

Using Generative Artificial Intelligence to Create Images for Land Use Planning and Communication



Manaaki Whenua
Landcare Research

Presenter: David Worden
Collaborators:
Dan Richards & Robyn Simcock


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What are GenAI image creation tools?



Midjourney Bot ✓ BOT Today at 9:26 AM

foreground green park, middleground houses residential, background distant hills, New Zealand, Christchurch - Image #3



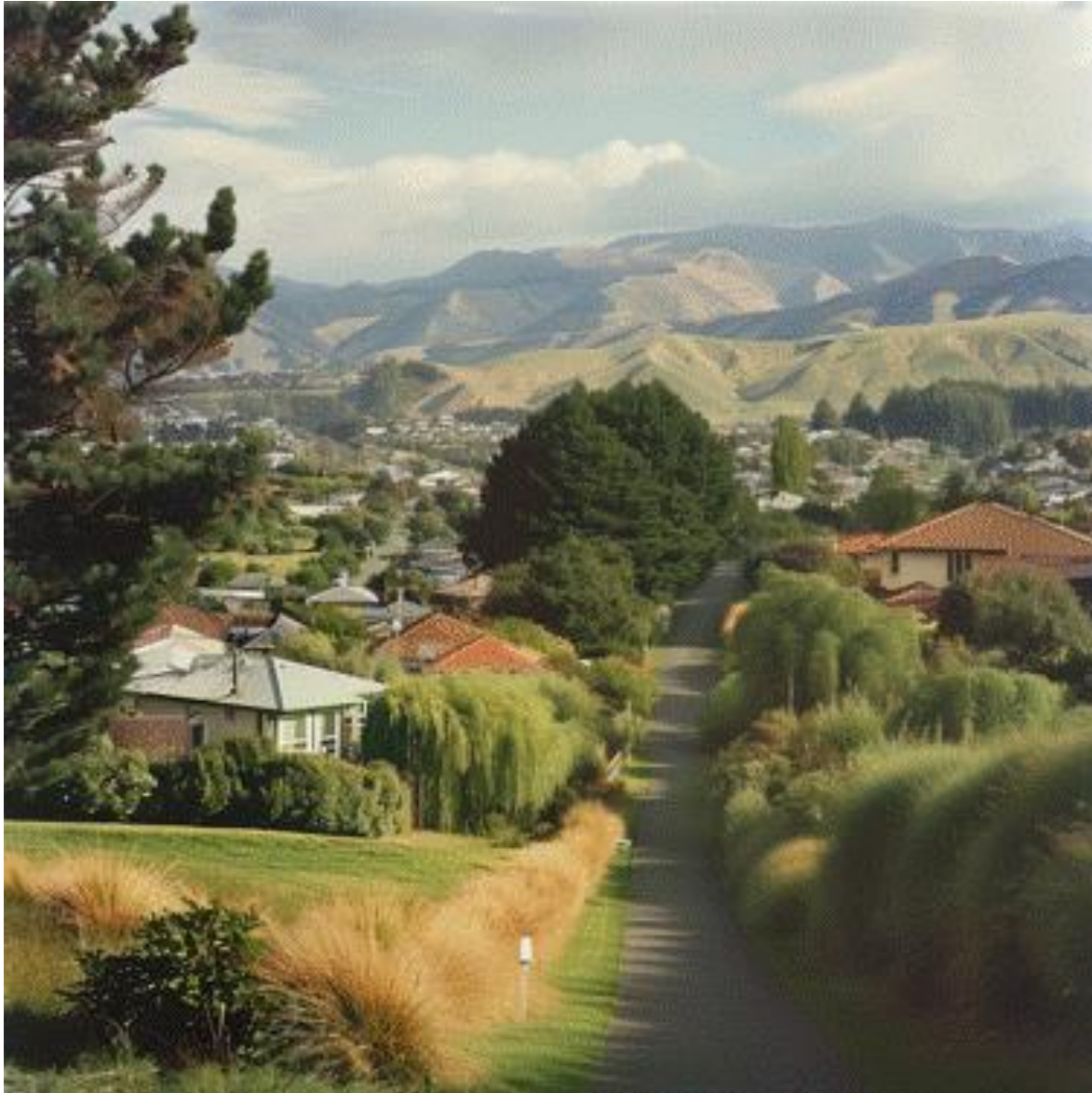
⚙️ Upscale (Subtle) ⚙️ Upscale (Creative) ✨ Vary (Subtle) ✨ Vary (Strong) 🖌️ Vary (Region)

🔍 Zoom Out 2x 🔍 Zoom Out 1.5x 🔍 Custom Zoom

← → ↑ ↓

❤️ Web 🌐

Prompt examples: *Region* editing



Prompting for:

- Active transport and green space boundaries.
- Open pasture and recreational spaces.
- High and medium density housing.
- Wetland restoration.

Assessing quality: GenAI is not perfect





Workshops

- During two workshops we assessed the quality of GenAI images for conceptualising green belt designs for Greater Christchurch.
- Workshop attendees included planners, urban designers, and policy folks.
- Thank you to Selwyn District Council and the Greater Christchurch Partnership for their support and attendance.



Green belt designs



We focused on three locations in Greater Christchurch:

- Eastern Christchurch / Marshlands
- Prebbleton
- Port Hills

*Note that the locations and designs were solely for discussion purposes and not indicative of any planned designs or projects.



Grounding images in reality

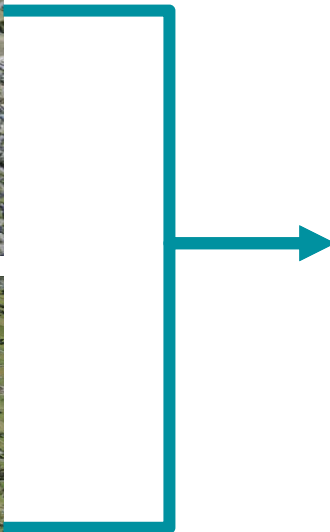


Marshlands Baseline:

- Runoff retention is 29%.
- 27% of residential land is within 300m (~5 minute walk) of an open space.
- Mean distance to the nearest open space from residential land is 558m.
- The average ultraviolet protection factor provided across the study area is 2.5.



Grounding images in reality



Blended image to represent Prebbleton status quo.

Actual images from Google Earth (south of Highway 76 and northeast of Prebbleton).

Different viewpoints and styles



Aerial,
photographic



'Bird's eye', concept
painting

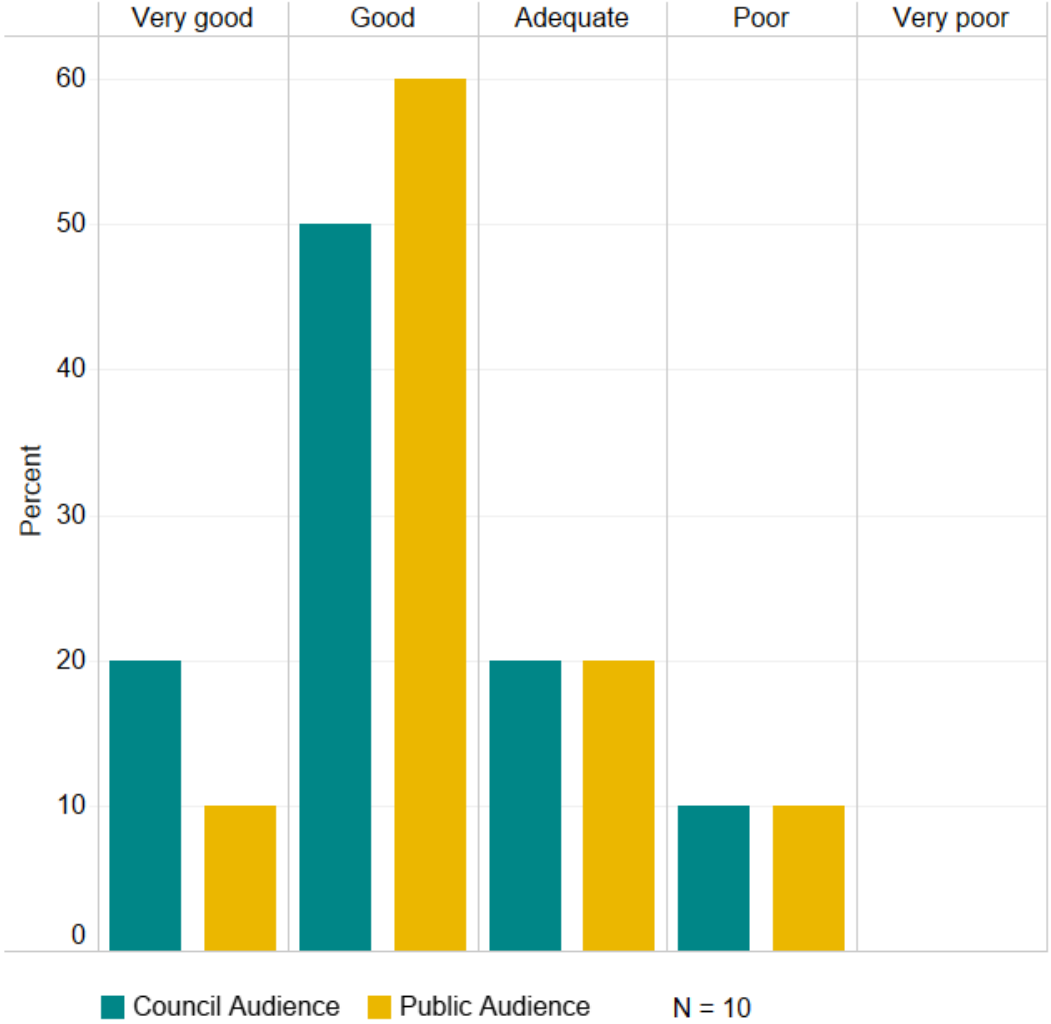


Design detail,
photographic

Marshlands: Residential development with wetland integration and restoration



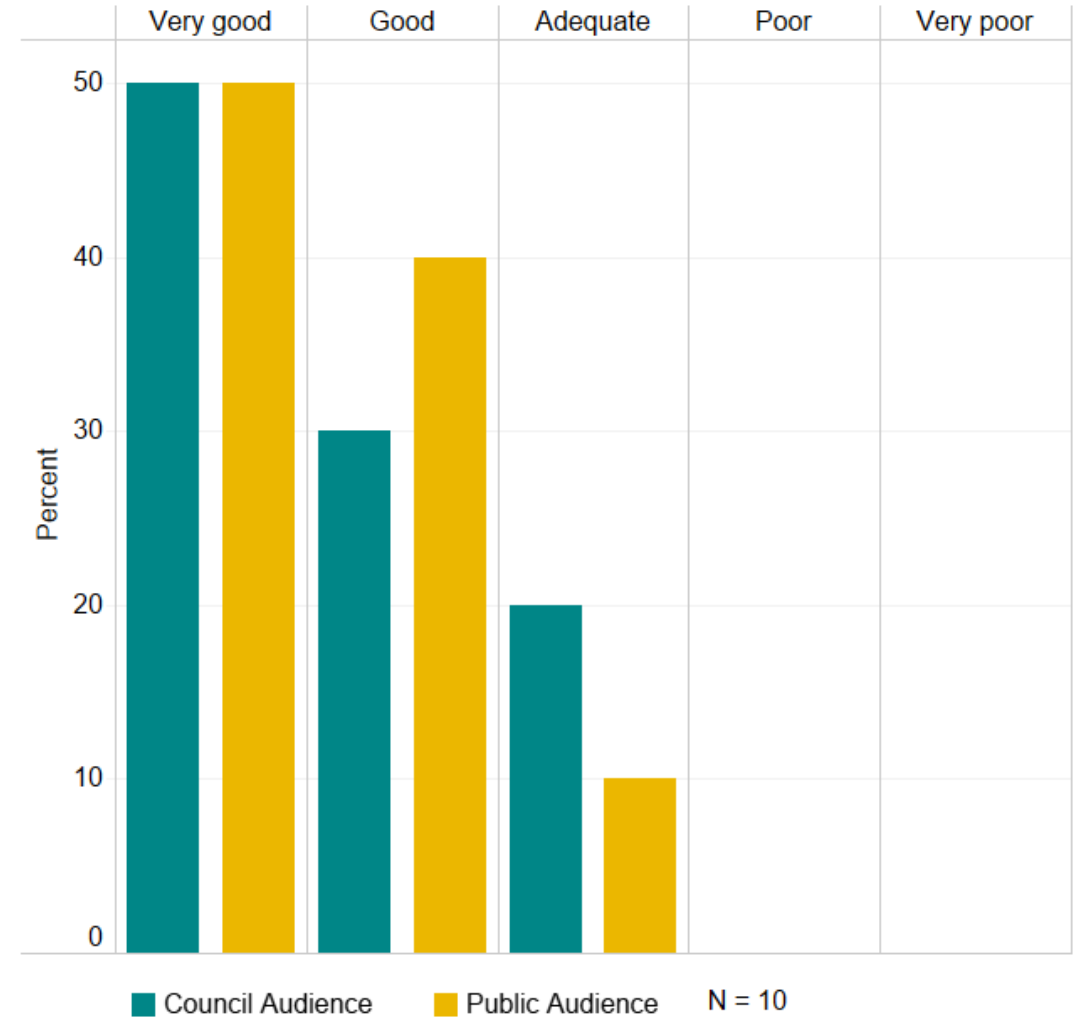
Marshlands: Residential development with wetland integration and restoration



Port Hills: Staged implementation of a fire resistant restoration design



Port Hills: Staged implementation of a fire resistant restoration design



Port Hills: Comparison of possible futures using animations



Increasing sprawl and urbanisation.



Increasing tree canopy and peri-urban buffer.

What's next?



- MBIE Smart Ideas: Harness generative artificial intelligence to inform nature-based adaptation to climate change.
- Using GenAI to scale up tailored and location-specific information for climate change adaptation that considers ethical adoption and meets the needs of farmers, councils, and Māori landowners.
- The project will take place over three years during which we will develop a platform for GenAI in climate change adaptation while also surveying potential end users and developing ethical use guidelines.
- **Contact us to join the mailing list: AI@landcareresearch.co.nz**

Kia ora rawa atu!



**Thank you to Selwyn District Council and the Greater
Christchurch Partnership.**

Acknowledgements



Images in this presentation originated from three sources:

1. Google Earth (slide 10)
2. Midjourney version 6 (created and used under a Creative Commons 4.0 International license)
3. Land Information New Zealand (Urban Aerial Photos of Christchurch on slides 8, and 9).

Questions?



Manaaki Whenua
Landcare Research

