Our City Tomorrow
Spatial Plan for Wellington City

Generating walking catchments

September 2021

Introduction

Travel rate models, such as walkable catchments, using pedestrian walking speeds are commonly used to understand the dynamics of individuals' movement through space. This analysis has many applications such as city planning, emergency evacuation routes and access to community services.

Wellington City Council has created a walking network for Wellington City using pathways and tracks, topography, and pedestrian walking rates. This network was used to create walkable catchments in line with guidance from the National Policy Statement on Urban Development 2020 (NPS-UD 2020). These catchments are used to identify areas suitable for intensification based on their accessibility to amenities such as public transport.

What is a walkable catchment?

A walkable catchment is "the area an average person could walk from a specific point to get to multiple destinations" (NPS-UD, 2020). A walkable catchment shows where and how far pedestrians can travel from a certain start point in any given direction. This can be done in two ways: using distance (e.g., an 800m radius) or using time (e.g., 10-minutes).

Wellington City Council has used time to create walkable catchments because it creates a more accurate, 'real world' result.

What is a walking network?

A walking network is a collection of paths and tracks a pedestrian uses when travelling to different locations. Information, such as walking rate and slope, is added to these paths and tracks to model 'real-world' conditions. This allows estimates of walkable catchment areas to be calculated.

What does the walking network for Wellington City include?

Creating a walking network for Wellington City was a cross-council project and included input from the Place Planning Team, Transport Strategy and Infrastructure, Community Services, and many others. It contains the following information:

- Path, tracks, and popular routes through parks
- Pedestrian tunnels and bridges
- Controlled crossing points with an average wait time
- Uncontrolled crossing points with an average wait time
- Slope gradient

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- Low, moderate, and high walking speed estimates based on direction of travel, for example walking uphill versus downhill

By including this information in our walking network, we can model 'real-world' conditions in our walkable catchments.

How does this apply to *Our City Tomorrow: Spatial Plan for Wellington City*?

The National Policy Statement on Urban Development 2020 (NPS-UD) sets out the objectives and policies for planning for well-functioning urban environments under the Resource Management Act 1991. It replaced the National Policy Statement on Urban Development Capacity 2016 (NPS-UDC) and took effect on 20 August 2020.

One of the policies in the NPS-UD is to enable building heights of at least 6 storeys within at least a walkable catchment of the city centre and metropolitan centres as well as existing and planned rapid transit stops.

We used the walking network for Wellington City to generate these walkable catchments and identify areas where intensification was required.

How did we calculate walking speed?

Walking speed is highly subjective. There is no such thing as an "average" walking speed that could be applied to everyone. With this in mind, we decided to calculate averages for low and moderate walking speeds to create an accurate walkable catchment.

It is generally assumed that the walking speed for the average person is 5km/h (1.4m/s). When we began reviewing scientific literature, we found that this was too fast for low and moderate speed walkers. We studied journals that measured walking speed ranges for different age groups and abilities to get a more accurate picture. These papers included studies from all around the world and include groups such as young children and retirees.

We then accessed anonymous data collected by the fitness tracker application, Strava, for Wellington in order to compare how the international literature compared to the walking data collected by Wellingtonians. This data, however, is biased towards people who are very fit and active. We knew this would not apply to everyone so we did some testing and data collection of our own.

Staff from Wellington City Council tracked their movements for two weeks, covering approximately 48km of Wellington's walkable areas.

Using a combination of all this information, we came up with an average for low (0.93m/s), moderate (1.1m/s) and fast (1.35m/s) walking speeds on flat slope. We used a mathematical function to extrapolate these speeds across different slope gradients based on international literature.

What does the walking network for Wellington City not include?

The walking network for Wellington City is constantly improving. We are working to include further information, including things like stairs and curb heights that would allow us to model walkable catchments for people who are mobility impaired.

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