

ACCESSIBILITY AND ATTRACTIVENESS – KEY FEATURES TOWARDS CENTRAL CITY REVITALISATION – A CASE STUDY OF CHRISTCHURCH, NEW ZEALAND

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Abstract: The aim of this study is to analyse the importance of accessibility (within the inner-city and from the residential suburbs into the inner-city) and attractiveness as two determinants for shopping and leisure time activities in the central city of Christchurch. The context is derived from consideration of divergent exogenous factors associated with selected cities in Germany and from the change of attitudes towards shopping and leisure time activities in modern societies.

Key Words: Central city revitalisation, Accessibility, Attractiveness, Urban sprawl, Retail

1 INTRODUCTION

The analysis of the correlation between urban sprawl and travel behaviour patterns has a long tradition in urban and transport planning. One development of particular interest has been the decentralisation of living areas from inner cities to the suburbs. This phenomenon was first perceived in the USA after World War II (Camagni, Gibelli & Rigamotti, 2002), and later in Europe and other industrialised countries. Changing lifestyles financed from rising personal wealth, as well as the increased desire for more freedom of space, generated the exodus from the cities. One solution was to move to the outskirts of cities creating new suburbs in order to obtain more living space at an affordable price with less construction impediments. While some jurisdictions managed to ‘curb the sprawl’ (Gow, 2000), numerous cities around the world have to cope with sub-urbanisation and its consequences. There are the direct negative effects on the natural environment generated by the scattered extension of low density land uses into rural and natural areas and a potential increase of air and water pollution. The most relevant negative factor however, is a change in mobility patterns. The city centres are depopulated through the loss of residential areas, replaced by offices and other tertiary uses. With more employees working inside but living outside the city centre, commuting distances have increased. The private motor vehicle is the most commonly commuter mode of transport as low-density suburbs are rarely linked with city centres by a convenient, direct and frequent public transport service.

This increase of suburban living led inevitably to an increase in demand of retail activities in suburbs, a shift or redistribution of inner-city retail towards suburban malls and relatively few people visiting the city centre for shopping or leisure purposes. Modern retail businesses need increased space to display their sales items. For many retail businesses, it was not longer tenable to operate an inner-city shop due to space restrictions. Moves to the suburbs of cities

allowed their business to survive and grow. Overall, living and retail shifts to the suburbs brought about a reduction of central city vibrancy, epitomised by a decline of business and retail activities. Some cities lost part of their identity leading to a reduction in liveability, attractiveness and inner-city safety. Therefore, in order to arrest decentralisation, city centres need to increase their attractiveness and accessibility by all modes of transport and so compete successfully with the suburban malls.

2 AIM AND METHODOLOGY

The aim of this study was to analyse the importance of attractiveness and accessibility as two major determinants contributing to the revitalisation of central cities. The case study was conducted in the city of Christchurch, a medium low density sized city with a population of 340,000, located in the South Island of New Zealand. Both researchers were based in Christchurch and have been involved with its revitalisation process. Both authors come from medium sized European cities and anticipated close parallels. It is important to comprehend the processes and complexities of central city development. An international literature review was conducted to identify and understand the issues facing stakeholder groups. This helped determine the methodology needed to deal with the decentralisation problem. A two-step approach was necessary. First the 'objective' measurement of attractiveness and accessibility factors and second the assessment of the perceptions of attractiveness and accessibility by central city visitors. 'Objective' measures were obtained by studying available statistics. 'Subjective' data were gathered in a survey over a three-day period, interviewing central city visitors. Comparisons of objective and subjective data sets provided the basis for making recommendations directed towards improved infrastructure and/or marketing and management initiatives.

3 BACKGROUND

Every city is unique and often the identity that is connected to this uniqueness is reflected by the centre of the city (Whyte, 1988). Throughout history, the city centre has fulfilled and offered a multitude of different functions, from social, cultural, political and economical institutions, over public places and green spaces, to residential areas with provision of goods and services within walk able distances. This multi-functionality provides the possibility for visitors to combine different activities during any visit. Present and past experts see this as the single biggest factor for the liveability of the central city (Steinebach, 2002). Recent surveys in Germany have shown that this is highly appreciated by the majority of people, with predictions for a growing importance of this trend in future (Frehn, 2004) (Monheim, 2000b). The city centre is characterised by high densities of buildings and people which is one condition for urbanity. But it also means more activities and more people in less space, which can, if badly managed, imply unpleasant economical, social and environmental consequences. Many centres have to deal with negative effects of traffic, like congestion, noise and air pollution or insecurity. High rents imply a high level of competition leading to chain store effects with disadvantages for local retailers. Thus the centre of a city is subject to complex interconnections, which have to be carefully managed in order to be successful.

3.1 Exemplary Central City Developments from Germany

In Germany, many city centres have gone through major changes in terms of central city amenity over the last 20 years, transformed from car oriented areas to pedestrian friendly environments, where the accessibility by car has become less important than the ambiance and the range of things to do. A lot of cities were able to limit the access to the city centre of

private motor vehicles and to extend their pedestrian precincts to average lengths of 4 – 9 km, with equal success for visiting people, inner city inhabitants and retailers (Jochims & Monheim, 1996; Monheim, 1997, 2000a, 2001a & 2001b). Changes in society brought about a different behaviour as people assess their free time differently, seeing it not only as a time to relax and ‘do nothing’, but as a time that should be spent in a meaningful way, experiencing new things and being entertained (Der Städtetag, 2002). The consequences of this attitudinal change effect the way people evaluate the activity of shopping. Shopping is no longer seen as being simply the activity that serves to meet the daily, weekly or monthly need for goods, but as an activity that is combined with spending time with friends or the family in an environment that offers a great range and variety of things to do. (Deakin, 2002; Jochims & Monheim, 1996). In Germany, people have rediscovered the city centre as an important destination for their leisure time activities, including shopping. Developers and city councils have reacted with the integration of entertainment with shopping centres and department stores in the city centre (Monheim, 2001b).

3.2 Accessibility and Attractiveness as Two Determinants

The viability of the city centre is dependent on the people who visit. In order to do so, the city centre needs to be accessible. What accessibility principally describes is the ‘ease to reach activities or locations’. Three aspects are important in this context: proximity or distance, transport mode available and socio-economic background (Ritsema van Eck & de Jong, 1999) (Handy & Niemeier, 1997; Liu & Zhu, 2004). Accessibility is conditioned by the land use structure. Opportunities grow with increasing density and mix of uses. More activities can be reached in less time using more transport options. The built environment influences the transportation network and directness or indirectness of connections. Land uses induce traffic thereby affecting travel speeds and times. In public terms, a city with a viable economy and a safe social environment is able to provide not only a pleasant urban location, but also an effective transportation system. This can include a high level of public transport service or sophisticated cycling and pedestrian networks and facilities. Socio-economic status regulates the modal options individuals have to choose between. Money is needed to run a car. A person has to be physically able to ride a bike. Personal attitudes and opinions also play an important role in this context.

The city centre needs to be attractive to make best use of high levels of accessibility. Attractiveness in this context could be described as the ‘quality and quantity of the options available in order to spend time usefully’. This is influenced by the mix and quality of activities available in the city centre. The higher the multi-functionality of the city centre, the greater its attractiveness. Attractiveness is dependent on the level of safety and security involved with movement to, from and during visits. It can be impacted by noise and air pollution and the aesthetic quality of the built environment including open spaces. All these aspects can also be seen as conditioning the environment within which central city activities are set. Together they attract people to the centre and make them stay there.

Attractiveness and accessibility are strongly interrelated. High accessibility by car, for example, is dependent on a high quality road network, which guarantees easy and fast access to sufficient car parks in close location to the city centre. However, the closer the cars can get into the centre, the more negative effects evolve for the urban environment, mainly in the form of congestion, traffic insecurity and air and noise pollution. Consequently a high grade of accessibility to the city centre can imply negative effects for the amenity within the centre. It can also influence the movement of pedestrians between different locations. That is why external accessibility and internal accessibility have to be distinguished (Baier & Heinz, 2000;

Baier & Schaefer, 1998; Topp, 1998 & 2002). Internal accessibility refers to the walking conditions within the city centre. These are dependent on the quality and quantity of links between different destinations, influenced by both distance and attractiveness of the walking environment. This is also influenced by the level of safety and security at all times of the day. Good signage orientation is another aspect especially important for new visitors. Fact is that a high quality walking environment can significantly extend the visiting times (Baier & Heinz, 2000; Baier & Schaefer, 1998). The multifunctional city centre is seen as the ideal place to provide this environment. (Frehn, 2004). Although accessibility is a relevant aspect for the viability of the central city, European studies showed that visitors assessed attractiveness more important than accessibility (Baier & Schaefer, 1998; Baier & Heinz, 2000; Monheim, 2001a & Topp, 1998).

3.3 'Objective' Measurable Situation and 'Subjective' Assessment

Differences in attitudes and motivations lead to differences in choices and behaviours. For example, two people in the same location who are unaware of their options may assess their (potential) accessibility differently (Handy & Niemeier, 1997). In German cities, before/after measurements of travel times demonstrated that the situation had improved after the implementation of a new traffic concept. However, a survey amongst car users revealed that a majority were convinced of the contrary. Hence, the assessment of a specific situation by people does not necessarily reflect the 'real' conditions. Therefore it is important to consider both the 'objective' measurable situation and the 'subjective' assessment of the situation by the individual (Baier & Heinz, 2000; Baier & Schaefer, 1998).

4 GENERAL FRAMEWORK FOR CHRISTCHURCH

4.1 Overview

Christchurch is the largest city in the south island of New Zealand with a growing and ageing population of approximately 340,000. Its population density with around 710 inhabitants/km² is more or less half the amount of comparable German cities. The main part of the city is flat and part of the Canterbury plains, which are restricted by the Port Hills to the south and the Pacific Ocean to the east. The moderate climate makes it a pleasant environment for cycling and walking for most times of the year. The central city is known as the area between the four avenues. It extends for 2 km in north-south direction and a little less in east-west and totals 360 ha, which is less than 1% of the whole city area. This specific study concentrated on the core commercial, retail and business area of the central city (27 ha) which represents the main part of the CBD.

4.2 Accessibility of the City Centre

Accessibility by Public Transport

The Christchurch bus system and pricing scheme provide a good service for both, commuters and casual visitors to the city centre. The coverage of residential areas by bus services has been calculated at approximately 85% for a concentric catchment area of 350m of each bus stop. However, the lack of priority lanes makes buses dependent on traffic volume and road congestion, which has high impacts on reliability and punctuality.

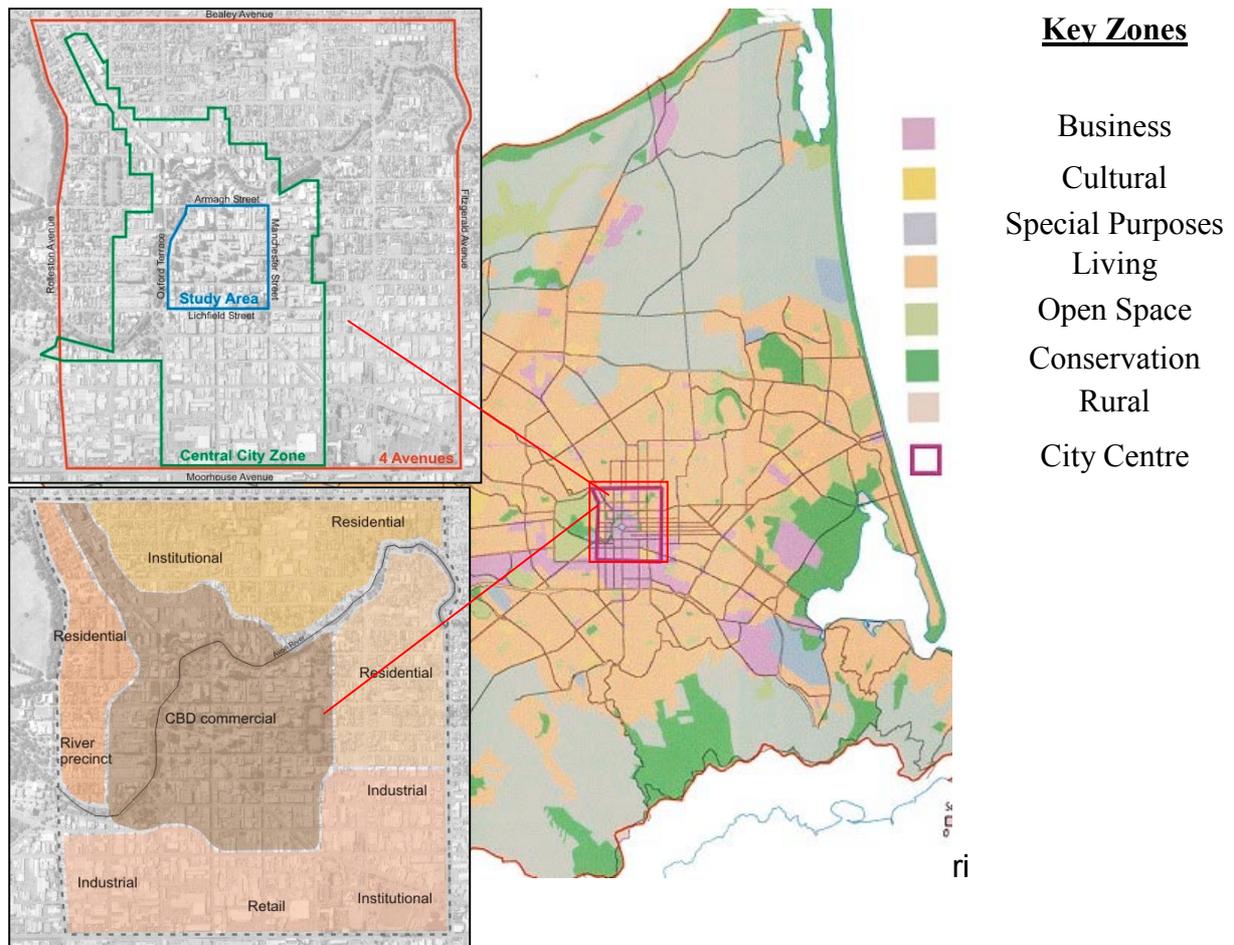


Figure 1: Land Use Map of Christchurch with Central City (Christchurch City Council 2001c)

Accessibility by Private Motor Vehicle. The Christchurch road network is defined by a radial street pattern outside of the four avenues and a rectangular grid pattern inside that area. The city core is surrounded by a one-way street box which eases the accessibility to the four corners of the central city and its major parking areas. This draws the traffic pressure from the centre, which provides the possibility for a better quality urban environment within the centre. It is estimated that with growing car ownership rates the congestion levels will triple by 2021 (Christchurch City Council, 2003a). Nevertheless, the present congestion situation can be regarded as moderate compared to other cities of similar size. GIS calculations based on average 24h travel speeds have shown that the central city is accessible by car within 20 minutes for over 95% of residential areas. Road safety is certainly an issue that affects the high accessibility level as Christchurch has to deal with a high rate with three road crash casualties for every 1000 residents each year, most of which tend to be severe.

Between 1998 and 2002, the number of on-street car parking has been reduced by 4.5% from 9871 to 9428 spaces, while the offer in off-street parking spaces was increased by 1% from 26424 to 26732 spaces. In order to compare the parking availability with other cities, it is important to assess the number of car parks by specific space (e.g. parking spaces per hectare (psp/ha)). This results in 26 psp/ha for on street and 74 psp/ha for off-street parking with a total of 100 psp/ha for the inner city (area between the four avenues). The international comparison puts Christchurch in a moderate position. Amsterdam (Netherlands) as one of the most pedestrian friendly cities totals 48 psp/ha, compared to Mannheim (Germany) as a city of similar size than Christchurch with 142 psp/ha (Topp, 1998).

In 2002, 75% of on-street car parks were free of charge (unrestricted and time limited) and 80% of all metered spaces were located within the CBD. Since 1994, free on-street parking has been replaced constantly with metered spaces (18% increase in metered spaces between 1994 and 2002), mainly with the intention to boost vehicle turnover. The maximum time limit for on-street parking is 2 hours. Of all the off-street spaces, only 4,146 (16%) were available to casual visitors. These were provided by Christchurch City Council with 9 parking buildings and a total of 2855 spaces and Wilson Parking Ltd. as a private company with 7 off-street parking areas with a total of 1291 spaces. The costs for parking have been constantly increased during the last ten years. Although higher costs for on-street in relation to off-street parking are part of the Council's strategy(Christchurch City Council, 2002), both types had a similar pricing structure at the time of the survey. (NZ\$2.00 per hour). Wilson Parking Ltd. offered cheaper rates for early-bird parkers and is thus more oriented towards potential commuter occupants. On the other hand, four of the council's parking buildings provide the first hour as free parking since August 2001, which is more oriented towards short time visitors.

The highest occupancy rates for on-street parking have been observed for unrestricted (77%) and 1h metered (76%), followed by 2h time limit (73%) and 2h metered (61%). All the time limited spaces with one hour or less only had occupancy rates of around 50%. Regarding the much higher amount of unrestricted parking spaces (5195) compared to metered (2402) and time limited (1645), it can be said that this type of on-street parking is the most frequently used within the central city of Christchurch. A more in depth analysis of 1h metered spaces revealed that over half of all users (57%) parked illegally, either because they failed to pay or they exceeded the time limit. This is mainly a problem of insufficient patrolling by parking wardens. The turnover was high with 2-4 vehicle changes per hour. The average occupancy rate for off-street parking was between 59 and 64% with an increase of 20 to 30% since 1998 (Christchurch City Council, 2003b).

Accessibility for Cyclists The proportion of cycling trips to the central city has been consistently decreasing over the last ten years. This is mainly due to a perceived and actual lack of safety, underlined by an estimated injury rate of 300 cyclists per year which kept stable over that period (Christchurch City Council, 2003a). The 1999 cycle network plan theoretically provides a high degree of accessibility for cyclists from all parts of the city to the centre. However, although the network has been constantly extended during the last six years, it is estimated that only 30-60% are currently functional and that dependent on future financing, it could take 30 years to complete it. Decentralised parking facilities are provided throughout the city centre. Some of the council's parking buildings offer lockable iron cages.

Accessibility for Pedestrians. Generally, pedestrians have to seek for priority at traffic lights. The large layout of most streets and the general lack of defined markings make the crossing more difficult and dangerous. This is in some way compensated by middle lane islands. But especially the multilane avenues surrounding the city centre are seen as an impediment for pedestrian accessibility. Walking in fact can be considered as not particularly safe in Christchurch, with pedestrians making up one out of five fatal road crashes and 11% of all reported road crashes. The largest part of these incidents are made up by people aged 15 or under and 60 or over (Christchurch City Council, 2001b).

4.3 Attractiveness of the city centre

Quality and Diversity of the Offer – Multi-functionality. Although the number of retail shops in the city centre is less with 565 shops compared to a combined of 640 shops in the 12

largest suburban centres, the central city has the highest concentration of business and employment in the city. By 2000, there were a total of 31,285 people employed in the central city, which is 19% of the city's total. 56% of the city's government administration and defence institutions were located in the central city, as well as 41% of finance and insurance businesses. Educational facilities accounted for 15% of the city. With 30%, a total of 241 accommodations, cafes and restaurants have been registered within the central city at that time. Although they accounted for only 11% of the total city area, the central city includes some of the most important cultural facilities, like the Museum, the Art Gallery, the Arts Centre and the Botanical Gardens. There are however clear indications for the underperforming of Christchurch's CBD. Retail rents are lower for CBD prime locations (\$600-\$900/m²) than for regional malls (\$800-\$1,200/m²). The main reason for this is seen in the decentralisation of prime office space, simplified by the topographical situation and based upon the perception of a general lack of well managed car parking. A further indicator for decentralisation is the decrease in retail floor space by 8% in Christchurch's CBD between 2000 and 2003, compared to a city wide increase of 13% for the same period. Nevertheless the core area provides a high range of quality and speciality shops that cannot be found in any of the malls. A main difference to European cities are the trading hours in the city centre, with the majority of shops closing between 5 and 6 pm. This worsens the competitiveness of the central city towards the longer opened suburban malls. It is in some way compensated by trading hours on Sundays.

Internal Accessibility. The central city as a whole and the focus area in special are characterised by a very compact structure, which provides short distances between all destinations. The total distance of footpaths within that area is comparable to the longest pedestrian precincts in Germany with 9 km. Particularities in Christchurch are the lanes and arcades that provide shortcuts reserved for pedestrians between different areas of the central city core. Although present plans by the city council focus on the prioritisation of pedestrians, the central city is still characterised by high traffic volumes, which negatively influence the ease of movement for pedestrians.

Open and Green Spaces / Air and Noise Pollution. Higher densities and property values in the city centre make the provision of green spaces a highly prized public good that can only be offered to a certain degree. This is especially apparent in the garden city of Christchurch, where the amount of public and especially private green space is and even more appears to be much less in the centre than in the rest of the city.

Generally, Christchurch has to cope with the problem of air pollution in winter. However, this is more related to the extensive use of log burners for private home heating, as to exhaust emissions from motor vehicles. Noise is an issue to that degree that there are a lot of 'boy racers' who try to 'show off' with their tuned up cars. Although the bus fleet is constantly modernised, there are still a lot of older buses with higher noise emission levels in use.

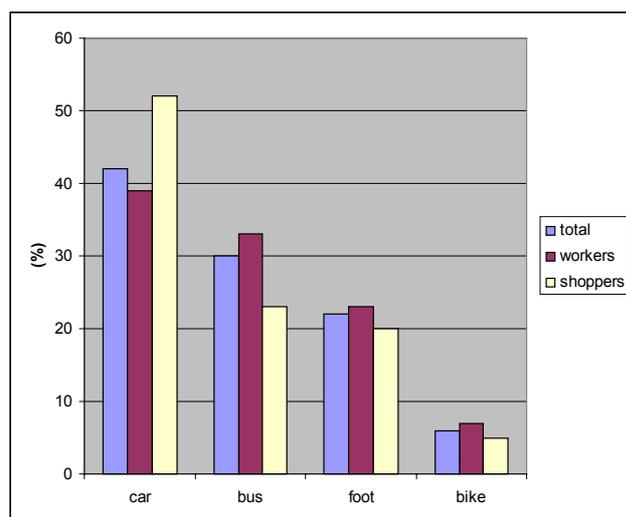
5 FINDINGS

To obtain information required for the 'subjective' assessment of the central city by its visitors, a survey using an interview administered questionnaire was conducted over a three day period (Thursday, Friday, Saturday) in mid October 2004. The questionnaire was composed of 35 closed ended questions which differed between simple and multiple answers, plus two open ended questions which provided a general assessment of visitors. Eight survey sites of high pedestrian flows (identified in former studies) were chosen. Pedestrians were

randomly addressed by the interviewers. The questionnaire only targeted people living in Christchurch City or its immediate surroundings (2h driving time from the centre). Tourists were excluded from the survey sample. All the data was entered into the Statistical Program for Social Scientists (SPSS) and evaluated on a quantitative basis. Open answers were coded into respective categories. Even if the sample size was under the target number with 340 valid responses, a comparison to the 2001 census for Christchurch City revealed an accordance to the population's structural average. Exceptions were the overrepresentation of 15-44 year old and the under representation of over 45 years. This went in common with a high proportion of students and a lower number of unemployed people. This may be seen as an indication for the higher attractiveness of the city centre for the younger generation. In order to distinguish between opinions and behaviours of different subgroups, most comparisons in the following analysis were made for the main reasons of the visit (work/study, shopping, service visit, food/drink, leisure), the travel modes used (car driver, car passenger, bus, bicycle, walking) and the age groups (15-24 years, 25-44 years, 45-64 years, 65 years +).

5.1 Accessibility of the City Centre

Modal Split. The modal split looked as follows: 42% came by car, 30% by bus, 22% on foot and 6% by bike. Bus usage was able to keep up with car usage on weekdays (both 36%), but dropped to almost half the percentage on Saturday.



Car usage on the other hand was higher on Saturday with 50%. Walking increased by 25% from weekdays to Saturday, while cycling remained more or less constant. A comparison between the main reasons for the visit revealed that car usage was highest for shopping (52%) and service visits (53%). Leisure was the only category with more bus (39%) than car users (33%), while bus usage was lowest for shopping and food/drink. Within the age groups bus usage was highest for the 15-24 faction (47%) and car usage for the 25-64 faction.

Figure 2: Modal Split between Workers & Shoppers

Distances and Times Travelled from the Place of Residence. The suburbs respondents lived in were projected into 12 concentric circles representing the distances 'as the crow flies' between the city centre and the outskirts of residential areas. This method gave an approximate evaluation of the catchment area of the city centre by km distance. Twelve km was the upper limit for the suburbs furthest away, above which respondents were considered as originating from outside the city boundaries. 60% of respondents came from an area of up to 4 km from the city centre. 12% were resident outside the city boundaries. Respondents were also asked for the time they spent travelling to the city centre on that day. Table 1 shows the differences in average travel times for the travel modes and the main reasons. Respondents on average took 19 minutes to access the central city. 86% of all pedestrians came from an area of up to 3 km from the city centre. The proportions for bus (~40%) and car usage (~50%) were more or less constant for all distances between 3 and 12 km. Car usage

was higher with respondents coming from outside the city boundaries (63%). The proportion of cyclists remained constant between 2 and 8 km (30 minutes as their maximum travel time).

Table 1 :Mean Average of Travel Time for Different Subgroups (min)

Type	mean average (min)
All respondents	19
Bus users	23
Cyclists	17
Car users	17
Pedestrians	17
Work/Study	20
Leisure	20
Shopping	16

Generally, the proportions between the purposes kept more or less constant independent on the distance from the city centre. This would be an indication for the high attraction the centre exerts on all areas of the city for these purposes. Workers and students took on average over 4 minutes longer than shoppers.

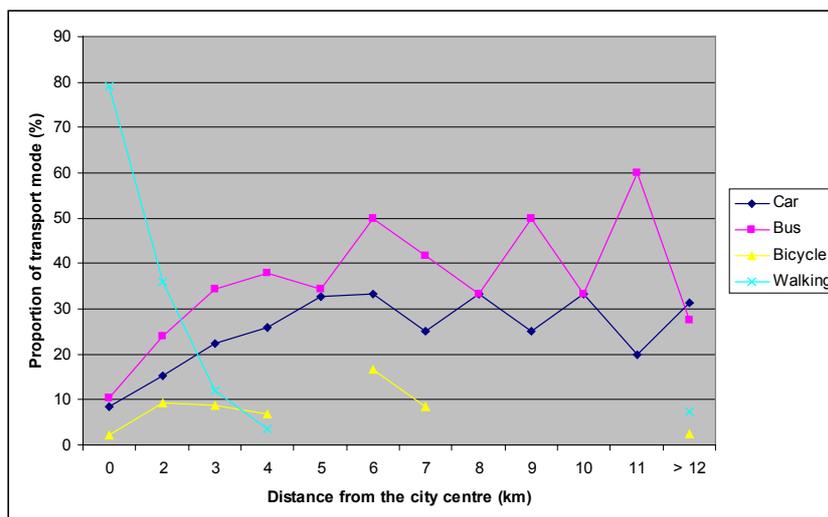


Figure 3: Transport modes and distance from the city centre

This has been related to rush-hour traffic and to the fact that they accept longer travel times as they lack the choice between several destinations. Shoppers on the other hand, can choose between the different or closest shopping areas. The fact that leisure visitors invested the same amount of travel time than commuters would underline the special attraction of the central city for these purposes.

Ease of Travel to/from the Central City and Problems Experienced. The assessment of the ease of travel has been positive as only 7 respondents stated that access was difficult, whereas a majority of 74% were convinced that they could always (42%) respectively often (32%) get easily to and from the central city. This perception was the highest for Saturday and the lowest for Thursday, which is obviously linked to the effect of rush-hour traffic. Car and bus users rated the ease to travel much worse than cyclists and particularly pedestrians. A reason for this is seen in the close catchment area pedestrians come from (3 km), wherein traffic is denser and travel speeds. This is underlined by the results for problems experienced with the trip to and from the central city. Almost half of all respondents were not affected by any problem (48%). The most named barrier however, was traffic or congestion with 28%. Car users were the largest group complaining about congestion (46%), compared to bus users (18%) and cyclists (35%). This shows that the group that is most responsible for the existence of the problem is most likely to criticise it. Pedestrians were least affected by traffic or

congestion as the differences in walking times are marginal dependent on the traffic strength. With an average of 5%, dangerous behaviours were the next most named problem, whereas 25% of cyclists said they felt affected by this. This statement underlines the dangerous relationship between motor vehicle users and cyclists. Problems with the bus service were generally only stated by actual bus users.

Accessibility by Public Transport. Car occupants were asked for their main reasons of non bus usage. The most significant were too long travel times and inconvenient timetables with 31%. The need to call at several locations and the transport of bulky goods were stated with 23%, followed by the habit of taking the car with 15%. High costs for public transport were only chosen by respondents from the age group 15-24, who might be considered as the least wealthy and therefore most concerned about saving money. It is doubtful however if this attitude is based on real cost analysis between public transport and the car. Only 8% stated that the bus stops were too far away and that there were no public transport connections. This correlates with the bus coverage of 85% for catchment areas of 350 m. Travel times were much more important to workers/students (24%) than to other groups (11%). Using the car out of habit was less a reason for workers/students (8%), than for other visitors (20%). Comparisons between the age groups showed a clear relation between the increase in age and choice out of habit

Accessibility by Private Motor Vehicle. All the results on car accessibility were drawn from the answers of the 142 (42%) of car users. Car occupancy rates were higher on Saturdays with 52% of car drivers having at least one passenger, compared to 39% on weekdays. The same relation applied between shoppers with 57% and workers with 37%. The results correlate with a 62% increase in car usage and a 180% increase in shopping rates between the weekdays and Saturday. Consequently the fact that more shoppers came by car on Saturday was compensated to some degree by a higher occupancy rate. It can also be seen as an indication that people use the Saturday to visit the central city with their partner or family.

Table 2 shows that parking buildings with 43% and on-street metered with 19% were the most frequently used types of parking, followed by private off street with 16%. By comparing this survey with the 2001 pedestrian activity survey (PAS) (Christchurch City Council, 2001a), it is interesting to observe a shift from on-street metered parking to parking buildings as the most frequent type of parking. There may be several explanations for this development: Firstly, the first hour free parking has been introduced for 4 of the 10 Council parking buildings since the PAS. Secondly, the number of available on-street parking spaces has been constantly reduced. Finally, the lower occupancy rates in parking buildings provide a higher probability to find a car park. Consequently, the strategy followed by the Christchurch city council to discourage on-street parking and shift the demand to off-street facilities seems to have been successful without a difference in the pricing scheme for on and off-street parking.

Table 2 : Type of Parking Space Used (%)

Type of parking space used	Total car users	PAS 2001	Work/study	Non-work/study
Parking building	43	22	32	21
On street metered	19	31	21	18
Private off-street	16	22	23	10
On street no time restriction	13	10	20	9
On street time restriction	7	6	4	9
Mall/supermarket car park	2.2	6	0	4
Total	100	100	100	100

Parking close to destination had the highest ranking as to the choice of the parking location (49%). Cost was the next most frequent answer (20%). By assessing the variability between the age groups, cost was more important for the younger groups, whereas the older groups again chose their car park more out of habit. A car park close to destination was most important for the 15-24 (59%) and least for the 25-44 (42%) year old. Cost was more important for workers/students (25%), than to the other groups (16%). This result correlates with the assessment of the parking costs, where 66% of workers/students believed that parking was too expensive, compared to 34% of visitors who came for other reasons. A majority of 92% of car users were able to give estimation about their expenditures for parking on that day. 43% parked free of charge. The other 57% on average paid NZ\$ 4.3. Workers/students paid more with NZ\$ 6.1 compared to NZ\$ 3.4 for other visitors. Consequently, for workers/students parking costs are more important as they contribute to a larger extent to their daily budget. The assessment between ease and time spent to find a parking space is inconsistent. While it took less than five minutes to find a parking space for a majority of 80%, only 40% stated that it would be often or always easy to find one. This would also contradict the occupancy rates of 50-77%, which should leave a good probability to find a parking space quickly.

Accessibility for Cyclists and Pedestrians. The travel distance was the largest burden for car users not to come by bicycle to the central city. This argument could be proven with respondents' place of residence. In fact only 9% came from neighbouring suburbs and a majority of 36% had their place of residence outside the city boundaries. It was interesting to see that a lot of people did not own a bicycle, independent from the age groups. One would expect that people from the youngest group should still possess a bike from the time they did not yet own a driving licence. Lack of safety was a concern for 12% of car users not to come by bike. The importance given to this problem increased parallel to the age groups (from 9% for the 15-24 to 22% for the 65+ groups). The main argument for 70% of car users not to walk to the city centre was the distance. This would still leave 30% as a potential target group for a modal shift.

Desired Accessibility Improvements. Two questions asked for the rating of desired improvements for better accessibility and attractiveness in the central city. Each of the treated categories was given one special aspect of improvement that has been valued as important from the evaluation of the present state. The results for accessibility are shown in table 3.

Table 3 Desired Improvements for Better Accessibility

Rank	Desired improvement	A	B	Most desired by	Least desired by
1	Better safety for cyclists	3.8	18/67	Workers/students Age 25-44 Cyclists	Shoppers Leisure Age 45+
5	More frequent PT services	3.4	30/50	Age 15-24 Bus users Cyclists	Shoppers Age 45+ Car users
6	More car parking	3.3	36/55	Age 15-24 Car users	Age 25+ Cyclists Pedestrians
7	Better safety for pedestrians	3.2	33/47	(Only small variations)	Age 65+

Methodology: The scale of the ratings was defined from 1 to 5, with 1 being least and 5 being most desired as an improvement. In Tables 3 and 7, column A stands for the mean average of all ratings for the respective aspect, which means the closer to 5, the higher is the rating for an improvement of that aspect. Column B represents the relationship between least (1&2) and most desired (4&5), with the exclusion of 3 as the neutral middle.

Better safety for cyclists was the overall most desired improvement. This was especially supported by workers/students in the age group 25-44, for whom it can be assumed that with a safer cycling environment, this would be a viable commuting alternative. The result also underlines the negative safety perception for cycling in Christchurch. The improvement of bus services shows a split between bus users and cyclists on the one and car users on the other side. As bus users are in the best position to judge the quality of the service, this would be an indication that services would need to be improved. The other part of the result can be interpreted in the way that cyclists would consider the bus as an option if the service was improved, as opposed to car users who were more reserved towards the enhancement of public transport. The addition of car parking was more important for car users than for pedestrians and cyclists. As compared to the results of surveys from prior years, this was not a major issue in this survey. The same was true for the enhancement of the pedestrian safety. There were few indications for the consideration of a modal shift as respondents were most supportive towards improvements for the transport modes they were already using.

5.2 Attractiveness of the City Centre

Distribution of Reasons for Central City Visits.

Table 4 shows the distribution of respondents' main and secondary reasons to come to the city centre.

Table 4 : Main and Secondary Reasons for the Central City Visit

Reasons for central city visit	Main reason		Secondary reasons	
	N	%	N	%
Work/study	154	45	11	2
Shopping	96	28	148	32
Grocery purchases	0	0	19	4
Service visit	17	5	24	5
Food/drink	16	5	156	34
Leisure	57	17	100	22
Total	340	100	458	100

While work/study was the most common main reason, it is the least secondary reason. Grocery purchases have not been named by anyone as a main reason and only been part of the visit for 19 respondents. This is related to the fact that grocery shops are barely a part of the offer in the central city. The main supermarkets are located at the fringe of the central city or distributed over the suburbs and primarily laid out to the accessibility by car.

Although there is a larger provision in service businesses than in grocery shops, service visits only played a minor role as well (5% of all visits). Food/drink have been very popular when combined with other purposes and were the most commonly mentioned secondary reason, closely followed by shopping. Leisure also played a more significant part as an additional activity than it did as a main reason for a central city visit. The central difference between the weekdays and Saturdays existed between work/study (weekdays 57% to Saturday 22%) and shopping purposes (weekdays 18% to Saturday 50%). Leisure time activities kept more or less constant over the three days. It has been assumed that these would play a more important role on Saturday due to more free time. Apparently this is not the case and it has been suggested that these activities are spent differently, with shopping as a potential substitute on Saturday. When analysing the main reasons of the different age groups, work/study and shopping accounted most for the 15-64 years, while leisure and especially service visits were a major part of the 65 years + age group. Considering leisure as a main reason, the age group 15-24 years had highest percentages on Thursday and lowest on Saturday. Consequently youth would be more likely to spend its leisure time in the city centre during the week, while older generations tend to do so on weekends. A reason for this might be seen in activities of youth sport clubs on Saturdays.

Multifunctional Use. The combination of activities has been very popular. Only 16% of visitors had no secondary reason for their visit. Workers and students were the group that most often combined activities during their visit. Not only was this behaviour of combining activities more efficient, it also seemed to be more satisfying. When work/study was the only reason, the visit felt for 91% of respondents as duty. 9% said it was a combination of duty and leisure and nobody described it as leisure. Whereas when it was combined with at least one other non-work activity, only 38% described the visit as duty, 18% as leisure and 44% as both. Assuming that leisure or at least a combination of duty and leisure increase the personal well-being, multipurpose visits can be regarded as more satisfying. Independent on the main reasons, shopping, food/drink and leisure were the activities most often combined.

Shopping. Ninety-six respondents shopped as a main, 148 as a secondary reason. Hence a total of 244 out of 340 respondents (72%) used the central city for shopping. A comparison between the age groups revealed a large increase for the 25-64 year age groups from the weekdays (29%) to Saturday (71%). This has been related to the fact that this age group composes the main part of the work force, for which Saturday remains as the only day for extensive shopping visits. The car was the favourite travel mode to access the central city for shopping purposes with 41%, followed by bus (29%) and walking (24%). Shopping has been subdivided into planned and non-planned visits. Planned shopping means that people already have an idea beforehand which products they want to buy, whereas with non-planned shopping, this may or may not evolve during the shopping activity. Another aspect is that shopping is not equivalent to buying, which is most accurately expressed in the activity of strolling or window shopping, as a process described as ‘to look at goods in shop windows without intending to buy’ (Collins English dictionary). Strolling/window shopping is therefore supposed to be equivalent to shopping visits that are not planned.

Table 5 presents a summary for the differences between planned and non-planned shopping visits. Non-planned shopping was more common in addition to another activity and more likely to be seen as a leisure activity. Car usage was highest when the shopping visit was planned as a main reason. Those visitors also spent more money in less time. The argument by Monheim (2002) that people who visit less often, spend more money could also be proven. Overall, the analysis of shopping behaviours revealed two major groups of shopping visitors in the central city of Christchurch. Firstly, car users who have planned the shopping visit as their main reason. They spend more money in less time. Secondly, people who shop as an additional activity. They are more likely to come by bus, spend less money in more time and see shopping more as a leisure activity. This leads to the question which group incorporates more advantages for the centre. The first generates higher turnover rates, but is based on increased car usage, which induces negative effects for the urban environment. The second seems to be, at least directly, economically less viable, but may contribute to an improved strolling atmosphere and consequently a higher level of amenity and more visitors in the long term.

Table 5 : Differences between Planned and Non-planned Shopping Visits

Summary for shopping	Planned shopping visit	Non-planned shopping visit
when main reason	65.6%	35.4%
when secondary reason	46.6%	53.4%
Shops visited	Less	More
Time spent	Less	More
Money spent	larger amounts	smaller amounts
Visit description	More duty	More leisure
Modal split car/bus	59/16	39/36

Description and duration of central city visit. Forty-four percent of all respondents described their visit as leisure, 25% as duty and 30% as both. Leisure activities were most satisfying, followed by shopping and food/drink. Work/study and service visits were most often described as duty. Almost 57% of non-work/study visitors spent between one and three hours and 16% spent more than four hours. The duration of the visit exponentially increased with the number of further activities.

Internal accessibility. For the assessment of internal accessibility both opinions on the relative distances between the destinations and the attractiveness of the walking environment are important. For an assessment of the distances the results from the PAS 2001 (Christchurch City Council, 2001a) on that question have been used, while the opinions towards the pleasantness were part of this survey. 94% of all respondents described walking within the central city as pleasant (70%) or very pleasant (24%). Only one expressed it as being very unpleasant. The results from the PAS 2001 revealed that for a majority of 84% everything (46%) to most places (39%) were in easy walking distance, with only 3% saying that the central city was too spread out. Consequently, internal accessibility in the central city of Christchurch received a very positive assessment. Respondents were also asked if they felt in any way disturbed by cars within the central city. For a majority of respondents this was neither the case with parked (82%) nor with moving (62%) cars. Single streets with high annoyance levels were Colombo Street as the central city street with the highest traffic volumes and Lichfield Street as a one way street characterised by high traffic speeds. Car users were the group that felt least disturbed by the presence of either parked or moving cars. Parked cars were the largest concern for cyclists. This result has been related to the problems involved with kerbside parking along cycle ways, as unexpectedly opened car doors present a high danger for cyclists. Pedestrians, who are subject to the highest fatality rates from traffic accidents, were in fact most concerned about moving cars.

Built environment. Table 6 represents the main characteristics of the streets in the study area, as well as the assessed attractiveness by central city visitors. The results show a clear difference between the first 6 and the last 5 ranked streets. Although respondents did not give much weight to the disturbance by cars, the streets on ranks 1 to 6 all have in common that they are freed of motor vehicle traffic to some extent. They also offer a higher amenity with open air hospitality areas, refurbished buildings and more greenery. The streets occupying the back places on the other hand are more car oriented and less attractive in terms of urban design, with Lichfield as the double lane one way street in last position.

Table 6 : Attractiveness of Central City Streets

Street name	Mainly characterised by	A	B
Oxford Tee	Part of greened river precinct; One lane street with low traffic speeds and volumes; Wide footpaths with adjacent open air hospitality uses	4.1	6/80
New Regent Str	Car free, only passed by tourist tram; Refurbished Spanish colonial buildings; Open air hospitality uses	4.1	7/75
Cashel Mall	Pedestrian precinct; Main shopping area; Partially open air hospitality uses	3.7	10/65
Cathedral Square	Car free central square; Everyday market; Street entertainers; Partially open air hospitality uses	3.7	13/62
High Str	In part pedestrianized; Refurbished buildings; Partially open air hospitality uses	3.4	16/50
Worcester Blv	Boulevard lay out; Low traffic speeds; Wide footpaths	3.3	24/47
Colombo Str	Main arterial with high retail share; High traffic volumes (buses), stop and go; Partially two lane kerbside parking	3.2	24/24
Gloucester Str	Central library as key tenant; Partially pedestrian crossing priorities; Two lane kerbside parking	2.8	36/22
Hereford Str	Unattractive built environment; Two lane kerbside parking	2.7	42/18
Manchester Str	High traffic volumes; Unattractive built environment; Two lane kerbside parking	2.6	48/16
Lichfield Str	Two lane one way street; High traffic volumes and speeds; Two lane kerbside parking	2.5	54/15

Desired Improvements for Higher Attractiveness. Table 7 shows the ranking for the most desired attractiveness improvements. The addition of greenery to the central city has always been an issue for Christchurch residents in the past, and was also very important in this survey. More car free streets were supported by 57% of respondents. Again, this is an issue more desired by the soft mode users than by car occupants. Improving the quality and diversity of the offer and extending the trading hours was mainly subject to improvement for the youth group. Bus users and especially cyclists were more in favour of longer trading hours than pedestrians and car users. This might be related to the fact that proportionally a lot of bus users and cyclists were workers/students who would still shop after work. The reduction of air pollution was more important than less noise. For both aspects, cyclists were the group most in favour of their improvements. This may be related to the fact that cyclists as the weakest and least secured participants of on-street traffic are most exposed to these emissions.

Table 7: Desired Improvements for Higher Attractiveness

Rank	To be improved (N)	A	B	Most desired by	Least desired by
2	More greenery	3.64	22/61	Cyclists	Pedestrians
3	More car-free streets	3.49	27/57	Cyclists Pedestrians	Car users
4	Reduced air pollution	3.47	28/54	Cyclists	Age 45+
8	Longer trading hours	3.17	37/49	Age 15-24	Age groups 45+
9	Reduced noise	3.22	43/47	Cyclists Age 25-44 & 65+	Bus users Age 15-24 & 45-64
10	Improved safety & security	2.98	39/41	Age 65+ Cyclists Car users	Age 45-65 Leisure Pedestrians
11	Better choice of shops	2.95	41/41	Age 15-24	Age groups 45+

6 CONCLUSION

In this study, accessibility and attractiveness have been considered as two vital determinants for central city viability. Overall, the comparison between the 'objective' situation and its assessment by central city visitors is seen as a satisfying relation in most terms. The survey analysis showed a common split between opinions and attitudes of different age groups, as the young generation was generally more supportive towards any improvement. The situation in Christchurch has also shown that low congestion levels and a high provision of car parking support the use of the car to the disadvantage of other modes. High accident rates create a lack of safety perceptions, especially for cyclists, which result in low proportions in the modal split and an elevated awareness for the elimination of this problem. The strategy followed by the City Council to discourage on-street parking by increasing the offer in off-street parking seems to be successful, even without a difference in the pricing structure. However, there was still a gap between the actual and the perceived parking offer. The introduction of a dynamic parking guiding system and more information about the actual parking situation should help to improve this misperception. A high catchment area makes bus usage equally successful to car usage among commuters. Patronage should be able to further increase with the planned installation of bus priority lanes. The majority of visitors made use of the multi-functionality of the central city, which revealed to increase the satisfaction level of the visit. This should be carried on to other 'potential' visitors by supporting the central city qualities through marketing campaigns. The compact structure of the central city creates a high connectivity between the different locations and resulted in a positive perception of the internal accessibility. Although people did not directly feel disturbed by cars, the areas with low motor vehicle presence were rated as the most attractive and more car free streets were desired by

the majority. Planned traffic abatement measures in the central city should help to achieve this. The study has also shown a difference in shopping behaviours between people who had planned their shopping and people who had not. While the first are (directly) economically more viable for businesses, the second may contribute to a better strolling atmosphere and thus a more viable city in the long term.

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