Business Case for Walking

Counting Walking to Make Walking Count in Auckland

Kent Lundberg, Principal Urban Designer

Engineering NZ Transportation Group, Queenstown, 21 March 2018

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Measuring Pedestrian Delay

Final Report

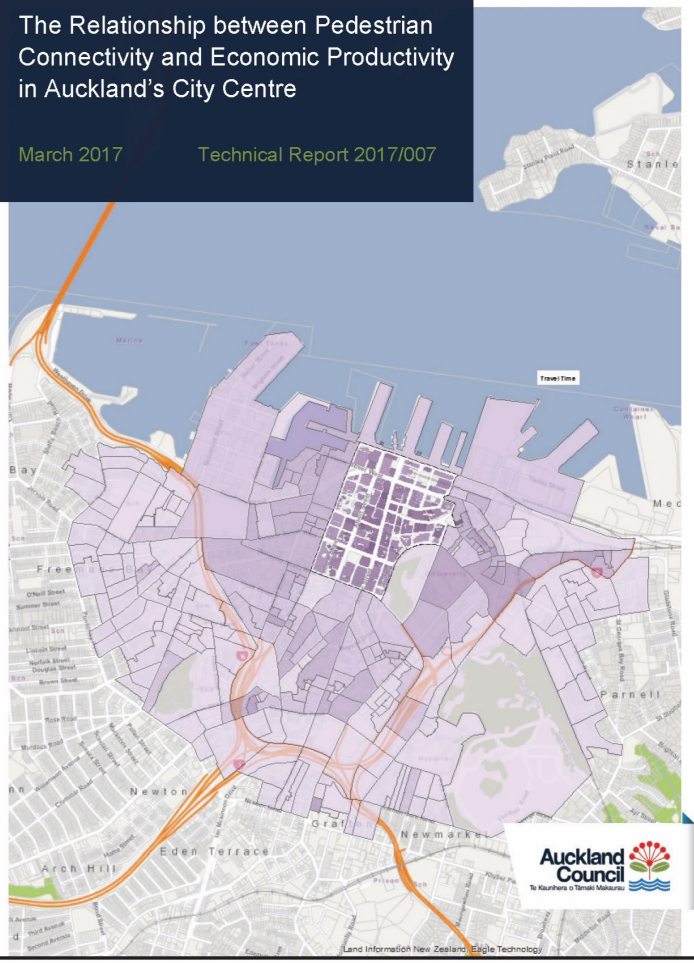
Prepared for: Auckland Design Office, Auckland Council

Date: 22 March 2017

Version: Draft

The Relationship between Pedestrian Connectivity and Economic Productivity in Auckland's City Centre

March 2017 Technical Report 2017/007



Available at KNOWLEDGEAUCKLAND.ORG.NZ

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Transport Economics

OTHER
SAFETY
HEALTH BENEFITS
ENVIRONMENTAL BENEFITS
TRANSPORT RELIABILITY BENEFITS
HEALTH BENEFITS (WALKING)

Pedestrian Connectivity and Urban Productivity →

WIDER ECONOMIC BENEFITS
-Productivity

Valuing the Urban Realm (VURT) →

Measuring Pedestrian Congestion →

TRANSPORT USER BENEFITS
-Travel Time Benefits
-Quality Improvements

Typical profile of benefits from a transport project

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Measuring Pedestrian Congestion

Counting pedestrians in travel time assessment

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NEW ZEALAND / TRANSPORT

Auckland traffic congestion costs city almost $2b a year

4:02 pm on 2 August 2017 Share this

Todd Niall, Auckland Correspondent
@toddniall todd.niall@radionz.co.nz

Traffic congestion in Auckland could be costing nearly $2 billion a year and is having a big impact on the city's productivity, according to a new report.

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Measuring Pedestrian Congestion

13x

pedestrians as vehicles on
High Street all day

4x

pedestrians as vehicles on
Queen Street all day

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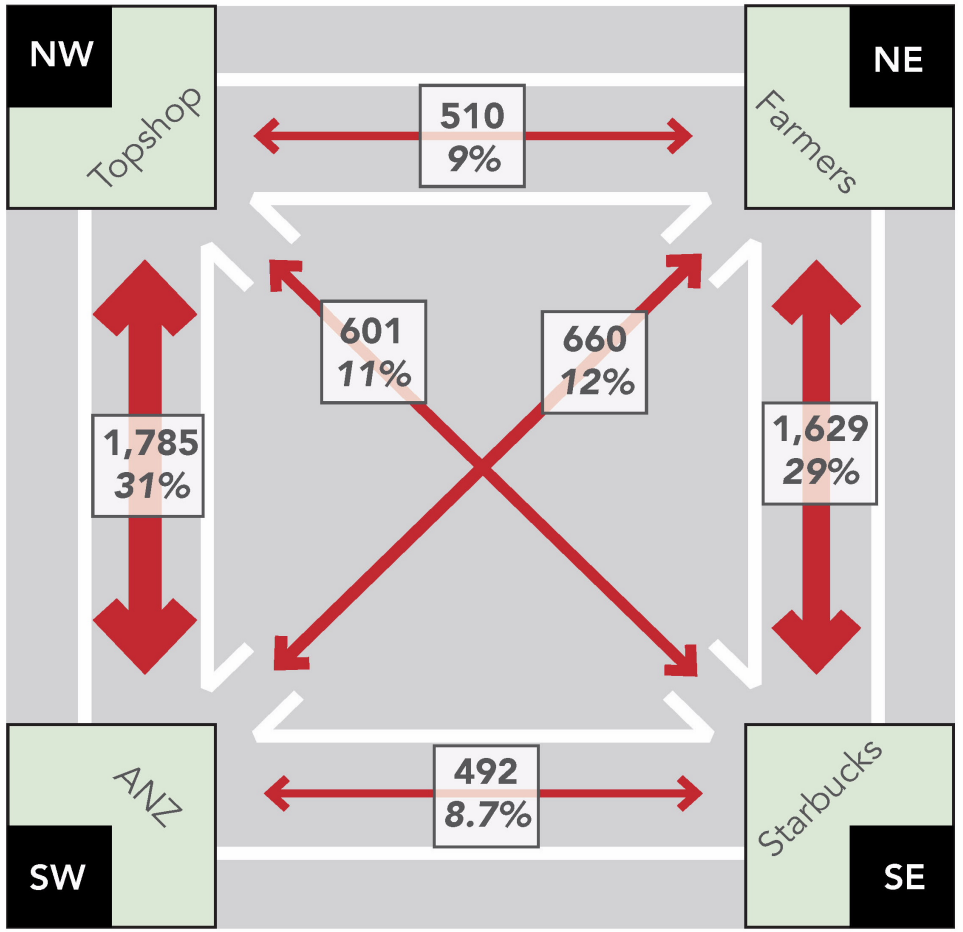
Measuring Pedestrian Congestion

Victoria St / Queen St



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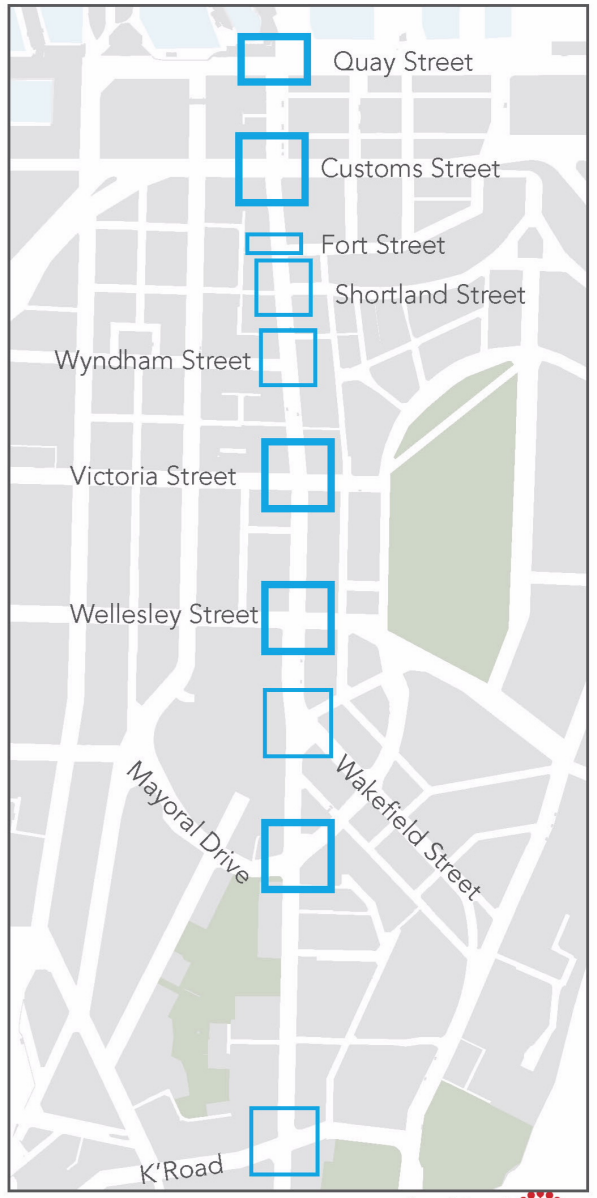
Measuring Pedestrian Congestion

CROSS STREET	INTERSECTION TYPE	COST OF DELAY/YEAR
Quay Street	Barnes Dance, Midblock Crossing, Very High Ped Volumes	$2m
Customs Street	Barnes Dance, T-Intersection, Very High Ped Volumes	$2m
Fort Street	Barnes Dance, Midblock Crossing, High Ped Volumes	$.5m
Shortland Street	Barnes Dance, T-Intersection Crossing, High Ped Volumes	$.9m
Wyndham Street	Barnes Dance, T-Intersection Crossing, High Ped Volumes	$.9m
Victoria Street	Barnes Dance, X-Intersection, High Ped Volumes	$2.2m
Wellesley Street	Barnes Dance, X-Intersection, High Ped Volumes	$2.2m
Wakefield Street	Barnes Dance, T-Intersection, Med Ped Volumes	$.5m
Mayoral Drive	Phased, X-Intersection, Med Ped Volumes	$.7m
Karangahape Road	Phased, X-Intersection, Med Ped Volumes	$.7m

*based on a 40 year period with 6% discount rate

Annual ~$13.0m

NPV = ~$186m



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Valuing the Urban Realm (VURT)

Estimating the user benefits from public realm investment

- Boffa Miskell (2017) applied Transport for London's Valuing the Urban Realm Toolkit to Auckland
- VURT scores places on ease of pedestrian movement and quality of public spaces
- Benefits are converted to monetary equivalents using willingness to pay survey
- Quantifies user benefits

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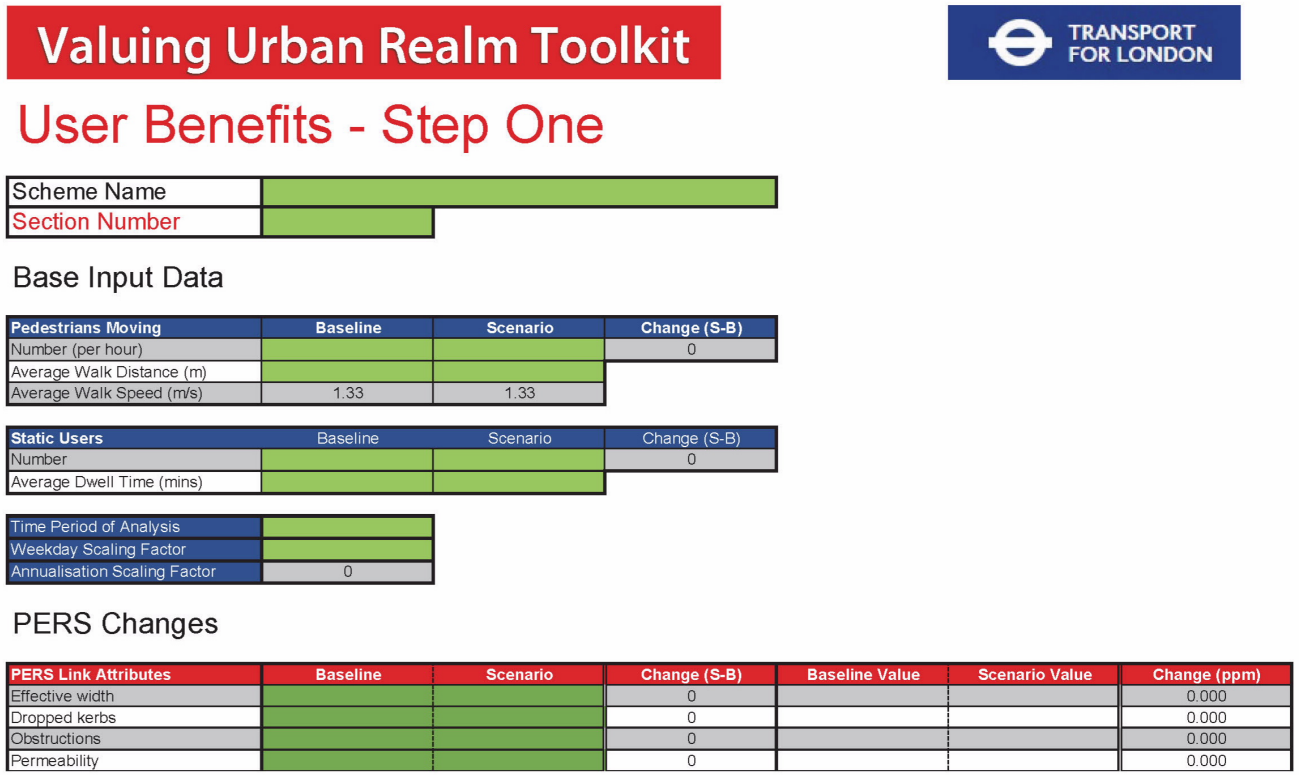
Valuing the Urban Realm (VURT)

- **Uses Pedestrian Environment Review System (PERS)**
  - » Future user numbers
  - » Effective footpath width
  - » Personal security
  - » Sense of place
  - » Feeling comfortable

- **Link and space values: moving through, lingering, and sitting**



Valuing Urban Realm Toolkit

TRANSPORT FOR LONDON

User Benefits - Step One

Scheme Name	
Section Number	

Base Input Data

Pedestrians Moving	Baseline	Scenario	Change (S-B)
Number (per hour)			0
Average Walk Distance (m)			
Average Walk Speed (m/s)	1.33	1.33	

Static Users	Baseline	Scenario	Change (S-B)
Number			0
Average Dwell Time (mins)			

Time Period of Analysis	
Weekday Scaling Factor	
Annualisation Scaling Factor	0

PERS Changes

PERS Link Attributes	Baseline	Scenario	Change (S-B)	Baseline Value	Scenario Value	Change (ppm)
Effective width			0			0.000
Dropped kerbs			0			0.000
Obstructions			0			0.000
Permeability			0			0.000

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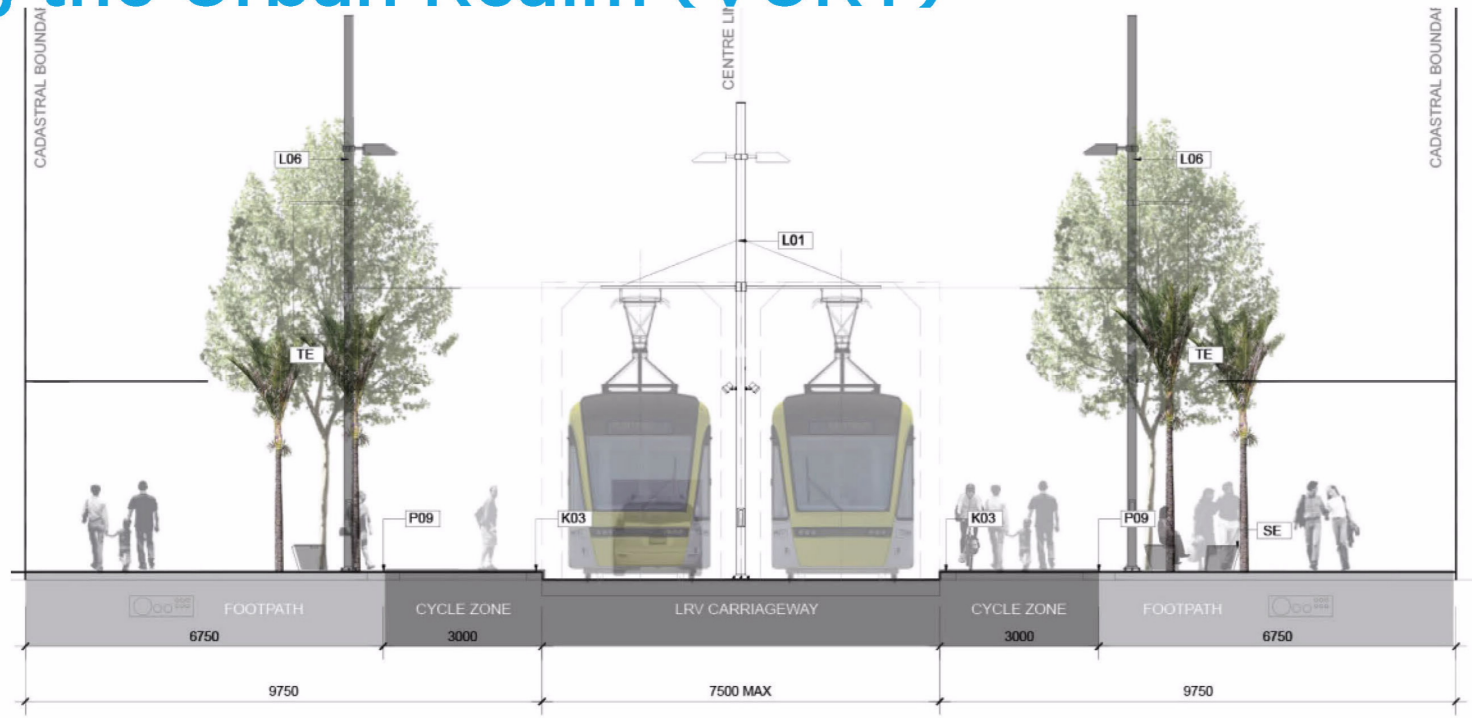
Valuing the Urban Realm (VURT)



SEGMENT ATTRIBUTES:

Block: Wyndham - Victoria Streets

Length: 210 metres

Width: 29 metres

Queen Street Future Transit Mall

- Future Light Rail Transit / Pedestrian Mall
- 200% growth footfall
- NZ$702,000 annual benefits (one block)
- NZ$15,150,000 lifetime benefits* (one block)

*20 year lifetime

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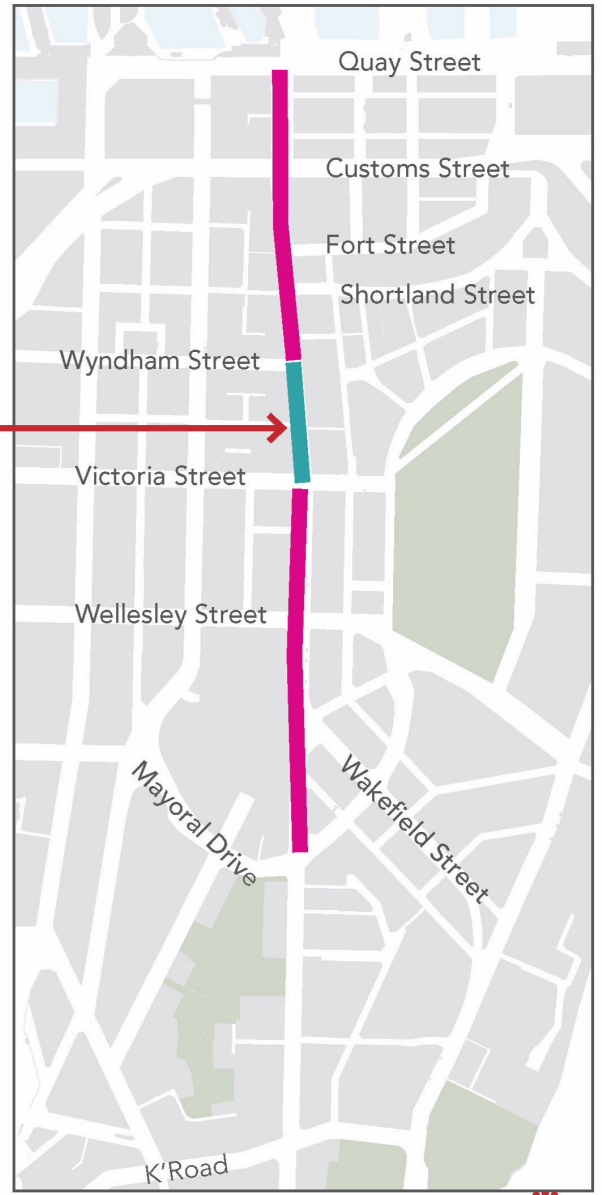
Valuing the Urban Realm (VURT)

- NZTA's procedures consider quality benefits, eg parameters for valuing improved PT stops, stations, vehicles
- But once people get off the bus, quality no longer matters!
- If this methodology was extrapolated along Queen Street the annual benefits would be $3.0 million (or $65 million lifetime benfits)

Study Area



$3.0m

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Pedestrian Connectivity and Economic Productivity

- We have good evidence on agglomeration economies at the ‘city-wide’ scale
- Doubling city size / density leads to a 3-10% increase in economic productivity
- There is less evidence on agglomeration economies at the ‘micro’ scale Effective Job Density (EJD)

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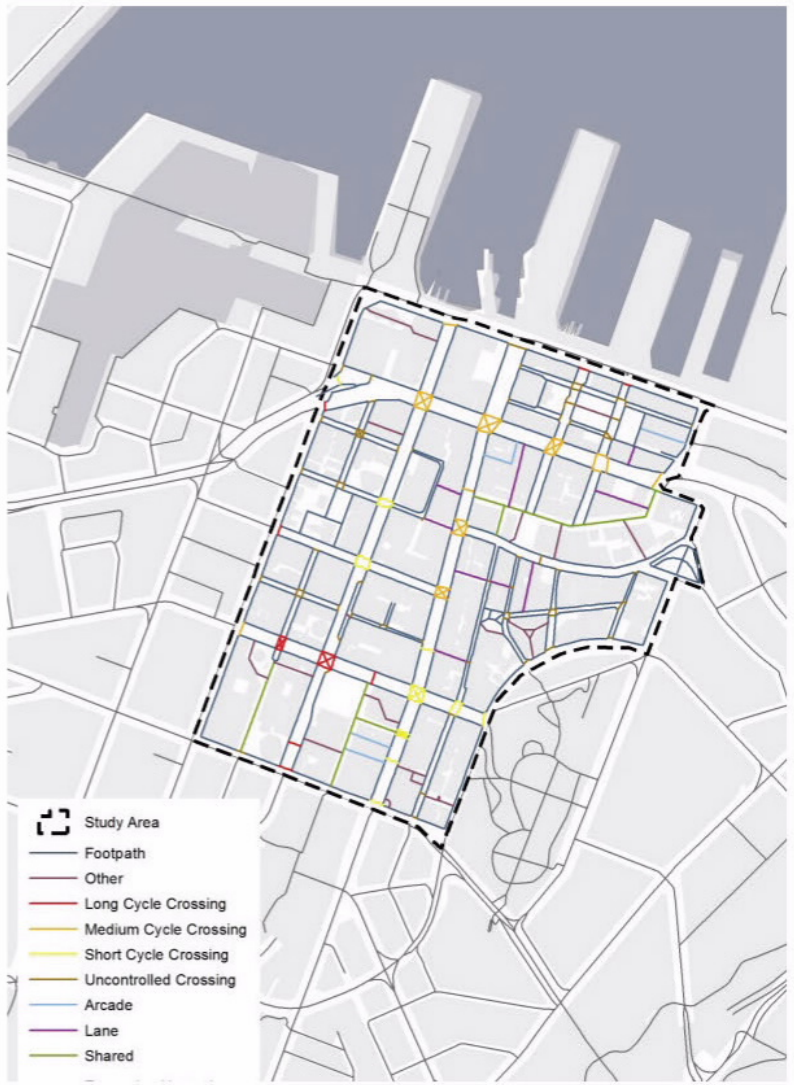
Pedestrian Connectivity and Economic Productivity

- Rohani and Lawrence (2017a) measured walkability in the Auckland city centre
- A pedestrian network was developed based on the existing road network in the study area
- Pedestrian links were assigned values based on their speed
- 'Network analyst software' was run to estimate the travel time between each origin and destination point
- Pedestrian travel time matrices were combined with detailed estimates of employment to create a measure of the Effective Job Density (EJD)

Walking network within the study area



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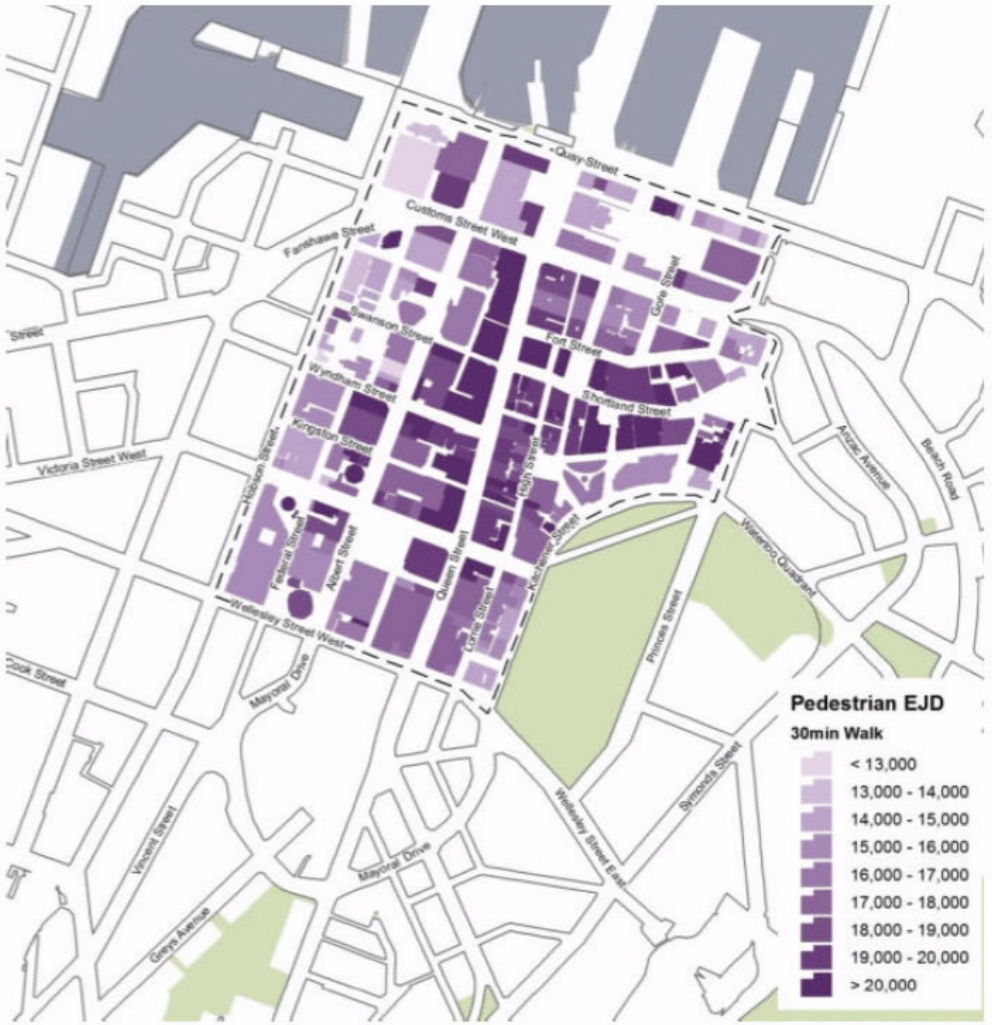
Pedestrian Connectivity and Economic Productivity

- Agglomeration economics literature suggests that there is a positive and causal relationship between EJD and productivity.
- They examined how variations in walkability related to variations in productivity
- Productivity was estimated using a proxy of wage levels by industry type
- Key result: Positive correlation between walkability and productivity

"There is a positive relationship between connectivity and economic productivity"



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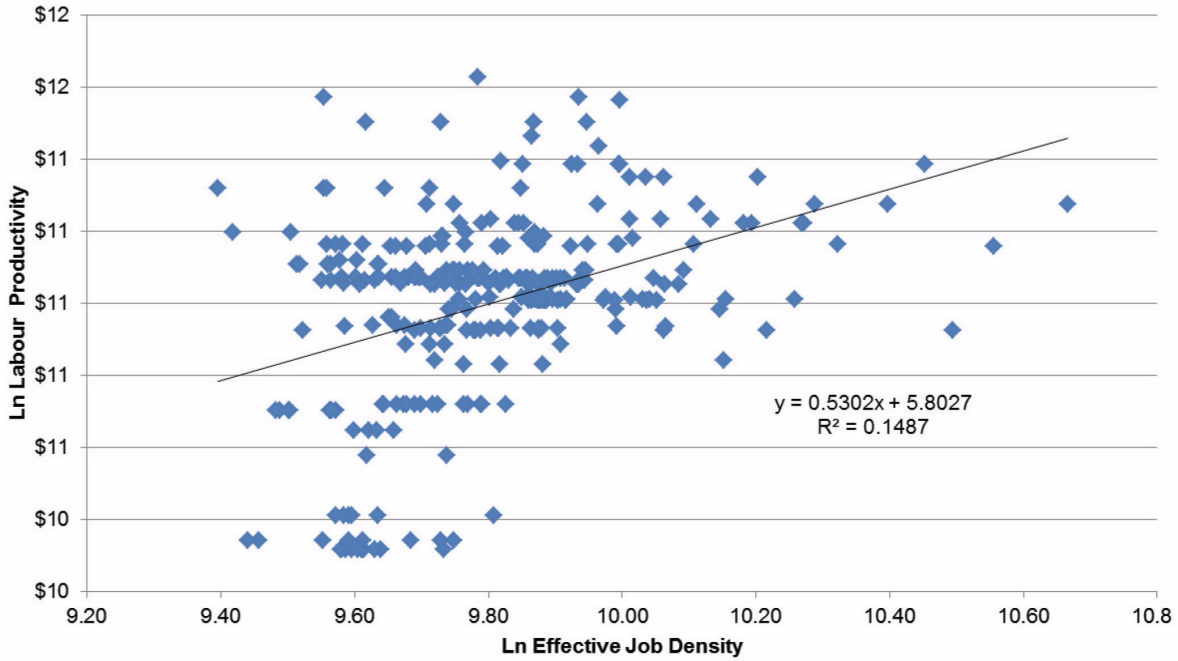
Pedestrian Connectivity and Economic Productivity

- The point estimate suggests that a 10% increase in walking EJD is associated with a 5.3% increase in productivity.
- This means that a 1% increase in walking EJD will increase the value of economy of the study area by 0.53% or approximately $42 million based on the authors' estimate of $8.01 billion GDP for the study area.

Figure 19: The association between walking EJD and labour productivity



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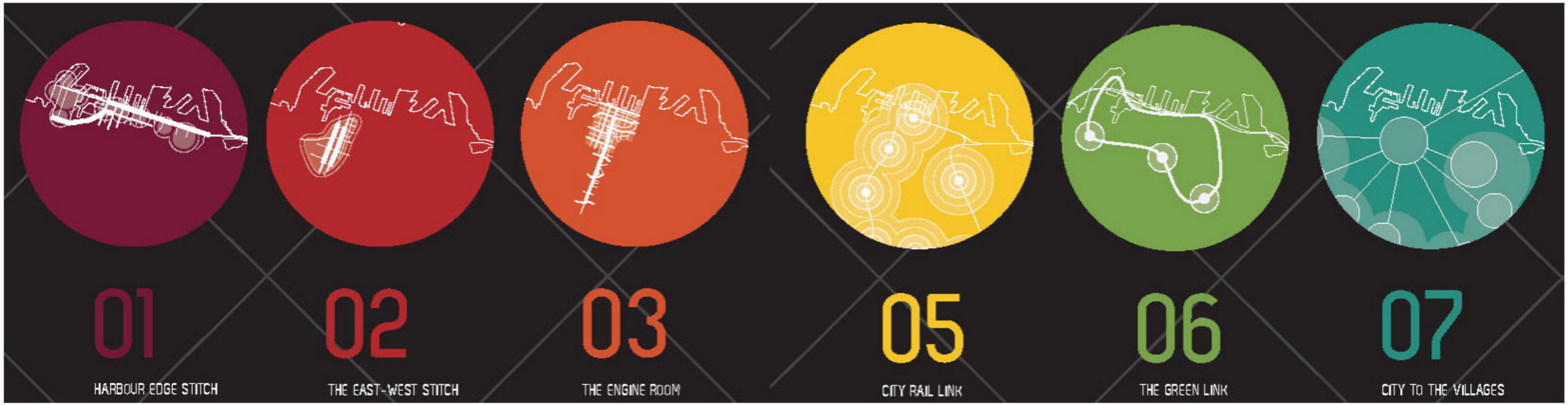
Pedestrian Connectivity and Economic Productivity

- How can producivity be improved by increasing EJD?



Pedestrian Connectivity and Economic Productivity

Scenario Testing

1.1 Additional through-block links

Change in EJD	**0.27%**
Impact on economy	**$11.13 million**

1.2 Shared streets, laneway network

Change in EJD	**1.21%**
Impact on economy	**$50.04 million**

1.3 Shortland Street connections

Change in EJD	**.029%**
Impact on economy	**$1.2 million**

$69m

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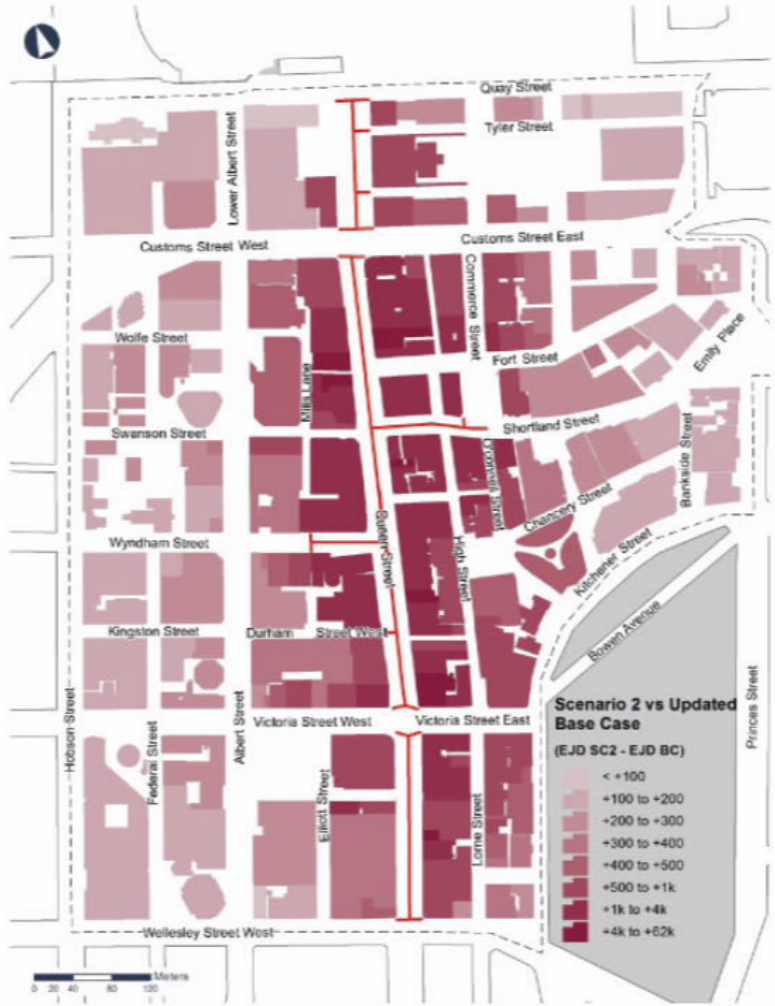
Pedestrian Connectivity and Economic Productivity

Scenario Testing

Figure 22 New EJD index scenario 2 compared to updated base EJD index



2. Pedestriansed Queen Street	
Change in EJD	5.90%
Impact on economy	$244 million

$244m

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This is surely overstated.
But even at a 1/4 this value, requires consideration about how transport appraisal is undertaken
(are we doing it right?)
$244 million
Benefits from walking (user benefits) add 20% to the benefits of Queen St/ Dominion Road light rail
$3.0 million
Public realm improvements
$13.6 million
Reduced delay at intersections
Agglomeration benefits


ZARA
NINE WEST
SWAROVSKI

Business Case for Walking

Counting Walking to Make Walking Count in Auckland

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Engineering NZ, Queenstown, 21 March 2018

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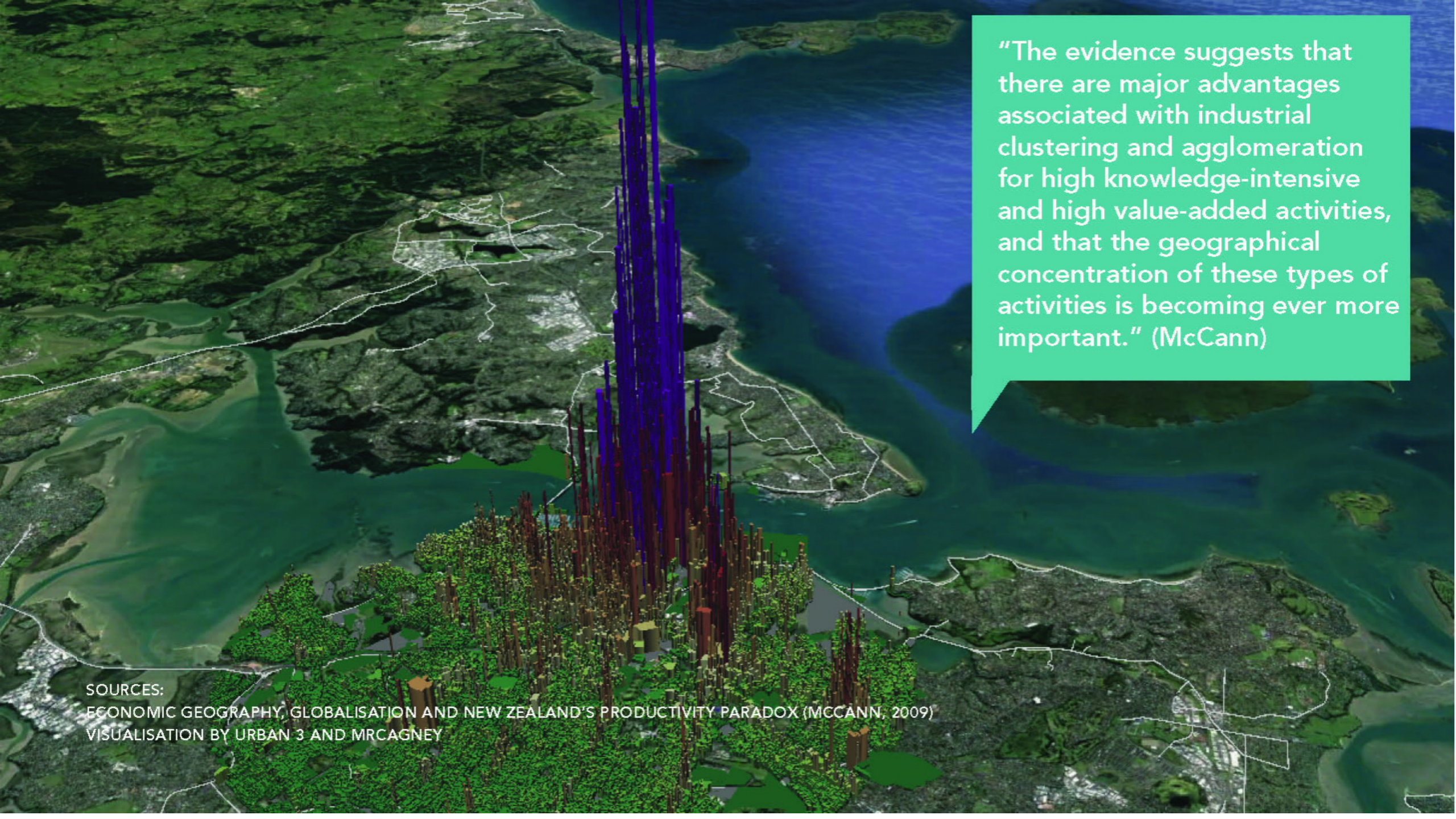
Proximity

Locating "in the centre of things" also means it is easier to meet people more often; whether it be a quick catch up coffee, a meeting with a number of people from different organisations, or simply bumping into people on the street – it is easier and less time consuming.

For most businesses, proximity to amenities for staff - including banks, supermarket, cafes, and services is an important location decision criterion.

SOURCES:
DRIVERS OF BUSINESS LOCATION IN THE AUCKLAND CBD (GRAVITAS, 2013)
AVAILABLE AT KNOWLEDGE AUCKLAND



"The evidence suggests that there are major advantages associated with industrial clustering and agglomeration for high knowledge-intensive and high value-added activities, and that the geographical concentration of these types of activities is becoming ever more important." (McCann)

SOURCES:
ECONOMIC GEOGRAPHY, GLOBALISATION AND NEW ZEALAND'S PRODUCTIVITY PARADOX (MCCANN, 2009)
VISUALISATION BY URBAN 3 AND MRCAGNEY

Valuing the Urban Realm (VURT)

Karangahape Road Scenario 1A

- Retain existing footpath width
- 320% growth footfall
- NZ$73,000 annual benefits
- NZ$1,600,000 lifetime benefits

Karangahape Road Scenario 2A

- Widened footpaths
- 320% growth footfall
- NZ$261,000 annual benefits
- NZ$5,600,000 lifetime benefits

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Measuring Pedestrian Congestion

Pedestrian Movement Count

- Videotape the two intersections for an hour during mid day
- Review footage and document every pedestrian movement in every direction

→

Average Delay per Pedestrian

- Signal timing data from each intersection
- Crossing distance for each leg of each intersection
- Average walking speeds

Assumption

Random arrivals at the intersection

→

Value of Travel Time

- NZTA Economic Evalutation Manual

  -Estimation Purpose of Trip (different purposes have varying values)

  -Average value of Time for Pedestrians

→

Annualisation Factor

- Based on the Heart of the City pedestrian counts for 2016. Calculated the ratio of a compable day to the annual pedestrian count.

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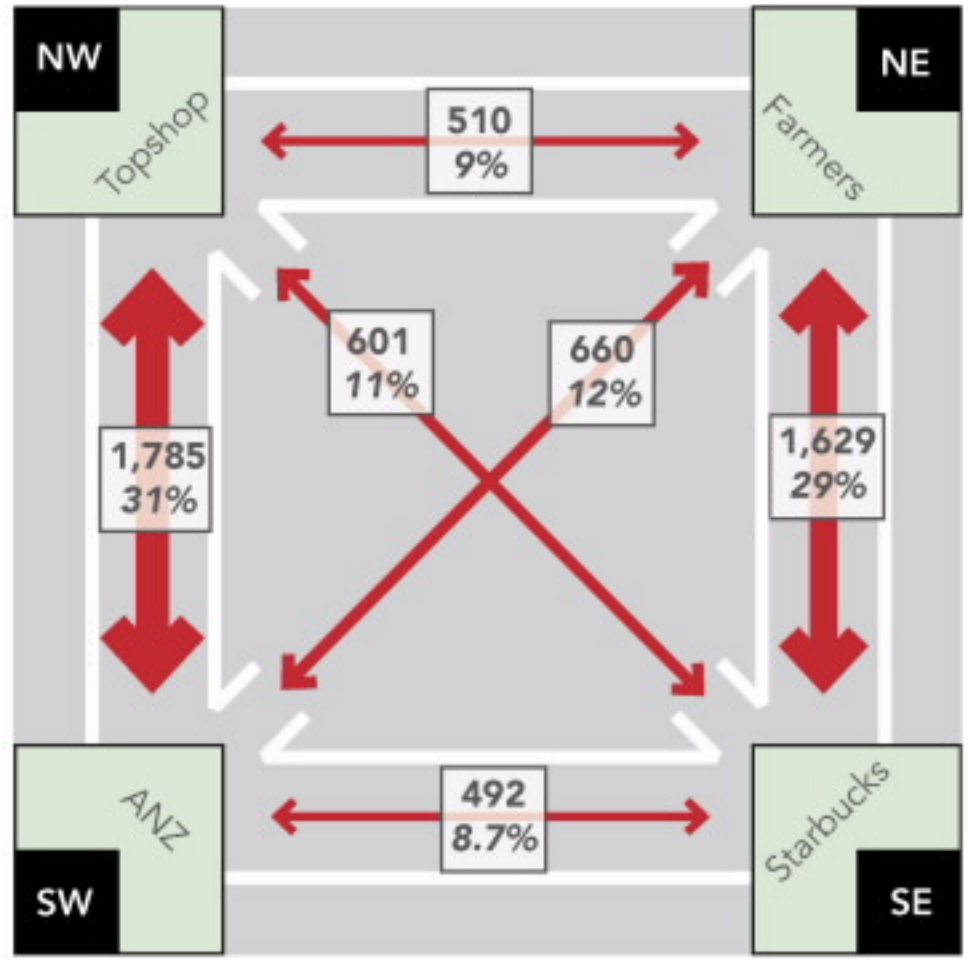
Measuring Pedestrian Congestion

- Over 7,700 pedestrians moved through the intersection in 1 hour
- 1,200 cars passed through the intersection in same hour
- Average delay per pedestrian 27 seconds
- 161,115 hours of annual delay to pedestrians
- Annual wasted time due to delay "costs" $2.2m
- NPV is $36m for free flow conditions

Victoria St / Queen St



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