Sustainable Transport at UC

Sustainability Summer Scholarship 2011-2012

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## Table of Contents

Executive summary  p. 4  
Introduction  p. 5  
Figure 1: Desire Lines  p. 7  
Figure 2: Safety and accessibility issues  p. 8  
New pathways  p. 9  
Figure 3: Potential new pathways  p. 10  
Through-routes  p. 11  
Figure 4: Through-routes for cyclists’  p. 12  
Figure 5: Through-routes for pedestrians’  p. 13  
Law Building Car park  p. 14  
Figure 6: Options for Law Building car park  p. 15  
Image 1: Painted Footpath  p. 16  
Shared pathways  p. 17  
Shared Pathway Flow Chart  p. 19  
Figure 7: Option 1  p. 20  
Figure 8: Option 2  p. 21  
Figure 9: Option 3  p. 22  
Figure 10: Divided pathway in Holland  p. 23  
Figure 11: Tennyson Street and Harakeke Street Christchurch  p. 24  
Wider Christchurch Infrastructure  p. 25  
Figure 12: Addresses from 2008 transport survey  p. 26  
Figure 13: Local roads for cyclists to use  p. 27
Executive Summary

- There are a number of safety and accessibility issues on campus that need to be addressed to provide for staff and students who are disabled.
- There are a number of desire lines and show where potential new pathways should go
- Potential new pathways should be created that are wide enough for new cyclists and walkers
- Through-routes are beneficial for showing quick routes around the University
- Car parks need to be made safer for cyclists and walkers and should not be used as main routes to get to buildings
- All the options for Ilam Road should be considered
- Maps can be created that show local roads for cyclists to use to get to University.

Recommendations

The university should work more closely with disabled student support to provide ease of access to disabled students.

Potential new pathways should be made wide enough for both cyclists and walkers.

Cycling and walking infrastructure should be coupled with signs around the University showing where facilities are and through-routes for cyclists and walkers.

All options for an Ilam Road cycle way should be considered in its development.
Introduction

The University Of Canterbury (UC) is currently involved in creating a master plan that will affect many different aspects of University life. UC hopes that through encouraging sustainable transport options students will opt for these over transport methods such as driving to University. A number of studies have shown that dependency on private vehicle for commuting is the single largest impact a University has on the environment (Shannon et al, 2004). While encouraging sustainable commuting options is beneficial for both the environment and the University new comers to cycling and walking will not occur if infrastructure is not adequate. Shannon et al (2004) found that reducing barriers to sustainable transport was more effective than promoting the health and environmental benefits. While every person is different, studies have shown that the biggest barriers to active commuting (cycling and walking) includes danger on the roads, bad weather, darkness, natural terrain (hills) and manmade terrain (poor roads) (Van Bekkum, Williams, Morris, 2011). To understand UC's current commuter nature and the possibilities for improvement research was conducted in a number of ways. The 2008 transport survey was very important in looking at past students thoughts on transport at the University and to assess how many students cycle, walk and drive to the University. Journal articles were useful to understand different ways to encourage sustainable transport use as were exploring websites from other Universities that have both high and low number of sustainable transport commuters. There were also a number of experts at the University of Canterbury who assisted with their local knowledge. The information was placed onto a digitised map on ArcGIS 10 with new pathways being added along with other options such as where end facilities should go as well as mapping out where the respondents to the 2008 transport survey commuted from. The maps are able to be seen online in print form and also on ArcExplorer. The maps on ArcExplorer are more interactive with some footpaths being able to be clicked on and the changes that are needed to create them are shown in the attribute table. Changes such as widening the existing pathway or adding in signs have been shown for each of the thoroughfare pathways. Also the accessibility and safety map can be clicked on to see which problem such as no cut down is in that position.

Past Reports

In 2007 R. Wardell for GHD and Abley Transport undertook an audit of UCs transport infrastructure in order to get a sense of what could be changed and what could be improved to reduce perceived barriers to students and staff. The report looked at a number of different issues that can affect a persons’ decision to cycle or walk to UC these included “highlighting obstructions, safety issues, crossing facilities, cycle trip end facilities such as stands, showers, lockers, ease of movement for people with physical disabilities, signage and recreational opportunities” (Wardell, 2007, p.1). The 2007 report is still relatively valid with many areas remaining unchanged. There have however been changes to the UC structure due to the 2010 and 2011 earthquakes in Christchurch such as
demolition work, out of bounds buildings and newly constructed temporary buildings. This current report focuses only on the main campus and not on the Dovedale campus as the future of UC is to create a central hub on the main campus and phase out Dovedale Campus.

The 2007 audit of the University found a number of issues with desire lines, maintenance issues and safety and accessibility. There were a number of key desire lines that were found that are still prevalent today. These lines, shown in figure 1, are important when designing new footpaths and shared paths. They show areas where pedestrians want to go but there is not currently any footpaths. A number of the desire lines are next to footpaths as the path is not wide enough. These desire lines were used as a guideline for the paths that have been recommended to be built. Figure 2 shows the accessibility and safety issues that are still prevalent in 2012 even though they were highlighted by GHD in 2007. Accessibility and safety issues are important to address as they provide visually impaired or wheelchair bound students and staff with equal opportunities to move around the campus with ease. The main areas of concern are where footpaths do not provide a cut down on one side of the kerb leaving the staff or student unable to get off the pathway. The maps on ArcExplorer show the different problems with each area however appendix 1 also shows a non-electronic copy of the accessibility and safety issues.
Figure 1: Desire lines as found by GHD transport that are still prevalent in 2012.
Figure 2: accessibility and safety issues around the University of Canterbury
New Pathways

By assessing the desire lines as well as looking at where new buildings have been created a map was created showing where new pathways could be put in place and where old pathways should be fixed. Figure 3 shows the potential new pathways that could be developed around the University of Canterbury. Some are already existing pathways that need to be made wider to allow for a shared pathway system. There are a number of cyclist priority pathways. These pathways will be designated for cyclist to use however it is expected that some pedestrians will also use them from time to time. There are also a number of pedestrians’ only paths. These paths will most likely also be used by skateboarders and scooters however by designating them for pedestrians only it shows people that there will be a high number of pedestrians on these paths and that the flow of traffic will be at a slower speed. The shared pathways that are continuous and show a through-route should be considered for a dividing path as described later in shared paths. This would mean that cyclists and pedestrians are separated by a barrier and would mean that there is less accidents and arguments. Other paths that are not through-routes will need to be made wider as most paths around the University are not wide enough, however a divider may not be necessary. The University should have signage for cyclist and walker which show outsiders that the University is dedicated to cycling and walking priority. This new infrastructure development will help to show the accessibility of the University by bicycle and could add to a cycling 'ride share' around the University.
Figure 3: the potential new pathways around the University of Canterbury that would make cyclists and pedestrians the priority.
Through-routes

In order to promote cycling and walking around the University it is necessary to show how assessable the University is and how much more efficient it is to cycle and walk around the University. This can be done by created a number of through routes which staff and students use to get from one side of the University to another. Figure 4 and 5 show the main thoroughfare routes though the University if the pathways from image 2 are created. If the potential pathways are created maps such as figure 4 should be signposted around the University so that cyclists and walkers know the most direct route for them to get around the University. The thorough routes on the map try to direct cyclists away from the pathway in front of C block as this is a major clash point that can be too hectic during some times of the day. If these routes that direct cyclists away from C block are created and cyclists are encouraged to use them then hopefully the number of cyclists in front of C block will lesson. Cyclists and walkers can use these paths and jump off when they are close to the building they are wishing to go to. The hashed lines along the path show pathways that do not exist. However most of the pathways that do exist will need signage and widening if these routes are to be created properly. Through routes will show the ease and efficiency of cycling and walking and may even encourage staff and students to do it more often.
Figure 4: The main thoroughfares created for cyclists to get through the University of Canterbury.
Law Building Car Park

There are a number of areas around the University that are highly unsafe for cyclists and walkers to use however are the most used through routes as they provide direct access to a number of areas. The area around the Law building is one such area. The car park area was not designed with the pedestrian or cyclist in mind yet it is a highly used through route due to its accessibility to the Recreational Centre or Kirkwood Village. It would be possible to redesign the car park so that it was more pedestrian friendly however this may just lead to an increase in car drivers as the car park is easier for them to access and more pedestrian friendly when they get out of their car. It would be best to encourage cyclists and pedestrians who are coming and going from the University to continue to do so than to building more infrastructure that helps car drivers. There are two potential options for infrastructure around the Law Building. Cyclists and pedestrians should be encouraged not to use the car park as a means to leave the University or to get to Kirkwood Village. With the increasing use of Kirkwood Village this could lead to a large number of cyclists and pedestrians using the car park which can be dangerous. Also for students who use wheelchairs or visually impaired students going through the car park is extremely dangerous.

As figure 6 shows there are 3 potential options available with the current car park set up. Option A should be built no matter if option B or C is chosen as it is an important route. Option A allows for more direct access to the bridge at the recreational centre and Kirkwood Village. It would provide students with the ability to not have to walk though the car park in order to get to these places. Pedestrian cut down and wheelchair accessibility should be in place to allow students to get to Kirkwood Village easily. There are two options for students who are coming into the University and might normally go through the car park. Option B sends cyclists around the Law courtyard while not actually going through it. The stairs in this area will need to be taken out and the grass area next to the courtyard will have to be modified for cyclists. Option C takes cyclists in front of the law building. This is the best option as it takes students directly to the secure cycle stand without having to go in the law car park. The current footpath, in front of the law building would need to be painted or put in a divide to separate cyclists and pedestrians as there is the potential for a high clash zone. Image 1 shows a possible option for a painted footpath. The area shown on image 1 is designed for pedestrians but could be easily transferred to cyclists. The painted footpath allows for minimal infrastructure however alerts people to the fact that there are cyclists in this area. It would not stop pedestrians from using the area but shows them that it is designated for cyclists. The footpath before option B or C would need to be made much wider as it is currently not practical to expect cyclist and pedestrians to be on it together. Making cyclists and pedestrians a priority at the University will also entail adding signs on pathways that show pedestrians the best route for them to take and how far away a building is. By creating infrastructure for cyclists and pedestrians as opposed to cars the University will cement its position as a cycling and walking University.
Figure 6: The potential infrastructure around the Law Building at the University of Canterbury to encourage safe use by cyclists and pedestrians.
Image 1: painted footpath at North lakes Shopping Centre Brisbane Australia
Shared Pathways

Shared Pathways is a term used to describe footpaths that are used by pedestrians and cyclists of all abilities and ages. As a path gets utilised more by the two separate groups there is a reduction in the level of service and safety for all path users (Cycle Notes, 2010, p.1). In order to address this issue a path can be widened or cyclists can be separated through the use of a bike only path and a footpath. As all paths within the University are allowed to be used by cyclist this has caused a lot of congestion and unsafe usage of the paths. A large and well utilised footpath is along Ilam Road. While this path is not often used by cyclists, Ilam road does not have a cycle way and has been identified as a dangerous area for cyclist. UC has mentioned creating a shared pathway for cyclists and pedestrians on both sides of the road. This however would be redundant if the path cannot handle the amount of traffic predicted in future and is uninviting for cyclists. In a report made by engineers from the University of Canterbury for the Victorian Transport Agency Australia a number of solutions and guides were created to help understand how wide a shared path should be (Cycle Notes, 2010 & Fowler, Lloyd & Munro, 2010). There are four main steps in designing an appropriate shared path these are shown in figure 7. A recent pedestrian and cyclist count has not been undertaken on Ilam Road. Once these figures are found it would be possible to understand just how wide a new shared path on Ilam Road would be.

There are however other issues when designing a shared path. Many cyclists, especially already established cyclists, may not like that they have to stop at each intersection when they are going straight in order to assess the turning traffic (Koorey, 2006, p. 4). This requires them to slow down, and wait, where as when they are cycling on the road they can have an uninterrupted (apart from parking and leaving cars, which should in theory still give way to them) journey. Such a path may only be used by novice cyclists and not experienced ones who are not afraid on the road. This has the potential to be very dangerous with the input of islands in the middle of the roads if cyclist are on the road cars cannot give them enough space when passing. This could lead to a number of accidents and would be far more beneficial to make the shared path appealing for all types of cyclists.

Figure 8 shows the three potential options along Ilam road that could be put in. Option 1 entails a small amount of infrastructure but would mean the path would be more likely to be used. Option 1 has a cut down before the intersecting road and means cyclists can go onto the road and then go back onto the footpath after the intersecting road. This would mean that car would be expected to stop for cyclist as they are now on the main road. This does have potential issues with cars turning into the intersecting lane and cyclists will need to be vigilant. An example of this is on Tennyson Street in Sydenham in Christchurch as figure 10 shows. Option 2 would have the most amount of added infrastructure needed. Cyclists are sent a small way back along the intersecting road and then given priority over cars to cross the road. Cars are on a give way signal and there is also a speed bump to reduce the speed that the cars will be travelling. An example of this is on Harakeke Street in Christchurch as figure 11 shows. Option 3 gives priority to cars and makes cyclists give way to cars at each intersecting roads. This is the current proposal set out by the Christchurch City Council. As the
above reasons have stated while this may have the less amount of added infrastructure, it is likely to stop a large number of cyclists using the pathway and will keep them on the street. This option also does not show newcomers to the University that cycling and walking are the priority as shows that cars are still the number one priority. Option 1 and 2 send the message that cycling and walking are the priority and should be considered instead of option 3. The pathway should also be divided between pedestrians and cyclists with a barrier between the two. Figure 9 shows a cycleway in Holland where the use of different surfaces for cyclists and pedestrians has created a barrier which means that cyclists can have a continuous journey on the path and not have to give way to pedestrians and pedestrians do not feel unsafe on the pathway. Research has shown that pedestrians will not use a pathway that is also a cycleway for fear of being hit by a cyclist (Taylor, Kingham, Koorey, 2009) a division between the two groups will stop this fear.

Another issue is the potential for growth along the pathway. The report found that there was a 14% growth rate due to the installation of a new off-road cycle path (Fowler, Lloyd & Munro, 2010, p.8). While this footpath is already in use with the growing encouragement by UC as well as the installation of a cycleway beside it such an increase could be possible. This needs to be taken into consideration when designing the new pathway as a pathway that is too narrow will not fix any of the current problems faced. A cycleway along Ilam Road is a very good idea but all options need to be considered before it is developed.
Step 1
Determine the “design hour” for the path

Step 2
Count the numbers of pedestrians and cyclists using the path at the design hour and their direction

Step 3
Determine the directional split of path users.

Step 4
Determine the appropriate path width for the number of pedestrians and cyclists using the path and the directional split.

Figure 7: Shared path flow chart
Option 1, shared path on Ilam Road
(cyclists able to go on the street when at an intersection)
Option 2, shared path on Iam Road (cyclist given priority at intersection)
Figure 8. The three options for an Ilam Road cycleway

Option 3, shared path on Ilam Road
(car given priority at intersection)
Figure 9: Cycleway and footpath in Holland showing division between users (Hembrow).
Figure 10: Tennyson Street in Christchurch, cyclists are brought onto the road so they have a continuous journey on the cycleway (Google Maps, 2012)

Figure 11: Harakeke Street in Christchurch, cyclists are given priority and cars are made to give way at the intersection (Google Maps, 2012)
Wider Christchurch Infrastructure

If the University can encourage more staff and students to use sustainable transport to get to and from the University the amount of congestion and pollution will drop largely. By implementing more infrastructure at UC the University will show sustainability as its priority. However commuting to the University may still be seen as a challenge to some cyclists as they feel unsafe on the roads (Van Bekkum, Williams, Morris, 2011). Most potential cyclists are used to driving in a car where using main roads is common place however on a bike it is much more common to avoid main roads and opt for local roads. The problem a number of potential cyclists have to cycling on local roads is that they don’t know where the local roads are. The 2008 travel survey showed that there are a large number of students and staff who drive to University despite living within a short distance from the University. Figure 12 shows the addresses of 900 respondents to the survey who drive to University. Around 400 of these car drivers lived within a 5km radius of the University. 5km is considered to be a very small distance to cycle and so there must be barriers that people have put in place to stop them from cycling. Figure 13 has been created to show potential cyclists routes that they can take using only local roads or roads with existing cycle lanes on them. It is hoped that the University will be able to join with the Council to create signs along roads that show cyclists where they should go. Also in the 2004 Cycle Strategy the Council said it was a priority to make a network of cycle lanes, it is hoped that this is still a priority and it will increase the number of cyclists on the roads. By increasing the number of staff and students who cycle to the University the congestion on the roads and in the car parks as well as the carbon footprint of the University will be lessened.
Figure 12: Addresses from respondents who drove from the 2008 Transport Survey
Figure 13: routes that staff and students can take that only use local roads or current cycle infrastructure.

Routes for Staff and Students to Cycle to the University of Canterbury 2012

Legend
- The University of Canterbury
- Cycle paths: Off the road pathways
- Cycle Lanes: On road pathways
- Bus Lanes: Cyclists are able to use these
- Key Routes: using local roads and cycle infrastructure
- Crossing a Main Road
- 5km Radius around the University of Canterbury

Created by K. Campbell 2012
Perception of Cycling and Walking at UC

There are different perceptions of cycling and walking at UC and a number of different barriers set up by different staff and students. Bonham and Koth found that the different levels of infrastructure and the different signage set out around a University campus can place one group as (ab)normal (2010). This is important when considering new infrastructure as if the University really wants to get more staff and students to cycle then the ideals people place around a group needs to be changed. By giving priority to sustainable commuters the University will show that they are not abnormal but are the ‘wanted’ group on campus. An example of where this is already working is the lack of car parking space at the University, with students only being given the ‘right to look’ for a parking space when they buy a permit it means that many do not find a space. This means that they are not given the priority and will hopefully find driving to be a strain rather than a convenience. However this does need to be coupled with a large number of bike parking to show how much easier it is for cyclists to find a park right outside a lecture theatre. Along with priority at the University students and staff need to change their perceived travel time for the actual travel time. Many people believe that cycling or walking will take them a much long time however often with congestion along with time to find a parking space cycling can be the fastest mode of travel (University of Canterbury Chronicle, 2003). In 2003 the University ran a race from a number of locations around Christchurch to find which way of commuting was the fastest. Cycling won in 4 of the 5 locations with a motorcycle taking out the last race (University of Canterbury Chronicle, 2003). Such experiments and contests as this can change people’s perception of cycling and the perceived length that it takes to cycle from one place to another. Another perceived issue is the cost of driving to University and back each day. Many do not add up the cost of petrol over a year as it is not paid for in a lump sum. The ‘Driving to UC Calculator’ on the University of Canterbury website can change such perceptions (University of Canterbury, 2012). The calculators show just how much it can cost a car driver to get to the University each year (University of Canterbury, 2012). Such tools as this can change how people perceive driving versus cycling and should be advertised more.

The University of Canterbury hopes to create a University that encourages staff and students to use sustainable transport to get around the University and to the University. By creating a number of new pathways and modifying existing pathways based on desire lines the University can encourage more walkers and cyclists around the University. The new pathways create new through routes that can show the efficiency of cycling and walking around the University. Areas such as car parks need to be considered for change as they are dangerous for cyclists and walker to be in. The Law Car Park currently has 3 options for change that would promote cycling and walking. Around greater Christchurch maps that show potential cyclists local roads that they can use to get to University will encourage more cyclists to cycle to UC. This infrastructure needs to be coupled with adequate signage to encourage more cycling and walking. Encouraging sustainable transport will lessen the Universities carbon footprint and in turn lesson the affect the University has on the environment.
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Accessibility and Safety Issues around the University of Canterbury
Annotations:

A. Civil/Mechanical access to Engineering road. There is no pedestrian cut-down provided.

B. Engineering Road. Pedestrian cut-down is provided on one side of the road but not on the other.

C. Disabled access ramp at Old Maths building is in excess of 8% recommended maximum for easy wheelchair use.

D. Forestry Road. Footpath ends, with no cut-down and pedestrian must move across grass to access other footpath.

E. Geography footpath. Pavement is obstructed by foliage and is damaged.

F. Arts Road. Pedestrian cut-down is provided on own side of the road but not on the other. Also it is very steep and would be difficult for a wheelchair to cross.

G. Arts Lecture theatres. Pavement is damaged due to tree roots.

H. Law Car Park. No pedestrian cut-down into the car park.

I. Law Car Park. Bridge over garden to allow ease of access and greater safety to pedestrians is blocked off by cars parked on either side.

J. University Drive, access to Recreation Centre. There is no pedestrian cut-down provided. Also pedestrians must walk through law car park to gain access.