Factors which affect peoples travel patterns tourism essay

This essay will discuss the extent to which the form and structure of the city, along with its transport network influences individual travel patterns. The different types of areas within metropolitan Perth will also be taken into consideration.

Due to the fact that the size of a city correlates with its density, the densest cities tend to also be the largest cities, which will in turn mean that people living in such a city are expected to embark on longer commutes. According to Brindle, " there is a small but significant relationship between residential density and car ownership: a large increase in residential density is associated with a small decrease in car ownership. It can also be deducted that the primary determinants of car ownership in a home include the size of the household, income, and the number of workers per household. Transit availability is also a significant factoring determining car ownership." (Brindle R 2003)

Recent research shows that people's travel behavior is related to certain characteristics of the built environment. This kind of travel behavior which includes trip-making frequency, distance and time travelled havebeen studied for a variety of land use patterns, street networks and streetscape design features. Table 1gives a synthesis of past research on urban form and travel behaviour relationship. Broadly, it can beobserved that

studies related to urban form and travel patterns originate from diverse sources andencompass a variety of geographic scale and locations. To add to

this diversity, many differentcharacteristics of urban form too have been examined in these studies and travel patterns have beenmeasured in a

number of ways. This section brings together the urban form indicators used and results ofrecent studies concerning urban form and travel patterns. Travel patterns are a result of individual choice to pursue activity at another location, choice ofdestination, choice of mode, choice of route and time (Munshi,

2003). Thus travel is a function ofcharacteristics of the base location (origin of the travel) and the environment surrounding the baselocation. The

surrounding environment to the base location has been studied in various terms, e. g. through distance to opportunities, like distance to city centre or sub

– centres. Distance to the city centrehas been studied in relation to travel distance and transport energy consumption by (Naess and Sandberg, 1996;

Stead and Marshall, 2001; Mogridge, 1985). Another indicator of the surrounding environment tothe base location is related to the mixing of land use as

this is assumed to affect the physical separation ofactivities in the environment surrounding the base location and therefore is a determinant of travel

XIII Back to menu Retour ausommaire 3 demand. It has been mainly measured as the job ratio and has been studied in relation to journeyfrequency in

(Ewing, 1995) as well as in relation to proportion of trips made by non-motorized modes in(Cervero, 1989). The proportion of residential to non residential

use has also been studied in relation to atransport mode index in (Zhang and Guindon, 2006). An aggregate measure of land use mix (termed

asdiversity) was examined by Cervero and Kockelman (1997), who report a link between land use mix andtotal non-work travel distance. The provision

of local facilities and services may clearly reduce traveldistance and increase the proportion of short journeys capable of being travelled by

non-motorizedmodes. Winter and Farthing (1997) reported that the provision of local facilities in new redevelopmentreduces average trip distances.

Hanson (Hanson, 1982) reports similar findings, showing that theproximity to local facilities is positively associated with average distance taking into

account averagesocio-economic characteristics of the trip maker. The type of neighbourhood at the base location is alsoknown to affect travel as

reported in Cevero and Kockelman (1997). They found that neighbourhoodswith high proportion of four-way intersection and limited on-street parking

abutting commercialestablishment tended to have an average less drive-alone travel for non-work purposes.

Factors which affect people’s travel patterns

Humans are naturally built to move around and travel. As soon as a person starts growing and has the strength, the person begins to go to various destinations and starts crawling around the house or running around, or walking to a friend’s house. As adults we frequently hurry to vehicles to go off somewhere. According to their age and other socio-demographic factors, people travel to various places by many modes. As it is though, the environment in which we currently live is planned for and traditionally suited to automobile travel. This narrow transportation planning vision compromises all of our travel decisions, but increasingly so for children and the caregivers who must provide them transportation to their important activities such as education and social events

(Beauumont and Pianca 20023. 2 Transportation Mode and Spatial Learning

Although studies carried out by cognitive mapping researchers point to a connection between spatial learning, and travel patterns, not much can be concluded about the manner in which existing transportation infrastructures affect peoples travel patterns and route selection. Recent research suggests that transportation infrastructure and modal networks such as transit routes, sidewalks, local streets, bike lanes, freeway networks and roads does have an effects on the travel behavior and the development of cognitive maps. The hierarchical nature of both transportation networks and land use systems in an urbanenvironment can affect the cognitive mapping process. In general, the more significant aparticular pathway

or landmark is to an individual’s navigation, the more it will dominate thecognitive map (7). The hierarchies of pathways in a region, such as highway and

freewaysegments dominating arterial and main roads, which in turn dominate local community andneighborhood street systems, contribute to the

hierarchical organization of cognitive maps. Infact, individuals will recognize elements in the environment more quickly if “ primed” by a cue

Mondschein, Blumenberg, and Taylor6from the same portion of their regional hierarchy. Zannaras also found that the layout of a citysignificantly

explained variations in the accuracy of wayfinding and location tasks (20). Sectorally-organized cities proved the more effective for remembering

locations, whileconcentrically-organized cities made wayfinding and location tasks more difficult. Likewise, familiarity, or “ route learning,” is clearly an important part of both route selection and modechoice because familiarity is dependent on repeated experience. Stern and Portugali highlighttwo

aspects of route familiarity: [1]

Familiarity with city structures, specific experience of a given locality in the city, and a general familiarity with the road hierarchy, signage, and traffic also affect peoples travel patterns. People who made use of different modes of transportation and travel tend to develop different degrees of familiarity with each transport system. This shows that individuals who use different

transportation networks, will understand the same urban environment from differing perspectives. For example automobile users and transit users, will understand a given city in very different ways. Much of the

scholarship on cognitive mapping has focused on drivers and the street andhighway network (22). This emphasis is likely due to the dominant role of

automobiles as wellas the route flexibility associated with using the street network. Yet preliminary evidencesuggests that cognitive maps are

differentially shaped by alternate transportation modes. Forexample, we know that individuals who rely on public transit or walking, on average,

travelshorter distances and travel less frequently than those who travel by motor vehicle. Therefore, one can hypothesize that the scope of their spatial

knowledge would be more limited anddifferently configured (by, for example, the network of transit routes) than those who rely onautomobiles and can

travel longer distances at greater flexibility and speed.

The quality and detail of spatial maps also may differ by mode. In a study of childrentraveling to school, “ active” modes of travel, such as walking and biking, appear to contributemore to the development of spatial knowledge than passive modes of travel, such as beingchauffeured by an adult or riding in a school bus. Specifically, walking and cycling to schoolhave been found to increase knowledge of the environment in comparison to children who arebused (23). These results suggest that variation in transportation mode may result in verydifferent levels of functional accessibility for individuals

from otherwise similar socioeconomicor cultural backgrounds. Finally, research also suggests that travel

behavior is influenced by perceptions ofdistance which affect “ the decision to stay or go…the decision of where to go…[and] thedecision of which route

to take” (24).

Cognition of environmental distance is influenced bypathway features, travel time, and travel effort which are substantially different

depending ontravel mode (25). The characteristics of travel by transit, which include indeterminate waiting attransfer points and walking trips between

services, may add to cognitive distance in a way thatauto travel does not. Drawing on a path-based theory of spatial learning, differences in cognitive

mapsbetween socioeconomic groups may also be explained at least in part by the different travelpatterns of those groups. Certainly, adults in higher

income households are more likely to havereliable access to automobiles. In contrast, over one quarter of low-income households do nothave

automobiles and are transit dependent (26). But transit use is also high among adults inlow-income households with automobiles since oftentimes there

are too few vehicles toaccommodate the number of household drivers. In addition to the well documented role that cognitive maps play in

explainingwayfinding and route choice, we hypothesize that travel by different modes in more or lesstransit- and pedestrian-friendly areas systematically

manifests in individuals' cognitive mapsstructured more by transit networks (i. e. transit lines, stations, and stops) than by the arterials, Mondschein, Blumenberg, and Taylor7collectors, and local streets that make up urban street networks. In other words, a modallyspecific wayfinding

experience significantly and systematically influences the formation ofcognitive maps. And these maps, in turn, influence trip generation, trip distribution, and modechoice

The impact of differences in socio-demographics on personal travel behavior

Individuals generate extremely complex travel-activity patterns as they participate in daily activities at different times and in different locations many researchers have conceptualized this observed behavior patterns as the outcome of choices made within constraints.

The preferred activity choices utility maximization is employed. Maintenance of an individuals schedule is the key service, this helps activities to be scheduled, the individuals all have an agenda and all negotiate with other individuals to schedule social activities more especially negotiating about participants, location and time. Individuals update their state after participating in an activity and this depends on their satisfaction with their activity and no doubt individuals will come across new people as a result of this activities

Another important service happens to be the maintenance of a personal network because just as their activities are influenced by their social network, their network in turn is influenced by their activity participation; individuals may visit or learn about new locations, they will also keep track of these locations they are familiar with, they will likely share them with others which is a form of influence

Interaction design: interaction between agents are an important component of agent- based applications. Agents have agenda, interact and negotiate with others to schedule social activities and it includes participants, locations and time, agents interactionx have several components, the negotiation set (the possible proposal) strategies, a rule to determine that the interaction is complete (Wooldridge, 2002)

Fatima et, al (2002) explains three methods for dealing with issues in multi-issue negotiation: all issues discussed together, issues discussed separately or issues discussed one after the other. It has been shown that proposing complete deals at each step is computationally more complex because it has such advantage as pareto optimality (Fatima et al 2006). For the negotiation set, list of activity pattern has been developed including the activity purpose and location as well as indication of which acquaintances are likely to be involved and when interacting with colleagues likely during the week while weekend is for family visit

In the model, it is difficult to decide issues independently eg the activity is likely to determine time, location etc and the order they should be discussed, should the activity or the location be decided first? However the choices sets

for certain issues are decided independently. The protocol proceeds as follows

the host proposes an activity to one or more of its acquaintances eg time and location could be there

the respondent gives possible days and time they will be available, the host adjust the time to make it convenient for many to be available

the respondent suggest location, the host creates intersection amongst those received, the host creates list bof potential activities, the respondent ranks them

the host determinesa best activity based on every one’s ranking and informs respondent of the details

The effects of urban form and structure on personal travel behavior

The relationship between city structure and travel behavior has been extensively researched by urban economists, geographers, and city planners. There has been a steady increase in the rate of car ownership and use in the twentieth century. There also seems to have been a steady decline in the use of transit and other modes, and the decentralization of both population and employment. Trends in travel and land use have complimented and re-enforced one another: growingcar ownership generated demand for highways, development of the highway systemchanged accessibility patterns, and population and jobs responded to these new patternsof accessibility (Jackson, 1986; Muller, 1981, 1995). By

1990, the suburbs of USmetropolitan areas were home to about 62 percent of the metropolitan population and 52percent of the jobs. At the same time, per capita car ownership and travel have reachedall-time highs (Pisarksy, 1996). 1 This section is drawn from Giuliano, 2000. 2 See reviews by Giuliano, 1995; Anas, Arnott, and Small, 1998; Pickrell, 1999.

From a broad perspective, city form, structure, land use and transportation trends are quite closely related. However, the historical record does not necessarily provideuseful evidence for understanding land use and transportation at a single point in time, and the empirical research on relationships between daily travel and land usecharacteristics is far less clear. Metropolitan Size and DensityExtensive research has been conducted on the relationship between metropolitandensity and modal split, commute trip length and total automobile travel. Newman andKenworthy (1989a, 1989b, 1998) conducted comparative studies of per capita gasolineconsumption and metropolitan densities. A comparison of cities around the worldyielded a non-linear relationship of increasing per capita gasoline consumption withdeclining density. Their work has been extensively criticized, primarily because percapita fuel consumption is an indirect measure of auto travel and because they fail toaccount for many other factors which affect automobile use, such as the employment rateor household size (Gordon and Richardson, 1989; Gomez-IbaÅ†ez, 1991). Pushkarev and Zupan (1977) documented a positive relationship betweenpopulation density and transit use, using data from 105 urbanized areas for 1960 and1970. Gordon, Richardson, and Jun (1991) found that cities with higher average densitieshave longer automobile commute times

than those with lower average densities. Notingthat density is a measure of concentration, the authors conclude that shorter commutesindicate greater efficiency of low density urban form: decentralization of both populationand jobs allows people to economize to a greater extent in selecting their job and housinglocations.

The effects of various transport networks and service patterns on personal travel behavior.

The personal travel environment can be described in terms of such dimensions as - Location - Access to the central-place system of the region (Christaller, 1933) - Access to work, shopping and leisure facilities - Provision of infrastructure facilities - Public transport supply - Settlement

structure and density - Topographybut also in terms of certain configurations, such as suburban structures, urban blocks or de-tached

house-settlements. As an outcome of this differentiation and of the functional separa-tion in general, the individual environments offer different

opportunities with regards towork, shopping or leisure activities. This paper analyses the interactions between these spatial dimensions, the individual

charac-teristics of the travellers and the observed travel behaviour.

The Personal Travel behavior of various individuals is affected by transportation network and service pattern in a city. This personal travel behavior which includes both the short-term and long-term travel choices of individuals in the city constitutes some central elements like car ownership and season tickets for public transportation, as well as destination, mode,

activity and choice of location. Going by recent research and literature, there hasn’t been any consensus reached about the effects of city spatial structure on personal travel behavior. Generally, there are differeing opinions about thsis. Some studies suggest that the impact of transportation network and service pattern on personal travel behavior is rather small (Bagley and Moktharian, 2000; Schimek, 1996; Petersen and Schallaböck, 1995; Downs, 1992; Schmiedel, 1984). Some other studies lean towards the conclusion that at least some variables are dependent on the transportation network, spatial structure and service pattern obtainable in the city. (Ewing andCervero, 2001; Newman and Kenworthy, 1999; Wiederin, 1997; Holz-Rau, 1990; Sammer etal., 1990).

Travel behavior is also affected by accessibility of facilities. this also goes to show the efforts of the surrounding residential area on individual travel behavior. If a person is able to reach a range of facilities within walking distance, then the probability of a locally oriented travel behavior with smaller distances will increase, as well as increased number of walking trips

The reason for this contradiction is not a basic difference in the assumptions accepted, butrather the selected spatial variables and the approaches used.

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Spatial structure: For example, some investigations concluding space-independence of travel behaviour characterise the spatial structure of areas only

bythe number of inhabitants – a variable known to have little explanatory power inother investigations, either. According to other studies the accessibility

of facilities is one of the most important spatial variables (Kitamura, Akiyama, Yamamoto andGolob, 2001; Handy and Niemeier, 1997; Simma, 2000). - Approaches

used: The question, whether the analyses are conducted at an aggregate or disaggregate level, has influence on the results. Mostly, the results at an

aggregatelevel are more conclusive than the results at a disaggregate level. One reason for thisis that other factors influencing travel behaviour are

normally not included in aggre-gate models. But especially these factors can be very important, as disaggregatemodels have shown (Bagley and

Moktharian, 2000; Simma 2000). The remainder of the paper is organised as follows: First, the study area and the computationof accessibility measures

is described followed by a description of the data source used forthe analysis. Then the modelling approach – Structural Equation Modelling – is briefly

out-lined. The core of the paper is the discussion of disaggregate person-level models for twomain trip purposes (shopping and working). The results are

summarised and interpreted in thediscussion. Based on this recommendations are given. 2. Study area: Upper Austria The general focus of the study –

the interactions between the spatial structure, personal char-acteristics and travel behaviour – cannot be investigated without a specific spatial frame.

Inthis case, the Austrian province (Land) Oberösterreich was selected for two main reasons. - Availability of suitable travel survey data: The provincial

government of Up-per Austria conducted a very detailed and quantitatively rich travel survey in1992, whose data was available for the study. Additional

spatial variables foreach municipality were added. - “ Small Austria”: Upper Austria can be regarded as a scale model of Austria. All regional types which

can be found in Austria also can be found in UpperAustria – a big agglomeration from an Austrian perspective, alpine regions, in-dustrial areas and less

developed rural regions.

Page 5

2. 1 General description Upper Austria is one of the nine Austrian provinces. It is located west of Vienna, east of Mu-nich and south of Prague. It has a

size of 12’000 km² and about 1. 3 million inhabitants. At avery general level Upper Austria can be divided into three parts – into the Böhmische Massivin

the north of Upper Austria, the Alpenvorland in the centre of the province and the Alps inthe south. The northern part of Upper Austria is disadvantaged in

several ways. This area is neither wellsuited for agriculture nor for tourism. Additionally the border to the Czech Republic wasclosed for the five decades

of the Cold War. As a result, the opportunities for industrial de-velopment after World War II were limited. The situation is different in the other parts of

Up-per Austria. The Alpenvorland is the centre of agriculture and industry, including a number oflarge scale factory complexes in the main cities. Half of

the population lives in the Alpen-vorland, and 13 of the 15 largest towns are situated here. The Alps, especially the Salzkam-mergut with its lakes and the

skiing areas, are dependent on tourism, including second-homeownership. Upper Austria consists of 15 districts, three cities with district status (Linz,

Steyr and Wels)and 445 incorporated municipalities. The respective district capitals are both – centres of thelocal administration, as well as of shopping

and industrial location for their area. Linz is thecapital of the province and by far its largest city. The 445 municipalities are very different intheir spatial,

socio-demographic and economic characteristics. The province’s overall struc-ture can be characterised as follows (see Table 1 for a more detailed

description of the spatialattributes). - Distribution of the inhabitants: 26% of the municipalities have less than 1’000inhabitants, 40% of the municipalities

have between 1’000 and 2’000 inhabitantsand further 18% of the municipalities have between 2’000 and 3’000 inhabitants. Only one municipality has

more than 100’000 inhabitants – Linz. - Location of the municipalities: The location of a municipality can be describedby two distance-variables – the

distance to the relevant district capital and thedistance to Linz. For the districts along the border to the Land Salzburg, Salz-burg is the relevant main

centre for employment and shopping. The distance toSalzburg replaces the distance to Linz for all municipalities, where more resi-dents recorded trips

to Salzburg than to Linz. - Number of accessible facilities: The number of accessible facilities is a meas-ure for the supply of activity opportunities for a

particular household. It is high, if a household can reach a shop, a supermarket, a bank, a post-office, a kinder-

garten, school, a pharmacy and a doctor in walking-distance (ten minutes). Itequals zero, if the household cannot reach any facility within this time. In

everymunicipality there are at least some households which cannot reach any facilitywithin a reasonable walking distance. - Share of working women:

Between 25 and 50% of the women in a municipal-ity are working. This variable is used in the models, because it characterises theimportance of the

traditional nuclear family and the sex-specific division of la-bour within the municipalities. - Commuting: Because workplaces are mainly concentrated in

Linz and the dis-trict capitals, people in the small villages often have to commute. In some mu-nicipalities more than 80% of the working adults are

commuters. - Share of farms: In some communities, the agriculture is still dominant indicat-ing a relatively low state of development. The importance of

the agriculture maynot only be shown by its share of employees, but also by the share of farmsamong all buildings. The latter variable is especially

interesting because manyfarms are run by farmers on a part-time basis. Table 1Descriptive statistics for the municipalities of Upper Austria (445

municipalities) MeanStandarddeviationMinimumMaximumNumber of inhabitants3’08110’530245208’727Distance to district capital1710059Distance to

Linz (Salzburg)46210143Number of reachable facilities (mu-nicipality level)2. 61. 407. 2Number of reachable facilities(household)3. 93. 208Share of

farms1912069Share of commuters62111584Share of working women3642550 These figures are calculated for each single municipality without

considering the neighbour-ing municipalities and their attributes. Statements across municipal borders can be made byapplying accessibility-measures.

Page 7

2. 2 Accessibility measures There is a wide range of possible definitions for the term accessibility, such as ‘ the potentialof opportunities for interaction’,

‘ the ease of spatial interaction’ or ‘ the attractiveness of anode in a network taking into

Travel is derived from activities that involve people participating in things such as school, work, sport, shopping, social events leisure. Activities that is non-discretionary such as work and school can be explained in part by the traveler’s socio-demographic characteristics and generalized travel cost (Hackney and Marchal, 2007). Other things not easily predictable are long term decisions such as moving to a particular town, participating in other activities etc, the reported purpose for a large number of trips are social and leisure ranging from 25 to 40% for various countries (Axhausen 2006).

Interest people in activities participation is as well driven by our changing use of information communication technology, the need for physically visiting places is drastically reduced by the use of internet for activities such as banking, shopping and participating in online communication or conversation and in overall, it affects people’s travel behaviors. People could change their activity schedules and their transport plans on the fly as a result of receiving information via a mobile phone whilst traveling or participating in an activity outside the home.

A graphic representation of individuals and their relationship could be seen in social network, if these social networks are well understood it will lead to a

better prediction of social activity schedules and forecast of travel patterns and demand for urban facilities more especially those that have to do with social and leisure activities. The understanding of these social networks comes in handy in influencing the urban design of residential areas and public spaces in order to encourage participation in social leisure activities in local communities.

Trip destination is determined by the members of one's social network because that is where the social activities go towards. Mc Pherson et, al. (2001) defined homophile as principle that contact between similar people occurs at a higher rate than among dissimilar people, some of the attributes used as similar measures includes age, social class, occupation, abilities etc. distance plays a key role in the maintenance of relationships.

McPherson et al (2001) claim that the most basic source of homophily is space because according to him " we are more likely to have contact with those who are closer to us in geographic distance than those who are distant". People influence each other by providing information or observing behavior eg a friend tells you about a barbing saloon and you wish to go get a haircut there. Other factors that indirectly influence travel behaviors includes moving closer to one's workplace, family or choice of vehicle. Greater proportion of travel has to do with social/leisure purposes; there is every need to understand the reason behind these.

Agent based modeling is commonly used for applications where the behavior and intentions of heterogeneous individuals as well interactions between individuals is required. Lists of attributes have been presented by Bonabeau

(2002) and Macaland North (2006) that systems should possess in order for agent based modeling to be considered include; relationship form and dissolve, agents have dynamic relationship with other agents, agents have a spatial component to their behaviors and interactions .

These are complex relationships and interactions between individuals and the individual's situated ness in an urban environment, each agent will have some level of satisfaction and will derive utility from sharing objectives, if along the line they are not satisfied with this current situation, then they will try to change it. The same applies to their involvement in the community, it depends on their needs

The environment has a network representation derived from the actual road network. These links contain attributes for the actual distance and ideas of travel times for different modes. Nodes exist at a point in space and mostly contain location that represent where joint activities take place or can be undertaken; there are different types of location and each type has a set of attributes, the major distinction between private and public residence (eg museums, parks, restaurants, gyms etc) they have opening hours

Personal social network defines each person's acquaintances, each pair has a type of relationship (eg friend, work etc) and can also tell how long they have seen each other, this model also contain neighborhood, here groups are formal and informal clubs that the individual is a member of eg special interest clubs, sports club etc, here the individual is effectively connected to many people, some connections may remain as friends even when the individual has left the club, t