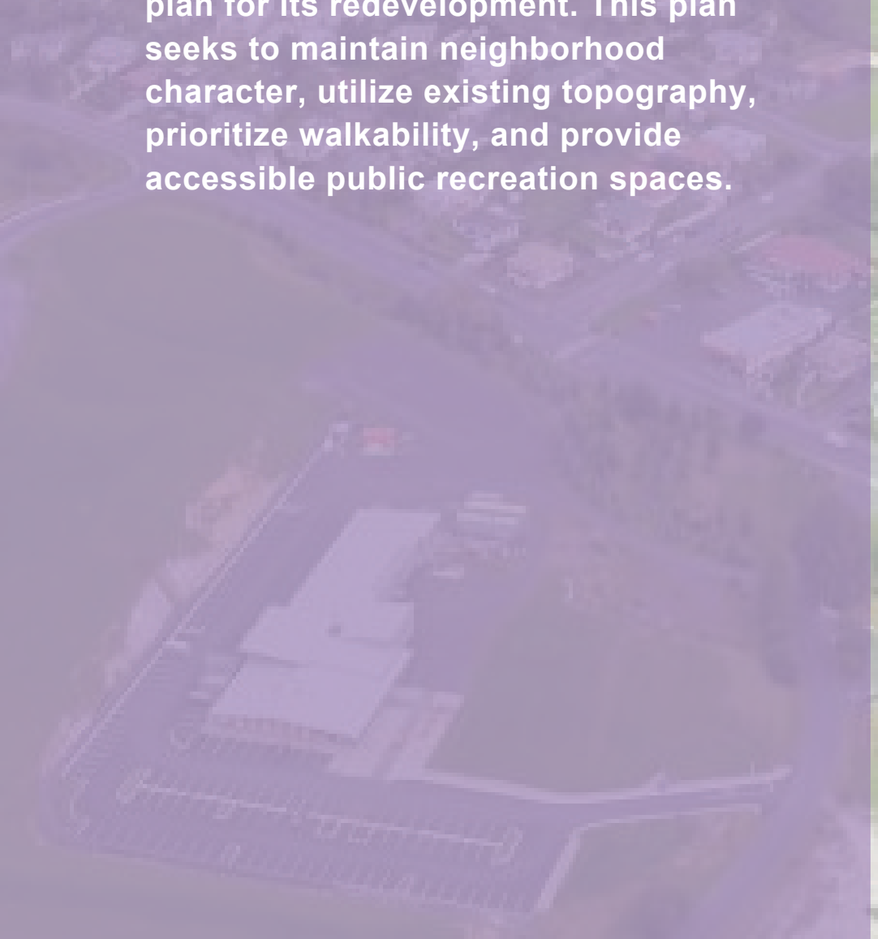
WALNUT HILL
DEVELOPMENT PLAN

18 Roy Crescent, Concord, Dunedin

This document descibes the planning context for the residential lot at 18 Roy Crescent and proposes a design plan for its redevelopment. This plan seeks to maintain neighborhood character, utilize existing topography, prioritize walkability, and provide accessible public recreation spaces.



ANALYSIS

Surrounding Area

Site Character & Planning Context

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Surrounding Area

The development is located in **Dunedin**, New Zealand's 6th largest urban area, in the district of **Concord**, a residential suburb 6km south of the city center.

Dunedin

- Population of 130,000
- Several years of population and GDP growth
- Home to University of Otago, one of the nation's top universities
- Extensive access to nature
- 54% home ownership, median house price: $430,000

Concord

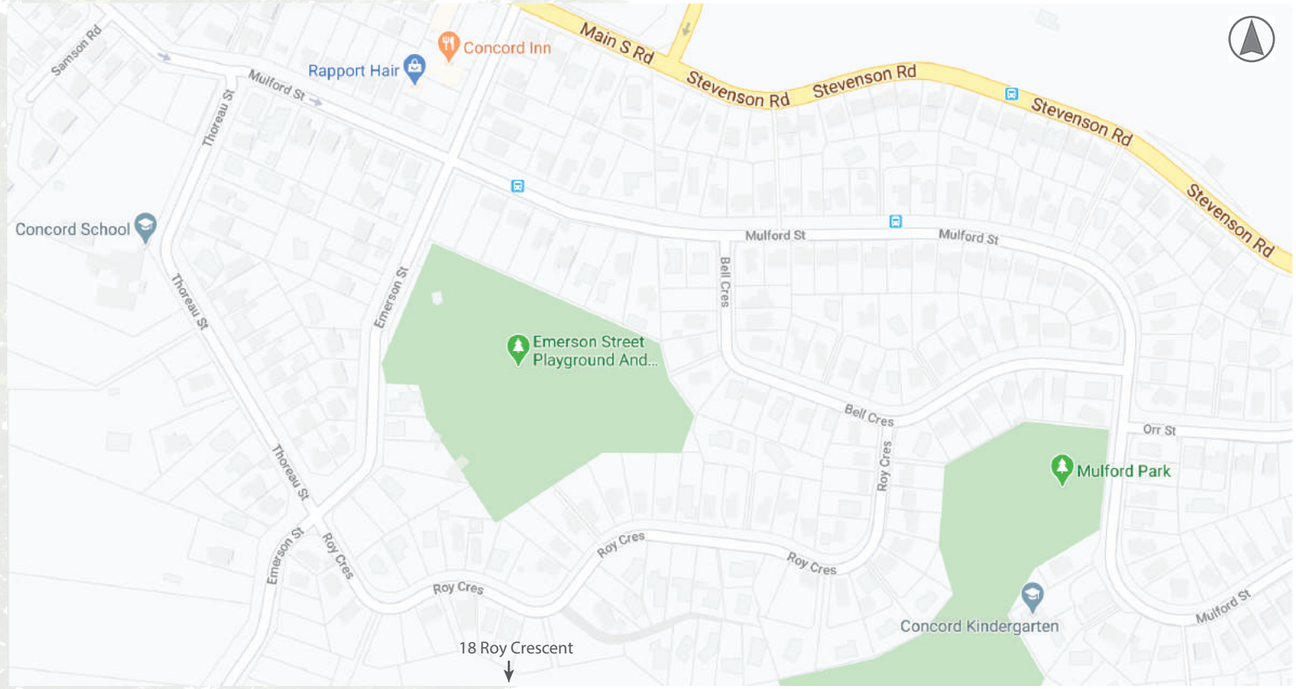
- Historically an industrial center, transformed to residential suburb
- Population of 1,512
- Median age: 36, median income: $29,300
- 63.8% home ownership, median house price: $411,000
- Amenities: school, park, churches, inn, select commercial offerings
- 10 minute drive to Dunedin city, public transport available
- 5 minute drive to beach access

An aerial view of Concord, from Otago Daily Times with edits by author

Neighborhood Character

- Zoned General Residential 1 near site with Rural Residential to the south
- Majority 2 - 5 bedroom homes, modest in character and varied in style
- Average lot size: 500 - 1000 m²
- Several parks and reserve areas
- Organic road pattern; large super-blocks with private right-of-ways

L to R: 120 Mulford Street and 12 Roy Crescent, Concord, from Edinburgh Realty



Concord road layout and lot subdivision, from Google Maps

DESIGN IMPLICATIONS

Because of the growing population and economy in Dunedin, there is high demand in the real estate. The proximity to Dunedin, the access to schools, parks, and beaches, and the modest residential character make this site an ideal residence for young, working-class families.

Residential development should provide a variety of architectural styles and maintain a mix of lot sizes roughly 500-1000 m². It should connect to Roy Crescent, a local road, and/or Emerson Street, a collector road. Road patterns should be organic to fit the current structure, but could be improved to minimize the number of lots without street frontage.

Site Character & Planning Context

18 Roy Crescent, as well as four other sites adjacent to the north, was recently rezoned to General Residential 1. Although this plan considers the development of 18 Roy Crescent specifically, the sites should be incorporated into the greater design plan of the area.

Planning Regulations

Taken from 2GP, effective 2018

Site Design

- Minimum Lot Size: 500m²
- Minimum Building Platform: 7m x 10m
- Building setbacks: 2m, 4.5m from road
- Driveway: 4m width, 1m from building

Road Design

- Road width: 16m, 6m carriageway
- Minimum cul-de-sac radius: 9.5m

Structure Plan (Figure 1)

- Proposed plan for sites 2-5 (Figure x)
- Must include vehicle access to Mulford Park
- Must provide access to 18 Roy Crescent

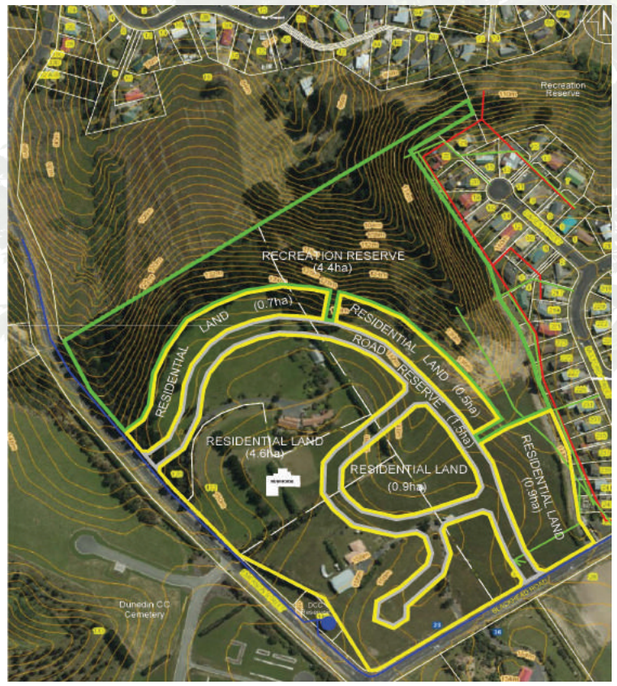


Figure 1, Emerson St Structure Plan, from 2GP

Site description, image from DCC aerial imagery, edits by author

View from the center slope, facing north

Middle of the southeastern slope, facing west

The center slope, from Emerson St, facing east

Bottom of the slope, from the center hill, facing north

Site Character

History

- Never been developed, used for grazing
- Much of the original vegetation remains

Current Uses

- Small scale grazing
- Low-fidelity farm structures

Features

- Large Center slope, facing north
- Steep gully off of Emerson St to the west
- Flat, grassy area at the base of the slope
- Vegetation and steep, varied terrain in the southeast corner
- Impressive views from center slope and eastern ridge

Access

- Rights over the right of way between 6 & 12 Roy Crescent
- 6m wide access leg between 16 & 28 Roy Crescent
- 4.5m wide access leg between 34 & 40 Roy Crescent

DESIGN IMPLICATIONS

The most defining aspect of this site is the topography, which provides design challenges and opportunities. The north-facing slope provides stunning views and year-round direct sunlight. However, the steepness of the terrain in some areas of the site will be challenging to build upon.

Access to the site is also an important consideration; the structure plan calls for vehicle access to Roy Crescent, but the access legs are too narrow for a standard road. The structure plan also calls for connection between the upper sites and Roy Crescent, which is contradicted by the proposed design.

Terrain

Terrain was a driving factor in the development design. The goal of the design is to be low impact and maintain as much of the existing terrain as possible. In addition, the design utilizes the strengths of the terrain: the north-facing aspect, lush vegetation, and natural drainage.

KEY FEATURES

Slope

The areas of the most extreme slope, the southern ridge line and the southeast corner, are to be designated reserve area.

The road pattern works with the contours, so while some roads will be steep, the earthworks needed will be minimal.

Lots are larger than required (average 800m^2), in order to ensure a minimum building platform and usable outdoor space.

Aspect

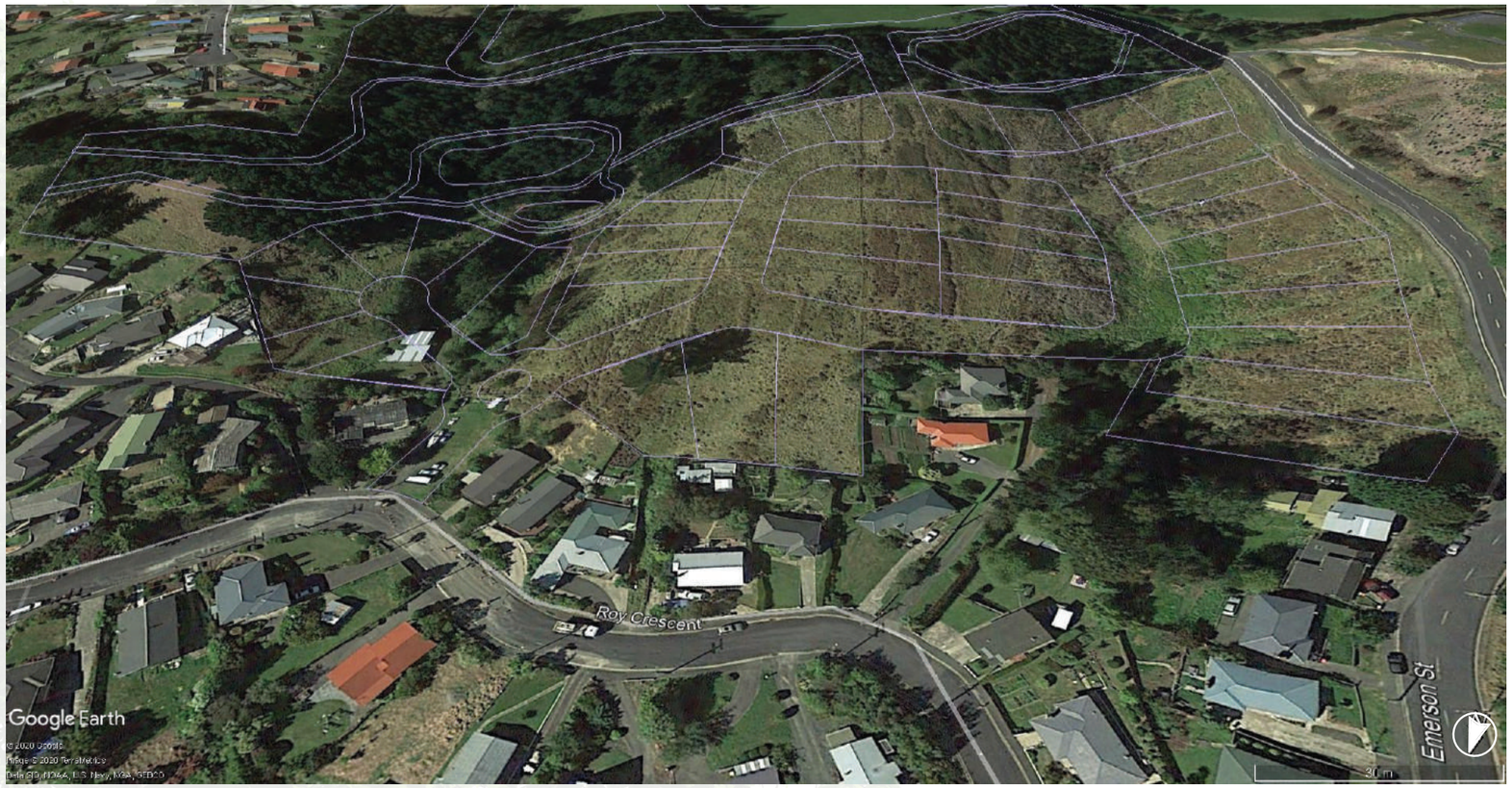
The number of east-west lots has been maximized to make use of the year-round northern sunlight. Residents will enjoy impressive views over the neighborhood and the hills beyond. Because of the degree of the upward slope, the effect of shadows or view obstruction will be minimal.

Vegetation

The dense forested area on the southern border of the development will be preserved in the reserve.

The walnut tree will be maintained in the middle of the roundabout, at the request of the owner.

The scattered trees in the southwest portion of the site will be removed as necessary.



Site design outline overlaid on terrain model, from Google Earth

2m contour overlaid on site design, from BricsCAD

PROJECTED EARTHWORKS

- Partially filling in the gully off Emerson Street to ensure minimum buildable platforms for the lots on either side of the north-south leg of Collins Crescent, and to level the road section where Walnut Street intersects Emerson Street
- Flattening the area around the roundabout to a near-flat grade
- Digging out the stormwater retention ponds and creating a water flow path
- Minor land flattening to create the road surface and building platforms on select lots

Roads

The road design prioritizes the slope of the site, connectivity between Roy Crescent and the southern sites, and access points for all lots. Road features are employed to calm traffic and direct vehicle flow through the neighborhood.

KEY FEATURES

Purchase of 34 Roy Crescent

The purchase of the empty lot adjacent to the easternmost access leg gives the ability to run a two-way road that connects Roy Crescent not only to Emerson Street, but to the additional 4 sites to the south. This connection is integral to facilitate traffic flow and create a cohesive development that integrates with the rest of the neighborhood.

Mini Roundabout

The decision to implement the mini roundabout was sparked by the need to preserve the walnut tree at the base of the access leg, at request of the owner. The roundabout serves additional purposes: it calms traffic both from turning into the development and from coming down the hill, and provides a focal landmark to instill neighborhood identity.

Split Carriageway

The north-south leg of Collins Crescent widens to 18m to make room for a 3m planted center median. This serves two purposes: managing runoff coming over the west side of the slope and off Emerson Street, which otherwise would have collected in the gully, and allowing for a split-height carriageway to mitigate the slope gradient across the street.

Raised Crosswalks

In two locations on Walnut Street there are raised pedestrian crossing lanes. These serve to slow traffic and provide a place for pedestrians to cross safely. The pavement is also a different color and material to indicate the crossing and to provide visual interest. The raised crosswalks coincide with the reserve access paths to provide easy and convenient crossing locations for pedestrians to move about the neighborhood.

Street Parking

The design offers more than required street parking, which was driven by the observation that 18 Roy Crescent often has many cars parked on the street, and the access to the reserve may increase the demand for street parking. The parking is taken out of the berm to avoid congesting the carriageway.

Diagram of a mini roundabout, from Global Streets Design Guide

Example of a mini roundabout, from National Association of City Transport Officials

Example of a split carriage way, Doon Street, Waverly NZ, from Google Maps

Example of a split carriage way, Doon Street, Waverly NZ, from Google Maps

Example of a raised crosswalk, from Victoria Transport Policy Institute

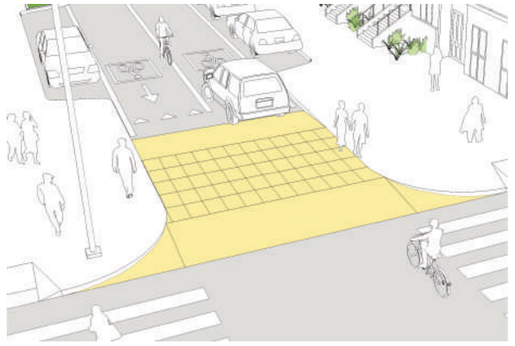


Diagram of raised crosswalk, from Global Street Design Guide

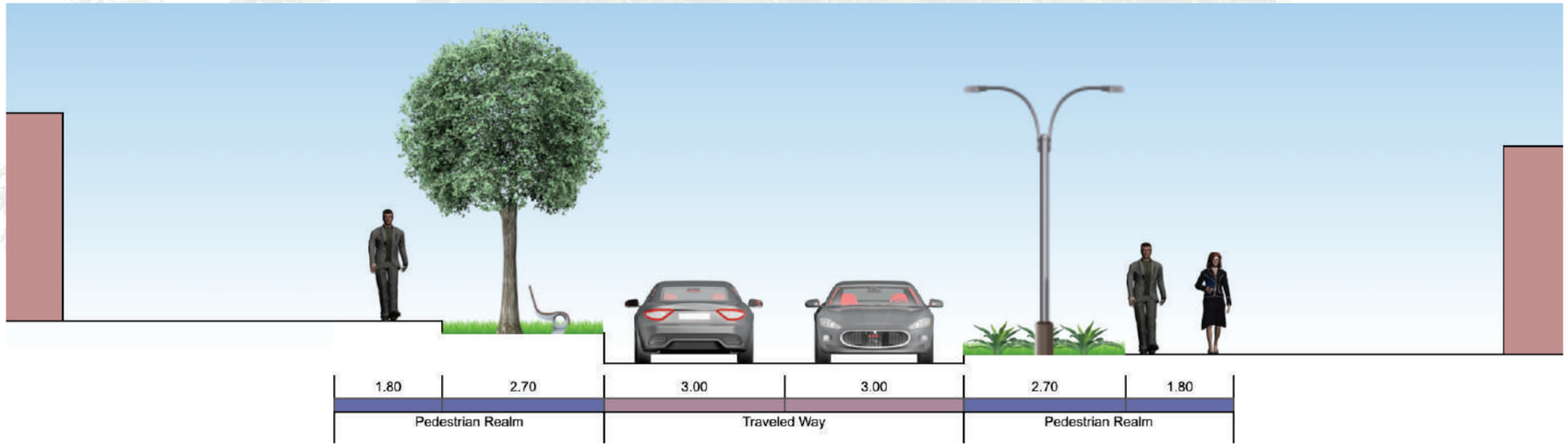
Diagram of indented parallel parking, from Global Street Design Guide

Example of street parking in berm, from Auckland Design Manual

Streetscapes

The streetscapes of the neighborhood were designed with the pedestrian in mind. The goal of these streetscapes is to create spaces where residents feel safe, comfortable, and accomodated to move about their neighborhood.

Walnut Street



Vertical gradient accommodates the natural slope.

Benches give people a place to sit, rest, and enjoy the view after the steep climb up Collins Crescent or afternoon hike through the reserve.

Vegetation provides shelter, greenery, and visual interest.

Lighting improves visibility and safety at night.

DIMENSIONS

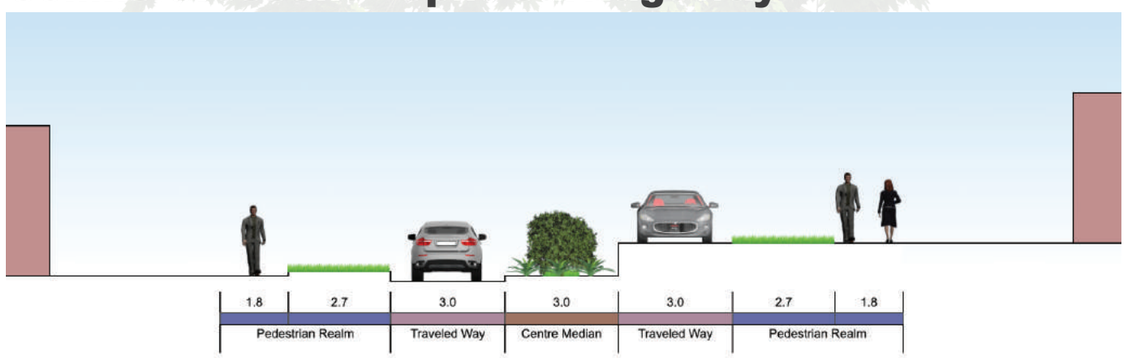
15m Width
The roads have a 15m width, 1 meter less than the suggested 16m width. The slightly narrower width will lessen the extent of earthworks required to run a road over steep slopes, and will encourage slower driving through the neighborhood.

6m Carriageway
The narrower 3m lanes safely control traffic and decreased area paved surfaces.

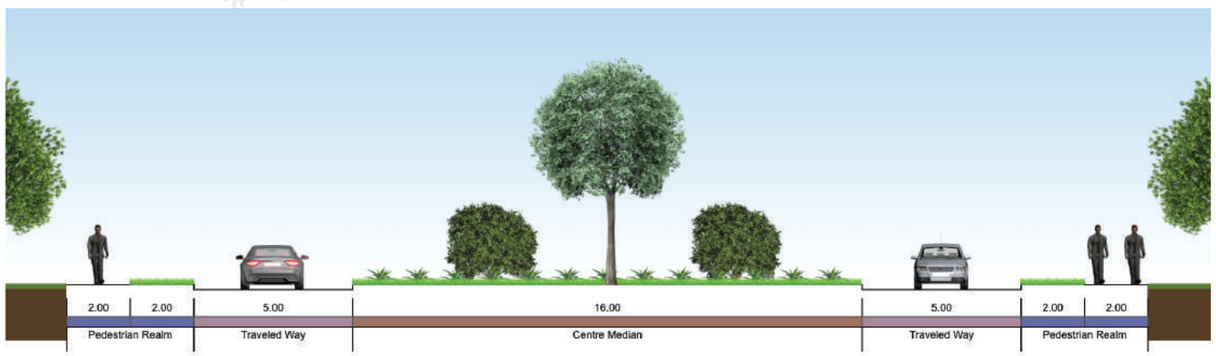
2.7m Planted Berm
The berm protects pedestrians from traffic, provides greenery and shelter, decreases runoff, and allows for 2.3m indented parking spaces with a .4 buffer between the car park and the foot path.

1.8m Foot Path
The foot path offers enough room for two people walking side-by-side or one standard width wheelchair.

Collins Crescent - Split Carriageway



Walnut Street - Roundabout



DESIGN

Public Space

The development offers public space in the form of the reserve on the southern border. There are clear physical and mental health benefits of access to nature in residential areas. Inspired by the Dunedin town belt and other green corridors, the reserve will serve as a recreation area, a connection to the adjacent Mulford Park, a catchment area for stormwater, and a central public space for the entire neighborhood to enjoy.

Pedestrian access path, Glenross St, Dunedin NZ, from Google Maps

Pedestrian access path, Mulford St, Dunedin NZ, from Google Maps

PEDESTRIAN ACCESS

There are three main pedestrian access paths to the reserve: one at the edge of the roundabout, one near the intersection of Walnut Street and Collins Crescent, and one between them at the bend of Walnut Street towards the top of the center ridge.

These access ways were placed in order to give as much of the site nearby access directly into the reserve.

The access ways are 6m wide to ensure pedestrian safety and comfort, and to invite them into the reserve.

STORMWATER RETENTION PONDS

Due to the steep slope of the site and the adjacent developments at higher elevations, the site will gather a high volume of runoff and is susceptible to soil erosion. To combat this, two retention ponds will be placed in the reserve area: one in the sunken pocket in the southeast side of the site, which will collect water coming off the eastern side of the center slopes of the site; and one to the south of the site border, which will collect water from the upper sites and the nearby cul-de-sac.

These ponds will also be areas within the reserve where people relax and congregate, not merely pass through. They will be outfitted with benches and tables for this purpose.

Stormwater retention pond, Bayside Reserve, Auckland, from Google Maps

Reserve walking trail, Jubilee Park, Dunedin NZ, from Google Maps

WALKING TRAILS

The reserve will be threaded with walking paths and trails to encourage movement through the area and to give residents a place to exercise. This will promote connectivity across the site and connection to neighboring areas, particularly Mulford Park.

Due to the steepness of the slopes, the trails will be equipped with stairs and railings where necessary. The main trails will be at least 2m wide to ensure comfort and safety.

Reserve road frontage, Town Belt, Dunedin NZ, from Google Maps

ROAD FRONTAGE

The reserve has road frontage to the south and is backed by lots to the north. The road on the southern side of the reserve is flatter and wider, and will provide better active surveillance to the site. The northern border is more forested and steep, but still well-connected to the development. There is a path that runs along the border which provides views over the site, and multiple wide access ways to allow pedestrians to move in and out of the reserve easily.

Placemaking

A residential development is not just a layout of roads and houses, it is a place where people will spend a large majority of their time with their friends and family. Giving meaning to a place is done by people, but the design is integral in provide places for this to occur. The following areas are highlighted for their potential to facilitate interaction, community, and placemaking.

People are draw to bodies of water: whether that is the local beach or the creek in the backyard. The **stormwater retention ponds** provide a destination for residents to walk to, have a picnic, or escape to nature and relax.

Example of a community enjoying a pond, from Google Image Search

Example of a sloped residential street, Cannington Road, Dunedin NZ, from Google Maps

Streets contribute to placemaking as much as lots and houses, as they are public and well-traveled areas in the development. Abundant sunlight and a nice view can be enough to give a street a sense of beauty and uniqueness. The stretch of **Walnut Street** that climbs the center slope will have this

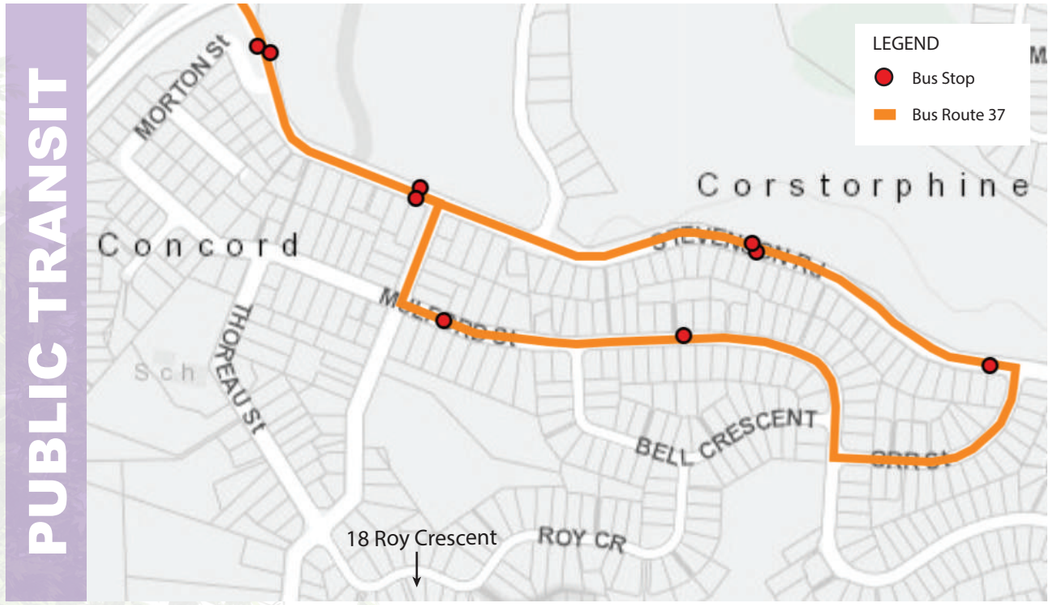
When used properly, cul-de-sacs are great tools for fostering community on a street. **Albert Lane** is a well-designed use of this tool: it is short and straight to avoid confusion in navigation, it provides access to a group of lots which would otherwise require narrow access ways, and it utilizes landscaping to break up the swath of concrete. The lots on this street will enjoy the benefits of an intimate community, without sacrificing connectivity or access to the rest of the development.

Example of a well-designed cul-de-sac, Stenhope Crescent, Dunedin NZ, from Google Maps

Connectivity

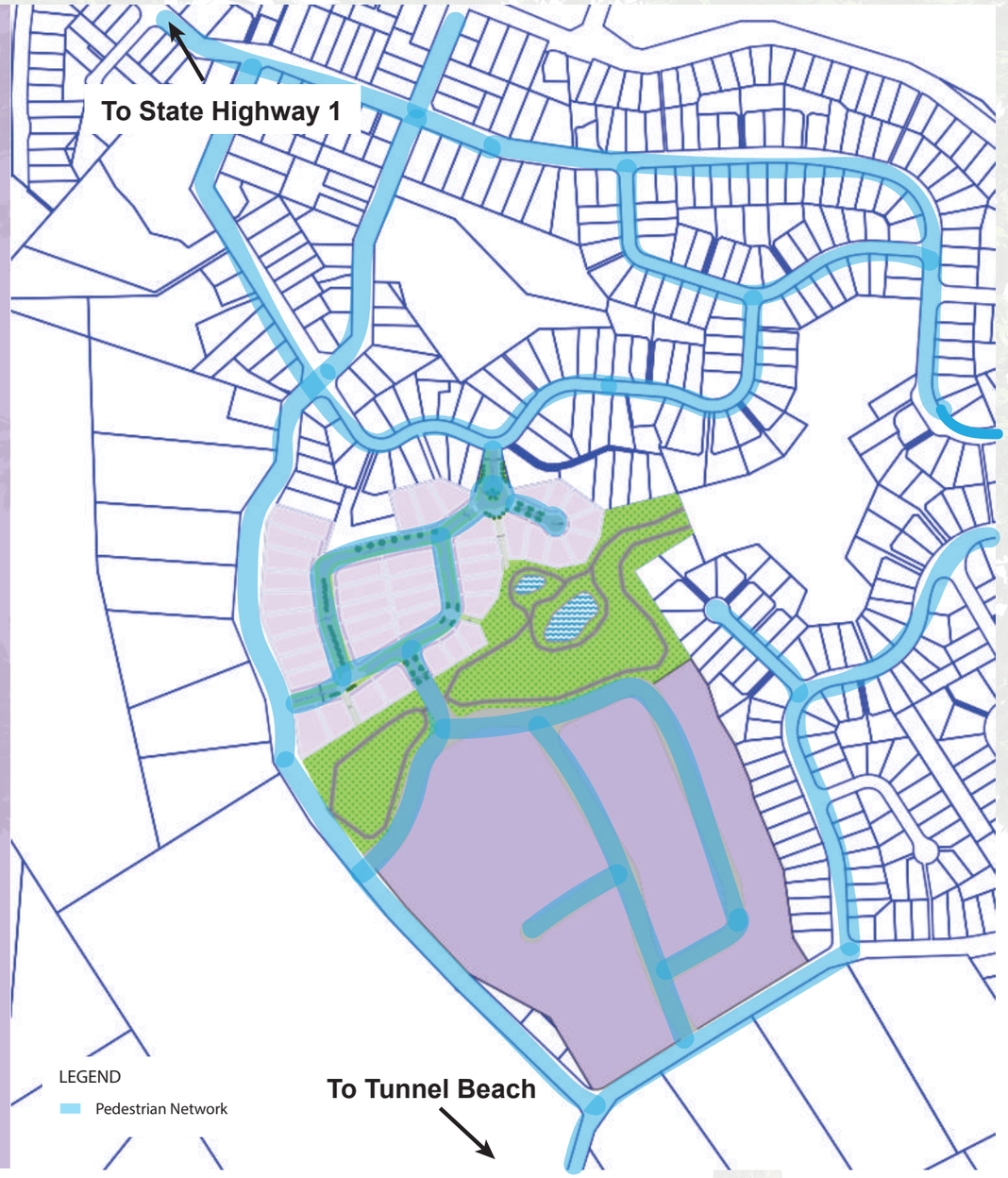
A good development will provide multiple options and modes of connectivity. Walnut Hill provides vehicle access to the surrounding neighborhood and the southern sites, pedestrian access through pathways and reserve trails, and proximity to public transportation routes to Dunedin City. These networks were designed to incorporate the entire site and be convenient and comfortable transit routes.

PUBLIC TRANSIT



Public Transportation Network Route 37, from Otago Regional Council website

ROAD NETWORK



Road network diagram overlaid on development design

PEDESTRIAN NETWORK

Pedestrian network diagram overlaid on development design

VISION