	25.2	24.0	21.0

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Business Census

Distribution of Industries

Measure of Agglomeration Economies

$$EJD_i = \frac{E_i}{\left(\sqrt{Ai/\pi}\right)^{\alpha}} + \sum_j \frac{E_j}{d_{ij}^{\alpha}}$$

EJD_i = the effective job density of jobs in location i

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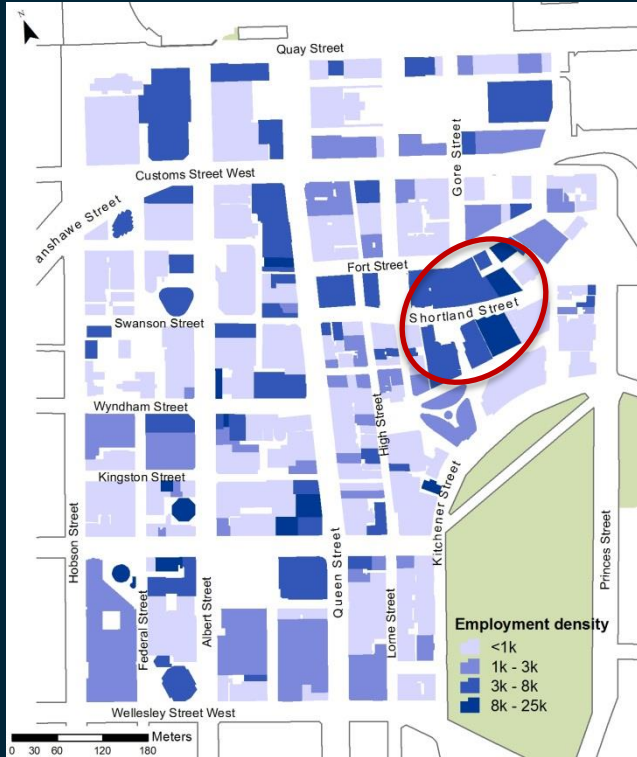
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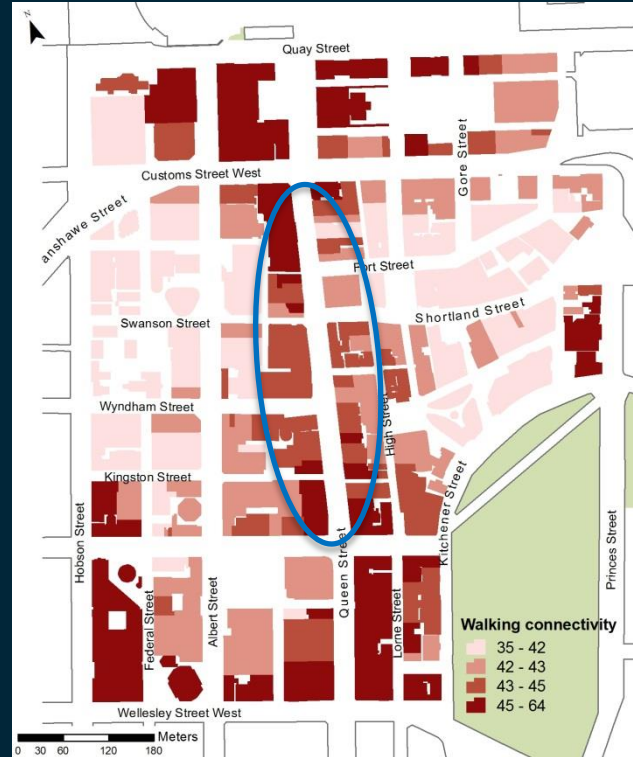# Walking Effective Job Density

Relatively higher EJD:

- Along Queen Street
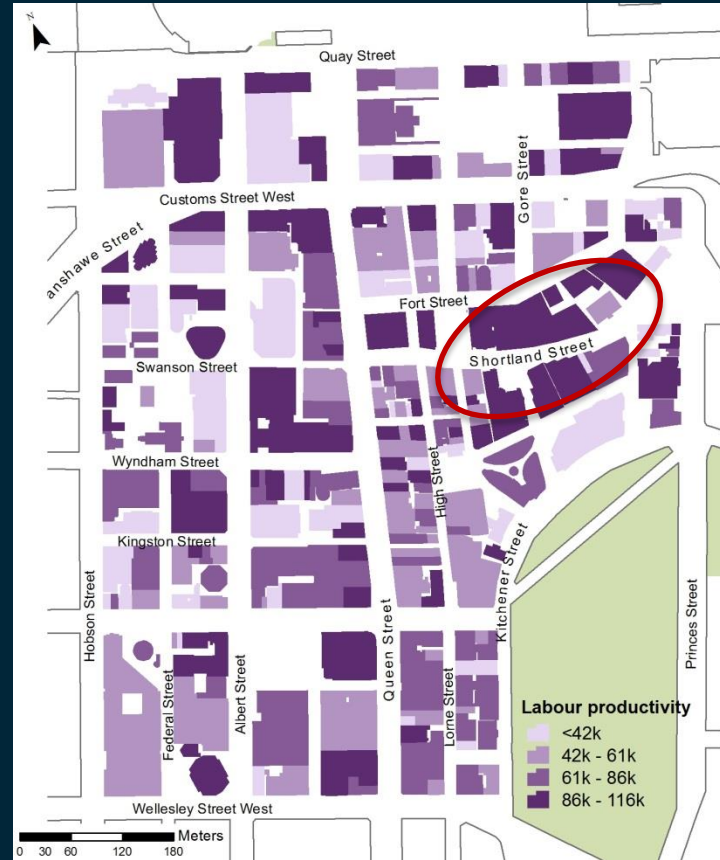
- The eastern part of the area
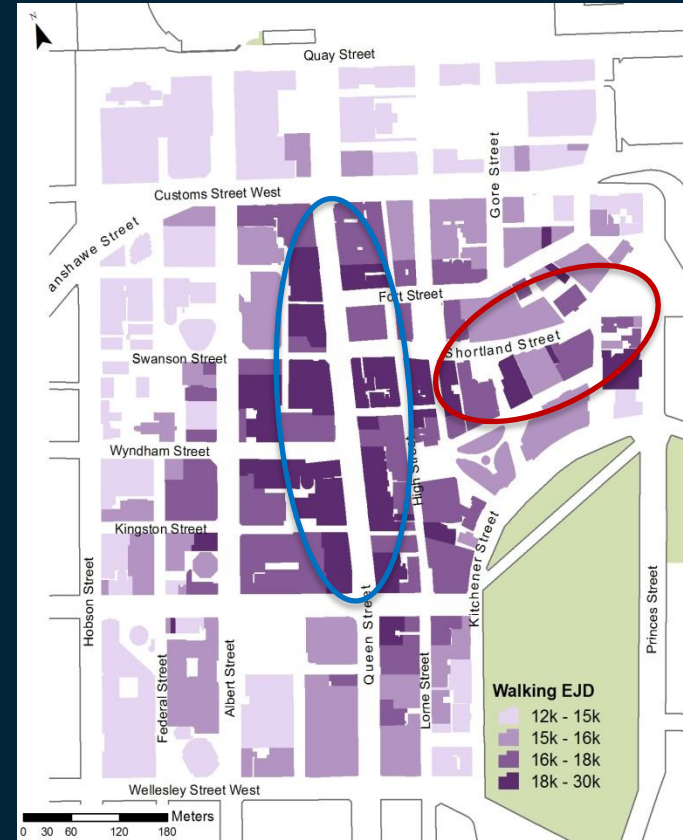
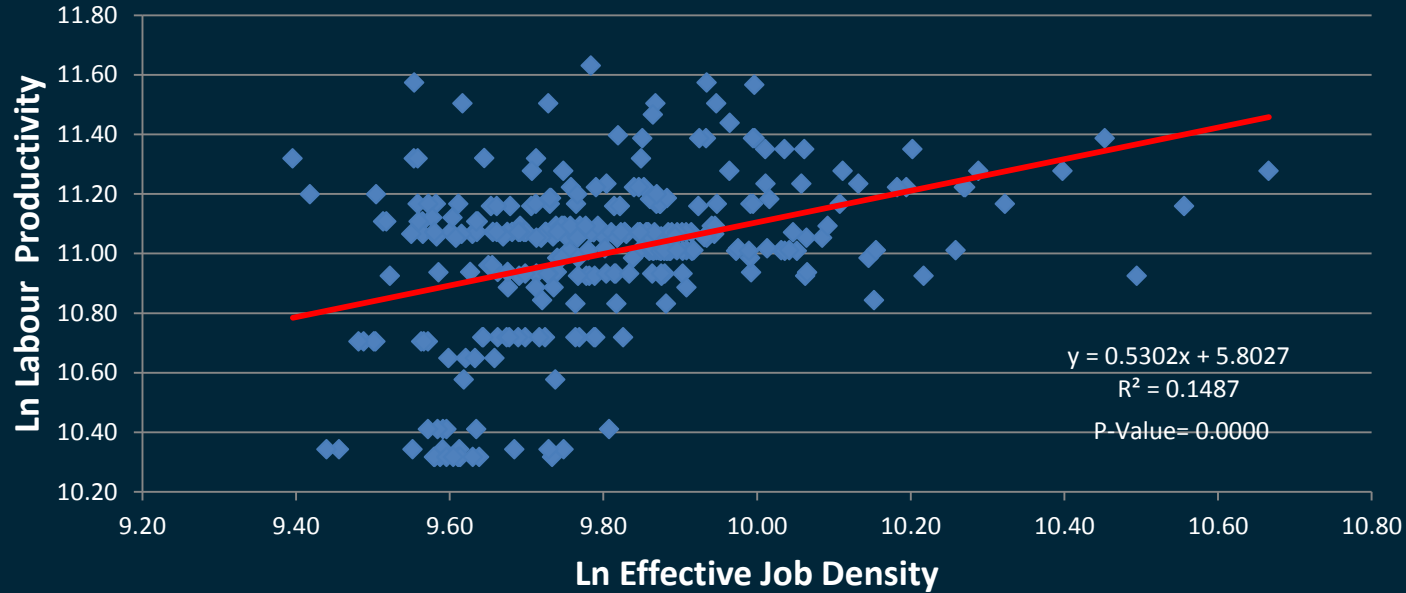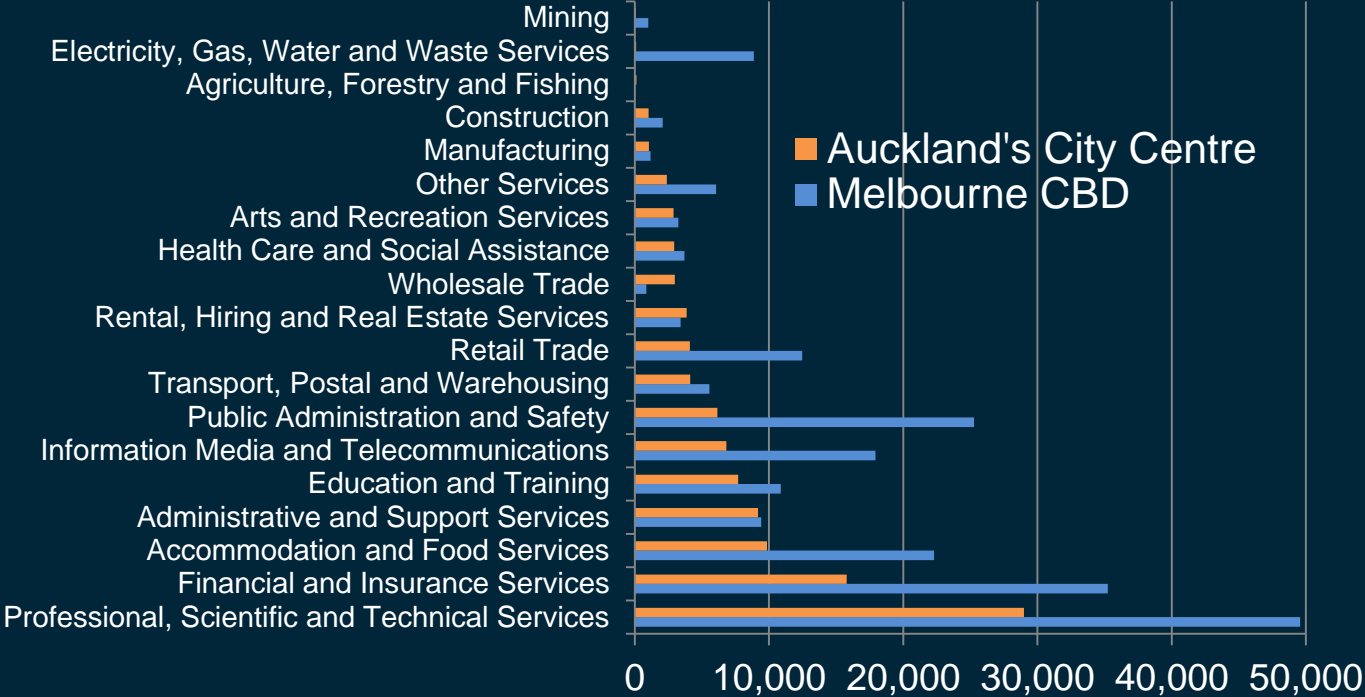# Employment Density   Walking Connectivity

Labour Productivity

- Mean wage per worker by industry

- Adjusted for industry premium in the city centre

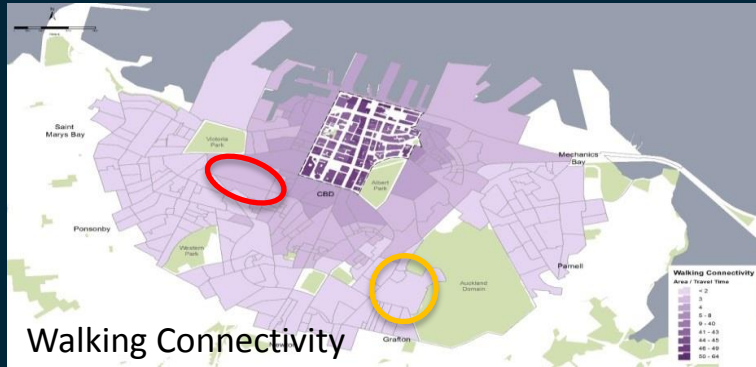# Walking Effective Job Density and Productivity

y = 0.5302x + 5.8027
R² = 0.1487
P-Value= 0.0000

Employment by Industry, Auckland's City Centre and Melbourne CBD

Walking Accessibility of the study area's fringe

Walking Effective Job Density in the Broader Travel Zones

Walking Connectivity

Job Density

EJD

Conclusions and Next steps

- **Improved pedestrian connectivity = Improved city centre's economy**

- **Additional outcomes:**
  Pedestrian network
  business profile datasets

- **The next phase : scenario testing**

- **Available on: Knowledge Auckland Website**

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