



Transport Accessibility

A quantitative measure

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Justice in public transport systems: A comparative study of Auckland, Brisbane, Perth and Vancouver

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ABSTRACT

Although the concept of social justice seems to be ubiquitous in most transportation plans, methods adopted to evaluate transit systems have little engagement with political theories to define justice. Without a proper definition, transport planners will be unable to design transit systems that achieve justice. The present study proposes a combination of sufficiency/equality and egalitarianism principles to define justice in transit. Based on this framework 1) access to public transport is a right, 2) public transport should provide a minimum accessibility, 3) public transport should benefit the low-well-off groups, and 4) a just distribution has to be spatially evaluated. The framework proposes a method that can be used to measure and compare justice in transit systems. The framework is applied to four case study cities: Auckland, Brisbane, Perth, and Vancouver. The results show that Auckland's transit system performs well relative to the other three case study cities by accounting for people and providing a minimum access to jobs. However, Auckland's transit services fail in the just distribution as it favours more affluent neighbourhoods. This issue is more severe in Brisbane's and Perth's transit systems. Vancouver, on the other hand, provides a better service for low-income neighbourhoods. This study contributes to the field of justice in transit by providing a clearly defined framework which can be adopted to analyse a city's transit system and compare it with other cities. It is expected to assist practitioners in obtaining insights that can inform policy decisions.



Right to the city: Applying justice tests to public transport investments

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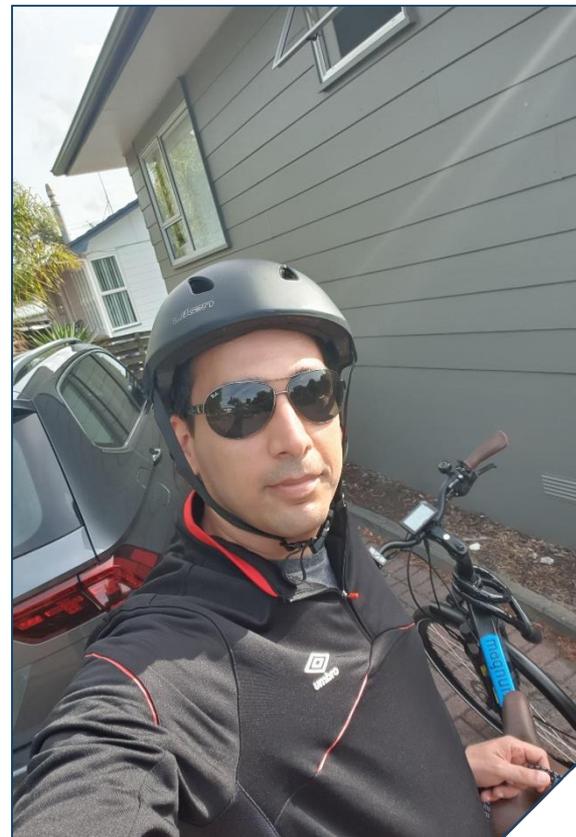
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ARTICLE INFO

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Public transport
Accessibility
Evaluation
Inequality
Policy

ABSTRACT

Many policy-makers are grappling with the twin challenges posed by growing travel demands and persistent socioeconomic inequality. To address these issues, numerous studies propose and apply "justice tests", which relate the effects of transport policies to prevailing socioeconomic deprivation. While the theoretical foundations of justice tests are well-established, there exists less agreement on methodological aspects and empirical specifications. In this paper, we propose a new criterion for evaluating the results of justice tests—namely the correlation coefficient—and explore its sensitivity to empirical assumptions by way of a case study of a major public transport investment. In comparison to other criteria identified in the literature, our proposed criterion appears to generate relatively stable results while being simple to calculate, interpret, and communicate.



A photograph of two cyclists riding on a paved path in a park. The cyclist in the foreground is a man wearing a red jacket and a white helmet, riding a road bike. The cyclist in the background is a woman wearing a black and red jersey and a blue helmet, also on a road bike. They are both smiling and appear to be enjoying their ride. The background is filled with trees and a bright, sunny sky.

**“You cannot
improve what
you cannot
measure.”**

-Darren Hardy

Details

Basemap

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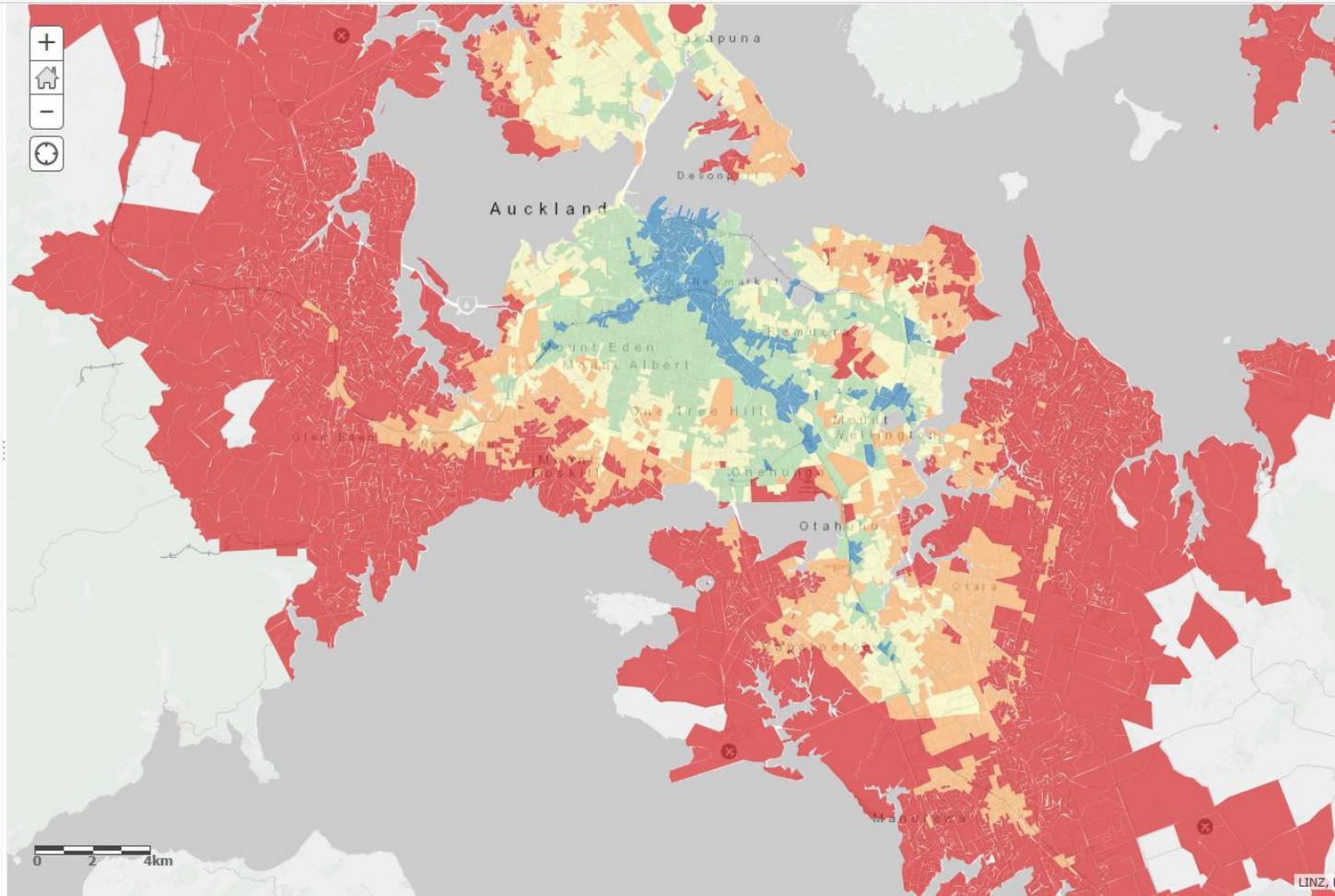
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About Content Legend

Legend

PT
Jobs within 45min on Public Transport divided by Total regional jobs

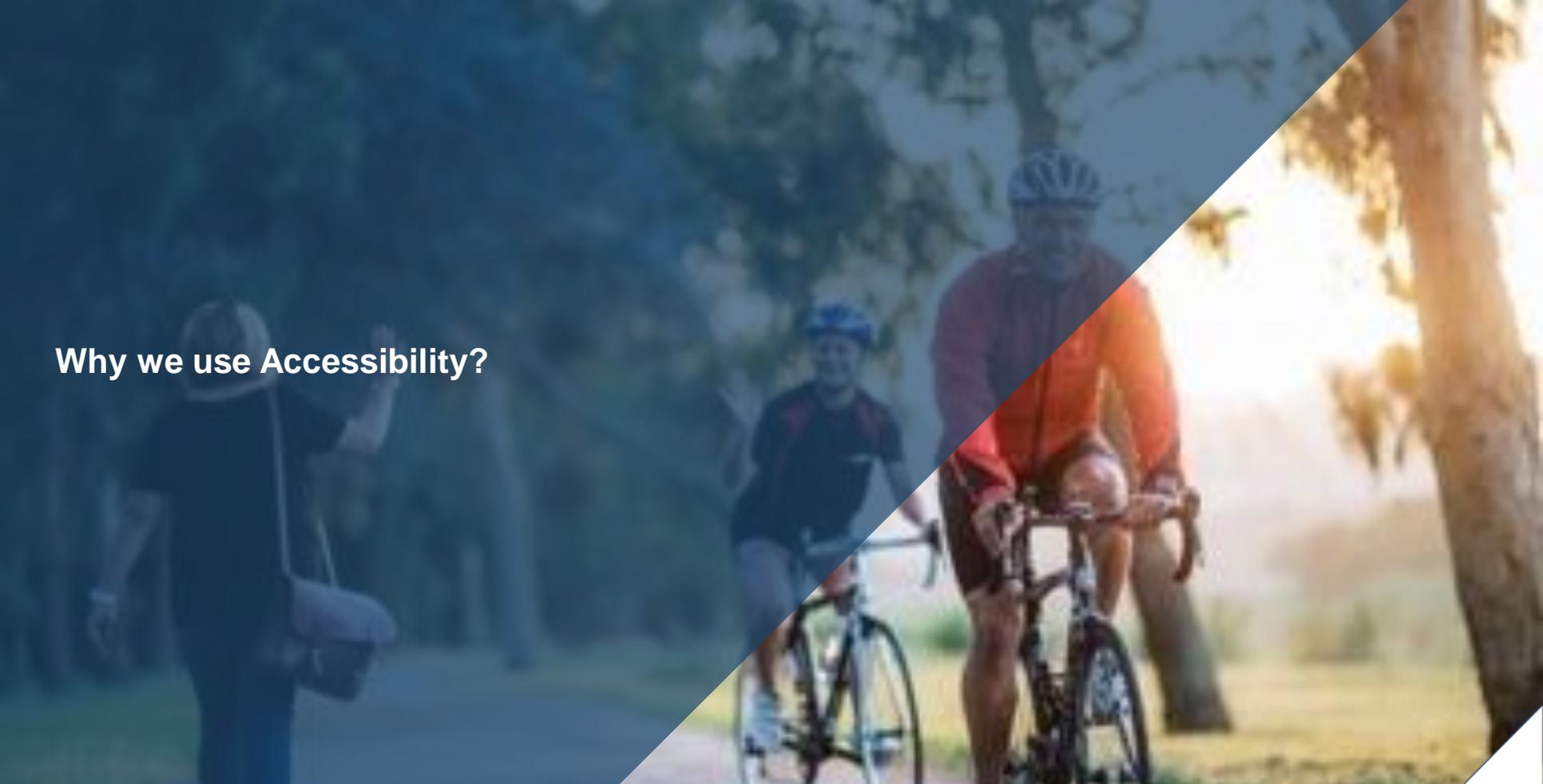
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- 30 - 40%
- 20 - 30%
- 10 - 20%
- < 10%



Why we use Accessibility?

How we measure Accessibility?

Results and discussion.



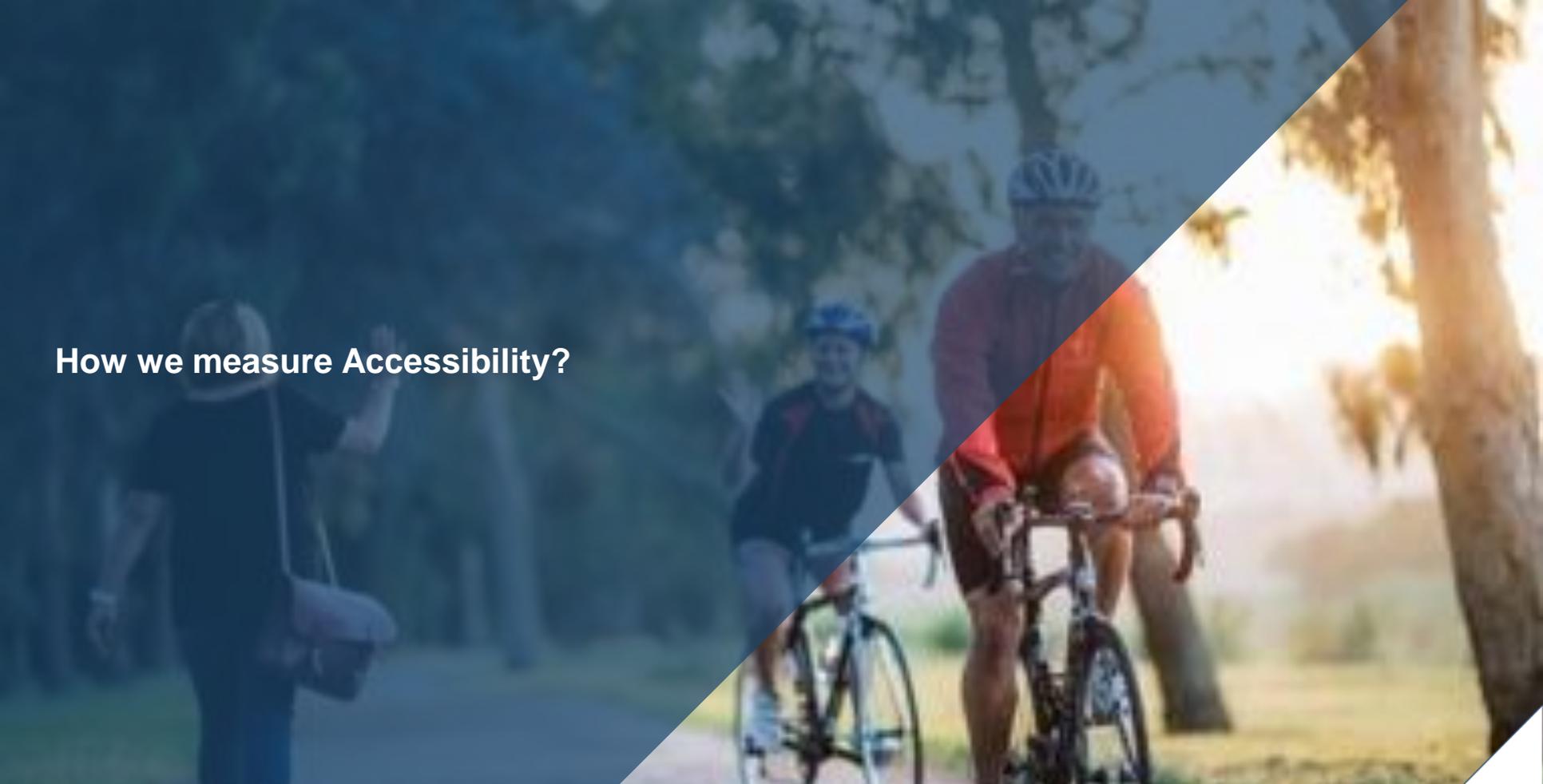
Why we use Accessibility?

Planning for Accessibility VS Planning for Mobility

- **Level-of-service**
- **Volume-to-capacity ratios**
- **Travel times**
- **Efficiency of the system**
- **Road building**
- **Increasing capacities**
- **Focuses on the means without direct concern for the ends.**

- **Time/cost of reaching a destination**
- **Attractiveness of the potential destinations**
- **Brings in land-use policies into account**
- **Expanding mode choices and reducing the need to drive.**
- **Focuses on the ends rather than the means**



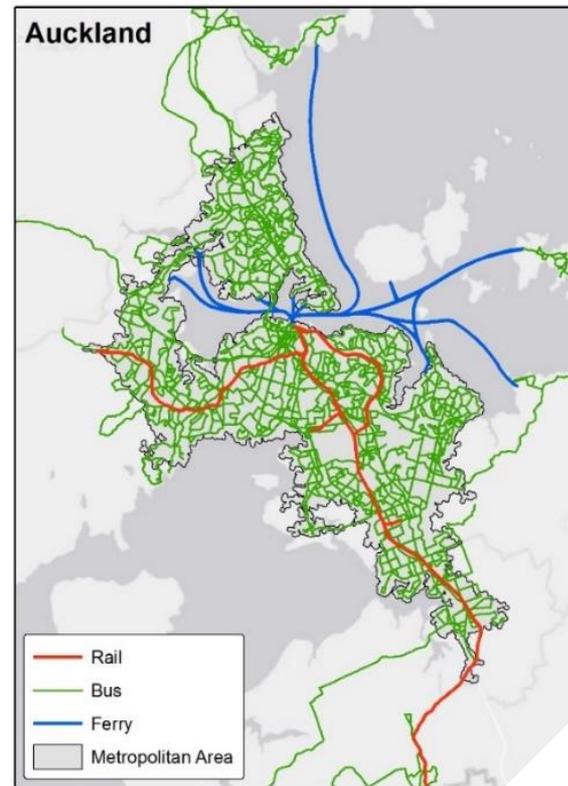


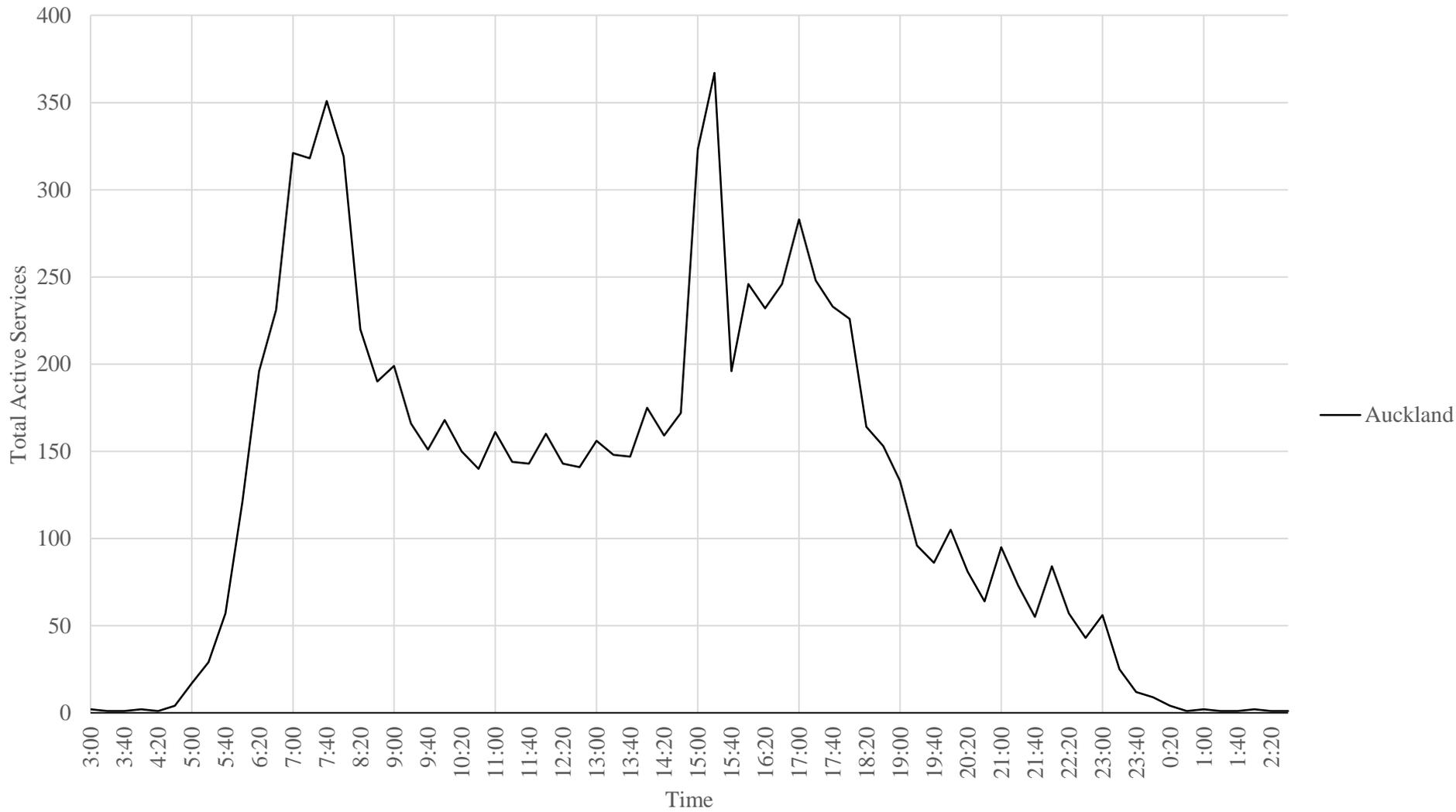
How we measure Accessibility?

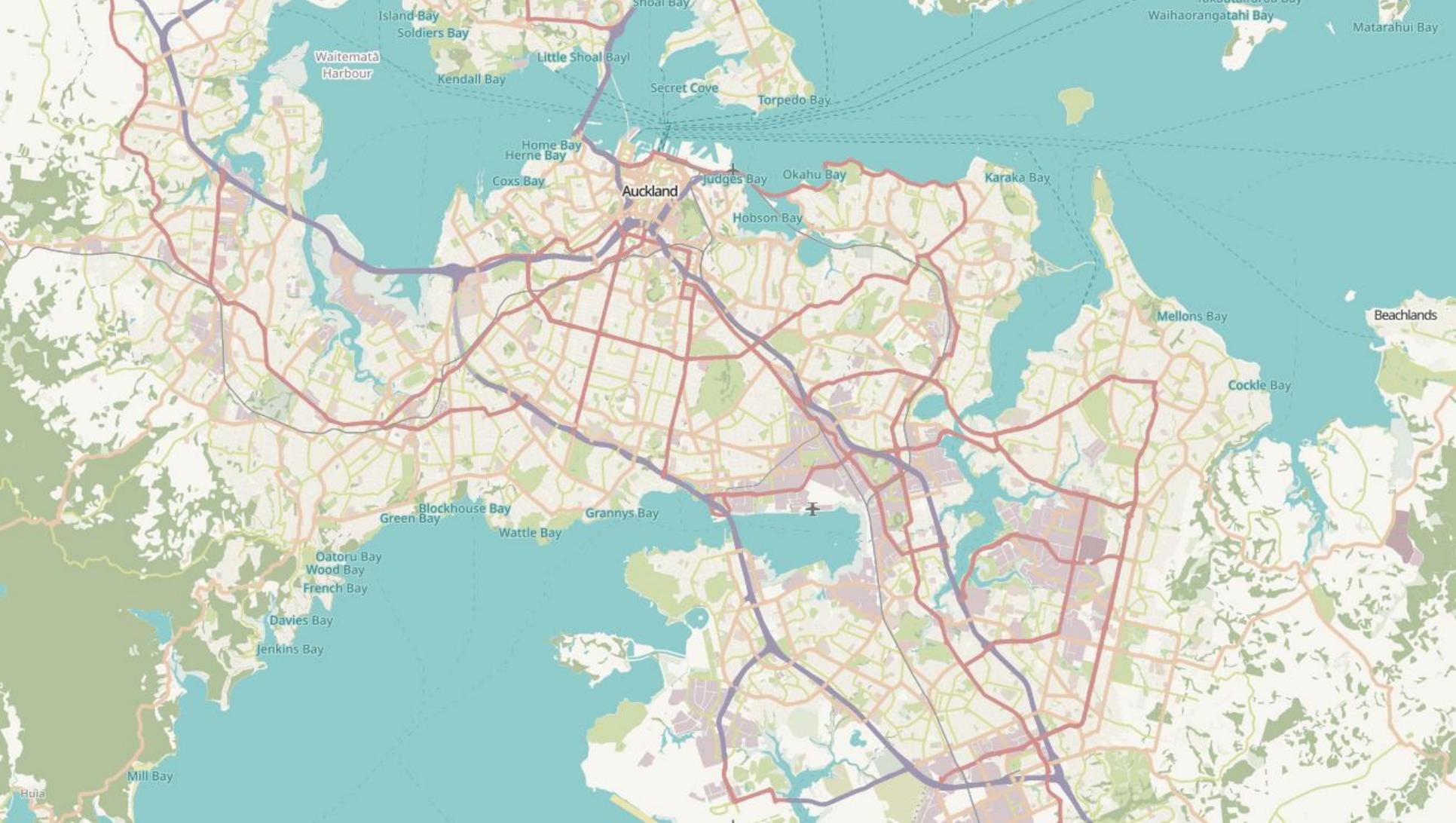
(Open) Data

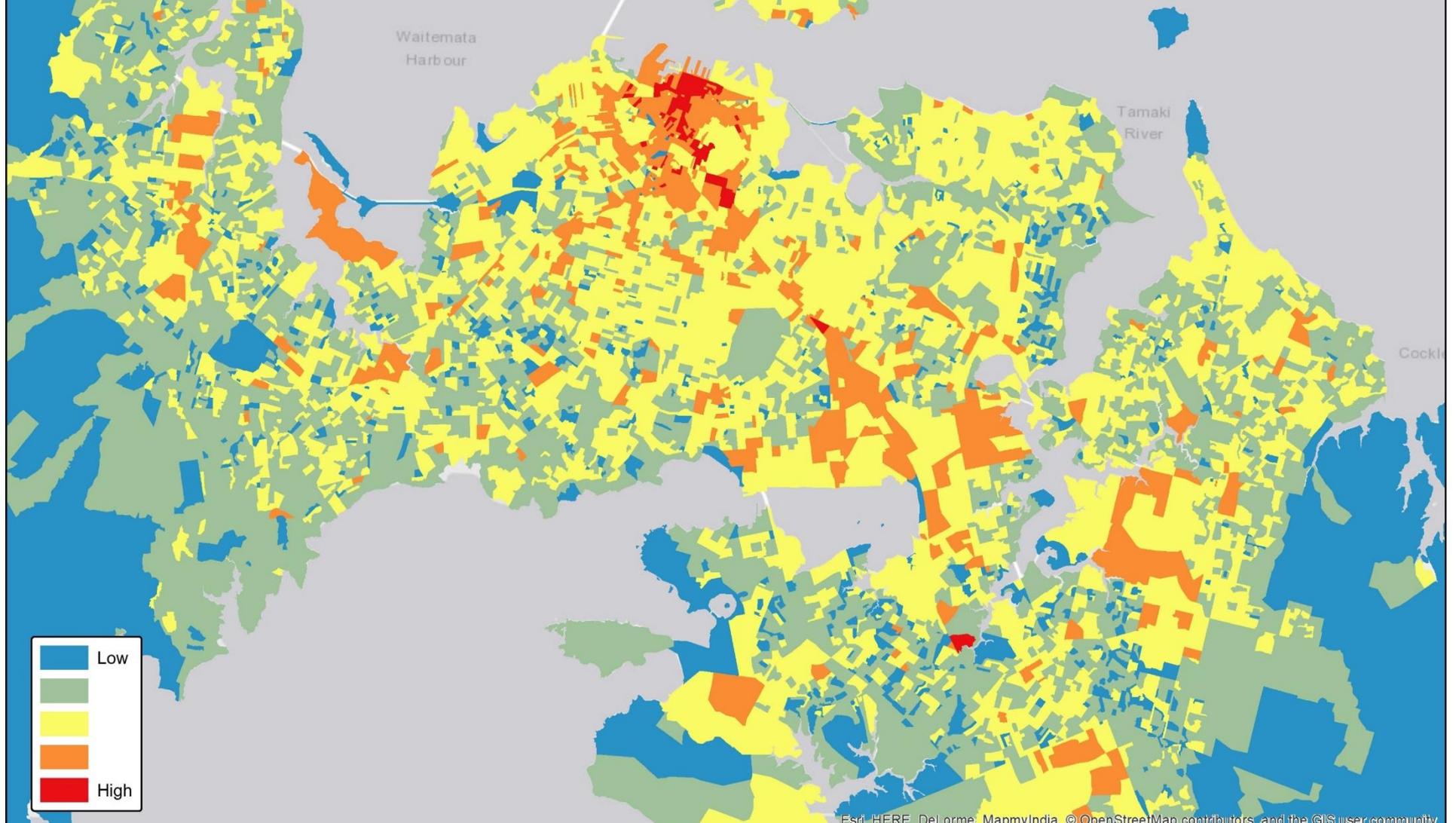
How we measure Accessibility?

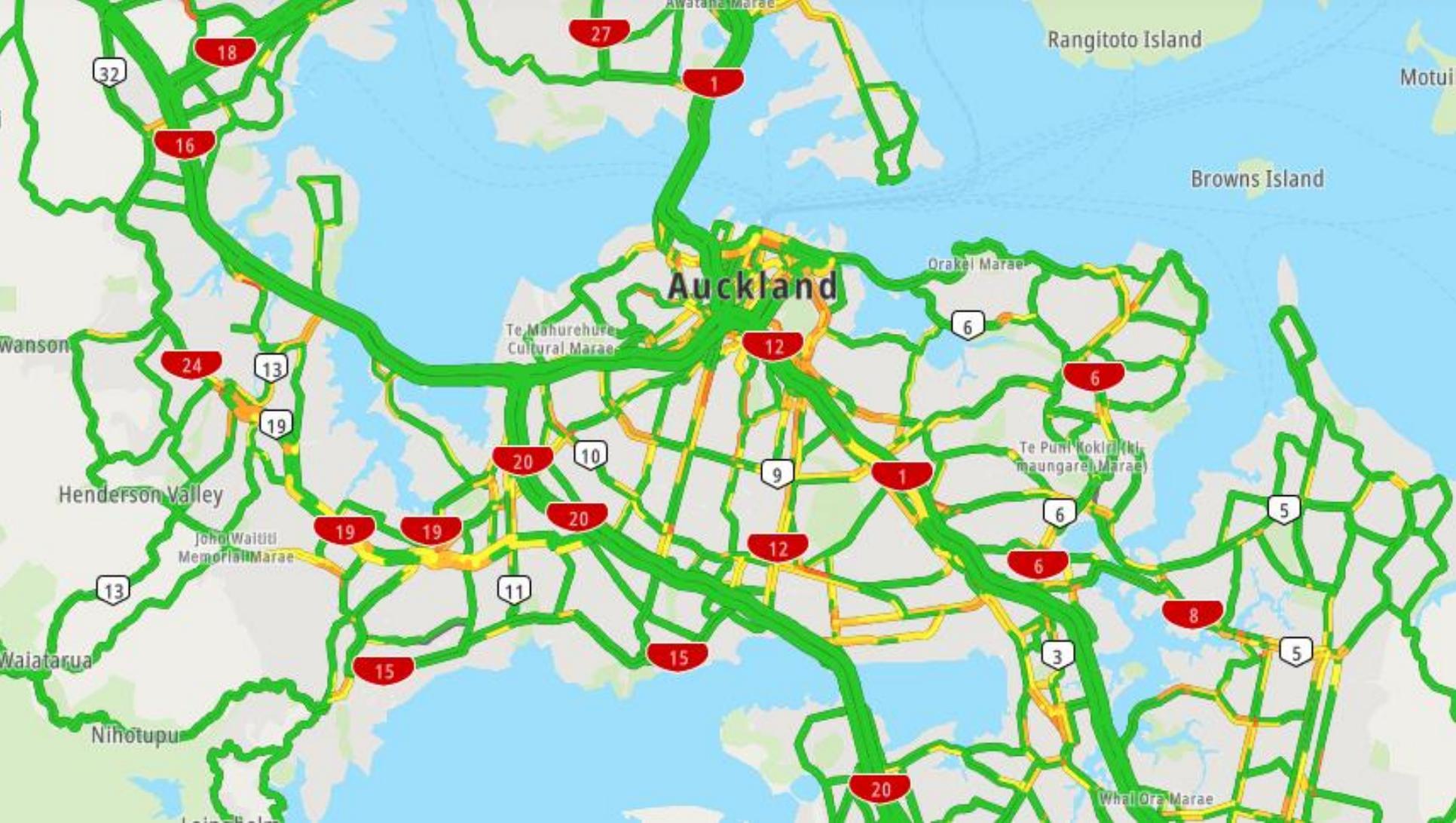
- General Transit Feed Specification (GTFS) for public transport data
- Open Street Map (OSM) for street network data
- New Zealand Census for demographic data
- TomTom traffic for historical traffic data





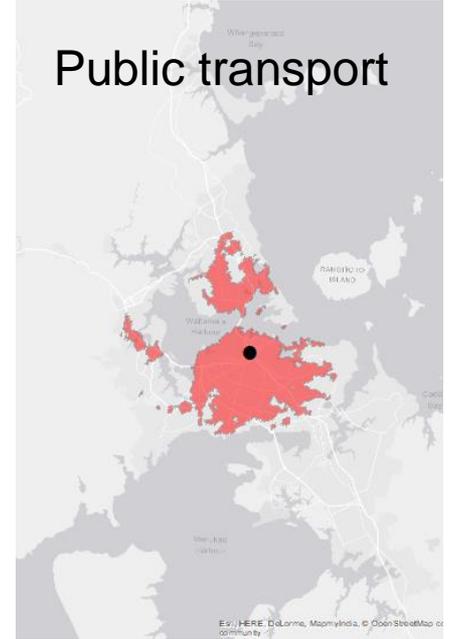
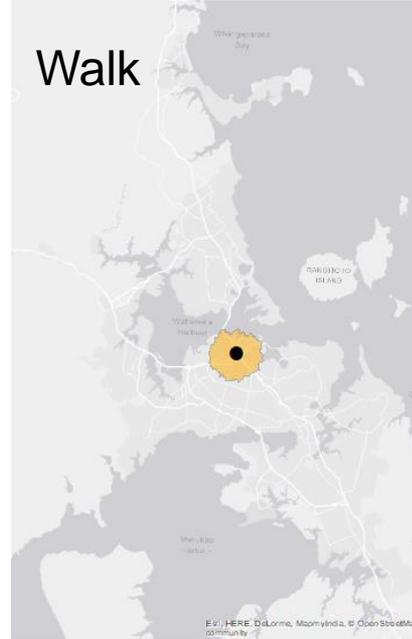
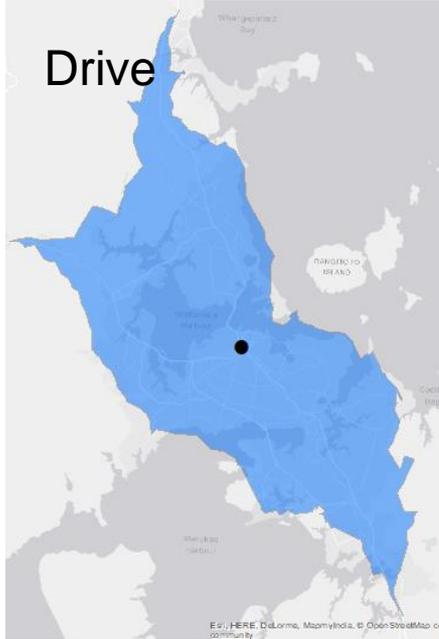






Accessibility Measure

How we measure Accessibility?

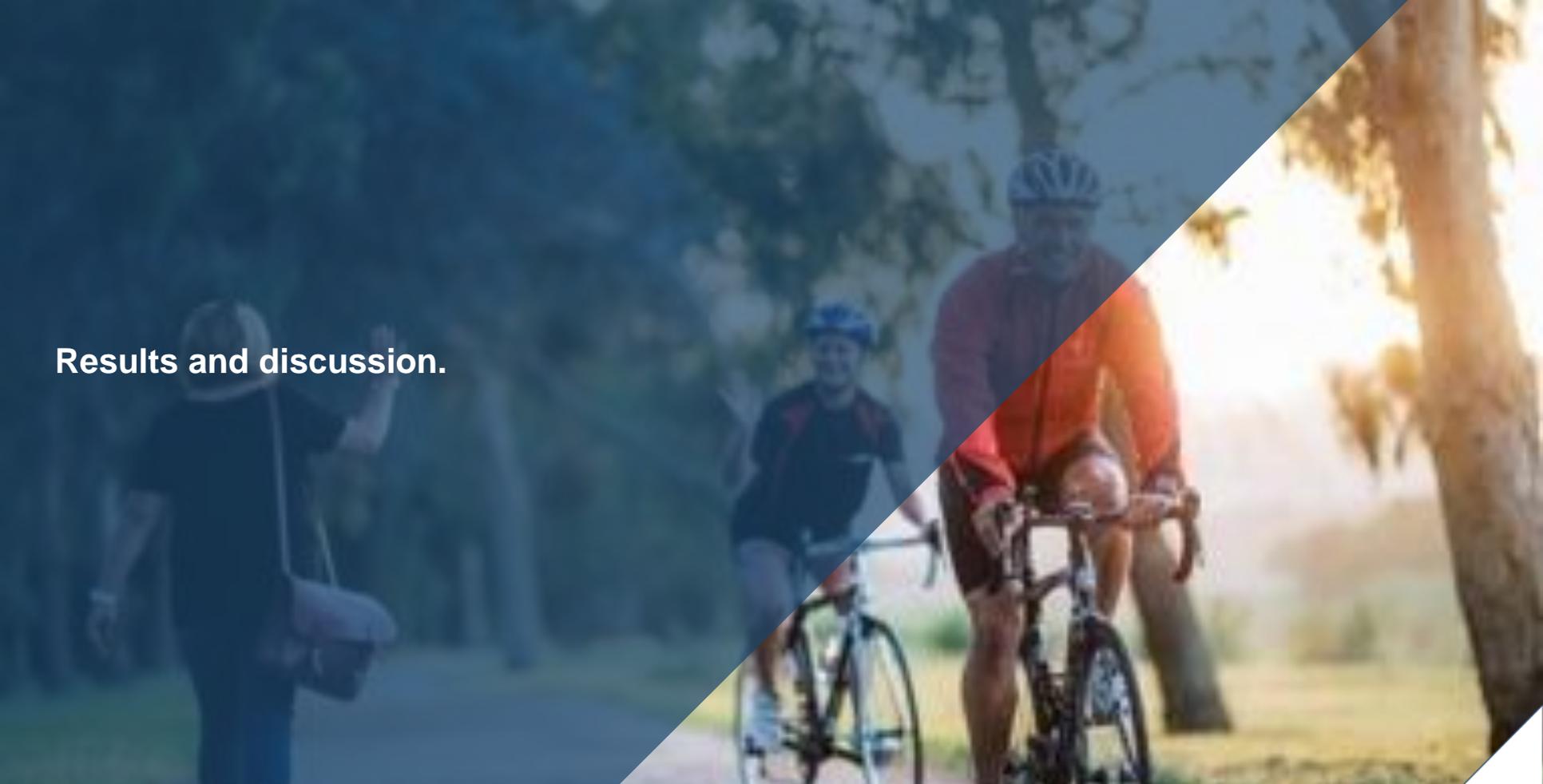


```
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    id_field = 'stop_name',
    mode = "BICYCLE",
    breaks = [500, 1000], #in seconds
    date_time = dt,
    control_vars = {'maxWalkDistance':'400'},
)
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1	30000	POLYGON ((174.457374975947 -36.60744500894256,...	659 Remuera Rd
2	60000	POLYGON ((174.5452041682058 -37.02319785620721...	Mayoral Drive Opposite Aotea Centre
3	30000	POLYGON ((174.5452041682058 -37.02319785620721...	Mayoral Drive Opposite Aotea Centre
4	60000	POLYGON ((174.9175795127303 -37.06124647696944...	464 Sandringham Rd
5	30000	POLYGON ((174.9175795127303 -37.06124647696944...	464 Sandringham Rd



Results and discussion.

Details

Basemap

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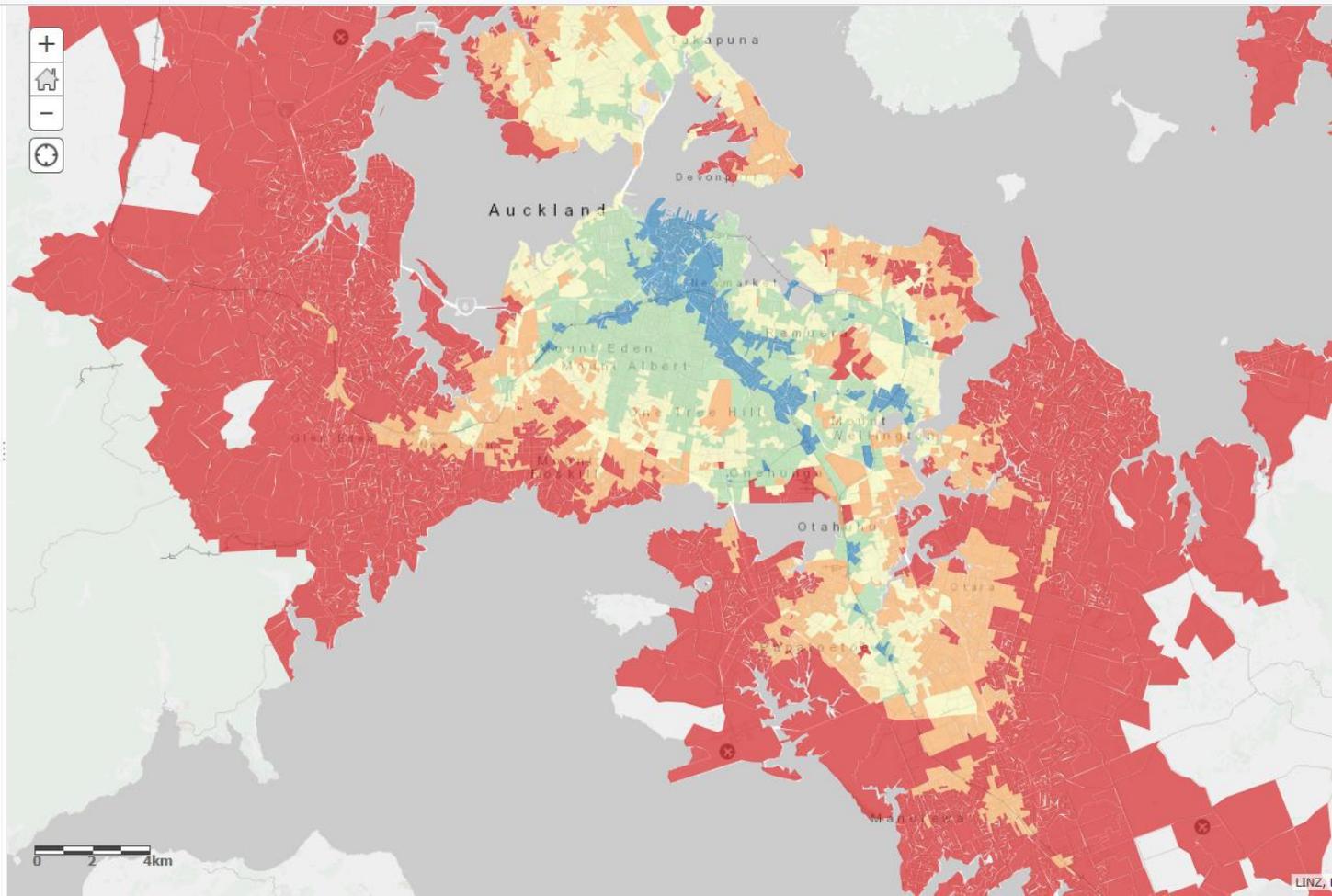
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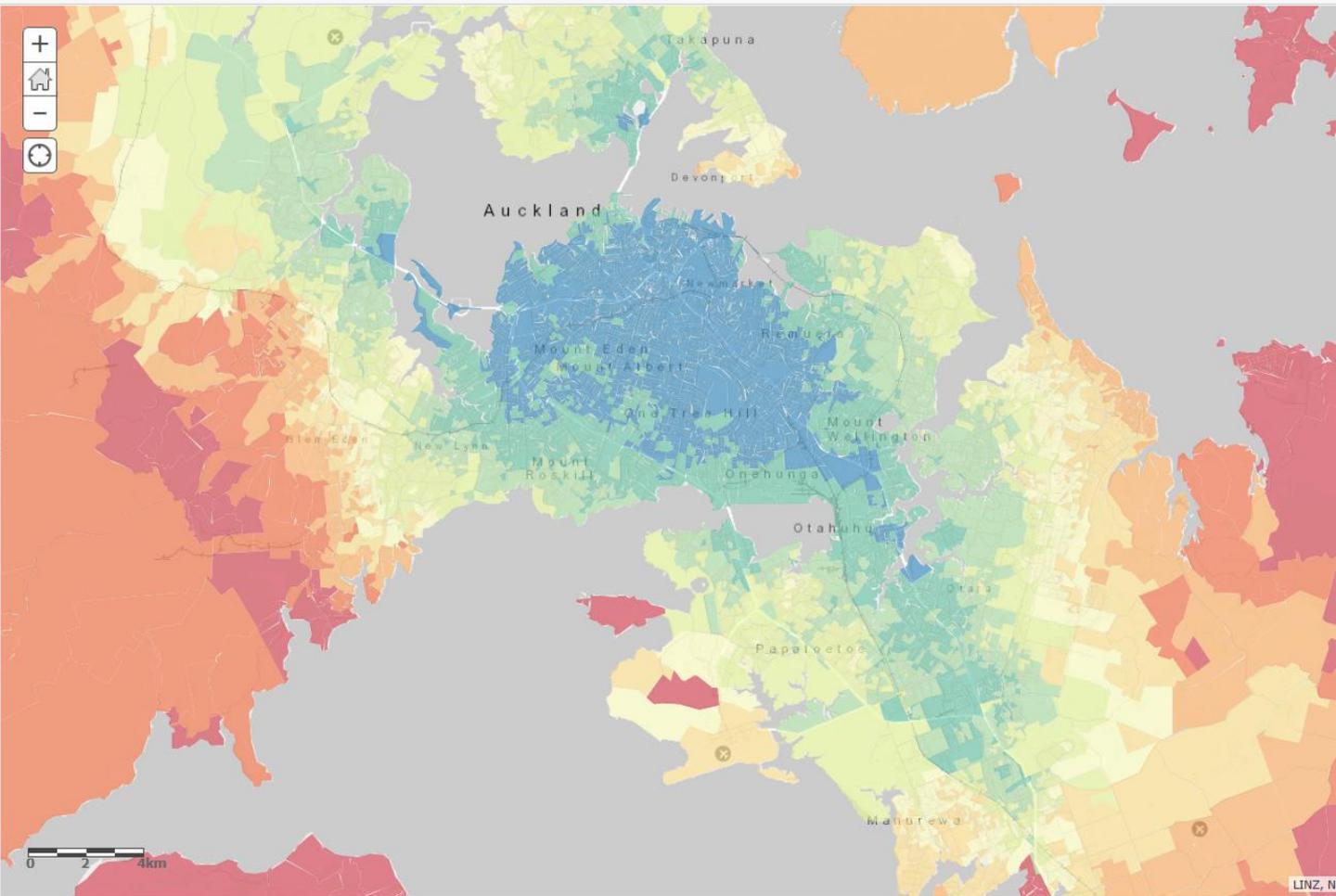
PT
Jobs within 45min on Public Transport divided by Total regional jobs

- > 40%
- 30 - 40%
- 20 - 30%
- 10 - 20%
- < 10%



Contents

- PT
- Driving
 - Jobs within 30min drive divided by Total regional jobs
 - > 80%
 - 70 - 80%
 - 60 - 70%
 - 50 - 60%
 - 40 - 50%
 - 30 - 40%
 - 20 - 30%
 - 10 - 20%
 - < 10%
- Walking
- Cycling
- NZTA Grey Basemap



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Basemap

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Driving

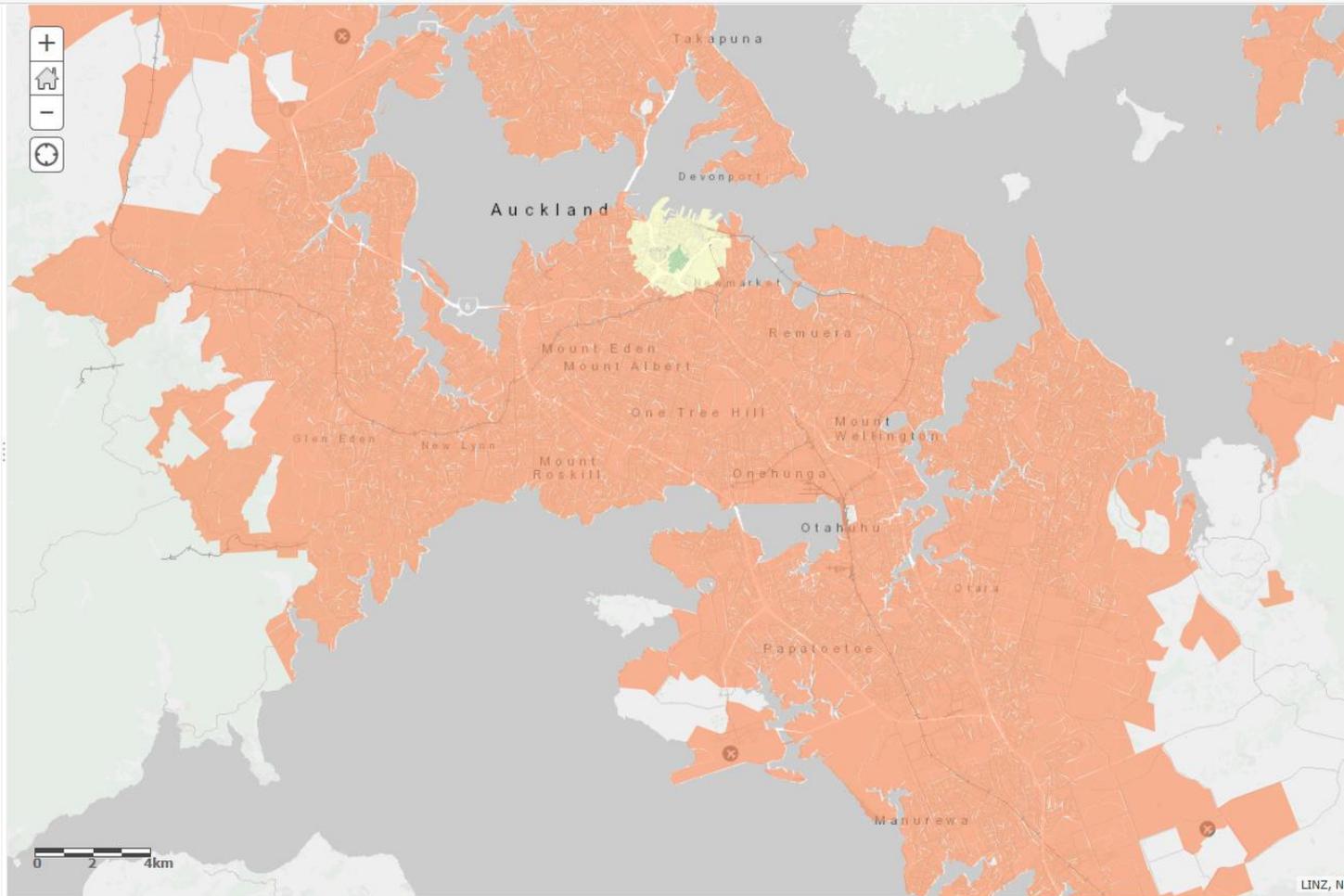
Walking

Jobs within 30 min walk divided by Total regional jobs

- > 20%
- > 10 - 20%
- < 10%

Cycling

NZTA Grey Basemap



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- Driving

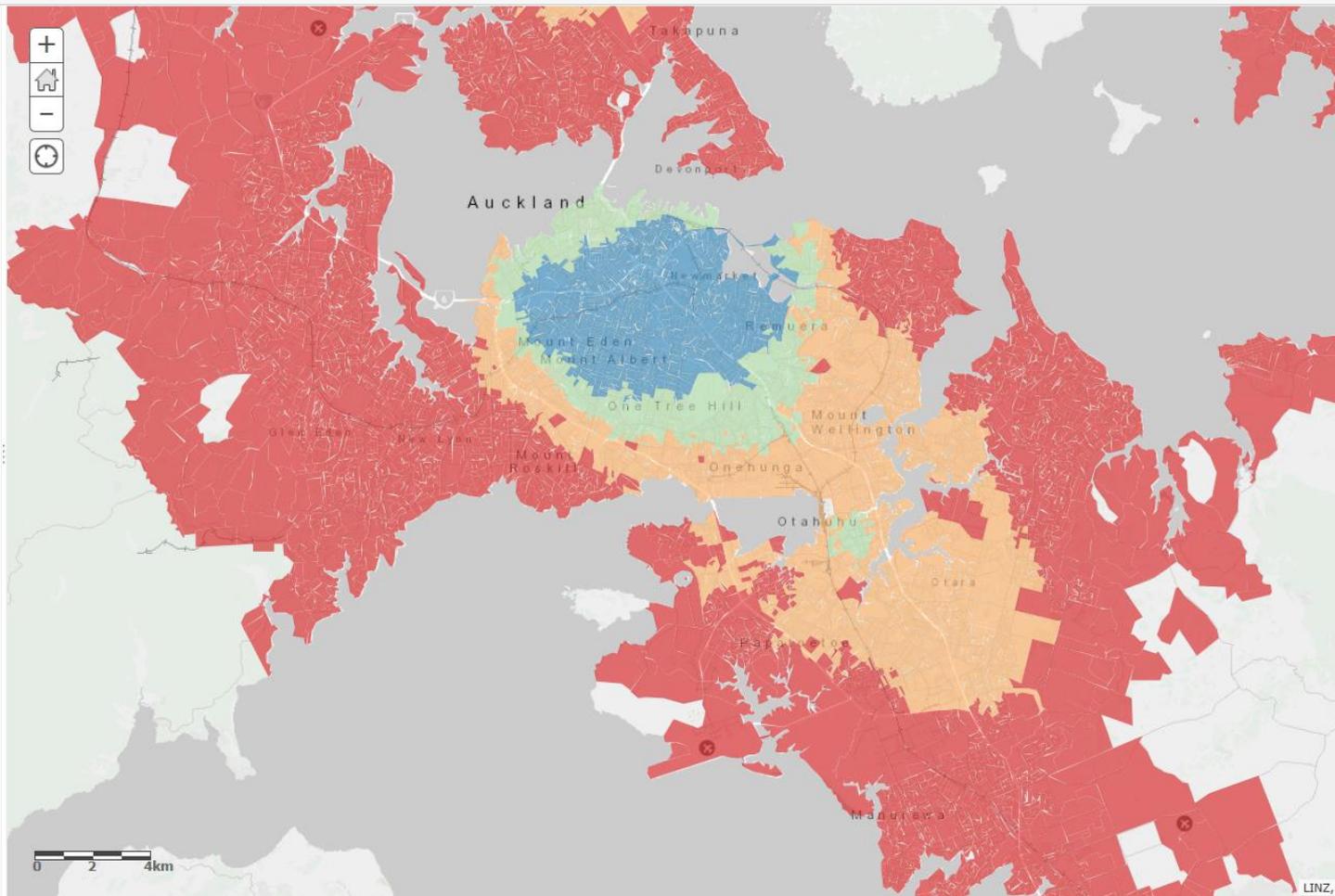
Walking

Cycling

Jobs within 30min cycling divided by Total regional jobs

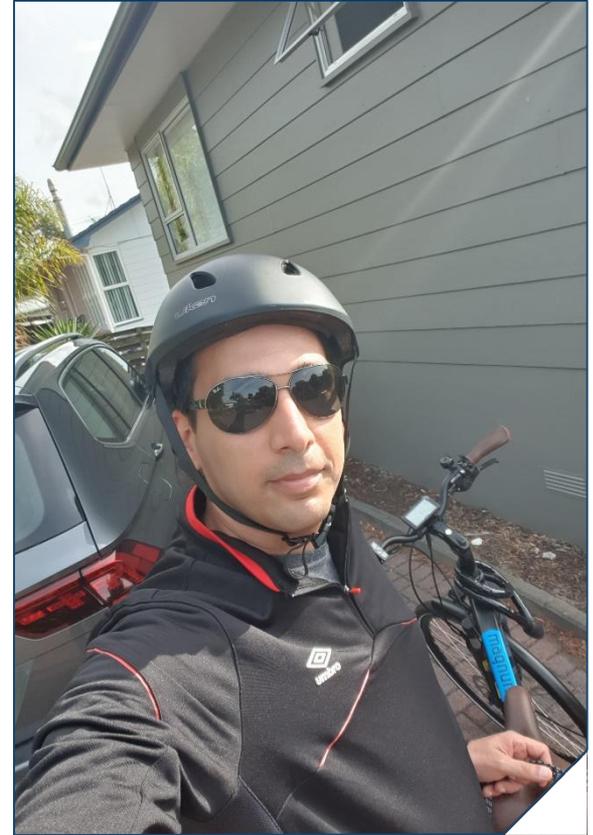
- > 30%
- 20 - 30%
- 10 - 20%
- < 10%

NZTA Grey Basemap



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Quantifying accessibility helps to consistently measure, compare, and track objectives in transport plans and to obtain insights that could inform policy decisions.



Thank you all