Measuring Public Transport Accessibility to Employment Sites in the Auckland CBD

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ABSTRACT

Currently there is global focus to increase the use of alternative modes of transport, particularly the use of Public Transport (PT). Part of this change is to improve accessibility. If the PT modal share is to be increased, the transport authorities, transport planners and other professionals need to ensure the service is available to as many people as possible.

To enable measurement and monitoring of PT, quality of service and accessibility ratings allow local authorities to define the level of service available to users at various times and locations. To date measuring PT accessibility in New Zealand has been limited. This paper outlines a proposed methodology for assessing PT accessibility to work places in the Auckland CBD from the surrounding areas with the aim of mapping the CBD area according to calculated PT accessibility levels.

In addition to providing information on PT service levels, it is expected this information can be used in planning to influence decisions around land use, travel demand/supply management schemes and planning regulations such as minimum or maximum parking requirements as well as being a useful tool to help predict modal share from new developments.

AIMS

The aims of this research project are:
• To propose a suitable methodology for measuring public transport accessibility to employment destinations in Auckland.
• To test the methodology by applying it to the Auckland CBD and to produce a PT accessibility map of the Auckland CBD area.
• To investigate ways in which this information can be used in developing policies aimed at increasing the PT modal share and reducing congestion during peak times.

THE METHODOLOGY – Potentially Accessible Working Population (PAWP) Index

PT Network and Timetables

Census Meshblock Boundaries and Working Population Figures

Potentially Accessible Working Population (PAWP) Index

Destination PT Service Points
5 Minute Walking Catchment
Study Area

Inbound PT Routes during the Morning Peak
Origin PT Service Points

Census Meshblock Boundaries

$$PAWP\ Value = \frac{Sum\ of\ WP\ Figures}{x} \times Frequency\ of\ PT\ service$$

PAWP Value = Sum of WP Figures x Frequency of PT service

1. Identify destination PT service points within the specified walking distance of the study area.

2. Identify the PT routes arriving at the destination service points within the morning peak. Then identify all origin PT service points along those routes accessed within a 30 minute travel time.
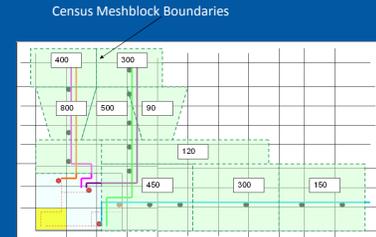
3. Match the origin PT service point locations with census meshblock boundaries and working population (WP) figures for each meshblock.

4. Calculate PAWP value for the study area.

THE RESULTS – Mapping PAWP Values of the Auckland CBD

PAWP Values – 5 Minute Walk

Britomart
Midtown
Upper Queen Street and Karangahape Road

Legend
PAWP Values
- Very High
- High
- Moderate
- Low
- Very Low
- Zero

0 200 400 600 Meters

PAWP Values are classified into five categories ranging from 'Very Highly' Accessible to Zero ie no PT service points within the specified walking distance.

1. The Auckland CBD area is generally accessible by public transport with very few areas outside of a ten minute walk of an inbound PT service point.

2. The 'Wynyard Quarter' area (north west currently has the lowest potential to be accessed via PT.

3. Accessibility to PT is not solely centred around the Britomart Transport Centre with other areas in the southern side of the central CBD resulting in higher PAWP values than Britomart.

4. There is generally an east/west bias in favour of the east which although related, cannot be solely explained by the general split in population distribution.

To incorporate the potential for PT transfers within the CBD 'Local PT' Routes are overlaid eg 'Link' and 'City Circuit'.

5. The existing local PT routes do little to ease the east/west bias.

PAWP Values – 5 Minute Walk with Local PT

Legend
Local PT Routes
PAWP Values
- Very High
- High
- Moderate
- Low
- Very Low
- Zero

PAWP Values – 10 Minute Walk

Britomart
Midtown
Upper Queen Street and Karangahape Road

Legend
PAWP Values
- Very High
- High
- Moderate
- Low
- Very Low
- Zero

0 200 400 600 Meters

SUMMARY AND CONCLUSIONS

The results illustrate that the PAWP index provides a suitable methodology for measuring public transport accessibility to employment destinations. The methodology has been tested using the Auckland CBD as a case study and found to produce significant results.

Some recommendations to increase the accuracy of the methodology include the incorporation of a detailed pedestrian network dataset, consideration of local PT transfers at the destination end of the trip and consideration of park and ride facilities at the origin end.

Even without minor improvements, it is considered that the potential uses of such a methodology are wide and varied. Initial investigations show the results being of particular relevance to PT route planning, land use planning and proposals, parking management plans and work place travel plans.

It is considered PT accessibility should have an important influence on the future transport and land use planning of New Zealand's urban centres, and the results of this research provide a significant contribution to this work.

POTENTIAL USES

- PT route planning
- Land use planning
- Assessing potential modal splits
- Parking management plans and policy
- Work place travel plans.

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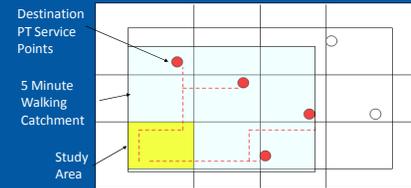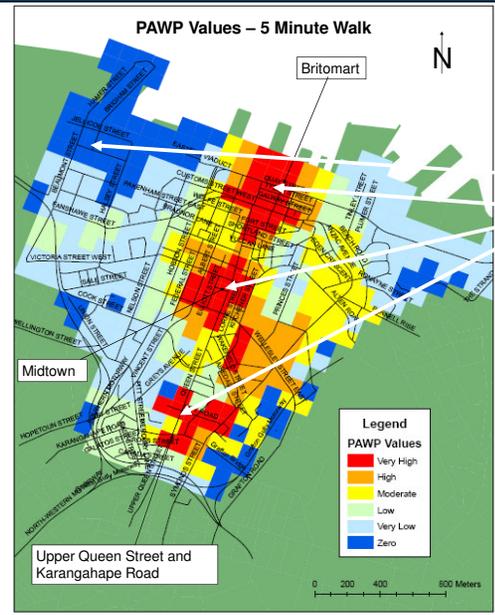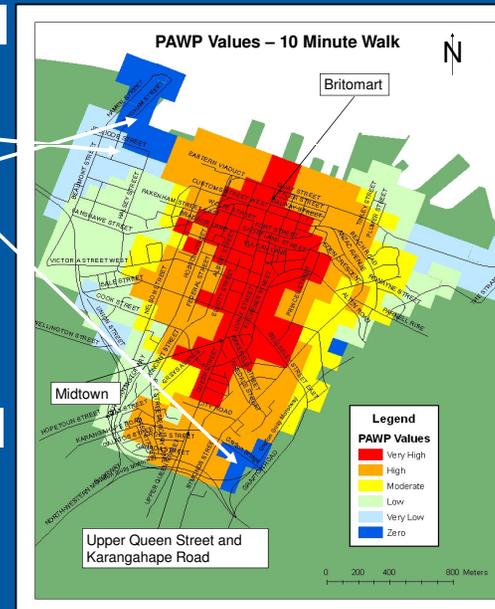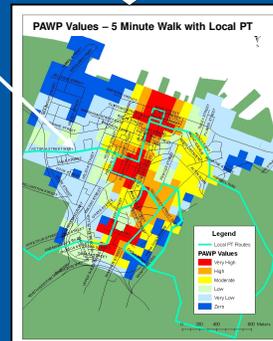Transport for London (2003), PTAL Methodology, London, UK – Best practice guidelines.