



# Queenstown Gardens Safety Report

Produced for Queenstown Lakes District Council



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# Queenstown Gardens Safety report

## 1. Introduction

Queenstown Lakes District Council (QLDC) has commissioned Opus International Consultants to produce a report providing a brief investigation into current safety hazards, and the potential effects of proposed developments within the gardens.

The report is commissioned in order to clarify conflicting anecdotal evidence about the relative safety of the facilities provided within the Gardens.

## 2. Background

The existing layout of Queenstown Gardens is shown below. In order to cater for increased visitors, a future plan has been designed to improve the facilities and user experience in the Gardens.



### 2.1. Provided Information

The only provided information is a proposed landscape plan for the gardens. The complete plan is attached as Appendix 1. This was prepared by Reset Urban Design in April 2017 and was primarily focused on landscaping and design features, rather than detailed consideration of user safety.



During the visit to site, a member of QLDC (Jeannie Galavazi) was present in order to help clarify the aims of the proposed plan, and some of the options that are being considered for development.

### 3. Scope of Report

This report investigates the current safety issues observed during a site visit, and gives an indication of the severity of each particular issue. Where appropriate, comments have also been made on potential safety improvements that could be made in the observed areas.

The proposed landscape layout has also been assessed, and potential safety issues highlighted. These should be taken into account in any future planning activities, or revisions to the current plan.

Finally alternative options are provided for the gardens with indications of how the safety may be improved through these recommendations.

#### 3.1. Risk Ranking

The potential safety problems identified have been ranked as follows:

The expected crash frequency is qualitatively assessed on the basis of expected exposure (how many road users will be exposed to a safety issue) and the likelihood of a crash resulting from the presence of the issue. The severity of a crash outcome is qualitatively assessed on the basis of factors such as expected speeds, type of collision, and type of vehicle involved.

Reference to historic crash rates or other research for similar elements of projects, or projects as a whole, have been drawn on where appropriate to assist in understanding the likely crash types, frequency and likely severity that may result from a particular concern.

The frequency and severity ratings are used together to develop a combined qualitative risk ranking for each safety issue using the Concern Assessment Rating Matrix in Table 1 below. The qualitative assessment requires professional judgement and a wide range of experience in projects of all sizes and locations.

Severity (likelihood of death or serious injury)	Frequency (probability of a crash)			
	Frequent	Common	Occasional	Infrequent
Very likely	Serious	Serious	Significant	Moderate
Likely	Serious	Significant	Moderate	Moderate
Unlikely	Significant	Moderate	Minor	Minor
Very unlikely	Moderate	Minor	Minor	Minor

Table 1: Concern Assessment Rating Matrix

While all safety concerns should be considered for action, the client or nominated project manager will make the decision as to what course of action will be adopted based on the guidance given in this ranking process with consideration to factors other than safety alone. As a guide a suggested action for each concern category is given in Table 2 below.

RISK	Suggested Action
Serious	A major safety concern that must be addressed and requires changes to avoid serious safety consequences.
Significant	Significant concern that should be addressed and requires changes to avoid serious safety consequences.
Moderate	Moderate concern that should be addressed to improve safety

Minor	Minor concern that should be addressed where practical to improve safety.
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**Table 2: Concern Categories**

In addition to the ranked safety issues it is appropriate for the safety audit team to provide additional comments with respect to items that may have a safety implication but lie outside the scope of the safety audit. A comment may include items where the safety implications are not yet clear due to insufficient detail for the stage of project, items outside the scope of the audit such as existing issues not impacted by the project or an opportunity for improved safety but not necessarily linked to the project itself. While typically comments do not require a specific recommendation, in some instances suggestions may be given by the auditors.

## 4. Safety Audit Findings

### 4.1. Vehicle Entrance/Exit

#### Serious

The current vehicle entrance has multiple reasons for concern. The probability of a crash is common, and due to the nature of mixed vehicle/cyclist/pedestrian collisions death or serious injury is likely.



#### 4.1.1. Narrow Entry

The current vehicle entry is 3.5 to 4m wide. This is not adequate to allow for two-directional traffic. As such vehicles perform unorthodox movements and inappropriately give-way to exiting vehicles in order to enter.



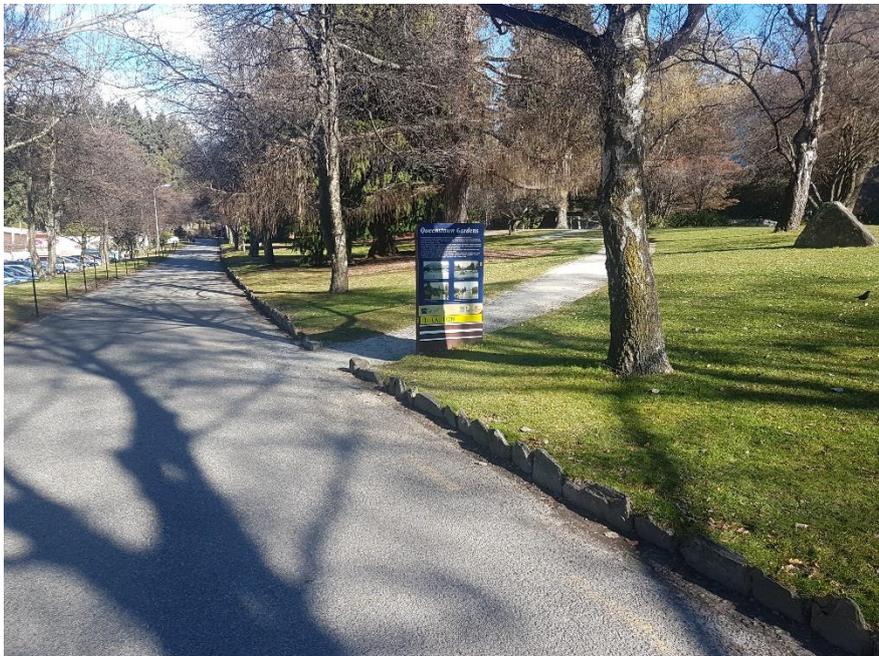
**4.1.2. Sight Distance for Exiting Vehicles**

The current roadside parking along Park St severely limits sight distance to the south for vehicles exiting the gardens. The issue is worsened by the slop of the Road, meaning oncoming vehicles are nearly impossible to see without slowly edging out into the live lane.



**4.1.3. Unsealed Path Termination**

An unsealed footpath from within the gardens terminates directly into the Entry/Exit junction. There is no clear direction for pedestrians, and as a result pedestrians are likely to be present at the junction



**4.1.4. Sealed Path**

The sealed shared use path on the west side of Park Street crosses at the vehicle entrance/exit junction with Park Street. Vehicles turning right into the gardens are unlikely to see any cyclists travelling southbound on the path which crosses directly through the entranceway.

The path also enters on an alignment that is likely to direct any southbound cyclists out onto Park Street and potentially into oncoming traffic.



**4.2. Ice Rink Carpark Entry**

**Moderate**

The Carpark entry is such that low speed vehicle collisions are expected to be common, though death or serious injury is unlikely to occur as these are primarily low speed vehicle vs vehicle collisions.



**4.2.1. Narrow Entry**

The Current vehicle entry is quite narrow. While on site it was witnessed that vehicles would often wait for others before using the entry/exit as there was not comfortably enough room for vehicles to pass each other.



**4.2.2. Sight Distance for Exiting vehicles**

The slope of the current entry/exit to the Ice Rink Carpark, along with the angle of intersection with the main gardens drive, can cause sight distances for exiting vehicles as the driver checks to their left. There is vegetation on the inside of the intersection limiting visibility, and the angle of the intersection means that there may be reduced visibility due to the vehicle pillars, or passengers in the front seat.

**4.3. Main Garden Driveway**  
**Significant**

The driveway often has a mix of vehicles and pedestrians. Collisions are expected to occur occasionally, however serious injury is likely to result due to vehicle – pedestrian collision.



**4.3.1. Narrow Width of Carriageway**

The main gardens driveway is currently too narrow to comfortably allow two-way traffic. It was observed that vehicles had to slow down excessively and perform careful manoeuvres in order to pass by one another.



**4.3.2. Pedestrians / Cyclists / Other Users**

It was observed that pedestrians and cyclists were very commonly using the main gardens driveway. With the narrow width and presence of vehicles, there is a very present risk of pedestrian/vehicle interaction, and several near misses were observed in the short time spent on-site.

**4.3.3. Presence of Steps**

There are several locations where steps are present for road crossings. These present a hazard as some users (e.g. those with children or prams) may have to spend excess time on/nearby the carriageway while they attempt to navigate the stairs. The stairs are generally uneven stone type steps which may exacerbate the issue.

**4.4. Tennis Club, Bowls Club, & Maintenance Lot Access and Parking Significant**

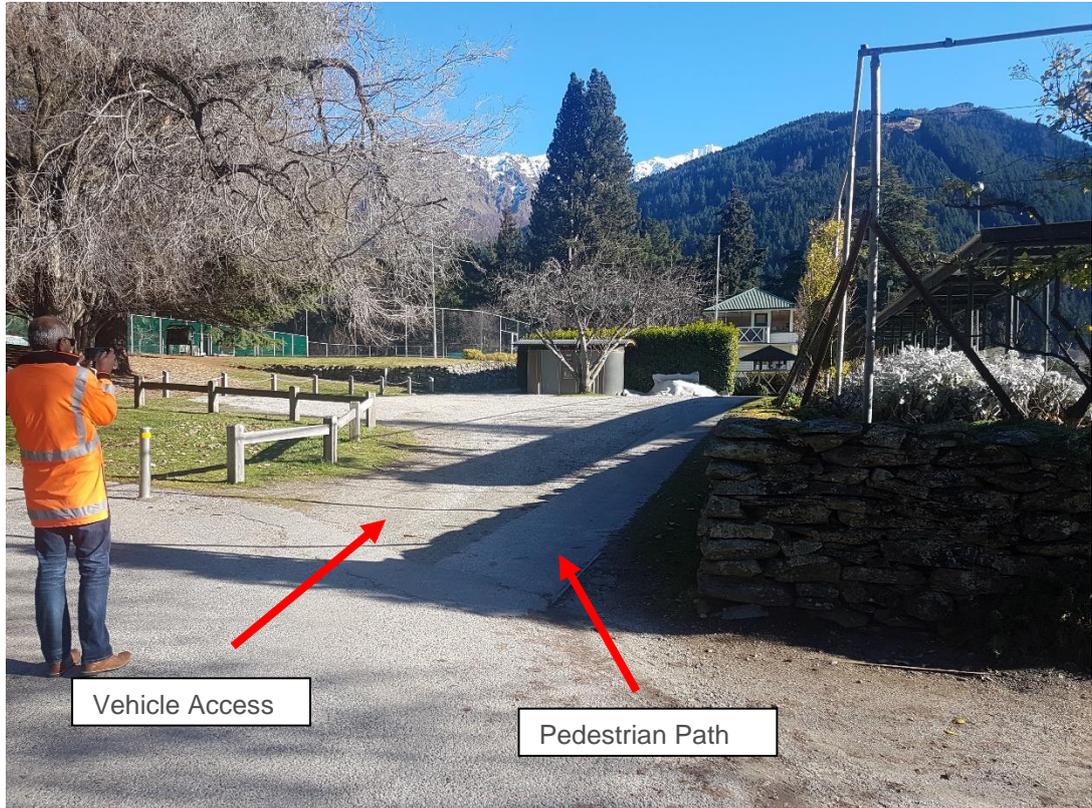
Access and parking for the maintenance lot, tennis and bowls clubs is located at the western end of the main garden driveway. There is also a public toilet located in the tennis club carpark. Similar to the driveway, there is often a mix of vehicles and pedestrians. Collisions are expected to occur occasionally, however serious injury is likely to result due to vehicle – pedestrian collision.



4.4.1. *Pedestrian/ Vehicle Interaction*

There is currently several footpaths directly connected to the carparks. Several of these lead into trafficable areas in ways which are not conducive to adequate sight distances, and could result in Pedestrian-vehicle interactions.

Pedestrian crossing points are also not marked clearly, and vehicles/pedestrians may be unaware of the potential for interaction. This may result in users not being as cautious as they need to be at a crossing point.



4.4.2. *Defined Parking*

The parking/no parking areas are not clearly labelled, resulting in parking patterns which are not consistent, and not in a controlled order to maximise safety. As such vehicles were observed parking at un-usual angles and in places which could cause visibility issue for vehicles and pedestrians.

4.4.3. *Narrow maintenance access*

The access way into the maintenance lot is not wide enough for two-way traffic. This may result in vehicles waiting on the main gardens driveway in order to allow vehicles to exit before being able to enter. This is not likely to cause major issues given the low volume of traffic expected to use this access way.



**4.5. Cycle & Pedestrian Paths**

The multiple intersections within the gardens are expected to produce cyclist and pedestrian collisions

**4.5.1. General**

There is a lack of clarity indicating where trails are footpath only, or shared use with cyclists. Overall the widths of most paths did not appear adequate to allow for safe cycle usage, particularly when shared with pedestrians.

Many paths begin or terminate in unusual places which is likely to result in users ending up in areas trafficable by vehicles. There are several steps leading to no paths as shown in the picture below. There is also a severe lack of ramps suitable for wheelchair or pram access.



The current path along Park Street is un-able to accommodate two-way traffic due to parked vehicles overhanging the footpath/cycle way which restricts its width severely as shown in the picture below.



There are several steep gradient paths in the gardens where cyclists are likely to travel at speed. The same paths are generally too narrow to allow bi-directional shared usage. There are also blind trail junctions/corners which are likely to result in cyclist and pedestrian collisions. The situation is made worse due to the mix of users (age/biking competency and local knowledge) on these trails.

**4.5.2. Bridges**

The main bridge connection to the Queenstown beach is a bottle neck that is not wide enough to allow for bi-directional shared usage. Furthermore there are multiple trail junctions on the Gardens side of the bridge, meaning cyclist and foot traffic is not necessarily flowing smoothly over the bridge, further decreasing the capacity of the bridge. The multiple approaches to the bridge have different gradients. The differential speed created by the varying trail grades has the potential to cause crashes as they merge.

## 5. Proposed Layout Analysis

The proposed layout is shown below. The layout removes general vehicle access from the main gardens driveway, relocates the main vehicle entrance to the Ice Rink carpark, and adds connection to the Maintenance Lot along the south (lake side) of the skating rink. These changes are done with the aim of improving functionality and ease of use for all, however there is a heavy focus towards improving the user experience for pedestrians and cyclists. Accompanying these main changes are several changes to the landscaping and path designs. These changes are aimed to improve the user experience in the park, and are not generally a concern in terms of safety.



### 5.1. Vehicle Access

The proposed vehicle access along the south side of the skating rink will be used to connect to the new private Tennis Carpark (Number 12 on map), the maintenance lot and the bowls club. As such the traffic volumes expected would not be insignificant. It is therefore expected that the connection would be wide-enough to accommodate two-way traffic.

In order to use this vehicle access, vehicles would have to utilize the skating rink carpark as a thoroughfare. This significantly increases the likelihood of problems in the carpark. The connection also joins onto the existing one way maintenance lot access, which would have to be widened to two lanes in order to accommodate increased traffic.

The plan indicates the area to be pedestrian only, but due to it also being the vehicle access there is likely to be significant conflict between the two user groups. Of particular concern is the Walkway down to the beach, which appears relatively narrow for the expected volume of bi-direction mixed vehicle/cycle/pedestrian usage.



The Proposed accessway its self is likely to require extensive safety work due to its proximity to the Queenstown-Frankton beachfront shared use trail.



It is expected the trail would need to be relocated further towards the lake in order to allow room next to the skating rink for a dual carriageway. Relocating the trail is likely to prove difficult however, both in terms of community acceptance, and the physical works required as the trail would likely need to traverse over the rocky beach on a boardwalk or similar.

The relocated entrance to the car park would not necessarily be a safety hazard, but would need very careful design in order to accommodate for the slope of Park Street, and the blind corner in close proximity to the entrance.

The relocation of the vehicle access away from the main pedestrian areas of the gardens is done in order to create separation of user groups, improving both user experience and safety for cyclists and pedestrians.

In discussions on-site, the possibility of limiting vehicle access to certain times of day was discussed. While this may increase visitor safety by reducing vehicle-pedestrian interaction during peak visitor hours for example, the solution is not recommended. Limiting vehicle access at certain times is likely to reduce clarity for users as to whether vehicles may be present, and where they need to be cautious, particularly if pedestrians are under the impression that there is no vehicle access at a time where vehicles may be present. During periods where the park is closed to vehicles, pedestrians will begin to use vehicle access ways which is likely to create a significant safety hazard as the behaviour continues while vehicles are able to access the park.

## 5.2. Cycle Path Link

The cycle path is proposed to link through the area by traversing the outskirts of the gardens.



Discussions with the council have suggested that separately proposed upgrades to the Queenstown-Frankton shared trail will result in significantly increased cycle commuter traffic, and ultimately the cycle traffic will quadruple in volume over time.

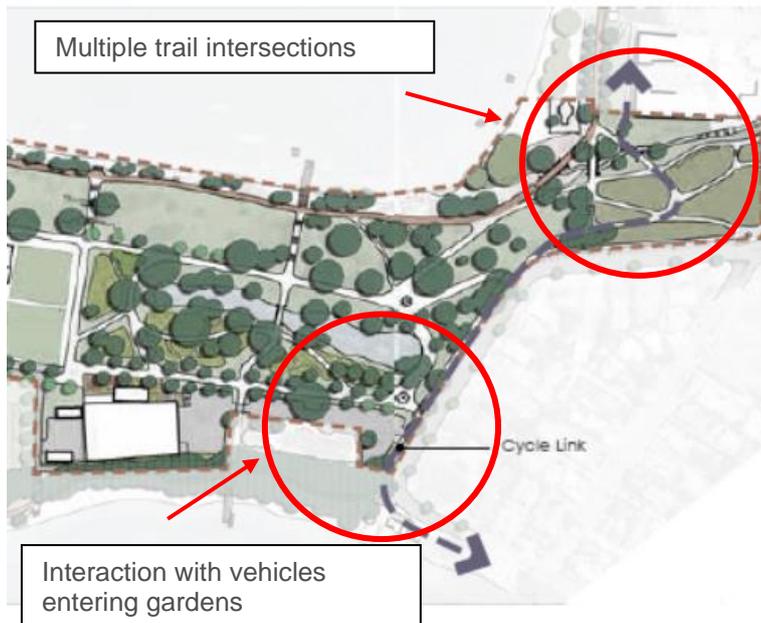
The current paths already present a safety hazard, and are not suitable to cater for an increased traffic load.

The cycle link is indicated to cross the proposed vehicle entrance to the gardens. This is a serious safety concern and it is imperative that any such junctions are designed with safety in mind. The safety of Vehicle/Cyclist intersections can be improved significantly with careful design.

Also of concern is the Northern area of the cycle path where multiple trail junctions occur on a steep hill. These are likely to lead to collisions as users are expected to be travelling very quickly in the Northbound direction.

The additional bridge may provide a bottle neck for users, and should be designed to adequately allow bi-directional traffic to flow without significant restriction.

It is unclear if the cycle link will be available to pedestrian use. The width of the path should be designed to reflect the intended use, and markings & signs must be adequate to inform users in order to prevent dangerous Cyclist – Pedestrian interactions.



## 6. Existing Layout Recommended Improvements

### 6.1. Main Vehicle Entrance/Exit

In order to improve user safety, the current vehicle entrance should be widened to accommodate vehicles moving past each other.

In order to improve sight distance for exiting vehicles, some current parking spaces should be removed from Park Street

Pedestrian/Cycle path crossings should be relocated further back from the junction with Park Street, and clearly marked so that both the vehicle users and cyclists/foot traffic are aware of the crossing. Improvements in marking and alignment of the crossing will help prevent confusion for cyclists and pedestrians, potentially resulting in these user groups using the vehicle accessway less frequently. Relocating the crossing points will also allow for improved visibility.

### 6.2. Ice Rink Carpark Entry

In order to improve user safety, the current vehicle entrance should be widened to accommodate vehicles moving past each other (2 way traffic).

If possible the intersection should be slightly re-aligned during this process to allow for better visibility. Ideally the entrance should be at a 90 degree angle to the main gardens drive.

### 6.3. Main Garden Driveway

The main driveways width should be slightly increased to allow two vehicles to move past one another. Care should be taken not to widen this so much as to encourage a higher operating speed.

A separated pedestrian/cycle path should be constructed alongside the main garden driveway in order to prevent interaction with motor vehicles. Accompanying the separated path should be crossing points that are clearly marked. This will reduce conflict points, and allow users to know where they will need to increase their awareness due to the presence of multiple user groups.

Steps near the carriageway shall be removed and replaced with ramps in order to more safely cater for the park users, particularly those with children, elderly or prams etc.

### 6.4. Tennis Club, Bowls Club, & Maintenance Lot Access and Parking

The parking areas and alignment should be marked clearly to ensure parking is occurring in a safe, efficient manner.

Pedestrian areas should be clearly marked as such, and possibly delineated with flexible plastic bollards or similar. This will allow clearer zoning so pedestrians and vehicles have a better idea of where to look out for other users.

In order for this to occur the several small parking zones should become one large parking area, with pedestrian access around the outside.

### **6.5. Cycle & Pedestrian Paths**

Increased clarity of the paths in the gardens should be a target. This will result in less users on vehicle access ways, and specified paths for cyclists to use in order to help reduce potential pedestrian-cyclist collisions.

If possible the scenic paths for visitors, and direct routes for commuters should be clearly marked. This could be performed with simple signage or coloured markings on the pathways.

The cycle paths on the hill towards Queenstown beach should be widened, and bushes removed in order to provide clear site distances at trail intersections. In order to help reduce cyclist speed in these sections it may be required to use bollards or chicanes, particularly at trail crossing points.

## **7. Proposed Layout Safety Recommendations**

### **7.1. Vehicle Access**

The proposed vehicle access way through the carpark and around the ice rink does not appear suitable to cater for the volume of traffic expected. It is therefore recommended that vehicle access be maintained along the main gardens drive.

This should be completed alongside the improvements mentioned above, namely widening of the road, separated shared use path and increased clarity of parking areas and pedestrian crossings.

Any proposed layout needs to adequately consider the access required to the maintenance depot. As discussed onsite the yard is used as a base for servicing other parks, so the traffic volume is an important consideration, as well as the level of access required for any machinery (trucks, tractors, towing vehicles etc). The appropriateness of having a maintenance depot contained within the gardens should be investigated and alternatives considered, as reducing the volume of vehicles is likely to improve both the safety and user experience of the park.

### **7.2. Cycle Path Link**

The current cycle path along Park Street is not suitable. It is recommended a suitable cycle path be constructed inside the Queenstown gardens boundary, away from the road.

The northern area with several trail intersections should be revised to have less intersections, with those remaining being carefully designed with user safety in mind.

In order to deter pedestrians from using the cycle commuter path, it may be possible to eliminate the pedestrian link to Queenstown Beach.

Care should also be taken to design the proposed bridge with user safety being a high priority.

The surrounding area may be investigated for other possible commuter cycle links. These should be considered as it will allow the large volume of fast moving cycle commuter traffic to stay clear of slower moving recreation pedestrians and cyclists in the main Queenstown gardens area. One such possible link is the path between Camp Street and Coronation Drive, though this path is also very narrow and steep, and would require extensive upgrades to be safely used as a cycle path.



# **Appendix 1 – Proposed Landscape Plan**



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