Environmental Quality, Distribution of Services and Implications for Children:

A regional analysis of the urban environment in Southport, Queensland

Jessica Strickland | S2793629

Urban Analysis | Griffith University

Abstract

Geographical Information Systems (GIS), such as Google Earth, fieldwork and environmental quality assessments are a combination of research tools that, when used effectively, can provide planners with valuable information about spatial relationships and the way in which people interact with the urbn environment. These tools were integrated and applied to Southport, on Queensland's southeast coast, to gain a better understanding of features within the region. In particular, three key aspects of Southport were focused on. The distribution of dining and retail services was examined and the data suggested that higher frequencies of such service outlets are located in regions of high density. Additionally, it was recognised that access to parks and greenspace as well as educational insittutions is fundamental for the healthy development of children. The locations of these features were examined and, although there are such services located throughout Southport, research indicated that pedestrian routes are, in many cases, hindered by main roads. Design of public spaces is known to contribute to the ways in which people do and don't use them and the observation was made that parks and greenspace did not appeared to be receiveing much use in Southport. It was suggested that this is likely due to the difficulty involved in accessing such facilities, however, further research is required to determine the underlying reasons for the apparent lack of greenspace and park use in Southport. Finally, Knox's Environmental Quality Assessment tool was used to assess eight locations in Southport to determine the liveability of each. Findings suggested that low density regions of Southport had a better overall appearance than areas of high density. Based on the findings, implictions for residents of Southport, in particular chilcren, were addressed.

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1.0 Introduction

Increasingly, research instruments such as geographical information systems (GIS) and environmental quality assessments, are used in conjunction with surveying, focus groups and interviewing to allow planners to better understand different people-place relationships (Balram & Dragicevic 2005, pp. 147-62). This report will use such instruments to examine the spatial relationships within the urban environment of Southport, on Queensland's southeast coast. Southport is described as a 'major centre for employment' and 'is supported by significant retail, commercial, health care, education, community, recreation and personal services' (Gold Coast City Council 2009, p. 9). This report will seek to assess the validity of this claim by analysing features of the urban environment and suggesting potential consequences for Southport residents. The locations of services such as dining and retail outlets will be studied and links to residential density will be examined. Additionally, the locations of parks and greenspace will be observed and the potential consequences of these spatial arrangements for children will be addressed. To assess the suitability for residential use, the environmental quality of eight specific locations around Southport will be assessed.

More and more commonly visualization techniques, including mapping using GIS, are utilised by planners to understand locations and to recognise potential challenges within societies. However, Dorling (1992, pp. 614-5) outlines the detriments associated with using maps as a means of visualisation in order to examine spatial associations within the urban environment. He argues that attempts at 'linking people to Cartesian coordinates, calculating straight-line distances between them, and wrapping Theissen polygons around them' are void as there is little consideration for the actual lives of the people being studied (Dorling 1992, p. 615). However, others (Lefera et al. 2008, pp. 474-80; Balram & Dragicevic 2005, p. 148) would argue that GIS and maps are important tools for geographers and planners. Furthermore, Patterson (2007, p. 146) states that GIS 'can contribute greatly to unify various disciplines that focus on spatial trends and elements', resulting in a more holistic understanding of urban societies and environments. For this reason, Google Earth was used as a mapping tool to better understand the relationships between features of Southport. In particular, educational institutions, parks and greenspace locations and the provision of dining and retail services in relation to density were observed.

Rosenberg (1966, p. 3) suggests that, for planners, 'the aim should be to organize the complexities of human settlement around the enhancement of the quality of life'. In many disciplines, environmental quality assessments are used as instruments to determine the liveability or quality of life of various locations (Van Kamp 2003, pp. 5-9). It is important to recognize, however, that this type of research is incredibly subjective as it is based on what an individual, or a group of individuals, deems as important in terms of liveability (Knox 1976, p. 107). Knox (1976, p. 107) outlines the usefulness of such research but recognises that 'it would be fallacious to assume that assessment techniques carry any real degree of objectivity, since the categories and their weightings are always dependent upon the subjectivity of those who design the schedule'. This is because the factors that people consider to be important in making an environment desirable, safe or aesthetically pleasing vary vastly from person to person (Ozguner & Kendle 2006, pp. 139-57; Wong & Domroes 2005, pp. 617-32). This essay will seek to apply an environmental quality assessment, designed by Knox (1976, p. 102-5), to eight locations within the Southport region, as determined geographically by the Australian Bureau of Statistics (2010a).

Although environmental quality assessments are a flawed research instrument in that they are incredibly subjective, ones that are designed to address the needs of a range of groups within a population can be useful as they allow for a better understanding of what aims might be undertaken to improve the liveability of an area (Rosenberg 1966, p. 3). For example, Rosenberg (1966, pp. 3-5) outlines the importance of recognising the often differing needs of children, old people, young adults and adults. This report seeks to examine the liveability of various locations within Southport for individuals, particularly within the group of children. For example, planners need to provide urban greenspace as it is shown to reduce

the risk of 'childhood obesity, attention-deficit disorder, impaired social skills (including increased violence), and alterations with mental health' (Louv, in Driessnack 2009, pp. 74). This report will seek to examine the environmental quality of Southport, the suitability of the eight locations for residential use and the potential consequences for children who live in the region.

1.1 An Overview of Southport

The Population

The regional area of Souhtport, as defined by the Australian Bureau of Statistics (2010a), has aproximately 30,000 residents and a population density of 2,100 individuals per square kilometer, making it a relatively dense part of Queensland, which has an average population density of only 2.6 individuals per square kilometer (Australian Bureau of Statistics 2010b). The majority of individuals that make up the region's population are in between the ages of 15 and 30, however, it is important to recognise that a large proportion (13%) are children under 15 years old (Figure 1.1) (Australian Bureau of Statistics 2010a). Additionally, the population of Southport is quite multicultural, with 34.6% of residents being born overseas, a much higher proportion than within the Queensland population as only 19.2% of Queenslanders are born overseas (Australian Bureau of Statistics 2010a; 2010b).

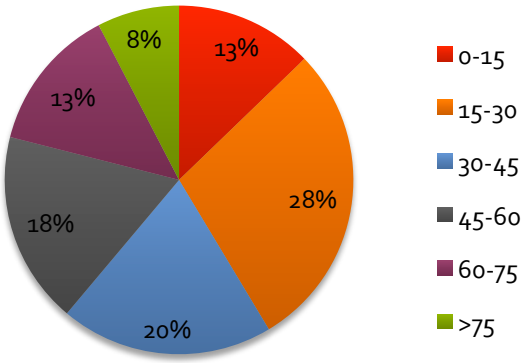

Figure 1.1: Proportions of Southport residents in different age groups.

The fertility rate of Southport (1.6) suggests that its population is growing at a rate greater than Sufers Paradise, but less than other suburbs and less than the rate of the state (Figure 1.2) (Australian Bureau of Statistics 2010a; 2010b; 2010c; 2010d; 2010e). Furthermore, car ownershps rates in Southport, compared to surrunding suburbs, are relatively low, with only 553 personal vehicles registered per 1,000 individuals (Australian Bureau of Statistics 2010) (Figure 1.3). This suggests a heavy reliance on using alternate methods for getting around, such as taking public transport, cycling or walking.

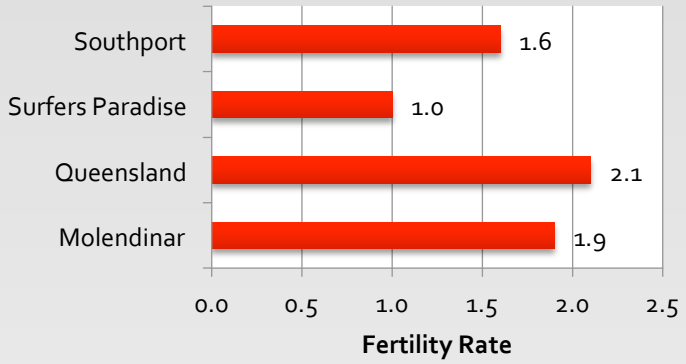

Figure 1.2: Fertility rates of Queensland, Southport and surrounding suburbs.

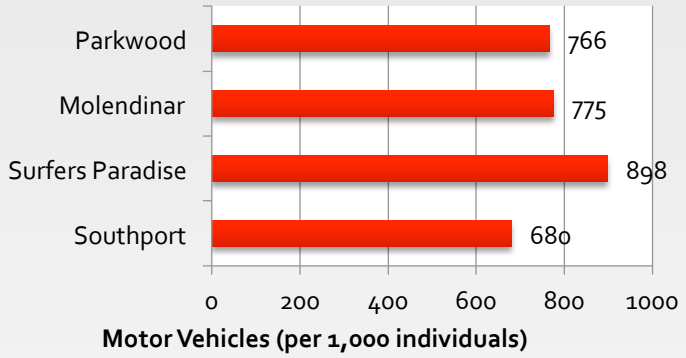

Figure 1.3: Vehicle ownership rates of Southport and surrounding suburbs.

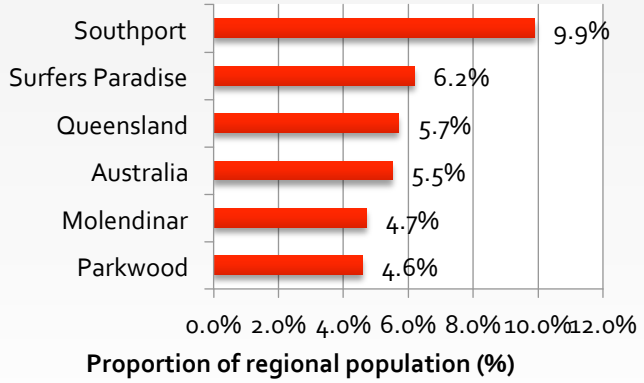

Figure 1.4: Average unemployment rates of Southport, surrounding suburbs, the state and the nation.

The Economy

When compared to surrounding suburbs or even Queensland and Australia, it can be seen that Southport has a relatively high unemployment rate, with 9.9% of the population claiming to be unemployed (Figure 1.4) (Australian Bureau of Statistics 2010). Additionally, Southport residents have a very low average taxable income when compared to surrounding suburbs or Queensland or Australian residents (Figure 1.5) (Australian Bureau of Statistics 2010). Despite these statistics that suggest Southport has a low socio-economic population, the average value of private dwellings in Southport is much higher than the average value for Australia or Queensland (Figure 1.6) (Australian Bureau of Statistics 2010).

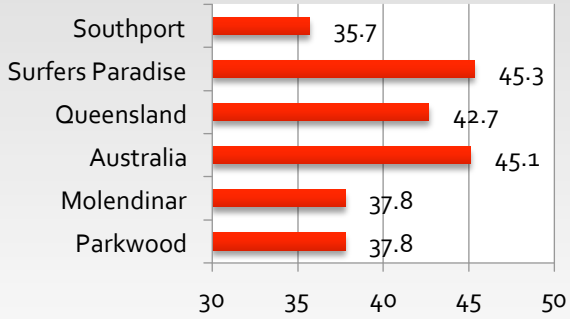

Figure 1.5: Average taxable income in Southport, surrounding suburbs, the state and the nation.

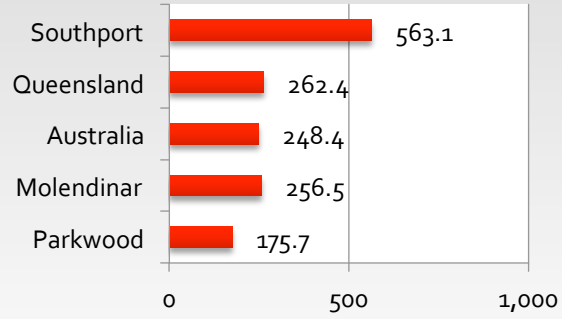

Figure 1.6: Average value of dwellings in Southport, surrounding suburbs, the state and the nation.

1.2 Aims and Objectives

This report seeks to gain a better understanding of the effect of Southport's urban environmental characteristics and their implications for the quality of life of people who live in the region, through the use of instruments such as an environmental quality assessment tool and Google Earth. In particular, the implications for children living in eight different locations within the region will be examined. Additionally, the locations of dining and retail outlets in Southport will be examined and the possible relationships between the locations of these services and density will be studied.

2.0 Methods

2.1 Spatial Analysis

Firstly, Google Earth was used as a research tool to map the locations of retail and dining outlets and to assess the relationship between residential density and the distribution of these services. Densities were looked at in terms of the maximum building heights of the area, as determined by the Gold Coast City Council (2008). Patterns between the incidence of these services and the density of these areas were observed and potential causes were hypothesised.

Secondly, Google Earth was used to locate various aspects and features of the urban environment within Southport in order to assess the suitability of Southport for children to live in. The locations of educational institutions as well as parks and greenspace were determined and examined.

Table 2.1: Addresses of the eight locations assessed in Southport, Queensland.

LOCATION	ADDRESS
LOCATION 1	Centre Alma Street
LOCATION 2	Corner Maid and Johnson Streets
LOCATION 3	Corner Hicks and Scarborough Streets
LOCATION 4	Centre Prince Street
LOCATION 5	Corner Pohlman and Nerang Streets
LOCATION 6	Corner Garden and Queen Streets
LOCATION 7	Centre Mabel Avanue
LOCATION 8	Centre Egerton Street

Furthermore, Google Earth was used to select eight locations within Southport, each approximately 800 metres apart. The proximity of these eight locations to educational institutions and greenspace was noted, to determine potential impacts on children living within the vicinity of each. Upon using GIS to map and examine the spatial relationships between these features of Southport, fieldwork was undertaken to gain a better understanding of the region. During the fieldwork, care was taken to recognise and record the locations of services and features that were not depicted on Google Earth. It was noted that certain relationships and distances between places seen using the software could be deceptive. For example, routes between services which appeared to be short and linear when examined using Google Earth, were often unsuitable for pedestrians, or difficult to access due to traffic or obstacles. This observation further supported Dorling's argument that visualisation techniques as a form of analysis are flawed and cannot be used independently of other research methods to gain a full understanding of people-place relationships (1992, pp. 613-37).

Figure 2.1: Map showing the eight locations assessed in Southport, Queensland (Google Earth 2010).

2.2 Environmental Quality Assessment

In order to rate and compare the liveability of different parts of Southport, Knox's Environmental Quality Assessment tool (1976, pp. 102-4) was utilised (Appendix 1). On Tuesday, the 29th of May, the eight equally distributed locations within Southport were surveyed in detail and, using this tool, an overall mark out of 100 was awarded to each. The Assessment of Environmental Quality tool was used to evaluate individual aspects of each location and penalty marks were allocated if the location did not meet certain expectations. Penalty points were allocated in four main categories (appearance, access, amenity and provision), which encompassed 16 key aspects of the area in relation to residential suitability (Knox 1976, pp. 102-4). In addition to Knox's instrument, a camera was used and field notes were transcribed to ensure accurate observations of each location were recorded.

It is important to recognise, however, that Knox's tool is designed to assess residential areas and hence may not be entirely relevant to some of the locations randomly chosen for assessment (1976, p. 101). Additionally, the tool is dated and puts emphasis on certain elements of the urban environment in a way that does not reflect modern planning theory. For example, the current general consensus among planners is that combining land uses, such as commercial and residential, can be beneficial as it can increase sustainability and 'decrease the travel distances between activities' (Jabareen 2006, p. 41). However, Knox (1976, p. 102) believes non-conforming land uses are a negative environmental feature and his tool is designed in a way that such areas are penalised heavily. Additionally, Knox (1976, pp. 102-3) emphasises the importance of close proximity to primary schools, shops, pubs and doctors. However, the tool does not consider other services such as higher educational institutions, post offices, dining outlets or exercise amenities (Knox 1976, pp. 102-4). For this reason, photography and GIS was used as a tool to document other aspects of the urban environment and to recognise potential trends and challenges within Southport not picked up by the Environmental Quality Assessment tool used.

3.0 Results and Discussion

3.1 Spatial Analysis

Density and Services

Within Southport, the spatial relationships between density and the prevalence of dining and retail outlets was examined using Google Earth as a mapping tool, as well as through fieldwork. It can be seen, through the use of Google Earth, that areas with high residential density, that is large building heights, are overpopulated by clusters of dining and retail outlets. This is shown in figures 3.1 and 3.2 where maximum building heights are represented by the numbers in the red zones. Fieldwork confirmed that, within Southport, areas with high densities are located on the land with the highest value along the Southport broadwater. It is likely that developers have attempted to capitalise on the amenity of the broadwater by building multi-storey residences along the waterfront, thus increasing the density of the area. Buckenberger (2011, pp. 70-2) outlines the fact that clusters of service outlets including retail and dining facilities are often located in regions of higher density. It appears that this is the case on the Southport broadwater, as dining and retail outlets have attempted to capitalise on the high densities of people residing along the waterfront.

Figure 3.1: Map of the dining and shopping outlets in regions with different building heights, as defined by the Gold Coast City Council, within Southport. (Google Earth 2010).

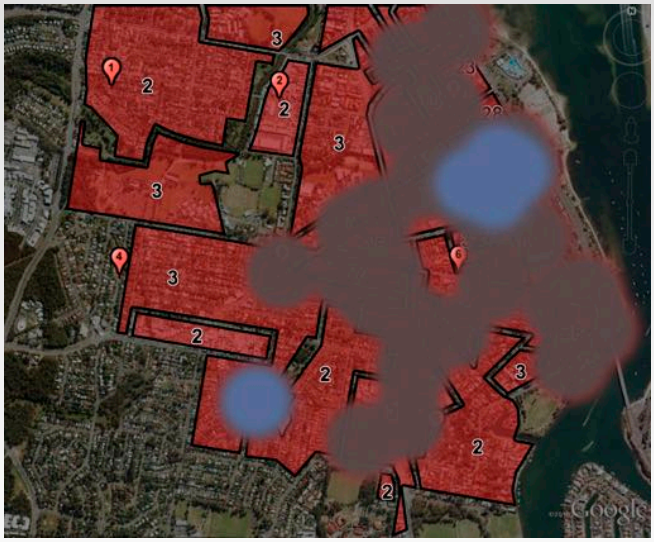

Figure 3.2: Map showing the clusters of dining (grey) and retail (blue) outlets in Southport (Google Earth 2010).

Children in Southport

It has been seen that a large proportion of Southport residents are families with children under 15 years old (Australian Bureau of Statistics 2010a). Furthermore, it is recognised that greenspace is very important for the 'physical, social and mental health' of children and it is fundamental to their successful development (McAllister 2008, p. 45). For this reason, the distribution of parks and greenspace within Southport was examined. It was found that there was a relatively even distribution of greenspace throughout the region with large amounts along the Broadwater, in the vicinity of the expensive, high denstiy strip of residential dwellings on the water (Figure 3.3). It would appear from the map produced using GIS that Southport children have adequate access to parks and greenspace.

However, Cohen et al. (2007, p. 513) make an interesting point about the use of parks and note that 'parks can play a role in facilitating physical activity, but do not necessarily do so'. Golicnik and Thompson (2010, p. 52) outline that the use of greenspace is often directly linked to the design of elements within the space that promote feelings of safety. They state that 'well-used (and well-maintained) city parks are likely to be perceived as safe places to visit' (Golicnik & Thompson 2010, p. 52). Furthermore, Floyd et al. (2011, p. 263) found that park designs that promote feelings of safety lead to an increase in the active usage by children. They state that 'blending natural landscapes, manufactured play structures, and fencing in close intimate settings can be used to create comfortable environments for children and families' (Floyd et al. 2011, p. 263). It therefore follows that well designed parks would encourage use by children, which is found to be positive to their healthy development. However, fieldwork and observation of open spaces and parks located within Southport indicated that they were not used extensively due to limitations in terms of accessibility, safety or amenity (Figure Figure 3.10). There is opportunity for further research to examine what the underlying reasons for the overall lack of greenspace and park use are in Southport.

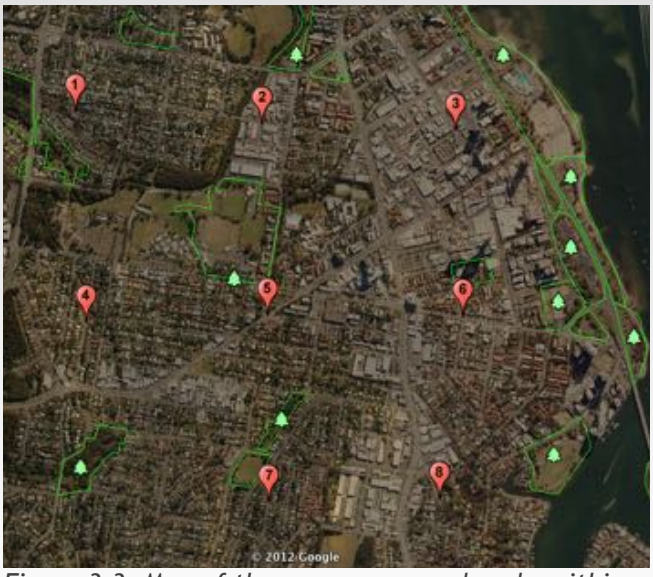

Figure 3.3: Map of the greenspace and parks within Southport and their proximity to the eight locations assessed (Google Earth 2010).

Figure 3.4: Map of educational institutions within Southport and their proximity to the eight locations assessed (Google Earth 2010).

Additionally, close proximity to educational facilities is a positive thing that can contribute highly to the residential quality or liveability of an area (Knox 1976, p. 102-3). Furthermore, the benefits having schools within walking distance of residences include increased physical health and decreased child obesity rates as it encourages non-vehicular travel (Trapp et al. 2011, pp. 172-3; Timperio et al. 2004, pp. 40-2). Hence, the distribution of educational institutions within Southport was examined using GIS to produce maps as well as through fieldwork. GIS suggested that there appeared to be a relatively even distribution of primary schools in particular, with a large proportion of the region being within a 500 metre raius of a primary school (Figure 3.4). However, fieldwork revealed that the deisgn of Southport is very vehicle focused and many of the pedestrian routes to and from these scools are disrupted by main roads or lack of sufficient pedestrian facilities (Figure 3.13).

3.3 Assessment of Environmental Quality

Within Southport, eight locations were visited and, using Knox's Assessment of Environmental Quality instrument, penalty points were awarded to each in four categories: appearance, amenity, access and provision. Overall, Location 2 received the most penalty points and only received a total score out of 33 out of 100 (Figure 3.5). On the other hand, Location 7 received the highest score of 86, as only minimal penalty points were awarded across the four categories (Figure 3.5). The penalty points awarded for each subcategory for the eight locations can be seen in table 3.1 and the specific criterion for each element can be seen in appendix 1.

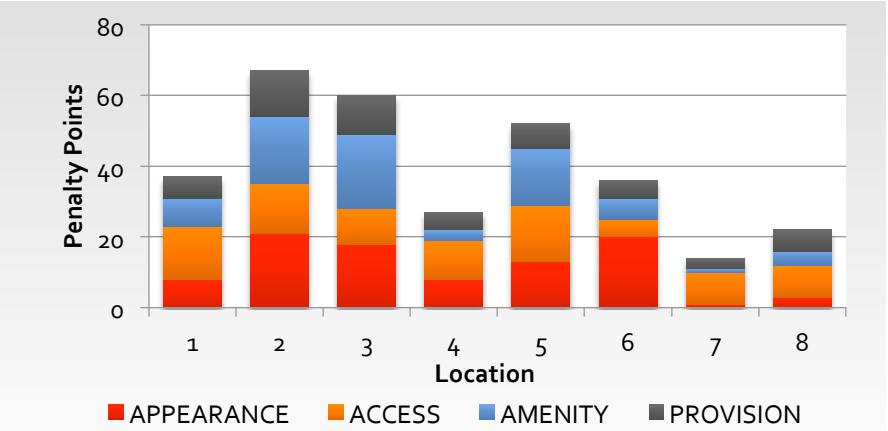

Figure 3.5: Penalty points given to the eight locations assessed within Southport across the four key areas assessed.

Table 3.1: Penalty points given to the eight locations within Southport in each of the 16 areas assessed.

ELEMENT	ASPECT	LOCATION							
		1	2	3	4	5	6	7	8
APPEARANCE	Non-conforming uses	0	9	8	2	3	8	0	0
	Landscaping/Visual quality	4	6	4	3	4	5	1	1
	Townscape/Visual quality	3	4	4	2	4	5	0	1
	Appearance of gardens/yards	1	2	2	1	2	2	0	1
ACCESS	Access to Primary School	2	2	4	2	4	4	7	0
	Access to other facilities	1	2	0	1	7	0	2	1
	Access to children's playground	6	6	5	6	5	0	0	6
	Access to park/public open space	4	4	1	0	1	1	0	2
	Access to public transportation	2	0	0	2	0	0	0	0
AMENITY	Traffic	6	2	9	1	8	0	1	3
	Noise	0	6	5	0	4	2	0	1
	Air Pollution	0	7	4	0	2	1	0	0
	Microclimate	2	4	3	2	2	3	0	0
PROVISION	Garaging/Parking provision	1	6	6	1	2	2	1	1
	Garden provision	2	4	4	1	4	2	1	3
	Provision of neighbourhood amenities	3	3	1	3	1	1	1	2
TOTAL PENALTY POINTS		37	67	60	27	53	36	14	22
FINAL SCORE (out of 100)		63	33	40	73	47	64	86	78

In order to gage the realationship between the geographical lcoation of the sites assessed and the penalty points given for each element (appearance, access, amenity and provision), GIS were used to produce figure 3.7. It can be seen that the northernmost sites (Locations 1-3) appeared to have the highest penalty points awarded and the southernmost sites (Locations 7-8) performed the best based on Knox's Environmental Quality Assessment tool (1976, pp. 102-5) (Figure 3.7). Additionally, as can be seen in figure 3.6, the element of appearance was rated better at the westernmost sites (Locations 1, 4 and 7) based on the tool (Appendix 1). Locations 2, 3, 5 and 6 are all located on land with large maximum building heights (Figure 3.6) and it can be seen that each received high penalty points for the element of appearance. This suggest that, for Southport in general, high density contributes to a degeneration in the appearance of a location. However, further research is required to investigate this relationship.

Figure 3.6: Maximum building heights for Southport (Gold Coast City Council 2008).

Figure 3.7: Penalty points awarded for each element at shown in terms of the geographical position if each of the eight locations assessed in Southport (Google Earth 2010).

Appearance

Non-conforming uses

Locations 1, 7 and 8 received no penalty points as there was no evidence of non-conforming land uses present, as the landscape was made up of one and two storey residential dwellings. At location 2, however, there was no evidence of residential dwellings and the land uses within the area appeared to be light industrial in nature and not suitable for residential use (Figure 3.8).

Landscaping/Visual quality

Locations 7 and 8 each only received one penalty point as there was mostly 'mature, good quality trees' and 'constructively located and well-kept grassed spaces' (Knox 1976, p. 102) (Figure 3.9). Location 2, on the other hand, received six out of seven possible penalty points, as there was little to no evidence of vegetation or landscaping (Figure 3.8).

Townscape/Visual quality

Location 6 was awarded full penalty points for townscape and visual quality, not due to the lack of aesthetically pleasing elements within the townscape, but rather due to the complete lack of harmony and integrated design. There was stark contrast between a large, new multistorey skyscraper and the rundown residential houses on tiny blocks with overgrown gardens that made up the area (Figure 3.10). Additionally, the pathway and street at Location 6 appeared to be unkempt and drab. On the other hand, Location 7 received no penalty points as it was well designed and appeared to have a 'harmonious, attractive arrangement' (Knox 1976, p. 102).

Access

Access to Primary School

In general, most of the locations assessed were within ten minutes walking distance to a primary school and therefore did not receive many penalty points. However, main roads dissect Southport and many pedestrian routes are hindered by these, including routes to schools from residential areas. Location 7 was awarded seven penalty points due to it being more than ten minutes walk from a primary school and due to the route containing main road crossings.

Access to other facilities

In general, most of the sites were five minutes walking distance to important services such as shops, a doctor or a pub. Location 5 received six penalty points, as none of these services were located within a five-minute walk of the area.

Access to children's playground

Within Southport, the research data indicates a general pack of children's playgrounds, with six of the eights locations receiving high penalty points for this criterion. Locations 6 and 7, however, received no penalty points as they were located within two minutes walking distance of a playground, with the route containing no main road crossings. Where playgrounds were present, its was also noticed that they were rarely being utilised (Figure 3.11).

Location Photographs

(Source: Jessica Strickland).

Figure 3.8: Example of non-conforming land uses at Location 2.

Figure 3.9: Mature trees and grassed areas at Location 7.

Figure 3.10: Lack of harmony between hard elements at Location 6.

Figure 3.11: Children's playground at Location 7.

Access to park/public open space

In general, there was quite a lot of variety between locations in regards to access to parks or public open space. Locations 1 and 2 each received four out of five possible penalty points as the closest park or open space was over 5 minutes walking distance away and the route involved main road crossings. Locations 4 and 7 each received no penalty points as they were within 5 minutes walking distance of a park and the pedestrian route was unimpeded. However, it must be noted that Location 4 provided another example of where environmental quality assessment tools can be misleading and are not a sufficient method of accurately rating the liveability of an area. There was a park located on the same street as Location 4, however, accessibility was impeded by a deep stormwater drain and the park could not be used by residents (Figure 3.12). Despite this major flaw, the location received no penalty points for this criterion as it satisfied Knox's description: 'park/P.O.S. within 5 minutes walking distance and involving no main road crossing(s)' (1976, p. 103). This exemplified the need for integrating the use of a variety of research methods as GIS alone would indicate that this location would have sufficient access to public open space when, in reality, it is lacking.

Access to public transportation

Knox (1976, p. 103) defines a place with ideal access to public transportation as a place where a 'public transport route' is 'within 3 minutes walking distance'. However, this measure does not sufficiently take into consideration the quality of the public transport service or the ease of use. For example, bus stops are very common in Southport so very few penalty points were given for lack of sufficient access to public transport. However, Knox's Environmental Quality Assessment does not take into consideration the reliability, frequency of connectivity of public transport services in the area (Appendix 1). A more in depth analysis would be required to better assess the access to public transport. This could include interviews or surveys designed to address residents' satisfaction or use of this service.

Amenity

Traffic

Location 6 was the only site not to receive penalty points for traffic issues as there was 'full separation of pedestrian and normal residential traffic' (Knox 1976, p. 103). Furthermore, the amenity of traffic was deemed important as it was weighted very heavily (Knox 1976, p. 103). In general, most locations received a significant amount of penalty points as there was regularly a lack of design features designed to promote the safety of pedestrian by separating them from traffic. Locations 5 and 3 were heavily penalised as there was 'excessive intrusion of through traffic' and 'traffic of unsuitable character' present, respectively (Knox 1976, p. 103) (Figure 3.13).

Figure 3.12: Inaccessible public open space near Location 4.

Figure 3.13: Location 5 road design contributing to traffic of an unsuitable character for residential areas.

Figure 3.14: The lack of trees and vegetation at Location 2 created a hot, uncomfortable microclimate.

Figure 3.15: A severe lack of parking was present at Location 2.

Noise

Noise is an environmental feature that can be difficult to assess using visualization techniques but which can largely impact the suitability of a location for residents to live (Kang & Zhang 2010, p. 150; Rosenberg 1996, p. 4). Locations 1, 4 and 7 rated very well in terms of noise, as they received no penalty points. On the other hand, Locations 2, 3 and 5 received penalty points due to the sound of heavy traffic in the area.

Air Pollution

In general, air pollution was not found to be a significant issue in Southport, as the assessment was conducted on a windy day. However, Locations 2 and 3 each received penalty points for air pollution, due to the strong scent of car fumes from nearby heavy traffic.

Microclimate

Overall it was noted that there is much that could be done to improve the microclimate of the eight locations assessed. Locations 1-6 all received penalty points for microclimate as there was a lack of trees and design features that prevented cool wind tunnels or scorching cement street scapes (Figure 3.14).

Provision

Garaging/Parking provision

All eight locations assessed received penalty points for parking provision, indicating that Southport is lacking in this area. Locations 2 and 3 seemed to have the worst provision of parking and garages and each received six penalty points (Figure 3.15). It was also noted that, at Location 2, many cars were parked illegally.

Garden provision

In general, the provision of aesthetically pleasing gardens was lacking also, as every location received at least one penalty point for this criterion. Location 1, in particular, showed that residents were greatly affected by the lack of gardens as there was evidence that the nature strip was being used as a children's play area, likely due to insufficient private garden space being available (Figure 3.16). It was noticed, however, that the condition and provision of gardens varied greatly between residential dwellings at each Location. For example, figure 3.17 depicts an aesthetically pleasing, well-sized garden at Location 7, however, some residences at this location were lacking severely in the provision of gardens.

Provision of neighbourhood amenities

Some neighbourhood amenities, such as lighting, telephone kiosks, post-boxes and bus shelters, were, for the most part present at every site (Figure 3.18). However, every location received at least one penalty point as it was lacking one of these amenities. For example, most locations did not have a bus shelter nearby, or lighting was lacking (Figure 3.19).

Figure 3.16: Children's play equipment on the nature strip at Location 1 indicates insufficient private garden provision.

Figure 3.17: Garden provision at Location 7.

Figure 3.18: Telephone kiosks were at most locations, such as Location 5.

Figure 3.19: Most locations, such as Location 2, lacked amenities such as a bus shelter.

Rosenberg (1966, p. 4) outlines the importance of having family houses away from traffic, as children need sleep undisturbed by 'noises and vibrations, moving lights, or direct lights from streetlamps'. However, of the eight locations assessed in Southport, the issues of noise and traffic were present in most of them (Figure 4.1). He then goes on to specify the types of play environments ideal for children:

> Small children need warm sunny corners, where they can shelter, something to climb on, opportunities for secrecy, covered space, water, mud and sand, mystery and beauty. The bigger children need hard ground to run and cycle. (Rosenberg 1966, p. 4)

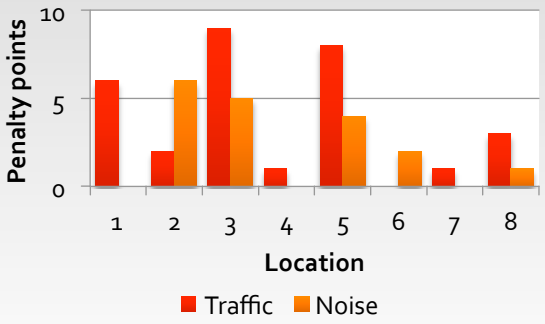

Figure 3.20: Extent of traffic and noise problems for the eight locations assessed in Southport.

Such play environments as those described by Rosenberg could be found either in private residential gardens or in public parks and greenspace. However, every location assessed using Knox's Environmental Quality Assessment tool received penalty points for not having sufficient provision of gardens. Also, Hall (2010, pp. 73-93) explains that the sizes of Australian backyards are shrinking. Therefore, there is the need for public parks to include these types of play environments described above. However, it is crucial that the design of parks and greenspace, including access to and from them, should not induce concerns about safety (Golicnik and Thompson 2010, p. 52). Carver et al. (2010, p. 1799) found that 'such concerns may cause parents to restrict their children's outdoor play', which has been found to have severe detrimental effects for the physical and mental health of developing children (Cohen et al. 2007, pp. 510-2). It is recommended that serious changes be made to the design of pedestrian accessibility within Southport in order to alleviate parental concerns and encourage increased use of parks and greenspace amongst children in the region.

5.0 Conclusion

This report has examined the distribution of dining and retail services within Southport, the impacts that the locations of educational institutions and parks can have on children in the region and has assessed the environmental quality of a number of locations within the suburb. In order to do this, several research methods were utilised, including Google Earth as a mapping tool, fieldwork and photography and the use of an Environmental Quality Assessment tool. The findings indicate that, within Southport, there is a strong relationship between density and the frequency of dining and retail service outlets. In particular, high-density areas with dense clusters of these service outlets were found to be located along the eastern edge of Southport, along the Broadwater. The research also found that, although there doesn't appear to be a lack of educational institutions of park facilities, there is difficulty involved with gaining pedestrian access to these facilities, due to Southport's incredibly vehicle-oriented nature. This report has recognised the importance of having easy access to quality parks in urban areas for the health and development of children and the apparent lack of park and greenspace use within Southport was also identified. Finally, the assessment of environmental quality across Southport suggested that there is a link between high-density areas and the degradation in the appearance of an area. In general, the southernmost region of Southport (Locations 7 and 8) was found to have the highest environmental quality. However, as with any form of subjective research, Knox's Environmental Quality Assessment tool was found to be flawed as it did not give a realistic assessment of some aspects of the urban environment. For example, mixed land uses, an environmental design feature recognised to contribute highly to sustainability (Jabareen 2006, p. 41), resulted in a lower environmental quality score. In order to better understand the spatial relationships recognised above, further in-depth research, using a variety of instrument and methods, is required. The key recommendations that this report makes is the need for better accessibility within Southport to encourage children to utilise existing neighbourhood facilities.

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6.0 Appendices

Appendix 1: Environmental Quality Assessment tool (Knox 1976, pp. 102-5).

Element			Penalty Points
Appearance			
Non-conforming uses (within or nearby) e.g. industry Circle A, B, C or D	A	Exclusively residential uses fully separated from other use zones	0
	B	Limited infiltration, or local preference of, non-conforming uses	1-2
	C	Some substantial infiltration of, or local dominance by, non-conforming uses	3-7
	D	Excessive infiltration of, or local dominance by, non-conforming uses	8-9
Landscaping/ Visual quality Circle A, B or C	A	Mature, good quality trees; constructively located and well-kept grassed spaces	0-1
	B	Insufficient poor quality trees/defectively located, and/or unkempt grassed spaces	2-5
	C	Total, or almost total, lack of trees/grassed spaces	6-7
Note: The incidence and visual quality of gardens is considered separately.			
Townscape/Visual quality Circle A, B or C	A	Harmonious, attractive arrangement or 'hard' elements (within and seen from the study zone)	0
	B	Some discordance or drabness within the 'hard' elements	1-3
	C	Excessive discordance or drabness within the 'hard' elements	4-5
Appearance of gardens/yards Circle A, B or C	A	Predominance of tidy/well screened gardens and/or yards within the study zone	0
	B	Some intrusion of unkempt/poorly screened gardens and/or yards	1
	C	Predominance of unkempt/poorly screened gardens and/or yards	2
Access			
Access to Primary School Circle A, B, C, D, E or F	A	Primary school with 5 minutes walking distance (600 yards) and involving no main road crossing(s)	0
	B	Primary school within 5 minutes walking distance but involving main road crossing(s)	1
	C	Primary school 5-10 minutes walking distance but involving no main road crossing(s)	2
	D	Primary school 5-10 minutes walking distance but involving main road crossing(s)	4
	E	Primary school more than 10 minutes walking distance (1200 yards) but involving no main road crossing(s)	5
	F	Primary school more than 10 minutes walking distance but involving main road crossing(s)	7
Access to other facilities (shops, pub, doctor) Circle A, B, C, D, E, F, G or H	A	Shops, public house and doctor all within 5 minutes walking distance (600 yards)	0
	B	Shops and doctor within 5 minutes walking distance	1
	C	Shops and public house within 5 minutes walking distance	1
	D	Shops only within 5 minutes walking distance	2
	E	Public house and doctor within 5 minutes walking distance	4
	F	Doctor only within 5 minutes walking distance	5
	G	Public house only within 5 minutes walking distance	5
	H	No facilities within 5 minutes walking distance	6
Access to children's playground Circle A, B, C, D or E	A	Playground within 2 minutes walking distance and involving no main road crossing(s)	0
	B	Playground within 2 minutes walking distance but involving main road crossing(s)	2
	C	Playground 2-4 minutes walking distance but involving no main road crossing(s)	3
	D	Playground 2-4 minutes walking distance but involving main road crossing(s)	5
	E	No playground within 4 minutes walking distance	6
Access to park/ public open space Circle A, B, C, D or E	A	Park/P.O.S. within 5 minutes walking distance and involving no main road crossing(s)	0
	B	Park/P.O.S. within 5 minutes walking distance but involving main road crossing(s)	1
	C	Park/P.O.S. 5-10 minutes walking distance but involving no main road crossing(s)	2
	D	Park/P.O.S. 5-10 minutes walking distance but involving main road crossing(s)	4
	E	No Park/P.O.S. within 10 minutes walking distance	5
Access to public transportation Circle A, B or C	A	Public transport route within 3 minutes walking distance	0
	B	Public transport route 3-5 minutes walking distance	2
	C	No public transport route within 5 minutes walking distance	5
Amenity			
Traffic Circle A, B, C or D	A	Full separation of pedestrian and normal residential traffic	0
	B	Very limited intrusion of through traffic/no intrusion of traffic of unsuitable character	1-2
	C	Some substantial intrusion of through traffic of unsuitable character	3-8
	D	Excessive intrusion of through traffic or traffic of unsuitable character	9-11
Noise Circle A, B, C or D	A	Acceptable residential standard, i.e. normal speech possible	0
	B	Slightly above acceptable residential standard, i.e. limited speech interference	1-2
	C	Above acceptable residential standard, i.e. normal speech difficult at some times	3-7
	D	Excessively above acceptable residential standard, i.e. normal speech always difficult and/or sometimes prohibited	8-9
Air Pollution Circle A, B or C	A	Negligible (or non-existent)	0-1
	B	Light	2-5
	C	Heavy	6-8
Microclimate Circle A, B or C	A	No discomfort from microclimate factors	0
	B	Some discomfort from microclimate factors, i.e. which minor improvements, e.g. tree-planting, could alleviate	1-2
	C	Excessive discomfort from microclimate factors	3-4
Provision			
Garaging/Parking provision Circle A, B, C, D or E	A	Full provision of garaging/parking facilities	0
	B	75%-95% provision of garaging/parking facilities, i.e. limited on-street parking	1
	C	50%-74% provision of garaging/parking facilities, i.e. some on-street parking	2
	D	25%-49% provision of garaging/parking facilities, i.e. substantial on-street parking	4
	E	0%-24% provision of garaging/parking facilities, i.e. excessive on-street parking	6
Garden provision Circle A, B or C	A	Full provision of adequate gardens or communal/ incidental open space: all requirements satisfied	0
	B	Insufficient provision of adequate or inadequate gardens, or inadequate position of communal/ incidental open space	1-2
	C	Excessive lack of gardens or communal/incidental open space	3-4
Provisions of neighbourhood amenities Circle A, B or C	A	Full provision of all neighbourhood amenities	0
	B	Insufficient provision of neighbourhood amenities, i.e. some amenities absent	1-2
	C	Total or almost total lack of all neighbourhood amenities	3

Note: Amenities include street lighting, telephone kiosks, post-boxes and bus shelters.
After Duncan (1971).