

# Recovery of recreational assets in Sumner

*Investigating the current state of walking and cycling tracks in Sumner following the Canterbury earthquake sequence, and identifying community desires for their recovery*

Nick Brunsdon, Andrew King, Joshua Neville,  
Sara Stratford and Matt Walcott

Geography 309, University of Canterbury

8 October 2012

## Table of contents

Executive Summary	3
Introduction	4
Literature Review and Background Concepts	4
Methods	7
Results	10
Discussion	15
Recommendations	16
Conclusion	17
Acknowledgements	17
References	18
<i>Appendices</i>	
Appendix A: Comprehensive table of tracks in Sumner	21
Appendix B: List of recreation leader survey questions	23
Appendix C: Residents survey questions and analysis	24

## Executive Summary

- Both Sumner and broader Christchurch residents hold a strong attachment to the Port Hills, with walking and mountain biking tracks serving as an important conduit into this environment. This report focuses on such tracks in the Sumner and Godley Head area, investigating the impact of the Canterbury Earthquake sequence and how the tracks can be improved as part of their recovery process.
- The Habitat Sumner group set out a brief that developed into the following research questions:
  - 1) How has the state of walking and mountain biking tracks in Sumner changed since the Canterbury earthquake sequence?
  - 2) How can the community's desires be implemented in the recovery of these assets?
- The report follows three methods:
  - 1) Geospatial Survey - forming a map and database of all walking and cycling tracks in the area, through physical surveying and secondary data collection.
  - 2) Interviews with key figures in the recreation community to gain a better understanding of the track network and current issues.
  - 3) Surveys of recreation leaders and Sumner residents to gain an understanding of their needs and desires.
- Due to earthquake damage, the length of open tracks has fallen from 65 Km to 29 Km, though there are plans in place to remediate, reopen or replace all but 3 Km. This comprehensively covers formal tracks, however may exclude some informal, community built tracks.
- Residents want better signage, more information about track closures and reopening. Recreation leaders also want better information about track closures, and mountain bikers in particular want the Captain Thomas track repaired or replaced and for a beginner to intermediate skill level transition mountain bike track developed. These survey responses are over-representative of currently active residents, due to self selection bias
- From these results we have developed a series of recommendations, suggesting potential locations for a new 'beginner to intermediate' mountain bike track, design considerations for all future trail developments, and potential opportunities for recreational use of red-zoned residential land.
- We recommend that future research assess the Sumner trail network in relation to NZ standard HB 8630-2004 to ensure tracks are fit for users intended purposes and are signposted correctly.

## **Introduction**

This is a report undertaken by University of Canterbury Geog 309 students, commissioned by Habitat Sumner, a division of the Sumner Community Group. Given the extensive damage and ongoing rockfall hazard threatening recreational assets in the Sumner area following the Canterbury earthquake sequence, a brief was developed to assess the extent of this damage, and identify how these assets can be improved in the recovery process so that they reflect the preferences of neighboring residents and visiting users. From first assessing determinants of track usage, and methodologies for assessing tracks in the Literature Review and Background Concepts, a set of three methods was developed. All three methods and their results are covered together, leading into a discussion and ultimately a series of recommendations.

## **Literature Review and Background concepts**

An assessment of background concepts and methodologies through a literature review was undertaken. This was to gain perspective of what Sumner was recovering from and to guide the formation of the research methodology. The literature was assessed across four categories: community recovery after a disaster; walking and cycling network evaluation methodologies; environmental influences on walking and cycling; and track classification.

### ***Community recovery after a disaster***

Following a disaster event, the recovery of a community can be determined by a number of factors. Nigg (1995) consults previous literature on the subject to address some factors understood to influence recovery outcomes. The first factor influential on outcomes was the physical recovery stages following disaster; restoration, replacement/reconstruction, and betterment/developmental stages (Nigg, 1995). The next influential factor is the constraints following a disaster, including physical, temporal, and subjective constraints (Nigg, 1995). She also found the focus on physical reconstruction misses the social realities that transpire in a post disaster community. Recovery in communities is not a linear process in which the physical reconstruction can repair the resultant damage to social networks, community framework, and resilience capabilities (Nigg, 1995).

Other authors on the subject also provide useful insight. Tocqueville (as cited in Patterson, Weil & Patel, 2007) looks at the outcomes that civil society acting together can achieve post disaster. Communities, by acting cohesively, can address both immediate issues and generate long term solutions that have better resultant outcomes than those communities that rely on government assistance alone. Chamlee-Wright and Storr (2011) explore prior research and theory with regard to social capital and how this is used to develop collective narratives. Social capital is understood in prior research as comprising networks and norms that individuals and groups utilise to pursue the individual and group ends. It is found that high social capital aids disaster recovery and improves efficiency. If a community's collective narrative is 'positive future outcomes, the encouraging features of place and space, and the resilience ideology,' the community's post disaster recovery outcomes will be more likely met.

Communities can derive a large number of benefits from community led development (Inspiring communities, 2010). Given the trying times that residents of Sumner have experienced, the development following the earthquake is likely to have a more positive impact on identity, resilience capabilities, and an improved sense of place, if a community focused and implemented approach is taken. This literature contributes beneficial arguments and discussions for recovery at a community level, and has also helped us to focus the survey in an appropriate manner.

### ***Walking and cycling network methodologies***

The body of literature addressing walking and cycling network methodologies assesses usage determinants for recreational facilities, primarily walking trails. All look towards increasing usage of community recreation facilities with the aim of reducing headline obesity rates, however go about this from a wide range of methodologies. Corti, Donovan and Holman (1996) follow a purely qualitative approach in assessing determinants of recreational facility use; whilst Lu & Campbell (2008) assess the same determinants through a quantitative approach, with both investigating user demographics and environmental characteristics of the facilities or trails. Troped et al. (2001) and Reynolds et al. (2007) both follow complementary quantitative approaches, with the former contrasting the self-reported barriers to trail use with objectively measured barriers, and the latter relating surveys of physical trail characteristics with usage patterns. These studies identified a conflict between a desire for well-provisioned facilities with desires for an authentic natural experience. Attempts to build up a demographic profile of trail users appears to be locale specific as suggested by conflicting results of these studies, and thus limiting replicability or any direct comparisons with the Sumner area.

### ***Environmental influences on walking and cycling***

This body of literature looks at the various different aspects that influence physical activity to increase fitness and reduce detrimental health effects. One of the most common features found throughout literature on this topic was the influence of aesthetic views and environments. It reads that people that live in a visually appealing environment were more likely to use recreational assets for exercise than people who lived in less visually appealing environments. Brownson et al (2000) reported 19.4% of participants reporting scenic beauty being the most likely aspect to influence the use of trails in Missouri. Conditions of tracks were also noted to have a large influence on usage. Siderelis et al. (2010) showing that mountain bikers tended to favor a mountain biking site with a non-degraded trail condition and a more challenging trail layout. Functionality was another significant result where by convenient facilities, access to services and traffic were all found as important factors in promoting exercise with 15.9% of participants liking the convenient location of trails (Brownson et al 2000). These studies identified key environmental influences that can contribute to the current state of tracks in Sumner, promoting important influencers that academic research has found to be valuable features of walking and cycling tracks. Therefore these influences can be promoted to the Sumner community as ideas of how to improve current or future developed tracks.

### ***Track classification***

Track classification is an effective means of letting users know if a track is appropriate for their intended use. Classification systems identify key physical attributes of tracks that impact on user experience and assign a descriptor that aligns these with user expectations (The standards council, 2004). In New Zealand, we have a variety of different management bodies of the recreation facilities available. This being the case, a standard for track classification has been developed: NZSHB8630:2004 "Tracks and Outdoor visitor structures." It can guide track development, maintenance, improvement, and signage so that users' needs and preferences are acknowledged and accounted for. This standard, however, is yet to be adopted by the Christchurch City Council and thus has not been applied to tracks in the Sumner area. In addition, the standard does not make provision for a mountain bike/multi use track grading system; we recommend supplementary information be used. Table 1 below indicates classifications that could be utilised throughout the Sumner track network. When assessments were made for each track in this report, the classifications in Table 1 were used.

Table 1: - Track Classification summary as developed from NZHB8630:2004, IMBA guide to providing great riding, and CCC mountain bike track guide.

Track Classifications of tracks in Sumner study area								
Attributes	Accessible Path	Path	Short Walk	Walking Track	Mountain Bike Beginner	Mountain Bike intermediate	Mountain Bike Advanced	Shared Use
<b>User Group</b>	Suitable for all including wheelchairs and Prams	Urban Residents	Short stop travellers	Day visitors	Beginner biker no prior experience required	MTB Moderate fitness and skill level required	MTB Advanced fitness and skill is required (not Down Hiller Tracks)	Mountain Bike and Walker tracks where MTB cedes to walker
<b>General description</b>	Sealed surface, wide track, shallow gradient	Well formed and compacted surface suitable for all ages, large amounts of furniture, reasonable width	Well formed and easy walking track, well maintained, nearby urban areas but set in natural environment	Extended Walking track, variable surface and gradient, suitable for those with more advance levels of fitness or looking for a remote experience	Single track or 4WD, short distance, compacted relatively smooth surface, track flows freely and is free from obstacles	Single track, some obstacles and technical sections but track flows freely, moderate distance, gradient can vary	Variable surface, with technical sections of track and on track obstacles, track is tight through most sections, a high level of skill is expected but full suspension not	Wide track with compacted surface, any length trail, designed with passing areas and high use. Gradient can vary

## Methods

Firstly, the project brief called for an assessment of the current status of the walking and mountain biking tracks in Sumner, and to investigate how the state of these tracks had changed following the earthquake sequence. To achieve this, a geospatial database of tracks in Sumner was compiled. This drew from a mixture of primary and secondary sources; the secondary sources being used to counter the challenge of currently inaccessible tracks. Secondly, the project brief sought an understanding of community desires for the recovery of these tracks. This was achieved through interviews, surveying of recreation leaders, and surveying Sumner residents. The scope of the study was informally defined in the brief as Richmond Hill, Sumner Valley, Taylor’s Mistake Valley and Godley Head. This was developed into a definitive area, comprising three area units from the Statistics New Zealand 2006 Census - Mt Pleasant, Moncks Bay and Sumner. Tracks that are outside this scope but provide connectivity into the area are also included. The study’s scope, in relation to the tracks surveyed, can be seen in Figure 1 below.

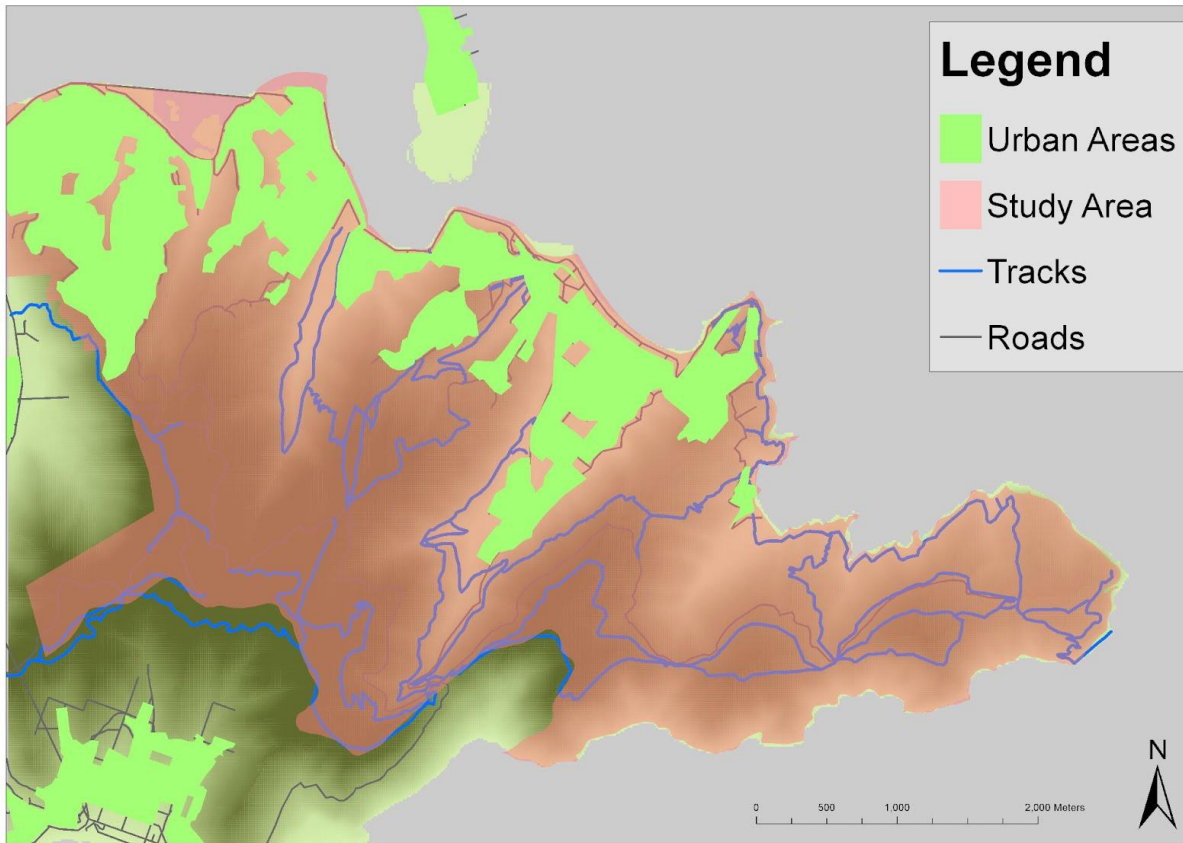


Figure 1:- Study area in relation to existing tracks, roads and urban areas.

### ***Geospatial review***

We aimed to physically survey as many tracks as possible, and then use secondary sources to supplement this data in the case where, tracks were inaccessible. The Christchurch City Council (CCC) map “Port Hills Walks - Eastern” was used to direct our efforts. This guide indicates which tracks are open to the public and therefore which are suitable for physical investigation. Open tracks were walked or mountain biked, with the GPS track log used to locate them as features within ArcMap. Track conditions were noted and categorised into a framework following a method inspired by Reynolds et al. (2007). For the significant proportion of tracks that were closed due to earthquake damage, their location was corroborated with an amalgam of alternatives. Mountain bike tracks were located using the crowd-sourced mountain bike track website [tracks.org.nz](http://tracks.org.nz), walking and shared use tracks from “Port Hills Walks - Eastern”, larger tracks from Land Information NZ (LINZ) topographic data, and narrow informal tracks from LINZ aerial photographs. In the case of these inaccessible tracks, conditions were assessed from the interviews as outlined below as well as track descriptions in “Port Hills Walks - Eastern”.



### ***Interviews***

Another data collection method utilised was the undertaking of several interviews. These interviews complemented the physical track survey as a source information on track status. The strength of this method is, that it is “helpful for delving into and attempting to understand complex behaviors, experiences, and opinions.” (Longhurst, 2009, 582). However it also posed challenges as described in Longhurst (2009, p. 582) “Formulating a schedule of questions and/or prompts, recruiting participants, organizing times and spaces in which to conduct interviews.” This was demonstrated by the difficulty we had in contacting and arranging an interview with a CCC park ranger, which took approximately two weeks.

### ***Surveys***

Two surveys was conducted in order to address the second component of the research question: understanding the community’s desires in the recovery of the track network. This method did suffer from a number of limitations associated with it, as given by Preston (2009, p. 47) “The design of the questionnaire reflects the research question, the type and size of the sample, and the available resources.” The small scale of our survey limits the inferences that can be made from it. In order to build a comprehensive understanding of track user groups and the state of the tracks, recreation leaders involved in organising recreation activity or track maintenance on Sumner trails were canvassed through an open-ended qualitative survey. Leaders of recreation groups were contacted via email, requesting their input, and were then followed up with brief survey comprised of six open ended questions (refer to Appendix B) seeking to understand the factors determining their trail usage, thoughts on the condition of trails, and ideas for the future. They were also requested to forward on the survey to relevant persons, thus gaining further respondents through a ‘snowball’ process.

A wider survey based around more quantifiable questions was circulated to Sumner residents. It was important to understand the Sumner residents’ perceptions and how they valued tracks to inform a recovery process that reflected their desires, as they are a key stakeholder group. From this survey we gained an understanding of the current and future usage and desires related to track usage in Sumner. The survey was used to understand several key issues regarding Sumner recreation tracks.

- A demographic profile of users to affirm how representative the sample was in relation to the Sumner population - age, gender, where they lived, and if they were involved in the Sumner Community Group.

Main characteristics were chosen from literature reviews and ideas from the recreation leader survey, also an optional comment box was placed for any additional information.

- Recreation determining factors - if they had children, dogs or any physical impairments.
- Participation in recreational activities and their frequency.
- The importance of various track characteristics.
- Change in usage of tracks following the earthquakes.
- What residents would desire as part of a future track network.

The survey was produced using surveygizmo.com which allowed it to be filed over the internet. Both a quantitative and qualitative approach was taken with multi choice questions and open-ended questions, with the questions and results shown together in Appendix C. Using the Sumner Residents' Association website and monthly email newsletter provided a conduit to the Sumner Community, as well as Facebook groups such as that of the Christchurch Coastal Pathway Project. While this provided useful insights, it suffers from self-selection bias, whereby the individuals with a self-interest in outcomes - walkers, runners and mountain bikers - are over-represented at the expense of inactive or infrequently active residents who are under-represented.

## **Results**

The extent of existing cycling and walking tracks in Sumner are illustrated in Figure 2 (p. 12), with the accompanying data summarised in Table 2 (p. 13), and a comprehensive track information table in Appendix A. The distances given in the table for each track were calculated using a feature geometry tool of ArcMap, the accuracy of which will depend on the accuracy of the track data. This is limited by the quality of GPS signals received, which can be limited by steep terrain such as that found in Sumner, and bush cover. From extensive discussions with Nick Singleton (CCC Port Hills park ranger), the formal tracks of the area are comprehensively covered, however it is worthwhile acknowledging that many informal tracks may not have been captured by these processes.

These measures enabled a count of the total distance of tracks available in Sumner of approximately 65 Km prior to the earthquake sequence, falling to 29 Km at the time of this study, although Mr Singleton outlined plans to remediate the majority of closed tracks. One track that was identified as unrecoverable was the Mount Pleasant Bluffs section of the Crater Rim walkway, however there are already plans in motion to develop an alternative route further North, which will offer a far wider viewshed, particularly to the North, thus it will have a much greater amenity value, not to mention greater resilience to

earthquake induced rock fall in future. The northern half of the Captain Thomas track is unlikely to be recovered, however there are plans in place to remediate the southern half of the track, and develop an alternative route to replace the connectivity of the northern section. The only tracks identified by Mr Singleton as likely to be unrecoverable and unlikely to be replaced with alternatives were the Tunnel Track and eastern-most section of the Godley Head. Once all recovery works have been completed, this will represent a net loss of approximately 3 Km across the study area, from the initial 65 Km of tracks in the area prior to the earthquake. In fact, the Department of Conservation is taking the earthquake damage as an opportunity to thoroughly renovate trail surfaces across Godley Head as rockfall damage is addressed. From discussions with Laurence Mote, a grassroots cycling advocate and trail developer, we were made aware of a plan to construct a track nominally titled *Sea to Summit* on council owned land on Richmond hill. The trail, annotated in Figure 2, would be constructed with a wide surface suitable for walking and mountain biking, and have a gentle grade to enable groups of all fitness levels. Despite a strong base of community support, gaining council approval for the track was identified as a barrier.

The recreation leaders' survey suffered a poor response with only four replies, however the respondents represented a range of groups, walkers and mountain biking groups of different skill levels, outlining useful points and suggestions and providing much needed perspective on how such trails are used. Across both groups, earthquake hazard safety was identified as a key determinant of track use, with Ian McLeod (walking group leader) expressing a desire for more information about risks so that his group could make informed decisions for themselves, rather than be subject to conservative blanket track closures. Mr McLeod stated that connections between Sumner trails and the broader Port Hills trail network was not an issue for walkers, due to the short distances that they cover. However, mountain biker Mandy Holdstock identified a desire for connectivity to create 'circuits' so they didn't have to cover tracks more than once and to minimise cycling on roads. Following on from this, Christchurch Single Track mountain bike club track development officer Graham Allan identified a longer term desire for the post earthquake recovery of a Port Hills traverse route in some form. Mr Allan also identified a need in the mountain bike community for beginner to intermediate trails, to provide a transition for learning mountain bikers who currently face a large step up in skill level coming onto the Port Hills trails from the popular flat trails of McLeans Island or Bottle Lake Forest. The Captain Thomas track (annotated in Figure 2) is currently closed, and Mr Allan described it as a critical link in a popular circuit that began and finished in Sumner township.

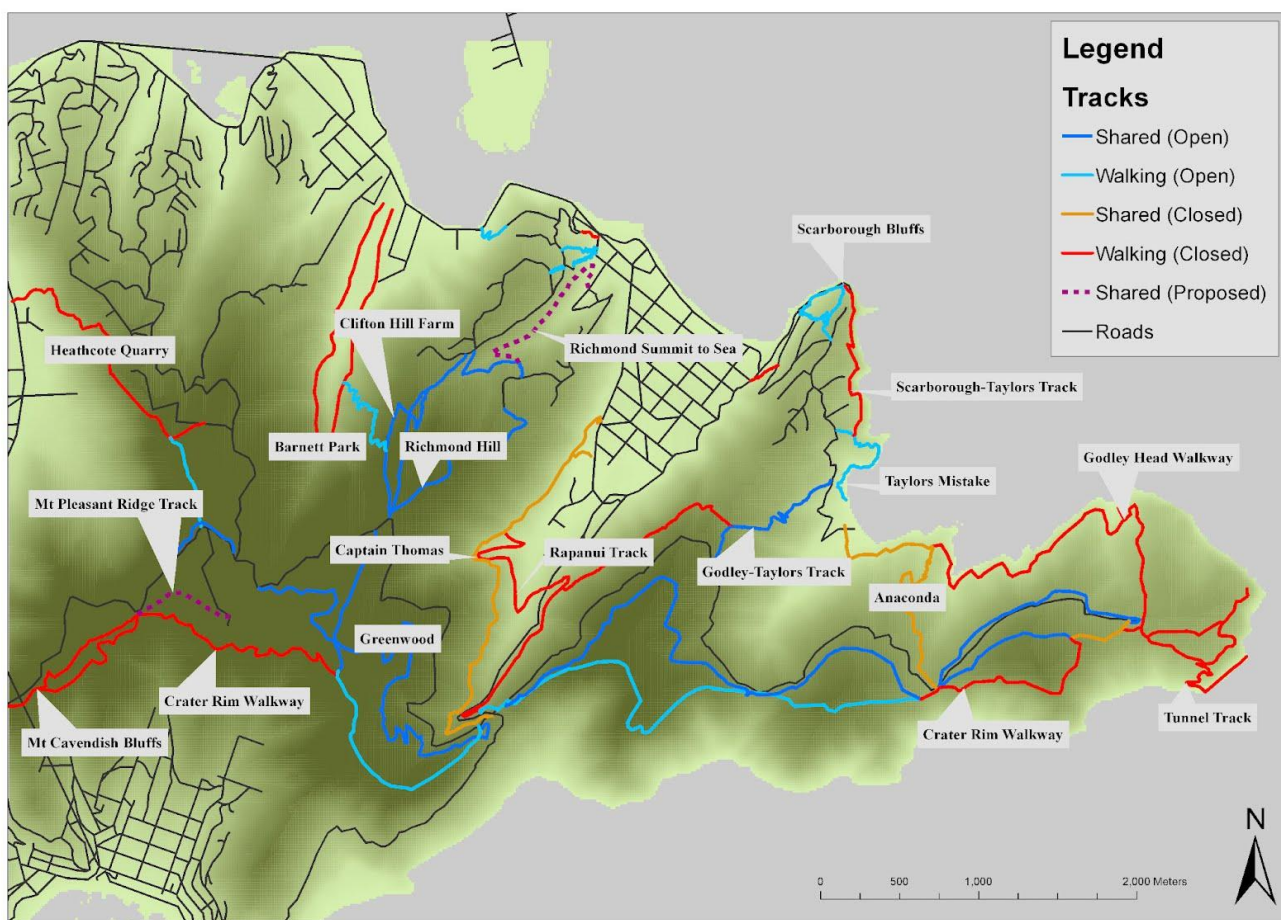


Figure 2: - Map of cycling and walking tracks in Sumner by usage type and track status, with names of major tracks annotated

The resident survey was completed by 56 respondents, collected over a three week period. The full question list and analysis of the quantitative responses are provided in Appendix C. Participants from the survey were mostly middle age with 71.4% being between 35 and 65 years old represented in Figure 3 and the majority of participants being female with 66.1%. 60% of participants indicated that they were from the Sumner Community Group, with 47.3% confirming that they received the Sumner Residents Association newsletter, corroborating with the association, as it claims to have a similar proportion of the community on its membership roll. 80.4% of participants were residents of the study area, primarily Sumner, as shown in Figure 4. The majority of participants were from a recreation background, as indicated by their high levels of daily walking and running, and high participation of weekly cycling and mountain biking. Responses to quantitative and qualitative questions outlined what residents found to

be important characteristics for current and future tracks. Maintaining a high quality natural environment was perceived to be the most important factor with 94.6 % of respondents indicating this important, this coincided with the importance of a pleasant view with 89.3% finding this fundamental. Several participants indicated frustration about closed tracks and a lack of information as to when they will re-open. One echoed the recreation leaders assessment of Captain Thomas, describing its closure as a “real shame”. Respondents also indicated variation for tracks that were both challenging and provided for different skill levels. More than half of respondents indicated that signage was important, with one noting the frustration caused by inconsistent signage for both tourists and locals alike, suggesting signs with times and distances. Another emphasised the importance of clear and accurate track descriptions for those with “physical challenges”.

Table 2:- Summary of tracks in Sumner by type and length	
Track Type	Length Approx (m)
Path Open	3,530
Path Closed	1,060
Short Walk Open	1,660
Short Walk Closed	9,460
Walking Track Open	10,225
Walking Track Closed	22,785
Shared Use Open	3,950
Shared Use Closed	3,210
MTB tracks	9,270
Total Tracks	65,150

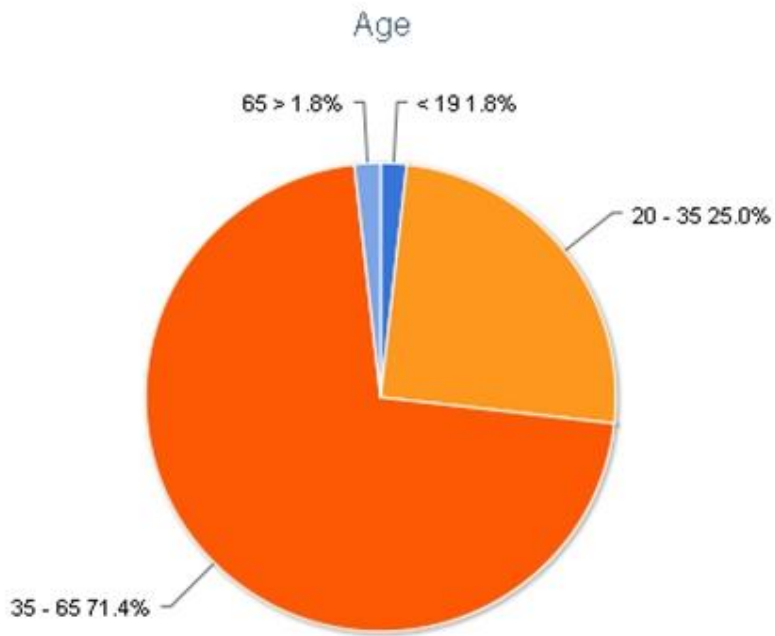


Figure 3: - Pie chart displaying the age groups of respondents to the resident survey

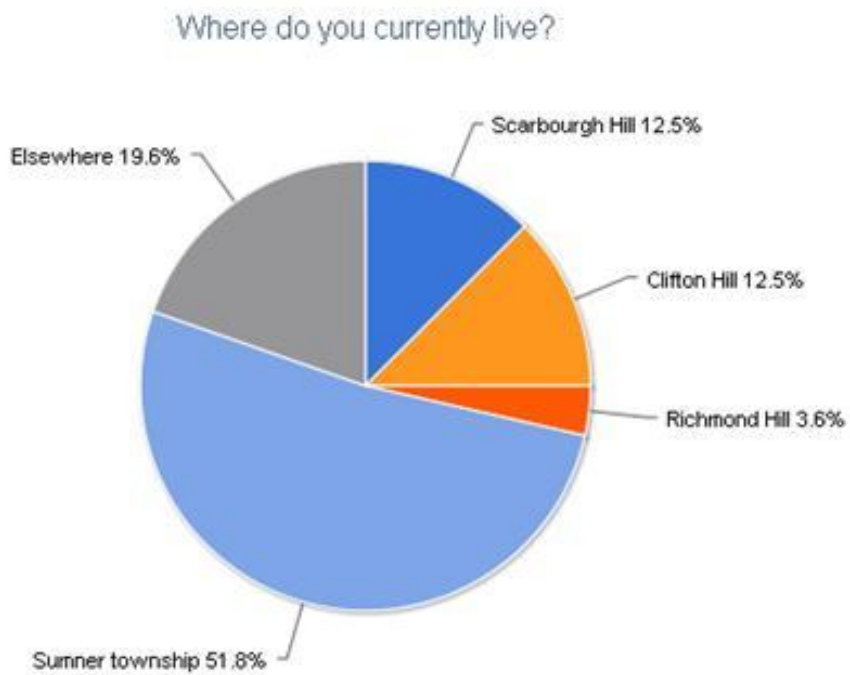


Figure 4: - Pie chart displaying where resident survey participants live

## Discussion

From the results of the recreation leaders survey, we recommend greater consideration of tracks that serve as a transition from beginner to intermediate skill level for mountain bikers, progressing from the basic, flat track of Bottle Lake and McLeans Island. Placement of new tracks should be guided by factors such as viewshed and distance from urban areas as these were identified as important in the residents survey. Trailhead amenities such as car parking, toilets and playgrounds were noted as important in the survey, so placing a new track next to existing facilities should minimise expenditure. Illustrated in Figure 5 are a series of potential sites meeting these requirements - the Richmond Hill sea to summit track (point 1), Barnett Park reserve (point 2), Richmond Hill (point 3) and Taylor's Mistake (point 4). There are currently plans to remediate or redevelop the Captain Thomas Track (point 5) and Mount Pleasant Bluffs track (point 6), however these could easily be adapted to serve the need for a transition track. The two tracks provide important connectivity for both walkers and mountain bikers, so their recovery is very important to recreational users.

We have identified two areas in Sumner where tracks could be recovered or developed using red zoned residential land. The Scarborough track "Whitewash head" (point 7) was identified as an important link from Sumner to Taylors Mistake by both mountain bikers and walkers, but is currently closed due to cliff collapse, however there is red-zoned land in the area that could serve to restore this link. Mulgans Track (point 8) was identified as a useful link by walkers and runners, but ends abruptly in an urban area. There is red zoned land at the top of the track that could potentially be used to develop a shared use track with wide views from the estuary across to Sumner beach, as desired by Sumner residents. Mountain bikers prefer circuits of tracks that minimise riding on-road, so individual tracks should be considered as part of a greater network, especially where they serve to connect the township up onto the ridges and Godley Head. Residents in particular identified an appreciation for tracks that incorporate natural viewsheds, so tracks should focus on natural surroundings, especially the ocean. Several respondents noted inconsistency in signage in Sumner tracks, so an audit of all existing tracks to ensure that they are fit for purpose under NZ standard HB 8630-2004 and are have appropriate signage would be desirable.

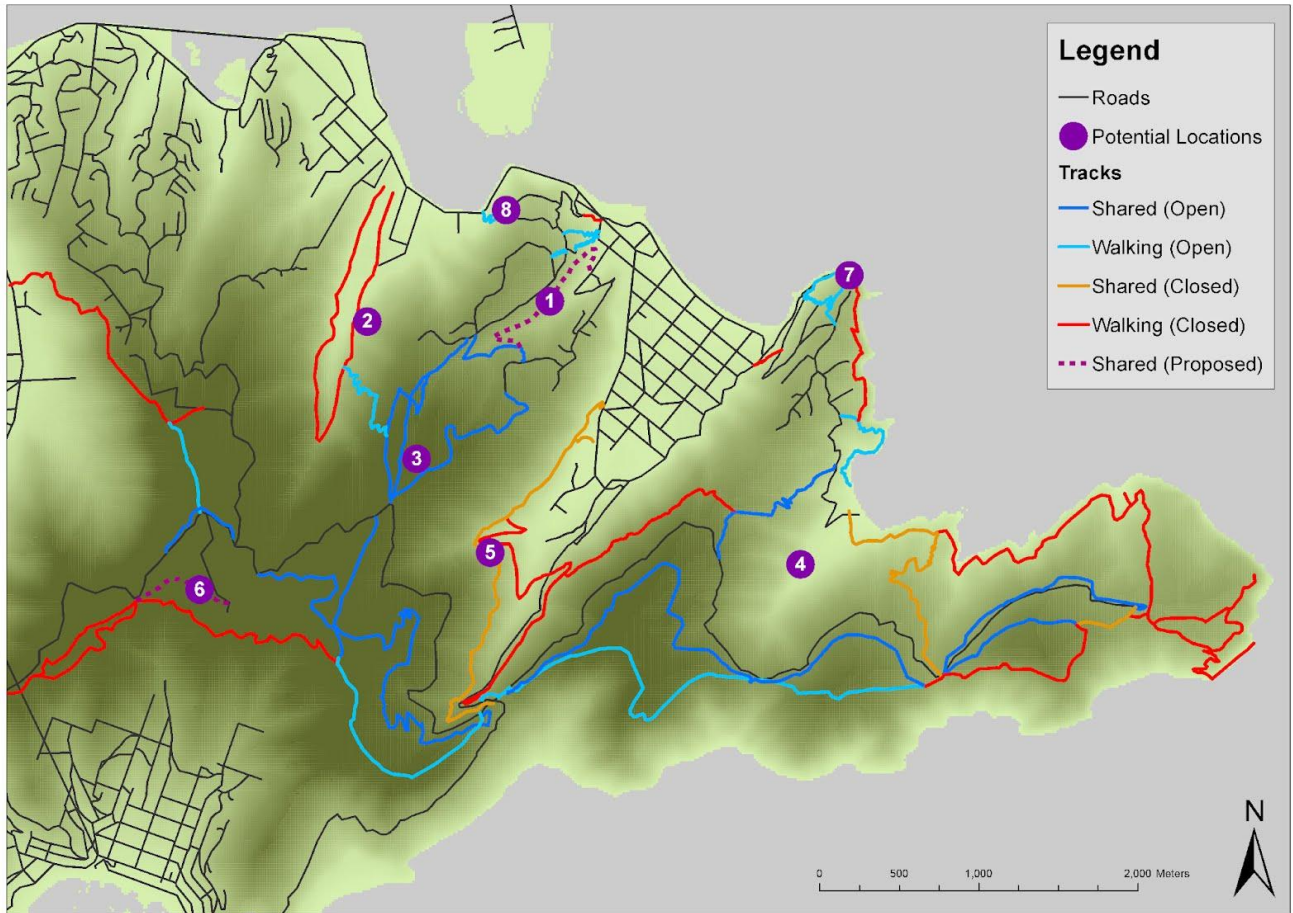


Figure 5:- Tracks in the Sumner study area, and potential locations for future development

## Recommendations

Following on from feedback from recreation leaders and residents, we have developed the following set of recommendations for trail planning and development.

1. Develop a beginner to intermediate transition mountain bike track.
2. Investigate the use of red-zoned residential land to restore connectivity of closed tracks or to develop new tracks.
3. Progress development of existing proposals on Richmond Hill and Mount Pleasant Bluffs.
4. Audit tracks to ensure that they are fit for purpose under the relevant NZ standard, particularly in relation to signage.
7. Ensure that new track developments incorporate natural viewsheds.
8. Consider new track developments as part of a network and the connectivity they can provide.



## **Conclusion**

This report is the result of 12 weeks of data collection and analysis, centered around three methods - a review of current and existing spatial information, surveying and interviews. This has all contributed towards the brief of investigating how the state of the walking and mountain bike tracks in the Sumner area has changed since the Canterbury earthquake sequence and how the community's desires can be incorporated into the recovery of these assets. All three elements of the research methods contributed towards a series of recommendations - of future research, specific needs to be addressed, and broader considerations for all future track developments in the area. This combines the thoughts of recreation leaders with the desires of Sumner residents, which in many case coalesced, highlighting the importance of these recommendations.

## **Acknowledgments**

Particular thanks are due to the Sumner Community Trust, including Habitat Sumner, and representatives Bailey Perryman and Shane Orchard. For their thoughtful responses, Graham Allen, Ian McLeod, Julie Ponsonby, Mandy Holdstock and especially Laurence Mote and Nick Singleton. For their assistance throughout the project, especially in forming this report, we thank Helen Fitt and David Conradson.

## References

- Auckland Council, Waiheke Local board. (2012). *Recreation Waiheke: Waiheke's open space network plan 2012 - draft*. Auckland:
- Bauman, A., Humpel, N., Leslie, E., Owen, N., & Sallis, J. (2004). Understanding environmental influences on walking: review and research agenda. *American Journal of Preventive Medicine*, 27(1), 67-76.
- Brownson, R.C., Housemann, R.A., Brown, D.R., Jackson-Thompson, J., King, A.C., Malone, B.R. & Sallis, J.F. (2000). Promoting physical activity in rural communities: walking trail access, use and effects. *American Journal of Preventive Medicine*, 18 (3), pages 235-241.
- Chamlee-Wright, E., & Storr, V. H. (2011). Social capital as collective narratives and post-disaster community recovery. *The sociological review*, 59(2), 266 -282.
- Christchurch City Council (2012). Port Hills Walks - Eastern Section. Retrieved from <http://resources.ccc.govt.nz/files/EasternWalkingMap-walks2012.pdf>
- Christchurch City Council, Greenspace unit. (2004). *Port Hills recreation strategy* Rob Greenaway & Associates.
- Corti, B., Donovan, R., & Holman, C. (1996). Factors influencing the use of physical activity facilities: Results from qualitative research. *Health Promotion Journal of Australia: Official Journal of Australian Association of Health Promotion Professionals*, 6(1), 16-21.
- Department of Conservation, North Canterbury Area and Christchurch City Council, Greenspace unit. (n.d.). *Port Hills walks: Eastern section*. Christchurch: Christchurch City Council.
- Donovan, R., & Giles-Corti, B. (2002). The relative influence of individual, social and physical environment determinants of physical activity. *Social Science & Medicine*, 54, 1793-1812.
- IMBA. (2007). *Managing mountain biking: IMBA's guide to providing great riding*. Boulder: International Mountain Bicycling Association.
- Inspiring communities, (2010). What we are learning about community-led development in Aotearoa, New Zealand. New Zealand: Inspiring Communities trust.

- Longhurst, R. (2009) Interviews: in-depth, semi-structured, *International Encyclopaedia of Human Geography*. 580-584
- Lu, J., & Campbell, M. J. (2008). The nature and heterogeneity of perceived constraints of using the trans-Canada trail for hiking/walking. *Leisure/Loisir*, 32(1), 183-201. doi: 10.1080/14927713.2008.9651405
- Macbeth, A., & Fowler, M. Ministry of Tourism, Nga Haerenga, The New Zealand Cycle Trail. (2010). *Cycle trail design guide*. Wellington: ViaStrada.
- Matamata-Piako District Council, (2008). *Matamata-Piako district council track strategy*. New Zealand Department of Conservation, Canterbury conservancy. (2008). *Mountain biking in Canterbury*. Christchurch: Department of Conservation.
- Nigg, J. (1995). Disaster recovery as a social process. Preliminary paper #219, Disaster research centre, University of Delaware .
- Patterson, O., Weil, F., & Patel, K. (2007) The role of community in disaster response: conceptual models. *Population response policy review*, 29, 127 -141.
- Pickering, M. (2001). *The port hills: the complete guide to all the walking tracks*. Christchurch: Preston, V. (2009). Questionnaire Survey: *International Encyclopaedia of Human Geography*, 46–52
- Reynolds, K. D., Wolch, J., Byrne, J., Chou, C., Feng, G., Weaver, S., & Jerrett, M. (2007). Trail characteristics as correlates of urban trail use. *American Journal of Health Promotion: AJHP*, 21(4 Suppl), 335.
- Siderelis, C., Naber, M., Leung, Y. (2010). The influence of site design and resource conditions on outdoor recreation demand: a mountain biking case study. *Journal of Leisure Research*, 42 (4), 573-590
- Statistics New Zealand (2011). Estimating local populations after the 2010/11 Canterbury earthquakes. Wellington: Statistics New Zealand.
- Statistics New Zealand. (2006). *Quick stats about Sumner*. Retrieved from <http://www.stats.govt.nz/Census/2006CensusHomePage/QuickStats/AboutAPI/ace/>

The Standards Council, (2004). *SNZ HB 8630:2004 New Zealand handbook: tracks and outdoor visitor structures*. Wellington: Standards New Zealand.

Troped, P. J., Saunders, R. P., Pate, R. R., Reininger, B., Ureda, J. R., & Thompson, S. J. (2001). Associations between self-reported and objective physical environmental factors and use of a community rail-trail. *Preventive Medicine, 32*(2), 191-200. doi: 10.1006/pmed.2000.0788

## Appendix A: Comprehensive table of Sumner tracks

Track Name	Length approx (m)	Classification	Status
Aranoni Track	340	Path	Open
Cattlestop Crag	620	Path	Closed
Clifton Spur	660	Path	Open
Edwin Mouldey Track	220	Path	Open
Flowers Track	440	Path	Open
Mulgans Track	320	Path	Closed
Scarborough Track	410	Path	Open
Taylor's Mistake	980	Path	Open
The Spur	120	Path	Closed
The Zig Zag	480	Path	Open
Barnett Park	3400	Short Walk	Closed
John Britten	690	Short Walk	Open
Jollies Bush	970	Short Walk	Open
Rapanui Track	2710	Short Walk	Closed
Scarborough Bluffs	380	Short Walk	Closed
Crater Rim Walkway	9990	Walking Track	Partially Open
Eastenders Track	930	Walking Track	Closed
Godley Head Walkway	3750	Walking Track	Closed

Godley-Taylors Track	1290	Walking Track	Closed
Greenwood	4080	Walking Track	Open
Heathcote Quarry	1910	Walking Track	Closed
Mt Cavendish Bluffs	1020	Walking Track	Closed
Mt Pleasant Ridge Track	670	Walking Track	Proposed
Rapanui-Taylors Track	1380	Walking Track	Closed
Scarborough-Taylors Track	1150	Walking Track	Open
Scotts Valley Track	3230	Walking Track	Closed
Tunnel Track	1770	Walking Track	Closed
Captain Thomas	3210	Shared Use	Closed
Clifton Hill Farm	1340	Shared Use	Open
Clifton-Richmond Track	670	Shared Use	Open
Frog Pond	400	Shared Use	Open
Richmond Hill	1540	Shared Use	Open
Richmond Summit to Sea	1240	Shared Use	Proposed
Anaconda	1540	MTB Intermediate	Closed
Godley Head	7730	MTB Intermediate	Closed

## **Appendix B: Survey for recreation leaders**

1. What factors determine the choice of tracks in Sumner by your group?
2. What factors would make your group use the Sumner tracks more frequently than at present?
3. Was your group satisfied with the condition of Sumner tracks prior to the earthquake sequence? After the earthquake sequence?
4. How does access to the broader Port Hills network from Sumner effect the use of Sumner tracks by your group?
5. Any comments or suggestions for the recovery of walking and mountain biking tracks in Sumner?
6. Are you happy with your comments being quoted in our final report?
7. Would you like to be sent an electronic copy of our final report once completed in early October?

## Appendix C: Questions and quantitative results of Sumner resident survey

### Question 1: Age

Value	Count	Percent
< 19	1	1.8%
20 - 35	14	25%
35 - 65	40	71.4%
65 >	1	1.8%

### Question 2: Gender

Value	Count	Percent
Male	19	33.9%
Female	37	66.1%
Other	0	0%

### 3. Where do you currently live?

Value	Count	Percent
Scarborough Hill	7	12.5%
Clifton Hill	7	12.5%
Richmond Hill	2	3.6%
Sumner township	29	51.8%
Elsewhere	11	19.6%

### 4. Please select if you have any of the following:



Value	Count	Percent
A dog?	18	50%
A child who lives with you?	23	63.9%
Physical impairment/disability?	1	2.8%

5. Are you a currently involved with the Sumner Community Group?

Value	Count	Percent
Yes, I am an active member	7	12.7%
Yes, I receive their newsletter	26	47.3%
No, but I have considered becoming involved	11	20%
No, I have chosen not to participate	11	20%
No response	1	1.8%

6. Please indicate how frequently you participate in the following recreational activities:

	Daily	Weekly	Fortnightly	Infrequently	Never	Responses
Cycling	16.1% 9	33.9% 19	5.4% 3	28.6% 16	16.1% 9	56
Dog Walking	28.6% 16	5.4% 3	0.0% 0	14.3% 8	51.8% 29	56
Jogging/Running	23.2% 13	28.6% 16	3.6% 2	14.3% 8	30.4% 17	56
Mountain Biking	1.8%	32.1%	12.5%	33.9%	19.6%	56

	1	18	7	19	11	
Sightseeing	8.9%	14.3%	14.3%	51.8%	10.7%	56
	5	8	8	29	6	
Walking	46.4%	37.5%	7.1%	8.9%	0.0%	56
	26	21	4	5	0	

7. Do you participate in any recreation groups?

Value	Count	Percent
Yes	16	28.6%
No	40	71.4%

8. If you answered 'yes' to question 7, please state which group(s)

9. How important are the following track characteristics to you?

	Very	Somewhat	Not Very	Not at all	Unsure	N/A	Responses
<b>The track surface for walking or biking:</b>	<b>35.7%</b>	<b>42.9%</b>	<b>21.4%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>56</b>
	20	24	12	0	0	0	
<b>The view:</b>	<b>48.2%</b>	<b>41.1%</b>	<b>8.9%</b>	<b>1.8%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>56</b>
	27	23	5	1	0	0	
<b>The distance from urban areas:</b>	<b>28.6%</b>	<b>46.4%</b>	<b>16.1%</b>	<b>8.9%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>56</b>
	16	26	9	5	0	0	
<b>The provision of seating, drinking fountains, etc:</b>	<b>7.3%</b>	<b>27.3%</b>	<b>40.0%</b>	<b>25.5%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>55</b>
	4	15	22	14	0	0	
<b>Personal safety:</b>	<b>41.1%</b>	<b>26.8%</b>	<b>26.8%</b>	<b>5.4%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>56</b>

	23	15	15	3	0	0	
<b>Lighting:</b>	<b>16.7%</b>	<b>16.7%</b>	<b>37.0%</b>	<b>29.6%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>54</b>
	9	9	20	16	0	0	
<b>Areas for children to play:</b>	<b>18.2%</b>	<b>18.2%</b>	<b>21.8%</b>	<b>30.9%</b>	<b>0.0%</b>	<b>10.9%</b>	<b>55</b>
	10	10	12	17	0	6	
<b>Areas for dogs to exercise:</b>	<b>17.9%</b>	<b>28.6%</b>	<b>12.5%</b>	<b>25.0%</b>	<b>1.8%</b>	<b>14.3%</b>	<b>56</b>
	10	16	7	14	1	8	
<b>Closeness to your home:</b>	<b>36.4%</b>	<b>41.8%</b>	<b>18.2%</b>	<b>3.6%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>55</b>
	20	23	10	2	0	0	
<b>Track distance:</b>	<b>39.3%</b>	<b>37.5%</b>	<b>17.9%</b>	<b>5.4%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>56</b>
	22	21	10	3	0	0	
<b>The ability to do the track as a loop:</b>	<b>46.4%</b>	<b>39.3%</b>	<b>8.9%</b>	<b>5.4%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>56</b>
	26	22	5	3	0	0	
<b>The easiness of the slope:</b>	<b>5.6%</b>	<b>18.5%</b>	<b>38.9%</b>	<b>35.2%</b>	<b>1.9%</b>	<b>0.0%</b>	<b>54</b>
	3	10	21	19	1	0	
<b>A challenge:</b>	<b>25.0%</b>	<b>62.5%</b>	<b>8.9%</b>	<b>1.8%</b>	<b>1.8%</b>	<b>0.0%</b>	<b>56</b>
	14	35	5	1	1	0	
<b>Historical features:</b>	<b>5.6%</b>	<b>25.9%</b>	<b>46.3%</b>	<b>16.7%</b>	<b>1.9%</b>	<b>3.7%</b>	<b>54</b>
	3	14	25	9	1	2	
<b>A high quality natural environment:</b>	<b>66.1%</b>	<b>28.6%</b>	<b>5.4%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>56</b>
	37	16	3	0	0	0	
<b>Signage</b>	<b>22.6%</b>	<b>34.0%</b>	<b>39.6%</b>	<b>3.8%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>53</b>
	12	18	21	2	0	0	

10. Are there other things you consider important for tracks to have? (optional)

11. This question aims to determine how your usage of tracks in the Sumner area has changed as a result of the earthquakes. Please indicate any change for each item below.

	<b>Significantly increased</b>	<b>Increased</b>	<b>Stayed the same</b>	<b>Decreased</b>	<b>Significantly decreased</b>	<b>N/A</b>	<b>Responses</b>
<b>The amount of time you use the tracks:</b>	<b>5.5%</b> 3	<b>0.0%</b> 0	<b>10.9%</b> 6	<b>27.3%</b> 15	<b>56.4%</b> 31	<b>0.0%</b> 0	<b>55</b>
<b>Your concern about safety:</b>	<b>19.6%</b> 11	<b>53.6%</b> 30	<b>23.2%</b> 13	<b>1.8%</b> 1	<b>1.8%</b> 1	<b>0.0%</b> 0	<b>56</b>
<b>The quality of tracks:</b>	<b>1.8%</b> 1	<b>5.5%</b> 3	<b>9.1%</b> 5	<b>52.7%</b> 29	<b>30.9%</b> 17	<b>0.0%</b> 0	<b>55</b>
<b>The selection available:</b>	<b>3.7%</b> 2	<b>5.6%</b> 3	<b>1.9%</b> 1	<b>13.0%</b> 7	<b>74.1%</b> 40	<b>1.9%</b> 1	<b>54</b>
<b>The average distance of your walk or cycle:</b>	<b>3.6%</b> 2	<b>3.6%</b> 2	<b>30.9%</b> 17	<b>32.7%</b> 18	<b>29.1%</b> 16	<b>0.0%</b> 0	<b>55</b>
<b>Your social interactions whilst using tracks:</b>	<b>1.8%</b> 1	<b>12.5%</b> 7	<b>35.7%</b> 20	<b>21.4%</b> 12	<b>25.0%</b> 14	<b>3.6%</b> 2	<b>56</b>

12. Please add any comments about your usage and how this has been affected by the earthquakes?

(Optional)