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List of Acronyms

AREDS	Auckland Regional Economic Development Strategy
ARTA	Auckland Regional Transit Authority
AVL	Automatic Vehicle Locator
BBLG	Broadband Liaison Group
CBD	Central Business District
CEO	Chief Executive Officer
CERI	Centre for Educational Research and Innovation
COMET	Central Online Management and Export Trade Accelerator Project
GPRS	General Packet Radio Service
GPS	Global Positioning System
ICTs	Information and Communications Technologies
ISP	Internet Service Provider
ITS	Intelligent Transport Systems
JOG	Joint Officials Group
KSO	Kiwi Share Obligation
LATEs	Local Authority Trading Enterprises
OECD	Organisation of Economic Co-operation and Development
RTPISP System	Real Time Passenger Information Signal Pre-emption System
SCATS	Sydney Co-ordinated Adaptive Traffic System
SMEs	Small and Medium Enterprises
TUANZ	Telecommunication User Association of New Zealand
VOIP	Voice over Internet Protocol
WCL	World Communications Laboratory

CHAPTER ONE:

Encounters with ICTs: Reassessing Geographic Approaches

Prologue

Subject: hello
From: Pippa
Date: 1/06/2007 4:49 p.m.
To: p.mitchell@auckland.ac.nz
Hello there,
My name is Pippa Mitchell. I live in Long Beach California in USA. Just for fun, I put my own name into the Google search and you were one of the results that popped out. I just thought it would be fun to say hello to another Pippa Mitchell.
Take care, Pippa

We tend to place great value in our name; it is a fundamental part of who we are. Receiving an email from another Pippa Mitchell was therefore both thrilling and disconcerting; emotions that neatly précis current discussions, (academic or otherwise), about the role of information and communications technologies (ICTs) in society. My encounters with modern ICTs began back in 1985 when my family received a phone call from my Uncle, not an unusual occurrence except that instead of being in England with the rest of my family he was in Swaziland and calling us on something called a cell phone (note it was not a satellite phone). I distinctly remember how clear the call was, very unlike the echoing, time-lag infused calls we were used to between England and our home in New Zealand. In today's world such a conversation is nothing out of the ordinary but in 1985 to a child growing up in Auckland, New Zealand, it was simply incredible. In that same year we bought our first personal computer. It was an Acorn BBC Computer with a monitor in a metal box the size of a small television and a keyboard with orange and black function keys. It was a novelty, something I could play games on or practise my times tables. By 1992 when I reached high school I could take computer science as an option and there were two classrooms devoted to computer labs. By the end of high school my assignments had to be produced on a word processor and mobile phones were slowly infiltrating my social circle. I

vividly remember one day at the beach with a group of friends when suddenly a phone rang and everybody around me reached for their bags. It was 1998. When I did my Masters in 2000 one still had to search for journal articles in the library hunched over leafing through the contents pages by hand. By the time I began my PhD, Google Scholar was available. In the span of my lifetime ICTs have changed our experiences of time and space. My mobile is on 24 hours a day, I am online throughout the day checking my two email addresses, my Facebook page, the news, and my friends' blogs. I use the web to conduct research, buy tickets, check my bank account, pay bills, and update my university webpage; all of which are aspects of my life that in the past would have required separate trips to different locations.

The potential of ICTs to transform individuals' everyday lives is now receiving considerable attention both in academic and popular literature. Figure 1.1 depicts three 2007 cover pages from respected weekly international magazines each of which claim to represent either methodological individualism (Time), personal choice (The Economist) or popular science (New Scientist). Crucially their commentary on the ramifications of ICTs illustrates what this thesis terms conventional ICT narratives. These narratives take two predominant tacks. One is the utopian perspective in which as Negroponte would have us believe "the post information age will remove the limitations of geography. Digital living will include less and less dependence upon being in a specific place at a specific time, and the transmission of place itself will start to become possible" (1995: 165). The alternative is a dystopian perspective, such as argued by Eriksen as "the unhindered and massive flow of information [that] in our time is about to fill all the gaps, leading as a consequence to a situation where everything threatens to become a hysterical series of saturated moments, without a 'before' and 'after', a 'here' and 'there' to separate them" (2001:2). As opposing as these two representations are they share a common structure, one that identifies technology as a driver of social change, also known as technological determinism. A view that this thesis argues is highly problematic as it has limited the type of research that is emerging on interactions with ICTs.

Figure 1.1: The cover pages of Time, The Economist and New Scientist, popular international weekly magazines which illustrate the prevalence of conventional ICT narratives.
Source: Time (2007), The Economist (2007) and New Scientist (2007)

Defining Information and Communications Technologies

Very few commentators actually define what they mean by ICTs as the complexity and plethora of ICTs that have emerged over the past 40 years have made it difficult for people to classify this constantly evolving category. The ubiquity of ICTs and their generally unconscious acceptance have proved particularly difficult for those seeking to investigate this field. Definitions that are emerging commonly emphasise the idea of a convergence between various technological innovations that have appeared over the late twentieth and early twenty first centuries. Hepworth (1987) argues that what separates ICTs from past technological innovations is the removal of the divide between telecommunications and information technologies, although one could argue that this division has always been blurred. What is arguably more distinctive about the new ICTs is how communications now intersect with computer orientated technologies. Quibria, Tschang, and Reyes-Macasaquit (2002) contend that ICTs' comprise any technologies that are involved in computing, communications and the Internet. It does appear, as Selwyn (2004) asserts, that emerging definitions are often too narrow, focussing specifically on software or hardware applications, or too broad and homogenous. He provides the following guide,

> "we know that people's use of technology extends far beyond the realm of the computer through technologies such as digital television, mobile telephony and games consoles… indeed the term ICTs more accurately refers to an updating of the conventional 'information technology' to encompass the rapid convergence of technologies such as computers, telecommunications and broadcasting technologies, as well as, stressing the communicative and networking capacity of modern-day information technologies… [it is therefore] best seen as an umbrella term for a range of technological applications" (2004: 346).

This thesis defines ICT using Selwyn's (2004) argument that any technology providing communications and/or information should be encompassed. I would add that while the foundations of these technologies stretch back into history the focus of this thesis will be on their more modern manifestations, those ICTs that have emerged since the 1970s; a decade that Castells identifies as the start of a "new technological paradigm, organised around information technology" (1996: 5). In general the ICTs this thesis refers to include the personal computer, email, mobile phones, the Internet and all their associated infrastructure and accompaniments.

The Thesis: Reassessing Geographic Approaches to ICTs

This thesis begins with the contention that many conventional ICT' narratives are methodologically and theoretically based on an erroneous set of generalisations about how individuals and ICTs interact. The constant perpetuation of utopian and dystopian perspectives driven by technologically determinist approaches has created a series of stumbling blocks, which have narrowed geographical imaginations and investigations into this field. In the late 1990s several of the conventional narratives emerging proclaimed that ICTs would provide a means to overcome the alleged tyranny of distance (Cairncross, 1997; Negroponte, 1995). A backlash from geographers followed. Geography was argued to be central to debates regarding ICTs because of their ability to reveal the fundamental role that space and time have in individuals' interactions with such technologies (Graham, 1998; Kirsch, 1995; Morgan, 2004). Geography as a discipline has often grappled with both how it is defined and its relevance to the world. Radical geographies of the 1960s and 1970s were earlier examples of this struggle.

In conducting this research and presenting my findings at various conferences I wrestled with which field of an increasingly fragmented human geography I am affiliated to. This thesis could equally place itself within urban, transport, educational or cultural geography. I found that people struggled to categorise my work and therefore relate to it but after attending the Association of American Geographers' meeting in April 2007 I realised that this research falls within the rapidly expanding area of communications geography. This led me to an article on the invisibility of communications in geography by Hillis who states that "Since at least the late 1960s, with few exceptions, the issue of communications has been underpursued, underexamined, and undertheorised by geographers" (1998: 543) something that I would argue is

only now beginning to change. Hillis'[1] article particularly appealed to me because it provided a succinct summary of the key issues that I had already identified in my research of the growing body of communications geography literature including work from Dodge and Kitchin (2004a, 2004b; 2005a, 2005b), Kellerman (2006), Thrift (1999a; 1999b; 2000; 2002; 2003; 2004a; 2004b; 2004c; 2004d; 2005; 2006), Thrift and French (2002) and Zook (2005). The key premise emerging from this work is that despite the numerous difficulties associated with research in this area, ICTs are generating important implications to geographic thought and geographic thought has the ability to increase our understanding of ICTs. Chapter Two works through this premise by means of the following points.

Hillis begins by identifying that geography often has difficulty investigating "phenomena undergoing rapid change" (1998: 544). Predicting technological change has always been extremely problematic, particularly when investigating ICTs effects on humans' relationships with their contexts (Nardi and O'Day, 1999), something the rapid emergence of ICTs has further complicated. This in part is why so few definitions of ICTs are found in the literature. Numerous metaphors have begun to emerge from the conventional ICT narratives in an effort to capture these changes. As Chapter Two identifies these dimensions have been very challenging for geographic thought in this area as the metaphors used are often technologically determinist in nature and treat time and space dualistically. To deal with this challenge I draw from Massey (1994), May and Thrift (2001) and others, furthering their arguments for the need to conceptualise space and time as an interrelated and interdependent timespace[2] in order to understand more fully the interactions of institutions' and individuals' everyday actions with ICTs.

The relative invisibility of such technologies, something picked up by Kellerman (1993) and more recently Thrift and French (2002) and Dodge and Kitchin (2004a; 2004b) is another key issue Hillis (1998) outlines. Most commonly this is discussed in terms of software. However,

[1] Dr Ken Hillis, currently Assistant Chair, Department of Communication Studies at the University of North Carolina, Chapel Hill has a background in human geography combining an interest in the rearticulation of space, spatial technologies and visual cultures with a focus on electronically mediated communication, see http://www.unc.edu/~khillis/index.html

[2] May and Thrift (2001) capitalise TimeSpace in their introduction but this was not picked up by the other authors in their manifesto. I have also chosen not to use it as semantically I feel removing the capitals further emphasises the rejection of the dualistic treatment.

drawing from Graham and Marvin's (2001) contention that ICT infrastructure is an essential yet often overlooked element of the 21st century city, this thesis demonstrates that all components of ICTs are often taken for granted, and that this is constraining research in this field. Chapter Two will discuss recent work by Dodge and Kitchin (2004a; 2004b; 2005a; 2005b), MacKenzie (2002) and Thrift (2004b, 2004d; 2004e) on the need to uncover the coded spaces of urban environments' increasingly ubiquitous computing backgrounds to develop an understanding of how these are being engaged with and performed. A recurrent theme throughout this emerging work is the need to access the gaps that exist between the developments of the technology and an individual's cognition as they engage with it, something which as Thrift and French (2002) identify is often deferred. They go on to argue that "software is… a space that is constantly *in between*" (2002: 311) an idea that this thesis expands out to encompass all ICTs arguing that the literature's argument for the need to access the gaps and uncertainties requires that greater attention be paid to accessing the *in between* as a space of performance. To do this Thrift's argument of the need to reframe space-time through a consideration of "unactualised possibilities" (1999a:58, citing Lewin, 1993) provides a useful entry point. ICTs are providing additional possibilities of action to individuals' everyday activities and this thesis concentrates on uncovering the conditions that enable these actions. These conditions populate the *in between*, between the cognitive recognition of the ICT, the identification of the conditions of possibility it enables and the decision to engage, in essence a mental space of performance, which, in turn may reveal to the individual or institution a multiplicity of timespaces.

There has also been a strong focus on the location and production of ICTs rather than their usage. Hillis argues this is due to the dominance of "empirical Marxists and poststructuralist cultural geographers. Both approaches implicitly treat communication technologies as a *consequence* of social relations, and not as *constitutive* of or active in their production" (1998: 558 emphasis added). This narrow focus has further been exacerbated by the development of numerous indicators and data sets focused on identifying nations' engagement with the so called knowledge economy which has led to conclusions that are often technologically determinist in nature. A greater focus on the role of non-human actants something that Hillis (1998) mentions, but as will be explored, has been particularly developed by Latour's (2005) work on an actor network approach, Thrift's (1999a) non representational style and MacKenzie's (2002) work on transduction, will be examined and put into practise through what Mulder (2002) likes to term an adoption of a *trans* attitude. This begins with rejecting the use of *post* as a backward looking meta-narrative aimed at generalising highly complex and context specific issues which insists the

researcher try to maintain an objective outsider position. Instead the *trans* attitude goes along with the process while reflecting on one's positionality within it. The benefit of this approach is that it acknowledges the layering of experiences that influence decision making processes. It accounts for both the effects of interactions and encounters, in this case with ICTs, as well as the affects. Affect is used both as a verb but more significantly as a noun throughout this thesis, drawing from psychology's use of it to mean the "emotional antecedents or accomplishments of an act" (Treble and Vallins, 1936: 14). In this thesis I will demonstrate how adopting a *trans* attitude with is recognition of affect provides the means to access and animate the *in between*. Importantly, there is a distinct lack of empirical work in this field that is informed by these newer approaches. This thesis begins to redress this through developing four empirically grounded interventions.

Each of these four interventions explores an aspect of the reality of interactions with ICTs in Auckland, New Zealand. They engage with key areas of geographical enquiry into ICTs; Chapter Five, Auckland's urban environment; Chapter Six, transportation; Chapter Seven, education; Chapter Eight, migration (each shortly introduced). Chapters Two through Four constitute different aspect of these interventions interweaving narrative descriptions from geography's theoretical approaches to each in Chapter Two, their background circumstances in Chapter Three, and the range of methodological approaches used to reveal each intervention in Chapter Four. By building on the previous chapter's narratives this thesis aims to establish the highly contingent nature of the complex interactions that are emerging among different institutions, individuals and ICTs. Chapter Nine draws these accounts to a conclusion, suggesting new narratives and raising questions for the future of such research.

It is important to acknowledge that this thesis' approach to time and space is based solely on an English speaking understanding of them. Thrift identifies that "thinking about space [and one could argue time] can vary quite radically from culture to culture, down to and including the most basic frames of reference such as what counts as the characteristic shape of an object, sense of direction, the spatial relation of bodies as they are pointed to and the sense of where a body is in its relation to larger surroundings" (2004a: 599). This is an important point and one that requires significant attention but it is outside the scope of this thesis.

The objectives of this thesis are to:

1. Critically analyse geographical conceptions of space and time since the 1960s in order to understand how geographical understandings of ICTs have been shaped.
2. Draw on emerging methodological and theoretical approaches to explore strategies for uncovering if, and how, ICTs are altering individuals' perceptions and constitution of time and space.
3. Reveal what if any aspects of individuals' usage of ICTs in their everyday lives are contingent on their previous experiences and their situatedness
4. Contribute some empirically grounded findings to add to the debate on the way that ICTs interact with individuals' everyday lives to reveal numerous conditions of possibility that populate the *in between.*

Why Auckland, New Zealand?

> "To understand the 'effects' of a new technology, one must understand the context(s) in which it diffuses and is adopted" (Adams and Ghose, 2003: 417)

New Zealand is generally perceived as a geographically isolated, developed country located at the bottom of the world (Forer & Parrot, 1991; Poot, 2004; Tan, 1999). This appearance of isolation is enhanced by several factors including its distance from major markets (its closest neighbour Australia is 1600km away), its small population of just over 4.2 million (Statistics New Zealand, 2008a), low population density and physical geography, (two major long narrow islands) (Poot, 2004). The Auckland Region is the largest metropolitan area with a population of just over 1.3million (Statistics New Zealand, 2008b). The region is administratively divided up into five highly urban councils, Manukau, Auckland, Waitakere, and North Shore City Councils and Papakura District Council, two peripheral District Councils, Rodney and Franklin which are predominantly rural, and the over arching Auckland Regional Council as illustrated in Figure 1.2.

Figure 1.2: The Auckland Region illustrating the various council jurisdictions and the region's location within New Zealand

Auckland provides an interesting context in which to examine everyday interactions among institutions, individuals and ICTs in a westernised society. During the 1980s and early 1990s New Zealand underwent a significant period of reforms moving it from a welfare state to a highly neo liberal economy, a period commonly referred to as the 'New Zealand Experiment' (Kelsey, 1999). Chapter Three will reveal how this period radically altered almost every aspect of living in New Zealand and this has had significant implications with regard to the development and utilisation of ICTs both nationally and in particular in the Auckland Region. Chapter Three works through O'Neill and McGuirk's (2005) idea of an institutional landscape, one in which various actors engaged in highly contingent, multi-scaled interactions, to explore the recent shift by the New Zealand government to invest heavily in ICTs. This shift, according to Larner, could be classified as evidence of 'after neoliberalism', which she identifies "involves the active building of new relationships, many of which are with non-traditional economic and social actors" (2005: 9). Chapter Three pays particular attention to the topic areas identified by the four empirical interventions, mapping out how the reform process has shaped Auckland's current challenges in the urban environment, transportation, education and migration.

An Archipelago of Situated Experiences

Methodologically this thesis draws primarily on Thrift's (1999a) proposition of a non-representational style, recognising its origins in Latour's actor network approach. As Chapters

Two and Four will discuss in greater detail, these appeal to this thesis because of their focus on performance and the situated knowledge of everyday practices. Thrift argues that more truthful accounts can be gained from developing the particulars through "an archipelago of situated knowledges" (1999b: 303). In line with Stakes' (1978) argument for the importance of experiential understandings these interventions are referred to throughout this thesis as *experiences*; Chapter Five explores Auckland's ICT Platforms: The Local Government Experience, Chapter Six – Experiences of the Real Time Passenger Information Signal Pre-emption System (RTPISP System), Chapter Seven - E-learning Experiences at the University of Auckland and Chapter Eight – The Experiences of Transnational Migrants.

A recurring phrase throughout this introduction has been 'everyday'. Throughout the social sciences there has been an increasing shift to focus on ordinary and mundane activities. However, as Thrift argues, the term has often been used as a code word "to articulate the uncomfortable feeling that something rather important is going on that they are not quite getting at" (2004b: 726). Chapter Two explores De Certeau's (1984) and Lefebvre's (1991a) work on the concept of everyday life to clarify its use in this thesis. Both theorists argue the dangers of perceiving everyday life as given, taken for granted, an argument that has already been raised regarding ICTs' theoretical conceptualisation, and which provides added incentive to practise a trans attitude in which nothing can be taken for granted.

An act that informs this idea of everyday lived experience is that of *invention*. Thrift described this process as the idea that while most consumer communities aren't actual inventors they do engage in a process of invention whereby "mere use is superseded by pleasure in the activity itself, of which the commodity is an active partner" (2006:290). Thrift (2006) proposes that if a commodity is sufficiently compelling the application of it will evolve beyond that originally intended and often beyond the inventor's control, what he terms "co-creating value" (2006: 290). This often establishes a reciprocal relationship of invention between the company and the consumer; however, importantly such relationships are "not predictable, in part because they are engaged in activities which find their own fulfilment in themselves, without necessarily objectifying these activities into 'finished' products or into objects which survive their performance" (2006: 290). The four empirical interventions this thesis explores exemplify this process of invention. For instance each institutional actor and individual is engaged in a process of invention, from when local government entities find ways to approach ICT infrastructural investments, to bus patrons' use of the real time sign at the bus stop, to when students utilise the

Internet to study from home rather than at university, or migrants' appropriation of different communications technologies to maintain contact with people 'back home'. This process of invention opens up numerous conditions of possibility and a way to examine the constitution of multiple timespaces.

Chapter Five, Auckland's ICT Platforms: The Local Government Experience is the first empirical intervention and focuses on the regional and national institutions' responses to the increasing ICT infrastructural investment required both privately and publicly. It demonstrates the importance of considering the social construction of the ICT landscape, an area that has received little attention in the geographic literature. Instead much of the attention, as Chapter two will demonstrate, has been on global cities, fractured landscapes and the digital divides that are emerging. What this intervention enables this thesis to show is how the contingent and complex relationships that are emerging among the public and private institutions are creating conditions of possibility that are directly shaping the provision of and access to ICTs in the Auckland Region. Furthermore these conditions of possibility provide a useful framing for the other three empirical interventions each of which is unfolding within these wider descriptors.

The second intervention, examined in Chapter Six, Experiences of the RTPISP System considers the installation of a real time information system commissioned by Auckland City Council in 2002 to create more efficient and reliable bus services by improving journey times, passenger information and reporting (Gravitas Research and Strategy Limited, 2004). The Real Time Passenger Information Signal Pre-emption System (RTPISP System) began rolling out in 2003. It is the first Intelligent Transport System (ITS) to be implemented in Auckland and this experience focuses on the initial stage of this located in Auckland City (see Figure 1.2). Chapter Two reveals that transport geography has generally focussed on ICTs ability to reduce physical travel or provide alternative options. The chapter focuses on how ICTs' can also transform existing transport systems. It not only outlines the institutional approach to developing the RTPISP System in Auckland but explicitly reveals individuals' perceptions of what is (usually) their first encounter in which ICTs are overtly performing a role in an everyday mundane practice, catching the bus. The study focuses on how this is affecting their practises and perceptions of catching the bus, whether they are more aware of different conditions of possibility in and around the bus stop environment and whether these feelings may lead them to constitute alternative timespaces.

Chapter Seven, the third intervention – The E-learning Experience, focuses on understanding what institutions and individuals perceive as the future potential of ICTs through an investigation of the increasing role that ICTs are playing in tertiary education. The impending ability of ICTs to revolutionise learning has been contested for well over 20 years with speculation, particularly at the tertiary level, that physical campuses will disappear as ICTs facilitate more open and flexible distance learning options. Chapter Two demonstrates that until very recently this focus has restricted the research conducted in geography and that more attention needs to be paid to blended learning which combines e-learning and traditional mechanisms. This type of learning is a growth area and yet little work has focussed on students' perceptions and experiences of such learning styles. This intervention concentrates on two first year geography papers run at the University of Auckland which used different e-learning mechanisms to provide blended learning courses. The students' perceptions of both traditional forms of learning such as lectures, an area that has not received much attention in recent years, and the use of e-learning mechanisms to compliment these are disclosed. The chapter examines whether these provide the students with more choice or conditions of possibility as to how they learn and if these lead them to perceive or constitute timespaces in different ways.

Chapter Eight introduces the final empirical intervention, The Experiences of Transnational Migrants, which explores the role that ICTs have played in the individual experiences of South Koreans and South Africans as they migrate to and situate themselves in Auckland. This intervention reveals how contingent people's experiences are on the spaces, places and times in which they encounter ICTs. It will demonstrate that these migrants' experiences of ICTs in their country of origin and the ongoing dialogues they have with family and friends directly contribute to how they engage with and use ICTs to embed themselves in Auckland. Chapter Two outlines how cultural geography predominantly focuses on the use of ICTs to facilitate transnational bonds and social spaces. What is lacking, however, and what provides the focus for this chapter, is a comparative investigation of how different cultural groups engage with ICTs as they imagine, mediate and negotiate their migration experience. The focus thus is another strategy to reveal the conditions of possibility in everyday experience and the timespaces the migrants constitute in Auckland.

Conclusion

> "Discoveries made about the structure of space and time always react on the structure of the mind. Other kinds of discovery enrich human knowledge without affecting its basis. However, anything to do with conceptions of space will suggest very different ways of constructing knowledge" (Bachelard, cited in McCarter, 1997: 333)

I came across this quote at the beginning of my PhD research process in a book on Frank Lloyd Wright's architecture (McCarter, 1997). It resonates strongly with the theoretical foundation of this thesis which will reveal to the reader how ICTs are increasingly becoming involved in Auckland's institutions and individuals' everyday practices from urban planning, to catching the bus, to learning, to the process of migration. As Bachelard states such investigations inherently come down to how we produce knowledge. Chapter Two considers how geography's treatment of time and space has evolved and must go on evolving in order to understand the emerging contexts around ICTs. It contends that the very way we develop understandings and explore these interactions must be much more responsive to how they are performed and the consequential effects and affects. The literature identifies gaps and uncertainties in how these engagements occur, an issue that is most often discussed metaphorically. Consequently, this thesis' attention is focussed on what I term accessing the *in between*, a mental space of performance; which involves the process of drawing from tacit knowledge, cognitive perceptions of the spatial and temporal environment and emotions, in order to explore the conditions of possibility that individuals are becoming aware of through their interactions with ICTs.

CHAPTER TWO:

Awakening the Technological Unconscious

Introduction

Most theorists agree that ICTs are having transformative effects on society and in particular everyday life but there has been intense debate as to actual impacts and the potential consequences. The chapter begins with a critique of the conventional ICT narratives that are driving much of the thinking about current technological changes. The theoretical limitations and short comings of these narratives are being exacerbated in geography by its persistent dualistic treatment of time and space. Consequently, in order to understand how geographical understandings of ICTs have been shaped the discussion then goes on to explore geography's theoretical developments concerning time and space over the last half century.

Geography is beginning to recognise the limitations of these current narratives and theories. These emerging understandings, both methodological and theoretical, provide a vantage point from which to reassess geography's approach to ICTs. First recent methodological investigations into a non-representational style of enquiry initially focusing on its origins in the actor network approach will be investigated. This approach has important implications for both how we understand the relative role of people and technology and for the actual structure of the thesis, as will be discussed. May and Thrift's (2001) concept of timespace will then be examined as an example of how geography is moving away from dualistic thinking. Building on this paradigm shift the idea of adopting a *trans* attitude is then discussed including concepts of transurbanism (Mulder, 2002: Thrift, 2004b), transduction (MacKenzie, 2002) and code space (Dodge and Kitchin, 2004a: 2004b: 2005a), to negotiate a way forward in geography's thinking about ICTs. The chapter reveals that while ICTs have been championed as formative they are still subsumed as secondary in the literature due to the continuing prevalence of conventional ICT narrative. The potential of these new understandings to uncover the emerging conditions of possibilities and the timespace frameworks these experiences invoke is then discussed by way of a conclusion. Figure 2.1 outlines the conceptualisation of this thesis.

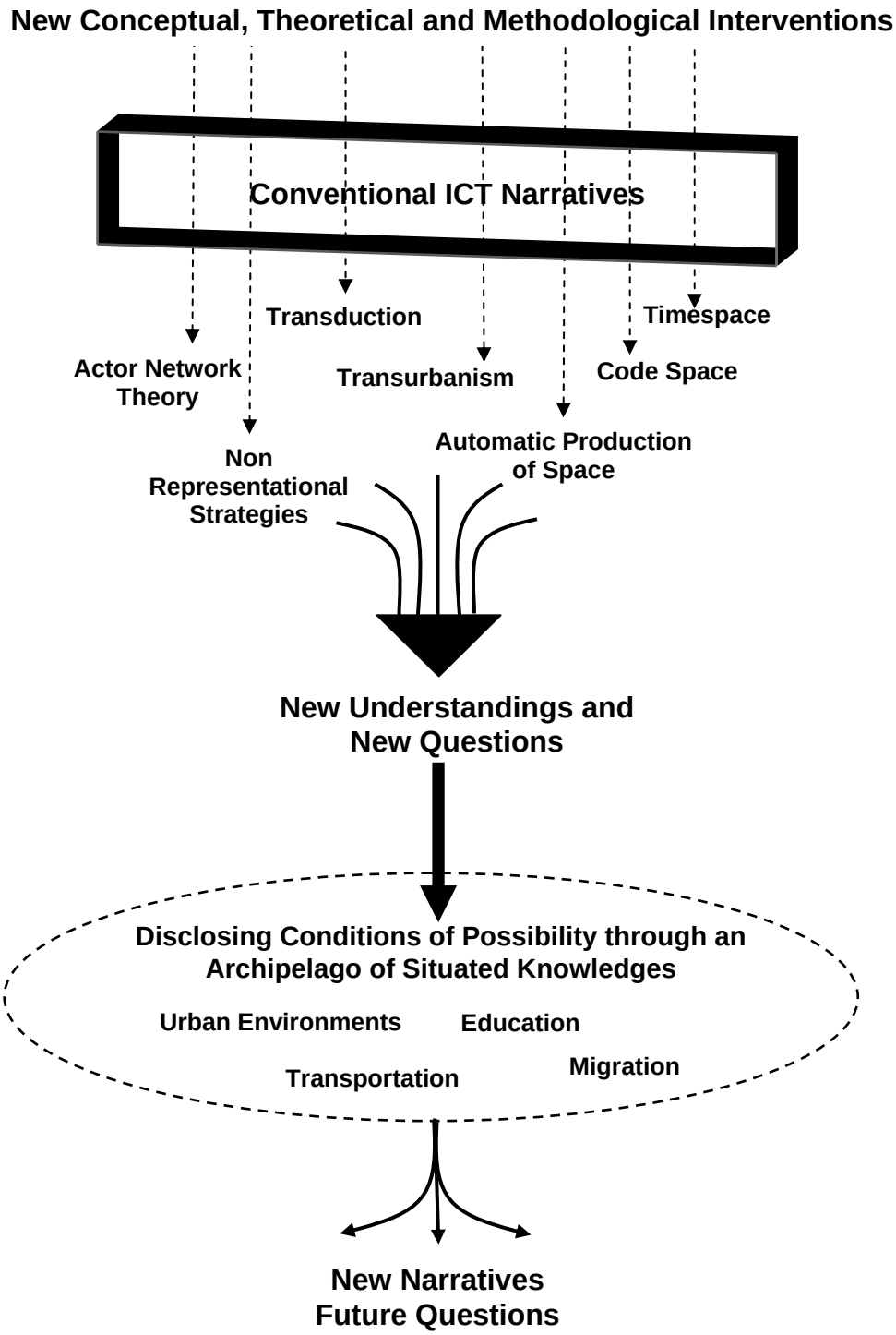


Figure 2.1: A conceptual outline of this thesis

A Critique of the Conventional ICT Narratives

> "Many people… see a society of isolated people, stuck indoors, glued to a screen, losing the taste for real human contact and experience. They worry about the exclusion of the poor, the old, and those too inept to lean how to plug in their modems. They imagine a new class of technological have-nots… They see an Orwellian world of lost privacy… In fact, the main impact of the death of distance will be to make communication and access to information in all its forms more convenient. On balance, that will surely be good for societies everywhere… it should, overall make people's lives easier and richer… The home will reacquire functions that it has lost over the past century. It will become not just a workshop, but a place where people receive more of their education, training, and health care. New kinds of community will develop, bounded electronically across distance, sharing work, domestic interests, and cultural backgrounds" (Cairncross, 1997: 233-234)

This statement is indicative of the type of conventional ICT narratives I wish to critique. Cairncross (1997) begins by rebuking the common dystopian take of social exclusion and isolation, however, in presenting her argument for what will come from the death of distance she succeeds in presenting the opposite utopian perspective which is just as erroneous. As Chapter One introduced, both of these perspectives are found scattered throughout the literature.

Whether ICTs will equate to freedom of the individual and society through the removal of the geographic constraints (Negroponte, 1995), or are responsible for a loss of social connection and an increasingly fast paced life in which both the past and future become blurred (Virilio, 1997; Eriksen, 2001) is held by many to come down to predicting the ramifications of technological change. Nonetheless most researchers also agree this is an inherently difficult task. The basic mechanics of such innovations can be projected with accuracy once the foundation has been set (Albright, 2002). What is more difficult to gauge is how they will be received by the public. Factors such as the timing, the impact of policy and human behaviour are variables that need to be taken into account. As Nardi and O'Day (1999) identify predicting the cause and effect relationships among humans and their institutional, social and economic contexts, all of which change over time, is very difficult. Conventional ICT narratives are also replete with metaphors from ones that attempt to convey the transitory nature of such technologies including the information superhighway and information age to ones that focus on their dynamism such as cyberspace and the digital divide. While often accused of obfuscating issues without due consideration for the consequences (Graham, 1998; Kirsch, 1995) such metaphors do have the

ability to capture the uncertain and often transitory nature of technological impacts which is why they remain so prevalent (Adams, 1997; Dodge and Kitchin, 2000; Graham, 1998; Lakoff and Johnson, 2003; Nardi and O'Day, 1999; Sawhney, 1996; Thrift and French 2002).

The greatest danger of attempting such predictions and something that is common to both the utopian and dystopian accounts is the tendency to be technologically determinist; the perspective that technology is the primary determiner of social conditions and social change (Graham, 1998). It is well recognised that such determinism is a significant risk when dealing with ICTs, a recognition that Heidegger usefully summarised in his Question of Technology, where he argues that so long as we regard it as neutral we are "utterly blind to the essence of technology" (1977: 4). I argue that this risk has unfortunately manifested itself as a fear, something to be avoided at all costs, a fact that has greatly restricted the range of research being conducted in this field.

Cairncross (1997), provides one of the most well recognised and vilified technologically determinist accounts, stirring up considerable contention among geographers (in particular see Gorman et al., 2004; Graham, 1998; Morgan, 2004). As Janelle identified in his review of the book, Carincross has the ability to "identify and interpret the key trends" (1998:485) but fails to think critically about her clearly determinist attitude to the positive attributes of technology. Cairncross is not alone however. Some prominent geographers have also shown this tendency including Harvey (1990) whose work on time space compression is imbued with a feeling of technological determinism. He emphasises the increased pace of life and argues that this is reducing individuals' capacity to deal with their everyday lives,

> "terror of time-space compression which ultimately dissolves everything into ephemera and fragments such that the devil takes not the hindmost but the global totality… the pace of change has suddenly accelerated. Geographers cannot escape the terrors of these times. Nor can we avoid in the broad sense becoming victims of history rather than its victors." (Harvey, 1990: 433)

The degree of determinism can vary greatly, as Graham (1998) identifies even the use of the metaphor *impact* when discussing the consequences of ICTs could be considered determinist. An increasing body of work is now recognising and developing means to negate such determinism. Much of this is emerging in the field of media studies (see Silverstone, 2005 and Morley, 2006). For geography, the continuing prevalence of determinist thinking is in fact symptoms of a much greater dilemma – the prevalence of dualisms. Geography has a surfeit of

dualisms and debating the merits and difficulties these pose contribute a significant amount of theoretical and empirical discussion. The dualistic treatment of space and time is probably the best recognised and interrogated of these and this theory chapter contests that its continuing prevalence is limiting the scope of geography's research into ICTs.

The Dualistic Treatment of Time and Space

Unwin describes how "from antiquity to the present day this concern with space and time would seem to be one of the core characteristics… of geographical enquiry" (2000: 17). This section explores geography's more recent discourse on time and space which emerged from the radical geographies of the late 1960s and 1970s (Peet, 1977). Peet's review identifies how this field went from "an attempt to engage the discipline in socially significant research to an attempt to construct a radical philosophical and theoretical base for a socially and politically engaged discipline" (1977: 17). This shift was strongly influenced by geographers' increasing engagement with Marxian theory which among other things allowed critiques of late capitalism to emerge (Peet, 1977). It has been argued that this period rescued geography from a fragmented and isolated existence (van Passen, 1981). Others however believe that "the past twenty five years have often emerged in critical opposition to the current ways of seeing… [but] they have also become yet more temporary dogmas" (Gould, 1982: 2). Two of the leading theories that dominated the radical geographies reworking of time and space, Hägerstrand's (1973) time geography and Lefebvre's (1991b) production of space, are the primary focus of this section due to their formative role in geography's subsequent engagements with ICTs.

It must be noted that a conscious choice was made not delve into the various different metrics often used to describe space and time including absolute, relative and social. This decision was based on two factors. Firstly, it has already been done very effectively and in great detail elsewhere (see Kellerman, 1989; Johnston, Gregory, Pratt and Watts, 2000). Secondly, this thesis wants to avoid treating time and space dualistically and therefore breaking the discussion down into the various forms seems epistemologically flawed. As will be discussed in the subsequent section on new understandings to progress we instead need to embrace the concept of a multiplicity of timespaces.

Hägerstrand's time geography emerged in the 1960s from his work at Lund University, Sweden. Developed in response to the increasing criticism of regional science throughout the 1950s it was intended to show the importance of considering individuals' spatial movements through time

rather than the aggregate. Based on individual actors, time geography was intended to demonstrate the need to treat space and time interdependently. It raised a number of issues concerning process, particularly the various constraints acting on the individual that affects their ability to attain goals through the completion of projects[3]. Time geography has provided some significant contributions to they way geography conceptualises time and space. It was one of the earliest attempts in geography to approach space and time as interdependent and signalled a change of approach in geography, a move away from its spatial bias (Parkes and Thrift, 1980). Kellerman (1989) describes how Hagerstrand was one of the first to recognise that geographers had been overemphasising the spatial and that it provided a means as Pred suggested to "cease taking distance itself so seriously" (1977:218). Davies (2001) identifies the value of time geography's ability to insert a spatial framework pointing out that it was Hagerstrands vision to illustrate "individuals' activities in space and time so that complex interconnections become visible" (2001: 134). Crang (2001) discusses how the idea of rhythm and pulsing cities emerged from time geography and the potential of what he describes as "Hagerstrand's provocative term of 'project'" (2001: 193).

It should be noted that discussions of time geography, such as those outlined above, have tended to identify potential rather than actual applications. One of the key criticisms of time geography is its inability to deal with lived experience and diversity (Buttimer, 1976; Kellerman, 1989; Parkes and Thrift, 1980; Rose, 1993). Kellerman identifies that Hagerstrand's treatment of time and space as limited "movement resources" (1989: 12) is contextual as it regards the individual "as a series of time space points" (1989:2) and therefore there is little consideration of power or social settings. Rose furthers this arguing that it erases "the emotional, the passionate, the disruptive, and the feelings of relations with others" (1993:28). Parkes and Thrift (1980) disagree arguing that "time geography does not deny a role for intention and experience" (1980:276) but that it finds them "rather difficult to handle at the moment" (1980: 276). Decades on these criticisms are still being applied to Hagerstrand's work (see Davies, 2001). Despite these criticisms time geography has undergone a recent renaissance (see Gren, 2001) and its presence is felt in much of the recent work conducted on geographies more recent reconceptualization of space and time. The most important aspect to be derived from time geography for the benefit of geography's understandings of ICTs is its emphasis on individual

[3] A succinct description of time geography's framework can be found in Flowerdew (2004).

actors, moving the focus away from space and to the nature of the individual's interactions with it, something the thesis strongly abides by.

Taking a phenomenological approach Lefebvre's 'production of space' questioned the multiple meanings of space and argued that it was a fundamentally social concept (Shields, 2004). Lefebvre's work offers a good starting point because so much of our thinking both on everyday life and the production of space originated with him. Kirsch identifies that Lefebvre "see[s] space as the product of social processes" (1995: 531), and that through viewing its production one can examine the endless transformations of space, particularly those mediated by technology without perceiving space as shrinking or being annihilated. This is significant in a literature that is dominated by the Marxist perception of the annihilation of space by time. Furthermore, in the phenomenological tradition Lefebvre forces the reader to challenge their understandings of space and, I would argue, time. The ubiquitous nature of ICTs in everyday life creates the need to renew this challenge, something that this research using Thrift's work and others, discussed shortly, begins to do. Lefebvre (1991b) also challenged the use of spatial metaphors concluding that they were examples of the spatial fetishism. He argued that such metaphors assumed various definitions of space without ever identifying them (Massey, 1992).

Lefebvre's primacy of the production of space over the idea that both time and space are socially produced (Unwin, 2000) reveals that despite his acknowledgment of their interdependence, at its heart the argument is dualistic in its treatment of the two. This could be attributed in part to what Unwin identifies as Lefebvre's "deep commitment to Marxism" (2000:15) which favours this dualistic treatment. Recently Elden (2003) have challenged this pointing out that the publication of a preface to the third edition of this work in 1986, which was never translated into English, Lefebvre clarifies many of his ideas including that both space and time were social products, the principles of a second nature. Much of geography's understanding of Lefebvre's Production of Space, however, comes through Harvey whose work is strongly influenced by Lefebvre, and the persistence of this dualism is revealed in much of Harvey's work for example the following quote from his discussion of the experience of space and time, "And if it is true that time is always memorialised not as flow, but as memories of experienced places and spaces, then history must indeed give way to poetry, *time to space*, as the fundamental material of social expression" (Harvey, 1990: 218 my emphasis).

Despite these criticisms however, what Hagertstrand did for geography's conception of time, Lefebvre did for space. He was able to imbue space with life as Merrifield (2000) describes it, "space becomes redescribed not as a dead, inert thing or object, but as organic and fluid and alive: (2000: 171), something that resonates strongly in today's world of ICTs. Another important aspect for this thesis is Lefebvre's emphasis on the body, which Unwin identifies he focussed on "reincorporating the body into his analytical framework" (Unwin, 2000: 16). As this theoretical chapter will reveal, the boundaries between human and non-human actants are blurred, this is one of the central tenets of the emerging understandings of how to construct knowledge on geography's conceptualisation of ICTs.

What could be described as three variations on a theme emerged in response to these reconceptualisations. Each considers the ramifications of technological innovation on time and space, be it the stretching out or the condensing down of social activities. Time space convergence is an idea developed by Janelle (1969) to explain the friction of distance. He cited innovations in transport as the means to demonstrate this phenomenon with the friction of distance lessening as a result of new technologies. He argued that it was a significant factor in the spatial adaptation of technologies particularly, though not always in areas of relative advantage (Janelle, 1969). There are numerous examples of time space convergence and the potential consequent divergence that can follow as the pressure of the 'shrinking world' globally, directly contributes to congestion locally (Janelle, 2004). Time space distanciation, the second concept was first proposed by Giddens (1981) in the context of structuration theory proposes the idea that societies are being stretched over time and space, and are reliant on the 'presence-availability' of individuals (Green, 2002). Despite its close affinities with convergence Giddens (1981) argues it has wider implications for social theory. The third concept is that of time space compression promoted by Harvey (1990). He believed that the 1970s and 1980s saw a dramatic change in the objective qualities of time and space through the process of compression. He recognises that this had been occurring for well over a century, and as with Janelle cites transport innovations as illustrative of this compression but identifies that the recent developments in telecommunications have really allowed capital to free itself from spatial constraints (Harvey, 1990).

Before moving on to the criticisms levelled at these approaches there is one other key architect whose work on the Network Society needs to be briefly considered, Castells (1996). He argues that the information society is sustained by a 'space of flows', what Hubbard (2004) terms a new

socio spatial logic. Castells' (1996) work emphasises the importance of networks in which the space of flows exists and their ability to connect key nodes of capitalism. An outcome of this is what Castells terms 'timeless time'. He argues that temporality has been "erased, suspended and transformed" (Dodge and Kitchin, 2004b: 196) by the new ICTs creating a timeless landscape. Interestingly time space distanciation/convergence never gained much traction theoretically, though the compression thesis has been used to such an extent that it has been referred to as a meta-narrative (Thrift, 2002) and Castells' significant body of work is readily referred to by a number of geographers in this field. This is particularly interesting because extremely similar criticisms have been levelled at all these concepts, as illustrated by Table 2.1 which summarises how each concept treats space and time, the major criticism levelled at them and their value to our understandings of ICTs in urban environments.

Changing Strategies: New Approaches to Building Knowledge

So far this chapter has outlined conventional ICT narratives and their influence on and interpretation within geography. This section explores some recent methodological developments that are reactions to the dualistic thinking and meta-narratives that yield generalised representations of the world and consequently suggest new ways to describe everyday interactions emerging with ICTs. Firstly, feminist geographers such as England (1994), Massey (1992; 1994), McDowell (1993) and Rose (1993) have been highly critical of geography's tendency towards dualistic thinking as invalidating and marginalising women, something reflected in the critiques identified previously. They identify the need to take a reflexive approach to research arguing that it we must "expose the partiality of our perspective" (England, 1994: 86). This need to engage with out positionality and its ramifications for the entire research process will be investigated in greater depth in Chapter Four, the methodology.

Table 2.1: A comparison of the traditional geographical concepts of space and time and the advantages and disadvantages of these in the examination of ICTs in urban environments.

Concepts	Key Works	Treatment of Space and Time	Major Criticisms	Value in the examination of ICTs in urban environments
Time space Convergence	Janelle (1969)	Space is a product of social processes. Space is dynamic and changing and by implication space is time. At a regional and global level convergence decreases time but as places became closer a feedback loop of divergence could also emerge due to increased congestion.	While it emphasises the interactions of technologies with both space through convergence and time through divergence this independent treatment is dualistic. Generalises local impacts in an effort to apply the concept to all technological innovations.	One of the first theories to establish the importance of ICTs recognising their impacts on time and space however its emphasis on overcoming distance reflects its dualistic approach which restricts its applications to the current emerging ICTs.
Time space compression	Marx (1973) Harvey (1990)	A passive receptacle that time, which is a dynamic force, acts upon to reduce it in numerous ways.	Dualistic treatment of time and space based on the Marxist premise of space being annihilated by time, where space is passive and time is dynamic, acting upon space. Tendency towards becoming a meta narrative of generalised statements Attempts an objective overview of the world and ignores human agency.	Favouring time over space it is technologically determinist arguing that ICTs result in sensations of social dislocation and an increased pace of life. Both of which mask the complex and contingent nature of ICTs on both space and time and have consequently constrained the research conducted.
Time space distanciation	Giddens (1981)	Space is the product of social processes; it is organic, fluid and alive. Time is being extended through the ability to access the world through networks of social activities that have emerged from ICTs.	As with convergence it treats space and time independently and while it doesn't go as far as compression it still favours time as the driving force. Trivialises localised impacts.	While treating time and space as malleable its handling of space as a barrier or gap which can be overcome by the extension of time through the use of ICTs is dualistic.
The Network Society	Castells (1996)	Space is viewed in terms of flows to show the importance of networks in which these flows exist and their ability to connect key nodes of capitalism. Argues that time has little role in these flows due to ICTs.	Treats time and space dualistically favouring a space of flows and regulating time referring to it as timeless time Tendency towards becoming a meta narrative of generalised statements neglecting localised impacts Attempts an objective overview of the world and ignores human agency	Argues that temporality has been erased, instead what is emerging is a timeless time, suspended and transformed by the new ICTs creating a timeless landscape. He is also technologically determinist in his predictions of ICTs' impacts on society.

After (Kirsch; 1995; Massey, 1994; Graham, 1998; Ong, 1999; Johnston, Gregory, Pratt and Watts 2000; Merrifield, 2000; Unwin, 2000; May and Thrift, 2001;Gren, 2001; Green, 2002; Thrift, 2002; Adams and Ghose, 2003; Smith, 2003; Flowerdew, 2004; Hubbard, 2004; Morgan, 2004; Shields, 2004)

Geography's recent engagement with Thrift's (1999a) non representational style strongly resonated with the concerns I address above regarding the need to develop a better way of understanding the role of both people and technologies in emerging engagements with ICTs. Consequently, I adopt a non representational style[4] to frame the thesis. This theorisation is often coupled with the actor network approach due to what Latham and McCormack define as their "onto-epistemological orientations" (2004: 703). It is therefore important to first identify the key aspects of the actor network approach that both appealed to this thesis and on which it builds through its use of a non representational style.

The actor network approach in Latour's own words is about "how *not* to study [things]… how to let actors have some room to express themselves" (2005: 142). He argues that while 'social'[5] theories work when "the ingredients are known" (2005: 142) they do not deal well with uncertainty and fast changes, key characteristic of any discussion concerning ICTs. The actor network approach essentially concerns the rebuilding of process and interactions between human and non-human actants through description. Neither of these are the "inflexible objects" (2005:144) that social theories often categorise them, instead Latour provides a useful example of how each of these actants are equally relevant to any description, "I would say that this computer here on my desk, this screen, this keyboard are objects made of multiple layers, exactly as much as you sitting here are; your body, your language, your worries. It's the object itself that adds multiplicity, or rather the thing, the 'gathering'." (2005: 144). This thesis draws on the actor network approach to describe this multitude of layers, each of the four interventions presents an empirical exploration of interactions between human and non-human actors by allowing them to express the conditions of possibility they are encountering through engagements with ICTs. These interactions are novel in the Auckland environment and therefore need describing in terms of how they work, their movements, flows and changes (Latour, 2005).

[4] Thrift originally used the phrase non representational theory, which is still widely used in the literature; however, I prefer the term style which he refers to in Thrift (2000), because as he identifies the word theory can be misrepresented (Thrift, 1999a). Style also denotes that it is a manner of doing something therefore encompassing both the term approach and methodology. Essentially it is more than an approach, a methodology or a theory, hence style is the most appropriate term to use.

[5] Latour argues that the use of the word social is not a problem "as long as it designates what is already assembled together, without making any superfluous assumption about the nature of what is assembled" (2005: 1)

Latour is also critical of the use of *a context* to provide a framework for the research, as he puts it "A frame makes a picture look nicer… but it doesn't really add anything to the picture… I would abstain from frameworks altogether. Just describe the state of affairs instead" (2005: 144). He expands on this last point in the following quote which reflects the increasing importance of the local

> "instead of trying some salto mortale toward the rear-world of the social context, I propose to trudge toward the many local places where the global, the structural, and the total were being assembled and where they expand outward thanks to the laying down of specific cables and conduits. If you keep doing this long enough, the same effects of hierarchy and asymmetry that before were visible will now emerge out of strings of juxtaposed localities. Since they are pinpointed inside the many oligoptica and panoramas, there is nothing wrong any more with using the word 'context' " (2005: 191)

Chapter Three could be described as this thesis' context as it outlines the legislative and governmental changes that have occurred in New Zealand over the past 20 years and the challenges that have arisen from these in the four areas the empirical interventions explore. I have attempted, however, to go beyond constructing a mere framework, to instead describe some of the numerous contexts caught up in this thesis. This involved unpacking the legislative and governance changes to reveal how global transformations were reinterpreted at the national and regional level. As Law and Mol state all "facts have been localised" (2001: 609) and the construction of this thesis seeks to reveal the validity of this statement.

Thrift (1999a), however, proposes that the actor network approach fails to do a number of things, aspects that prompted his development of a non-representational style. Firstly, Thrift argues that in some instances the actor network approach has been taken too far in its emphasis of the contingency of possibilities, "actor network theory has become contingency incarnate; the gaps and uncertainties having become almost as important as the networks." (1999a: 57). This theory chapter again and again touches on this idea of gaps, of the *in between* and believes that while in some cases Thrift may be correct in stating it has gone two far one of the greatest merits of the actor network approach is the recognition of such gaps and uncertainties. Thrift also believes that the actor network approach cannot cope with "the unexpected and unrequited" (2000: 214). This he puts down to the way it deals with an event believing that it is too often neutralised. Finally, Thrift criticises the actor network approach's neglect of what he terms "human capacities of expression [and] powers of invention" (2000: 215) again accusing the

actor network approach of neutralising their potential. Interestingly, however, Thrift states that we need to avoid the "tendency to consider life from the point of view of individual agents who generate action by instead weaving a poetic of the common practices and skills which produce people and selves" (2000: 216). The actor network approach performs such weaving of both human and non-human actants, both important players in this thesis.

Thrift's call for non-representational theory emerged from his dissatisfaction with the representative nature of much social science theory, contending that we need to question academics' position as experts (Thrift, 2004c). Thrift provides the following definition

> "Nonrepresentational theory arises from the simple (one might almost say commonplace) observation that we cannot extract a representation of the world from the world because we are slap bang in the middle of it, co-constructing it with numerous human and non human others for numerous ends (or more accurately, beginnings)" (1999b: 296)

The thesis is heavily influenced by Thrift's recent work which as Lorimer states has "become a particularly effective lightening rod for disciplinary self-critique" (2005:83). Methodologically non-representational theory centres on performance and the situated knowledge of everyday practices which will be discussed in the subsequent methodology chapter. Theoretically two aspects are of interest to this thesis. First is Thrift's attempt to refigure space and time "as a series of possible worlds… [of] unactualised possibilities" (1999a: 58) an idea borrowed from Lewis (1973 cited in Thrift, 1999a: 58). He argues that the present is increasingly important due to emerging ICTs but refrains from the common arguments that time is speeding up and out of our control, discussed later. Instead Thrift treats the world as momentary, full of possibilities and that ICTs provide a means to constitute different times and spaces in everyday situations, that prior to this remained unactualised. In his paper Afterwords Thrift discusses "Re-timing space and re-spacing time" (2000: 221) arguing four important considerations regarding such unactualised possibilities, each of which provides a fundamental basis for four Auckland experiences that are explored.

First, the importance of a space's past, the need to acknowledge what has gone before. The construction of this thesis, as discussed in Chapter One, takes into account the past spaces at every stage with each chapter building on the previous one to inform the complex and dynamic timespaces in which the four subsequent exploratory interventions are being experienced. Second, the idea that space times are spread out across the world due to new technologies,

something that is similar to distanciation and this chapter will shortly develop the wider international literature to demonstrate that while the four empirical interventions are highly localised instances, they share commonalities around the globe. Third, the practical distribution of such space times is important as "different things need to be tried out, opened up, which can leave their trace even when they fail" (Thrift, 2000: 222). Each empirical chapter focuses on institutional and individual everyday practices; they reveal what people tried out, what did and didn't work given their experiences and how in turn this has meant that in some instances they now constitute spaces and times in different ways. Finally, that space times are approximations of what Thrift calls "close-to but not-quites" (2000: 222). This idea of gaps, of the need to access the *in between* - between cognition and action, the deferred aspects of software - will be discussed later. This aspect is difficult to capture in the four empirical interventions. How can one tell if these are approximations, would I as a researcher determine this based on a summary of them, or is it a personal judgement for each actor to make? Or is it merely the need to find a way to access the *in between*, considered shortly. I would argue that this can only be answered after the story has been told and so will be discussed in the conclusion.

The second theoretical consideration is the role of affect as a way to access the formation of emotions, an autonomous perspective of individuals and interactions between human and non-human actants (Thrift, 1999a). Affect provides the *how* in terms of accessing the four aspects discussed above because it impacts upon formation; it discerns emotions and alters subjectivities (Thrift, 2000). Thrift argues that "urban space and time are being more explicitly designed to invoke affective responses according to the practical and theoretical knowledges of affect that have been derived from a host of sources" (2004b: 730). Each of the interventions begins with an examination of the *effect* of ICTs on a set of everyday activities. Once it begins to delve into the institutions' and individuals' experiences however, it is dealing with the *affects*, how they are now performing the experience, their emotional responses i.e. how their thought processes are now informed differently due to the addition of the ICTs to the experience.

A number of criticisms have been levelled at Thirft's non-representational style. Lorimer (2005) believes that much of this stems from its use of the term 'non' something that he proposes should be replaced with "more-than-representational" (2005: 84). The implication of 'non' is that all representation is false, however, as Dewsbury et al. argue it could also be taken that "non-representational theory is that it is characterised by a firm belief in the actuality of representation. It does not approach representations as… a covering which is laid over the ontic

[it] takes representation seriously; representation not as a code to be broken or as an illusion to be dispelled rather representations are apprehended as performative in themselves; as doings" (2002: 428). Another criticism that has been levelled at non-representational theory is regards the impossibilities of conducting research in this manner. Nash refers to this as "The energy spent in finding ways to express the inexpressible" (2000: 662) and focussing on Thrift's use of dance is concerned by the emphasis on "being-in-the-world, [something that may] constitute a retreat from feminism and the politics of the body in favour of the individualistic and universalizing sovereign subject" (2000: 662). Nash emphasises the fundamental importance of retaining geography's focus on the "political, economic and cultural geographies of specific 'everyday practices'" (2000: 662) in order to counterbalance this affect. Pain and Bailey (2004) also have difficulties envisioning the outcomes of the non-representational style arguing that there is such a diverse range of approaches emerging from such action research that more attention needs to be applied to both the parallels among these and the need for them to recognise each other.

While both the non-representational style and the actor network approach provide avenues into the kind of thinking needed to reconceptualise time and space in light of emerging ICTs there is a need for a more explicit look at the role of technology. Consequently, this theory discussion now returns to a further consideration of the types of approaches that could be used in framing this thesis, through an in depth consideration of what Mulder (2002) terms the *trans* attitude.

Emerging Understandings

One conclusion that can be drawn from the above discussion is that what is currently occurring is far more complex and contingent than any of the conventional accounts allow for. The geographic literature has recently begun to engage with a range of emerging concepts in order to better comprehend how interactions with ICTs may be or are changing individuals' perceptions and behaviour altering their constitution of time and space. Building on the previous discussion of geography's changing conceptualisation of time and space this section begins with a discussion of May and Thrift's (2001) manifesto on timespace in which the contributing authors provide some useful starting points for the "making-living… [and] living-thinking" (2001:38) of timespace. The discussion then moves on to Mulder's (2002) proposition that we need to embrace a 'trans' attitude, in order to understand how cities are developing is explored through his and Thrift's (2004b) work on transurbanism, MacKenzie's (2002) concept of transduction and Dodge and Kitchin's (2004a; 2004b; 2005a; 2005b) work on code space. A key reference

for much of the work in this field is Thrift and French's (2002) 'Automatic Production of Space' which along with other selected works by Thrift will be used to round off this discussion of emerging understandings by exploring how the unpacking of the technological unconscious and everyday life can be directly translated into the empirical grounding this thesis's four interventions provide.

Timespace – a new take

May and Thrift's (2001) work on timespace, provides a way to encompass the idea that time and space are interconnected and interdependent. They draw from Massey who argues that space and time are "inextricably interwoven" (1994: 261). Massey uses Einstein's work on space-time in order to illustrate two key points. The first is that this interdependence does not signalise the removal of the differences between the two dimensions. In fact she argues that "It is not that we cannot make any distinction at all between them but that the distinction we do make needs to hold the two in tension, and to do so within an overall, and strong, concept of four dimensionality" (1994: 261). Secondly space and time still require defining but not in the dualistic nature of space is not time and visa versa. Instead they require positive definitions in their own right and these "must be interrelational" (Massey, 1994: 261).

May and Thrift take Massey's work further with the concept of timespace explaining that it embodies the "radical unevenness in the nature and quality of social time" (2001: 5) and considers spatial variation as a constitutive part of this rather than an extra dimension. Their discussion begins as this chapter did with a criticism of the continuing dualistic treatment of time and space. Their contribution to the argument is that what has been occurring recently is the tendency to work with the basic dualism but prioritise space, treating it as dynamic. They believe that such accounts too often proceed as though questions of "time and space are able to be treated in isolation" (2001: 3) rather than seeking to clarify their inter dependency. In particular they are highly critical of how accounts of time space compression usually proceed. They point out that if you step outside the focus on communications and transportation developments there is a much more complex restructuring occurring than the simple acceleration of life and collapse of space. This thesis will demonstrate that even within these two areas this point is true.

May and Thrift set a challenge to the contributors of their book to "think in terms of a multiplicity of… timespace[s]" (2001: 3) firstly by practising or "making-living" (2001:38) and

then by imagining or "living-thinking" (2001:38) timespace. Crucial to this thesis is their following account of the current situation,

> "The problem is that we know remarkably little about the everyday TimeSpace of the city that is not surmise: we have a battery of results from time budget studies and the like which are indicative, but rarely more… we have some phenomenological interventions, and we have one or two ethnographic studies. Yet, even a short period of reflection suggests that it is unlikely that the TimeSpace of the Western city can be encompassed by just one account. It is not so much one big screen as many tiny windows" (2001: 35).

This thesis approaches the four empirical interventions as timespace frameworks, a series of 'tiny windows' into the localised interactions of ICTs and aspects of everyday practices that are being played out in Auckland.

In the second part of the book both Loy (2001) and Crang (2001) begin to provide entry points into such thinking. Loy (2001) identifies that time is being commodified and poses an important question to reflect on, "do we actually have less time, or does it only feel that way, because there is something different about the way we 'use' time today?" (2001: 263). He also identifies that this modernist desire to make time a commodity exacerbates the rush by making us speed up in order to gain time. Although as Crang (2001) points out we are not dealing with a singular commodified time. Instead he argues that such a narrative "needs to be inflected… by a sense of complex starting points" (2001:191). They identify that removing the dualisms between space, time and event allows us to identify the "different temporalities orchestrated through [places]" (Crang, 2001: 191) and reveal timespaces "as no longer hollowed out but, always with a particular texture and flavour" (Loy, 2001: 280). This latter conceptualisation is not new, Kellerman identified that "Time and space may be viewed as being both contexts and compositions. As the most basic dimensions of human life, they serve as obvious, almost trivial contests of human life. On the other hand, time and space are also compositional in their being resources and factors for human action." (1989: 1). This thesis proposes that ICTs may provide a way to now perceive the consistencies and grains of timespace.

May and Thrift (2001) open their manifesto by identifying the spatial turn recently taken by the social sciences, and consequently, much of their initial focus is on bringing temporality back in. They do however acknowledge that there is a much greater obsession emerging within the literature over the relationship between technology and time. Hubbard and Lilley (2004) identify that part of the reason for this fixation is "modernisation involves the transformation of

the 'concrete' spaces of everyday life into the abstract spaces of state capital, it also seems to involve the irresistible replacement of slow spaces by faster ones" (2004: 277). Hubbard and Lilley argue that this is particularly due to the industrial embrace of "modern clock time" (2004:275) and the trend of comparing urban and rural living through that analogy of the fast paced modern urban environment. This perception have been further emphasised by reactions to it such as the 'Slow Food' and more recent 'Slow City Movement' which among other things argues that "The faster the information highway takes people into cyberspace, the more they feel the need for a subjective setting—a specific place or community—they can call their own. The faster the pace of life in search of profit and material consumption, the more people value leisure time" (Knox, 2005: 5). Eriksen's 'Tyranny of the Moment', referred to in Chapter One through his argument that life is becoming a "hysterical series of saturated moments" (2001:2) is yet another perpetuation of this sensation. This thesis questions whether the impression of not having enough time is directly related to the increasingly dynamic spaces we may encounter and engage in, conditions of possibility that reveal that space is less passive than ever before because ICTs provide us with the ability to access and constitute a multitude of timespaces.

The concept of timespace is inherently about moving beyond deterministic and dualistic thinking and it was the first concept that I encountered during my research to do this so explicitly. It was therefore fundamental to the formation of the thesis and my engagement with a non representational style which builds on the same principles. Throughout the thesis the term timespace is used to replace time and space emphasising that the conditions of possibility perceived are as much temporal as they are spatial. There are however limitations to the employment of this concept to this thesis. May and Thrift (2001) have little to say about the ramifications of ICTs and as revealed above are primarily concerned about reasserting time back into the spatial turn in which geography has been engaged. Geography's theorisation and methodological developments around ICTs are intrinsically about how time and space are conceived. Timespace provides a point of departure for this thesis to move on from these debates through adopting a non representational approach enhanced by taking a *trans* attitude, which will now be discussed.

The trans attitude

Mulder (2002) proposes that with the advent of new technologies the old concepts of urban environments are disintegrating. He points out that meta narratives such as modernism and postmodernism attempts at idealised urban models are flawed, arguing that "A city is an

unstable system, a living system which is in a state of continual decomposition, but which also continually reorganises and rearranges itself, which expands and shrinks" (2002: 7). He believes that we have moved beyond *post* with its tendency to look backwards stating that it "means nothing more than that something is undergoing rapid change with an unknown destination" (2002:5). Perceiving urban environments as constantly under transformation and in transition Mulder (2002) proposes the adoption of a " 'trans-' attitude" (2002:7) where "you consciously go along with the developments instead of frantically trying to maintain a position outside them" (2002: 7). Ruby (2002) proposes that the use of this prefix first expresses "the will to transgress the subject described in the root noun" (2002: 17) and secondly that it oscillates between moving "away from something and towards something else" (2002: 17) recognising that the transgressed subject is indispensable.

Mulder applies this prefix to describe the current urban context through the idea of transurbanism which he describes as "urbanism plus transformation" (2002:7). Transurbanism is a term that I embrace in this thesis for the reasons outlined below, however, I believe that Mulder (2002) is in fact contradicting himself by describing it as a process of addition. The aim of the *trans* attitude is to open up the layers of experience to expose the effects and affects of interaction, therefore acknowledging the inherent transformative nature of urban environments, not merely adding the concept of transformation on to existing urban processes.

The interactions of emerging ICTs and the built environment constitute what Mulder terms the "highly informed character" (2002: 8) of current urban environments. Mulder argues that "you cannot design a city, but you can help a city organise itself" (2002:10) particularly through ICTs which he points out underlie the "narrative of globalization" (2002: 10). Particularly pertinent to this thesis is Mulder's description that

> "A city is not really just a network of intersecting information and commodity flows; that would be too meagre a representation. The city is still localised as a place or a region, but 'locality' now means the feeling of being somewhere, of having a place in a context where your life has some relevance. A city produces a series of 'localities'. It's no longer a single public domain but a concatenation of diaspora-related public domains in which numerous 'cultures' or 'contexts' are settled but linked via the media to similar cultures and contexts elsewhere" (2002:9)

This process of transurbanism particularly appeals to Thrift because it "involves a host of times and spaces whose interactions and interferences are not incidental but constitutive" (2004b:725), something that follows through to his arguments of timespace and ties directly into what is occurring in this thesis' four interventions. Thrift (2004b) highlights four aspects of transurbanism that he believes are vital to geography's consideration of what is now occurring in urban environments. Firstly, following through on this rejection of *post* he argues against the proposition that we now live in a postsocial world suggesting that in fact the opposite is occurring. ICTs are facilitating a wider range of relationships not only with other people but with non-human actants as well. Thrift insists that we take the "nonhuman aspects of the city much more seriously" (2004b:726) something that this thesis will repeatedly demonstrate, initially in Chapter Five, which explores the social construction of Auckland's ICT platforms, an intervention theoretically grounded in Graham and Marvin's (2001) recognition of the need to unpack the infrastructural black box.

Secondly, Thrift identifies that what is occurring is a "continual process of tinkering… so much of what cities produce consists of minor variations on existing structures" (2004b: 726). Thirft (2004b) targets the continual negative connotations that our consumption practices are emptying out our cultural practices, proposing this argument is as flawed as the postsocial one. While Thrift (2004b) draws examples from music and gardening this idea of tinkering could equally be applied to Web 2.0 applications such as You Tube, Wikipedia (and spin offs) and Google Earth which also as Thrift puts it demonstrate that "in part precisely because of rampant commercialisation has made its delights and frustrations open to a wider audience" (2004b:729). This element is apparent in all four of the empirical interventions but in particular is revealed in Chapter Five's discussion of council websites, and the migrants' appropriation of different ICTs in Chapter Eight.

The third aspect Thrift raises is politics, specifically the "practice and content" (2004b: 726). He emphasises the "spatial grammar of power" (2004b: 729) which can lead to one view, in his case London, dominating the story and perspectives. Thrift argues that the differing perspectives that have dominated the practice of politics in the city have led to a "creatively agonistic to and fro… to some basic ground rules which are very rarely challenged" (2004b: 726). This thesis picks up on this aspect of transurbanism in Chapters Three, Four and Five through the use of a governmentality framework both to explore the political landscape

associated with ICTs in Auckland and as a way to reveal differences and challenge the ground rules often associated with such governance structures.

The final aspect of transurbanism that Thrift (2004b) identifies as affect, a concept he argues that links the three other aspects. While this aspect has already been discussed in detail, here Thrift is interested in "how to take affect into our urban accounts" (2004b: 730) proposing that urban environments are increasingly being designed to "invoke affective responses" (2004b:730). He suggests that through transurbanism we can begin to "recognize the realm between thinking and affects" (2004b:731) and believes "we require a micropolitics of the subliminal, much of which operates in the half second delay between action and cognition" (2004b: 732).

The notion of accessing the *in between* is a recurring theme both within Thrift's work and wider discussions regarding the role of metaphors in dealing with the uncertainty associated with ICTs, something that has already been discussed in the context of conventional ICT narratives. Gentner, Imai, & Boroditsky identify that "Very little understanding of time is purely temporal. Most of our understanding of time is a metaphorical version of our understanding of motion in space" (2002: 139). Consequently spatial metaphors have been favoured despite the dualistic treatment of space as passive and inactive. Clarke (2000) believes there is role for timespace/spacetime metaphors to describe gaps, the *in between* similar to Deleuze's explanation of transition between two spaces of enclosure, however, concrete examples of such metaphors are lacking (Nardi and O'day, 1999). A concept that Urry points out provides a means to move "*beyond* metaphors" (2005: 9 emphasis original) is MacKenzie's (2002) work on the concept of transduction, which, I argue performs Mulder's (2002) idea of a *trans* attitude. MacKenzie identifies two key problems with the way that technology is currently treated. Firstly, the tendency to view technology solely as an object, what he terms "an empty metaphysical abstraction disguising social processes" (2002: 205) and secondly, as temporally neutral, "an ahistorical hand colonizing human cultures with its material structures and logic" (2002:205). MacKenzie's (2002) discussion picks up on many of the themes that have been identified in this chapter. He identifies the problematic of perceiving technology through a utopian or dystopian lens and the resultant anxieties these invoke, particularly that "time itself is being colonized by speed" (2002:1) and that "to think 'the body' or to think 'time' is to run up against the limits of thinking" (2002:1), and one could argue that the same could be said about 'space' and the body.

MacKenzie also provides a succinct summary of the point raised above by Thrift regarding the culpability of consumption practices, stating that "our current susceptibility to excitement or anxiety about new technologies cannot be completely dismissed as ephemeral, or as the ideological effect of product advertising and commodification. Even if we become more critically aware of the way in which stories told about technology are at odds with technical practices, something more is at stake" (2002: 209). In essence there is a need to find a middle ground between the grand narratives and innumerable micro-practices (such as this thesis' four interventions) (MacKenzie, 2002). This may be done using the concepts of transduction as it provides a means to overcome these difficulties and breaks down the dualism between society and technology as it involves "thinking relationally about technical action" (2002: 209) and the "thinkability of technology" (2002:3). MacKenzie uses a useful analogy to explain the process of transduction

> "Making a brick, it seems trivial to say, is a transductive event. The event in which clay and mould exchange properties is a point of inflexion, not simply a point of intersection or collision. What counts as the form of a brick and what counts as its matter are effects of this interaction. They are not its pre-existing constituents. Only because the habits of thinking of matter and form as separate is so strong can such a occurrence appear trivial. Moreover… it does not always occur so transiently as it does when clay and mould are brought together. The point of inflexion, or the moment when actors exchange properties can have an extended duration" (2002: 210)

As with the other emerging understandings addressed in this section MacKenzie emphasises the complexity and contingency of fundamentals such as time, technology and corporeality. He argues that there is nothing purely human, that we loose the ability to extrapolate out our and society's constitution if we continue to maintain that technology merely as an instrument, a similar argument to the actor network approach. Taking a leaf from Mulder's (2002) work transduction allows us to go along with developments. This idea of the interweaving of human and non-human has also been done by Thrift (2000; 2006). While the four empirical interventions in this thesis do not represent such obvious examples of these interconnections they nevertheless illustrate transductive processes, possibilities of action that have arisen directly from the complex and contingent aspects of interacting with ICTs in Auckland .

Dodge and Kitchin's (2004a: 2005a) idea of code space draws directly from MacKenzie's (2002) work and crucially brings in space, something that was conspicuous by its absence from MacKenzie's work. They define transduction as the "constant making anew of a domain of reiterative and transformative practices" (2004: 162) and propose that much of it is conducted through code. While MacKenzie (2001) draws on Simondon's technicity to provide an ontogenetic account of time, Dodge and Kitchin's (2005a) idea of code space proposes that space is also ontogenetic, constantly coming into being through the process of transduction, and therefore provides an entry point into considering city spaces in new ways. Viewing things ontogenetically also feeds back into the earlier discussion concerning the need to access the *in between* something that spacetime metaphors have the potential to do but which Dodge and Kitchin's (2005a) code space informed by transduction appears to actually succeed in doing.

Dodge and Kitchin identify that software or code now "produces, monitors, surveys, augments and controls many aspects of daily life" (2005a: 162). Their emerging body of work on code space (2004a; 2004b; 2005a; 2005b) provides some much needed empirical grounding to the theoretical developments identified in this chapter. They point to the increasing capacity of objects due to code and how as many others have commented (Thrift, 2004d) there is still much to be uncovered from the technological unconscious. This aspect will be examined in greater detail in the RTPISP System experience where real time signs provide an interface between the 'reality' of catching the bus and the coded spaces of the bus system.

Technicity, transduction and code space allow a process of intersection and therefore provide a way to interrogate how timespaces emerge from the ICTs that are present in this thesis' empirical chapters by revealing the conditions of possibility. Mackenzie (2002) develops the idea of transduction through a set of comparative studies, something that this thesis' four interventions also centre on, from how local governments are recognising the important role that ICTs may play in urban planning and economic development, to catching the bus before and after the real time signs were put in place, to how migrants' embeddedness in Auckland is informed by their ability to communicate with their country of origin before and after the Internet, and finally through traditional learning versus e-learning. Each chapter identifies personal reflections by individuals on how their experience of ICTs in specific circumstances came into being and the conditions of possibility that have emerged which provide entry points into a multiplicity of timespaces.

Grounding the Technological Unconscious in Everyday Life

What is meant by the term everyday life is a significant area of debate throughout the social sciences. It is a phrase identified in the introduction as in wide use but what the term encompasses still remains opaque. Geographic considerations of everyday life tend to draw from two leading French philosophers De Certeau (1984) and Lefebvre (1991a) whose critiques reasserted the importance of everyday life for many geographers. This section will not attempt to critically analyse their work, this has been done with great skill elsewhere, see Highmore, (2002), Crang, (2000) and Merrifield, (2000). Instead it draws on elements of both De Certeau (1984) and Lefebvre (1991a) to outline why this thesis focuses on experiences of everyday life.

Lefebvre argues that in the modern context everyday life is both determined by but also a site of resistance to capitalism (Highmore, 2002). Many have credited him with useful historical perspective particularly the connection between the development of this idea of an everyday life with modernity through a dialectic of resources and routines (Drotner, 1994). Of particular interest is that this dialectic approach presents everyday life as the "inevitable starting point for the realization of the possible" (Lefebvre, 1971:14). This is a key reason for this thesis' focus on 'everyday' activities, as it is at this level that the conditions of possibility are realised. This point is reiterated by Highmore who identifies the following quote from Lefebvre "Everyday life is profoundly related to all activities, and encompasses them with all their differences and their conflicts; it is their meeting place; their bond, their common ground" (Lefebvre, 1991a: 97) which summarises the importance of considering everyday life as a way to "explore the relationship between different spheres" (Highmore, 2002: 128) such as leisure, commuting, work etc.

De Certeau (1984) has quite a different take on the everyday though with the same intention, to stop researchers taking it for granted (Drotner, 1994: Highmore, 2002). His account is centred around aspects that govern everyday activities (Drotner, 1994), in particular the binary view that the idea everyday life is operated through strategies, which exert control over space and tactics, which disrupt, or in Highmore's words are "the inventive employment of possibilities within strategic circumstances" (2002: 159). There have been many justifiable criticisms of this binary view (Drotener, 1994; Highmore, 2002) but what is useful about such considerations are that De Certeau infuses the concept of everyday life with creativity, mystery and power (Crang, 2000).

To summarise the value of considering a series of everyday experiences, the following quote from Merrifield is particularly relevant,

> "our academic space… - is itself becoming (has become?) yet another abstract space of capitalism, and we ourselves are the perpetrators, are the formulators of new kinds of representation that are inexorably tied to relations of production… In our daily practice we deal more with abstract representations and codifications of society which are wrenched out of the lived experience of both ourselves and others outside the academy" (Merrifield, 2000: 181)

Throughout this chapter the need to empirically ground this type of research has been emphasised, and Merrifield's argument is imbued with this same call, something this thesis seeks to begin to redress.

Thrift and co-authors have built up a series of interesting articles on society's interactions with ICTs with a particular focus on software. These are exceedingly useful contributions to geography as they open up new fields, stimulating and challenging how we think about the changing world in which we live. There is however a need to ground much of this work to avert the wrenching that Merrifield (2000) refers to above. One of the most cited articles is Thrift and French's (2002) 'Automatic Production of Space'. This provides a useful explanation of what they consider are the four reasons for the "unrecorded" (2002:311) nature of the automatic production of space occurring in Western Cities. Three of these reasons, that "software takes up little in the way of visible space" (2002:311), that "software is deferred" (2002:311) and that "we are schooled in ignoring software" (2002:311) I would argue, can equally be attributed to the hardware components, which have, with some prominent exceptions (see Graham and Marvin, 2001), also gone unrecorded. The fourth aspect goes back to a theme that has threaded its way through this chapter, accessing the *in between*, in this case Thrift and French propose that "software is… a space that is constantly *in between*" (2002: 311). Describing how it provides a conduit for the deferred action between the development of an application or event and its expression in everyday life. In proposing the automatic production of space Thrift and French contend that "we can no longer think of city spaces in the old, time-honoured ways" (2002: 331).

Much of Thrift's work builds on the idea that these elements remain unnoticed paratexts (2004a) of our technological unconscious society (Thrift, 2004d). This unconscious he argues is resulting in the "full-blown *standardisation of space*" (2004d: 177). Thrift elsewhere argues

that "this new technological world is working directing into our unconscious, acting rather like a substitute for, or, more likely, an extension of, biology" (2005: 474). Thrift (2004a) proposes that the computing background has become so ubiquitous that what is now occurring is a process of qualculation where spaces that were 'natural' before are now inundated with calculations due to ICTs. These spaces are now much more mobile and in flux, they are no longer enclosed containing exact calculations, they have "become a means of making qualitative judgments" (Thrift, 2004a: 584), yet these relative spaces are situated within an absolute space of calculation where "everything can be framed as in perpetual movement" (Thrift, 2004a: 592). Thrift emphasises the need to focus attention on everyday life in this qualculated world because this process can "exceed and transform existing spaces and times as [it applies] a new set of arts of distribution, which bring with them new problems and new solutions" (2004a: 601).

Each of these points adds a critical dimension to this thesis' four empirical interventions. Are individuals as technologically unconscious as Thrift has led us to think in their everyday practices? Thrift has a preference for putting a positive spin on the potential of ICTs, something that this thesis needs to be aware of in its analysis. It is more likely that there are both benefits and disadvantages depending on individuals' personal experiences and the timespaces in which these interactions occur and those that can be constituted as new possibilities of action. This thesis will demonstrate that our everyday lives are changing due to interactions with ICTs but whether such changes are in fact leading to either the automatic production of space or a standardisation of space I would argue is a far from clear.

Framings: Geographical Treatment of ICTs in Urban Environments, Transportation, Migration and Education

Urban environments, transportation, migration and education are four areas of geography where an increasing amount of work on the role of ICTs in today's world is occurring. Rather than attempt to cover these extensive developments this section focuses on how in each area their consideration of ICTs has changed over time, identifying the key developments within each discourse, exploring the gaps that exist and how this thesis' four interventions are situated to contribute some new empirical understandings.

Urban Environments

Townsend (2001) believes that two perspectives have tended to dominate geography's examination of the interactions between ICTs and urban environments, the global city approach and the urban dissolution perspective. The global city approach gained traction in the early 1990s, a period of rapid urbanisation that occurred worldwide. Castells (1996) focussed on the emergence of megacities, those with a population of over 10 million. While recognising that these large urban agglomerations comprise all the extremes from the disenfranchised and disconnected to the most powerful and innovative Castells argues that more importantly they are the "actual development engines… [and] are connecting points to the global networks of every kind. Internet cannot bypass megacities: it depends on the 'telecommunications' located in those centers" (1996: 410). As Townsend (2001) argues however there is very little evidence to support Castells' (1996) observations, a point that can still be made today. Hall also identifies the emergence of dominant global cities whose urban hierarchy is increasingly being determined by their technological prowess stating that "What is clear is that cities are defined in this hierarchy, not according to any of the previous models, but simply in relation to the informational economy" (1997: 318). Hall recognises that the urban models generated in the 1960s fail to adequately capture what is occurring and instead argues for a model that relates cities to their "position in the globalized informational economy" (1997: 320). Unlike Castells (1996) Hall (1997) does recognise the lack of empirical data to support these claims but argues it is more due to a lack of data collection than actual evidence (something that is partially true, in the mid 1990s there was very little cohesive statistical information on ICTs). Once again however Halls' (1997) argument is too restrictive and fails to capture the complexity of what is actually occurring.

In his paper Townsend (2001) instead proposes the emergence of a new type of networked city. Based on an empirical investigation of Internet infrastructure and domain name densities in the US Townsend (2001) concludes that such cities are dependant on their economic ability to prosper from technological innovation and a highly skilled workforce to maintain it. This concept is particularly pertinent for Auckland as this raises "practical concerns for urban planners and policymakers" (Townsend, 2001: 56). The human capital aspect of Townsends' argument is particularly important as he uses this to veer away from the technologically determinist arguments of Castells (1996) and Hall (1997), stating that "Although the Internet is the increasingly visible vehicle for this transformation, it must be made clear and explicit that societies create technologies, not vice versa" (2001: 57).

Even more pervasive within the geographic literature's examination of ICTs role in urban environments has been the urban dissolution perspective. Graham (2004) calls this a "post modern fantasy" (2004: 6) based on several flawed notions of cyberspace including the ability to free oneself from the restricted corporeal reality of city spaces, the collapse of all geographical constraints through the death of distance, an inclusive virtual community based on democratic processes and finally the removal of people's "reliance on place" (2004: 8). Malecki (2002) drawing on Townsend identifies problems with this urban dissolution concept demonstrating that the Internet in fact reiterates four long standing characteristics of communications technologies, the dominance of large firms in their innovation; their invisibility; their functionality as a network; and, the rise of private telecommunications networks. Malecki (2002) shows that the Internet is in fact reinforcing an urban hierarchy and that fractured infrastructure and digital divides are part and parcel of this.

More recently there has been a move away from the extremes of post urbanism to a consideration of the fractured urban landscape of specialist centres and digital divides (Graham, 2002) or what Marvin and Graham (2001) like to term the splintered urbanism of today's cities. The concept of the digital divide originated in the United States in the late 1990s to describe unequal divisions of ICTs between different socio-economic groups. As Servon (2002) has noted, however, such divides are not merely a problem of access, they are preceded by basic levels of availability and the skill level of those involved. Graham identifies the emergence of unevenly distributed "premium networked spaces" (2000: 185) that cater for those with the power and skills to access them as a prominent example of the digital divides that ICTs are promoting in urban environments. Graham and Marvin argue that the rapid privatisation of utilities and services throughout the 1990s has created a fragmented urban environment in which "energy and communications grids [extend] through the fabric of city spaces… always laden with social and political biases, highly uneven power struggles and cultural and historical specificities" (2001: 42). This is an important point in the exploration of Auckland's ICT platforms in the first experience as New Zealand's neoliberal reforms were some of the most extreme (as will be revealed in Chapter Three).

Empirical investigations of the role of local government in these discussions though has been largely absent despite the recognition that they form an integral part. Castells argues local government has a pivotal role in the new institutional arrangements of the network state as they become a "node of the chain of institutional management, able to input the overall process, yet

with added value in terms of their capacity to represent citizens at a closer range" (2004: 84). Castells (2004) describes how urban policy makers are constantly balancing the demands of governance, economic pressures and conflicting social agendas, something that the emergence of new ICTs has further complicated. Thus there is a need as Graham (2000) puts it to reproblematise networked urban infrastructures in the light of their privatisation and liberalisation, identifying that urban planners have undergone a shift, from strategic and visionary planning to more pragmatic responses to local issues. Cohen-Blankshtain, Nijkamp, and van Montfort identify that policy makers' perceptions of, and decisions to, consider ICTs as a means to improve situations are influenced by whether the problems were spatial, or socioeconomic in character and that "there are no 'ready made' ICT policy recipes" (2004: 2656). This in part explains why little comprehensive ICT policy work had been conducted.

One of the few prominent empirical investigations of the role of local government is van der Meer and van Windens' (2003) work on e-governance in European cities. Identifying three manifestations of ICTs in cities, local access to technology, local electronic infrastructure and local electronic content, they propose that the interactions between these form a "local digital flywheel" (2003: 411) which policy makers should focus on enhancing. The first exploratory intervention unpacks the conditions of possibility that are emerging from Auckland's local government's experiences of the region's ICT platforms and the entry points these are providing into in increasing multiplicity of timespaces. It draws on van der Meer and van Windens' (2003) three aspects to illustrate that the concept of the digital divide is too simplified and instead through highlighting the condition of the Auckland Region's local access to technology, local electronic infrastructure and local electronic content demonstrates that it is more a question of presence and absence than a simple divide. The experience explores the background motivations and decision making process of the key actors in Auckland ICT platforms as they relate to the region's local government, something critically lacking in the existing literature. Only recently have investigations into the urban planning component begun to emerge (see Graham and Marvin, 2004; Corey and Wilson, 2006) but often these are still more a description of what urban planners have done and suggestions as to what may change, rather than an engagement with the actors to unravel their performances. As Auckland's local government tries to situate itself in this changing urban environment infused with ICTs it is developing several infrastructural, economic and social initiatives. These reveal conditions of possibility that the council actors are realising, uncovered by the *in between* mental space of performance

in which their relationships and motivations are played out, and which create entry points into a multiplicity of timespaces.

Transport and Transportation

The starkest examples of technological change have been witnessed in transportation, inspiring much of the time space convergence and compression theses. This has resulted in transport geography's predominant focus on technologies that reduce the need for or substitute physical travel. A trend that is both exacerbated and been driven by what Urry (2002) argues is geographers' concentration on *necessary* travel, which presumes that only essential movements will be undertaken with the greatest speed and least travel required. Subsequently much of the work that has been done to date explores the potential of what Janelle identifies as innovations that provide "virtual mobility" (2004: 86), predominantly telecommuting, teleconferencing and e-commerce. While a useful description of each can be found in Janelle (2004) what this discussion is interested in is the restrictions this focus has placed on transport geography's theoretical consideration of ICTs.

Janelle (2004) does argue that these innovations will not result in the 'death of distance' (Cairncross, 1997) and that instead what will occur is a "gradual rather than revolutionary change" (2004:108). He also concedes that much more needs to be known about the impacts of such innovations on urban environments and the relationship between home and the workplace before the concept of virtual mobility can be truly understood. Vilhelmson and Thulin also come to this conclusion stating that "there is rarely a straightforward substitution potential in the interaction between transportation technology and ICT" (2001: 1026). Their discussion compares ICT based modes of work to travel based modes in Sweden and found that while teleconferencing and teleworking were occurring they were not attracting the large numbers analysts anticipated. Instead ICT based activities are becoming more time consuming leading Vilhelmson and Thulin to suggest this may lead to a displacement effect where other actions are sacrificed. They conclude that,

> "The potential and consequences of the use of technology are often looked upon in quite similar ways…But it is also clear that circumstances beyond the system under study may also influence the development process and bring about some potential effects, embedded in technology, that may be more desirable than others" (2001: 1028)

As with Janelle (2004) and Vilhelmson and Thulin (2001), Urry (2002) also concludes that a better understanding of travel behaviour and the value of co-presence is required and that

corporeal travel will remain a key element of our day to day lives. Urry (2002) demonstrates that instead ICTs are fulfilling niches where such travel is not so necessary, take for example online banking, and consequently that much more attention is required regarding individuals' travel motives, their social practices and how "old *and* emerging technologies… reconstruct notions of proximity and distance, closeness and farness, stasis and movement, the body and the other" (2002: 271 emphasis in original). In Hodge and Koski's examination of research possibilities in relation to ICTs they identify that "we know very little about how these new technologies will affect individual travel behaviour" (1997: 192). Dziekan and Vermeulen's draw a similar conclusion in their examination of the psychological effects of real time displays stating "that knowledge about the behavioural effects these have on customers… in the real world is quite sparse" (2006, p.72). These studies demonstrate a notable lacuna concerning the interactions of ICTs and individuals' travelling experiences.

Consequently, more attention is now being paid to what Hanson (1998) refers to as the off road/on road intersection, an area she asserts holds an interesting set of questions. Such intersections are predominantly captured under the term intelligent transport systems (ITS) which encompass a new set of innovations that integrate ICTs into transportation through surveillance, traffic management, onboard navigation and real time information, among others. The degree to which ITS could be assimilated into our transport experiences is illustrated in the following quote,

> "Increasingly, automobile software also reaches beyond the vehicle itself. So, for example, 'intelligent vehicles' drive on 'intelligent streets' loaded up with software that surveys and manages traffic, from the humblest traffic light phasing to the grand visions of integrated transport management systems that will increasingly control traffic flow while giving an illusion of driver freedom" (Thrift, 2004e: 50)

Work conducted in this area both within and outside geography has concentrated on two concepts. Firstly, how such systems can enhance transport safety through mechanisms such as surveillance and traffic management software (Annino and Cromley, 2005). Secondly, the development of sustainable transport practices through travel demand management initiatives that either increase the efficiency of passenger transport, for example real time information, or charge for the use of private vehicles, for example congestion charges (Hodge and Koski, 1997). Hodge and Koski argue that "Perhaps no topic has generated more conjecture than the issue of impacts of Intelligent Transportation Systems (ITS)… on metropolitan form" (1997: 195) but

that there is little empirical research on people's responses to these, therefore limiting our understanding of their potential.

The second exploratory intervention of the thesis explores the installation of Auckland's first ITS the RTPISP System. This type of travel demand management system specifically targets people's travel behaviour, encouraging them to utilise alternative modes to the car by providing choices through ICTs such as real time displays. The few studies conducted into this type of system identify that the effects of the user's perceptions are generally positive. Dziekan and Vermeulen demonstrate that the use of real time information displays for passenger transport "can greatly reduce anxiety" (2006: 72) and also reduce passenger perceived wait time. The concept of 'wait time' is central to any passenger transport initiative principally as this time is often considered onerous (Hess, Brown, and Shoup, 2004) or even as the longest part of the journey (Li, 2003). In their study Hess et al. (2004) found that bus patrons' perceptions of wait times were very subjective identifying a clear difference between the perception and the reality of longer wait times. While the intervention does not involve comparing bus patrons' perceptions of wait time with the actual time they waited, it does consider bus passengers' time perceptions and the potential impacts of the real time signs on this.

Chapter Six provides some empirical evidence of how an everyday activity, catching the bus, has become embedded in technology as a result of the implementation of the RTPISP System. The real time displays act as an interface between the bus patrons' real life transport encounters and the background hidden software, in essence a means to access the *in between* of peoples' responses to the systems coded spaces. The gap between the patrons' cognition of the sign information and the conditions of possibility they then recognise. These circumstances provide the opportunity to constitute different timespaces both in and around the bus stop. The information the displays provide, both consciously and unconsciously, affects the behaviour of the waiting passengers. It will reveal that individuals are now able to constitute and engage in a range of timespaces in the bus stop environment; timespaces that were not previously accessible. Clearly this interaction is not a compression of space by time; in fact, the provision of real time information is opening up space in ways potentially not previously experienced by these bus passengers.

Education and E-learning

The role of ICTs in tertiary education has been an issue for over twenty years, with prominent debates both over the impersonality of computers (Hiltz, 1986) and the practicalities of using ICTs in the most effective manner (Chou, 2002). Until recently the e-learning discourse has predominantly focussed on distance learning as a means to provide a more flexible and open learning environment through the applications of various ICTs. The benefit of e-learning for such courses is now well recognised (Haythornthwaite and Kazmer, 2002). However, recent work by the OECDs Centre for Educational Research and Innovation (CERI) found that ICTs are being used to complement rather than replace traditional forms of tertiary learning (CERI, 2005). There is a clear lacuna in the literature as little has focussed on what is occurring on campus. As Forer identified while distance learning can provide a "good test bed for some aspects of virtual learning" (1998:150) the great majority of tertiary students still partake in traditional campus based courses where e-learning is not the dominant mode of delivery.

There has also been growing concern in the discourse that the pressures of neoliberal reforms on tertiary funding around the world favour technologically determinist thinking that encourages a critical deployment of e-learning as a means to cost reduction, with little concern for the implicit effects of the technological delivery (Peters and Roberts, 1998; Vandenberg, 2005). These issues will be discussed in depth in Chapter Three with relation to the New Zealand tertiary sector. Vandenberg (2005) argues that for the e-discourse to avoid such thinking one must recognise the embeddedness of technologies in tertiary institutions.

Generally the use of e-learning on campus based courses is referred to as blended learning (Stubbs, Martin and Endlar, 2006). There is as a balancing act of learning activities and the 'right' mix of communications tools. They conclude that research into such learning by and large concerns the "challenge of appreciating how the nature and form of communication shapes the student learning experience and the actual learning outcomes" (2006:164). Motteram (2006) also emphasises the importance of the student's learning experience in his discussion of blended learning. He identifies that the key factor for such learning is that technologies are there to mediate the learning experience "to structure learning to make it more valid an experience and more accessible to a range of participants" (2006:19). Notably, however, such research commonly emphasises the technologies involved and neglects to assess the effectiveness of the traditional mechanisms used alongside them. As Laurillard (1993) points out there are also

issues relating to both the intrinsic limitations of the traditional approaches involved and the way they are delivered.

There is now a greater attention being paid by the e-learning discourse to the institutional embedness of such learning something sparked by the neoliberal agendas of the 1990s (Vandenberg, 2005; Davis and Fill, 2007; Martin and Treves, 2007; White, 2007). Increasing attention is being given to modelling the effectiveness of e-learning mechanisms, including the use of online assessments, students' attitudes to them and different teaching methods (Carver, Evans and Kingston, 2004; Sivo, Pan and Hahs-Vaughn, 2007; Chang and Tung, 2008; Lynch et al., 2008). Geography in particular provides a useful arena in which to explore e-learning because as Treves and Martin so succinctly state "Geography is a diverse and dynamic discipline, with teaching methods covering a wide range of traditional lecture and seminar-based modes in addition to small group tutorials, 1-day and residential fieldwork, computer-based practical's and a significant research project component" (2007: 774). This is evidenced by the increasing number of geographers investigating the application of e-learning mechanisms in field exercises (Latham and McCormack, 2007; Hirsch and Lloyd, 2005; McMorrow, 2005).

This thesis's third intervention examines e-learning in the context of two first year geography courses at the University of Auckland, 'Digital Worlds' and 'The Natural Hazards of New Zealand'. Both would be classified as blended learning courses. This intervention specifically focuses on the students perceptions and opinions rather than measuring their engagement with various learning mechanisms. These opinions include their views of traditional learning as well as their e-learning experiences which provided a useful context to explore the students' perceptions of the interactions between these and compare the two forms. They were also asked to describe their usage patterns, and the benefits and problems associated with each mode. While obviously more subjective this approach provides a way to reveal the students actual experiences and, by giving voice to the students, builds on a small but increasing body of work that values what they have to say as an important means to "extend our knowledge of e-learning" (Gilbert, Morton and Rowley, 2007: 562). This provides a means to access the *in between* by identifying their perceptions of the conditions of possibility the courses provide, conditions which in turn are generating alternative timespaces that, as will be demonstrated, are highly complex and contingent on several factors.

Migration and Transnationalism

Since the early 1990s the migration experience has become increasingly imagined, mediated and negotiated through emerging ICTs. The ability to be interconnected to many nations in numerous ways has stimulated much interest in geography regarding the potential of transnational social spaces and formation of transnational bonds. Cultural geography contains extensive debates regarding how these concepts relate to existing theories within the migrant discourse including globalisation, immigrant assimilation and ethnic pluralism (Faist, 1999; Kivisto, 2001; Portes, 1999; Vertovec, 1999). The transnational discourse is quick to identify ICTs as a core driver behind the increasing interconnectedness that shapes what it is to be a transnational migrant (Kivisto 2001; Portes, Guarnizo and Landolt 1999; Vertovec 1999) but there has been very little that has gone beyond simply stating this fact to actually investigate how ICTs are used on migrants' transnational practices. Panagakos and Horst (2006) argue that part of the reason for this lacuna stems from the apprehension of appearing technologically determinist identifying that,

> "While scholars should remain sceptical of technological determinism and over optimistic prophesies about the transformative power of ICTs in everyday life, there is no doubt that new technologies have an impact on how transnational migrants imagine, negotiate and create their social worlds across broad transnational fields. (2006: 120)

Transnationalism is a highly problematic concept[6]. Portes (1999) identifies a series of factors that can impact on the formation of transnational bonds. Firstly, the motivations for migration can have a significant effect on how people maintain relationships with those in their country of origin. He proposes that those that move due to political issues are more likely to "remain morally tied to kin and communities left behind and, hence, are more likely to engage in a variety of activities to bridge the gap and sustain a common bond" (1999: 464), whereas if the migration is more individual the opposite is the case as it then lacks the "normative component attached to… participants in a political diaspora" (1999: 464). Secondly, there are the complicating factors of the impact of moving to a new country. The potential discrimination faced by a migrant group that by its race and culture is perceived as different, is a pressure that Portes (1999) maintains is likely to increase their transnational bonds. The case study will reveal that such generalised statements can produce contradicting arguments in terms of the

[6] For a useful unpacking of the issues refer to the special issue of Ethnic and Racial Studies 1999, 22(2).

formation of such bonds, and that attempting to identify the level of transnational activities by focussing on such push pull factors can be problematic.

Another predominant factor of much of the work on transnationalism is its focus on migration from the 'South' to the 'North'. In these circumstances three key elements are often used to identify transnationals, citizenship, remittances and their level of politically activity in their country of origin. A change in citizenship or the attainment of dual citizenship is a problematic indicator, primarily because it is highly contingent on the foreign policies of the countries involved (Faist, 1999). The matter of remittances is commonly tied up in discussions of citizenship due to the propensity of nations to adjust their foreign policy to "sustain remittances and create investment avenues for citizens and their children from abroad" (Faist, 1999: 4). The level of political activity has often been highlighted through the potential role of ICTs in facilitating greater participatory democracy. Froehling's (1997; 1999) work on the Zapatista rebellion in Chiapas, Mexico is a frequently cited example. Staheli et al., (2002) identify that the Internet "promises remarkable changes in political participation that may enhance the meaning of citizenship and the practice of democracy" (2002: 991) given low voter turn out. Both Froehling (1997) and Staheli et al. (2002) identify however, that while the Internet provides potential for new opportunities and connections for migrants, what Froehling describes as a "new rhizome of social relations" (1997: 304), they both recognize that it is neither a panacea or a wholesale tool of liberation as much of the hype has suggested. These engagements are complex and contingent and subjectively influenced by the methods applied and the contexts in which they are examined, as the experiences of South African and South Korean migrants in Chapter Eight will illustrate.

Recently a "second wave of transnational research" (Rogers, 2005: 430) has begun to emerge which critiques the discourses bias towards transnational elites and the movement of migrants from developing to developed countries, particularly the United States (Conrad and Latham 2005). In particular the emphasis on economic rationality as a core driver of transnational bonds is being increasingly questioned (Voigt-Graf, 2005). This emerging research identifies the need to consider the role of *middling* transnationalism or the everyday practices of middle class migrants (Smith 2005) as they move to "hidden, less obvious, sites of urban change" (Friesen,

Murphy and Kearns, 2005: 366)[7]. This thesis's final empirical intervention picks up on this by examining the everyday experiences of South Korean and South African migrants' interactions with ICTs, and what role they may have performed in their ability to imagine, negotiate and mediate their migration experience. It therefore differs from the standard approaches found in the literature for a number of reasons. All three countries would be classified as developed thereby blurring the assumptions identified above regarding citizenship, remittances and political activity. Further it begins to inform a gap that both Vertovec (1999) and, Panagakos and Horst (2006) identify, the need for more comparative studies particularly drawing out how different migrant groups appropriate ICTs for different purposes. It also takes into account Adams and Ghose's (2003) identification of the need to embed such research by providing a breakdown of the telecommunications development and capabilities of the three countries. The two migrant groups focused on in this research are quite disparate and this appears to have been accentuated through the increasing choice and accessibility of ICTs, revealing the importance of the places they originated from and the timespaces they do or do not constitute in their new 'home' New Zealand.

Conclusion

The key aspect to be taken from this theoretical discussion is that this thesis does not employ one overarching theory or framework; instead it dips into a range of emerging work, primarily within geography, that is grappling with the potential of ICTs to alter our temporal and spatial perceptions. The chapter began with a critique of conventional ICT narratives that are clearly failing to encompass the ramifications of emerging ICTs. One of their fundamental flaws is their continuing dualistic treatment of time and space leading to a bias toward technological determinism. So are the new understandings emerging able to provide a way out of this cul-de-sac? This thesis would argue that they provide a good entry point. Thrift's non-representational style in particular provides some important challenges to how geographers approach their research and pose some useful questions in particular about our treatment of space and time. These questions resonate strongly with this thesis and will form a critical element in how it is developed. Neither of these approaches, however, has much to say about technology per se, instead it almost unconsciously remains in the background.

[7] For an informative discussion of this emerging second wave of transnational research see the special issue of the Journal of Ethnic and Migration Studies 2005, 31(2).

This chapter explored the new understandings of time and space that are emerging, specifically the May and Thrift (2001) timespace manifesto. This discussion also provides some vital theoretically progressive steps in how this thesis constructs in particular the four Auckland experiences of the interaction between everyday activities and emerging ICTs. Once again, however, almost in a conscious effort to avoid determinism, these new understandings down play the role of technological innovation, which is why the discussion then turned to the idea of embracing a *trans* attitude, exploring the concepts of transurbanism, transduction and code space. Each of these provides a way to liberate and enlarge the way geography deals with ICTs without dualistic tendencies, determinist attitudes or underplaying the aspects of space, time or technology. Most importantly they provide a way to access the *in between* that appears to be an underlying theme throughout the theory. In revealing this process of intersection they provide a way to interrogate how timespaces may emerge or be constituted from interactions with ICTs, a fundamental aspect of this thesis' four empirical interventions.

The summaries provided of the four empirical interventions' theoretical developments in geography demonstrated the consequences of conventional ICT narratives on the type of research that has usually been conducted. Table 2.2 summarises the developments that have emerged from these research areas when conceived as sets of possibilities of actions. This table will be built on in each empirical chapter to reveal the new conditions of possibility that are being constituted through the institutions and individual's experiences of a multiplicity of timespaces. These introductory tables to Chapter Five through Eight will also speculate about other hypothetical possibilities of action that may eventuate from these conditions, essentially areas of further research. Each of the four interventions is a timespace framework which reveals the low level everyday practices that show how unstable cities are in light of ICTs and how as Mulder (2002) argues, ICTs merely provide ways to organise them. Further, by interrogating institutions' and individuals' experiences this thesis is able to begin to access the spaces *in between* the original intention of the technology and its applications in everyday life, something of fundamental importance to our ability to understand the actual emotional affects that these are having.

Table 2.2: The possibilities of action uncovered regarding the interactions of ICTs and individuals temporally and spatially by four areas of the geographic literature, urban environments, transportation, education and migration.

Urban Environments	Transport and Transportation	Education and E-learning	Migration and Transnationalism
The presence of digital divides indicates problems of access to ICTs and levels of disparities in education particularly the skills to use ICTs. Policies targeted at providing the infrastructure to facilitate access are emerging but less attention has been paid to upgrading people's skills.	The role of surveillance including the ability to monitor transport behaviour particularly safety and infringements. An example is congestion charging, where certain transport modes are charged for the use of a space often during a particular time period.	The removal of face to face communication due to the employment of ICTs to convey information to students flexibly in both time and space.	Transnational bonds usually measured through citizenship and political activity across space, but which can change over time. For example participatory democracy through online interactions, migrants outside the space of contestation can become involved.
ICTs' ability to enhance corporate control across boundaries is creating a chain of Global Cities such as New York, Hong Kong etc leading to the centralisation of decision making. The Internet is in fact reinforcing urban hierarchies.	The use of signal pre-emption at traffic lights to give priority to vehicles equipped with specific equipment. This can reduce travel times.	Distance learning allows students to be flexible both in the spaces they learn and to lesser extent the times they engage in learning activities. Neoliberal pressures are evident though with efficiency and cost strongly influencing the learning environment.	The retention of transnational social spaces – the interaction of individuals from the same 'home' across spaces and times. Often driven by economic rationality for example the provision of remittances.
Urban dissolution brought about by the privatisation of utilities particularly telecommunications is occurring. This has resulted in the fragmentation of urban environments. The removal of the need for face to face contact is changing the dynamics of central city areas, as people increasingly work from home.	The ability to both monitor and provide information on transport related systems in real time including public transport and traffic incidents	Blended learning presents some learning flexibility both temporarily and spatially but requires the students' physical presence at a specific time and place for certain learning activities.	Particular focus on two groups of transnationals. One, the fluid movements of transnational elites. Two the movements from developing nations to developed ones such as the United States.
The emergence of network cities with economies based on technology and a highly skilled ICT workforce. Their economies are dominated by financial activities and service provision..	The use of teleconferencing to communicate with others without the need for physical travel or teleworking to enable people to work from an alternative space e.g. home	E-learning mechanisms are providing a range of ways to communicate information to students and these are becoming increasingly flexible in both space and time.	Emerging second wave of research in to middling transnationalism or the everyday practices of middle class migrants often moving between developed nations.

CHAPTER THREE:

New Zealand's Changing Policy Context: Neoliberalism, After Neoliberalism and the Role of Emerging ICTs

Introduction

> "In the go-get-'em mood of corporate and public sector 'restructuring' along neoliberal lines, capital-intensive 'natural monopolies' such as telecommunications, energy, water, and public transportation systems were also targeted for revamping through cost-cutting measures and privatization… They were no longer deemed the responsibility of governments to keep afloat… they must become for-profit enterprises with transnational as opposed to national market reach, and focussed on commercial as opposed to everyday communications needs" (Franklin, 2004: 22)

This quote succinctly summarises the neoliberal processes experienced throughout the world in the 1980s and 1990s. Nowhere, however, have such processes changed the existing situation as drastically or moved as quickly as in New Zealand (Bray and Walsh,1998: Dalziel, 2002). This period of restructuring altered the way New Zealand's economic governance structures are formed and maintained. Neoliberalism is a term often used to describe new conservative theories on the benefits of a market driven economy. As Johnston, Gregory, Pratt and Watts put it "The overarching claim is that free markets maximise human welfare: economically, markets efficiently distribute knowledge and resources; socially, liberal individualism will maximise moral worth; and politically, liberalism maximises political freedoms since it rests on the most efficient (Pareto-optimal) distribution of resources and wealth" (2000: 547). Larner (2005) cautions against such homogenous treatments of neoliberalism identifying four problems with this type of definition. First, the prominence of discussions concerning the ramifications of what has been lost through the process of neoliberalism which Larner terms "welfare state nostalgia" (2005: 11). Second, that there is a need to move away from the perception that neoliberalism and neo-conservatism are inherently connected, to an understanding of the

complexity and contingency of different neoliberal projects, something that O'Neill and McGuirk (2005) also argue for. Third, that it is essential to recognise such projects are "more multi-vocal" (2005: 11). Pertinently Larner argues that New Zealand's incoming fourth labour government, which initiated the New Zealand reform period in 1984, is but one of many transformative influences of the time which also included "Feminism, environmentalism and the so-called 'Maori renaissance'" (2005: 11). The final problem is that there is a particular bias towards viewing neoliberalism as a "top-down impositional discourse… [which] may explain the creation of particular subject positions, but not the creation of acting subjects" (2005: 12). Larner summarises that it is "important to remember that neoliberalism is first and foremost a *political* project" (2005: 17 original emphasis).

This chapter describes the ramifications of this neoliberal project on New Zealand's ICT developments through focusing on four policy landscapes each of which corresponds to one of the four empirical interventions in this thesis, telecommunications, transportation, education and migration. As stated in Chapter Two this is not a mere framework, reiterating the standard narratives of neoliberalism's impacts on society as criticised by Larner (2005) above. Instead it actively constructs the locale in which these interactions are occurring in recognition of Law and Mol's rejection of the universalism of science for the argument that all "facts have been localised" (2001: 609); a point that is often overlooked in a growing body of literature into the interactions of ICTs and urban environments. Rose argues that a governmentality framing provides a useful way in which to approach this construction as it allows the discernment of "the continual attempts to define and redefine which aspects of government are within the competence of the state and which are not, what is and what is not political and what is private" (1999:18). For Rose the contextual challenge is how to adequately conceptualise the range of governing arrangements and the practices and performance of governance. This chapter uses this argument to add the next narrative layer to the four interventions this thesis explores adding a local dimension to Chapter Two's discussion of how geography is slowly rethinking the role that ICTs play in these spheres.

As this chapter maps out changes within the urban telecommunications, transport, education and migration sectors the following two aspects are exposed. Firstly, how the legislative changes unfolded and what this meant for the institutions involved. Secondly, how ICTs have become an increasing component of recent policy changes in these four areas resulting in several initiatives both at the national and local Auckland scale. This latter aspect begins to reveal what

Larner (2005) identifies as the after neoliberal context in which we find ourselves, pointing out that the neoliberal discourse and associated techniques are still very relevant but that there is much more "experimentation, contradiction and contestation" (2005: 17) occurring at all levels and a myriad of actors involved. This thesis's adoption of a *trans* attitude may appear to be at odds with Larner's (2005) conception of 'after' however, by using this term she too is identifying her dissatisfaction of the use of *post* to capture the increasing role of non traditional economic and social actors in neoliberal processes (Larner, 2005; Larner and Craig, 2005). By arguing that "It is important to remember that neoliberalism is first and foremost a *political* project... [it is not] a monolithic whole in complete control of hegemonic actors. Rather we need... to foreground contestation and contradictions... and be more sensitive to the implications of our theoretical analyses" (Larner, 2005: 17 emphasis in original) is in fact demonstrating a *trans* attitude.

This chapter concludes by applying O'Neill and McGuirk's (2005) idea of an institutional landscape to the Auckland Region. O'Neill and McGuirk argue that this idea stems from the need to have

> "theories of the urban and the regional economy that embrace economy as a diverse, complex, multiply constituted set of events, with an excess of agents, institutions and politics, practices, imaginations and desires; economic spaces where the powerful compete for the enactment of their visions. In other words, a useful theory of the urban- and the regional-scaled economy will be something other than a theory of the general landscape of capitalism… at the very least to demonstrate the need for detail about what is happening at the national scale and the way this articulates with events at the scale of the city and the region." O'Neill and McGuirk's (2005: 290)

By applying this concept of an institutional landscape to the Auckland Region this chapter is able to draw together the changes that have occurred within the four sectors of telecommunications, transportation, education and immigration to provide the means to introduce to the pivotal position of the key players within these sectors. This introduction allows the next layer of the four narratives to be embarked upon both in Chapter Four, the methodology, and in the first exploratory intervention, the experience of Auckland's local government as it tries to adjust to the ICT platforms that are emerging.

New Zealand's Neoliberal Reform Process

In 1984 New Zealand's fourth Labour Government initiated a significant raft of neoliberal reforms which lasted into the early 1990s. The process began with a Treasury briefing paper in that same year to the incoming government proposing four major policy changes, which were rapidly implemented,

1. The floating of the New Zealand dollar and the removal of controls on foreign exchange transactions.
2. The removal of consumer and producer subsidies, most notably in the agricultural sector.
3. The liberalisation of the labour market.
4. A greater emphasis on transparency and accountability in the public sector

(Bush, 1995; Kelsey, 1999)

During this period of radical change the "relentless pursuit of free market principles… exposed a small remote country of 3.8 millions people to the full impact of international market forces" (Kelsey 1999:8). Consequently, these reforms' "transformed the New Zealand economy from one of the most interventionist in the OECD to one of the most open and market-based" (Conway and Orr, 2000: 8) and there have been many subsequent debates as to whether this was in fact a good thing or not (Kelsey, 1999; Dalziel, 2002). Two important factors to consider are that the unlikely champion of this process was the Labour government who up until then was recognised as very interventionist and welfare state orientated, and that while Labour was the instigator, the incoming National government elected in 1990 embarked on aspects Labour had held back on particularly regarding industrial relations, where they essentially removed all the power of the Unions (Bray and Walsh, 1998). By the mid 1990s most sectors in New Zealand had been or were embroiled in restructuring processes

The Changing Telecommunications Landscape

Historically New Zealand's adoption of emerging technologies and development of appropriate legislation has been rapid, particularly given its small size and geographically isolated location. In 1876 the first telephone was installed only one year after its invention and in 1903 the government passed the Wireless Telegraphy Act making it the first country in the world to recognise the potential of the emerging technologies (Newman, 2005). New Zealand has also gained the status of a fertile testing ground for new technologies, providing as it does a small westernised developed nation. The most prominent example of this was the trial of Electronic Funds Transfer at Point of Sale (EFTPOS) in 1985. This caught on extremely rapidly and New

Zealand now has one of the highest rates of penetration in the world with one EFTPOS terminal to every 54 people (Ministry of Economic Development, 2001).

There have, however, also been many setbacks the most pertinent example of which is illustrated by the case of the World Communications Laboratory (WCL). Established in 1992 as a "centre of excellence for developing broadband connections capable of supporting voice, data, video and graphics" (Newman, 2005)[8] the WCL was designed to take advantage of New Zealand's increasingly deregulated environment (Johnstone, 1995). The neoliberal reforms meant that between 1987 and 1989 the New Zealand Post Office's statutory monopoly on the country's telecommunications market was removed and in 1990 the State Owned Enterprise that was the Telecom Corporation of New Zealand was privatised and became the incumbent Telecom New Zealand (referred to from here on as Telecom) (Ministry of Commerce, Resources and Networks Branch, 2000). Unlike most other countries in the OECD New Zealand did not initially set up a regulatory body or develop any sector specific regulation, instead relying on the general competition laws of the 1986 Commerce Act to monitor Telecom's monopoly position (Ministry of Commerce, Resources and Networks Branch, 2000). According to Johnstone in an article for the magazine 'Wired' the laboratory sort to capitalise on this environment stating that

> "Anybody - including foreign telcos and cable operators - can do anything they like in these areas. Williamson [Communications Minister at the time] will freely tell you that Saddam Hussein could run a radio station in New Zealand if he wished. If you own spectrum, which you can purchase in a government-run auction, you can use it for cellular phones, TV, radio, whatever - you and the market decide. This freedom from red tape puts Godzone, in the words of Nicholas Negroponte, director of the Media Lab … "so far ahead of the US, it is the mouse that roared." (1995: 164-165)

The WCL collapsed within a year after the government pulled its support for the enterprise (Newman, 2005) and it provides a useful indicator of the recurring pattern that began to emerge in New Zealand's telecommunications sector over the next two decades. Successive governments' continued this non interventionist approach to both the telecommunications sector

[8] Quote taken from Keith Newman's website detailing New Zealand's telecommunications time line http://www.wordworx.co.nz/KiwitelcoTimeline.htm accessed 7 February 2005

and the information technology industry in New Zealand depending solely on market competition to provide regulation (Ministry of Commerce, Resources and Networks Branch, 2000). The only contingency put in place at the time of Telecoms privatisation to ensure it didn't abuse its dominant position was the Kiwi Share Obligation (KSO) which among other things requires Telecom to maintain free local calling options and ensure rural customers are charged at a comparable rate to urban ones (Ministry of Commerce, Resources and Networks Branch, 2000).

A crucial aspect of this initial reform process was the decision not to unbundle the local loop[9]. Effectively unbundling would have allowed competitors relatively unrestricted access to the incumbents' infrastructure, something most OECD countries pursued in the mid 1990s with varying success. Johnstone raised this issue quoting John Houlker, then in charge of New Zealand's Internet gateway, who believed it was the key reason for the WCL failure stating "I used to think that having a lot of fibre up and down the country was a big deal… But in fact, it's irrelevant… What you need to make the whole thing work, is high-speed access to the local loop… But no one was willing to pay for the cost of laying the high-speed links into the sites" (1995: 167).

The following decade saw a dramatic change in the telecommunications sector globally, as it moved from a basic infrastructural provider to a central economic component and a significant revenue generator. Throughout this period the New Zealand telecommunications sector was embroiled in legal disputes as new competitors attempted to gain a foothold which by 2001 finally led to a duopoly emerging between TelstraClear (previously Clear Communications Ltd, Saturn Communications and Telstra) and Telecom. The government, which had been threatening regulation to ensure Telecom acted as a fair agent (Garland, 1996), finally initiated a review of the telecommunications sector stating that there was a need for some "light handed industry specific regulation" (Ministerial Inquiry into Telecommunications, 2000:2). The resulting Telecommunications Act 2001 is based on the principle of "As much market as possible, as much regulation as necessary" (Cunliffe, 2005). There were four major outcomes from this regulatory process. A Telecommunications Commissioner was appointed to oversee

[9] Unbundling the local loop allows competitors access to the infrastructure holder's (in this case Telecom's) telephone exchanges allowing them to install their own equipment and therefore compete on a more level playing field.

commercial agreements, a Telecommunications Carriers Forum was established for the industry to develop self regulation, the KSO was modified to encompass Internet access requirements and share the costs among the industry players and, over a decade after the rest of the world the Commerce Commission was finally asked to investigate the potential of local loop unbundling.

In December 2003 the Commerce Commission reported their findings, which determined that a form of unbundling was required. Unlike the local loop unbundling referred to previously which was designed so that if competitors wanted access they had to install their own equipment, the Commerce Commission identified that it was more realistic to provide unbundled bitstream. Defined as "access [to a] wholesale product that consists of the provision of transmission capacity [along fibre optic cables] in such a way as to allow new entrants to offer their own, value added services to their clients" (Commerce Commission, 2003:24) after the European Union's findings on the subject. The Commerce Commission argued that with a clear lack of infrastructural competition in New Zealand this would allow competitors to have access to Telecom's high speed connections without having to build their own infrastructure, something most of them could not afford to do.

In November 2004 a review of the Telecommunications Act was initiated as the experiences of the intervening three years had revealed the need for some fine tuning in what the discussion paper described as "the monitoring and enforcement of the prompt development and implementation of regulated service supply agreements" (Ministry of Economic Development, 2004a; iii). In essence history was repeating itself with Telecom's market dominance, as in the 1990s, causing problems for incoming competitors. This review stemmed from two key motivating factors. Firstly, there was yet again a discrepancy between the regulation and what was actually occurring. When the bitstream was unbundled specific terms and conditions were outlined, and this was known as the Regulated Service. At the same time, however, Telecom went ahead and offered a comparative but more immediate service providing access to their infrastructure under a strict contractual arrangement. The government's service (Regulated UBS) took a long time to be determined through a process of commercial negotiation and so as the review puts it "Access seekers faced with such a choice might have to decide between entering the market at an earlier stage on less advantageous terms or waiting until the regulated service is available on better terms but where earlier entrants have built a sizeable customer base and brand recognition" (2004a; 5). In addition because of the way the Act was worded if an access seeker did choose to go with Telecom's offer then they would be unable to change to the

regulated service until their contract with Telecom expired. In July 2005 several of these smaller access seekers wrote to the Commerce Commission complaining that Telecom was behaving in an anticompetitive manner by offering lower connection fees to its own Internet Service Provider (ISP) Xtra than could be obtained at wholesale prices (Nowak, 2005). At the annual Telecommunications Users Association of New Zealand Conference in July 2005 this issue was raised repeatedly by both the Telecommunications Commissioner and the smaller access seekers.

The second motivation for the review was New Zealand's continual languishing near the bottom of the OECD ICT rankings. In 2004 the Ministry of Economic Development completed the report for the Minister of Communications (Ministry of Economic Development, 2004b) which included an analysis of New Zealand's performance in terms of OCED ICT indicators. The government used these indicators to set a benchmark with the goal of returning New Zealand to the top half of the OECD ranking by per capita income (Ministry of Economic Development, 2004b). Out of the 30 countries in the OECD New Zealand ranked in the bottom third for virtually all the telecommunications services compared in 2004. Two services were identified as key problem areas. Firstly, New Zealand was ranked 29 out of 30 for cellular phone pricing performance, indicating that prices were too high and have restricted demand for cellular services (Ministry of Economic Development, 2004b). The mobile phone market in New Zealand is a duopoly between Telecom and Vodafone with the market share split almost 50:50. The second problem was New Zealand's slow uptake of broadband. As at March 2004 the OECD average was 5.5% uptake while New Zealand was at 2.9%, ranking it 22nd out of the 23 OECD countries with a broadband uptake of just over 1% (Ministry of Economic Development, 2004b). The measurement of broadband uptake however, is not the most reliable gauge with which to assess New Zealand's performance in terms of ICT. Due to the KSO provision there is a significant price differential between dial up connections with free local calling and broadband; consequently New Zealand still retains a high level of dial up although the total number of subscriptions is decreasing from 63.1% at March 2006 to 55.8% in September 2006 (Statistics New Zealand, 2007a).

There has recently been a distinctive shift in the New Zealand government's approach to ICTs with an increasing recognition of the significant role ICTs might play in the nation's future. Consequently the government identified the need to develop a coordinated approach to the multitude of initiatives that were springing up. This consolidation process began through the

development of the Digital Strategy, which, initially released for consultation in June 2004, received over 200 submissions prior to being launched in May 2005 (Ministry of Economic Development, 2005a). It set out an action plan for the next five years, detailing a series of initiatives centred on three concepts - connection, confidence and content. The strategy acknowledges the importance of developing all three of these areas in conjunction stating that "Connection is necessary but not sufficient – it simply provides the means. Confidence gives us the skills and a secure online environment, whilst accessing or creating content provides a compelling reason to make it happen." (Ministry of Economic Development, 2005a: 10) One of the main priorities of the strategy is to find ways to move New Zealand up the OECD rankings to the top ten and $400 million in government funding was invested to fulfil the strategy's action plan. A Digital Strategy Advisory Group was established, made up of community and business people, to advise the various Ministers involved including those for Information Technology and Communications, Economic Development, and Education. It provides the Ministers with an oversight of the initiatives, updates them on progress and advises them of future possibilities. Of the various initiatives the strategy contains two of the most prominent are the Community Partnership Fund ($20.7 million) targeted at supporting and strengthening community partnerships by addressing the development of ICT based skills and the creation of New Zealand online content, and the Broadband Challenge ($24 million) designed to roll out competitive, affordable broadband services in regional centres and smaller communities (Ministry of Economic Development, 2005a). This provides clear evidence that the types of initiatives emerging reflect the experimental and are contested in the after neoliberal context that Larner (2005) identifies.

Despite these numerous legislative steps and emerging policies New Zealand's performance against other countries in the OECD was only now slowly beginning to change. New Zealand's ranking for broadband uptake has remained quite static in the bottom 10 of the OECD (OECD, 2006) and it is still also ranked in the bottom 10 in terms of mobile pricing in low, medium and high user baskets (Ministry of Economic Development, 2005b). In response to this lack of movement the government commissioned a stocktake of the telecommunications sector in December 2005. Among the raft of measures to emerge from this was the decision to finally unbundle the local loop (Cabinet Policy Committee, 2006). The justification given was the need to "facilitate competition by improving access at the wholesale level to the fixed local-loop telecommunications network" (Cabinet Policy Committee, 2006:2). Part of the measures suggested to enact this included the structural separation of Telecom into wholesale and retail

divisions, comparable to what occurred in the United Kingdom in September 2005 (Keown, 2006). Telecom has responded pragmatically, particularly given the repercussions of what many described as a shock decision by the government, which wiped $1billion (NZD) off the value of Telecom shares when the New Zealand Stock Exchange opened for business the day after the announcement (Pannett and Louisson, 2006). Subsequently, Telecom has been engaged in numerous technical arguments both with government and competing ISPs over the reality of providing access to its exchanges and has attempted to come up with an alternative form of separation to the government's proposal. The tense cycle of ineffectual intervention by government and unforeseen and at times anti competitive reactions by the private sector is beginning to occur once again. This final step by government, something many suggest should have occurred in 1992, may break it[10]; Nonetheless New Zealand is still a long way from the type of competitive ICT environment required to move it into the top ten of the OECD.

Chapter Five, the first intervention explores the experiences of Auckland' s local government as it attempts to situate itself within the ICT platforms that are emerging as a direct result of the reform period and after neoliberal context currently emerging. This experience will reveal that while significant responsibilities were devolved to local government through its restructuring in the early 1990s, these were not supported by powers of enforcement. Given the cycle of legislative reform and private sector reaction described above, Auckland's local government has found itself in a challenging position with regard to developing policy, managing infrastructural investment and creating initiatives which recognise the shift of ICTs from a basic infrastructural service to an important economic component and revenue generator.

The Changing Transport Landscape

The neoliberal reform period fundamentally altered the operation and funding of transportation in New Zealand. It was in this that the restructuring most strictly adhered to the core principles that services and systems were best run by the private sector, there should be competition

[10] In September 2007 the Government announced the operational separation of Telecom New Zealand into three operationally separate divisions - a network unit, wholesale unit and retail unit. Initially Telecom had opposed the split instead proposing the two way separation but the replacement of the CEO with British Telecom executive Paul Reynolds, who had previously under seen the same process at British Telecom agreement was reached. Separation began in April 2008

between modes and intermodal neutrality, Government interest should be confined to strategic policy development and that safety regulations should be jointly developed by operators and the Government (Dunlop, 1999). To achieve these principles the 1989 Transit New Zealand Act was passed which led to the formation of Transit New Zealand, the first overarching transport agency of its kind in New Zealand. Transit New Zealand's (referred to from here as Transit) role was to overview all land transport except rail with the aim to "promote policies and allocate resources to achieve a safe and efficient land transport system that maximises national economic and social benefits" (Dunlop, 1999:58).

The 1989 Act also initiated the process by which responsibility for local roading and passenger transport was devolved to regional councils, who in turn had to submit an annual district land transport programme to Transit to be eligible for funding (Pawson, 1992). This commercialisation of transportation continued in 1991 with the introduction of competitive tendering processes both at the national scale where Transit had to apply this to all state highway construction and maintenance projects, and at the local level where local councils had to undertake this process for goods and services. At the local level this considerably opened up the process to private companies. These include newly formed Local Authority Trading Enterprises (LATEs) such as council owned bus companies which were now able to be sold off to private enterprise (Pawson, 1992).

The consequence of this reform period on passenger transport has been quite dramatic, most notably in Auckland where the commercialisation process has been whole heartedly embraced (Mees and Dobson, 2006). They calculated that between 1986 and 1991 the number of passenger transport users in Auckland dropped by half and directly attribute this to the reform process stating that,

> "This patronage decline is one of the most dramatic declines in public transport usage ever recorded anywhere in the world, and cannot be attributed to 'usual suspect' factors like density, dispersed employment and car ownership, because these hardly changed between 1986 and 1991. What did change substantially was the quality and popularity of bus services, which carried the vast majority of public transport passengers before and since 1989. Service levels and vehicle standards declined following privatisation, integration disappeared and the system became less legible, comprehensible and reliable" (Mees and Dobson, 2006: 13)

Abusah and de Bruyn (2007) identify that this decrease in passenger transport was part of a wider international trend but that the decline was much sharper in Auckland and the recent increases are significantly less than comparable cities in Australia and Canada. They dispute the argument that Auckland's low density urban sprawl makes it difficult to cater for passenger transport as when compared to cities such as Melbourne, Brisbane and Vancouver this supposition proves false (Abusah and de Bruyn, 2007). Instead the commercialisation processes have not come to fruition, as with discussion of the previous telecommunications landscape. The most pertinent example of this for this thesis was the competitive tendering of subsidised bus routes which saw the emergence of a number of private operators particularly in Auckland where the demand was greatest. The originally Auckland Regional Council owned bus operator became the Yellow Bus Company, a LATE. Since the early 1990s there have been between five and seven private bus companies operating in the Auckland Region however the expected competition has not emerged. In 1998 the LATE was acquired by the multinational Stagecoach (Commerce Commission, 1998) which effectively gained a monopoly position operating virtually all bus services in Auckland and Manukua City (see Figure 1.2). The other bus operators could not compete on this scale and subsequently carved out niches either to the north, west or east of Auckland City resulting to this day in very little direct competition for the same bus routes.

Buses provide the majority of Auckland's passenger transport and they accounted for 82% of all passenger transport trips in 2004 (Auckland Regional Council, 2005). In light of the lack of competition among bus companies it is not surprising to understand why by the early 2000s the Auckland Region was recognised as one of the most car dependant cities in the world, with a congested roading system and an incomplete passenger transport network that fails to cater to the majority of the region's population (Mees and Dobson, 2006; Abusah and de Bruyn, 2007). During the 1990s the rail network was completely neglected and almost entirely sold off as part of the reform process (Mees and Dobson, 2006). It was only in 2002 that a renewed emphasis and investment was made in rail as a viable form of passenger transport in direct contrast to most comparable cities overseas (Mees and Dobson, 2006) and it still has very long way to go.

In 2003 a Joint Officials Group (JOG), comprising of central government, the transport sector and Auckland local government representatives was formed to address Auckland's transport problems. This marked a turning point from the stringent hands off neoliberal approach to transport and further evidence to support Larner's (2005) claims about the role of various

governance structures after neoliberalism. The two key outcomes of this were that funding processes were streamlined with the formation of the Auckland Regional Transit Authority (ARTA) through which all local government funding was channelled. There was also a shift in emphasis from road solutions to regional passenger transport and travel demand management initiatives (Joint Officials Group, 2003). There have been numerous criticisms of this process particularly the argument that ARTA adds another layer of bureaucracy with too much emphasis on road orientated solutions (Mees and Dobson, 2006). Despite this the formation of ARTA is the first time that Auckland has had one regionally coordinated transport entity, something that has been a major obstacle in planning processes. Secondly, the JOG process was the first time that travel demand management measures was formally recognised as an integral part of a transport package for the Auckland Region. Included in this recognition by JOG was the application of ICTs to enhance transport initiatives such as the Real Time Passenger Information Signal Pre-emption System (RTPISP System), investigated in Chapter Six. While originally commissioned in 2001 it is exactly the type of project that the JOG initiative promoted. The RTPISP System was initiated by Auckland City Council with the aim to create a more efficient and reliable bus services by improving issues such as journey times, reliability, passenger information, and the reporting information on bus services to the operators and planners (Gravitas Research and Strategy Limited, 2004). Areas that had received very little attention throughout the numerous changes to passenger transport services in Auckland. The system is what is known as an Intelligent Transport System (ITS) due to its use of ICTs for communication, monitoring and the provision of real time information. Although Auckland City was responsible for the pilot project a memorandum of understanding was signed among all the councils in the region in December 2001 to ensure that the same system was rolled out region wide. This was a vital aspect of the project because if separate councils had gone with different systems the buses, many of which cross jurisdictional boundaries every trip, would have had to be equipped with multiple systems, a situation that would have soon become untenable.

The successful tender Saab ITS Pty Ltd a Brisbane based company, rolled out the first on-street aspects of the system in 2003 in Auckland City and the rest of the region is now beginning to do the same. When complete the system will be the largest of its kind in the world, comprising over 750 real time signs and over 1000 buses equipped with automatic vehicle locators. Three factors differentiate this system from comparative systems worldwide. Firstly, its scale; most similar systems focus on key service routes not an entire region. Secondly, all buses are

equipped with General Packet Radio Service (GPRS) a mobile data communications system and Global Positioning System (GPS) antenna, other systems rely on a beacon and VHF radio systems. Finally, while all of these systems are based on historical prediction times, this system to ensure the accuracy of the real time information combines that with daily and weekly information so it is able to adapt quickly to issues such as road works[11]. This system is an example of the way ICTs are being used in the transport sector in a reaction to the after neoliberal processes now emerging throughout New Zealand and particularly in Auckland.

The Changing Education Landscape

There was significant dissatisfaction with New Zealand's education system at the beginning of the 1980s. It was perceived as weighed down by bureaucracy, failing standards and a lack of accountability. Grace (1991) argues these were common concerns throughout the western world during this period. Reforms to the education sector were strongly driven by Treasury officials who argued that the following three propositions should shape education policy. First that it was a market commodity not a public good, second that the relationship between the educator and the student should be that of provider and consumer, and further that free market processes were more efficient and equitable in the provision of education than the government was (Grace, 1991). These formed the basis of the subsequent changes made to all levels of the education system (Grace, 1991: Perris, 1998).

The tertiary sector, in which Chapter Seven The E-learning Experience is centred, was radically altered by the reforms. Essentially, the neoliberalist thinking behind these policies perceived the primary purpose of tertiary education was to lay "solely in the acquisition of marketable skills" (Boswell, 1995: 19) implying a much narrower focus than the traditional 'liberal' university education. The initial review of the tertiary sector in 1988 was conducted without consultation much to the anger of the Universities, two of which took the government to court over it (Perris, 1998). The Education Amendment Act of 1990 was modified as a result of these protests; however, the incoming National government in 1991 reinvigorated the Act declaring that the reforms had not gone far enough particularly in the devolution of responsibility to educational institutions (Perris, 1998). One of the most significant changes was the introduction of fees,

[11]See the Infopolis 2 website http://www.ul.ie/~infopolis/index.html a project partly funded by the European Commission Telematics Application Programme for detailed information on other Real Time Systems throughout Europe.

which until this point had been nominal. This was driven by a briefing paper given to the incoming National government by Treasury in 1991 which argued for a substantial increase in tertiary tuition fees, a practice that has seen subsequent fee hikes annually since (Perris, 1998). To provide for this sudden increase in fees the government introduced a student loans scheme in 1992 (Perris, 1998). Considered highly controversial the scheme charged students interest from the moment the loan was taken out, i.e. while they were still studying (Barr, 2004). This combination of policies directly contributed to increased pressures on students' timespaces as they sought to juggle study, work and recreation through the tight constraints of timetables, limited incomes and transport requirements (Forer, 1998). This was an elemental culture shock to a society used to a protectionist welfare state, one compounded by the increasing value placed on tertiary education generally. Consequently,

> "the impacts of change in this sector have not only been felt by students, but also their families, friends and other members of the support network, thus extending the impacts of such change to many other sectors of the economy and society" (Boswell, 1995: 2).

The student loans scheme has undergone several more changes over the past ten years, including a significant change in terms of interest due to mounting student debt. In April 2007 the government initiated a program of write offs and interest free loans which will have a dramatic effect on the pressures students are facing (Ministry of Education, 2007).

Institutionally, since the late 1990s there has been a growing expectation for tertiary courses around the world to adopt increasing if varied levels of ICT use. The e-learning discourse identifies that much of this emphasis has arisen from the neoliberal reforms that most tertiary institutes in the developed world experienced throughout the 1990s. This is a central concern for e-learning as the reforms were fixated on technologically determinist assumptions. In New Zealand, as globally, the reforms encouraged the critical deployment of e-learning as a means of cost reduction, with little concern for the implicit effects of the technological delivery style (Peters and Roberts, 1998; Vandenberg, 2005). Vandenberg (2005) argues that to avoid such thinking one must recognise the embeddedness of technologies in tertiary institutions. The increasing focus on e-learning, however, has also been driven by cheaper, more advanced technology and especially students' demand for convenience learning.

In New Zealand an E-learning Advisory Group was established in 2001 to advise the Ministry of Education on e-learning in the tertiary context and develop a coherent strategy (E-learning Advisory Group, 2002). The Advisory Group recommended the implementation of three

initiatives to transform the country's e-learning environment. These were, the formation of a tertiary learning consortium of groups to develop e-learning with government funding, the development of an e-learning web based portal[12] through which information and services associated with e-learning could be accessed, and finally the founding of a Collaborative Development Fund to provide the capital for tertiary institutes to develop their e-learning capabilities (E-learning Advisory Group, 2002). This is another example of a shift in focus to elements other than the purely economic ones of neoliberalism as indicated by Larner (2005). The government's approach to e-learning attributes equal weight to the economic and social benefits of such mechanisms. In particular it focuses on their use to provide learning opportunities of those with limited access to educational facilities due to age, disability or socio economic status.

The e-learning experience discussed in Chapter Seven, focuses on two first year Bachelors Degree Geography courses that have e-learning components. Table 3.1 shows the current New Zealand e-learning context in terms of Bachelor level courses at tertiary institutions. In order to situate the two courses it also specifically draws out the type of e-learning being offered by Geography degrees. Both courses are currently situated within the web supported category with the intention to become web enhanced according to the Ministry of Education's definition (see table) but as will be revealed in Chapter Seven for quite different reasons. This table illustrates that there is an equal distribution of courses offered that have no web access to those that are web supported or enhanced. Noticeably those that are web based make up a very small proportion illustrating the point made in Chapter Two regarding the increasing popularity of ICTs to compliment rather than substitute traditional forms of learning.

[12] For this portal see http://www.elearn.govt.nz/elearn/elearn.portal

Table 3.1: The levels of online content in courses offered at all tertiary institutions in New Zealand by full time Bachelors degree, with specific detail on Geography courses

Type of Institution/ Discipline	Type of Full Time Degree	Percentage No Web Access[3]	Percentage Web Supported[4]	Percentage Web Enhanced[5]	Percentage Web Based[6]
Institute of Technology or Polytechnic – All[1]	Bachelors	57	32	9	2
University – All[1]	Bachelors	34	30	32	4
Total University and Institutes – All[1]	Bachelors	37	31	29	3
University – Geography[2]	Bachelors	36	25	39	0

Source: A. Jesuthasan (personal communication 1 June 2006 statistical data compiled from the Ministry of Education)

[1] All means inclusive of all fields of study the tertiary institution offers

[2] Geography as a field of study is only identified in terms of University courses

[3] Where no part of the course or course is accessible online

[4] Where a course or course provides students access to limited online materials and resources. Access is optional, as online participation is likely to be a minor component of study

[5] Where a course or course expects students to access online materials and resources. Access is expected, as online participation is likely to make a major contribution to study

[6] Where a course or course requires students to access the accompanying online materials and resources. Access is required, as online participation is required

The Changing Immigration Landscape

New Zealand is often somewhat contentiously referred to as a country of immigrants, something that the Maori[13] strongly dispute as this negates their "first nation status as people of the land" (Bedford, Ho and Lidgard, 2000: 8). What the neoliberal reforms did to this already complex situation was to greatly reduce the barriers to international mobility (Pawson, 1996). This had a significant impact on both how immigrants were chosen and where they came from.

Until the neoliberal reform period New Zealand's immigration policies were centred on what was seen as traditional sources of migrants from its colonial past i.e. those from the United Kingdom and Ireland (Bedford, Ho and Lidgard, 2000). The 1986 review of this policy led to a significant shift in focus which was in-line with the neoliberal thinking of the period (Bedford, Ho and Lidgard, 2000; Winkelmann, 2000). There was much greater recognition of New Zealand's location in the Asia Pacific Rim with the goal to increase trade and attract investors and entrepreneurs to the country. In 1991 the incoming National government took these

[13] New Zealand's indigenous people, who migrated to the country from the Pacific over 2000 years ago

changes a step further with the Immigration Amendment Act. This replaced the selection of migrants by the country's occupational needs with a points system whereby points were awarded based on skills, age, education and evidence of a job offer (Winkelmann, 1999). Four categories for permanent residency were established General, Business Investment, Family and Humanitarian. The greatest number of immigrants came from the General category which by 1996 accounted for 61% of migrants (Winkelmann, 1999). These categories were further clarified in 1995 when the English language requirements were extended from just the principle applicant to all adult family members. Any professional registration requirements for New Zealand e.g. doctors, lawyers etc also had to be obtained to qualify for the associated points (Winkelmann, 1999). Further changes were enacted in 2002 with the restructuring of the categories into three types, skilled/business, family sponsored, and international /humanitarian, the provision for bonus points in areas of skill shortage was also added (Butcher, 2004).

Overall evidence of a shift to the policies and techniques associated with after neoliberalism are much less marked in the context of New Zealand's immigration policies than with the previous two sectors. An exception to this is educational migration which boomed in New Zealand during the mid 1990s. Butcher (2004) identifies that there has been little connection between migration and education policies in New Zealand with a range of government and privately run providers creating a complex environment for migrants to try and adapt to.

Bedford, Ho and Lidgard identify that "New Zealand's reliance on immigration from Asian countries and from parts of Africa will become greater during the early twenty first century as the flows of skilled New Zealanders out to work in Australia, North America and Europe… increase, and immigration from traditional sources in Europe and Pacific… remains relatively stable" (2000:29). The Experiences of Transnational Migrants, examined in Chapter Eight, focuses on two specific groups from these more recent migrants to New Zealand, the South Africans and the South Koreans. Figure 3.1 illustrates the exponential growth of both these migrant groups in New Zealand since 1991. According to the 2006 Census South Africans now account for 1 percent and South Koreans 0.7 percent of New Zealand's approximately four million people (Statistics New Zealand, 2007b).

These two groups were selected due to both their increasing presence in New Zealand and because of how they are situated in relation to New Zealand technologically. South Korea is known as a world leader in terms of ICTs particularly high speed broadband infrastructure,

therefore providing a striking contrast to the New Zealand situation revealed earlier in this chapter. That English is not their first language also played a part in their choice as this can present a considerable barrier to new migrants (Portes, 1999). They provided the opportunity to explore whether the use of ICTs reflected such difficulties in how it was appropriated. The South African's were chosen because they are technologically more comparable to New Zealand. South Africa has experienced similar regulatory changes including a lack of competition in the telecommunications sector (Makhaya and Roberts, 2003; Ministry for Economic Development 2005b). South Africa has experienced significant political upheaval resulting in clear disparities and prominent digital divides (Servon 2002) however due to the points system discussed these migrants to New Zealand have a high level of assets and skills to meet entry requirements and as such where not so overtly exposed to these disparities.

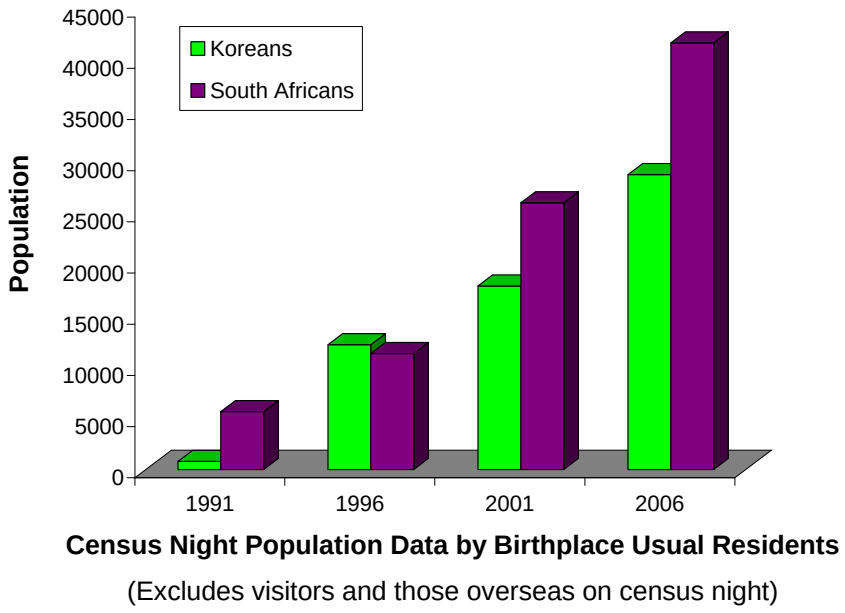


Figure 3.1: Population increase of South Koreans and South Africans in New Zealand

Unlike the other sectors discussed so far in this Chapter there are less overt examples of the application of ICTs to specific immigration initiatives. The primary exception to this is the changing role of ICTs in immigration processes after 9/11. This event significantly altered the processes associated with passport control and other customs processes all over the world including New Zealand (see Davies, 2002). Instead this discussion draws from the previous analysis of New Zealand's telecommunications sector in order to begin to understand how the South African and South Korean migrants are engaging with ICTs in Auckland. Table 3.2, drawing from International Telecommunications Union statistics provides comparative

statistical data on the telecommunications capabilities of these three countries at different points since 1995. This comparison provides a way to recognise the various levels of exposure the migrants have had to ICTs as in order to understand the interactions outlined in Chapter Eight it is important to identify these migrants' experience of ICTs prior to migration. These may have had a profound influence on their perceptions and use of ICTs in Auckland. This is in-line with Adams and Ghose's (2003) emphasis on the need to understand the context in which the experience occurs as outlined in Chapter One.

From the series of indicators identified in Table 3.2 Internet subscriptions via broadband provides the clearest illustration of the differences among the three nations. South Korea is clearly a leader in this area although it is interesting to note that in 2005 New Zealand and South Korea had equal numbers of Internet users per 100 people. This demonstrate that it is the means of accessing the Internet, New Zealand has a relatively high level of dial up access (Mitchell, Forthcoming), rather than the level of access that is different. As previously discussed the high level of dial up has been attributed to free local calls although if the telephone subscriptions costs in Table 3.2 are compared this perception of free could be questioned. Mobile phone use has also increased significantly in all three countries however mobile charges have varied, decreasing in South Korea, remaining relatively static in New Zealand and increasing sharply in South Africa. On their arrival to New Zealand all of these factors fed into the migrants' interactions with ICTs as will be revealed in Chapter Eight.

Table 3.2: A comparison of New Zealand, South Africa and South Korea's telecommunications at time intervals since 1995, based on International Telecommunications Union (ITU) data

ITU Statistics	New Zealand	South Africa	South Korea
Population	1995 - 3,673,400 2005 - 4,029,000	1995 - 41,894,030 2005 - 47,432,000	1995 - 44,553,710 2005 - 48,294,140
Internet subscribers (Total broadband) per 100 inhabitants	2000 - 0.12 2005 - 8	2000 - 0 2005 - 0.3	2000 - 8 2005 – 25
Internet users per 100 inhabitants	2000 - 5 2005 - 68	2000 - 0.67 2005 - 11	2000 - 0.82 2005 – 68
Total telephone subscribers (fixed + mobile) per 100 inhabitants	1995 - 57 2005 - 131	1995 - 11 2005 - 82	1995 - 45 2005 – 129
Mobile cellular telephone subscribers per 100 inhabitants	1995 - 10 2005 - 88	1995 - 1 2005 - 72	1995 - 4 2005 – 79
Residential monthly telephone subscription (US$)	1995 - 22.73 2005 - 28.06	1995 - 11.72 2005 - 13.67	1995 - 3.24 2005 - 5.07
Price of a 3-minute fixed telephone local call (peak rate - US$)	1995 - 0 2005 - 0	1995 - 0.06 2005 - 0.19	1995 - 0.04 2005 - 0.04
Mobile cellular - price of 3-minute local call (off-peak – US$)	1995 - 0.98 2004 - 0.97	1995 - 0.56 2004 - 1.25	1995 - 0.42 2004 - 0.16

Source: Data compiled from the International Telecommunications Union (2007)

Auckland's ICT Institutional Landscape

So far this chapter has explored the outcomes of the neoliberal reform process on four evolving landscapes, telecommunications, transportation, education and immigration, each of which adds to the narratives of the four interventions this thesis focuses on. In each instance ICTs are beginning to play an emerging role in how decisions are made and processes are enacted. Taking O'Neill and McGuirk's (2005) concept of an institutional landscape I propose to focus on Auckland's ICT institutional landscape, i.e. specifically drawing attention to institutional engagements with ICTs. Their concept of an institutional landscape is based on a Deleuzian view of territory which provides a way of "thickening the analyses of contemporary urban- and regional-scaled economies" (2005: 288). O'Neill and McGuirk's (2005) work is particularly pertinent for this thesis due to its focus on Sydney, Australia which has undergone remarkably similar changes to the Auckland Region over the past 20 years. Table 3.3 demonstrates ways to investigate this thickening, breaking down the various landscape components and O'Neill and McGuirks' (2005) explanation of each, and then constructing Auckland's ICT institutional landscape from this framework. This construct provides a way to summarise the particulars of what is occurring at the national scale in order to move forward with the four local Auckland experiences, a central intent of O'Neill and McGuirks' (2005) proposition to articulate these connections in greater detail.

Table 3.3: An outline of O'Neill and McGuirks' Institutional Landscape identifying examples from the Auckland Region

Landscape Component	O'Neill and McGuirks' Explanation	The Auckland Region
A discursive field	"where past, present and future create and dissolve economic activity and opportunity" (2005: 289)	The neoliberal reforms and subsequent after neoliberalism institutional arrangements have significantly influenced the roles that specific actors are taking and the type of public private projects that are being initiated
Real Regulatory terrain	"Patterns of national and regional laws and rules define and confine a territory's productive activities, its industrial relations, its resources, its exploitation practices…" (2005: 289)	Many actors are engaging in unforeseen roles particularly local government as a direct response to the legislative evolution associated with ICTs over the past twenty years
A set of ordered behaviours and repeated practices	"These can often and do take place without decision-making, overt management or conscious logic" (2005: 289)	Much of what is occurring in the region in terms of ICTs is being performed through informal networks of individuals who have worked in the sector for long periods.

Hard structures, especially corporations and government agencies	"These structures are built by the enactment of regulations, by repeated practices and by enabling narratives." (2005: 289)	There are numerous government agencies involved in the Auckland Region's ICT platform, this is identified as a problem by many as it has resulted in a lack of regional coordination and funding.
Constructed at multiple scales	"Never exclusively at the scale of the city or the region" (2005: 290)	Disproportionately the largest metropolitan area, Auckland is considered a globalising city with more in common with other cities in Australia and Asia. This chapter has also reflected the dominant effects of national legislation.
Contingent operation	"The power of seeing the economic landscape as thick with institutions and institutional practices is that there is no such thing as, say, a common form of neoliberalism, or a common form of governance, or a common form of economy" (2005: 290)	What is occurring in Auckland is highly fragmented at all scales.

Source: Adapted from O'Neill and McGuirk (2005: 289-290)

This chapter has actively constructed the four locales in which this thesis' empirical interventions are positioned in line with Law and Mols' (2001) argument for the localisation of facts. It has also begun the process of constructing what Rose (1999) terms a governmentality framework through the development of Auckland's ICT institutional landscape in Table 3.3. This provides the means to conceptualise the range of governing arrangements and the practice and performance of governance occurring in Auckland. Numerous institutional actors are emerging in this landscape, each of which performs a variety of roles.

Table 3.4 identifies these roles according to the four key focus areas of this thesis, Auckland's ICT platform (telecommunications), the Experiences of the RTPISP System (transportation), the E-Learning Experiences (education) and the Experiences of Transnational Migrants (immigration). These roles have been categorised and colour coded to allow the reader to get an overall impression of what the various roles the institutions are undertaking in these different experiences. These are subjective categories which denote the primary roles of each actor and an explanation of what each category represents is outlined in the key below. This identification process provides the means to move forward with the four interweaving narratives of this thesis. Now that these actors have been introduced, Chapter Four the methodology, will outline the range of methodological approaches used to reveal each of the four empirical interventions.

Table 3.4: The various roles that key actors and projects in the Auckland Region are engaging with in relation to the four key focus areas of this thesis

Table 3.4 – KEY

Role	Description
Legislation	Develop national legislation
Policy Development	Develop strategies and policies at either a national or local scale
Funding	Provide funding
Facilitation	Actively engage with a range of actors to develop initiatives and projects, have the ability to fund these and develop policy, unlike advocates.
Infrastructure Owner Operator	Physically own infrastructure such as fibre optic cables, phone lines, electricity, electronic signage
Data Collector and Researcher	A passive role collecting statistics, developing indicators and writing reports for other actors.
ISP Operator	Internet Service Provider
Wireless Broadband and Phone supplier	Provide wireless broadband and phone connections that have no fibre optic cable infrastructure
Mobile Provider	Provide all mobile phone operations and services
Advocacy	Advocate but don't develop policy, legislation or have any ability to fund projects
None	They do not have a clear role in this area but may have an underlying impact.

Actors		Role in Auckland's ICT Platform	Role in Experiences of the RTPISP System	E-Learning Experiences	Transnational Migrants' Experience
Central Government	**Ministry of Economic Development**	**Legislation** **Funding** **Policy Development** **Facilitation** **Data Collector & Researcher**	**None**	**None**	**Policy Development**
	Ministry of Education **Tertiary Education Commission**	**Advocacy**	**None**	**Legislation** **Funding** **Policy Development** **Facilitation** **Data Collector & Researcher**	**Policy Development** **Data Collector & Researcher** **Facilitation**

	Immigration New Zealand	None	None	Policy Development Facilitation	Legislation Funding Policy Development Facilitation Data Collector & Researcher
	Statistics New Zealand	Data Collector & Researcher	None	Data Collector & Researcher	Data Collector & Researcher
Local Government	Auckland City Council	Policy Development Facilitation	Facilitation	Facilitation	Facilitation
	Franklin District Council	Policy Development Facilitation	Facilitation	Facilitation	Facilitation
	Manukau City Council	Policy Development Facilitation	Facilitation	Facilitation	Facilitation
	North Shore City Council	Policy Development Facilitation	Facilitation	Facilitation	Facilitation
	Rodney District Council	Policy Development Facilitation	Facilitation	Facilitation	Facilitation
	Waitakere City Council	Policy Development Facilitation Infrastructure Owner Operator	Facilitation	Facilitation	Facilitation
	Auckland Regional Council	Policy Development Facilitation	Facilitation	None	Facilitation
	Auckland Regional Transport Authority	Policy Development Facilitation	Infrastructure Owner Operator Funding Policy Development	None	None
	Broadband Liaison Group	Advocacy	None	None	None

	Auckland Regional Economic Development	Policy Development Facilitation Data Collector & Researcher	None	None	None
Private Telecommunications and ICT Providers	Telecom New Zealand	Infrastructure Owner Operator ISP Operator Mobile Provider	None	ISP Operator Mobile Provider	ISP Operator Mobile Provider
	Vodafone	Infrastructure Owner Operator Mobile Provider	Infrastructure Owner Operator	ISP Operator Mobile Provider	ISP Operator Mobile Provider
	Woosh Wireless	Wireless Broadband & Phone supplier ISP Operator	None	Wireless Broadband & Phone supplier ISP Operator	Wireless Broadband & Phone supplier ISP Operator
	Wired Country	Wireless Broadband & Phone supplier	None	Wireless Broadband & Phone supplier	Wireless Broadband & Phone supplier
	Vector	Infrastructure Owner Operator	None	Infrastructure Owner Operator	None
	ITS providers Technisist/ Saab ITS	None	Infrastructure Owner Operator	None	None
Other Actors	Telecommunications Users Association of New Zealand	Advocacy	None	None	None
	Connect Auckland	Advocacy Data Collector & Researcher	None	None	None
	The University of Auckland	Infrastructure Owner Operator	None	Infrastructure Owner Operator Facilitation	None
	Auckland Private Bus Companies	None	Infrastructure Owner Operator	None	None

CHAPTER FOUR:

Methodological Approaches: accessing the *in between* through an Archipelago of Situated Experiences

Introduction

> "there's also often a very strong – and important – 'post-hoc', or retrospective dimension to… accounts. When you talk to people who've done research, they often feel forced into positions in which, in retrospect, they have to be able to give you a very confident account of what they were doing, whereas, if you'd been there at the time, they were probably rather less sure of themselves and were making quite a lot of incidental choices that only retrospectively acquire the gloss of being derived from clear methodological principles." (Morley, 2007: 71)

The account depicted in this quote is particularly pertinent for this thesis as it is conducting research into an area of geography where the terrain is relatively unexplored. In recognition of the point Morley (2007) makes above this chapter begins with a discussion of the series of retrospective decisions I made during the concluding phase of this thesis. The chapter then builds on Chapter Two's theoretical discussion of the actor network approach and non representational style examining the methodological implications of these for the thesis. This discussion provides further details of the ideas identified in Chapter One that this thesis' four empirical interventions create an archipelago of situated experiences. My positionality as a researcher had fundamental implications in the construction, application and analysis of this thesis and each of the four empirical interventions. The finer points of the methodological approaches employed for each experience are then detailed including their value to the thesis and the measures used to mediate or negate problems that arose.

Retrospective Decisions

As Morley (2007) stated there is always a strong retrospective element to social science research and this section outlines these elements and the decisions that I made as a consequence during the concluding phase of this thesis. Firstly, while this thesis has always drawn from the actor network approach and Thrift's non representational style my understandings of these were far less confident when I set out to design and conduct the four empirical interventions. A common theme in much of Thrift's work is the fact that often such approaches are simply common sense, and in effect this (along with my personal experiences, as will be demonstrated) is what primarily drove both the constitution and interpretation of the four interventions. As a result the use of the actor network approach was subsumed into the justification for adopting a non representational style and not applied to the four interventions. Furthermore, the non representational style was also not explicitly referred to in the four interventions as it frames the structure of the thesis as a whole.

Secondly, another decision that was made in hindsight was the use of a single methodology chapter. I had originally envisioned incorporating the methodological approaches within each of the four experiences this thesis investigates. This was primarily motivated by the fact that all the four experiences were initially written up as full academic papers and presented at various international geography conferences[14]. The current trend towards reconceptualising geography's methodological approaches, however, touched on in Chapter Two and explored in greater detail shortly, strengthens the need to situate the various methods used in a single chapter. While this divorces each experience's methods from its associated findings and explications, co-locating these provides a valuable way to discuss both why and how these approaches were influenced by wider theoretical developments.

[14] Mitchell, P. 2006. Conference Presentation - The penetration of ICTs into campus based tertiary learning and the implications for the E-learning discourse. Geography of the Information Society Session. *International Geographic Union 2006 Conference 'Regional Responses to Global Changes: A view from the Antipodes'*, 3-7 July, 2006, Brisbane.

Mitchell, P. 2007. What's going on at the bus stop? The Impact of Auckland's Real Time Passenger Information System on Patrons Timespace Perceptions. *Network and Communications Studies*, 21(3-4):331-348

Mitchell, P. 2008. A long way from home? The role if information and communication technologies in South Korean and South African migrants' experiences and imaginaries as they settle in Auckland, New Zealand. Aether: the Journal of Media Geography, 4: 20-36.

Mitchell, P. 2008. Not So Automatic: The Contingent Role of Auckland's Local Government in the Region's Information and Communication Technology Infrastructural Development. *Social and Cultural Geography.* 9(6):693 -710.

The final retrospective decision made concerns the role of the first empirical intervention that examines the experience of local government in Auckland's ICT platforms. Initially this investigation was undertaken to form part of the thesis' context. I thought that establishing the state of Auckland's ICT infrastructure, especially aspects such as the accessibility to various ICTs including the Internet and mobile phones, would provide useful information to enhance the descriptions of people's interactions with various ICTs in the other three experiences. It was not in fact until it came to writing up that I realised that it had in fact failed to provide much useful background information for any of the experiences. Instead its detailed investigation of how Auckland's local government was adapting to emerging ICTs both in terms of urban planning and the way they operate was much more informative as an experience in its own right, one that demonstrates that the reactions of institutions to emerging ICTs are socially constructed. Chapter Three was therefore included to construct the locales in which these four experiences exist.

Accessing Unactualised Possibilities

Along with human geography's increasing rejection of meta narratives, which Chapter Two dealt with, there is also a wider questioning of research methods occurring within the social sciences (Pryke, Rose and Whatmore, 2003; Law, 2004). Thrift drawing from Haraway argues that a more truthful approach to developing knowledge is through "an archipelago of situated knowledges" (Thrift, 1999b: 303) which this thesis sets out to do by constructing the four empirical interventions. It could be argued that these four experiences may also be referred to as case studies, a concept often fraught with debates as to whether they are a method or a paradigm, whether they provide causal or narrative analysis, the relationship between the case and the theory, and the balance between authenticity and authority[15]. The reason I have chosen to construct these four experiences as empirical interventions rather than case studies is related to the way they are constituted.

The term case study evokes feelings of neatly packaged fact finding missions each with its own hypothesis, methodology, results, discussion and conclusion. Using this standard scientific framework they are too often assumed to have the ability to predict and generalise, though this has been regularly contested (Rice, 2003; Hammersley and Gomm, 2000; Stake, 1978). The

[15] For a thorough discussion of these debates see Gomm, Hammersley and Foster (2000)

intention of this thesis' four experiences is to demonstrate what a different approach, one that reveals the conditions of possibility emerging from interactions among institutions, individuals and ICTs and the entry points these provide into multiple timespaces, means for how geography conducts research into this field. While the conditions of possibility identified in each experience are highly situated this approach enabled both human and non-human actants' performances, the effects and affects of ICTs and the unactualised possibilities to be revealed. This process of revelation began with the narrative strands introduced in Chapter One and each chapter has added another layer. The case study method generally precludes the type of approach described here in part due to the academic baggage it has gained over the decades.

Furthermore Law argues that "Perhaps we will need to rethink how far whatever it is that we know travels and whether it still makes sense in other locations, and if so how. This would be knowing as situated enquiry. Almost certainly we will need to think hard about our relations with whatever it is we know, and ask how far the process of knowing also brings it into being" (2004: 3). During the initial stages of this PhD I considered what encounters I was having with ICTs in Auckland and began to question whether my experiences were shared by others living in the region. I was curious to explore other people's reality of these situated experiences which I consider an important first step before discovering whether it does in fact make sense in other locations as Law suggests. Consequently I drew from my own personal experience of living in Auckland to generate all four of the empirical interventions, as will be explored in depth in the discussion of my positionality.

This process drew from my tacit knowledge of "how things are, why they are, how people feel about them, and how these things are likely to be later or in other places with which this person is familiar" (Stake, 1978: 6). The "vexed question of *tacit knowledge*" as Morgan (2004: 6) likes to describe it, has met renewed interest particularly among economic geographers focusing on the knowledge economy (Ibert, 2007; Morgan, 2004). Ibert (2007) makes a useful distinction between knowledge, a "rationalistic strategy that treats… knowledge as an independent factual object" (2007: 104), and knowing, a verb that "conveys a performative conception and treats human expertise as being inseparably intertwined with social practices" (2007: 104). He points out that Polanyi originally used the term tacit knowing, which illustrates the need to accept that all knowledge has a tacit component in much the same way that Law does with his "knowing as situated enquiry" (2004: 3), which I practise in this thesis. Thrift also draws on Polanyi quoting his statement "we know more than we can tell" (2006: 286) to illustrate his points concerning

invention, which this thesis's introduction identified is taking place in each of the experiences. Thrift identifies that "Persons are trained to conjure up 'unthinkingly' more and better things… by drawing on a certain kind of *neuroaesthetic* that works on the myriad of small periods of time that are relevant to the structure of forethought and the ways that human bodies routinely mobilise them to obtain results" (2006: 286). In other words these are the *in betweens* which this thesis is aiming to explicate through interrogating people's reactions to certain ICTs in certain situations. The reason that these *in betweens* can now begin to be accessed is because ICTs are creating conditions of possibility, as Thrift points out, the convergence of technology and biology is

> "producing a more attuned and 'informed' sense of materiality. To begin with, they are converging as a series of systematic knowledges are formed about them which are, in part, replacing supplementing the tacit knowledges that used to suffice. Many of these knowledges are then migrating into software and other quasi-mechanical means of applying knowledge, thereby turning up in confirmatory ways scattered through and/or constituting new environments" (2005: 469)

These *in betweens*, what Thrift likes to term "unactualised possibles" (2000:217) can only be accessed through performance and understanding of the affects, and Thrift (2004b) proposes that new technologies are modifying urban environments to invoke and stimulate affective responses. Unlike effect, which is more material, immediate and concerned with how relationships contextualise emergence, affect alters subjectivities and impacts upon formation. In essence affect deals with the myriad of changes that result from an effect, something that Thrift argues cannot be accessed through meta narratives (2000). This point is central to the motivations behind the methodologies identified in this chapter. They are targeted at prospecting the way in which institutions and individuals engage with ICTs and how this in turn affects their ability to constitute multiple timespaces. Some pertinent questions are: what factors will motivate the next infrastructural investment in ICT and how will this be influenced by the relationships among the councils and the telecommunications providers? What would make the bus patrons choose to do something else while waiting for the bus? What factors determine which ICT the migrants use to communicate with a family member? Does a students' learning style influence whether they attend lectures or not? In each case there are an increasing multitude of alternatives and what they choose to do not only shape their experiences but the technology itself. In essence the experiences uncover 'what' they do, rather than representing 'how' they do it (Thrift, 2000).

While this thesis' four experiences all explore the interactions of individuals and institutions with emerging ICTs, the latter three specifically focus on everyday encounters. The phrase 'everyday life' has already been examined theoretically through Chapter Two's discussion of Lefebvre's (1991a) and De Certaeu's (1984) critiques. This chapter focuses on uncovering the relationship forming and creative elements that these theorists identify. Latham (2003) distinguishes three elements that are vital if credible accounts of everyday life are to be developed. These entail respect of social practices as different though equivalent to other "more contemplative academic modes" (2003: 1998), an awareness that these practices are ingrained with "creativity and possibility" (2003: 1998), and that "the everyday should not be viewed as a world apart from more rationally grounded realms of social action such as 'the state'… what needs to be recognised is how all elements of social life, all institutions, all forms of practice are in fact tied together with the work of getting on from day-to-day" (2003: 1998). This thesis aims to address these three elements, first, by treating each of the experiences as equivalents, both with each other, the wider social context of Auckland, New Zealand and the global development of ICTs. Second, in focussing on the interactions of these experiences with new ICTs, it is delving into an incredibly creative environment full of new possibilities of action. Third these encounters pervade the local, the national and the global context, each of which is exposed through the performance and conditions of possibility that emerge in the specific situated experience discussed. Figure 4.1 provides a conceptualisation of the permeability of these encounters.

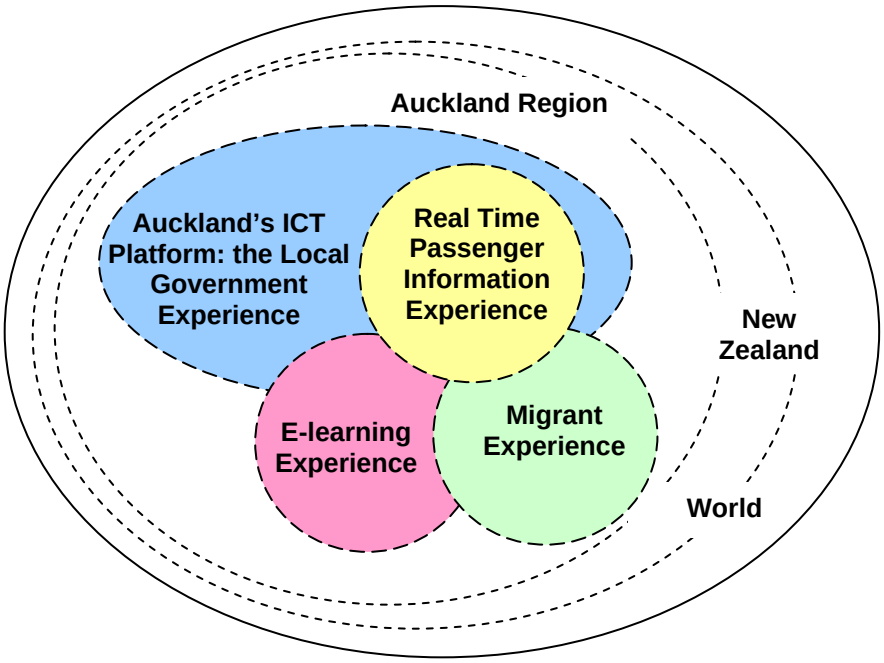


Figure 4.1: The permeability of the four experiences investigated in this thesis both with each other and with the environments in which they operate, locally, nationally and globally.

This chapter draws from Latham's (2003) approach to performance, which identifies the need to reframe both the creativity of our research and our relationship to it, an approach he describes as "less radical than that suggested by Thrift" (2003: 2004). In reflecting on his use of diary-photo and diary-interview methods Latham identifies that "performance helps to deflect us away from looking for depth (in the sense of a single unified truth) and directs us towards detail (in the sense of a fuller and more variegated picture of the interviewee)" (2003: 2007). In particular he argues the need for more than increased reflexivity arguing that "to work towards creating more supple and pluralistic accounts of the social events… requires an approach to writing that is more experimental and pragmatic than is currently evident" (2003: 2007). Consequently the next section of this chapter takes an in-depth look at my positionality and how this influenced the construction of this thesis and the analysis of the four experiences. The subsequent section then outlines how this notion of performance enhanced the standard methods applied to each of the experiences by ensuring they focused on the rich detail of the perceptions, reactions and interactions occurring among individuals, institutions and ICTs in Auckland.

Positionality

Reflexively analysing ones position when conducting research is fundamentally important, as demonstrated in the previous discussion of Laws (2004) work. It is also a central tenet to much of Thrift's work on a non representational style, and Latham's (2003) argument that there is a need to go further than using reflexivity simply to reveal the partiality of ones accounts. When I reflect on my positionality it comes with the realisation that it had fundamental ramifications for *both* the initial thesis formulation and the subsequent methodological choices made. I experienced considerable insider/outsider tensions throughout the research process which not only exposed the partiality and specific nature of my approach (England, 1994) but the need to work through the implication of this. Rose concludes her critical evaluation of reflexivity with the following statement,

> "We cannot know everything, nor can we survey power as if we can fully understand, control or redistribute it. What we may be able to do is something rather more modest but, perhaps, more radical: to inscribe into our research practices some absences and fallibilities while recognizing that the significance of this does not rest entirely in our own hands" (1997: 319)

Consequently, throughout this chapter I will reveal how by reflecting on my positionality, embedded as it is in my tacit knowledge of Auckland, the research was strengthened, as it

allowed me to articulate in certain ways the claims made. I will also identify how my fallibilities and uncertainties were mediated or negated through intentional design or accidental discovery.

My motivation for engaging with this thesis topic relates back to my previous occupation as a transport planner for Auckland's largest local council, Auckland City. Employed to work in the passenger transport team my main project was the RTPISP System. While the reasons for the initiation of this project were outlined in Chapter Three, which will be explored in depth in each associated experience, its relevance to the discussion at this point was due to my involvement in the on street testing of the real time signs. I noticed that as I waited for the bus I became more conscious of the bus stop environment. The technology behind the sign had given me the freedom to engage with timespace in different ways, I no longer felt restricted to maintaining a constant vigil of the road just in case I missed the bus. I became more aware of the shops, the condition of the footpath, the people around me and the actions I could undertake while waiting. This realisation made me think about the impact of ICTs on everyday mundane activities such as catching the bus, and the ramifications of this for geography. It was this realisation that motivated my decision to conduct a PhD to investigate these phenomena further. This starting point also unintentionally led to the thesis being structured around a series of empirical interventions as it seemed natural to investigate this particular project; however I also recognised the need to explore other everyday activities. I therefore considered what other experiences could be developed and again my positionality played a vital role. Table 4.1 details my positionality in relation to all four of this thesis' experiences. It demonstrates that in each instance it was my initial positionality that provided the foundation for the empirical intervention, it also reveals the ramifications of this and how I attempted to mediate or negate these, in line with Laws argument for "knowing as situated enquiry" (2004:3).

Table 4.1: Reflexive analysis of positionality in each of the case studies

Experience		Positionality	Ramifications	Mediation/Negation[1]
Auckland's ICT Platforms: the Local Government Experience		Previously employed as a student for the ARC I worked at all of the other councils in the region on environmental issues. I was also employed as an Assistant Transport Planner at Auckland City Council. From these I have an understanding of the institutional processes involved and the relationships among the various councils.	The actors appreciated my knowledge of the terminology used and local government processes they had to engage with. The private sector actors were wary of my previous council experience and needed assurances before imparting certain commercially sensitive knowledge.	As part of the ethical requirements I supplied full transcriptions of the interviews to each actor for their approval. I made it very clear to all actors that I was no longer employed by any of the councils.
Experiences of the RTPISP System		As one of the primary transport planners involved in the testing and installation of the RTPISP System project I acquired an intense knowledge of all aspects of the system. I continue to have a training and technical sub contractor position to an external consultancy managing the project. I have been a regular bus commuter for over 15years on various routes.	My level of knowledge about the system informed the questionnaire formulation and there was a risk of assuming the patrons had the same understanding of the signs as I did. Ethically required to inform them of my involvement in the project. This may have influenced their responses both making them more inquisitive due to my expert knowledge but also more reluctant to criticise due to my perceived position of power in the project	As a bus patron I was able to observe patrons behaviour as they engaged with the signs thereby mediating my assumptions. A pilot study was also conducted to reduce this risk. Conducted the questionnaires at the bus stops thereby engaged with participants in a place familiar to them and where their knowledge and experience was situated. Answered any questions they asked about the system and due to ethics requirements provided them with a participant information sheet of further information sources.
Experiences of E-learning	**The Digital Worlds Course**	Involved in the courses for 3years as tutor, course coordinator and lecturer. Consequently engaged in the development and instruction. As a postgraduate student utilised some of the same University wide e-learning mechanisms.	Strong position of power both in terms of the course development and student activities. Personally distributed the questionnaire requesting that they answer it.	Ethical requirements for an anonymous questionnaire allowing students to answer candidly. Required to emphasise that it was completely voluntary and had no effect on their course assessments. Box provided in class or at the Student Centre for returned surveys.
	The Natural Hazards of New Zealand Course	While not directly involved in the course there was a potential that I had tutored some of the students in other papers. As a postgraduate student utilised some of the same University wide e-learning mechanisms.	Potentially perceived as being in a position of power from students' previous experience of me tutoring them which may have encouraged or stopped these students completing the questionnaire. Personally distributed the questionnaire requesting that they answer it. Insider knowledge as the course coordinator aided in the formulation of some questions	Ethical requirements that an anonymous questionnaire to allow students to answer candidly. Required to emphasise that it was completely voluntary and had no effect on their course assessments. Provided a box for them to be handed into either in class or at the Student Centre.
The Experiences of Transnational Migrants		Parents migrated to New Zealand from England prior to my birth, grew up experiencing isolation from my family network and the problems and issues of communicating long distance.	Used my childhood experiences to inform the interview questions.	Purposely revealed my positionality as part of a migrant family during the interview process to inform them of my own experiences, and provide a bridge of understanding allowing for more personal dialogue.

[1] All of the Participant Information Sheets and Consent Forms required by the University of Auckland Ethics Committee can be found in Appendix A.

Research Methods and their Value to the Thesis

This section details the relatively standard research methods used during this thesis. Recent discussions in communications geography, particularly concerning how to research the virtual, have grappled with whether new methods are required or if current methods need to be re-appropriated[16]. This is also debated by Thrift (1999b) and Law, who argues that standard methods are still extremely relevant but that currently "they are badly adapted to the study of the ephemeral, the indefinite and the irregular" (2004: 4). This chapter makes its case around Law's (2004) point that a great deal more can be done with existing methods. Latham also makes this point identifying that "rather than ditching the methodological skills that human geography had so painfully accumulated, we should work through how we can imbue traditional research methodologies with a sense of the creative, the practical, and being with practice-ness that Thrift is seeking" (2003: 2000). While Latham (2003) demonstrated this through the diary-photograph, diary-interview method, this thesis uses multiple qualitative and some quantitative methods. Each of these methods was chosen because of what it could illicit from the particular experience in which it was applied, focussing on accessing the *in between* moments revealed by the interactions with ICTs. Table 4.2 identifies the research methods used in the context of each experience and the value of these to the thesis in terms of its aim to exposing the various conditions of possibility emerging to access multiple timespaces. This is followed by a detailed discussion of these methods and the issues that arose during their administration.

Table 4.2: Overview of research methods and their value to the thesis

Aspect of Thesis Research	Research Method	Quantity	Value to thesis
Auckland's ICT Platform: the Local Government Experience	Interviews	28	Method triangulation among these different data sources revealed the highly contingent interactions between the public and private sector and the imbalances and tensions occurring at the local level as a result of central government inaction. The policy document and web site analysis provided formalised institutional information augmenting the interview and observant participation data.
	Policy Document Analysis	Numerous	
	Observant Participant	4 different events	
	Web site analysis	8	
Experiences of the RTPISP System	Questionnaire	100	Administering the questionnaire at the bus stop provided a way to gain immediate reactions as they were actually engaged in the activity at the time. This provides valuable situated knowledge of their experiences.

[16] Discussion occurred at the 2007 AAG Conference in the Virtual Methodologies session sponsored by the Communications Geography Specialty Group. Panel - James Craine, Gregory Donovan, Clayton Rosati, Kristofer Erickson and Mathew Zook.

E-learning Experience at the University of Auckland	Anonymous Questionnaire	167	Provides insight into students' opinions of learning mechanisms and their opinions and experience of a range of technologies, something that has received limited attention in the literature to date.
Transnational Migrants' Experiences	Interviews	24	The in depth scale enabled personal stories to be elicited from the migrants. Very little research has looked at how migrants are specifically utilising ICTs and this research begins to fill that gap.

Auckland's ICT Platforms: the Local Government Experience

As introduced in Chapter Three Rose (1999) contends that the governmentality framework provides a means to consider the numerous complex relations between state and non state authorities to unpack the governance structures in place. This framework provides a useful means to explore the ICT platforms emerging in Auckland and expose the background power struggles of the diverse and disparate authorities in the region, in so doing revealing "the complex and contingent histories of the problems" (Rose, 1999: 21). The multiple methods used in this experience, introduced in Table 4.2, enabled what Baxter and Eyles (1997) identify as method triangulation where constructs are corroborated using data from more than one method, an important way to add credibility to the data.

Twenty eight semi structured in-depth interviews were conducted with a range of actors involved in the Auckland ICT environment, actors that have already been introduced in Table 3.4. Table 4.3 identifies the number of interviews conducted with each of these stakeholders' groups. Different actors were targeted at the different organisations involved. At the local government level individuals involved in ICT policy and planning, infrastructure and website content development were targeted. These people were identified through phoning each council's reception, explaining my research and asking to be put through to someone who may be able to help. This did not prove very difficult as often there were a limited number of people involved in activities concerning ICTs and depending on the scale of the council it was often only one or two individuals. Two of the eight local government entities (see Figure 1.2) declined to be involved in this research. One was Papakura District Council where the key individual was on maternity leave, the other was the Auckland Regional Council where restructuring meant my requests were passed on to someone very new to the position who felt unable to participate. At the central government level a quick check of websites revealed that all matters concerning ICTs were dealt with through the Ministry of Economic Development. I contacted the Ministry's reception explaining my research and asked to be put through to the

relevant people, which again was relatively straight forward as it was quite a small team. Interviews were conducted with the staff responsible for ICT legislation and initiatives. Three of these were based in Wellington and provided a national overview. The fourth participant was based in the Auckland office and was able to speak more specifically about the region. Another key group of actors were the telecommunications sector where I was able to conduct interviews with what could be described as the 'big six' companies in Auckland, who dominate 90% of the market. Each company was contacted by phone and the purpose of the research described, they were then asked who it would be best to speak to. At all of the organisations this resulted in the interview being conducted with a senior manager either of the telecommunications infrastructure, public sector relations or in some cases the chief executive officer (CEO). This could be said to reflect favourably on how my research was received, in all cases they were exceedingly willing to make time to talk to me and provide me with considerable information. The final group in Table 4.3 are two non profit organisations involved in promoting ICT initiatives in Auckland. One interview was conducted with the CEO of the Telecommunication User Association of New Zealand (TUANZ) which represents a cross section of the major business users of telecommunications throughout New Zealand from banks, to retail outlets, to government agencies and the telecommunications sector. The other organisation Connect Auckland was established out of the Auckland Regional Economic Development (AREDS) process to facilitate support networks among start up IT companies in the region. Again a single interview was conducted with the CEO.

Table 4.3: Breakdown of the Auckland ICT Platform Participants

Stakeholder Group	Organisation	Number of Participants
Local Government	Auckland City Council	3
	Franklin District Council	2
	Manukau City Council	3
	North Shore City Council	2
	Rodney District Council	2
	Waitakere City Council	3
Central Government	Ministry of Economic Development	4
Telecommunications Sector	Telecom New Zealand	1
	Vodafone	2
	Woosh Wireless	1
	Wired Country	1
	Vector	1
	City Link	1
Non profit organisations	TUANZ	1
	Connect Auckland	1
Total		**28**

An interview guide approach[17] was used to ensure all the topics for discussion were covered while creating a flexible dialogue that allowed tangents to be explored. The interview subjects were given a choice as to where the interview was conducted with all but one selecting their offices, the one individual selected a local café she liked. All the interviews were recorded and then fully transcribed and sent back to the interviewees to review as outlined in Table 4.1. The commercially sensitive nature of some of the issues discussed and the small scale of the sector in Auckland were the key reason for this process. While all the interviewees were given the ability to review their transcriptions only one actually modified what they had discussed in the interview downplaying the political nature of some of their comments. Email correspondence was maintained with a number of the participants after the initial email contact for clarifications and advice in terms of additional information sources.

In parallel to the interview process three other research methods were employed. The interviews with the key stakeholders stimulated invitations to a number of engagements concerning ICT infrastructure and policy initiatives in the region. Attending these not only enabled further recruitment of participants but allowed me to familiarise myself with the participants and their interrelationships, in other words undertake participant observation. There is, though an increasing rejection of this idea, instead one must recognise that "we are located *in* the world" (Thrift, 2002) by becoming an observant participant. One parallel method employed therefore was that of observant participant which allowed me as Thrift terms it to reveal the,

> "classes of experience, which, have been too rarely addressed, the productive, the interactive, play; all those responsive activities which are usually involved in 'setting up' situations, which, because they are often considered to be always already there, are still too little considered." (2000: 244).

The first of these engagements involved attending meetings of the Broadband Liaison Group (BBLG), which comprises all of the Auckland councils and meets once a month to discuss broadband roll out and ICT policy and infrastructural issues. The second was a day long workshop on the MUSH Project a government initiative focusing on the provision of high-speed broadband capacity for the municipality, universities, schools, and hospitals. The third was a meeting of the Accelerating Auckland - Steering Group which comprises local government, tertiary institutions and private sector IT companies investigating ways to attract people to the

[17] Please see Appendix B for the interview guides used.

ICT industry. The final engagement was the TUANZ Telecommunications Users Day, held annually in Wellington and attended by over a hundred individuals in key ICT positions in New Zealand. The day provides a platform to discuss a range of issues around the regulatory environment and commercial initiatives. At all of these meetings I was able not only to observe but also engage in with the various actors and their discussions of the numerous initiatives proposed. These events allowed me to witness and experience the reality of interviewee's responses to questions concerning the relationships between the actors.

The second parallel method involved the analysis of relevant policy documentation to examine the public formalised versions of the organisations' approach to ICT. This information was compared to what the interviewees had stated about the reality of the situation and what had actually been achieved, providing insight into the difference between formal representations and the actuality. Initially, documentation was obtained from searches of the organisations' web sites. This provided useful reference material for the interviews. Most of the interview participants also provided additional documentation at or subsequent to the interviews. The equivalent documentation was gathered from each of the local councils interviewed and comparisons drawn between the vision statements, approaches and funding outlined in these. Comparable documents were also obtained from the private sector organisations relating to their strategic planning around ICTs in the Auckland Region.

Targeted analysis of the Auckland Region's local government websites was the third method employed. This was not done to assess the quality of the websites or of the information they provided but to identify what services were provided online such as application forms, bill payments and consultation opportunities. This was designed to gauge the councils' appropriation of ICTs for various council services such as electronic transactions. The website analysis provided added detail on the current situation which complemented the interviews conducted with the councils' web masters as these actors often primarily focussed on what they intended to provide in the future.

Experiences of the RTPISP System

The new real time signs of the RTPISP System that have been installed at bus stops throughout Auckland City are creating a novel ICT encounter for many of these bus patrons. It was

determined that the most effective research method to investigate this was a verbally administered questionnaire[18]. While providing a means to collect a large amount of standardised information the primary reason for this choice was that it provided a practical way to collect situated data. Administering the questionnaires at the bus stop not only triggered immediate reactions to the questions as they were actually engaged in the activity at the time but also put me partially in the role of observant participant as I could watch the patrons behaviour while I was engaging with them. There are many drawbacks to conducting research using a questionnaire including reliability, validity, sampling errors and response errors (Parfitt, 1997). The former two were dealt with firstly through the size of the sample, 100 participants, and secondly through conducting a pilot questionnaire which revealed errors and biases in the questions and provided the opportunity for these to be modified.

Due to the practical constraints of the research there was some sampling bias. The questionnaires were administered at fifteen different bus stops equipped with real time signs in Auckland City on weekdays between 9-10am to capture a range of potential bus patrons from commuters to more casual users. They were unable to be conducted during the peak hours of 7-9am and 4-6pm as the high frequency of buses meant that although the survey took only three minutes it was often impossible to complete before a bus arrived. The other key restriction was that the majority of the real time signs had been installed at bus stops inbound to the central business district (CBD). These stops were selected for signs as they had high patronage numbers one of the key requirements for sign installation. To complicate factors the outbound stops that had signs were mainly located in the CBD and catered for multiple routes making the completion of surveys difficult due to time constraints. The 15 bus stops used were selected for their very similar environments which shared the following characteristics:

- Located on suburban shopping centres on main arterial roads
- High morning patronage numbers
- Serviced by multiple high frequency (10 minutes apart) bus routes that were heading to the same destination, the CBD
- Most were no more than 20 minutes from the CBD
- Fares were either $1.50(NZD) or $3(NZD).

This sampling bias was intentional as the research is designed to focus on patrons' interactions with the timespaces around them. If stops were located in residential areas where the choice of

[18] See Appendix B for a copy of the questionnaire

alternative activities to engage with while waiting is restricted the findings would have been very different and not particularly useful for what the experience attempts to explore.

Response errors were in part managed by personally verbally administering the questionnaire to all the participants therefore avoiding multiple interpretations of how the question should be asked or explained. As Parfitt (1997) identifies, however, this approach can lead to expectational errors as the researcher is attracted by answers that agree with the hypothesis. In an effort to mediate this several of the questions were constructed as multiple choice to prevent subjective interpretations of the answers. Further, the overall research question was relatively neutral, focussing on if and how they interact with the signs; it was not specifically targeted at assessing the benefits or problems with the signs. Analysis of the questionnaire data was conducted in Excel. The data was examined from a number of angles including gender, age, reason for catching the bus and commuting frequency, and cross analysis of these variables was also carried out to ascertain any correlations between these demographics and their perceptions of the real time signs.

E-Learning Experiences at the University of Auckland

As discussed previously due to the complications of researching ones own students anonymous questionnaires[19] was selected as the most appropriate research method to explore the two first year geography papers GEOG103 Digital Worlds and GEOG105 The Natural Hazards of New Zealand, run at the University of Auckland. For the 2006 Digital Worlds course two questionnaires were administered at the beginning and end of the course, and this process was repeated for the 2007 course. These questionnaires were used to ascertain students' initial perceptions of e-learning and how this changed over the course. Both questionnaires were handed out at the end of lecture slots and students were asked to submit their completed forms to the box supplied. This box was made available both in class time and between classes in the School of Geology, Geography and Environmental Science Student Resource Centre. In 2006 the first questionnaire obtained 25 responses and the second 27 responses out of a total class size of 56. In 2007 the first questionnaire elicited 32 responses but the second one only 15, this may have been due to timing with the course assignment due the same week. The total class size in 2007 was 82. Originally I had intended to run two focus groups, one after each questionnaire; however in 2006 no students volunteered for the first focus group. When asked why they

[19] Please find copies of the Digital Worlds and The Natural Hazards of New Zealand questionnaires in Appendix B.

explained that they were either juggling full time work or more than one part time job while completing the paper and simply had no time outside of class. Consequently, just one focus group was run after the paper had finished when theoretically the students had more time. Again this met with limited success with only two of the six students who volunteered turning up. In 2007 it was decided not to run the focus group aspect due to the very limited success it met with in 2006.

I had originally intended to focus solely on the Digital Worlds course for this experience but when The Natural Hazards of New Zealand course was first offered in 2006 I recognised that it provided information on an additional e-learning mechanism to that of Digital Worlds and so investigated the 2007 course. Instead of having assigned laboratory streams The Natural Hazards of New Zealand course utilises a CD ROM of virtual field trips and students are expected to conduct the associated labs in their own time. For this course a single anonymous questionnaire was handed out in the second to last week of the course. The administration of the questionnaire was the same as that of Digital Worlds with distribution occurring in class time and the same collection box procedure used. The course had 148 students enrolled, although conversations with the lecturers identified that just over 100 of these regularly attended lectures. Consequently I only distributed 100 questionnaires in class and there were two left over, so the 68 completed surveys that were returned could be considered as an over 50% return rate given the lecture turn out.

Analysis of all the questionnaire data was conducted in Excel. The data was examined using a similar process to the RTPISP System experience with a number of angles including familiarity with e-learning, preferences for traditional or online methods and perceptions of the various e-learning mechanism used as key variables.

The Experiences of Transnational Migrants

The most significant work conducted on migrants' use of ICTs has emerged from the transnational discourse where there is increasing discussion of the need to conduct comparative analysis of different migrant groups to discover how they are appropriating ICTs (Vertovec, 1999). This research therefore took a comparative approach, conducting semi structured in

depth interviews[20] with fourteen South African and ten South Korean migrants. Chapter Three has already outlined the reasons for comparing these two migrant groups, including their increasing numbers in New Zealand and the similarities and differences of their telecommunications sectors compared with New Zealand. The South Africans and South Koreans are also very different culturally. South Africa has experienced significant political upheaval resulting in clear disparities and prominent digital divides (Servon, 2002). A racially complex nation I endeavoured to acknowledge this by conducting interviews with migrants from the major racial groups that have settled in Auckland: Afrikaans, South African English, South African Indians and South African Coloureds.

Two methods were used to recruit the migrants. Emails containing a participant information sheet explaining the research and an interview guide, both requirements of the University of Auckland's ethics committee were sent to the two main ethnic organisations that represent each group, The Korean Society of New Zealand and the South African New Zealand Charitable Trust. Over half of the twenty four migrants interviewed were recruited using this process. The remainder were recruited through a snowballing technique whereby the initial participants were asked for contacts. Originally the same numbers were to be interviewed from each group but I was more successful recruiting the South African migrants. Despite providing all the information in Korean and a translator for interviews[21] the language barrier remained a problem with some declining on the basis they didn't feel they could contribute adequately. In all but one case I was invited into the home of the migrants to conduct the interviews and I made a point of relating my own immigrant background, which, I found provided a bridge of understanding and enabled a more personal dialogue.

Another point of comparison both within and between the two migrant groups was also used, the time of migration. Migrants were selected from both before and after the advent of new ICTs such as the Internet. This was done to illicit the different experiences and views of the participants to ICTs. 1996 was chosen as the cut off year between the two groups because it was the year Internet and email became readily available in New Zealand. Those arriving in or before 1996 i.e. the pre Internet group comprised of five South Africans and six South Koreans. The earliest migrants were a South Korean who arrived in 1973 and a South African who

[20] Please see Appendix B for copies of the interview guides used.

[21] Only one Korean migrant actually used a translator for the interview.

arrived in 1976 and the most recent were in 2005 and 2003 respectively.

There are two further aspects that can play a determining factor in peoples approaches to and perceptions of technology, age and gender. The participants were not selected on the basis of either but it is important to state their composition as it did effect the results in some instances. The South Africans' ages ranged between their thirties and sixties and the South Koreans between their twenties and fifties. The reason for the younger South Korean participants is two fold. Firstly, they had either moved out with their family or to go to University in New Zealand. Secondly, the immigration points system makes it very difficult for those in their twenties to migrate independently (without older family members) to New Zealand. In terms of gender there was an unintentional bias towards women which was more significant among the South Koreans with only two male participants. There is no clear reason for this but importantly the communication gender imbalances identified by authors such as Panagakos and Horst (2006) did not appear to be present. This could be attributable to the focus on migrants from developed nations rather than the more frequent focus on those from developing nations.

Conclusion

This chapter has outlined the development of methodology to explore constitutive processes relating to ICTs in Auckland and the various methods used in each experience to access the *in between* in order to constitute the multiple timespaces that could potentially emerge from these interactions of individuals, institutions and ICTs. Numerous conditions of possibility may evolve from these interactions and the subsequent four experiences will identify which ones have and which still have the potential to emerge. While these conditions are informed by our tacit knowledge they are increasingly being supplemented by ICTs which are now informing almost every aspect of our daily lives. This is creating a situation in which the *in betweens*, the moment or interval between cognition and action, which Thrift also terms unactualised possibles, can begin to be revealed. While this thesis uses standard methods to do this I have taken on board Law's (2004) argument that a great deal more can be done with these. The research methods used in each experience aim to disclose people's opinions, perceptions and decision making processes, in essence what they actually do and why, rather than the more commonly used how. This focus is driven by this thesis' appropriation of aspects of the actor network approach and non representational style both of which require the researcher to not only reflect on their positionality and its consequences to the research but to describe rather than represent what is occurring in the everyday.

CHAPTER FIVE:

Auckland's ICT Platforms: the Local Government Experience

Introduction

Urban spaces are far from passive receptacles on which ICTs act; they are complex timespaces of policies, civil processes and private public interactions. This chapter[22] focuses on Auckland's ICT platforms from the perspective of the region's local government as this lens has not often been applied to such narratives. As Chapter Two revealed this lack of attention is despite the fact that urban environments are struggling to deal with the "emergence of privatised, customised infrastructure networks across transport, telecommunications, energy and water" (Graham and Marvin, 2001: 9). In New Zealand these neoliberal reform processes and subsequent reactions to them significantly restructured and devolved power to local government (as discussed in Chapter Three). The chapter explores the ramifications of these processes as changes in national legislation can both contribute to and detract from regional ICT initiatives (van den Berg and van Winden, 2002). It draws from Rose's (1999) proposition of a governmentality framework, expanded on in Chapters Three and Four, to explore how local government is attempting to situate itself in this complex and constantly evolving urban environment replete with ICTs, as

> "attempts at governing are always limited by the conceptual and practical tools for the regulation of conduct that are available… Far from homogenising discursive space, [governmentality] show[s] how the space of government is always shaped and intersected by other discourses' (Rose, 1999: 22). Moreover, these discourses are grounded in 'the heterogeneity of authorities… of strategies, devices, ends sought, and the ways in which our present has been shaped by such conflicts" (Rose, 1999: 21).

[22] A substantial proportion of the results from this chapter have been published see Mitchell, P. 2008. Not So Automatic: The Contingent Role of Auckland's Local Government in the Region's Information and Communication Technology Infrastructural Development. *Social and Cultural Geography*, 9(6): 693-710.

This framework provides a way to conceptualise the heterogeneity of authorities involved in Auckland's ICT platforms as they relate to the region's local government. By posing a series of questions concerning what the decision makers and key actors relationships are like, how these are motivated and performed, what they are attempting to do in the current context, the conditions of possibility through which emerging timespaces are being constituted begin to emerge. Chapter Three also established Auckland's institutional landscape (O'Neill and McGuirk, 2005) thus providing a frame for the locale in which developments are situated.

The conditions of possibility emerging from Auckland's local government's engagement with ICTs in its urban planning processes can also be viewed as a series of possibilities of action. Table 5.1 below builds on Chapter Two's Table 2.2. Column one contains those possibilities that have predominantly been examined in the literature (as seen in Table 2.2). The second column identifies the conditions of possibility revealed through this chapter's empirical intervention, while the third column suggests some hypothetical possibilities of action that could have occurred and may still occur but were not recorded during this investigation.

Table 5.1: Possibilities of action emerging around Urban Planning and ICTs that have previously been investigated by Urban Geography, the conditions disclosed in this intervention, and those possibilities that could have hypothetically emerged from these interactions

Previously Investigated Possibilities of Action	Conditions of Possibility Disclosed in this Intervention	Hypothetical Possibilities of Action
The presence of digital divides indicates problems of access to ICTs and levels of disparities in education particularly the skills to use ICTs. Policies targeted at providing the infrastructure to facilitate access are emerging but less attention has been paid to upgrading people's skills.	The presence and absence of ICTs is due to an extensive range of contingent factors associated with local electronic infrastructure, local access to technology and local electronic content.	Recognition by central government that there are numerous reasons as to why areas are disconnected from ICTs, aspects that are contingent not only on infrastructural provision but skills, experiences and how applicable ICTs are to these areas daily lives.
ICTs' ability to enhance corporate control across boundaries is creating a chain of Global Cities such as New York, Hong Kong etc leading to the centralisation of decision making. The Internet is in fact reinforcing urban hierarchies.	Auckland's local government infrastructural initiatives include: Councils enforcing policies regarding telecommunications companies installation of ICTs Council working with telecommunications companies in public private partnerships for the installation of ICTs.	A regional approach to Auckland's ICT problems in which all the local government entities have the same infrastructural policies for ICTs and all telecommunications companies deal with a single representative body for local government.

Urban dissolution brought about by the privatisation of utilities particularly telecommunications is occurring. This has resulted in the fragmentation of urban environments. The removal of the need for face to face contact is changing the dynamics of central city areas, as people increasingly work from home.	Auckland Local government economic initiatives include: Councils and central government support small and medium enterprises with training in ICT skills networks Development of technology parks where ICT industries are concentrated in an innovative environment	The emergence of public private partnerships to support small and medium enterprises' investment in ICTs. This may involve training, leasing equipment, trading advertising space and so on.
The emergence of network cities with economies based on technology and a highly skilled ICT workforce. Their economies are dominated by financial activities and service provision. .	Auckland Local government social initiatives include: Provision of access to the Internet and skills courses through local libraries Council websites moving into transactional spaces and increasing online consultation	The emergence of an online portal for the entire Auckland Region through which all the councils, libraries, tourist information etc can be accessed. It will also provide online forums where the public can interact with a range of local government actors.

This chapter reveals that there has been a clear shift both in the context of neoliberal initiatives and in how a number of the actors involved in Auckland's ICT platforms think about and approach ICT initiatives. This shift is explored through the infrastructural, economic and social initiatives embarked on by local government as it attempts to situate itself in the emerging ICT platforms of Auckland. While Thrift and French (2002) stressed the important software aspects of ICTs, considerably more work is needed on the constitutive character of ICTs, especially with attention to the nature of investment processes that provide, or do not provide, various technological platforms. Table 5.2 identifies various key actors involved in Auckland's ICT platforms, their primary function in terms of ICT infrastructure[23] and any associated ICT platforms. In doing so this chapter explores the framing effects of Auckland's ICT infrastructure in order to demonstrate that these new connectivities have effects that are in-the-making, that is the effects are known by *accessing* and by *exploring* information and communication infrastructure possibilities. The discussion will then turn to a consideration of the emerging timespaces that are being constituted from these conditions of possibility.

[23] The primary functions identified in Table 11 are in some cases similar to the roles they were allocated in Table 6 but in this case they are specifically connected to what ICT infrastructure they may operate.

Table 5.2: The associations of key organisations and projects and the various Auckland ICT platforms in which they are engaged as of 2005-2006

Central Government	ICT Platforms	Local Government	ICT Platforms	ICT Sector	ICT Platforms	Other Players	ICT Platforms
Ministry of Economic Development	None	Auckland City Council	Lease utilities e.g. lamp posts to mobile providers for cell sites	Telecom New Zealand	Copper Lines CDMA Fibre Optic Broadband Cell Towers	TUANZ	None
Ministry of Education	None	Franklin District Council	Have a preferential relationship with Wired Country in terms of planning processes	Vodafone	GPRS Wireless Broadband Cell Towers	Connect Auckland	None
Immigration New Zealand	None	Manukau City Council	None	Woosh Wireless	Wireless Broadband and Phone Cell Towers	Accelerating Auckland Steering Group	None
Statistics New Zealand	None	North Shore City Council	Lease utilities e.g. lamp posts to mobile providers for cell sites	Wired Country	Wireless Broadband and Phone Cell Towers	University of Auckland	Internal Fibre Optic Broadband Loop External connections through various ISPs
MUSH Project	None	Rodney District Council	None	Vector	Fibre Optic Broadband Electricity Gas		
Project Probe	Particular relationship with Telecom to provide fibre	Waitakere City Council	Fibre Optic Ducting	City Link	Fibre Optic Broadband Cell Towers		
Digital Strategy	None	Broadband Liaison Group	None				
		Auckland Regional Transport Authority	All equipment associated with the RTPISP System				

KEY

	Fund Infrastructural Initiatives		Own but do not operate ICT infrastructure		Advocate for infrastructural improvements
	Own and Operate ICT infrastructure		Lease infrastructure for ICT use		Collect statistical information on ICTs

A Question of Presence and Absence

One of the most prominent devices used to illustrate the social ramifications of ICTs in urban environments is the digital divide. Providing statistical evidence of citizen's access to ICTs this concept has proved both a useful tool to illustrate disparities and problematic due its ability to over generalise situations (Selwyn, 2003; Servon, 2002). Figure 5.1 below provides a typical example of the presence of digital divides in Auckland City, it illustrates that numerous factors including, educational background, income and age, contribute to the emergence of digital divides. All appear to influence the uptake of ICTs even at the low level of a Census Area Unit. This figure adds emphasis to Graham's statement that the 'cores and peripheries of the global information 'age'… now often lie … literally a few feet apart' (2002:34). However, the increasing application of ICTs by local government to a range of initiatives demonstrates that in order to consider the contributing factors and underlying motivations of the individuals involved a broader approach than the identification of digital divides is required.

A number of researchers have identified problems with the concept of the digital divide. Servon (2002) suggests that the concept needs redefining as it is not merely a problem of access in the sense of possession or permission to use but reflects a complex set of socio economic issues including the skills and knowledge of how to use it. Morgan (2004) also asserts that there is a clear difference between access to ICTs and the actual use and application of them. Selwyn (2003) argues that the current focus on digital divides is contrived due to its underlying assumption that ICTs are 'inherently desirable' (2003: 106). He raises the important aspect of people's non-use of ICTs and outlines a structure, agency debate between those who choose not to use ICTs and those who are unable to due to their socioeconomic status and/or education.

This chapter proposes that focussing on the idea of a 'divide' is too restrictive and that instead disparities need to be considered in terms of their presence and absence, and that there are both obvious and not such obvious causes for these. Drawing on van der Meer and van Windens' (2003) article this chapter contends that the way ICTs are embedded and accessed should be examined through three aspects, each of which constitutes a field for new possibilities of action. Firstly, by their presence or absence at an infrastructure level, the periphery of the Auckland Region is struggling to encourage investment, while central areas are saturated. van der Meer and van Winden (2003) categorise this as 'local electronic infrastructure', which, is associated with the idea that ICTs enable different kinds of interactions and alters the relative advantage of

existing technologies by introducing alternatives or enhancing the quality of available ones. Secondly, through access possibilities, some groups are in better positions to adopt ICTs and to afford more advance technologies while others are simply less inclined to recognise and adopt them. van der Meer and van Winden (2003) refer to this as 'local access to technology' which opens up the possibility of new, improved or modified entry points. Thirdly, the way these interactions are embedded relates to the ability of groups to experiment and upgrade. In particular this relates to having the resources to buy certain software and hardware and the ability of individuals with skills to maximise the potential conferred by the ICTs. This is often perceived in terms of 'local electronic content' (van der Meer and van Winden, 2003) where different presentations of new and existing content can alter how and what can be undertaken by a variety of local government and community services.

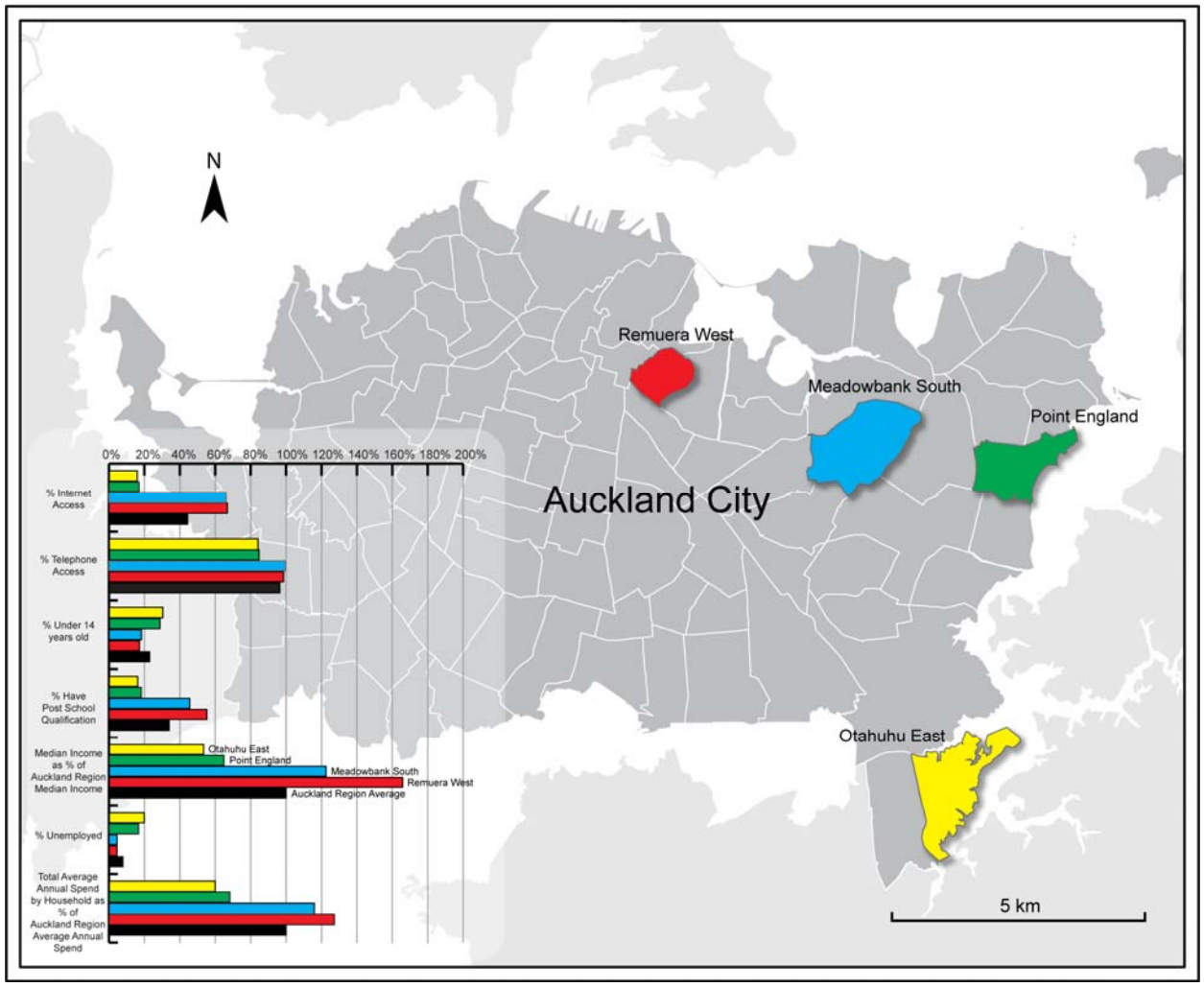


Figure 5.1: The two highest and two lowest census area units for ICT penetration in Auckland City Council illustrating the presence of digital divides within close proximity, and selected socio-economic factors that may have contributed to this.
Source: After Census data 2001 Statistics New Zealand.

A Fait Accompli? Local Government's role and relationships with Auckland's ICT Platforms

Local government officials in the Auckland Region argue that the neoliberal devolution of power and responsibility's (outlined in Chapter Three) has forced them into the unexpected role of facilitating ICT initiatives for two reasons. Firstly, due to the failure of central government legislation to stimulate competition and secondly, the inability of the private sector to resolve pressing issues (in the given regulatory environment) around the concentration of their investments in selected locations. These tensions are both accentuated and magnified in the Auckland Region due its dominance. As Local Government Interviewee A stated 'We [New Zealand] all face similar problems but Auckland will face them earlier and more intensely'. The resulting differentiated geography of infrastructure is both increasingly defining Auckland's urban landscape and in turn being defined by numerous entities performing in Auckland's ICT institutional landscape. This interplay is occurring in cities throughout the world, it can be seen in the problems faced in American cities over their concerns about the practicalities of stimulating technologically innovative economies (Townsend, 2001) or in van den Berg and van Winden's argument that at the local level European cities should 'not compete with private sector initiatives but… take up the challenge when the market fails' (2002: 269).

Reactions to the Telecommunications Legislation and Policy Developments

Both local government and the private ICT providers were highly critical of central government, particularly the Telecommunications Act 2001 (introduced in Chapter Three). Consensus among those in local government was that the Act favoured telecommunications companies and provided local government with little recourse. The following comment is indicative of this,

> "we are getting a bit impatient with providers that hide behind the Telecommunications Act. We want people to enable, not hide behind something. We want them to be more upfront and more open, to be partners". (Local Government Interviewee B)

The Act provides for telecommunications companies to install and maintain infrastructure anytime and anywhere in the road reserve[24]. The provision of a Road Opening Notice is the only condition over which the councils have control. This, however, simply manages timing

[24] The road reserve is the area set aside for infrastructure such as water mains, sewage pipe, electricity cables and increasingly fibre optics. It usually runs under the pavement on the side of the road.

and transport mitigation, it does not determine how the space within the road reserve is utilised or dictate clear conditions of reinstatement. This illustrates the failure of central government to provide the means of enforcement along with the devolution of power that the neoliberal reforms brought, as one interviewee stated,

> "If you have a road, [Company A] will come in and put [x number] cables in a trench side by side rather than vertically, two reasons, [one] easy access for maintenance… [two] they've privatised that whole area of scarce resource, it blocks out their competitors… the council can't say well until you fix that you can't dig anymore sites in the city" (Local Government Interviewee A)

To further exacerbate matters providers claim the location of cables is commercially sensitive information. As a result none of the councils know the location of ICTs infrastructure in their jurisdiction. This lack of transparency is a significant problem in the relationship between local government and the providers and has had serious repercussions for the region's urban planning leading to some nonsensical scenarios. The North Shore City Council described how it had found certain companies had run their cables directly through storm water drains. Consequently, when they sent root cutters through to clear the drains they inadvertently cut several fibre optic cables. This led to financial costs for all parties involved due to arguments over liability. Another example occurred in 2000 when five separate providers planned to individually trench the main street of Auckland's CBD to lay new fibre optic cables. Had it not been for Auckland City Council negotiating for the providers to work in 'good faith', with four out of the five agreeing to share trenches, the disruptions to the CBD and the wider economic impacts to Auckland and New Zealand from such an event would have been disastrous. Such scenarios support van der Meer and van Winden's (2003) conclusion that despite their focus on a variety of examples national legislation and economic development were the primary determiners of local conditions.

Those in the private ICT sector while recognising the need for the 2001 Telecommunications Act, tended to argue that specific regulation was meaningless as its purpose was often rapidly superseded by new technologies. As one participant explained

> 'Five ten years ago there were a lot of countries that were making their decisions about unbundling things you couldn't really point to new technologies… But now they are, like wireless broadband in the USA… and we are seeing that in NZ as well… The technology is providing choice which renders a lot of regulatory decisions that countries have been

making in the last few years a bit irrelevant I think'. (Private Telecommunications Company Interviewee A)

The New Zealand government's failure to unbundle, as discussed in Chapter Three, was identified by many of the interviewees in all sectors as a fundamental reason for the sectors' problems. Some within the private sector however suggested that the sparseness of regulation had in fact stimulated innovation and creativity in the sector. Wireless providers in particular emphasised this identifying that it was because of the current situation that they had pursued wireless technologies to negate the problems others were facing in directly competing with the incumbent Telecom. Central government's most recent attempt to consolidate the various ICT initiatives springing up into a single action plan, The Digital Strategy (introduced in Chapter Three), has generally been well received by both local government and the private sector. The consensus of all those interviewed was that it is an ambitious undertaking but they were glad to see the government finally responding to the ramifications of ICTs, something that many believed was well overdue. Several of the local government actors commented on the fact that it basically mirrored steps they were already taking and it merely provided a more formalised setting. There were reservations over the practicalities of implementing it, several identifying five years as potentially too short for the changes required to organisations' cultures. There were also concerns over where the money was actually going to come from. Staff interviewed at the Ministry for Economic Development, its author, agreed that the government probably should have done something sooner. They also recognised that this was just the initial step and that it was essential to continue the momentum created by the strategy by immediately embarking on the practical initiatives identified.

Relationship Tensions

The key area of tension is interactions with the incumbent Telecom. The local government participants described the ICT sector as highly reactive to Telecom, believing this to be the predominant reason for Auckland's extremely uneven geography of infrastructural development. Anecdotally, situations were described where a council had been working closely with a particular provider only to have them back out at the last minute due to Telecom coming in with a competitive initiative in the same area. Those councils on the periphery of the region Rodney, Waitakere and Franklin identified that their geographic location had been detrimental to ICT investment, particularly expensive infrastructure such as fibre optics, and that this was

exacerbated by these reactionary attitudes. One interviewee summarised their level of frustration at the sector's apparent lack of interest in the land use planning processes stating

> "I find if fascinating that the level of green-fields venture capital that is going on amongst the ICT providers… is really minimal… they are stuck in the central city fighting tooth and claw for what is essentially a pretty over supplied market" (Local Government Interviewee C)

Some investment is occurring in the peripheral areas of the region, where there is a clustering of industries that require both the latest in ICT and large spaces e.g. film companies, boat builders and tertiary institutes, each of which provides an example of what Graham (2000) identifies as a premium networked space. These areas are often unevenly distributed and cater only for those with the power and skills to access them (Graham, 2000). Auckland City's central business district (CBD) is another good example of such a space. Figure 5.2 illustrates components of the CBD's ICT infrastructure illustrating it as a mature and some would say oversaturated space. This saturation is both motivated by and a driver of, business' continual focus on the CBD as a premium location. As Malecki identifies the continual importance of the central city is due to the "accumulated investment in prior networks" (2002: 420).

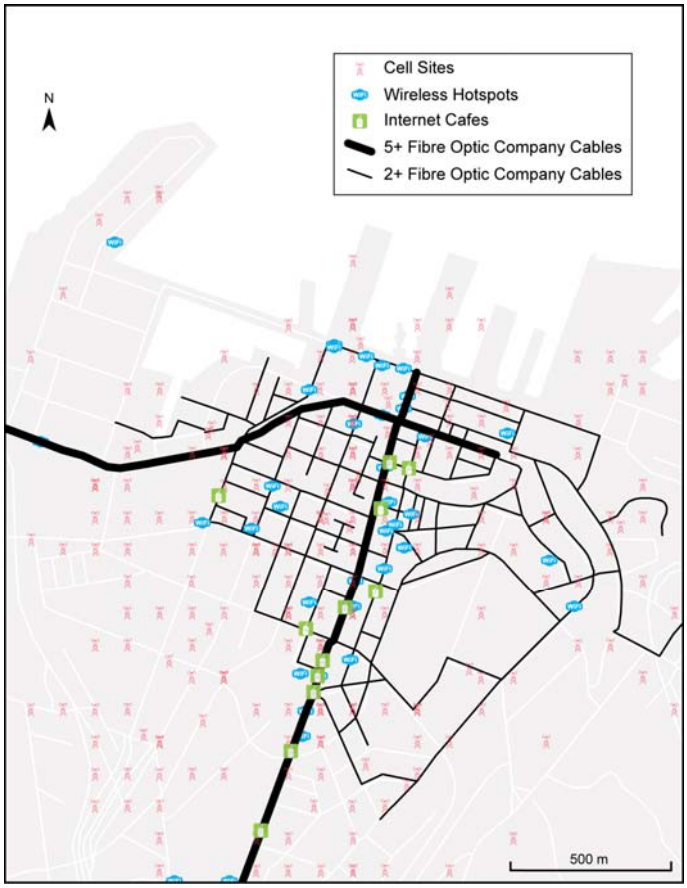


Figure 5.2: Components of Auckland City's central business district's ICT infrastructure.
After Mapzone (2005), Radio Spectrum Management Group (2006), Telecom New Zealand (2006).

The private ICT sector agreed that Telecom's dominance influenced their business practices but argued that the key problem was actually the lack of a coherent regional approach to ICT policies and urban planning. They identified that dealing with multiple planning documents, parochial politicians and the various interpretations and approaches by local government to ICTs was confusing and frustrating. Comments such as, "Everyday we probably have conversations with one council that we have already had with three others…I'm not saying lets create a super council, I'm saying lets be a bit more coordinated on ICT in the region" (Private Telecommunications Company Interviewee B) and "there is not a clear approach to it. Nobody wants to own it" (Private Telecommunications Company Interviewee C) illustrated this. A clear example of the difficulties this can create relates to Auckland City Council's ban on overhead cabling. This was instrumental in the only alternative infrastructural competitor, TelstraClear's decision not to invest in the Auckland Region. The expense of under-grounding was prohibitive because in order to provide a comprehensive network they had to go through centrally located Auckland City (see Figure 1.2). As such they chose not to service the region. The immediate consequences of this is that owing to a lack of competition Aucklanders pay some $10(NZD) more per year for their line rental than those in other region's.

Some Progress – Elements of Regional Coordination

In 2002 the Auckland Regional Economic Development Strategy (AREDS) was initiated in recognition of the fact the region was suffering economically due to too many disparate organisations. The region's ICT development in particular was singled out as suffering from the lack of a regionally coordinated approach. Two key entities emerged from the Strategy to address this problem. The first was Connect Auckland which is part of a wider international initiative that began in San Diego to facilitate networking between entrepreneurial 'start up' companies. Interviewing their Executive Director, who previously ran Connect Scotland for nine years, revealed some interesting facts about the Auckland Region. Using Statistics New Zealand data Connect Auckland had calculated that between 2001 and 2005 approximately 8,000 knowledge based start ups emerged in the region. Over 90%, however, failed within the first year. Furthermore, the number of companies that successfully grew beyond nine employees was actually declining year on year. Consequently, they summed up their role as one of networking "to help existing technology based firms competing in an offshore market place you require additional resources and know how to enable their growth and try and reverse the trend of companies not going over 9 people" (Non Profit Interviewee A). Part of the reason for this failure was that while Auckland is a stimulating environment for entrepreneurs this also

makes it highly competitive, which, Connect Auckland concluded meant the companies "don't really trust each other, they don't network, they don't collaborate and because they are not doing that they are not learning from each other the mistakes that companies have made about how to enter into markets" (Non Profit Interviewee A). Another reason they attributed to this failure was the relationships among the region's councils. Connect Auckland believed that generally the councils had over optimistic perceptions about the ICT cultures in their cities stating that there was a big "disconnect between the policy making and reality" (Non Profit Interviewee A). Even simple elements such as a database identifying all the start ups in Auckland do not exist.

The second entity that emerged from AREDS was the Broadband Liaison Group (BBLG). It comprises representatives of all the region's local government bodies and is facilitated every two months by the Auckland Regional Council. The group emerged specifically from AREDS' response to Project Probe a central government initiative to supply all rural schools with high speed broadband. After its initial success with this project the group decided to continue expanding its vision to encompass facilitating broadband and wider ICT infrastructure issues in the region. Those interviewed described it as a vital forum where they can share ideas and discuss problems. They are also encouraging the ICT industry and government organisations to approach the BBLG first rather than the individual councils in order to develop a more cohesive regional approach. Although the councils each have unique situations to contend with it was clear from meetings attended that this group has the potential to develop the type of coordination that the Auckland Region so desperately needs. Both Connect Auckland and the BBLG are initiatives that demonstrate a shift in attitudes away from a solely neoliberal top down driven focus to one that is more contested between various private and public actors, providing further evidence of what Larner (2005) terms after neoliberalism.

Emerging Initiatives: what Auckland's Local Government Sector is doing

Clearly New Zealand's neoliberal reforms dramatically altered the infrastructural landscape, creating a fragmented and highly politicised environment; a phenomenon that occurred worldwide as documented by Graham and Marvin, (2001). In the Auckland Region it has fallen to local government to adjust to these new rules of engagement which are inherently both spatial and temporal as they are contingent both on Auckland as a geographic region and the period of legislative and technological change presently occurring. Graham's (2000) identification of the

shift in policy makers' thinking is mirrored in Auckland. There has been a conceptual change from ICTs as internally focussed information technology developments to important tools for economic growth and education. Table 5.3 presents a summary of the key initiatives that Auckland's local government is engaged in. It shows that none of the councils yet have a strategy document pertaining to ICTs, reflecting similar findings in Europe by van der Berg and van Winden (2002), and Cohen-Blankshtain et al. (2004) demonstrating the recentness of this mental shift. Two directions were taken by the councils in response to this policy vacuum. The first centred on developing prescriptive ICT strategies in which the council identified infrastructural codes of practice, regulatory changes to policies and plans, and targeted community initiatives. The alternative direction considered ICTs as too ubiquitous to attempt to develop a detailed ICT focussed strategy and favoured generic references to ICT in economic development and land use planning documents. Interestingly, it was not because these councils categorised ICTs as too omnipresent to actively engage in developing targeted projects as often they where more concerned with producing practical results than those councils developing specific ICT strategies.

Table 5.3: Local government ICT initiatives in the Auckland Region

Category of Initiative	Initiative creating an entry point into an emerging timespace	Approximate annual investment made by Councils ($NZD)	Number of Councils involved (Out of 6)
Infrastructural Initiatives	Changes to policy documents and/or investment in physical infrastructure	$500,000+	5
	Land use planning to 'Future Proof' green fields developments	$1,000,000 +	4
Economic Initiatives	ICT enablement targeted at Small & Medium Enterprises	$5000	5
	Development of Technology Parks	$500,000+	5
Social Initiatives	Public Internet access through libraries	$2000	4
	Enhancement of council websites	$5000	6

Infrastructural Initiatives

Graham and Marvin contend there is an "intrinsic dynamism and seamless interdependence between the 'urban' and the 'infrastructural, or the 'social' and the 'technical'" (2001: 214). Consequently, infrastructure is never stable and can become vulnerable to the fickleness of governance structures, as is clearly evident in Auckland. Discussions with Auckland's local government revealed that their approach to ICT infrastructure was determined by two aspects.

First the type of relationship they wished to have with private industry, one of cooperation with or enforcement over and second whether they sought to embark on regulatory changes or direct practical involvement in the infrastructure's construction. Figure 5.3 situates the four approaches Auckland's councils are taking as they revealed themselves from this classification. These approaches should also be considered in the context of Table 5.2's identification of the various ICT platforms.

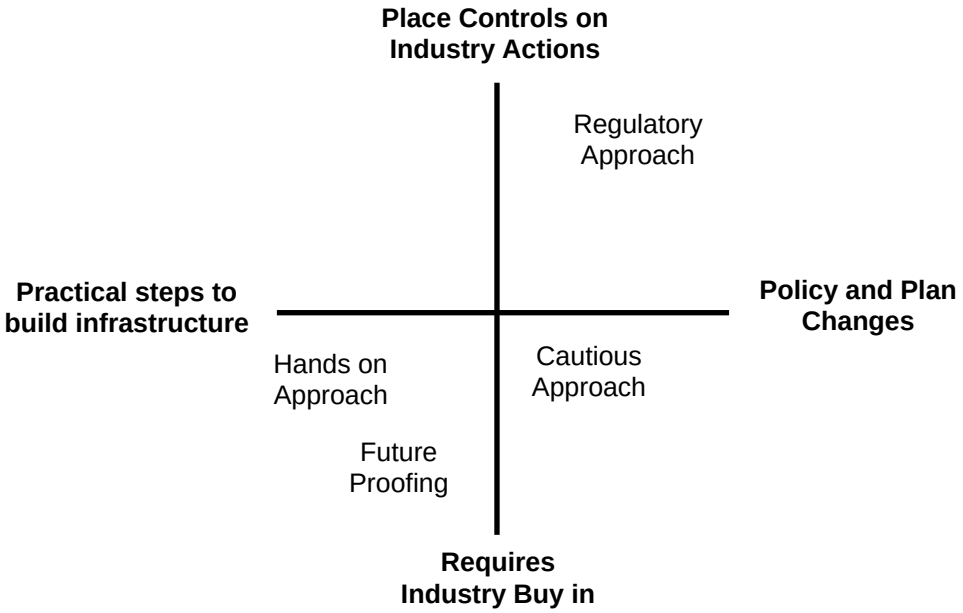


Figure 5.3: The position of four approaches Auckland's local government is taking to the provision of ICT infrastructure by the degree of industry engagement and regulatory change.

The 'Hands on Approach' describes councils that are investing in their own ICT infrastructure in order to stimulate competition. Waitakere City Council, which requires contractors during new developments or cable laying projects to install an extra duct at the council's expense, provides a good example of this. The 'Regulatory Approach' involves the alteration of urban planning and policy documents to provide more control over what can occur in different land use planning zones. This is being considered by several councils and is in direct response to their feelings of powerlessness under the Telecommunications Act 2001. The third approach is the 'Future Proofing Approach' which involves targeted stimulation of competition for green fields' development. Such developments involve public private partnerships which are a relatively new concept in New Zealand despite being well established overseas (van der Meer & van Winden, 2003). The most successful partnership to date is in Manukau City where the Council has successfully partnered with both Telecom and Vector (see Table 5.2 for their

respective ICT platforms) in two separate developments geared towards high tech living and working environments where people can utilise the choices that ICTs bring. Fourth and finally, the 'Cautions Approach' which is where councils take a wait and see attitude, monitoring how the industry is reacting to the other approaches being adopted. Franklin and Rodney District Councils, which sit on the periphery of the region and whose constituencies are predominantly rural, are both taking this approach. They cite frustration with the reactive nature of the region's ICT companies and describe having to actively pursue companies to invest in areas. They are exasperated by what they perceive as companies' disinterest in their long term land use planning documents, which they argue provide worthwhile areas of investment for ICT infrastructure.

Economic Initiatives

96% of enterprises in New Zealand employ 19 or fewer people and 87% employ 5 or fewer people (Ministry of Economic Development, 2006) demonstrating that New Zealand's economy is based almost exclusively on small and medium enterprises (SMEs). According to the most recent figures from the Business Operations Survey 93% of businesses use computers and 91% the Internet, up 15% from 2001 (Statistics New Zealand, 2007c). An increasing number are also turning to broadband Internet connections rather than dial up with only 11% still solely relying on the latter (Statistics New Zealand, 2007c). Overall, 34% of businesses used the Internet to receive orders for goods or services with the highest proportion 48% located in the transport and storage industry (Statistics New Zealand, 2007c). While there are statistical problems associated with comparing businesses' use of the Internet, these numbers are comparatively low when compared to other OECD countries (OECD, 2005).

In March 2005 the Ministry of Economic Development launched the Central Online Management and Export Trade (COMET) Accelerator Project in recognition of the need to encourage SMEs' use of ICTs to improve the country's economy (Ministry of Economic Development, 2005c). The primary purpose of COMET is to use e-commerce to remove the geographic distance and isolation of running a business in New Zealand (Gifford, 2005). With an initial pilot of 30 SMEs the project proposes that even if only 1% of the 324,293 SMEs that existed in 2004 were able to go online the economy would benefit by millions of dollars (Gifford, 2005). Although this is a central government initiative Auckland's local government is taking an active part promoting SMEs in their constituencies for participation in COMET through their Economic Development Agencies. Increasingly, councils in New Zealand are establishing such agencies through public private partnerships to engage more actively in

economic development. Along with involvement in central government initiatives these agencies are engaging in independent training on e-commerce and ICT skills for small businesses, areas where many of those interviewed identified a gap. The industry is slowly developing more flexible pricing plans and dynamic options geared towards SMEs' specific needs but the need for COMET in the first place illustrates that what is occurring is thus far inadequate. The councils interviewed described how many SMEs are reluctant to invest in ICTs until they have built their business because they perceive it as a luxury rather than a tool for growth. A phrase commonly used was that "they don't know what they don't know" (Local Government Interviewee A).

Technology parks gained currency internationally in the 1990s as the knowledge based economy gained momentum. Komninos (2002) defines them as developments that include high tech companies engaged in all aspects of business from research and development to sales. They are also usually closely associated with tertiary institutions. He differentiates them from research parks which are usually attached to universities and business incubators for start up companies. Looking at the Auckland Region there are five developments that loosely fit into Komninos' (2002) description, however, these do include aspects of what he defines as research parks. Castells and Hall (1993) identify three reasons, reindustrialisation, regional development and the creation of synergies, for the development of such parks. The five in Auckland originate from the latter two of these motivations. Firstly, all of the parks described the attraction of investment by large ICT firms into their cities as the key driving force behind the initiatives. Secondly, four of the technology parks in Auckland are synergies among tertiary institutions, local government and the private sector.

Choi (2005) identifies that in South Korea, innovation clusters or technological parks, were seen by local governments as their ticket to competing in the knowledge wave, a way to "actively stimulate regional technological capabilities" (2005;209). One of the dangers Choi (2005) identifies, however, is that local government's focus on attracting only new, in vogue industries to invest in the parks which can lead them to neglect their own regional economy's needs. This is certainly a risk in the Auckland Region but the current developments seem to be more balanced in their approach. An example of this is the Smales Farm Technology Office Park on the North Shore targeted at Hi Tech industries in line with North Shore City Council's identification of ICTs as one of its strengths (North Shore City Council, 2004). The North Shore is a high socio economic area and has significantly higher access to the Internet (74%),

compared to the Auckland Region (62%) (Statistics New Zealand, 2007d). Smales Farm is still in its initial development stage but projections for the social and economic outcomes for the North Shore are highly favourable. It is expected to produce in direct output around $NZD 700 million per annum and generate around 7,000 jobs on site and potentially an additional 15,645 jobs regionally (Lysnar, McLaren and Spoonley, 2004). The purpose of the park is in line with the North Shore's economic development policies.

Social Initiatives

All of Auckland's councils have recognised the need for what van der Meer and van Winden (2003) term socially inclusive initiatives. Public libraries favoured for their safe learning environments are an obvious choice for these. van den Berg and van Winden (2002) identify that this is a common practice throughout Europe, with various capabilities from basic Internet, email and word processing through to touch screens of online services. They note though that while the provision of free Internet access through public facilities is an increasingly popular tool of social inclusion often the required educational component is lacking. Servon's (2002) work agrees with this point asserting that combating disparities through such initiatives requires a shift in focus from who has access to what are the skills necessary for people to go online.

Each library in the Region provides Internet access either free or for a minimal charge. They also appear to be conscious of the dangers noted by van den Berg and van Winden (2002) as they all run courses on basic Internet skills and how to use online databases. Waitakere City provides a good example of a council that is developing this further, initiating a learning centre initiative which provides free training to the public on computer and Internet skills through certain libraries in the area. This is something that several of the other councils are also considering. All of the region's libraries are also able to be accessed via the Internet and provide free 'e-resources' i.e. access to online databases of information associated with various subject areas.

Generally considered as marketing tools promoting the city in a globally competitive environment (Urban, 2002) national legislation has meant that Auckland's local government websites are also geared toward enhancing social inclusion. This is being done through the provision of online services and spaces of interaction between the council and its constituents. Despite most being established in the late 1990s the councils have only recently developed specific policies and strategies pertaining to their appearance and content. This change relates to

what the webmasters interviewed identified as a metamorphosis from basic information provision to interactive tools and online services. This shift has come from two sources. The first is what some in the literature describe as the move in local government from predominantly service provision to a more active democratic and public policy role (Pratchett, 1999). The second is a realisation of the potential to combine the diverse range of issues and services local government covers in one place (Urban, 2002). Figure 5.4 illustrates both the pressures forcing this metamorphosis and the responses to these as described by the various website managers.

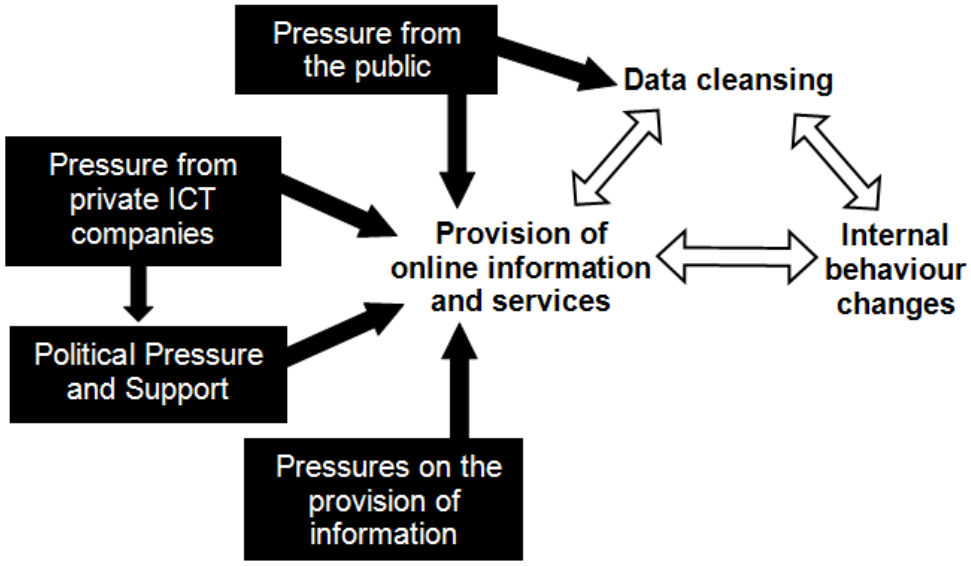


Figure 5.4: The pressures and responses associated with Auckland's local government websites.

Today's public is much more computer orientated and councils are noticing this first hand in the increasing demand for online services as depicted in Figure 5.4. Councils spoke of a balancing act between meeting people's demands for information and keeping to the core principles of local government. They often felt that the public expected everything within the administrative boundaries (and sometimes outside it), even events outside their control, to be accessible through the council website. To manage this situation Waitakere City is considering taking a portal approach where the council website would sit as a link alongside community groups, businesses and so on. They envision that the portal would eventually be taken over by someone else, who that may be (private or public) again illustrates the challenges such technology is introducing in the area of governance.

The second pressure illustrated in Figure 5.4 is the constant bombardment of new hardware and software packages by private ICT companies. Despite occurring on an almost daily basis all of

those interviewed stated that they generally ignored such information unless there was a potential that the technology was relevant to something the council was considering or if it would enhance what they termed 'their core business' e.g. finance, data management, and land information. Several councils employed business analysts to examine these proposals essentially to prevent potentially wasteful investments in gadgets as often the private company would approach a politician instead of the officers involved. This leads into the third pressure, the need for political support. All of those spoken to believed that their councillors were in favour of the websites' direction but several identified the advantages of having a political champion who ensured they were getting the required resources. It was noticeable, however, that all but two of the councils interviewed were well under resourced in this regard.

The final pressure identified often escapes people's attention due to its practical nature. The councils have had to ensure that any forms or documents that require downloading are a suitable size or carry warnings about download times. This is due to the high number of residents that still rely on dial up rather than broadband Internet connections as stated in Chapter Three. This demonstrates how fundamental issues of infrastructure can have immediate low level effects on the everyday operations of council services.

Chiefly three responses have emerged from these pressures. First, all the region's websites are increasingly focussing on ways to facilitate a more interactive online relationship between people and their council. Primarily this is being driven by what they termed a move into *transactional space* i.e. online payments for services. Auckland City is at the forefront of this initiative and instigated a high profile advertising campaign in 2005 demonstrating the advantages of these services. It appears that these provisions are rapidly being adopted by the public. Online payment of parking fines in Auckland City became available in March 2005 with 3,597 payments in the first month. By August this had increased to 6,241, which accounted for about 15 per cent of the tickets issued. This transactional space is co-constructed by the second response, data cleansing. To facilitate online services tasks such as consolidating name and address registers and property information were essential. This process exposed the lack of communication both between council departments, and with the public, leading on to the third response a behaviour change within councils. Providing information in an instantly accessible form requires significant co-ordination as it must be kept up to date. Those interviewed noted that these requirements differ from the usual work flow of local government.

Constructing Emerging Timespaces in Auckland

In the theoretical chapter of this thesis the concept of timespace as articulated by May and Thrift (2001) was unpacked. As many of the contributors to May and Thrift's (2001) manifesto stated such a reconceptualisation is both important and challenging. This discussion informs this concept with some insights into the constitution of the timespaces in the Auckland Region given the conditions of possibility that are arising from the experiences of its local government. These timespaces have already been hinted at, particularly in Table 5.3 and Figure 5.4.

Four approaches were identified to the types of infrastructure initiatives embarked on by the councils. As noted each council is experimenting with more than one of these approaches at the same time as they attempt to identify what works in a given circumstance. Consequently, the timespaces that are emerging originate primarily from the constraints of the legislative, physical and private sector situation, each of which is interdependent both temporally and spatially. Potentially, the 'Hands on Approach' could construct a timespace of infrastructural flexibility working around the constraints of commercial sensitivity and restricted investment. This enables councils to assert some urban planning controls and potentially build working relationships with providers. Currently, however, the timespaces emerging are full of complex contractual negotiations and conflicts around liability and responsibility both in terms of use of the space and the timing requirements to commit. The other approach to construct various timespaces is the 'Future Proofing Approach'. The constitution of such timespaces, however, hinges on the both the council and the provider coinciding in terms of their strategic planning and the spaces they want to invest in. When this combination occurs the resulting potential timespaces of each future proofing venture appear to be successful enterprises of cooperation and communication. The other two approaches being adopted by Auckland's local government have yet to progress far enough to allow any documentation; their constitution will be dependant on how the power relations between the councils and providers are played out.

The economic initiatives provide much clearer iterations of the type of timespaces that are being constituted. The local government's focus on building up SMEs' ICT skills is geared towards providing them with opportunities to engage in e-commerce and the global economy. The timespaces being constituted, however, are not those expected in a competitive commercial environment where SMEs would have a range of choices for their ICT investments. Instead they are engaging with timespaces created by local government training and central government funding where their basic needs are met but where their future sustainability is uncertain. The

investment in technology parks presents a potentially more promising set of timespaces in terms of economic development. The councils in partnership with private businesses and tertiary institutions are creating spaces of cross sector interaction. This is due both to the increasing popularity of investing in such parks internationally, and the interest and willingness of both the councils and the private sector to engage in it at this current point in time. However, most of these developments are in their preliminary stages and so it is too early to tell how successful the interactions within these emerging timespaces will be.

The two social initiatives identified reflect both the simple and more complex types of timespaces that are being constituted in Auckland. The library initiative is essentially a combination of the right timing both in terms of public demand and the ability of the libraries to fund the projects (thanks to the Digital Strategy) and the local government working with their libraries to facilitate the space in which to do this. Council websites, however, provide a myriad of conditions of possibility as implied in Figure 5.4 in which the responses of local government to a range of pressures are constructing entry points into numerous timespaces. The transactional space of real time payment constructs an interesting timespace in which the public's relationship with the council takes on a greater level of convenience and trust, something that is co-constructed by the second response, data cleansing, which is generated both by increasing public demand for accurate information and the metaphorical need to 'clean house' felt by the council. Both these responses and the pressures felt by council officers have also led to behaviour changes within local government. The timespaces being constituted are pragmatic i.e. the need for equipment and skilled people involving spatial and structural changes within councils coinciding with an ICT skills shortage which makes recruiting such people difficult. They are also more cerebral, providing both convenience and flexibility and an arena of trust and negotiation.

Conclusion

Auckland's local government experiences of the ICT platforms emerging in the region are both complex and contingent on a range of factors. This chapter began with a rejection of the digital divide concept as too simplified and instead proposed a broader approach focusing on three aspects to reveal the presence and absence of ICTs in the Auckland Region. The first of these aspects involved a consideration of Auckland's infrastructural landscape. This chapter has shown that there is a mismatch of novel initiatives and conflicting policies which are highly

contingent on the various relationships between local government and private ICT operators. The second aspect, access possibilities, was demonstrated through the range of economic initiatives the councils are attempting to develop, initiatives that are still highly dependant on central government support, despite the devolution of power that occurred due to the neoliberal reforms. Third and finally these actions are embedded in the coded space of electronic content, an aspect that can indeed alter how and what can be undertaken by a variety of local government and community services.

In developing Auckland's governmentality framework through the lens of O'Neill and McGuirk's (2005) institutional landscape this chapter's main intent was to identify the conditions of possibility emerging from the interrelationships of the numerous actors with local government in connection to the region's ICT platforms. Exploring what these relationships were like particularly focussing on their motivations and how the relationships are performed provided a useful initial step. Politically there are a range of actors involved in the governance of Auckland's ICT environment and the decisions being made and initiatives being adopted are clearly contingent on how these actors have developed their approaches to ICTs and how they engage with the other players. As Rose (1999) identified it is vital to consider all of these elements. To date many of the motivations of Auckland's key actors have been somewhat confused. On the one hand local government legislation is putting pressure on these councils to facilitate economic wellbeing thereby stimulating competition amongst them while on the other hand there is a lack of actual competition among the private ICT sector many of which are struggling to survive. All of these actors recognise the urgency of developing a regionally coordinated approach and some inroads have been made. The region still has a long way to go before anything more comprehensive will emerge and this will probably, ironically, stem from further central government intervention such as the restructuring of the fragmented councils into a super council.

The various initiatives emerging from the local government sector in Auckland as it attempts to situate itself within the region's ICT platforms are creating a particular field of possibilities. Some of these initiatives appear to be more successful than others but all are clearly contingent on how the various parties interact. Auckland's local government identify that they feel forced into the position of stimulating ICT initiatives, a position they felt was somewhat ironic given the governments insistence in market led development. Research by van den Berg and van Winden, (2002) and van der Meer and van Winden, (2003) has demonstrated that this is not a

unique situation. This research demonstrates though that more attention needs to be paid to what local governments are doing, given the immediate consequences to local access, economic development and the ability to compete in the global economy.

Finally the conditions of possibility emerging from the infrastructural, economic and social initiatives the councils are undertaking are providing entry points into the construction of distinctive timespaces. Some of these timespaces are clearly already creating new environments of opportunity for the region's ICT platforms; others however may never emerge if the potential spaces of interaction and timing of the policies and investments were to change. Others may emerge in a different form to what has been revealed here. The important point to remember is that as May and Thrift state

> "there are all kinds of TimeSpaces which are there to be practices and thought – once we stop using theory as a declamatory tool, once we put aside an oracular mode of analysis, once we understand that, even within capitalist social relations, diversity of experience is not some kind of mirage or unfulfilled yearning" (2001: 36)

CHAPTER SIX:

Experiences of the Real Time Passenger Information Signal Pre-emption System

Introduction

Catching the bus is an everyday experience for millions of people around the world. It is a process subject to the vagaries of weather, traffic lights, congestion and road works and is often perceived negatively as inconvenient and time consuming particularly when compared to other passenger transport modes such as rail (Currie 2005; Rainsford and Mackaness 2002). As Chapter Three revealed though it is the predominant form of public transport in Auckland and one which both central and local government is increasingly investing money in to improve. The RTPISP System is an example of this investment. It is the first intelligent transport system to be used in the region and a novel experience for both the institutions involved and the individual bus patrons.

This chapter[25] reveals how the real time passenger information signs located at the bus stops provide an interface between bus patrons' real life transport encounters and the hidden coded spaces (Dodge and Kitchin, 2005a) of the RTPISP Systems' software. The information the real time signs provide both consciously and unconsciously effects and affects the behaviour of the waiting passengers. This interaction is not a compression of space by time as discussed in Chapter Two; in fact, the provision of such ITS are opening up timespace in ways these bus patrons have not previously perceived. In investigating the patrons' interactions with the signs, this intervention attempts to access the *in between*, the gap connecting the original intention of the technology and its applications in everyday life. In this instance the gap between the patrons' cognitive interpretation of the sign information and the conditions of possibility they perceive as a result, provide for the constitution of alternative timespaces that present options and choices previously unknown.

[25] A substantial proportion of the results from this chapter have been published see Mitchell, P. 2007. What's going on at the bus stop? The Impact of Auckland's Real Time Passenger Information System on Patrons Timespace Perceptions. *Network and Communications Studies*, 21(3-4):331-348

Chapter Two discussed the developments in the international geographic literature concerning ICTs and transportation and summarised these in Table 2.2 as a set of possibilities of action. As with Table 5.1, Table 6.1 also builds on Table 2.2, illustrating three types of possibilities of action; those that have mainly been examined in the literature; some hypothetical possibilities of action that could have resulted from the interactions between the bus patrons and the RTPISP System but were not recorded during this investigation; and, those disclosed via this empirical intervention, which, form the basis of discussion for the remainder of the chapter. The first two of these possibilities, the surveillance and signal pre-emption aspects of the RTPISP system, are best considered in terms of Dodge and Kitchin's (2005a) code space. This section also demonstrates how the RTPISP System has begun to inform the decision making practices of the institutional actors involved, revealing the processes of qualculation occurring that as Thrift puts it have "become a means of making qualitative judgments" (2004a: 548). The discussion then moves on to explore the possibilities of action identified in Table 6.1 on the other side of the interface - the bus patrons' real life encounters with the signs. First it appears that the signs are beginning to change people's perceptions of the bus service, mostly in a positive manner, which was an original goal of Auckland City Council's installation of this system. Second, as a result of this perception the bus patrons are slowly beginning to trust the sign information and rely on it. The possibilities of action that are emerging from both of these developments are beginning to allow the bus patrons to behave differently. I say allow because this change in perception is providing the ability to constitute alternative timespaces, which they quite possibly were not aware of or could not conceive accessing prior to the sign interface. This is the *in between* which that the thesis is interested in accessing.

Table 6.1: Possibilities of action emerging around ITS that have previously been investigated by Transport Geography, the conditions of possibility disclosed in this intervention, and those possibilities that could have hypothetically emerged from the Interactions

Previously Investigated Possibilities of Action	Conditions of Possibility Disclosed in this Intervention	Hypothetical Possibilities of Action
The role of surveillance including the ability to monitor transport behaviour particularly safety and infringements. An example is congestion charging, where certain transport modes are charged for the use of a space often during a particular time period.	The RTPISP System provides surveillance of drivers by bus operators and both of these by the councils and ARTA	Improved bus services due to the real time reporting aspect of the system providing information to make more realistic timetables
The use of signal pre-emption at traffic lights to give priority to vehicles equipped with specific equipment. This can reduce travel times.	The RTPISP System reducing the trip times of buses and increases the efficiency of the service through the use of signal pre-emption.	Exercised choice to use alternative transport mode if access to the preferred timespaces was not provided e.g. long wait so took the car

The ability to both monitor and provide information on transport related systems in real time including public transport and traffic incidents	Providing new and useful knowledge to the patrons on the bus services the RTPISP System had a positive psychological effect on their perception of the reliability and frequency of the bus service.	Increased economic activity in the shops around the bus stop due to patrons constituting alternative timespaces while waiting for the bus
The use of teleconferencing to communicate with others without the need for physical travel or teleworking to enable people to work from an alternative space e.g. home	Patrons have begun to increasingly trust in the information the real time signs provide. This has began to influence their decision making and behaviour as they recognise increased choice concerning the constitution of multiple timespaces at and around the bus stop. This is allowing the patrons to use time and space in different ways from the prior to the real time sign installation	Modal shifts where more Aucklander's choose to catch the bus instead of use their car due to the RTPISP System' improvements to bus services both off and on street.

Figure 6.1 reveals the demographic composition of the 100 bus patrons surveyed by age[26], gender, on average how often they caught the bus during the week or user frequency, and their reason for catching the bus. It shows that women and those under the age of 25 years were over represented in the survey which is comparable to national data on bus patronage (TNS, 2007). During the analysis it was determined that the reason for catching the bus could be disregarded because the results did not show any specific relation between this aspect and the patrons' perceptions and behaviour. Gender, age and an individual's familiarity with a technology are common categories used in the literature to assess individuals' experiences of ICTs however most of the attention has been centred on how these different groups engage with computers and the Internet. There are an increasing number of studies focusing on the influence of such real time systems on passenger transport patrons' perceptions but there is still very little that breaks this down into different user groups (Dziekan and Kottenhoff, 2007). Such categories are also regularly used as indicators of digital divides; however, as stated in Chapter Five this is too limited a concept to comprehend the complex and often contingent aspects involved in individual's ability to access and use of ICTs.

[26]The youngest age group actually ranged from 16 to 24 years old. The University of Auckland Ethical Guidelines requires minors i.e. those 16 and under to have consent from a guardian, which was not practical for this research and so the questionnaire was not administered to any minors. This was partly ensured by conducting the survey after 9am when most minors were at school

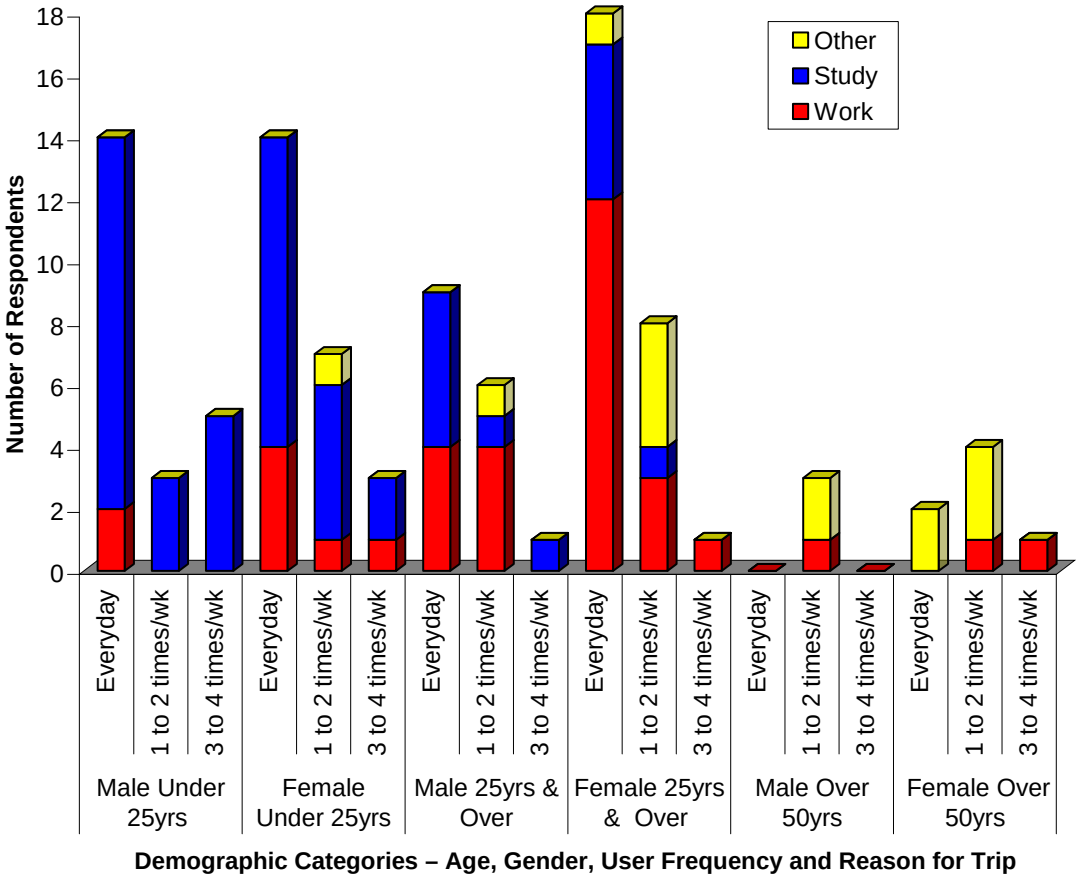


Figure 6.1: Demographics of the RTPISP System questionnaire showing the number surveyed in terms of Gender, Age Group, User Frequency and Reason for Trip.

RTPISP System: the Ramifications of a Troubled Start

The initial roll out of the system was repeatedly delayed owing to several technical problems. In particular the supplier underestimated the complexity of the systems requirements given the geography of the region and the way bus services were structured. This resulted in considerable negative media coverage[27]. Consequently Auckland City Council decided on a low key approach to the roll out with extremely limited publicity on how the system worked. This decision was made in an effort to negate the criticism by attempting to try and solve the problems rather than get involved in a media debate. In hindsight this decision had important ramifications for the results, as those surveyed at the bus stops were left to rely on their personal understanding of how the real time signs conveyed information.

[27] Rudman, 2004. Predicting bus times still a hit-and-miss affair. New Zealand Herald http://www.nzherald.co.nz/topic/story.cfm?c_id=348&objectid=3559360

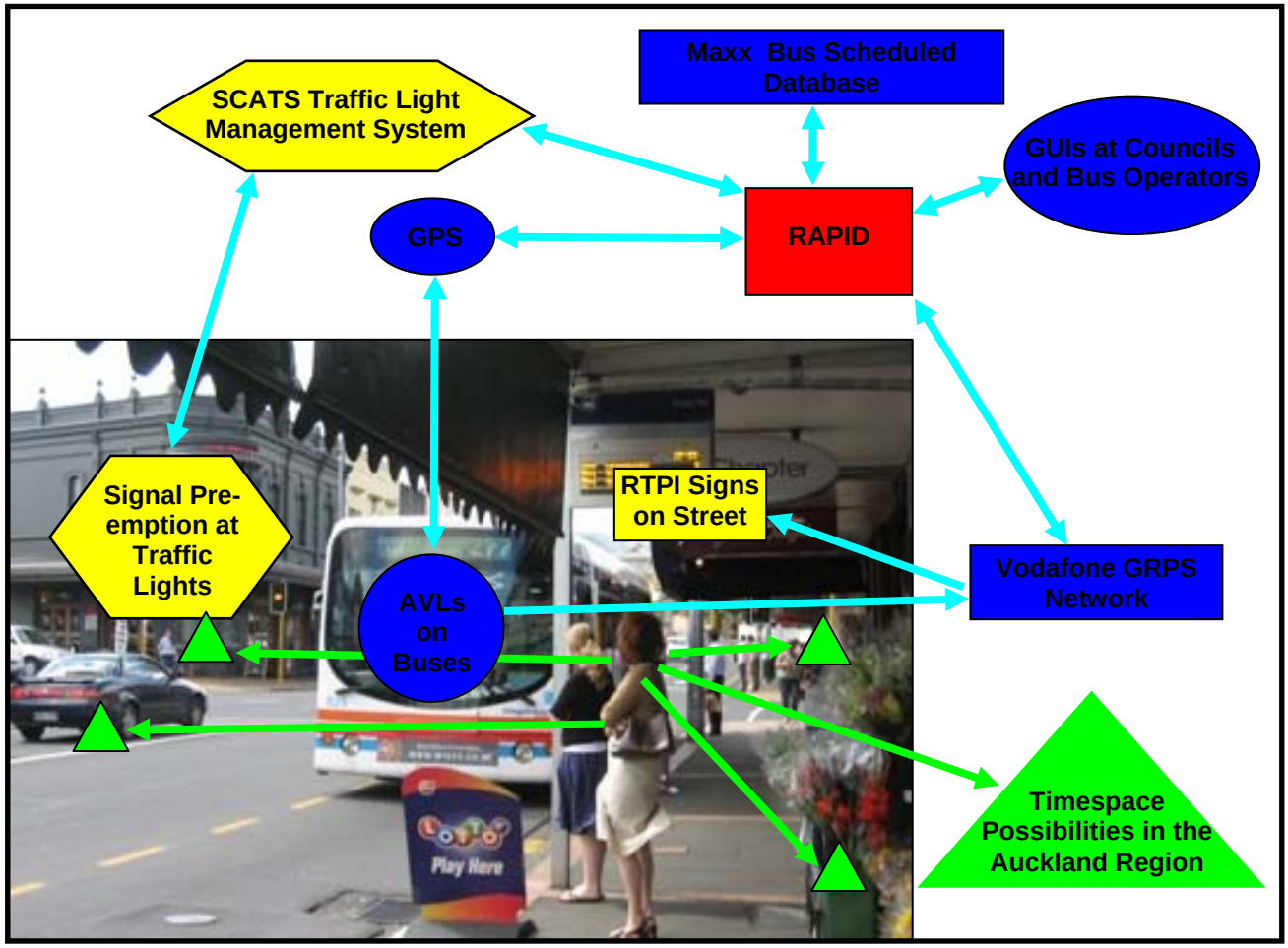
One particular problem is that currently the real time signs display a mixture of scheduled and real time information. Essentially the moment a bus registers for a trip on the system the scheduled time displayed on the sign is replaced by real time updates of the bus as it moves along the route. If a bus does not register for the trip the sign continues to count down the expected scheduled time to DUE and then changes to 'DLY' i.e. delay, then clears off the sign. Currently, there is no way for a patron to differentiate between the schedule and real time and so any missed trips, driver error or equipment faults are publicly displayed as delays. This has had a misleading impact on patrons' perceptions of the system's reliability as it is often something independent from the coded spaces of the system that has resulted in the 'missing' bus.

Surveillance and Signal Pre-emption: the RTPISP System as a Coded Space

The surveillance and signal pre-emption aspects of the RTPISP System are two of the more recognised components in the geographic literature on ITS as discussed in Chapter Two. While the benefits of such components are well recognised this chapter is interested in viewing them as parts of the RTPISP System's coded space in order to explore the variety of conditions of possibility initiated depending on the situation of the actor involved. For the bus patrons on the street these aspects form part of the unconscious background. For the institutions involved however these are two crucial components of the system that allow them to monitor operations and make decisions about the region's passenger transport planning.

Dodge and Kitchin (2005a) propose that code space is where much of our experience of space is now coming into being, through a process of transduction. The RTPISP System can be conceptualised in these terms. They divide coded space into four forms. Coded objects, which use code to function and cannot be accessed without software; coded infrastructure, the networks regulated by code that link objects and infrastructure; coded processes, the transaction and flow of digital data across coded infrastructure, and; coded assemblage, the convergence of the other three forms in one system (Dodge and Kitchin, 2005a). Figure 6.2 applies these four forms to the Auckland RTPISP System distinguishing the surveillance and signal pre-emption aspects. This diagram also demarcates the fact that some of these coded space attributes exist within the reality of the bus patrons experience of catching the bus in the sense that they can visualise them, e.g. the traffic lights changing to green, the real time information sign, and the box containing the Automatic Vehicle Locator (AVL), which sits by the driver on the bus (the

photograph illustrates a typical example of the 15 bus stops surveyed). Presenting a conceptualisation of the interactions of the RTPISP System and the bus patrons in this way also hints at the type of timespaces in and around the bus stop and in the wider Auckland Region that the bus patron could begin to access. There are a complex range of technologies that comprise the RTPISP System and Figure 6.2 exposes the need to "investigate empirically questions concerning the extent to which people's everyday activity patterns are based on different kinds of technologies" (Vilhelmson and Thulin, 2001: 1028).



KEY			
	Coded Object	→	Coded Process
	Coded Infrastructure	⬭	Surveillance aspect
	Coded Assemblage	⬡	Signal Pre-emption aspect
▲	Timespaces in and around the bus stop	→	Recognising entry points into timespaces

Figure 6.2: The RTPISP System as a coded space with the surveillance and signal pre-emption aspects distinguished and the various interactions between the coded space of the RTPISP System and the patron standing at the bus stop, with some of the timespace possibilities that may emerge

The surveillance aspects of the RTPISP System are provided through the connection between the coded assemblage of Rapid, the AVLs, the Global Positioning Satellites (GPS) and a Graphical User Interface (GUI) which provides real time monitoring of the system. This interface provides a number of capabilities including a Geographical Information Systems' (GIS) map of the Auckland Region on which the location and status of buses can be checked. It also shows the ability to view the real time signs remotely to see what they display, and an interface with the traffic lights through the Sydney Co-ordinated Adaptive Traffic System (SCATS) to alter signal pre-emption. The GUI also provides access to a reporting function which allows bus operators and councils to access a variety of reports on everything from late running and missed trips, to travel times and the accuracy of the sign information displayed.

The GUI is also designed so that different actors have access to different sets of information, for instance the bus companies can only see information pertaining to the buses and routes they operate. Alternatively ARTA as the owner and operator (see Table 3.4) has access to all aspects of the system. The use of ITS for monitoring and reporting is relatively common as demonstrated by the work of the Transportation Research Board of the National Academies (2003) into its importance both operationally and in terms of obtaining continued political and funding support. In the case of the RTPISP System this surveillance aspect has led to various tensions. Bus companies are now able to keep tabs on individual bus drivers, an aspect that generated alarm amongst the drivers with concerns about the 'big brother' aspect of the system. There have been cases of damage to the on-bus equipment as a result of this. The councils and ARTA in turn are able to view all of the bus companies' operations and assess compliance with various requirements. During the initial stages the bus companies, which are private operators (as explained in Chapter 3) felt it was unnecessary for local government to have so much information on their day to day operations particularly concerning ticket revenue. This has always been an area of contention as bus companies run a mixture of commercial and subsidised trips some of which are on the same routes, for instance most peak services are commercial, whereas off peak and lower patronage routes are subsidised by ARTA. Eventually it was decided that ARTA and the councils should have access to all such information because of the role it played in future planning and development of routes and plans to move to integrated ticketing, something not currently present in Auckland.

The signal pre-emption aspect essentially entails modification to traffic lights so that when a bus is approaching it is given priority. There are many different systems and approaches to doing

this[28]. In the case of the RTPISP System the region's traffic lights are managed by the SCATS system with which the RAPID system directly communicates as shown in Figure 6.2. The SCATS system provides numerous different priority types depending on what phase the lights are in i.e. red, amber, green, when the bus is approaching. Of course in congested situations the pre-emption makes hardly any difference but there is little that can be done about this. The other difficulty is that buses often arrive from different directions at the same set of lights. To prevent the intersection jamming the system either works on a first come first served basis or has the ability to give late running, or full buses priority over other buses. Overall the system has proven effective in reducing trip times by shaving minutes off standard travel times. This aspect of the system has proven very useful both in persuading the bus drivers of the benefits of the system over the surveillance aspects, and for ensuring the system's continued funding.

Both the surveillance and signal pre-emption aspects of the RTPISP System illustrate the complexity of its coded space and the influence of this on the key institutional actors' behaviour and decision making processes. Considering the system as a coded space, however, is only a first investigative step as "The extent to which code is embedded in everyday society (as objects, infrastructure, processes, and assemblages) is not the same thing as the extent to which it makes a difference to everyday life" (Dodge and Kitchin, 2005a: 169). The discussion will now move on to how the system is facilitating the individual's ability to uncover conditions of possibility, conditions which may provide a way for these bus patrons to begin to constitute a multiplicity of timespaces.

Altered Perceptions of the Bus Service

A key intention of the RTPISP System was to improve the frequency and reliability of Auckland's bus services. This was primarily done to encourage more people to make the modal shift from Aucklander's love affair with the car as revealed in Chapter Three to passenger transport (Gravitas Research and Strategy Limited 2004). This section examines the results of the questionnaire to identify how the system may have altered people's perceptions of the bus service, changes that are enabling the bus patrons to recognise new opportunities in and around the bus stop environment, enlarging the conditions of possibility they perceive as available.

[28] The following website while slightly out of date provides information on comparable real time systems throughout Europe http://www.ul.ie/~infopolis/existing/stopdisp.html#systems

The installation of the real time signs was viewed positively by the majority of the bus patrons surveyed 83% stating that they had a favourable first impression with comments such as "Really informative, good to know what is happening" or "Makes a huge difference, actually represents what is coming, it's great". Of those surveyed 30% were not aware that the signs actually provided real time information. This is a substantial percentage of the respondents and so the results were analysed to see if this had a direct impact on their responses to the rest of the survey. This did not to seem to be the case, in fact only 20% of this group made negative comments about the signs. This lack of knowledge about how the signs worked does however, demonstrate the consequences of the low key publicity approach taken by Auckland City Council. Importantly an aspect that may go some way to explaining these findings is that in asking this question I made the patrons aware that the system was real time, often explaining how it actually worked. It is quite possible that being equipped with this new information influenced their perception of the sign and consequently how they responded to the remainder of the questionnaire.

The bus patrons were asked "Do you find that knowing how long you have to wait for the bus changes your perceptions about the frequency and reliability of buses?" Just over half, 52%, stated yes this knowledge had changed their perceptions. In order to explore just how their perceptions had changed they were also asked to explain their yes/no responses and these are categorised in Table 6.2.

Table 6.2: The various categories of bus patrons' responses to whether the real time signs have changed their perceptions of the bus service

Category	Explanation
Yes – Blank	No explanation was offered
Yes – Neutral	Their response was neutral e.g. "Just as I expected"
Yes – Negative	The signs had elicited a negative response e.g. "They are not as reliable as I thought, there are lots of DLYs"
Yes – Positive	The signs had elicited a positive response e.g. "Bit more reliable at least you know if they are going to be late"
No – Blank	No explanation was offered
No – Neutral	Their response was neutral e.g. "hard to say, not really"
No – Negative	The signs had elicited a negative response e.g. "Always been bad we just know now"

Figures 6.4, 6.5 and 6.6 show how the various responses identified in Table 6.2 were influenced by the age, gender and user frequency of the bus patrons. Figure 6.3 shows that men identified much more strongly with the signs having positive impact on their perceptions of the frequency and reliability 41% compared to 23% of women. They were also more likely to offer an

explanation as to their response with 73% doing so compared to 49% of the women. These findings corresponded to findings by Servon (2002), OECD, (2005) and Haythornthwaite and Wellman (2002) which all identify that during initial encounters with new ICTs (such as in this intervention) men are more inclined to actively engage with the technology.

Figure 6.4 demonstrates that only just over 30% of each age group identified that the signs had had a positive influence on their perception of the bus services' frequency and reliability. Those in the under 25 and over 50 year age groups were slightly more inclined to be negative about the bus service whether or not the signs had influenced this position with 17% and 20% respectively. Figure 6.5 illustrates that those who caught the bus everyday were much more likely to state that the signs had a positive influence on their perceptions. This however may primarily be due to the majority of this group being comprised of male participants. The less frequently the patrons used the bus services the more inclined they were to give a negative response to this question irrespective of whether they believed the sign had influenced their perception or not. 19% of those who caught the bus once or twice a week and 18% of those in the three to four times per week user group responded negatively compared to 13% of those who used the buses everyday.

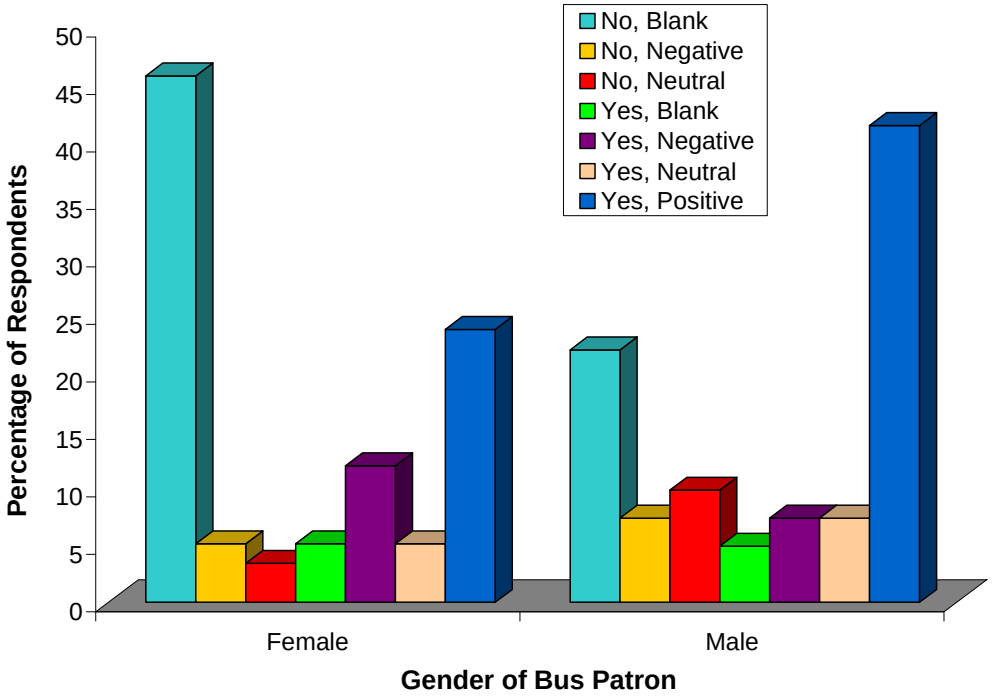


Figure 6.3: Whether the real time signs influenced the bus patrons' perception of the frequency and reliability of the bus service and in what way by gender

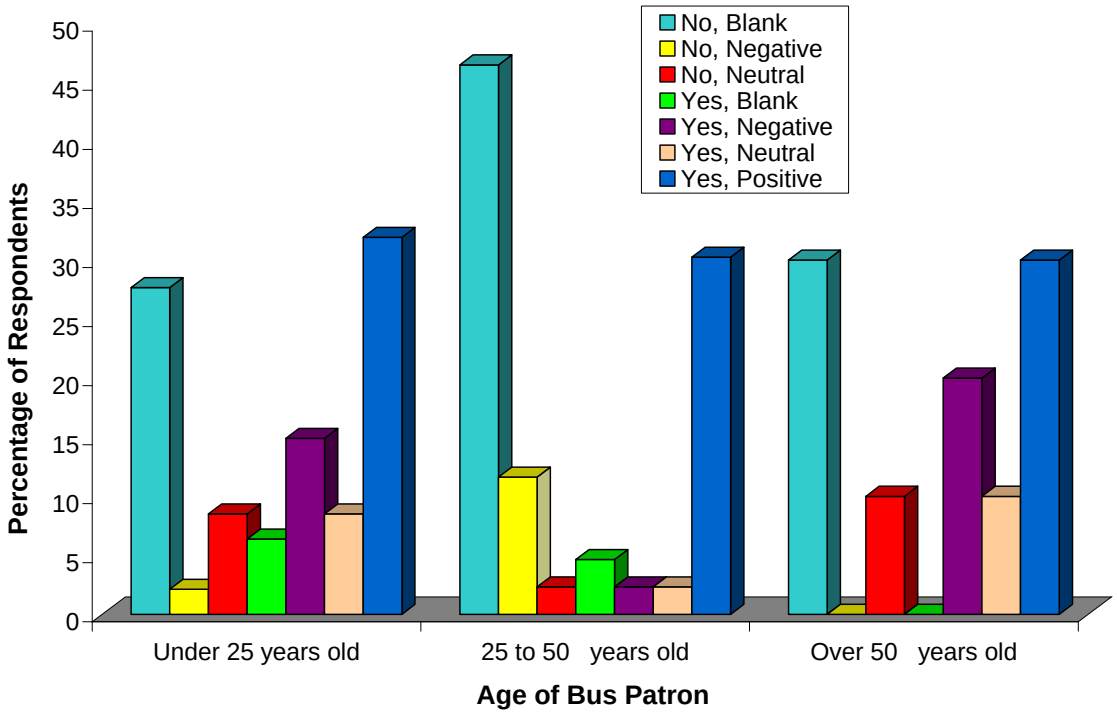


Figure 6.4: Whether the real time signs influenced the bus patrons' perception of the frequency and reliability of the bus service and in what way by age

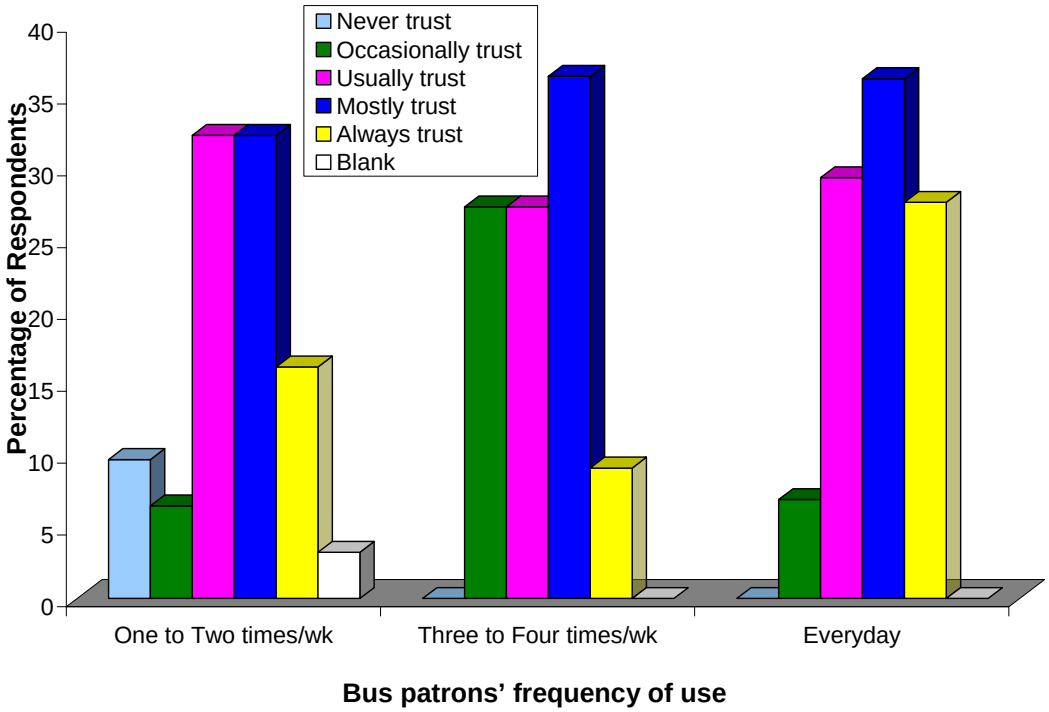


Figure 6.5: Whether the real time signs influenced the bus patrons' perception of the frequency and reliability of the bus service and in what way by user frequency

One of the most frustrating aspects of catching the bus particularly in peak is the risk of it already having filled up from earlier stops and driving straight past the stop you are waiting at. This is a common occurrence in Auckland as most of the in peak trips are run commercially and the companies generally attempt to maximise the revenue while minimising the investment i.e. don't put enough buses on routes. Chapter Two identified that ITS can have a positive psychological effect for instance in their research into a real time information display system in the Hauge, the Netherlands, Dziekan and Vermeulen found that such signs "can greatly reduce anxiety" (2006: 72). The bus patrons' perceptions were therefore assessed to see if this same phenomena was present. They were asked, "If the bus drove past completely full does the knowledge the signs provide of when the next one is due make the experience any less frustrating?" 77% stated that yes it did make the experience less frustrating which lends critical support to the Dziekan and Vermeulen (2006) findings. This result did not vary much when examined by age, gender and user frequency, the only two slight differences being that 40% of those over 50 still found it frustrating, as did just under 40% of those that only caught the bus 1 to 2 times per week.

While the majority of those surveyed agreed that the real time signs were a good idea, only just over half are beginning to sense that the sign information might enable different interactions and opportunities. The conditions of possibility that are emerging consist of heightened understandings both negative and positive of the information the signs provide. Generally women, those under 25 and over 50 years old, and less frequent bus users were more likely to be negative identifying that the sign information made them more aware of problems with Auckland's bus services, highlighting delays, a failure to arrive on time according to the schedule, and the problem of missing buses (which as explained is when the sign counts down to an arrival but the bus fails to appear, this can be due to equipment failure or human error). These negative dimensions as a result of the signs showing the current problems with Auckland's bus services in a much more overt way than previously, has significant flow on effects as will be revealed in the remainder of this chapter. There are those bus patrons, however, who are recognising more positive dimensions particularly men and everyday commuters. These patrons identified conditions such as feeling like more investment and attention was being paid to bus services, that at least one now had a realistic idea of the timetable and that the bus service was generally better. Furthermore, as the literature argues such ITS generally have a positive psychological effect and this is beginning to be apparent from the 77% who felt their frustration at a full bus driving straight past had eased. These more

positive assessments are also having ramifications for the type of timespaces these bus patrons are beginning to constitute.

The Role of Trust

Trust, often measured in terms of reliability in transportation research, has been identified as the most important factor in people's consideration of passenger transport, even more so than cost and frequency (Lyons, Harman, Austin and Duff, 2001). People's perceptions of the reliability of the bus service directly fed into their level of trust in the RTPISP System. The early difficulties with the RTPISP System directly influenced people's level of trust in the system with several people commenting on how initially the real time signs didn't seem to work properly but had generally improved. For others however these early problems combined with their general dissatisfaction with bus services in the region made them very sceptical about the potential of the system. The DLY feature in particular generated negative statements that undermined the patrons trust with comments such as "It is good in some ways but the delay can be misleading, the bus won't turn up if this appears on the sign" or "Not as reliable as I thought too many delays". These factors were certainly compounded by the lack of publicity first about how the initial problems were resolved and secondly about how the system actually works.

Each questionnaire participant was asked on a scale from one to five to rank how much trust they placed in the information the real time signs provided with one being 'never trust it' and five being 'always trust it'. 58% mostly or always trusted the sign information with women being more likely to rank their trust as such, 66% compared with 46% of men. When the issue of trust was looked at from the age of the bus patron there were some clear distinctions between the three age groups and the level of trust they had in the sign information as shown in Figure 6.6. Those under 25 were more inclined to 'usually' or 'mostly' trust the sign rather than 'always' or 'never'. This may be due to their high level of exposure to ICTs in general which the literature argues has meant they are more critical and questioning of such technologies (Morris and Venkatesh, 2000; Prensky, 2001). Those in the older age groups were more likely to 'mostly' or 'always' trust the sign information. Interestingly those in the over 50 age group tended to favour the extremes either 'always' or 'never' trusting the sign information with comments such as "All this is so wonderful, it's like magic" or "It's all too confusing, I am too old to learn new tricks". Morris and Venkatesh (2000) identified that older people are more inclined to ask for help to understand a new technology before embracing it, help that was not

available in this instance due to the council's low key approach. The signs, however, provide a much more simplified medium than the software package Morris and Venkatesh (2000) used in their analysis which may partly explain the extremes in these older patrons' responses.

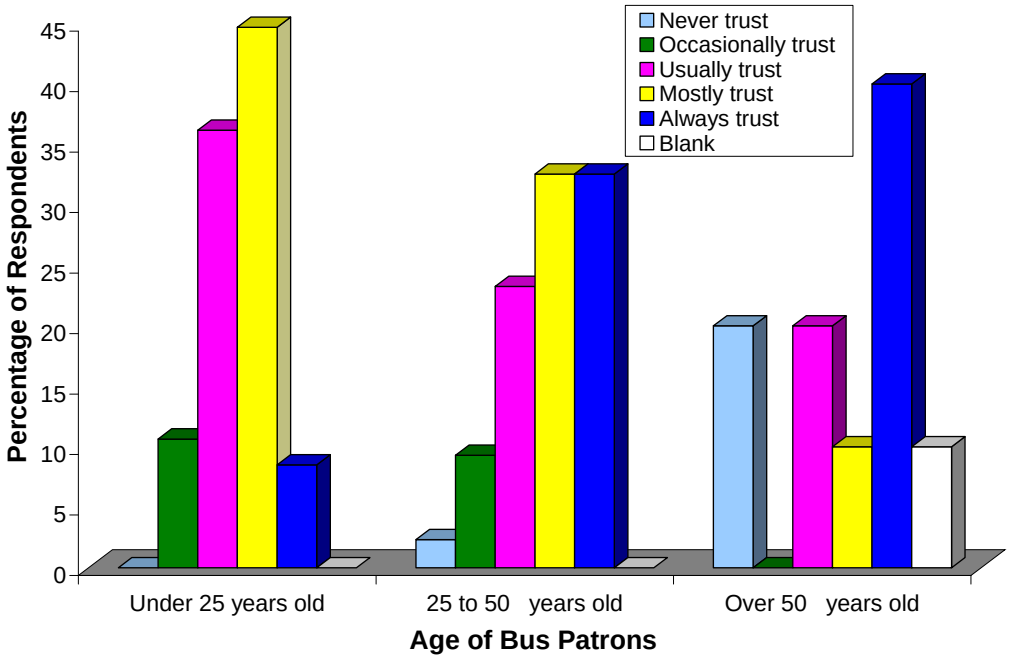


Figure 6.6: Bus patrons' level of trust in the information provided by the real time signs by age

The frequency with which the patrons caught the bus and therefore their familiarity with the signs also played a part in how much they trusted the sign. Everyday commuters, the most familiar with how the signs operate, were more likely to trust them with 27% stating 'always' and 36% stating they 'mostly' trusted the sign information. Those who only used the bus one or two times per week were the only group to have patrons state that they 'never' trusted the sign information at 10%, which could be attributable to their lack of familiarity with the system. 27% of those who caught the bus three to four times a week identified that they only 'occasionally' trusted the sign information which is over four times the percentage that stated this in the other two age groups. When examined more closely the majority of patrons in this group were also male and under 25, both of which were less likely to trust the sign information overall.

Trust plays an interesting role in the level of awareness of the various conditions of possibility the bus patrons are beginning to identify. Once again the failure of the council to provide much information on how the system actually worked proved highly problematic. Interestingly women were more likely to trust the sign information than men despite men more often identifying that the signs had had a positive influence on their perceptions of the bus service. This shows a distinction between how the patrons perceive the bus services in general and how

they feel about their own bus catching experiences. It also demonstrates that numerous factors can contribute to the conditions of possibility that may emerge and that there are an infinite number of these depending on the individual's experience, age, gender and many other factors not recorded in this empirical intervention.

Changing Behaviour: Constituting Emerging Timespaces at the Bus Stop

As the bus patrons begin to work through their experiences of the RTPISP System they are beginning to perceive the bus services as more or less reliable and they have different degrees of trust in the information, a perception that may change over time. The bus patrons are starting to make decisions based on these new conditions of possibility, and these in turn are beginning to contribute to patrons' constitution of alternative[29] timespaces. From personal observation and my own experience of using bus stops equipped with real time signs I had begun to be more aware of the space in and around the bus stop. I began to notice the broken seat and, the shops, and was more willing to engage in other activities while waiting as my eyes were no longer glued to the street waiting for the bus. This perspective was also observed by Dziekan and Vermeulen who speculated that "people may simply walk by the stop, see that there are still several minutes until… departure, and decide to use the remaining time to do something else" (2006: 84). Consequently, the questionnaire was interested in seeing whether the Auckland patrons behaved similarly regarding the space of and around the bus stop and whether the provision of real time information provided them with more choice as to what they could do while waiting.

As outlined in Chapter Four all of the 15 bus stops used in the survey were located in suburban shopping areas comprising of cafes, bookshops, greengrocers and so on as illustrated in Figure 6.2. These environments were selected as they provide several opportunities for waiting bus patrons, offering access to alternative timespaces. The patrons were first asked which one of the following statements best described their use of the electronic sign at the bus stop. Did they,

A. check what time the next bus is due and sit and wait
B. check what time the next bus is due and then do something else while you are waiting e.g. go to the dairy

[29] Alternative to their bus catching experience prior to the sign installation.

C. check what time the next few buses that you are wanting are due and plan your activities around that
D. do not use the sign, just sit at the bus stop

The majority, 71%, of the bus patrons surveyed stated that they checked the sign and then just waited for the bus and a further 5% identified that they did not use the sign. There appear to be two predominant reasons for this. Firstly, mistrust of the sign information. The negative reactions discussed earlier were demonstrated very clearly through the responses to this question with comments such as "I couldn't risk it" and "No, because sometimes the information is wrong" were common. Interestingly the other factor was less overtly connected with the RTPISP System itself. Several of the bus patrons identified that their purpose for being at the stop was to catch the bus so they felt no need to do anything else except wait.

The remaining 24% of those surveyed chose B or C i.e. either to do something else while waiting or planned their activities around the sign information. Consequently by actively making the decision to do something else while waiting these individuals are beginning to constitute new timespaces. The most common activity they chose to engage in related to retail activities such as buying a coffee or looking in the bookshop, not a terribly surprising finding given the location of the stops surveyed. What was interesting was what emerged when the particulars of this 24% were examined. Women were slightly more likely to go and do something else 27% compared to 19% of men and those between 25 to 50 years were also slightly more inclined to do something else while waiting 28%, compared to 21% for the under 25, and 20% for those over 50. These results mirror those for the amount of trust the various groups placed in the real time information discussed previously. When looked at from the perspective of the frequency with which they caught the bus, familiarity was again a key feature, of those 24%, as 58% of these were everyday commuters. It was clear, however, that what the patrons' behaviour was contingent on was the length of the wait. If the wait was quite long, usually over 20 minutes, they would consider alternative modes of travel such as walking or going home to get the car. This has implications for transport planning particularly in terms of bus service frequency, as clearly despite this recent advent of real time information there is still a point at which people begin to consider the car a viable alternative.

To determine just how influential trust in the RTPISP System is to these bus patrons' decision making processes each was asked "If you knew reliably that the bus is more than 10 minutes

away do you feel this gives you a choice as to what to do with that time?". The percentage of patrons who responded yes they would consider doing something else while waiting for the bus more than doubled to 62%. This dramatic increase implies that if the reliability of the RTPISP System can be improved (which is currently occurring) this will alter the bus patrons behaviour while they wait, potentially allowing them to constitute many more alternative timespaces around the bus stop. Among other things this would have economic ramifications for any shops or services in that area around these real time signs.

The patrons were also asked two questions pertaining to whether their perceptions of the bus stop environment and the shops around the bus stop had changed. Again the questions asked for a yes/no response and explanation. 81% said that 'No' it had not changed their perception of the bus stop environment, and notably none of these respondents provided an explanation as to why they felt this way. Just under half of the 19% that said 'Yes' did provide explanations and these were generally associated with noticing the other people waiting at the stop more or that the sign made the stop more professional or official. This latter point requires further investigation which unfortunately was outside the scope of this research. When asked whether their perceptions of the shops and environment around the stop had been influenced by the knowledge the sign provided, again most people, 72%, responded in the negative. Interestingly the people who agreed their perceptions had changed were not necessarily the same for each question with only 11% identifying their perceptions of both the stop and the shops had changed.

Of course the constitution of multiple timespaces as a result of the sign information is not simply restricted to the environment in and around the bus stop itself, the timespaces accessed can be much further a field. Another common scenario that all bus patrons' experience particularly in the peak hours is a bus arriving at the stop with standing room only. From personal observation I had noticed that before the signs were installed if this situation occurred everyone at the stop would queue in an attempt to squeeze on. After the sign installation there was a subtle change with some people choosing not to queue. When asked about this over 50% of patrons responded that they now actively made the choice to wait for the next bus if they saw that there was only standing room. A small percentage of these put the coda on that they would only do so if they were not already running late. When this is broken down by gender, age and user frequency the results are similar. The only clear exception was those in the over 50 age group who were the least likely to wait with 70% stating that they would try to get on the bus

despite their only being standing room. In New Zealand it is generally expected that people give up their seats for senior citizens and the front seats in buses have signage indicating this. This aspect may have contributed to this finding as most of those surveyed in this group would have been senior citizens and therefore possibly they were working on the basis that they would get a seat despite the fact that there was standing room only.

The patrons' willingness to wait was most clearly effected by how regularly they caught the bus. Table 6.3 illustrates using raw numbers that less frequent users were more likely to try and get on the bus that had standing room only than wait for the next bus particularly those who caught the bus 3 to 4 times per week. When a chi squared test was applied to this data the distribution was shown to be statistically significant with a *p value* of less than 0.05. Clearly the provision of real time information provided the bus patrons with choice. Choice provides a sense of empowerment which can subsequently result in a reduction of anxiety. Furthermore, by choosing to catch the next bus these individuals actively choose to constitute another timespace (that of the next bus) which may have flow on implications for everything they did that day.

Table 6.3: Bus passengers' willingness to wait for the next bus if there is standing room only on the one at the stop as determined by their bus catching frequency.

Frequency bus caught during weekdays	"Don't wait catch this bus"	"Yes, wait for next bus"[1]	Total
1 to 2 times per week	16	15	31
3 to 4 times per week	8	3	12
Everyday	20	38	58
Total	44	56	100

[1] Includes those that said they would only wait if they had time i.e. weren't in a hurry.

The period of time people have to wait before the bus arrives, or the wait time, is a key consideration for any transport initiative as too long a wait can be highly detrimental to the person's experience of the service. Hess, Brown, and Shoup (2004) identify that people's perceptions of wait time can be highly subjective, as discussed in Chapter Two. In this intervention the patrons were asked if knowing in real time when the bus is due changed how they felt the waiting time passed i.e. does the time pass quicker, slower or neither. There was an almost even split between those who considered it made them feel like the time passed quicker and those that didn't feel that it made the time pass any differently i.e. neither. Furthermore, 22% stated it made them feel like the time actually passed slower. It is interesting to note that while knowing in real time when the bus was coming did alter individual's perceptions of how

the time passes; this did not seem to predicate patrons' decisions to do something else while waiting for the bus. So while patrons' timespace perceptions were in some cases altered by the real time signs it did not automatically led them to choose to constitute alternate timespaces.

Conclusion

This empirical intervention has shown how Auckland bus patrons' mundane everyday activity of catching the bus has begun to be transformed by the RTPISP System. This is a novel encounter with a new ICT both for the institutions involved and Auckland's bus catching public which proved to be a decisive factor. For the institutions, particularly Auckland City Council, this newness caused a number of problems when it came to the commissioning of the system, and the council's decision to have minimal public information had severe ramifications.

Dodge and Kitchin argue that "code makes a difference to the constitution and material and discursive practices of everyday life… In short, code, to varying degrees, conditions existence" (2005a: 164). The RTPISP System is a clear example of the difference that code is making in this case both to the planning of passenger transport in Auckland and the mundane everyday activity of catching the bus. Figure 6.2 revealed the coded components of the RTPISP System and how they interacted both with each other and the institutions and bus patrons using it. Drawing from MacKenzie's (2002) discussion on technicity or "the extent to which technologies mediate, supplement, and augment collective life" (2005a: 169) Dodge and Kitchin (2005a) contend that many activities that could occur prior to the invention of code are now increasingly dependent on it, they emphasise though that this process of technicity is not deterministic. In this case the bus patrons would still be able to catch the bus without the RTPISP System, as many still do at stops without signs, however their experience is now being augmented as the real time information provides more choice both as to which bus to catch and what they may be able to do while waiting.

The surveillance and signal pre-emption aspects were initially focussed on as these are two of the most commonly recognised elements of ITS in the literature. What this intervention has revealed is that by conceptualising them as part of the wider code space of the RTPISP System the institutions are beginning to engage in the process of qualculation identified by Thrift (2004a). These aspects are enabling ARTA, all of the region's councils and the region's bus operators to gather large amounts of information that was not previously available on the

operations of Auckland's bus services. They are then utilising the various functions and insights the system provides to make decisions concerning everything from day to day operations, to funding and future transport planning developments.

This chapter then went on to explore the individual bus patrons' engagement with the system. As previously identified the system is augmenting these individuals' bus catching experiences. Dodge and Kitchin contend that "technicity is contingent, negotiated, and nuanced; it is realised through its practise by people in relation to historical and geographical context" (2005a: 170) and this was evidenced by the variety of reactions to the sign information and the conditions of possibility that the patrons are beginning to recognise. For instance despite the majority of those surveyed agreeing that the system was a good idea this didn't necessarily led to the perception that the system had positively influenced the patrons' views of bus services in the region. Both negative and positive reactions are evident. Negativity was strongly derived from the low level of trust placed in the system, which is directly connected to the initial problems with the system and the failure of Auckland City Council to address these publicly. Positive views were associated with the more realistic information the signs provide, such as the fact that they now know when the next bus is coming if one drives past full. These differing pre-conditions of possible interaction, particularly disparities such as the men being more likely to consider the signs positively, influenced the bus patrons' perceptions of the system, yet less than half trusted the sign information, demonstrating just how nuanced and contingent the process of technicity is in the case of the RTPISP System.

What is noteworthy is that some of the sensed conditions of possibility are enabling the patrons to begin the process of constituting alternative timespaces. These timespaces are often ones they may otherwise have not been aware of or had the ability to access prior to the sign installations. Although the number of bus patrons that choose to engage in other activities while waiting for the bus is still quite small the most telling aspect was that if the system could be proved to be reliable the bus patrons were increasingly willing to do something else while waiting for the bus to arrive. By interrogating the data this chapter has revealed the ways in which these bus patrons are slowly starting to view the timespaces in and around the bus stop itself, either through more awareness of the environment or feeling differently about the wait time. In doing so it has shed light on what occurs in the gap between the conditions of possibility that can be conceived of through the ICTs, in this case the RTPISP System, and what is actually constituted in terms of alternative timespaces - the *in between.* From the timespaces that are beginning to

be constituted either through engagement in retail activities, the decision to opt for an alternative mode of travel due to delays or the decision to wait for the next bus this chapter clearly shows that the RTPISP System is not instigating a compression of space by time as discussed in Chapter Two instead it is opening up multiple timespaces in ways not hitherto experienced by these bus patrons..

CHAPTER SEVEN:

E-learning Experiences at the University of Auckland

Introduction

E-learning is gaining prominence in tertiary institutions throughout the world as a way to provide more flexible and open learning environments through the use of ICTs. The concept of e-learning has been around for over 20 years with Hiltz's (1986) investigation one of the first to consider the implications of ICTs on learning, particularly the impersonality of computers as compared to face to face contact. A large amount of the focus, as discussed in Chapter Two, has been on ICTs' ability to enhance distance learning (Haythornthwaite and Kazmer, 2002). Recent international research by the OECDs' Centre for Educational Research and Innovation (2005) concluded that while most tertiary institutions were developing "some form of central strategy for e-learning" (2005:13), it had not lived up to the hype of the dotcom era. Physical campuses are not being replaced by virtual ones, and that the economic benefits of e-learning had been overstated. Instead their research identified that predominantly e-learning involved blended learning or the use of ICTs to complement rather than replace traditional forms of tertiary learning, a finding that was mirrored in recent Ministry of Education statistics on the status of e-learning in New Zealand as Chapter Three revealed.

This chapter focuses on students' experiences of two blended learning first year geography courses, Digital Worlds and The Natural Hazards of New Zealand. Stubbs, Martin and Endlar (2006) state that research into blended learning concerns the "challenge of appreciating how the nature and form of communication shapes the student learning experience and the actual learning outcomes" (2006:164). Motteram (2006) also emphasises this point identifying that the key to blended learning is recognising that the technologies are there to mediate the learning experience "but at the same time help to structure learning to make it more valid an experience and more accessible to a range of participants" (2006:19). Again drawing from Table 2.2 in Chapter Two, Table 7.1 builds on the developments in the international geographic literature concerning ICTs and education as a set of possibilities of action. The first column contains those possibilities that have received attention in the literature, and column three suggests some

hypothetical possibilities of action that could have resulted from the interactions between the e-learning mechanisms and the students but were not observed in this instance. The central column identifies the possibilities of action disclosed in this empirical intervention. These possibilities are surfacing from the students' engagements with a range of ICT mechanisms including virtual field trips and online tutorial components that are being employed in the Digital Worlds and Natural Hazards of New Zealand courses. Each interaction is beginning to alter the students' perceptions, behaviours and decision making processes associated with learning. The ensuing conditions of possibility they are recognising are, in some instances, leading to the students' constitution of multiple and different timespaces.

Table 7.1: Possibilities of action around E-learning that have previously been investigated by Education Geography, the conditions of possibility disclosed in this intervention, and those possibilities that could hypothetically have emerged from the interactions

Previously Investigated Possibilities of Action	Conditions of Possibility Disclosed in this Intervention	Hypothetical Possibilities of Action
Impersonality of computers – the loss of face to face communication due to the employment of ICTs to convey information to students flexibly in both time and space.	The University of Auckland's computer supported learning management system Cecil is changing students' expectations and the way academics convey information.	Cecil is expanded to provide video footage of lectures and real time video interactions with lecturers and students providing an online timespace which reduces the need to be in the same physical space at the same time.
Distance learning allows students to be flexible both in the spaces they learn and to lesser extent the times they engage in learning activities. Neoliberal pressures are evident though with efficiency and cost strongly influencing the learning environment.	Blended learning – students appreciate the combination of traditional and e-learning mechanisms to provide them with added flexibility that neither can provide if used alone. The still favour face to face contact though and the motivation of needing to physically attend classes.	Students are very selective in which technologies they use for which tasks as only some provide conditions required to construct more flexible learning. Which technologies are appropriated will be a complex process.
Blended learning presents some learning flexibility both temporarily and spatially but requires the students' physical presence at a specific time and place for certain learning activities.	Students' behaviour is changing and a wider range of learning styles can be catered for via e-learning. The students are more aware of alternative timespaces that can be used for learning	
E-learning mechanisms are providing a range of ways to communicate information to students and these are becoming increasingly flexible in both space and time.	Students prefer certain ICTs to communicate with tutors and lecturers e.g. email created more flexibility rather than waiting until office hours. Reveals interesting aspects about the use of specific technologies for specific purposes.	

Chapter Three described the underlying political processes that have led to the current tertiary education situation in New Zealand and this chapter begins by providing further evidence of this through its discussion of the University of Auckland's institutional responses to e-learning. Prior to 2006 various arbitrary e-learning initiatives were occurring around the University but most of these failed due to lack of support and funding. In 2006 a restructuring process was undertaken to reorganise these disparate units and this resulted in the establishment of the eLearning Design and Development Group within the University's Centre for Academic Development. This group's work is primarily targeted at providing staff with the necessary skills, training and support required to provide e-learning mechanisms to their students[30]. When asked how the group is situated within the wider national legislative initiatives discussed in Chapter Three the group's manager responded by agreeing that there had been increased attention paid to e-learning at a national scale since the mid 1990s and that the group's practices do reflect this. However, the group's development was not directly instigated by the national processes. The eLearning Design and Development Group also promotes a collaborative approach in which ideas and experiences are shared and is engaging in a number of projects both within the University and with external organisations.

Operating separately to this group is what the University considers its two main e-learning mechanisms. The first is the Library Electronic Academic Resources Network (LEARN). This gives access to an extensive collection of international online databases, journals, electronic learning support and a catalogue of all the print based resources throughout New Zealand on a 24/7 basis. This system has revolutionised the way students and staff conduct research both in terms of the information sources provided and the various workshops that are run both online and off line on how to use these services. The other primary mechanism is Cecil the University of Auckland's computer supported learning management system. The deployment of Cecil began over seven years ago and it plays a significant role in students' University experience (Sheridan, White, and Gardner, 2002). Operating two interfaces, one for the students that contains information on all their papers, communications, lecture notes, marks, tests etc the other for instructors, which allows staff to provide course information, communications and assessments online (Sheridan et al, 2002). Resources for all of the papers and courses run by the University are accessible through Cecil, although not videos of lectures, and the system is tied

[30] For more specific information go to the following link http://www.cad.auckland.ac.nz/index.php?p=elearning

into the enrolment database to ensure information on students' profiles are always current. The University of Auckland is home to over 28,000 students and during semester time an average of 24,000 student logins to Cecil were recorded per day (Cecil, 2006). The students' perceptions of Cecil in the two courses this intervention examines will be investigated at various points throughout this chapter.

Introducing the Two Courses

The methodology used to investigate this empirical intervention was detailed in Chapter Four and this also revealed how my position as a both a tutor, lecturer and student gave me a unique set of insights both as an insider and outsider on these two courses. The Digital Worlds course has run yearly since 2004 in the University's Summer School semester, which lasts for six weeks from the beginning of January and is viewed as the equivalent of a third semester in that it is an arena for mainstream courses. According to the University prospectus Summer School is targeted at three different groups of students: those who want to proceed through their degree faster; those making up failed papers; and those undertaking double majors who require flexibility in their timetable (University of Auckland, 2006). The prospectus emphasises that Summer School papers require a high level of commitment as they represent full papers with a condensed teaching schedule of 6 rather than 12 weeks. For some this pressure is increased because summer is traditionally a time when students engage in part or full time work to earn money for the following year's study. Unfortunately no formal research has been conducted on the Summer School programme as a whole to identify the types of students that enrol but observation suggests that Digital Worlds reflects the three categories identified by the prospectus. Overall, the student composition of Digital Worlds was mixed with students at varying stages of their degrees; several were in their final year and using Digital Worlds to complete. The great majority were subject to a range of external pressures and often commented on how their summer work commitments made it difficult to juggle their timetable.

The Digital Worlds' course was initially proposed to provide an avenue for combining aspects of human geography related to contemporary processes with knowledge of geospatial technologies. It was also concerned with developing and evaluating new teaching modes and its placing in Summer School was essentially one of pragmatic logistics both for the material and the staff involved. Enrolment in the Digital Worlds course has increased from an initial 28 students in 2004 to 56 in 2006 and with its new classification as a general (liberal education) course increased to 79 in 2007. The structure of the course has remained the same over the four

years, with three, one hour lectures and one, two hour lab per week. The labs were run using a combination of traditional lab teaching instructions and certain e-learning mechanisms, often with the expectation of additional independent work for completion. The students were encouraged to attend labs to collect instruction handouts and listen to the tutor's briefing. The handouts were also made available after the lab at the School's student centre. They were given one week to complete each lab which was then emailed to the tutor. The two hour labs gave students the opportunity to have questions answered immediately by the tutors but students could also email questions to the tutors outside of these times. Each lab included a GIS component that could only be completed in a geography computer lab, although the University Information Commons was also configured for GIS the students would have needed to be supplied with the correct files and this option was not provided. The geography lab provides 60 computers and is open from 8am to 6pm Monday to Friday, subject to limited competition from other courses. The labs also had an online component which could be completed anywhere including the University Information Commons which has some 400 computers open from 7am to 10pm seven days a week. Consequently, a student could technically complete all the labs in their own time using these venues, removing the need for Internet access at home, and without ever attending their assigned lab times. Notably however, throughout the 2006 and 2007 courses attendance in formal lab times was quite high, about 70% to 80%. Each of the labs also had a 'U lab' component, which entailed preparation work for the following week's lab. 'U' stands for ubiquitous, emphasising the nature of the lab. This involved autonomous field observation or data capture in a range of locations using appropriate technology and resources, such as a mobile phone.

The intention of the first questionnaire was to ascertain the students' perceptions of both traditional and electronic forms of learning. It was distributed to the class during their first week of the course. There was a 44% response rate to this questionnaire in 2006 and a 40% response rate in 2007. As less than 50% of the class responded this may indicate that the results are atypical of the wider group but the fact that the students were all undergraduates and had chosen this specific paper in summer school makes them reasonably homogenous in terms of this research. While none of the results are statistically significant they provide some interesting insights into how students perceive these two learning forms. The second anonymous questionnaire was administered near the end of the paper with the aim of assessing the students' perceptions of e-learning now that they had experienced some mechanisms. In 2006 the response rate was slightly higher for the second questionnaire at 48%, unfortunately in 2007 the

response rate dropped significantly for the second questionnaire with only 19% responding. Part of the reason for this lower response rate may relate to the second questionnaire coinciding with the course essay due date.

The Natural Hazards in New Zealand course, as explained in Chapter Four, was selected to provide additional information for this case study as it also utilises e-learning but in a different format to that of Digital Worlds. First offered in 2006 The Natural Hazards in New Zealand course introduces students to the impacts of a range of natural hazards on the landscape through a series of case studies and scenario models. Unlike Digital Worlds this is a first semester course runs over 12 weeks, it therefore does not have the pressure of a compressed timetable. The course is structured around two lectures per week with a 40% internal assessment component comprising of four laboratory exercises and a test. The response rate of 68 students, as previously explained in Chapter Four was an over 50% return rate.

Field trip campaigns are not undertaken in first year owing to the size of stage one courses. This course was designed with that aspect in mind coming up with the novel solution of using a CD to provide a series of virtual field trips as a useful substitute. Distributed free to students at the beginning of the course they were instructed to use the CD to perform the four laboratory exercises. The CD contained various layers of detail on each case study as illustrated in Figure 7.1 below. The CD replaced traditional labs and provided the added dimension of a virtual field trip containing substantially more information than could have been contained in a traditional lab slot. As this was a new course and the first time something like this had been done within the School it has retained a series of ‘‘drop in’’ lab times for the students so that if they needed face to face interaction with the tutors they could. These were held three times during the week prior to the week the laboratory exercise was due. The CDs provided the students with the flexibility to conduct the labs at any point, as long as they handed the relevant one in at the appropriate deadline.

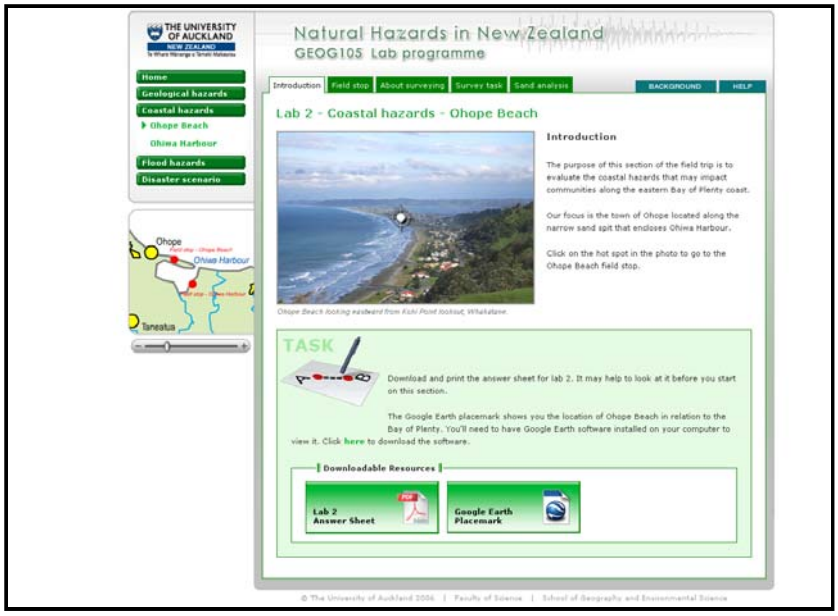


Figure 7.1: A screen shot of one of the lab exercises provided on the CD, note the tabs across the top indicating various layers of material and the link to Google Earth at the bottom.

Students' Understanding of and Exposure to E-learning

The generally accepted understanding of e-learning involves using ICTs to facilitate a more flexible and open learning environment. It was important though not to assume either that the students had such a general understanding or that they defined e-learning in the same manner as this. Consequently, the preliminary question asked in both course questionnaires was – "Have you come across the concept of 'virtual learning' or 'e learning' and if so what is your understanding of it?". Figure 7.2 shows that the majority of those students taking the Digital Worlds course had some awareness of e-learning. In 2006 84% of the class had an elemental understanding of e-learning with 28% specifically referring to Cecil and a further 40% referring to the Internet or online learning, several commenting on its intent to "ease access" or "replace face to face contact". In 2007 the results were less marked with only 62.5% stating they had an understanding of what was meant by e-learning. A further 6% queried whether Cecil was e-learning or mentioned they had seen adverts for it online but didn't know what it was about. It is unclear as to why there was such a difference between the years. One potential reason was the transition to running the Digital Worlds as a general education course in 2007 opened it up to a wide range of students from very different backgrounds. In a reverse of this trend 55% of those taking The Natural Hazards of New Zealand course had no understanding of e-learning. A partial explanation for the difference between the two courses may be tied to the interests of the students taking them. Those interested in Digital Worlds are probably more aware of issues concerning technology than those interested in the environmental issues of the Natural Hazards of New Zealand course.

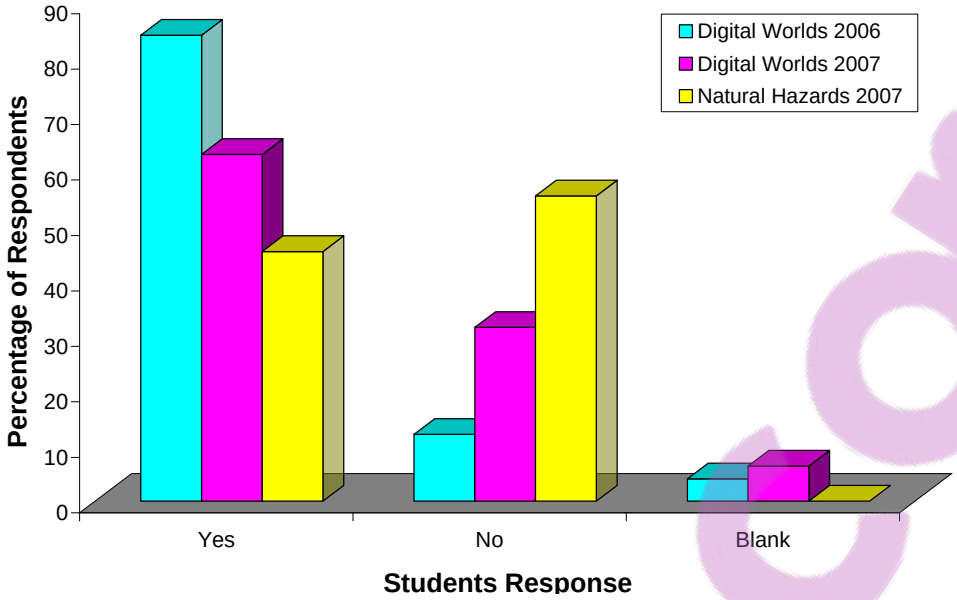


Figure 7.2: Whether the students had previously come across the concept of virtual learning or e-learning

The students on both courses where then asked about their actual experiences of e-learning at the tertiary level. As Figure 7.3 demonstrates the results were more comparable both between years and courses with 36% of the 2006 Digital Worlds, 31% of the 2007 Digital Worlds students and 25% of The Natural Hazards of New Zealand students surveyed stating yes they had some experience of virtual learning. This low percentage may explain why less people knew what e-learning was in both courses in 2007; however, over half of those that demonstrated an understanding of e-learning had not actually experienced it at the tertiary level. In addition, many students stated that their experience was limited to the use of Cecil with comments such as "only if Cecil counts" indicating their uncertainty as to what e-learning actually constitutes.

In addition the second questionnaire administered at the conclusion of the Digital Worlds course explored whether the students understanding of e-learning had improved due to their exposure to various mechanisms throughout the course. In 2006, 78% of the respondents agreed that they had gained a better understanding of e-learning and in 2007 this increased to 93%. The majority of those that responded in the negative explained that they had already been familiar with the concept of e-learning.

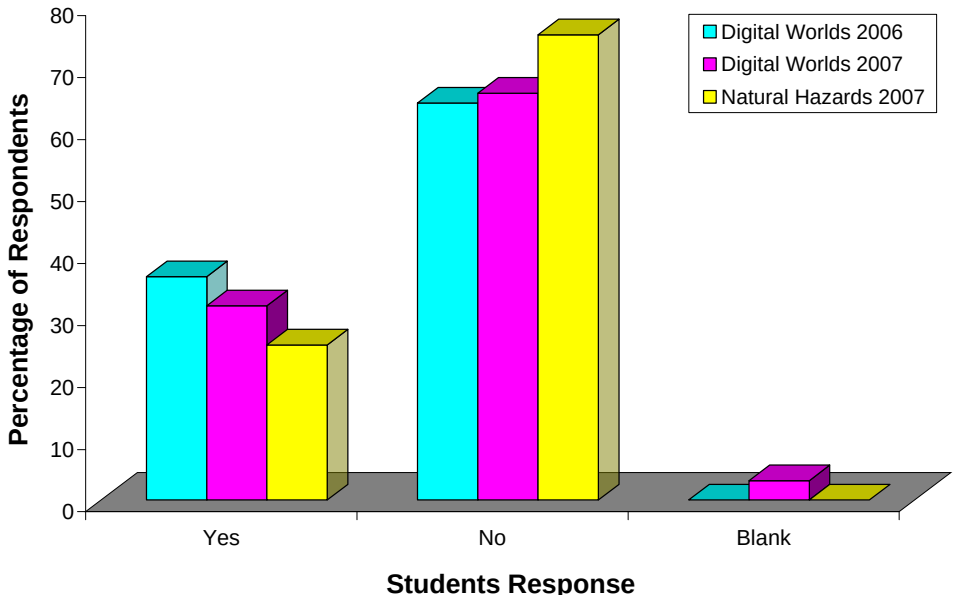


Figure 7.3: Students' experience of tertiary courses run online

The University of Auckland's use of Cecil as its main e-learning mechanism to provide course information was also explored in the initial questionnaires administered to the Digital Worlds course in 2006 and 2007. The students were asked about Cecil's online discussion forum mechanism as it provided a comparative means to the online interactions of distance learners, as this is where most research is situated. In Cecil this mechanism allows students enrolled in the same paper to discuss issues and also provides a medium for the instructors to initiate discussion about various aspects of the paper. In both 2006 and 2007 just over half of the students who responded had used this mechanism during their time at the University of Auckland. Considering the ubiquitous use of Cecil for the basic provision of learning material this is quite a low percentage. Of these students some found the forum to be a positive experience identifying that it was a "good way to seek help", "a good tool for discussion" and "can be helpful as other students are usually going through or experiencing the same problems". There were also those students who had a negative experience with the forum. Of particular note within this group were the 12% in 2006 and 16% in 2007 that had begun to use the forum only to find that no one else was, so they stopped and consequently chose not to use it in any other papers that offered it.

In order to discover whether there was simply a general reluctance to used online discussion forums or whether this issue was specific to Cecil two subsequent questions were asked. Firstly, had they experienced other chat rooms besides Cecil and secondly if an online paper specific chat room was set up separately from Cecil, would they use it. In 2006 68% and in 2007 63% of

students had used such online chat rooms outside of Cecil. When asked if they would use an alternative forum to Cecil 44% in 2006 and 59% in 2007 stated that, yes, they would. These results are not really clear cut enough to draw any specific conclusions. A key point to note is that of those students stipulating that they would use an alternative course chat room several qualified this, stating they would only do so if others used it. This indicates that how the chat room is used and facilitated rather than the mechanism that provides it is the primary issue. The majority of those that stated they wouldn't use an alternative chat room tended to prefer face to face contact rather than any online forums with comments such as, "No, personally I don't really like talking to people that I don't know" and "No I'd prefer to talk to a tutor or fellow student in class or in an office hour (sic)".

Blended Learning: What Possibilities May be Emerging?

Combining traditional forms such as lectures with e-learning mechanisms to provide blended learning can be a difficult balancing act (Motteram, 2006; Stubbs, Martin and Endlar, 2006). Much of the research in this field emphasises the technologies involved while neglecting to assess the effectiveness of the traditional mechanisms used alongside them. As Laurillard (1993) points out there are issues relating to both the intrinsic limitations of the traditional approaches involved and the way they are delivered. Consequently a range of questions were asked of the students in Digital Worlds and The Natural Hazards of New Zealand courses. First the students' attitudes and preferences associated with traditional forms of learning and various e-learning alternatives was ascertained. The e-learning mechanisms used in each course are then explored in greater detail to identify what the students found useful and what problems they had. This is then followed by a more in depth look at the Digital Worlds course where students were actually asked to reflect on any learning or behaviour changes and if and how their temporal and spatial perceptions may have changed as a result to exposure to blended learning. All of these aspects are enabling students to perceive an increasing range of conditions of possibility in their tertiary learning experiences. In essence they provide the moments of *in between* as the potential of blended learning begins to be realised by those it directly affects, the students.

Traditional and E-learning Mechanisms: a Balancing Act

The initial questionnaires administered to the Digital Worlds students enquired into their impression of lectures and followed this with a series of questions asking them to choose

between traditional learning mechanism and an e-learning alternative. Figure 7.4 illustrates the students' responses to these questions. It appears that students still perceive lectures as a good way to learn with 68% in 2006 and 91% in 2007 identifying positively with this statement. The key justifications they provided were the extra detail given by the lecturer and the ability to perceive any emphasis the lecturer placed on details. There was also a proportion that stipulated that the ability of the lecturer played a key factor on the value of attending lectures.

Figure 7.4 also demonstrates that students' preferences varied significantly when asked to choose between a traditional mechanism and an e-learning alternative. The most interesting finding was that cross-analysis of the students' responses to the different forms of learning revealed no clear preferences for either approach. There was a slight favouring towards traditional forms of learning with 36% in 2006 and 19% in 2007 preferring to attend lectures and tutorials. Overall, however, there was considerable variation, from preferring lectures but wanting to conduct tutorials online or the reverse, through to those who had had negative experiences in lectures and therefore would choose to do everything online.

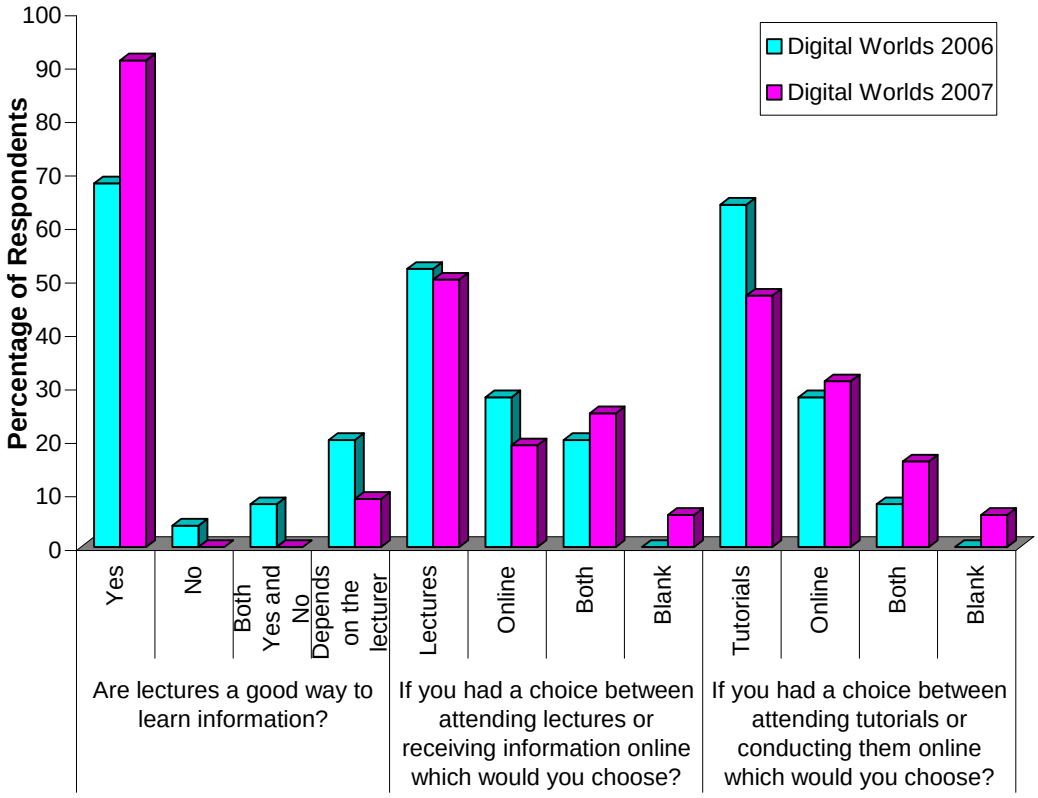


Figure 7.4: Questionnaire results from 2006 and 2007 illustrating students' preferences when it comes to traditional and e-learning mechanisms

To provide further details as to the types of responses given Table 7.2 contains examples of the students' justification of their particular preferences. It reflects the diverse range of experiences and learning styles of the students and the conditions of possibility emerging from these are as varied as the students' responses to the preferences. According to the students, traditional mechanisms provide face to face contact that required them to physically attend. Many identified this as a key motivation factor for learning. The possibilities that arise from this scenario are well recognised, the ability to get immediate responses to questions and a level of added detail the lecturer/tutor provides that can't easily be conveyed electronically. Accessing and conducting the lectures and tutorials solely online gave quite different conditions of possibility with students recognising the increased flexibility provided both in terms of the pace of their learning and where and when this was undertaken. Interestingly the students that preferred to conduct tutorials online identified it as a way to reduce their level of anxiety, also for those students`` with less confidence it provided them with the conditions of possibility to avoid peer pressure. There were a small but growing number of students between 2006 and 2007 who preferred to have both types of learning. This is in line with the growing trend towards blended learning courses. What this reveals is that students' preferences are very much based on their learning styles. The greater the range of learning options the more conditions of possibility students are able to recognise.

Table 7.2: Extracts from Digital Worlds students responses to question regarding their preference for traditional and or e-learning mechanisms.

Preference	Examples from Students Responses
Attend Lectures	*"I would choose attending lectures because you can get extra information which is relevant to the topic taught on that day"* *"personal attendance, as it forces you to learn more"*
Access Lectures Online	*"Receiving it online. I could learn at my own pace and at my discretion; would not be effected by poor timetabling and travel time to campus"* *"Online. Basically this is because I prefer the flexibility of the Internet. Doing course online are much easier to fit in around other things (sic)"*
Both Attend Lectures and Access Lectures Online	*"With sufficiently good lecture material – something closer to an HTML textbook than a PowerPoint presentation – would choose online. However I'd still likely need lectures to force myself to study"*
Attend Tutorials	*"I would choose attending tutorials because I feel that human interaction is key to learning"* *"Attending tutorials – instant feedback is much better"*
Online Tutorials	*"Online – easier to ask questions without people looking at you weirdly"* *"Conducting tutorials online. I am generally too shy to approach a tutor in person to ask for help, and email them anyway."*
Both Attend Tutorials and Access Tutorials Online	*"Attending tutorials for debatable issues and group dynamics but online tutorials for informative sessions"*

"Attending tutorials helps. But I feel emailing the tutor questions is better as you don't need to ask them face to face. In tutorials sometimes it could be harder to get answers if there are a lot of other people"

The Natural Hazards of New Zealand course's use of a CD to replace traditional labs provided the opportunity to focus on a specific characteristic that is often used to differentiate between traditional and e-learning mechanisms, face to face contact. The questionnaire first asked the students how they felt about the absence of face to face contact. The majority 43% did not find this to be a problem. A quarter of the respondents however did not like this aspect and a further 19% had mixed feeling with comments such as a "Was OK – less pressure to complete etc in certain time but didn't encourage you to do your best (sic)" or "It was OK, but sometimes it helps more to have a real person explaining things to you" or "Its OK. Makes me more independent, creates motivation to do it myself. However it is nice having someone doing it with you for questions I needed to ask or wanted to ask (sic)". The remaining 11% pointed out that the 'drop in' labs did provide face to face contact if they needed it.

The 'drop in' lab times provided the students with the opportunity to have some face to face contact with the course tutor if required (they also had the option to email the tutor or visit them during office hours). The course tutor commented on the fact that very few students attended the 'drop in' labs and that they were considering fazing them out. He also recognised that it was usually the same students who turned up each time, demonstrating the different learning requirements of students. Figure 7.5 breaks down the students' responses when asked if they had attended any of the 'drop in' labs. It shows that only 17% of students actually had dropped in, mainly because of a particular question or lab that required further clarification. Of the 83% that didn't attend these labs most stated it was because they didn't need to with 21% identifying that the times were inconvenient. The three 'drop in' labs run in the week preceding the lab due date were all held at the same time from 4-6pm and it was suggested by some students that the 'drop in' labs should be at a variety of times to prevent timetable clashes. As with the Digital Worlds students a lack of face to face contact did not appear to be such a significant problem when it came to the tutorial/lab components. The Natural Hazards students appeared to reduce their contact with the tutors as a direct result of the CD but before the possibilities of this condition can be fully ascertained analysis of several other questions must first be worked through. Pedagogically blended learning is designed to provide a more open and flexible learning style and it appears from the conditions of possibility that these students are beginning to identify this as something they both want and increasingly come to expect from tertiary institutions.

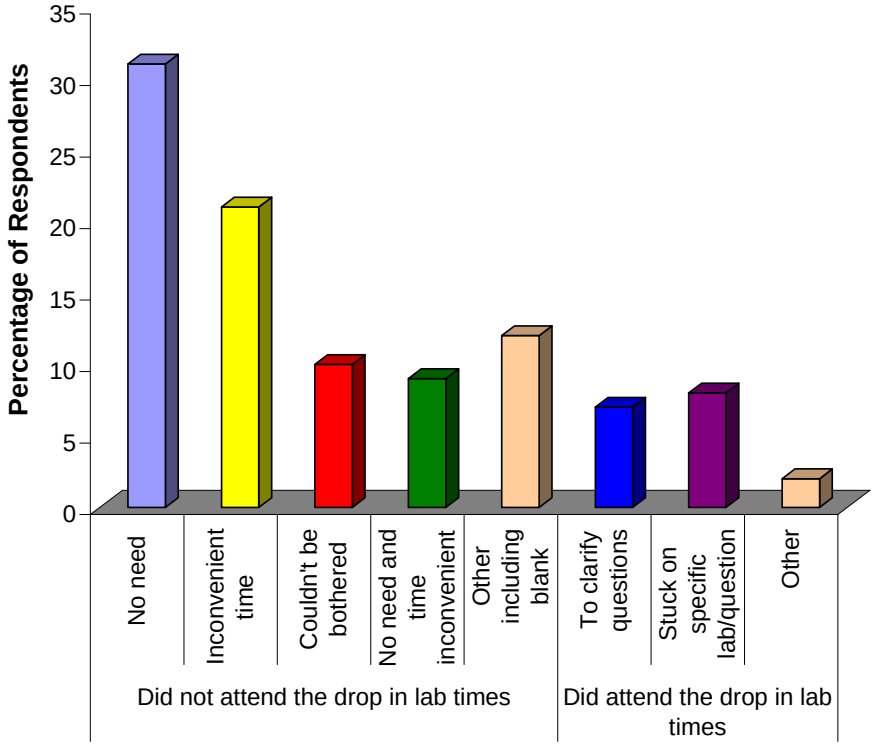


Figure 7.5: Students attendance of the 'drop in' labs and their explanations

What the Students Considered to be the Useful Aspects of the E-Learning Mechanisms Applied

The students on both courses were asked a series of questions regarding what they found useful about the e-learning mechanisms they were exposed to during the courses. For the Digital Worlds course this included online tutorial components, Cecil, and text messaging. The Natural Hazards of New Zealand students were specifically asked what they had found useful about the provision of laboratory exercises via the CD. Figure 7.6 draws from the second questionnaire administered during the 2006 Digital Worlds course[31] and shows that 85% of the respondents believed the mechanisms had been useful for a variety of reasons including their flexibility and their simplicity. Figure 7.7 demonstrates the findings of The Natural Hazards of New Zealand students' responses and, as with Digital Worlds, comments relating to flexibility and the ability to conduct these in their own time, and at their own pace were identified as the greatest benefits. The students also particularly liked the ability the CDs gave them to re-read information which proved to be useful both for their labs and revision for the test and end of semester exam.

[31] As discussed in Chapter Four the second questionnaire in 2007 received few responses and therefore does not provide sufficient data for graphical representation.

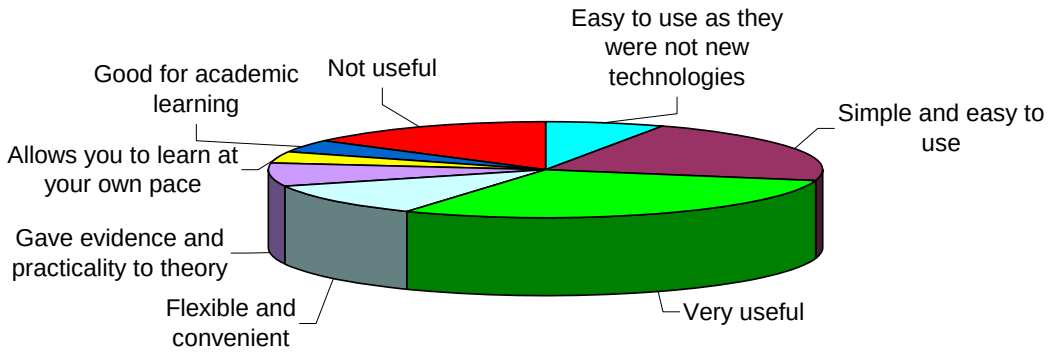


Figure 7.6: Digital Worlds 2006 – Aspects students found useful about the e-learning mechanisms

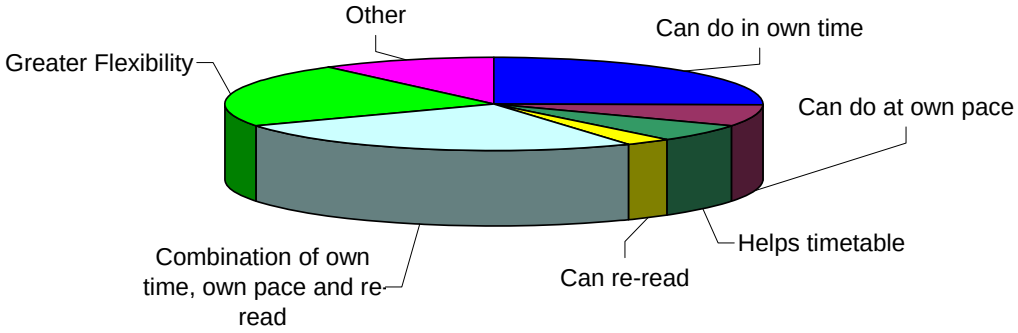


Figure 7.7: Natural Hazards of New Zealand – Aspects the students found useful about the CD e-learning mechanism

The aspects students considered useful in their experience actually confirmed their earlier expectations concerning what blended learning can provide by way of conditions of possibility. In both courses students recognised flexibility and convenience as important aspects along with the ability to undertake learning at their own pace. These conditions are forging entry points into timespaces of more accessible and open learning practices. Learning is no longer limited to specific spaces and times such as with lectures and tutorials/laboratories, yet simultaneously these timespaces retain what still appears to be a crucially important aspect for students' learning – face to face interaction.

Problems identified by the students with the e-learning mechanism used on both courses

When asked about the problems encountered during their experiences of the various e-learning mechanisms, students' responses fell primarily into two categories. First there was an assortment of responses concerning technical problems relating to the actual use of the e-learning mechanisms and second issues concerned with the students learning behaviour.

Figure 7.8 shows the responses of the 2006 Digital Worlds students to the question 'Did you experience any problems with the technologies during the course?' A range of problems were identified by 44% of the students. One of the key issues was that the labs had a strong Geographic Information Systems component with software only available on the Geography computers. As stated previously this lab was open from 8am-6pm Monday-Friday, but at times was blocked off for other courses resulting in access difficulties. The 2007 responses were very similar with most students finding the mechanisms useful with the greatest limitation being the GIS components of the labs.

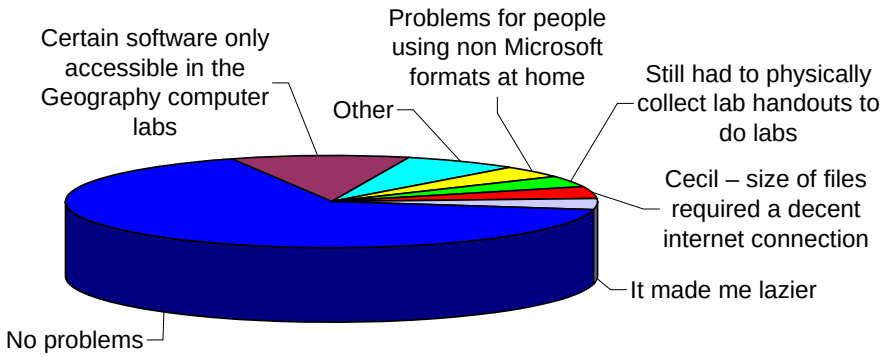


Figure 7.8: Digital Worlds 2006 – Problems the students identified with the e-learning mechanisms used during the paper.

The students of the Natural Hazards of New Zealand course were asked two questions relating to any problems regarding the use of the CD. Figure 7.9 illustrates the problems associated with navigating the CD. Interestingly the main problem was the fact that there was no one available in the immediate vicinity to answer questions, which accounted for 22%. This was identified as one of the key benefits students recognised with traditional forms of learning as shown in Figure 7.4. Technical problems with the use of the CD and a lack of clarity were the other two key problems accounting for 14% and 16% respectively. Another interesting point related to the absence of face to face interaction was that without the typical reminders given in class about due dates 6% identified that they missed handing in labs at the correct time. The students were also asked what they thought could be improved about the CD. The responses illustrated in Figure 7.10 show that most, 48% were quite happy with the existing CD format. There was a lot of variety in the improvements suggested, some of which were contradictory i.e. too much or too little information, which once again showed the differing levels and learning styles of the students.

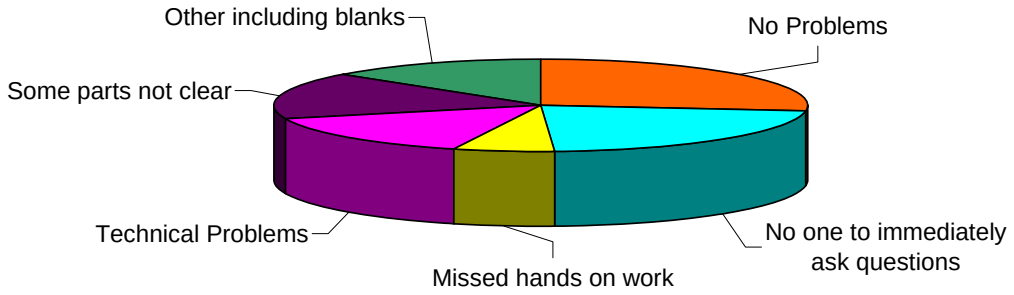


Figure 7.9: Natural Hazards of New Zealand – The Problems the students had with the CD

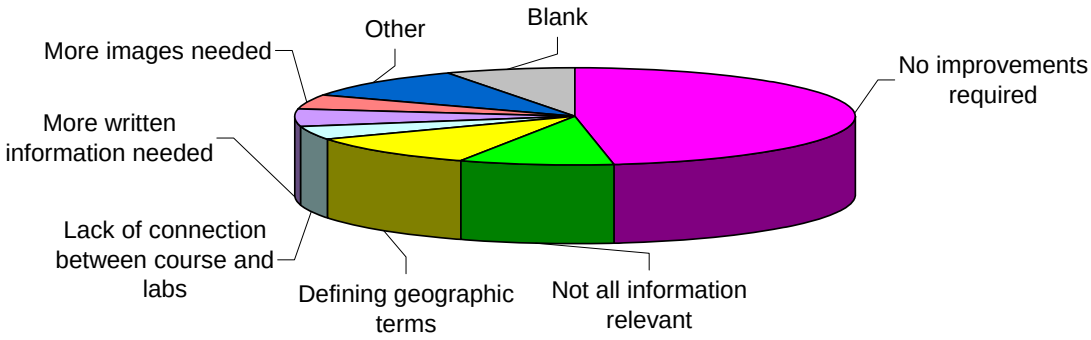


Figure 7.10: Natural Hazards of New Zealand – What the students thought could be improved in the CD labs

While clearly there are still aspects of both courses use of ICTs that need to be ironed out the key point to note is that none of these are significant issues. As long as the courses continue to practise blended learning then the conditions of possibility emerging from the useful aspects of the ICTs and complimented by the retention of traditional physical contact should begin to open up a multiplicity of very flexible timespaces for the students learning experiences.

The Emerging Timespaces of Digital Worlds

So far this Chapter has built up a picture of the range of conditions of possibility that spring from the blended learning used in the Digital Worlds and The Natural Hazards of New Zealand courses; conditions that are beginning to construct entry points into emerging timespaces around the students' learning behaviours. This section reveals what some of these timespaces are beginning to look like for those students undertaking the Digital Worlds course.

The Digital Worlds students were asked to reflect on whether the use of these e-learning mechanisms had altered their perspectives or behaviour in terms of the way they approached learning. In 2006 there was quite a range of responses to this question as illustrated in Figure

7.11. The majority, 41%, clearly identified that the course had changed their perspectives and behaviour with comments such as, "Definitely change perspective – makes a difference having those resources so readily available. More open to using Internet, willing to explore more" or "Yes definitely. I'm more pro e-learning now and feeling confident to do work online and submit work online".

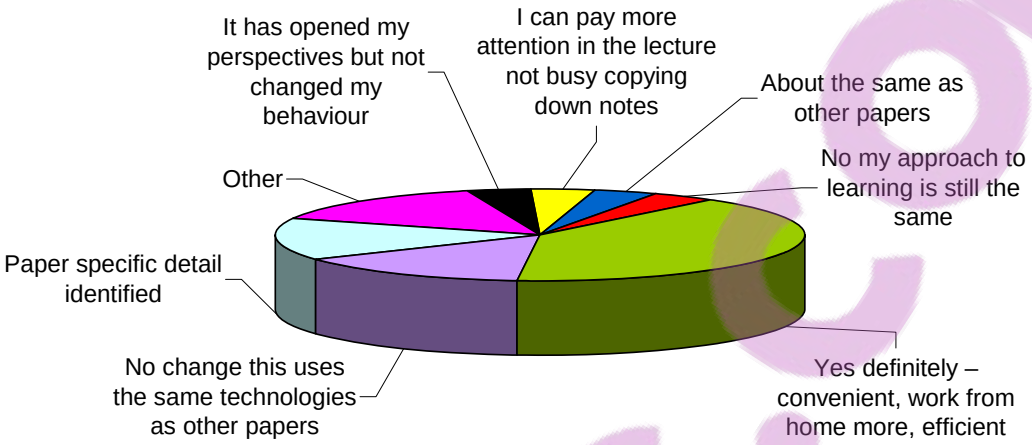


Figure 7.11: Digital Worlds 2006 – Ways in which the e-learning mechanisms have changed the perceptions and behaviour of the students

In 2007 the results were quite different with over 50% of the respondents stating that their perspective and behaviour had not changed. The key reason given was that they already had experience with these technologies on other courses so this was nothing new to them.

The Digital Worlds students were also asked about the provision of lecture notes, readings and course announcements through Cecil. The questionnaire pointed out that this was a relatively new mechanism and prior to its advent they would have had to rely on taking their own notes in class. The students were first asked whether they thought provision of material on Cecil had altered their behaviour or attendance of lectures. The majority of the respondents in 2006 and 2007 identified that they still considered attending lectures as important, mainly to get more detail. In 2006 52% and a third in 2007, however, stated that they appreciated the added flexibility of having the material accessible online in case they missed a lecture for some reason. In 2007 there was also increased mention of the need to take fewer notes in class and pay more attention to what the lecturer was saying as they new they could download the slides later.

The students were then asked how useful they found having materials such as lecture handouts available online through Cecil. In 2006, 89% stated they found it very useful for quite a number of reasons including 30% who identified using it to catch up on notes if they missed a lecture

and 26% commenting on being able to pay more attention to what the lecturer was saying in class rather than furiously copying down the slides. Two indicative examples of the comments made were, "Very useful – Missed a few lectures because of work so downloaded the course material" and "Very useful, allows me to listen more in class and take in concepts rather than continuously note down facts and numbers".

In 2007 100% of the students found the provision of material on Cecil useful, identifying very similar reasons to those given in 2006. During the 2006 Digital Worlds paper there had been occasional problems with the quite large sized PowerPoint documents put on Cecil. This issue was compounded by the prevalence of dial up Internet connections. In 2006 dial up was still significantly cheaper than broadband and hence most of the students probably relied on this type of connection. In 2007, however, due to the recent legislative changes outlined in Chapter Three, most of the class had broadband, also the provision of material on Cecil improved.

Forer (1998) describes learning as a spatio-temporally constrained activity, and argues that e-learning provides greater choice to students juggling study, work, family and recreational activities. The Digital Worlds students were therefore also asked to comment on the impact of the e-learning mechanisms on their spaces and times. This was to see if by giving students access to blended learning courses such as these we can begin to imagine the timespaces they may constitute. The range of responses to this question from the 2006 questionnaire are shown in Figure 7.12. Over 60% did include a reference to the flexibility and the greater range of choices provided by these mechanisms. There was an increased awareness of other spaces such as the home as a study environment with 29% feeling it gave them more time. Interestingly 19% of students in the 2006 questionnaire left this answer blank. In Chapter Two the technological unconscious and taken for granted nature of many ICTs was examined, particularly Thrift and French's (2002) work on the automatic production of space, and this sizeable proportion of blank answers may indicate that these students hadn't really considered the ramifications of ICTs on their times and spaces, instead just taking them as given. Very similar results were recorded in 2007 with again over 60% identifying increased flexibility and choice. The timespaces that are beginning to emerge reflect that tertiary learning experiences are no longer fixed to specific locations and times. Learning can occur in multiple contexts though students still appreciate a point of physical contact. There are certain aspects that will always be easier on campus where facilities are located, yet how, when and where these are accessed is increasingly flexible and open.

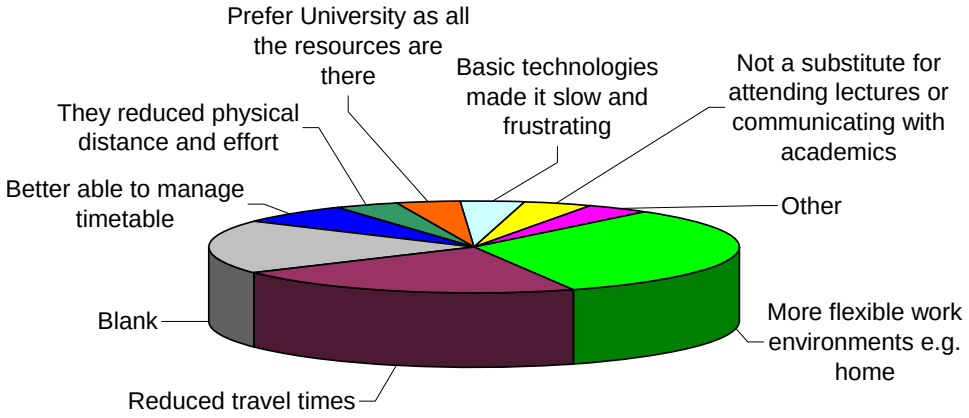


Figure 7.12: Digital Worlds 2006 - How students perceived their times and spaces had been influenced by the e-learning mechanisms used in the course.

The Changing Nature of Communication between Students and their Tutors and Lecturers

The range of ICTs that students now have access to has extensively opened up the ways in which they can communicate with lecturers and tutors. From personal experience I have found that students are now more likely to swamp you with emails than visit during your office hours. Much of the discourse has focussed on how information is communicated to the students which this chapter has already explored. This section investigates what role ICTs may be playing in how students in turn approach lecturers/ tutors. These changes are creating new conditions of possibility regarding the student teacher relationship due to the increased accessibility these imply.

The increasing prevalence of text messaging particularly among youth (16-24 years old) led the Digital Worlds' main lecturer and course designer to experiment by providing students with the ability to text message questions concerning the course. The initial questionnaire subsequently included a question asking students whether they would consider text messaging the lecturer and to explain their answer. The majority, 72%, responded that 'Yes' they would consider using this option and there was quite a mixture of explanations, as demonstrated in Figure 7.13. The second questionnaire administered in 2006 contained a follow up question asking if they had sent any text messages to the lecturer and once again to justify their answer. The responses were quite surprising given the initial popularity of the idea, only 2 of the 27 students that responded had actually text messaged the lecturer. All of the students involved in the paper had mobile phones (this had been ascertained for one of the lab activities) so accessibility was not an

issue. The responses given for not utilising this tool varied but the majority 33% stated that they hadn't needed to ask any questions, which as a tutor on the course I found somewhat surprising given my frequent interactions with the students. As such I recognised they need for further investigation.

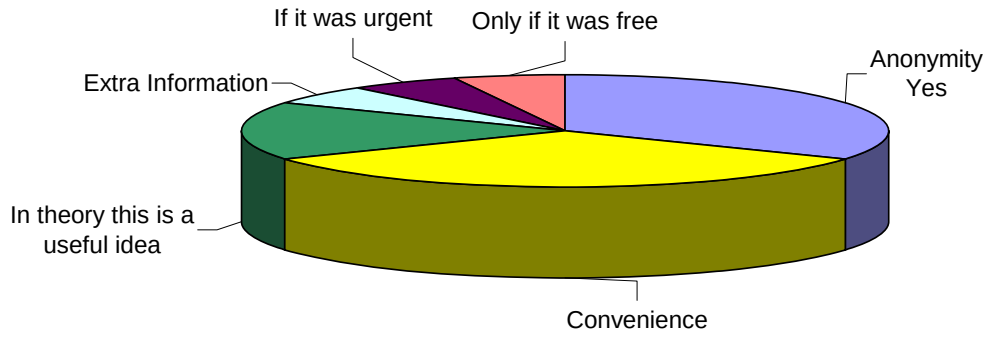


Figure 7.13: Digital Worlds 2006 – The reasons given by those students who responded favourably when asked if they would text message the lecturer

Unfortunately only a limited form of follow up to this investigation was available in 2007 as the main lecturer, who's mobile had been the point of contact was on sabbatical and a number of replacement lecturers were brought in to teach. Consequently the initial questionnaire was adapted to ascertain the students' communications preferences by asking which of email, phone or text message they would consider using to communicate with lecturers on the course and to explain their choice. This was done both to investigate the other more common options available and to explore whether the 2006 results concerning text messages was particular just to that group of students or if it was a wider phenomena. As shown in Figure 7.14 below, there was an overwhelmingly negative response to the use of text messages to communicate with the lecturer. In both 2006 and 2007 the lack of detail was a deterrent for the use of text messages but what was revealing about the 2007 survey was that 39% of the students stated that they wouldn't use it because they considered it was too personal or informal a way to communicate with a lecturer. This demarcation of ICTs for different purposes is interesting as it reveals that students can be very selective as to which technologies they appropriate for which tasks, something that requires future investigation but is beyond the scope of this thesis.

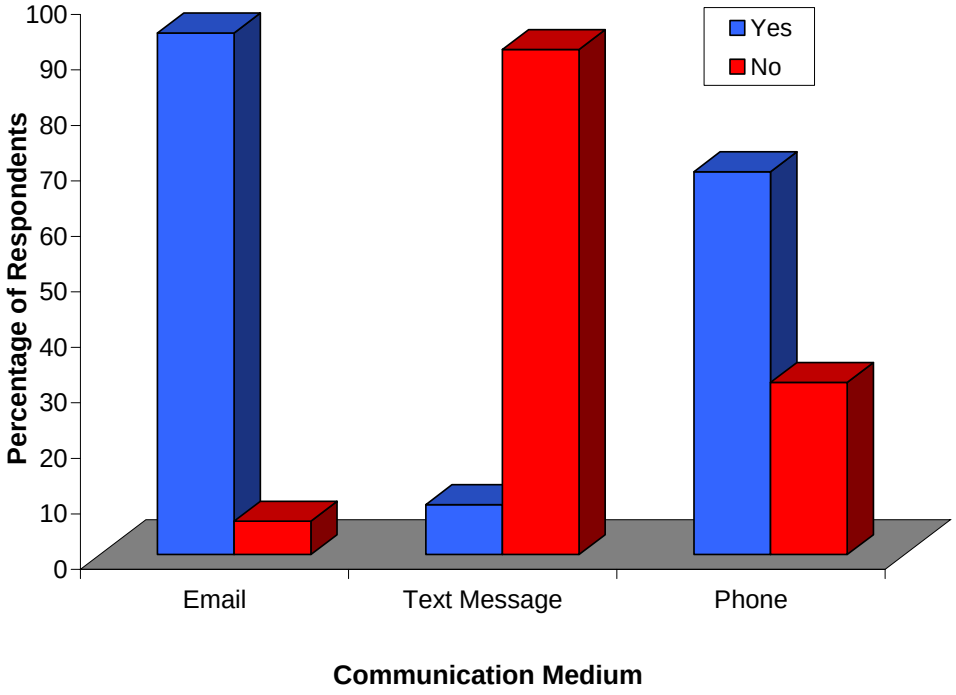


Figure 7.14: Digital Worlds 2007- Preferences of students to three means of communication with lecturers

The students of the Natural Hazards of New Zealand course were asked a series of questions concerning both how they had communicated with lecturers and tutors and also what the preferred method would be if they had a choice of technologies. Figure 7.15 illustrates how the responding students communicated with staff during the course. It shows that as with the Digital Worlds students email was the most preferred option accounting for 40%.

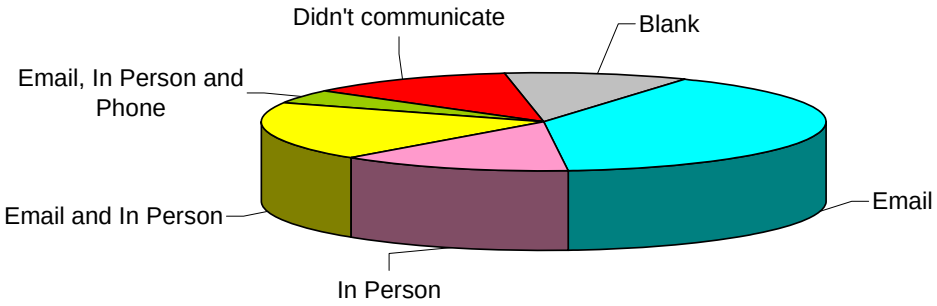


Figure 7.15: Natural Hazards of New Zealand – How the Students Communicated with Lecturers and Tutors during the course

The Natural Hazards of New Zealand students were also asked what their preferred method of communication would be with lecturers and tutors. To communicate with lecturers again 41% of students identified email as the most preferred means, in person was the next most preferred at 26%, followed closely by a combination of the two forms of communication at 22%. Only

one respondent identified the phone and this was used in combination with email. The most prominent reasons given for the use of email was convenience 34%, that it was easy 29%, and flexibility 9%. For in person the reasons related more to the interaction between the student and the lecturer with 27% identifying it gave them a better understanding, 21% more detailed explanation and 9% identifying it as instant and easy. How the students preferred to communicate with their tutors elicited very similar responses. Email was again the preferred option at 38%, followed by in person at 30%. A total of 11% identified they preferred to use both email and in person. None of the students that responded would choose to use the phone to communicate with their tutors. The key justifications for using email were that it was easy 23%, convenient 21% and flexible 21%. The preference for in person was closely tied to gaining a better understanding through talking to the tutor 39%, that you could get an instant response 14% and convenience 7%.

The means that students use to communicate with lecturers and tutors has evolved as different ICTs become available. These results demonstrate that students appreciate having a range of communications options as these create conditions of possibility that make staff more accessible. As many students identified, what they wanted to discuss and the immediacy of the issue determined which ICT they used, for example the following students ticked yes for both email and phone providing these explanations, "Email – convenient, fast. Phone – because you can have an actual conversation and discuss rather than ask" or "Email – Have time to word/explain our questions to the best of our abilities. Phone – Instant feedback" or "Email – you can explain any problems you have in detail. Phone – Best way to get instant communication with the lecturer". The failure of students to engage with the option of text messaging offered during the 2006 Digital Worlds course provides an interesting insight into how the various ICTs are beginning to be appropriated for different roles. This process needs much more investigation but it appears clear that not all of the ICTs that could be used for e-learning will create conditions of possibility that led to emerging timespaces for students' tertiary learning experiences.

Conclusion

Chapters Two and Three revealed that both the international literature and statistics from New Zealand's tertiary sector indicate that the growth of e-learning is predominantly occurring in blended learning courses conducted on campus. While tertiary institutions around the world are

beginning to adapt to this situation the University of Auckland has only recently consolidated its approach. The University's two primary apparatus for e-learning, the Library's LEARN network and Cecil, have been established for a number of years and yet there was no coordinated policy on e-learning and little guidance for staff until the emergence of the eLearning Design and Development Group in 2006. The literature raises concerns over the pressures of neoliberalism on the application of ICTs for purely cost reduction purposes, a very technologically determinist approach (Peters and Roberts, 1998; Vandenberg, 2005). Chapter Three exposed the dramatic consequences of this neoliberal reform process on New Zealand's tertiary sector. The focus by the University of Auckland on LEARN and Cecil without any clear e-learning policies demonstrates the remnants of these reform processes as there was a obvious failure to as Vandenberg (2005) argues to recognise the embeddedness of technologies. The students' reactions to Cecil are also clearly indicative of this disconnect. There was clear evidence that certain aspects of Cecil such as the online discussion forums were failing to provide much of a conduit for learning and this indicates a gap between the intentions of Cecil's designers and the practicalities of running tertiary courses.

The increasing range of ICTs being utilised in tertiary course are clearly impacting on students' learning experiences (Haythornthwaite and Kazmer, 2002; Stubbs, Martin and Endlar, 2006). This chapter's focus on two blended learning courses Digital Worlds and The Natural Hazards of New Zealand has revealed that the conditions of possibility arising from these are complex and contingent on numerous factors. Forer (1998) has argued that e-learning provides a way to enhance learning rather than replace campus based courses and this research supports this supposition. Most of the students involved in these courses were under 25 and so could be described as what Prensky (2001) calls Digital Natives, essentially differentiated from older generations by their ability to speak the "digital language of computers, video games and the Internet" (2001:1). If we were taking a technological determinist standpoint as described in Chapter Two these students should have fully embraced these technologies and potentially preferred them to more traditional forms of learning. This however was clearly not the case. The students were far more discerning about the ways in which the ICTs could or could not be used in a learning environment. The Digital Worlds students' rejected text messaging as too limited for the level of knowledge that was required or too personal a means of communication with an authority figure. They also dismissed of any idea of online discussion forums, despite many experiencing these in other aspects of their life, again because these were often badly facilitated, lacking in detail. The Natural Hazards of New Zealand students experienced quite

a different application of e-learning to those of Digital Worlds yet many of their responses were complimentary.

This chapter has demonstrated how the conditions of possibility emerging from students' experiences on these two courses are revealing the *in between* moments, between what are often students' first experience of e-learning mechanisms and their subsequent moulding of these to suit their own learning styles. A process that is forging entry points into several timespaces which students are now beginning to access. Student learning is now no longer fixed purely in the timespaces of campus based traditional forms of pedagogy; however these are still an important component of these emerging timespaces. What the conditions of possibility described in this chapter show is that these are complexly layered timespaces in which these mechanisms have added more flexibility and accessibility to students' existing tertiary learning experiences.

CHAPTER EIGHT:

The Experiences of Transnational Migrants

Introduction

> "While scholars should remain sceptical of technological determinism and over optimistic prophesies about the transformative power of ICTs in everyday life, there is no doubt that new technologies have an impact on how transnational migrants imagine, negotiate and create their social worlds across broad transnational fields. (Panagakos and Horst, 2006: 120)

This chapter[32] explores South Koreans and South Africans' use of ICTs as they imagine, negotiate and mediate the process of migration to Auckland, New Zealand. This intervention contributes to the increasing body of work within social and cultural geography that explores the emergence of transnational social spaces created by provision of ICTs. As with the previous three empirical interventions Chapter Two's Table 2.2 is reformed in Table 8.1 to illustrate the possibilities of action associated with the experiences under scrutiny, those already identified in the literature, those hypothetical possibilities that the migrants may have undertaken but which weren't witnessed during this research process and those that will be revealed in this Chapter. These latter actualised possibilities are explored by uncovering the migrants' discovery of the various conditions invoked by their use of ICTs in imagining, negotiating and mediating their migration experience.

[32] A substantial proportion of the results from this chapter have been published see Mitchell, P. 2008. A long way from home? The role of information and communication technologies in South Korean and South African migrants' experiences and imaginaries as they settle in Auckland, New Zealand. Aether: the Journal of Media Geography, 4: 20-36.

Table 8.1: Possibilities of action emerging around migrants' use of ICTs that have previously been investigated by Social and Cultural Geography, the conditions of possibility disclosed in this intervention, and those possibilities that could have hypothetically emerged from these interactions

Previously Investigated Possibilities of Action	Possibilities of Action Disclosed in this Intervention	Hypothetical Possibilities of Action
Transnational bonds usually measured through citizenship and political activity across space, but which can change over time. For example participatory democracy through online interactions, migrants outside the space of contestation can become involved.	Imagining the new environment they are moving to by using the ICTs available at the time of migration such as the Internet to imagine the new spaces.	Increasing use of online shopping to buy things from their country of origin. Thereby potentially reducing the monopoly position of ethnic businesses.
The retention of transnational social spaces – the interaction of individuals from the same 'home' across spaces and times. Often driven by economic rationality for example the provision of remittances.	Negotiating the migration to and embedding in Auckland through the maintenance of contact with family and friends left behind, through a range of ICTs. The role of citizenship, political activity and remittances did not play an overt role in such negotiation.	A range of online cultural organisations/ support networks which connect up those who wish to migrate with those that have already migrated to New Zealand.
Particular focus on two groups of transnationals. One, the fluid movements of transnational elites. Two the movements from developing nations to developed ones such as the United States.	Mediating the migration process and new timespaces they are exposed to through cultural organisations, social networks, ethnic businesses and the provision of news online.	Targeted websites aimed at specific cultural groups which provide all the necessary information required for migration to New Zealand from housing to schools to jobs.
Emerging second wave of research in to middling transnationalism or the everyday practices of middle class migrants often moving between developed nations.	Older migrants renewing bonds and contacts due to the advent of new ICTs creating new transnational social spaces	The end of formal cultural organisations as ICTs lessen the feelings of isolation and alienation, enabling migrants to feel more culturally empowered.

South African and South Korean migrants are increasingly prominent in New Zealand accounting for 1% and 0.7% respectively of the country's approximately 4 million people as revealed in Chapter Three. This is a direct response to the neoliberal reform process's policies which altered New Zealand's selection of immigrants away from traditional sources to a more skills based criteria (Bedford, Ho and Lidgard, 2000). The South Koreans and South Africans are quite disparate cultural groups and this experience will demonstrate that these differences are in fact accentuated by the increasing choice and accessibility of ICTs.

This experience will also begin to inform a gap that both Vertovec (1999) and, Panagakos and Horst (2006) identify concerning the need for more comparative studies, particularly drawing out how different migrant groups appropriate ICTs for different purposes, as discussed in

Chapter Four. This comparison is extended to the period of migration with participants selected from both before ICTs such as the Internet became prominent, pre 1996, and those that have migrated to New Zealand subsequently, post 1996. Furthermore, I revealed my own background as a first generation New Zealander with migrant parents, in Chapter Four, an experience that provided a practical bridge of understanding between me and the research participants which greatly informed this experience.

Imagining a New Home

The migration experience can be divided into two stages, the initial decision to move and associated information gathering, and the settling in process after migration. The decision to migrate can be motivated by a multitude of factors. Portes proposes that those that move due to political issues are more likely to "remain morally tied to kin and communities left behind and, hence, are more likely to engage in a variety of activities to bridge the gap" (1999: 464), whereas if the migration is more individual the opposite occurs as they lack the "normative component attached to… participants in a political diaspora" (1999: 464). The responses from the South Korean migrants would fall into this latter category with personal motivations such as obtaining a good education for their children and the learning of English being key reasons. Moving to a less high pressure environment and a better climate were also factors. Those from South Africa identified more with those subjected to political pressures, therefore falling into the former category. As one interviewee commented everything in South Africa is racial[33]. All of these migrants raised crime and safety issues in South Africa as the predominant motivator. Job opportunities and the perception that New Zealand had a similar lifestyle were often secondary influences.

Once the decision to migrate is made and the potential destinations identified it becomes an information gathering process as the migrants geographical imaginations begin to construct the new environment. The idea of geographical imaginations has been developing since the 1960s. Harvey described how

> "This imagination enabled the individual to recognise the role of space and place in his own biography, to relate to the spaces he sees around him, and to recognise how

[33] This was taken into account when selecting South African participants. Those interviewed represented Afrikaans, South African English, South African Indians and South African Coloureds.

> transactions between individuals and between organisations are affected by the space that separates them… It allows him to judge the relevance of events in other places… It also allows him to fashion and use space creatively and to appreciate the meaning of spatial forms created by others" (1973: 24).

The concept has been significantly furthered since, Gregory's recognition of the importance of "consider[ing] diverse geographical imaginations" (1994: xi) and more recently by Whatmore's identification that such imaginations "alert us to a world of commotion in which the sites, tracks and contours of social like are constantly in the making through networks of actants- in-relation that are at once local and global, natural and cultural, and always more than human" (1999:33). Whatmore's (1999) work is of particular interest to this experience as it is informed heavily by the actor network approach. This experience provides a good example of this process as the migrants' attempt to imagine the new lives they may lead in Auckland. The increasing ubiquity of ICTs implies as Whatmore (1999) states that this process is increasingly more than human for example the Internet provides a much greater range of information from which to imagine. Although the time at which migration occurred of course influenced what tools were available Table 8.2 demonstrates that overall personal contact with people who already lived in New Zealand were still preferred by both migrant groups. Clearly, while some diversity was present this lack of reference to the Internet points to problems with the assumption that it is an inherently desirable point of reference, something that Wilding identifies as a danger because it "fails to capture the complexity with which the Internet, like all consumer products, is rejected, adopted, extended or ignored by specific individuals" (2006, 127). In essence when considering the role of ICTs in our geographical imaginations we must be careful not lean towards technological determinism.

Table 8.2: The type of ICT medium used by each migrant group to garner information for their geographical imaginations of New Zealand

ICT Medium	South Koreans		South Africans	
	Pre Internet	Post Internet	Pre Internet	Post Internet
Primarily Internet		1		6
Primarily People	2	4	5	1
Primarily Other e.g. Immigration Agencies	3			2

Most of the South Africans in the post Internet group relied heavily on the Internet for two purposes. Firstly, they looked at tourist sites to get an idea of the environment and try and

picture the place they were moving to. Secondly, job sites were used to apply for positions prior to migration. This was in part due to the entry requirements discussed in Chapter Three and also obtaining a job often provided the security needed to make the final decision to move. In several cases such online job applications were successful and the interviewees identified that the ease and ability to communicate frequently via email was essential to this process. The following quotes are indicative of the type of responses the South African migrants gave,

> "Almost exclusively the Internet… surfing the net and see what is out there [found a job advertised in Albany, Auckland] is this a place I want to live? So I would go into searching for geographical type sites to see how far it was from major cities…" (Female South African Interviewee A)

> "Basically what I did was put my CV on the net and said somebody employ me. I sent it to Australia and New Zealand and got three job offers from New Zealand so we came and had a look and decided yes" (Female South African Interviewee B)

They also commented that sorting out details for job applications such as filling in forms and exchanging information was infinitely faster than via the postal service. A further six had relatives already living in New Zealand who were their main source of information. Often these relatives were very proactive in encouraging them to migrate helping them to find jobs and homes. Of these six, five were from the pre Internet group so their relatives in a sense were doing what the Internet subsequently did. The remaining two participants who came out in 1998 and 1999 did not have Internet access in South Africa or any contacts in New Zealand. They relied on pamphlets from immigration services and books from the library. The following quotes demonstrate individual migrants' use of personal contacts in New Zealand.

> "My in-laws had been here for 2-3 years and said it was a lovely place. At the time I was living in Leeds and didn't want to go back to South Africa because of the problems so came to New Zealand" (Female South African Interviewee C)

> "We had always wanted to leave South Africa and my wife's sister had been living in New Zealand since 1992, she had been wanting us to move out… they were quite alone and really wanted us to come over so they applied a lot of pressure because they knew we were looking to move" (Male South African Interviewee D)

Somewhat surprisingly given its level of use in South Korea, see Chapter 3, Table 8.2 also shows that the Internet was not a major source of information for any of those interviewed. Only three directly referred to using it and in each case didn't explore much further than the website of the learning institutes they were to attend. The chief source of information for six of the South Koreans, including two of those that referred to websites were people already living in New Zealand. Although similar to the South Africans none of these were existing family members instead they consisted of family friends or associates. In all six cases these where their chief source of information irrespective of whether they migrated before or after 1996. The remaining three South Koreans were all from the pre Internet group and used a range of information sources from newspaper adverts promoting New Zealand to information from immigration agencies in South Korea. The following quotes provide insight into how information about New Zealand was obtained from personal contacts in New Zealand,

> "My father's friend's son was at the University of Auckland so he supplied me with the information I needed" (Female South Korean Interviewee A)

> "We had a family friend in Auckland that helped a lot" (Female South Korean Interviewee B)

The Internet can provide a range of information for migrants and even in some cases facilitate real time interactions with the new environment, for example web cams. Some of these migrants particularly the South Africans are beginning the make use of the various conditions of possibility the Internet now provides, however, it appears that person to person contact still remains a favoured source of information. This may be due to a number of reasons that this research was unable to explore, such as the quality of New Zealand websites for overseas visitors and the level of trust the participants had in the Internet as an information source. It does appear though that at least among this group that ICTs are not having such an overt impact on their imaginations as one would expect. This reveals the importance of not falling into the technologically determinist trap that Wilding (2006) identifies in the assumption that the Internet is both desirable and a primary source of information for everyone in the 21st Century.

Negotiating the Migration Process

The next stage of migration involves negotiation of the new environment. This was considered through two aspects. Firstly, the second wave of transnational research now emerging strongly

critiques the emphasis on migrants' "economic rationalist motivations" (Voigt-Graf, 2005: 368) which has been driven by a developing to developed nation sampling bias, particularly the movement from South America and the Caribbean to the United States (Conradson and Latham, 2005; Smith, 2005; Voigt-Graf, 2005). Consequently, the types of transnational bonds being focussed on revolve around the retention of strong kinship and cultural ties to their country of origin brought about by their desire to create a better future for their families (Vertovec, 1999). Three indicators are used to investigate these bonds, citizenship status, remittances and if they are still political active in their country of origin. All of the participants had permanent residency, which, in the New Zealand context entitles a person to virtually the same rights as citizenship. Most had also obtained citizenship or were in the process of applying. When asked whether they had dual citizenship there were a range of answers which related to when they emigrated and whether government policies allowed for it at the time, this is evidenced by a greater number of the South Africans having dual citizenship. The response to sending back remittances was an overwhelming negative from all the migrants. Instead a few migrants commented on sending money as presents but emphasised that none of their family back home was financially dependent on them, a similar finding to Voigt-Graf (2005) in her study of Indian migrants in Australia. Further, virtually none of those interviewed were still politically active in their country of origin. Most felt it was not relevant to their current lives and that they would be out of touch with what was occurring anyway. These findings disrupt the economic rationality argument found in parts of the literature demonstrating that these indicators are not such effective gauges of the development and maintenance of bonds among middling transnationals. This is not to say the ties are not present, instead it illustrates that they can take different forms reflecting the importance of place and space in terms of their where they came from and how this influences their interactions with their country of origin.

The second aspect of negotiation this intervention considers is the migrants need to retain contact 'back home' to their country of origin. The impacts of moving to a new country such as New Zealand are influenced by several aspects. Portes (1999) argues that the potential discrimination faced by a migrant group who by their race and culture are perceived as different, often in an effort to negotiate this, strengthens their transnational bonds by being more in contact with those 'back home'. This phenomenon was clearly evident among the South Korean migrants. Between 1991 and 1996 there was a 1421% increase in their New Zealand population (refer to Figure 3.1) and this rapid and visible rise resulted in significant discrimination (Small, 1996). The cultural differences among the South Africans of different racial backgrounds (as

identified in Chapter Four) were less pronounced primarily due to their similar lifestyle approach to New Zealanders especially around outside sporting activities. The reasons for developing such thick transnational bonds are therefore not as obvious as one could expect less frequent need for contact 'back home'. The Afrikaans South Africans, however, discussed how they had been subjected to discrimination due to their accents, with people accusing them of, or simply assuming they were racist without any basis.

This research draws strongly on Wilding's (2006) work to explore how these migrants are maintaining communications 'back home'. Wilding identifies a clear "historical progression in the typical mode of communication" (2006, 130) and that families appeared to use a layering approach as new ICTs became available. Her research is particularly relevant due to its focus on communications amongst family members in similar circumstances in an Australian backdrop, which shares many similarities to New Zealand. This layering effect is clearly illustrated in Table 8.3 which provides a break down of which ICTs these South Korean and South African migrants used when they first arrived and which they currently use. Each of these encounters with an ICT opens up new conditions of possibility for the migrants. Their changing use of these ICTs over time provides an avenue to access the *in between* as it provides an insight in the reasons behind their thought processes, why they chose to change their use of certain ICTs while retaining their use of others.

Table 8.3: Comparing the migrants' use of various ICTs from when they arrived in New Zealand to how they use them currently

KEY			
	Not available at that point in time		Not regularly if something happens (good/bad news)
	Everyday		Don't use because of technological difficulties either in NZ or in country of origin
	A couple of times per week		Don't use
	Weekly		Thinking about getting it
	Every couple of weeks		Never thought about it
	Monthly		Have looked but never done it
	Occasionally		Don't have one
	On special occasions		Used to coordinate another form of communication

Country	Time Period	Email	Fax	Letters	Phone	Text	VoIP (Skype)	Internet Chat (Cyworld)	Internet Shopping	Internet Newspapers
South Korea	On Arrival									
Arrived 1973	Currently									
South Korea	On Arrival									
Arrived 1992	Currently									
South Korea	On Arrival									
Arrived 1993	Currently									
South Korea	On Arrival									
Arrived 1994	Currently									
South Korea	On Arrival									
Arrived 1994	Currently									
South Korea	On Arrival									
Arrived 1994	Currently									
South Korea	On Arrival									
Arrived 2000	Currently									
South Korea	On Arrival									
Arrived 2002	Currently									
South Korea	On Arrival									
Arrived 2003	Currently									
South Korea	On Arrival									
Arrived 2005	Currently									

Country	Time Period	Email	Fax	Letters	Phone	Text	VoIP (Skype)	Internet Chat (Cyworld)	Internet Shopping	Internet Newspapers
South Africa	On Arrival									
Arrived 1977	Currently									
South Africa	On Arrival									
Arrived 1990	Currently									
South Africa	On Arrival									
Arrived 1991	Currently									
South Africa	On Arrival									
Arrived 1995	Currently									
South Africa	On Arrival									
Arrived 1996	Currently									
South Africa	On Arrival									
Arrived 1998	Currently									
South Africa	On Arrival									
Arrived 1999	Currently									
South Africa	On Arrival									
Arrived 1999	Currently									
South Africa	On Arrival									
Arrived 1999	Currently									
South Africa	On Arrival									
Arrived 2000	Currently									
South Africa	On Arrival									
Arrived 2001	Currently									
South Africa	On Arrival									
Arrived 2001	Currently									
South Africa	On Arrival									
Arrived 2002	Currently									
South Africa	On Arrival									
Arrived 2003	Currently									

Obviously for the pre Internet group most of the current ICTs were not available at the time of migration. As Table 8.3 shows their most common forms of communication were letter writing, phone calls and later on the fax machine. Letters were the most common medium primarily because they were the least expensive option and the migrants often wrote them on a monthly basis to account for the delay in replies. In most cases letters have been superseded by email, however, many people commented on how they still sent cards or letters on special occasions because they were more personal, as these two quotes reflect,

> "I think letters are very intimate… because they are more friendly… I can feel their love, they really love me because it is more valuable than Internet I think [sic]". (Female South Korean Interviewee A)

> "It tells you that someone is prepared to take the time and make the effort to buy the paper… it is extra effort and you appreciate that" (Female South African Interviewee A)

The entire pre Internet group described how expensive phone calls had been when they first arrived and how they would either wait for specials to phone home or until an important occasion such as a birthday occurred. As the price of calls dropped and numerous low-cost calling cards appeared on the market this option became more favoured and as Table 8.3 illustrates is still very dominant amongst all those interviewed today. Several of the interviewees explained that the phone allows them to hear the other persons' voice and all the expressions and intonations that go with that providing both a more personal and a more informative experience. Interestingly, among South African migrants the phone is now being complemented by other mechanisms such as text messaging and Voice over Internet Protocol (VOIP), these aspects are discussed later. Fax machines where often used to write long letters to circumvent postal delays but Table 8.3 illustrates that generally its use has declined with time. The exception to this was a small number of the South Africans whose parents had chosen not to use email, so they continue to use fax machines to communicate.

Distinctly different shifts in communications mediums have occurred between the two migrant groups over time. This experience proposes that as there is more availability and choice in how to communicate cultural differences and the technological advances in their country of origin are being reflected more strongly than ever before in what they adopt. This in turn has important ramifications for the role of place in such investigations. South Korea has especially advanced Internet and mobile technologies (OECD, 2005) as shown in Table 3.2. This has led to an

increasing number of specialist blogging networks in particular Cyworld which came to prominence in the early 2000s. Cyworld is, in part, an Internet portal providing limited shopping and news services but primarily an online community, which, over 13million South Koreans utilise (Kim, 2006). Structured around personal homepages or *minihompy*, depicted in Figure 8.1, it differs from those encountered on sites such as My Space in several ways. Most significantly to register for a homepage a person must use their South Korean national identification number which in turn means you can search for anyone if you have their surname and birth date. This removes the anonymity often associated with web blogging. Further, each *minihompy* is a virtual room which can be structured so different levels of access to information can be set up. Users can invite friends and family to become *il-chon* best described as relatives, which, allows them to view private areas and make modifications. The users can also customise their virtual room with decorations such as wallpapers but they have to purchase these directly from Cyworld, a process which can become quite expensive as there is a constant pressure to update. All of the South Korean participants were familiar with Cyworld and 80% had *minihompies*. In all cases it had replaced much of their email correspondence and most of them checked it at least a couple of times per week, often everyday, as shown in Table 8.3. Interestingly, for those who migrated prior to Cyworld emerging it was pressure from friends and family back in South Korean that made them join up, as one stated "If I don't do that I have no way to communicate with them [sic]" (Female South Korean Interviewee A) [34]. Generally Cyworld was dominated by the younger generation indicating the presence of a digital divide; however different age groups are beginning to engage, reflecting Chapter Five's arguments about the limits of this concept.

The strict formatting of Cyworld also meant that when asked whether there were differences between the *minihompy* of those who had created pages from New Zealand and those living in South Korea the answer was a clear no. The way Cyworld registers users altered about two years ago. Initially, there was no validity check on the national identification number used so one could register as someone else. This has now changed and if you are a permanent resident somewhere outside of South Korea you have to register as a foreigner using your passport. This does not appear to restrict the ability to use Cyworld but several participants identified that it has had implications for accessing other South Korean websites.

[34] For an in depth discussion of the role that Cyworld has played in the lives of South Korean students living in Auckland, in particular its importance for keeping real time connections to friend and family both in Auckland and back in South Korea please see Collins, (2006).

Figure 8.1: An example of the South Korean Cyworld and what a basic minihompy looks like.
Source: Screen Shot courtesy of Francis Leo Collins, 2007

The trend in communications mediums has been quite different among the South Africans with an increasing preference for VOIP facilities notably Skype, illustrated in Figure 8.2. According to Chen et al., (2006) there are over 85 million Skype users worldwide, a user base that is growing by more than 100,000 per day. Although there have been some issues over the quality of the service (Chen et al., 2006) its popularity is due the provision of free international calls and heavily discounted calls to landlines via VOIP. Of those interviewed, as shown in Table 8.3, four used Skype quite often, and three were thinking about getting it, as one participant stated "We use it for almost all our overseas calls now even though [not all] our friends have Skype you can phone a phone and it is much cheaper" (Female South African Interviewee E). Interestingly, this later aspect appeared not to be that well known among the South Africans as a further two believed it would not be worthwhile until their family members had the Internet facilities to cope, unaware of the ability to call landlines. There are several land line based calling cards and calling specials to South Africa from New Zealand, however, of the six commonly available international calling cards, the rates to South Africa were one of the more expensive on offer and three times that of the rates to South Korea. This may in part explain why Skype is such an attractive option for the South Africans. The participants also appreciated the added value Skype provided through being able to see one another while speaking. An aspect that has added a different dimension to their communications, as the following quote illustrates.

"we have the whole family around us so its fantastic, that's a change that I have seen, my husband and my sisters husband, and her sons and my daughter wouldn't phone each other they would send emails… in any 12 month time they wouldn't talk to each other.. where as since we've had Skype they would be in the room with me and I would connect with my sister and her family would be with her and at some point we wouldn't even communicate with one another they would do it but to pick up a phone and have a one on one communication with one another feels odd, my daughter would say 'what should I say'… With Skype we have that whole joking humorous conversation which is lovely." (Female South African Interviewee A)

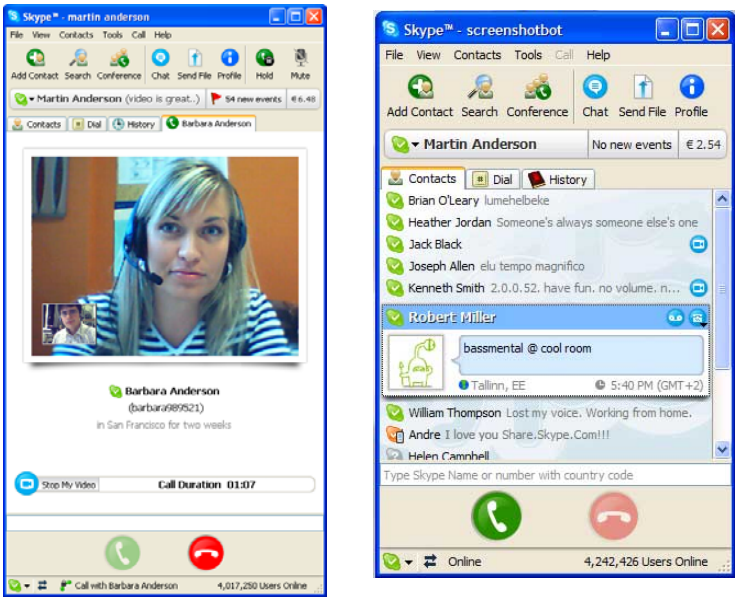


Figure 8.2: Two images showing what Skype Users see and experience
Source:http://share.skype.com/sites/en/2005/12/skype_20_beta_free_video_calli.html *accessed 18/12/2007*
http://kynesinkilts.files.wordpress.com/2007/08/skype.jpg *accessed 18/12/2007*

The South Africans have also engaged in more intense mobile phone communications primarily text messaging. This mechanism was often employed to keep in touch with family members that had returned to South Africa for a visit. As Table 8.3 demonstrates text messages tended to be used for immediate communication, often sending good or bad news quickly. The migrants described how they appreciated the convenience of letting someone know in real time that they were thinking about them without the complications of time differences or computers. Table 8.3 also shows that often text messaging performed a coordination role, discussed later. These different shifts between communication mediums by the two groups are illustrated in Figure 8.3 below. This summarises the different preferences between the two migrant groups and demonstrates the layering effects Wilding (2006) discusses.

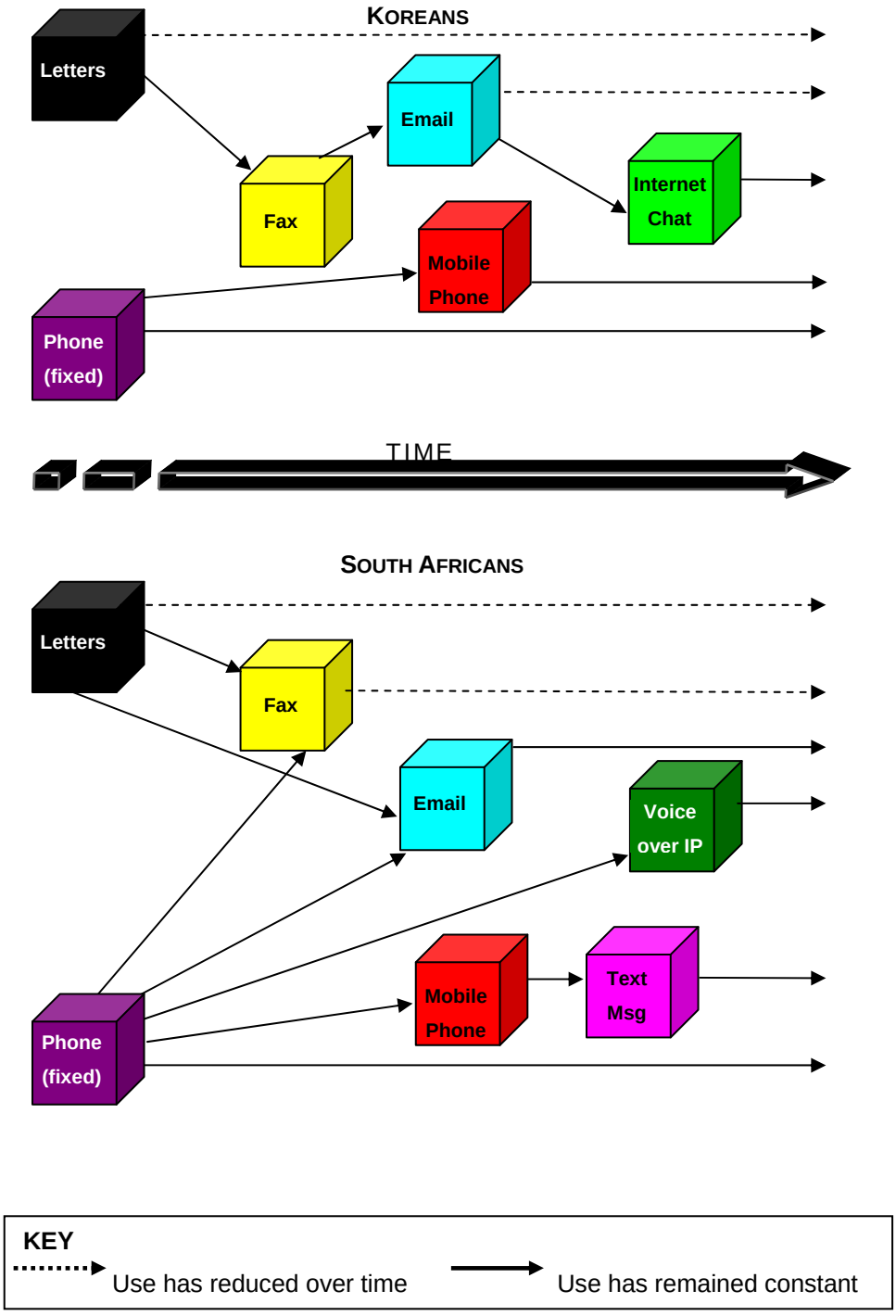


Figure 8.3: Preferred ICT use over time by the South Korean and South African migrants

Despite some increasingly clear preferences for the different conditions of possibility the various types of ICTs have provided over time Table 8.3 reflects that two distinct timespaces are emerging. Firstly, all of the migrants described a lessening of communication over time particularly with friends, despite having more means to communicate than ever before and the corresponding sensation of the reduced distance between them that these enable. All of the participants had at least one computer at home, over 90 % had broadband and most often all

members of their family had mobile phones. The migrants described how at first they had many new experiences and information to share with family and friends but over time as they settled into a daily routine there was less need to communicate so regularly. This decrease was also attributed to the loss of shared experiences with those who had been 'left behind'. These are reflected in the following quotes.

> "When I first came over I sent newsy emails back, very much. That has tapered off now, it was because everything was so new and because I had very little to do… when you first arrive your sense of dislocation is so great. The only anchor you still have is what is behind you. The future is blurred" (Male South African Interviewee F)

> "you just grow apart… there is nothing in common anymore. I don't think they are interested in what is going on here, they heard when we came over." (Male South African Interviewee G)

> "when you don't have that life interaction with people it is hard to keep the letters going…after a while you grow apart I guess." (Female South Korean Interviewee C)

Secondly, the increased choice and accessibility to ICTs led many of the participants to describe feelings of empowerment. This feeling stemmed from their response when asked to speculate, given the rapid increase in available ICTs, what their migration experience would have been like if they had moved out either earlier or later than they did. None of the participants are high intensity users of ICTs but it was clear that they all had an appreciation of the choice and information that these provided. Several of them commented on the fact that simply knowing the technology was there if needed was enough to make them feel less isolated and more empowered. They all agreed that had they moved out at a different point in time it would have had a considerable effect on their experiences. This provides an insight in the *in between* as the migrants begin to realise that these ICTs are enabling them to engage much more easily on a transnational basis if the need arises. This in turn leads to a multitude of alternative timespaces which they had not previously considered around how they engage in relationships both socially and economically. As one of the earlier South Korean migrants explained,

> "Definitely… look at my daughter for example whose friends seem to roam globally or come from countries far and wide, and they travel frequently… in my day when a friend left me that would be the end of that… goodbye and maybe never see you again. But these days they keep in touch by Internet, msn, it is just amazing. They can keep their

> relationships going and I wish that kind of technology was available to me way back when we first emigrated because it was really difficult. I had already formed good relationships with my relatives before we left South Korea so for me to suddenly loose all that networking and family ties it was really difficult and I think that if we had Internet back then I would have been able to keep up the quality of the relationships more. Even though the ties are still there, I remember when I went back the first time after 7 or 10 years so much had happened to their lives in South Korea that we had missed out on. I though oh what a shame. I think that if we had had that technology we wouldn't have missed out on so much of their lives and visa versa." (Female South Korean Interviewee C)

The more recent migrants expressed similar sentiments in terms of an appreciation of what ICTs have enabled them to do, as summed up by this South African migrant.

> "I think it would have been amazingly different because I don't think I would have come out without a job offer and I wouldn't have been able to get a job by the Internet in those early days. So probably what we would have done is to come here and to negotiate work in person and that would have taken much more costly effort… and then I probably would have done more homework in terms of where I want to go, instead of picking applications across the board." (Female South African Interviewee A)

Mediating the Migration Process

This section examines the ways in which the South Korean and South African migrants are using ICTs in the mediation of their everyday experiences in Auckland, interactions that are leading to an increasing awareness of the different conditions of possibility that may arise. This will be explored through four facets commonly associated with migrants' adaptation to new spaces, cultural organisations, social networks, ethnic businesses and the provision of news. In each case the changing conditions constitute new entry points into an increasing range of timespaces associated with the migrants' national and transnational associations.

Shibutani and Kwan (2005) identify that cultural organisations are an important means of easing the transition process for migrants, offering a venue to share experiences with others in the same position. There are several such organisations in New Zealand and the migrants were asked whether they had joined any such organisation when they first arrived in New Zealand. For the South Africans there are two particularly prominent clubs in Auckland, the South African New

Zealand Charitable Trust and The Afrikaans Club of New Zealand, which, caters for the wider community of Afrikaans speakers. Nine of the fourteen South Africans interviewed had considered or attended at least one event but all but one had chosen not to join any of the available organisations. What was surprising was the vehemence with which most of them had rejected such organisations, either because they had actively chosen to embrace the New Zealand culture or because they felt the organisations expressed views they were opposed to as illustrated by the following quotes.

> "I did not move from South Africa to New Zealand to live in a South African community" (Female South African Interviewee B)

> "In some ways I prefer to not to have too much contact with South Africans because it limits my experience in working with other people" (Female South African Interviewee A)

> "Definitely not, avoid them like the bloody plague… There are a lot of things the club holds to that we didn't like about South Africa. Sort of extreme, conservative groups that we didn't mix with anyway back in South Africa… We are adult enough to find our own way without having to fall back on those sorts of networks." (Female South African Interviewee E)

Instead the South Africans mainly drew their support from religious organisations, which, in some cases were culturally orientated such as the Afrikaans Church. All of the participants had sorted these out on arrival but generally not with the specific intention of meeting other South Africans. In fact, they described ending up at churches that had several other South Africans by default, which, appears to be indicative of the clustering of cultural groups that still occurs in Auckland. There was also some movement overtime to different churches and often away from the more culturally specific congregations.

A very similar scenario played out amongst the South Korean migrants with most joining a church immediately, however, in all cases these were specifically South Korean churches due to the preference for receiving sermons in Korean. For many of them the church played an important role in helping them settle in. Interestingly, there was a perception among some of them that many of the newer migrants were attending these churches for the social support networks rather than any religious affiliation. As with the South Africans there are also more formalised cultural organisations, in Auckland the most prominent is the Korean Society of New

Zealand. There was however a similar rejection of such organisations by the South Korean migrants as was demonstrated by the South Africans. Only one South Korean participant was an active member, although several had working relationships with the Society. Again this appeared to be a reaction to the active decision to settle in New Zealand, as one migrant put it.

> "Koreans in New Zealand choose to live here because they don't want a busy involved life anymore… [when they first come] they don't want anything to do with Koreans, want to be free want to be somebody different… later they realise they can't survive 'because I am yellow anyway'. So they start to go to church, but less obligation and commitment and a lot of support [at the church compared to the society]" (Female South Korean Interviewee D)

There were two exceptions to this. A number of the younger South Koreans had or were members of the University of Auckland Korean Students Association which actively recruited South Korean students through events such as Orientation. Secondly, three of those interviewed were members of a Korean Wellness Group, established to help South Korean healthcare professionals working in New Zealand. Both organisations, however, are designed to act as support networks for very specific sections of the community. Importantly, what is clear from the discussion thus far is the absence of ICTs. None of the participants commented on feeling less of a need to join an organisation because maintaining cultural ties was easier with the advent of new ICTs. This research speculates that these changing conditions are allowing them to feel less isolated and more empowered may subconsciously be feeding into an emerging timespace in which migrants don't feel the need for these more formal cultural organisations but clearly more research is required.

Tied closely with the participants' affiliations are the types of social networks they develop as they mediate the migration experience. In this case the two migrant groups were quite different. The South Africans had mixed social networks with friends from a range of nationalities and backgrounds. Several were involved in their children's schools and outdoor activities, which provided opportunities to meet a variety of people. They again described how the number of South Africans that they did know, was more by default than an intentional decision due to their church activities and through the subsequent migration of other family members. The South Koreans were much more likely to have social networks comprised almost entirely of South Koreans and ICTs seem to have played a significant part in this. The pre Internet South Koreans commented on the fact that initially there were no other South Koreans to socialise with but with

the influx in the mid 1990s this suddenly changed. At the same time, and in part because of this influx, they were exposed to new ICTs and increasingly able to re-forge old contacts. This raises an interesting question for the discourse regarding the role of ICTs in creating new transnational ties amongst migrants who previously would not have been considered transnational. The other aspect is the role that ICTs have played in the lives of the younger South Korean migrants interviewed. Many of these came over as school children and lost contact with friends back in South Korea, they also attended schools with very few South Koreans. When they reached University however they were not only exposed to the Korean Students Association but through it to Cyworld on which the association hosts its site. Suddenly it became exceedingly easy to communicate with other South Koreans, in fact there was a pressure to do so and consequently, the separation they felt as a result of migration was eased. This is a clear example of Portes's (1999) suggestion discussed earlier that migrants from cultures that feel different or alienated form stronger transnational bonds. It also shows however that these bonds can change given the conditions of possibility available to the migrants at that point in time.

Two consumer practices, shopping and acquiring news online, comprise the final two facets that this experience explores of the migrants mediation practices. It has been extensively illustrated in the literature that when migrants reach a critical mass in the destination country ethnically specific businesses emerge (Li, 2006). Since the mid 1990s this has occurred in both the South African and South Korean communities in Auckland. This research investigated how often migrants frequented such shops and whether the advent of online shopping had altered their behaviour in any way. All of the migrants where aware of the rapidly increasing number of such businesses but most were infrequent customers. For those that had come over pre Internet, when there were very limited options, they had had to find alternatives and so now only considered such shops for special treats. The more recent immigrants discussed that the expense, that prices were marked up, or that the deliberate decision to do most of their shopping in New Zealand shops as this is where they lived, were the main reasons for such infrequent visits. What was most fascinating was the exceedingly low rate of online shopping through South Korean/South African websites, or in fact any website. The exception to this rule was Trade Me, the New Zealand equivalent of E-Bay, which all the participants mentioned. It was more common for items that they were interested in purchasing from South Africa/South Korea for them to first check the prices online and then compare them to prices in the shops in Auckland. There was an increasing trend however, to buy presents, often flowers and gift

vouchers for people in their country of origin using the local websites. It doesn't appear that the conditions of possibility that have so far emerged constitute increasing competition between ethnic businesses and the Internet, although this may change in the future.

The ability to get the news online has led to a great deal of debate regarding the role of print based media and, the partiality of such news (Gunter, 2003). Very little research though has considered the role of online newspapers in the transnational discourse. When asked about their use of such facilities there were a range of responses. About a third of the participants checked almost daily and these were from both the pre and post Internet groups. The majority of the remainder responded that it really depended on what had been occurring for example North Korea's launch of its first atomic bomb had led many of the South Koreans to check the online news with much greater frequency than before. There was, however, a difference between how the two migrant groups viewed the news. Most of the South Koreans used portals such as Korean Yahoo! or www.daum.net which provides news headlines and summaries. The South Africans tended to select specific national newspaper sites or even regional papers, however, recently these smaller papers have begun to charge an online subscription fee which had deterred all of those participants that had used them. This difference requires further investigation but again brings into focus the role of place i.e. their country of origin, in their mediating tactics.

Conclusion

This empirical intervention has explored the migration process of a select group of South Korean and South African migrants to Auckland through three aspects, imagination, negotiation and mediation, each of which is being informed by ICTs. It demonstrates that these facets are contingent on a number of factors including the ICT environment from which they had come and their culture reflecting the need for more comparative investigations as Panagakos and Horst (2006), and Vertovec (1999) recognised.

The advent of recent ICTs has enabled a vast array of geographical imaginations to emerge, which, as Whatmore puts it, "are constantly in the making" (1999: 33). For these migrants the process of imagining Auckland though was still very much mediated by people they knew rather than what Whatmore terms the "more than human" (1999: 33) actants. Interestingly the Internet appeared to open up more conditions of possibility for the South Africans than the South

Koreans despite the marked difference in Internet subscription rates identified in Chapter Three's Table 3.2. This shows that how our geographical imaginations are shaped is due to a complex set of factors, including areas outside the scope of this thesis such as the quality of websites and the level of trust in such information. This emphasises the danger of assuming that the Internet is both a primary and desirable source of information (Wilding, 2006).

The migrants' negotiation of the transnational social spaces between New Zealand and their country of origin was examined in two ways. Firstly, it supports growing criticisms of the literatures predominant focus on migrants from developing countries such as South America to developed ones like the United States (Conradson and Latham, 2005; Voigt-Graf, 2005). This intervention demonstrates that the common indicators of citizenship, remittances and political activities are not always applicable to the maintenance of everyday transnational bonds particularly when the movement is between middle class migrants in developed countries. Furthermore, Portes (1999) arguments regarding what determines the strength of transnational bonds are also more difficult to relate when dealing with this type of migrant.

The second aspect of negotiation pertained to how the migrants communicated 'back home' to friends and family over time, which clearly reflects similar findings to Wilding (2006). As the ICTs emerged they fulfilled various niches depending on the circumstances of the person, they very rarely fully replaced. For instance some of the older methods such as letter writing and faxes were no longer as favoured but had retained a place dependant on whether a more personal touch was desired or, the constraints of the technology accessible to the person they were contacting. Secondly, the increasing availability and choice in how to communicate was strongly reflected in what each migrant group chose to adopt. Figure 8.3 demonstrated that while initially the two migrant groups had very similar practices these have diversified over time corresponding to the increasing choice of ICTs. South Koreans are much more orientated around Internet forums such as Cyworld, whereas the South Africans are utilising text messaging and VOIP more frequently. The means of communication appears dependent both on the migrants prior experiences of ICTs in South Korea/South Africa and on the continual pressure from 'back home' to adopt new communication technologies. There were however three overarching commonalities in both migrant groups' communication patterns. The frequency of communication decreased over time, the ICTs provided a feeling of empowerment and some ICTs tend to be used more as coordinators of communication. Their use of ICTs is leading these migrants to constitute timespaces which are much more centred on the emotions

generated from the potential of these ICTs as mediums of interaction with friends and family. This is because while the migrants' use of ICTs has diverged, an aspect contingent on place and culture, their overall communications behaviour has remained relatively static. The migrants appreciated the availability of a wide range of communication choices, none of them are high ICT consumers but they all valued their increased ability to constitute new timespaces depending on whether they wanted to communicate faster, in more detail or using a more personal means.

Finally, this chapter examined how the migrants' use of ICTs contributed to their mediation of their lived experience in New Zealand. There appears to be a trend away from formal cultural organisations instead churches played a more predominant role for both groups. Although it must be said that the South Koreans were much more overtly using specific Korean churches due to the language barrier. The literature identifies the importance of cultural organisations as a venue to share experiences (Shibutani and Kwan, 2005). These findings however indicate that ICTs are providing another means to share and that possibly subconsciously the feeling of empowerment engender by ICTs that the migrants described is also influencing this rejection of the more formal organisations.

The second mediation process examined was the types of social networks the migrants are developing. While the South Africans are developing very mixed networks the South Koreans were more likely to associate only with other South Koreans. For the South Koreans ICTs appeared integral to the older migrant's ability to re-forge contacts and for the younger migrants increased their exposure to South Korean culture through Cyworld. Both aspects have radically altered their social networks creating fresh entry points into a range of timespaces around reawakening their cultural background.

The final two aspects of mediation discussed involved consumer activities. The Auckland landscape is becoming increasingly populated with ethnic businesses but these migrants were generally infrequent visitors to them. Interestingly, this was generally to do with cost and the desire to adapt to living in New Zealand by buying local products. While online shopping could potentially challenge these ethnic businesses creating points of entry into alternative timespaces in which good are bought direct, online, instead of through an intermediary, this has not yet eventuated. Secondly, the literature is increasingly focussing on the potential of online

newspapers to replace print media but very little has been conducted on migrants' use of such a medium. This use appears extremely mixed and requires further investigation.

In comparing the experiences of South Korean and South African migrants to New Zealand this research has raised more questions than answers. The multifaceted role that ICTs play in imagining, negotiating and mediating migrant's transnational social spaces has been established. The variety and accessibility of ICTs was central to how these migrants behaved, they were aware of what they could do but only chose to do what they felt was necessary for the situation at hand. This comparison also demonstrated that how they choose to communicate was effected by their cultural differences both in terms of trends in the country they came from and how this difference impacted on their experiences of the country they migrated to. This increasing ICT enabled choice is revealing such factors in much more detail than ever before, which demonstrates the continuing relevance of place and space to any investigation of the role of ICTs in geography.

CHAPTER NINE:
Conclusions and Reflections on Constituting Knowledge about ICTs

Introduction

I began this thesis by telling my personal ICT story, one that spans some of the most recent and rapidly diffused technological changes in human history, including the popularisation of the personal computer and mobile phones and the emergence of the Internet. These technological changes were fundamental aspects of my formative years and this, I argue, has given me a differently informed perspective from many other theorists working in the field of communications geography. Today ICTs are ubiquitous and sheer pace of the changes occurring is often taken for granted. This is one of the key problems identified by researchers such as Thrift and French (2002) and I too took these changes for granted, that is until I stood at a bus stop one day testing a new real time passenger information sign. Suddenly, one of the most mundane aspects of my daily life, catching the bus, was also being reinvented by ICTs.

This thesis has demonstrated that the role ICTs are performing in people's everyday activities in the city is increasingly situated in the *in between.* People are increasingly becoming aware of the conditions of possibility that ICTs are enabling, possibilities that may in turn open up a multiplicity of timespaces. This focus reflects the shift occurring in the emerging literature away from the overriding generalisations argued by conventional ICT narratives usefully summarised by Graham,

> "Discussions about ICTs and cities tend to deny continuities and emphasise revolutionary transformations. New media technologies and practices are often abstracted from their historical contexts and presented simplistically as meteoric impactors arriving as if from nowhere to revolutionise pre-existing places and mobility practices. The subtle interrelations between old and new, non-mediated and mediated, that occur within the fine-grained fabric of cities and everyday life, tend to be glossed over in such hyperbolic discourse" (2004: 35)

This thesis has put Thrift's (1999a) non representational style into practise using it to construct the Chapters as a series of layers with interweaving narrative strands. This was an intentional

effort to move away from the more traditional linear style, and the use of interventions rather than case studies sort to emphasise this. In concluding this thesis has contributed to how geography constitutes knowledge about ICTs at three different levels, each of which will now be discussed in turn. Implicit throughout these three levels is the use of a non representational style. Firstly, at an empirical level each of the four empirical interventions contributes to geography's consideration of the role of ICTs within the fields of urban environments, transportation, education and migration. The use of a non representational style revealed findings that both affirm and disrupt the existing literature. Secondly, at a methodological level the conditions of possibility institutional and individual actors are beginning to perceive through their encounters with ICTs were uncovered. A fact made easier by conducting the research in the Auckland Region, a setting and scale that provides a counter narrative to the literature's emphasis on global cities and technological hubs. These conditions were made visible by the non representational styles emphasis on affective responses. Thirdly, at a theoretical level, the focus on the *in between* as more than a gap or a blank but as a process, a mental space of performance, which needs to be interrogated in order to understand how the interactions between individuals and ICTs are enacted. Building on the methodological claims through the use of a *trans* attitude this thesis demonstrates how the concept of the *in between* contributes to the future development of a non representational style.

An Empirical Contribution

At an empirical level this thesis' objective was to contribute grounded findings to the debates in the geographic literature over the way that ICTs interact with institutions and individuals' everyday activities. Chapter Two unpacked the existing commentaries on ICTs in the context of four fields of geographic research urban environments, transportation, education and migration. Table 2.2 then summarised the developments these discourses identify as a set of possibilities of action. Each of the four empirical interventions sought to conceive whether focusing on uncovering the conditions that enact these possibilities might reveal a different set of actions. Table 9.1 below also draws on Table 2.2 as a baseline with the first column repeating the possibilities of action that have been recognised in the geographic literature associated with each of the four fields. The second and third columns summarise how taking this different methodological approach both affirms and disrupts these possibilities of action. In each of the four interventions some of the conditions recognised in the literature were affirmed. For example in the Auckland ICT Platform experience, the neoliberal reforms directly contributed to

its highly fragmented ICT landscape and disparate levels of access leading to the supposition that a process of urban dissolution was occurring. However, other conditions were also recognised which disrupt the finality of these possibilities of action. Taking the above urban dissolution argument, the heavy investment and ICT saturation of Auckland's CBD and general lack of uptake of tools such as teleworking indicate that the continuing importance of face to face contact is in part negating the extremes of urban dissolution. In focussing on the conditions rather than the concrete actions this thesis demonstrates that more research is required at an empirical level into the complex and contingent interactions occurring among ICTs, institutions and individuals.

Table 9.1: The ways in which the findings of this thesis' four experiences have both disturbed and affirmed the current literature

	Current possibilities of action recognised in the literature	Aspects revealed by the empirical intervention that affirm these	Aspects revealed by the empirical intervention that disrupt these
Local Government's Experience of Auckland's ICT Platforms	The presence of digital divides indicates problems of access to ICTs and levels of disparities in education particularly the skills to use ICTs. Policies targeted at providing the infrastructure to facilitate access are emerging but less attention has been paid to upgrading people's skills.	There are clear disparities regarding internet access throughout the region and these reflect socio-economic differences indicating the presence of digital divides.	The digital divide concept is too simplified and narrow. This experience demonstrated how viewing ICTs in terms of presence and absence reveals both the more obvious disparities that digital divides identify but also through exploring how Auckland's ICTs are socially constructed reveals the less obvious aspects
	ICTs' ability to enhance corporate control across boundaries is creating a chain of Global Cities such as New York, Hong Kong etc leading to the centralisation of decision making. The Internet is in fact reinforcing urban hierarchies.	Auckland presents an interesting situation as it suffers from its geographical location on the periphery and has trouble attracting head offices or skilled ICT workers, yet at a national scale it represents the opposite situation.	The centralisation of decision making is a generalised statement. What is occurring in Auckland while influenced by wider global activities is also very much driven by the needs, wants and experiences of those living in the region
	Urban dissolution brought about by the privatisation of utilities particularly telecommunications is occurring. This has resulted in the fragmentation of urban environments. The removal of the need for face to face contact is changing the dynamics of central city areas, as people increasingly work from home.	The neoliberal reforms contributed to Auckland's highly fragmented ICT landscape and this has influenced the levels of access available.	Auckland's central areas are saturated by ICTs but this has in fact encouraged investment and vibrancy rather than a hollowing out. Face to face contact is still central and very few people have taken up working from home.
	The emergence of network cities with economies based on technology and a highly skilled ICT workforce. Their economies are dominated by financial activities and service provision.	As the largest metropolitan area Auckland is aspiring to become a networked city but it is far from achieving this.	

	Current possibilities of action recognised in the literature	Aspects revealed by the empirical intervention that affirm these	Aspects revealed by the empirical intervention that disrupt these
Experiences of the RTPISP System	The role of surveillance including the ability to monitor transport behaviour particularly safety and infringements. An example is congestion charging, where certain transport modes are charged for the use of a space often during a particular time period.		The RTPSIP System has several surveillance elements in its coded spaces. These are enabling the councils to more accurately plan and fund passenger transport, and monitor both bus operators and bus drivers actions.
	The use of signal pre-emption at traffic lights to give priority to vehicles equipped with specific equipment. This can reduce travel times.		Signal pre-emption is a prominent part of the RTPISP Systems coded spaces. It acts as a way to obtain more funding and as an incentive for the bus drivers to compensate for the big brother effects of the surveillance.
	The ability to both monitor and provide information on transport related systems in real time including public transport and traffic incidents	The real time signs at the bus stop are providing the patrons with a much more transparent view of the bus services. The GUI also allows the bus operators and councils to monitor the buses in real time.	These interfaces are not just providing information they are changing perceptions and behaviours. The bus patrons are engaging with the timespaces in and around the bus stop in different ways. Bus schedules are being changed to reflect more realistic travel times.
	The use of teleconferencing to communicate with others without the need for physical travel or teleworking to enable people to work from an alternative space e.g. home.		While neither teleworking nor teleconferencing were directly addressed in this intervention its focus on ITS disturbs the literature's bias towards virtual travel. It opens up a gamut of possibilities which constitute a range of timespaces rather than annihilating space by time.
E-learning Experiences	The removal of face to face communication due to the employment of ICTs to convey information to students flexibly in both time and space.		Blended learning provides a means to combine face to face contact and computers. Also depending on the students' learning styles and what aspect i.e. lecture or tutorial was involved didn't necessarily miss the face to face aspect.
	Distance learning allows students to be flexible both in the spaces they learn and to lesser extent the times they engage in learning activities. Neoliberal pressures are evident though with efficiency and cost strongly influencing the learning environment.	The University of Auckland's emphasis on developing the LEARN and Cecil technology without considering the wider context of staff student interactions and how learning is performed came through in the students lack of prior understandings of e-learning.	

	Current possibilities of action recognised in the literature	Aspects revealed by the empirical intervention that affirm these	Aspects revealed by the empirical intervention that disrupt these
E-learning Experiences	Blended learning presents some learning flexibility both temporarily and spatially but requires the students' physical presence at a specific time and place for certain learning activities.		E-learning provides the same benefits when delivered in a blended learning context. More attention is required by the literature to on campus examples as this is were the majority of e-learning is occurring.
	E-learning mechanisms are providing a range of ways to communicate information to students and these are becoming increasingly flexible in both space and time.	This experience affirmed this statement because generally the students appreciated the combination of the two types of learning adjusting each to suite their learning style and timespaces.	
Transnational Migrant's Experience	Transnational bonds usually measured through citizenship and political activity across space, but which can change over time. For example participatory democracy through online interactions, migrants outside the space of contestation can become involved.		While ICTs are enhancing the ability to construct transnational social spaces there are many other factors involved. Consequently, all the migrants identified a lessening of communication over time as they had less in common to discuss.
	The retention of transnational social spaces – the interaction of individuals from the same 'home' across spaces and times. Often driven by economic rationality for example the provision of remittances.		When considering migration between developed rather than developing nations other indicators of transnational bonds need to be considered. The role of online interactions such as Cyworld form an interesting means to do this as clearly this both re-forged old bonds and created new connections amongst the younger generation.
	Particular focus on two groups of transnationals. One, the fluid movements of transnational elites. Two the movements from developing nations to developed ones such as the United States.		There didn't appear to be any political activity online by these migrants. This could quite possibly relate to the fact that they made the decision to migrate for a variety of reasons and not just because they felt unsafe or forced out of their country of origin.
	Emerging second wave of research in to middling transnationalism or the everyday practices of middle class migrants often moving between developed nations.	This intervention supported the need to focus on middling transnationalism as many of the findings disrupt the literatures focus on economic rationality of transnational elites or those moving from developing to developed nations.	

A Methodological Claim

Chapter one concluded with Bachelard's assertion that discoveries to do with the conception of space and time "suggest very different ways of constructing knowledge" (cited in McCarter, 1997: 333). Methodologically this thesis' presents a different approach for geography to construct knowledge about technology. One that focuses on uncovering the *conditions* institutions and individuals are beginning to perceive in their encounters with ICTs, conditions that may or may not be performed but are increasingly possible because of the advent of such ICTs. This process of uncovering such conditions of possibility (in homage to Thrift, 1999a) makes ICTs more visible, not only in terms of research outputs but also for the individuals and institutions researched. In all four of the empirical interventions the very act of interviewing or surveying them changed their awareness of the role ICTs were playing in their everyday activities.

This focus on uncovering the conditions that the actors were actually experiencing rather than trying to represent them developed predominantly from two core arguments presented by both Thrift's non representational style and Latour's actor network approach. The first argument is Latour's contention that there is a need to allow "actors [to] have some room to express themselves" (2005: 144), which can be shown by focussing on their "affective responses" (Thrift, 2004b: 703). This was done in two ways. First I reflected on my own affective responses. As revealed in Chapter Four each of the four exploratory interventions was generated from considering the effects of these on my own experiences and asking whether my affective responses were mirrored by others living in Auckland. In doing so I embraced Law's proposal that "we need to think hard about our relations with whatever it is we know, and ask how far the process of knowing also brings it into being" (2004:3). Secondly all four of the experiences expressly focussed on the actors' opinions and perceptions, identifying the *affects* of these ICTs on how they are now performing the experience; whether it was how the local government actors viewed the telecommunications companies, or how the bus patrons thought of the new real time signs, or students' thoughts on blended learning, or how migrants determined their use of various ICTs.

The second point, argued by both Latour (2005) and Thrift (1999b), is best summed up by Thrift's assertion that "we cannot exact a representation of the world from the world because we are slap bang in the middle of it" (1999b: 296-297). This has been demonstrated in two key

ways throughout this thesis. Chapter Four revealed the centrality of my own positionality in the formation of the four empirical interventions and in how I interacted with the participants. This connects strongly to the previous argument about my own and all the participants' affective responses to these emerging ICTs. The other way in which this was demonstrated was through adopting a *trans* attitude (Mulder, 2002) by going along with developments, rejecting of the concept of *post* as backwards looking. In particular three of the points Thrift (2004b) contends in his interpretation of transurbanism provide a useful way in which to demonstrate what adopting this *trans* attitude uncovered.

The first contention that Thrift (2004b) raises is the rejection of the postsocial world thesis. He argues that in fact the very opposite is occurring, that ICTs are facilitating a wider range of relationships not only with other people but also with non-human actants. This was demonstrated in Chapter's Five through Eight. In Chapter Five Auckland's local government was shown to be developing numerous approaches in its relationship with the telecommunications companies operating in the region, some of which have been highly successful such at the future proofing projects involving Manukau City Council and Vector, and some of which have been outright failures such as Waitakere City Council's provision of ducting for cables. No matter what the outcome the point is that previously there was almost no tangible connection but now in order to supply Auckland with the ICT infrastructure they are required to work together. Chapter Six revealed how the RTPISP System is making the relationships between the bus operators and the council, and the bus operators and their drivers far more transparent. The system has also greatly increased the council staff and bus operators' interactions with non-human actants, in this case the GUI and the coded spaces it allows them to interface with. Chapter Seven provided evidence that there are many more human/non-human relationships emerging as the students and staff used an increasing array of ICT mediums for learning. For instance Cecil has now become an almost daily essential both for staff to make announcements and load up course information and for students to download that information and ask questions. Chapter Eight not only demonstrated how the migrants' layering of ICTs is enacting a much wider range of human/non-human relationships but that through these, for the South Koreans at least, old contacts are being renewed and the younger generation, though not physically in South Korea can reconnect with their culture through Cyworld, where they can mentally exist for short periods of time.

Thrift goes on to argue that many of the current technological changes are in fact just adding layers, "minor variations on existing structures" (2004b: 726). Again this was evident in all four of the empirical interventions. The provision of public services by local government as discussed in Chapter Five is a core business; the advent of websites has simply added variations to this making certain processes more public and interactive. For the bus drivers in Chapter Six their job is virtually the same except for minor variations in what they enter into the ticketing machine. They still abide by the same schedules and rules but are now far more conscious of being under real time surveillance. Chapter Seven's two first year courses entail blended learning, probably the most overt example of such minor variations. The students clearly demonstrated their appreciation of the different and complementary qualities that both the traditional and e-learning mechanisms provided. In Chapter Eight it was the migrants' layering for the ICTs that best illustrated Thrift's point. The migrants did not really abandon any communications formats. Instead they chose the most appropriate one for the situation, be it immediacy or intimacy, something also noted by Wilding (2006).

The third aspect raised by Thrift in his discussion of transurbanism is that of the political landscape in which individuals' interactions with ICTs are occurring. That much of the discussion about ICTs has, and still remains, apolitical is very problematic and stems from the concern I raised previously regarding the suppression of the geographic narrative in much of the literature. Investigating the interaction among ICTs, institutions and individuals was, I would argue, made easier by focussing on Auckland, New Zealand. The Auckland Region presents a counter narrative to the literatures' emphasis on global cities and technological hubs. As Friesen, Murphy and Kearns identify it is a "hidden, less obvious, [site] of urban change" (2005: 366) located on the geographic periphery. Yet is has its own "spatial grammar of power" (2004b: 729) as the largest metropolitan area in New Zealand with nearly a third of the countries population. It therefore provided a fascinating and easily accessible landscape in which to explore the interactions between ICTs and individuals. The relatively small scale of the ICT sector in Auckland, combined with my positionality as someone who had grown up in the region and working as a local government planner aided in my ability to access a range of actors. I further accept that due to these circumstances it was relatively straightforward to access the senior managers and CEOs of the core institutions involved in Auckland's ICT landscape, something that would probably involve extensive and complex undertakings in larger scale urban environment such as London.

This methodology however, could be replicated in other urban environments at different scales given the right resources. The insights and conditions identified though would be quite different as the constituted dimensions of the timespaces beginning to emerge are dependent on past experience and place. This thesis has demonstrated that all facts need to be localised (Law and Mol, 2001). Chapter Three revealed how by unpacking legislative and governance changes invoked by neoliberalism, global transformations were reinterpreted at the national and regional level. The changes that each of the four sectors, telecommunications, transport, education and migration underwent, and the after neoliberal responses that are now emerging, are constituent parts of the wider conditions of possibility of living and working in New Zealand that all the actors are now beginning to sense and engage with. Utilising O'Neill and McGuirk's (2005) work I conceptualised Auckland's ICT Institutional Landscape revealing the numerous actors involved and the different roles they were performing. This provided a means to connect the wider national frameworks to the regional scale of Auckland and began the process of situating the targeted empirical interventions. Building on this the second step was the construction of the four exploratory interventions as an archipelago of situated experiences.

As each one unfolded the conditions of possibility being recognised and the timespaces that emerged, were demonstrably contingent on being performed in Auckland, New Zealand. The complexities and highly politically charged relationships among local government, central government and the private ICT sector in Chapter Five would have progressed quite differently if the local loop had been unbundled when Telecom was privatised. The initiatives and approaches that have emerged are in some ways unique and yet there are wider similarities in terms of local government's overall struggle to situate and adapt to ICTs (see van der Meer and van Winden, 2003; Cohen-Blankshtain et al, 2004). Chapter Six demonstrated that the significant passenger transport issues faced by Auckland coloured the perceptions of the bus patrons questioned. There was already a strong element of mistrust. The difficult relationship between the private bus operators and the councils was a key arbitrator in how the RTPISP System rolled out and many of the more public difficulties such as the DLY issue. In Chapter Seven the degree of e-learning emerging at the national scale in New Zealand and the University of Auckland's concentration on technological solutions without simultaneously considering their embededness was clearly reflected in the students' prior understandings of and engagements with e-learning mechanisms. A fact that had follow on effects in terms of the conditions of possibility they conceived in their experiences in the two blended learning papers. Chapter Eight contained the most palpable evidence of how the actors use of ICTs is contingent

on their previous experiences and their situatedness. Table 3.2 in Chapter Three framed this through revealing the differences in the telecommunication landscapes of South Korea, South Africa and New Zealand. The way in which the migrants imagined, negotiated and mediated their migration process was strongly influenced by their prior interactions with ICTs. This dictated both their initial uptake and, through their regular communication back home, also determined which ICTs they retained, for example the fax machine for many of the South Africans, and of the new ICTs employed the use of Cyworld by the South Koreans.

A Theoretical Claim

The order in which I was exposed to various theoretical conceptions was crucial to the way this thesis developed. Grahams (1998) article on the end of geography and Kirsch's (1995) 'The Incredible Shrinking World' provided a useful starting point introducing me to the annihilation of space by time thesis and the problems associated with this dualistic line of thinking particularly as it concerns emerging ICTs and geography. May and Thrift's (2001) manifesto on timespace then provided a useful discussion of how geographers were attempting to overcome this space time dualism. At the same time I encountered Castells (1996) body of work on the information society which presented a detailed account of how ICTs were shaping the world. My understanding of Castells work however was heavily coloured by Graham (1998), Kirsch (1995) and May and Thrift's (2001) caveat's that space and time should not be treated dualistically. Particularly problematic was Castells (1996) concepts of a space of flows and timeless time, and this led me to reject many of his claims. I instead turned to Thrift's growing body of work since 1999 concerning various insights into technology and especially the role of software. Particularly influential was his work with French (2002) on the Automatic Production of Space. Dodge and Kitchin's (2004a; 2004b; 2005a; 2005b) work on code space presented a new way to conceive the role of ICTs. They in turn drew from MacKenzie's (2003) work on transduction as a means to remove the dualism between technology and society which enabled me to begin to consider the timespaces evoked by recent ICTs. In fact the parallels and absence of particular connections within the literature was quite telling. Many of these theories go to a certain point and no further. May and Thrift (2001) while arguing for time and space to be treated interdependently primarily focus their attention on temporality and give only fleeting references to the role of emerging ICTs, MacKenzie (2003) while bridging the gap between technology and society seems to neglect the role of space, whereas Dodge and Kitchin (2004a; 2004b) have much less to say about time. Also noticeable is the sparseness of the literature that

has developed these ideas, particularly in combination. There appear to be two reasons for this current lacuna. Firstly, many of these discussions suppress the geographic narrative in that they either don't deal with the context or the context is controlled or based in particular ways. Secondly, the rapid advancements in ICTs have led to the fear that any research will be out of date before it is published. This presumption forgets that such research should be about more than just chasing the fads of each new technology. This lacuna encouraged me to make a theoretical claim about the usefulness of accessing the *in between* through a series of actions:

- Make ICTs visible both infrastructurally and cognitively by focussing on the gap between ICTs and how they are performed
- Recognise the often increasing possibilities emerging from human/non-human interactions
- Acknowledging the situatedness of all interactions with ICTs
- Provide additional relational content to the concept of timespace

Thrift suggests that we need to "recognise the realm between thinking and affects" (2004b:731). I have already discussed how this thesis was initiated by my own affective responses to ICTs in Auckland and focussed on accessing the participants' opinions in order to uncover their own affective responses. What it is necessary to call attention to here is the use of affect to access the *in between* as a mental space of performance. The affective responses of the participants revealed what conditions of possibility they perceived and/or further actions they constituted in each experience. These responses are becoming more than simply a reaction; they are leading to a process of invention in which an application evolves beyond what was originally intended and often beyond the inventor's control (Thrift, 2006). While this can be imagined in the obvious sense of modifications and alternative uses what I have demonstrated in this thesis is that this process of invention can also be extended to the timespace possibilities the individuals and institutions are beginning to constitute through various initiatives and experimentation. For instance in Chapter Five the 'Hands on Approach' utilised by Waitakere City Council is a process of invention. By actually constructing their own ducts they intended to go beyond the dominance of the main telecommunications companies both by freeing up capital for smaller companies and by ensuring they knew where the ICT cabling was going. The timespace they were attempting to constitute was one in which they increased their ability to control both the timing of cabling and the spaces in which it was placed. However, what actually emerged was a particular timespace of conflict and negotiation around the companies' resistance to committing to the council's schedules and locations. For the bus patrons in Chapter Six the information provided by the real time signs enabled the patrons to essentially re-invent their bus catching

behaviour, be it constituting timespaces whereby they do something else while waiting, or timespaces involving choosing a different modal choice such as walking or returning for their car because they did not want to wait. Chapter Seven revealed an interesting exception to this process of invention. While the use of a mobile phone primarily for text messaging has become one of the most referred to forms of invention in recent years, the students' did not take the invention process further by using it to communicate with lecturers on the course. Their view that it both lacked detail and was too personal a means of communication does appear to highlight the intriguing idea of unsuitable timespace relations. In Chapter Eight the migrants are utilising certain ICTs more as a means to coordinate communication. The South Africans through text messaging and the South Koreans through Cyworld are arranging alternative timespaces of communications often by more intimate means such as phone calls. Overall this process of invention is clearly opening up numerous ways to engage with the *in between* a concept realised through the adoption of a *trans attitude* that Mulder (2002) promotes. This attitude provides a means to progress Thrift's (1999a; 2000) proposal of a non representational style as a means to go along with the performances enacted because it aids both in the need to acknowledge what has gone before and as a way to accept that for every encounter there are both actualised and unactualised possibilities.

New Types of Narratives and Future Questions

> "The problem is that we know remarkably little about the everyday TimeSpace of the city that is not surmise: we have a battery of results from time budget studies and the like which are indicative, but rarely more… we have some phenomenological interventions, and we have one or two ethnographic studies. Yet, even a short period of reflection suggests that it is unlikely that the TimeSpace of the Western city can be encompassed by just one account. It is not so much one big screen as many tiny windows" (May and Thrift, 2001: 35).

By accessing and animating the *in between* this thesis proposes a new type of narrative one that provides an entry point as May and Thrift put it into the "many tiny windows" (2001: 35) that make up the plurality of today's urban environments. By focusing on the performance of the *in between* spaces, the conditions that institutions and individuals are beginning to perceive in their encounters with ICTs are revealed. These conditions are highly contingent on previous experiences of spaces and places reiterating Graham's (1998) argument that geography is central

to any conceptualisation of how ICTs are transforming everyday lives. The recognition that time and space can no longer be treated dualistically is also of central importance to this new type of narrative. This thesis works with May and Thirft's (2001) concept of timespace to begin this process but further grammatical changes are needed. While each of the four interventions demonstrated how recognised conditions of possibility are providing an entry point into a multiplicity of timespaces the actual discussion of the emergent timespace frameworks was limited. Thrift's (1999a; 2000) non representational style begins to provide the new language needed to express these frameworks; a language of performance and affective responses but more work is needed on how to detail the *in between*.

This process of opening up has revealed just how much there is still to know both methodologically and theoretically. The heuristic tables at the beginning of each empirical intervention contained a third column identifying hypothetical possibilities of action that were not observed to emerge from the interactions investigated. These provide a useful starting point for future research. Why was it that these possibilities were not witnessed in the Auckland Region, was it merely the sample size, was it because there was an overwhelming bias that went undetected concerning the actors' general perceptions of ICTs, or was it simply that the infrastructure is not yet in place to enable that particular possibility to emerge? There is increasing attention being paid to the idea of emergent disciplines within academia, in Great Britain this is being driven by a substantial grant from the Leverhulme Trust for the 'Embedding of Emerging Disciplines' (Leverhulme Trust, 2008). In writing this thesis I utilised a range of disciplines, from the humanities such as sociology and psychology through to computer science and engineering. I began this thesis with the goal of defending geography as a discipline in the face of arguments about its relevance in today's societies. While this thesis has demonstrated the need to retain a geographic perspective it has also highlighted some of the limitations of this perspective to date. ICTs are creating a multitude of effects and affects in terms of how individuals and institutions perceive the world. This thesis has demonstrated that it is only by adopting more flexible and open ways of researching such developments, in this case through the use a non representational style enhanced by the adoption of a *trans* attitude, that the complexity of these encounters can be revealed.

Appendix A: Ethics Forms

Contents of this Appendix

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THE UNIVERSITY OF AUCKLAND
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The University of Auckland
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www.auckland.ac.nz

Participant Information Sheet – CEO Semi Structured Interview

Title: Technology, Infrastructure and Timespace: Exploring Emerging Connectivity in Auckland

To: The CEO of……..
(The appropriate organisation's name will be entered.)

My name is Phillipa Mitchell. I am a student at the University of Auckland carrying out my PhD in the School of Geography and Environmental Science. The aim of my thesis is to explore the way information and communications technologies (ICTs) e.g. email, mobiles, the internet, are affecting people's everyday lives. I am also investigating how this may influence the way they think about time and space, as many people comment on how the pace of life has increased and the world is getting smaller due to ICTs. As part of this research I would like to develop a picture of the ICT infrastructure and the roles it undertakes in Auckland. The purpose of this is to develop a context for my three case studies that will explore: migrants use of ICTs; the Real Time Passenger Information transportation project; and, virtual learning at the University of Auckland. This research is being funded by a University of Auckland Doctoral Scholarship and the School of Geography and Environmental Science.

As part of my thesis I would like to conduct interviews with those staff that would be able to provide me with insight into the ICT infrastructure of Auckland. The purpose of these interviews is twofold. Firstly, it is to gather information that will enable a picture of the ICT infrastructure to be developed. It is understood that some of the information is likely to be commercially sensitive and it will only be used in the final report or publication in accordance with the conditions set by your organisation. Secondly these interviews will also explore the industries opinions and attitudes toward this infrastructure: its development; changes it has undergone; and, future predictions.

I would like to conduct the interviews at a time convenient to the individual during working hours for no more than 1.5 hours. The staff are under no obligation at all to be interviewed. I would prefer to audio tape the interview but this would only be done with the consent of the individual staff member and could be turned off at any time. Two weeks after the interview a transcript of it will be available for the staff member to review and edit should they feel the need to do so. The information they supply can be withdrawn any time up to 1 December 2005. The data will be stored for six years and then archived in a locked filing cabinet at the home of the researcher.

If the information provided from this interview is reported or published it will identify your organisation but will not identify the individual staff member as the source of the information.

Thank you very much for your time and help in making this study possible. If you have any queries or wish to know more please phone or write to me at:

School of Geography and Environmental Science
Attn: Phillipa Mitchell
The University of Auckland
Private Bag 92019
Auckland
Tel: 3737 599 Ext 84607 (at University) or 021 361 370 (mobile)
My supervisor is:
Professor Richard Le Heron
School of Geography and Environmental Science

The University of Auckland
Tel: 3737 599 extn. 88453

If you have any concerns of an ethical nature you can contact the Chair of the University of Auckland Human Participants Ethics Committee at 373-7599 extn. 87830. Secretariat, Rm 016 Alfred Nathan House, 24 Princes Street, Auckland.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 18 May 2005 for 3 years from 18 may 2005 to 18 May 2008 Reference Number 2005/203

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CEO CONSENT FORM - Semi Structured Interview

THIS CONSENT FORM WILL BE HELD FOR A PERIOD OF SIX YEARS

Title: Technology, Infrastructure and Timespace: Exploring Emerging Connectivity in Auckland

To: The CEO of…….
(The appropriate organisation's name will be entered.)

Researcher: Phillipa Mitchell, School of Geography and Environmental Science

I have been given and have understood an explanation of this research project. I have had the opportunity to ask questions and have them answered.

I agree for selected staff from this organisation to be approached for an interview during work time.

I understand that the data will be stored for six years and then archived in a locked filing cabinet at the home of the researcher.

I understand that the staff members will be audio taped and that they have the right to turn this off at any time. I further understand that they will have the choice of reviewing a transcript of the interview two weeks after it has taken place.

I agree that although the organisation will be clearly identified in this research, the identities of the staff interviewed are strictly confidential and will not be disclosed either directly or indirectly.

I understand that that staff members interviewed have the right to withdraw their information/data up to the 1 December 2005.

Signed:_____

Name: _____
(Please print clearly)

Date:_____

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 18 May 2005 for 3 years from 18 may 2005 to 18 May 2008 Reference Number 2005/203

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Participant Information Sheet – Staff Semi Structured Interview

Title: Technology, Infrastructure and Timespace: Exploring Emerging Connectivity in Auckland

To: Staff of……..
(The appropriate organisation's name will be entered.)

My name is Phillipa Mitchell. I am a student at the University of Auckland carrying out my PhD in the School of Geography and Environmental Science. The aim of my thesis is to explore the way information and communications technologies (ICTs) e.g. email, mobiles, the internet, are affecting people's everyday lives. I am also investigating how this may influence the way they think about time and space, as many people comment on how the pace of life has increased and the world is getting smaller due to ICTs. As part of this research I would like to develop a picture of the ICT infrastructure in Auckland. The purpose of this is to develop a context for my three case studies that will explore: migrants use of ICTs; the Real Time Passenger Information transportation project; and, virtual learning at the University of Auckland. This research is being funded by a University of Auckland Doctoral Scholarship and the School of Geography and Environmental Science.

You are invited to participate in my research due to your involvement in the ICT infrastructure in Auckland and I would appreciate any assistance you can give me. I have the employer's permission to interview you. The purpose of this interview is twofold. Firstly, I would like to discuss any information you may be able to provide me with to develop a picture of Auckland's ICT infrastructure. It is understood that some of this information is likely to be commercially sensitive and it will only be used in the final report or publication in accordance with the conditions set by your organisation. Secondly I would like to discuss your views on the industries' opinions and attitudes toward this infrastructure: its development; changes it has undergone; and, future predictions

I would like to conduct the interviews at a time convenient to you during working hours for no more than 1.5 hours. You are under no obligation at all to be interviewed. I would prefer to audio tape the interview but this would only be done with your consent and could be turned off at any time. Two weeks after the interview a transcript of it will be available for you to review and edit should you feel the need to do so. The information you supply can be withdrawn any time up to 1 December 2005. The data will be stored for six years and then archived in a locked filing cabinet at the home of the researcher.

If the information provided from this interview is reported or published it will identify the organisation you work for but will not identify you as the source of the information.

Thank you very much for your time and help in making this study possible. If you have any queries or wish to know more please phone or write to me at:

School of Geography and Environmental Science
Attn: Phillipa Mitchell
The University of Auckland
Private Bag 92019
Auckland
Tel: 3737 599 extn. 84607 (at University) or 021 361 370 (mobile)
My supervisor is:
Professor Richard Le Heron

School of Geography and Environmental Science
The University of Auckland
Tel: 3737 599 extn. 88453

If you have any concerns of an ethical nature you can contact the Chair of the University of Auckland Human Participants Ethics Committee at 373-7599 extn. 87830. Secretariat, Rm 016 Alfred Nathan House, 24 Princes Street, Auckland.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 18 May 2005 for 3 years from 18 may 2005 to 18 May 2008 Reference Number 2005/203

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STAFF CONSENT FORM - Semi Structured Interview

THIS CONSENT FORM WILL BE HELD FOR A PERIOD OF SIX YEARS

Title: Technology, Infrastructure and Timespace: Exploring Emerging Connectivity in Auckland

To: The Staff of…….
(The appropriate organisation's name will be entered.)

Researcher: Phillipa Mitchell, School of Geography and Environmental Science

I have been given and have understood an explanation of this research project. I have had the opportunity to ask questions and have them answered.

I agree to take part in this research and am willing to be interviewed during work time.

I understand that the data will be stored for six years and then archived in a locked filing cabinet at the home of the researcher.

I agree/do not agree (please delete one) that I will be audio taped and understand that, even if I agree, I may choose to have the recorder turned off at any time.

I would like/ would not like (please delete one) a copy of the interview transcript sent to me two weeks after the interview to review and edit.

I understand that although the organisation will be clearly identified in this research, my identity is strictly confidential and will not be disclosed either directly or indirectly.

I understand that that I have the right to withdraw any of the information/data I have provided up to the 1 December 2005.

Signed:_____

Name: _____
(Please print clearly)

Date:_____

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 18 May 2005 for 3 years from 18 may 2005 to 18 May 2008 Reference Number 2005/203

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Auckland, New Zealand

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Participant Information Sheet – Anonymous Questionnaire

Title: Bus Patrons Impressions of the Real Time Passenger Information System

To: Bus Patron

My name is Phillipa Mitchell. I am a student at the University of Auckland carrying out my PhD in the School of Geography and Environmental Science. The aim of my thesis is to explore the way information and communications technologies (ICTs) e.g. email, mobiles, the internet, are affecting people's everyday lives. I am also investigating how this may influence the way they think about time and space, as many people comment on how the pace of life has increased and the world is getting smaller due to ICTs. As part of this research I would like to examine the impacts of the Real Time Passenger Information System that Auckland City has rolled out at bus stops in the City.

I must advise you that I was previously employed by the Auckland City Council as a transport planner on this project and continue to do some contract work on it. The summary findings of this questionnaire will be provided to the Auckland City Council. This research is being funded by a University of Auckland Doctoral Scholarship and the School of Geography and Environmental Science.

As a bus patron you are invited to participate in my research by answering a questionnaire. I am interested in your opinion of the real time sign and its impacts on your perceptions of time and space. The international literature in this field identifies that real time information alters bus patrons' views of public transport particularly its reliability. It also identifies that an awareness of when the bus is due in real time alters people's behaviour in terms of what they do whilst at the bus stop. You are under no obligation to answer the questionnaire it is completely voluntary.

The questionnaire should take no more than 5 minutes of your time, and will be administered verbally by myself, the researcher. The questionnaire is not collecting any personal information, however as I will be administering it to you personally anonymity cannot be guaranteed. If the information you provide is reported or published, this will be done in a way that does not identify you as its source. The data will be stored for six years and then archived in a locked filing cabinet at the home of the researcher.

Thank you very much for your time and help in making this study possible. If you have any queries or wish to know more please phone or write to me at:
School of Geography and Environmental Science
Attn: Phillipa Mitchell
The University of Auckland
Private Bag 92019, Auckland
Tel: 3737 599 extn. 84607 (at University)

My supervisor is:
Professor Richard Le Heron
School of Geography and Environmental Science
The University of Auckland
Tel: 3737 599 extn. 88453

The Head of Department is:
Dr Willie Smith
School of Geography and Environmental Science

The University of Auckland
Tel: 3737 599 extn. 85284
If you have any concerns of an ethical nature you can contact the Chair of the University of Auckland Human Participants Ethics Committee at 373-7599 extn. 87830.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 8 February 2006 for 3 years from 8 February 2006 to 8 February 2008 Reference Number 2005/438

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FACULTY OF SCIENCE

The University of Auckland
Private Bag 92019
Auckland, New Zealand

www.auckland.ac.nz

Participant Information Sheet – Anonymous Questionnaire

Title: Technology, Infrastructure and Timespace: Exploring Emerging Connectivity

To: Student of GEO103 Digital Worlds Summer School 2006/2007 Paper

My name is Phillipa Mitchell. I am a student at the University of Auckland carrying out my PhD in the School of Geography and Environmental Science. The aim of my thesis is to explore the way information and communications technologies (ICTs) e.g. email, mobiles, the internet, are affecting people's everyday lives. I am also investigating how this may influence the way they think about time and space, as many people comment on how the pace of life has increased and the world is getting smaller due to ICTs. As part of this research I would like to examine the role of ICTs in tertiary learning. This research is being funded by a University of Auckland Doctoral Scholarship and the School of Geography and Environmental Science.

You are invited to participate in my research due to your enrolment in the GEO103 Digital Worlds Summer School paper. The Digital Worlds paper examines the interactions between technology and space and society. One of its goals it to try and encourage students to utilise different forms of communications technologies e.g. email, chat rooms, mobile etc throughout the course to mediate their learning experience.

I would like to invite you to fill out an anonymous questionnaire to ascertain your understanding of the interactions between technology and society and space with particular relation to tertiary learning. As I am also a tutor on the course I must make it clear that you are under no obligation at all to fill out the anonymous questionnaire it is completely voluntary and that your non participation will have no bearing on your status in the course. The questionnaire is anonymous and has absolutely no connection to the coursework or assessments in anyway.

The anonymous questionnaire should take no more than 20 minutes to complete, it will be distributed to you are the end of class time for you to take away and fill in. Could you please return the questionnaire by Friday 10 February 2006 to the green box provided in the School of Geography and Environmental Science's Student Resource Centre. The final page of the questionnaire invites you to attend a focus group discussion on the topics covered by the questionnaire. If you are interested and complete this page could you please tear it off the questionnaire before you submit both sheets to the box to ensure the anonymity of the questionnaire. Participation in the focus group is completely voluntary and choosing not participating in it will have no bearing on you status in the course. The information provided by the questionnaire will be used in the thesis and may be reported or published externally, it will only identify the name of the paper and that it was run at the University of Auckland. The data will be stored for six years and then archived in a locked filing cabinet at the home of the researcher.

Thank you very much for your time and help in making this study possible. If you have any queries or wish to know more please phone or write to me at:
School of Geography and Environmental Science
Attn: Phillipa Mitchell
The University of Auckland
Private Bag 92019
Auckland
Tel: 3737 599 extn. 84607 (at University)

My supervisor is:
Professor Richard Le Heron
School of Geography and Environmental Science
The University of Auckland
Tel: 3737 599 extn. 88453

The Head of Department is:
Dr Willie Smith
School of Geography and Environmental Science
The University of Auckland
Tel: 3737 599 extn. 85284

If you have any concerns of an ethical nature you can contact the Chair of the University of Auckland Human Participants Ethics Committee at 373-7599 extn. 87830.
APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON
7 December 2005 for 3 years from 8/12/05 to 8/12/08 Reference Number 2005/421

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The University of Auckland
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Auckland, New Zealand

www.auckland.ac.nz

Participant Information Sheet – Focus Group

Title: Technology, Infrastructure and Timespace: Exploring Emerging Connectivity

To: Student of GEO103 Digital Worlds Summer School 2006 Paper

My name is Phillipa Mitchell. I am a student at the University of Auckland carrying out my PhD in the School of Geography and Environmental Science. The aim of my thesis is to explore the way information and communications technologies (ICTs) e.g. email, mobiles, the internet, are affecting people's everyday lives. I am also investigating how this may influence the way they think about time and space, as many people comment on how the pace of life has increased and the world is getting smaller due to ICTs. As part of this research I would like to examine the role of ICTs in tertiary learning. This research is being funded by a University of Auckland Doctoral Scholarship and the School of Geography and Environmental Science.

You are invited to participate in my research due to your enrolment in the GEO103 Digital Worlds Summer School paper. The Digital Worlds paper examines the interactions between technology and space and society. One of its goals it to try and encourage students to utilise different forms of communications technologies e.g. email, chat rooms, mobile etc throughout the course to mediate their learning experience.

I would like to invite you to participate in a focus group discussion with other students from the course. The discussion will be facilitated by myself and covers the same topics as the anonymous questionnaire you filled out. As I am also a tutor on the course I must make it clear that you are under no obligation at all to attend the focus group, it is completely voluntary, and further that if you chose not to participate in the focus group this will have no bearing on you status in the course. The focus group is part of a completely separate research project and the reason the Digital Worlds paper was chosen was due to its similar themes.

The focus group discussion should take no more than 1 hour and will be held during the week in the School of Geography and Environmental Science. It will be audio taped. If the information provided from this focus group is reported or published it will identify that the paper was at the University of Auckland and may state the name of the paper but will not identify you personally as the source of the information. As students participating in the focus group may know each other anonymity and confidentiality cannot be guaranteed for any comments made during the discussion. You may remove yourself from the focus group at any time and this will have no bearing on your status in the course but you cannot withdraw any information you may have already contributed to the discussion. The data will be stored for six years and then archived in a locked filing cabinet at the home of the researcher.

Thank you very much for your time and help in making this study possible. If you have any queries or wish to know more please phone or write to me at:

School of Geography and Environmental Science
Attn: Phillipa Mitchell
The University of Auckland
Private Bag 92019
Auckland
Tel: 3737 599 extn. 84607 (at University)

My supervisor is:

Professor Richard Le Heron
School of Geography and Environmental Science
The University of Auckland
Tel: 3737 599 extn. 88453

The Head of Department is:
Dr Willie Smith
School of Geography and Environmental Science
The University of Auckland
Tel: 3737 599 extn. 85284

If you have any concerns of an ethical nature you can contact the Chair of the University of Auckland Human Participants Ethics Committee at 373-7599 extn. 87830.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 7 December 2005 for 3 years from 8/12/05 to 8/12/08 Reference Number 2005/421

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STUDENT CONSENT FORM – FOCUS GROUP

THIS CONSENT FORM WILL BE HELD FOR A PERIOD OF SIX YEARS

Title: Technology, Infrastructure and Timespace: Exploring Emerging Connectivity in Auckland

To: Student of the GEO103 Digital Worlds Summer School Paper

Researcher: Phillipa Mitchell, School of Geography and Environmental Science

I have been given and have understood an explanation of this research project. I have had the opportunity to ask questions and have them answered.

I agree to take part in this research and am willing to participate in the focus group discussion during term time.

I am aware that the researcher is also a tutor on the course, but I understand that participation in the focus group is completely voluntary and that if I choose not to participate it will have no bearing on my status in the course.

I understand that the focus group discussion will be audio taped and that if I decided to leave during the discussion I will not be able to withdraw any contribution I have already made.

I accept that anonymity and confidentiality cannot be guaranteed as the participants in the focus group may already know each other. I understand that the researcher will never identify me directly in her research and will only disclose the name of the paper and that it was run at the University of Auckland.

I understand that the data will be stored for six years and then archived in a locked filing cabinet at the home of the researcher indefinitely.

Signed:_____

Name: _____
(Please print clearly)

Date:_____

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 7 December 2005 for 3 years from 8/12/05 to 8/12/08 Reference Number 2005/421

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THE UNIVERSITY OF AUCKLAND
NEW ZEALAND
Te Whare Wānanga o Tāmaki Makaurau

Student Participant Information Sheet

Title: Exploring e-learning mechanisms being used in the School of Geography, Geology and Environmental Science courses

To: Student of GEO105 Natural Hazards in New Zealand First Semester 2007

My name is Phillipa Mitchell. I am a student at the University of Auckland carrying out my PhD in the School of Geography, Geology and Environmental Science. The aim of my thesis is to explore the way information and communications technologies (ICTs) e.g. email, mobiles, the internet, are affecting people's everyday lives. I am investigating how this may influence the way they think about time and space, as many people comment on how the pace of life has increased and the world is getting smaller due to ICTs. As part of this research I would like to examine the role of ICTs in tertiary learning. This research is being funded by a University of Auckland Doctoral Scholarship and the School of Geography, Geology and Environmental Science.

You are invited to participate in this research due to your enrolment in the GEO105 Natural Hazards in New Zealand paper. This anonymous questionnaire focuses on the use of virtual field trip lab exercises via a CD ROM. This is a form of e-learning that is increasingly being used in tertiary institutions such as the University of Auckland. I would like to invite you to fill out an anonymous questionnaire to ascertain your experience of using the CD, how it differed from more traditional methods such as compulsory lab times, and what you felt were the benefits and problems with this approach. The questionnaire is a nonymous and has absolutely no connection to the coursework or assessments in anyway. You are under no obligation at all to fill out the anonymous questionnaire it is completely voluntary and your non participation will have no bearing on your status in the course, grades or academic relationships with the department or members of staff. Your return of the questionnaire will serve as a form of consent. As the questionnaire is anonymous, once it is completed and returned, no information can be withdrawn.

The anonymous questionnaire should take no more than 20 minutes to complete; it will be distributed to you at the end of lecture times in week 10 for you to fill in. Could you please return the questionnaire by Friday 18 May 2007 to the box provided either at the end of class time or to the School of Geography, Geology and Environmental Science's Student Resource Centre. The information provided by the questionnaire will be used in my thesis and may be reported or published externally, it will only identify the name of the paper, the year and that it was run at the University of Auckland. A summary report of the findings will also be put on Cecil for your information. The paper records will be stored in a locked filing cabinet in the researchers' office until completion of the PhD and then destroyed.

Thank you very much for your time and help in making this study possible. If you have any queries or wish to know more please phone or write to me at: School of Geography, Geology and Environmental Science, Attn: Phillipa Mitchell, The University of Auckland, Private Bag 92019, Auckland, Tel: 3737 599 extension 82924 (at University).

My supervisor is:
Professor Richard Le Heron
School of Geography, Geology and Environmental Science
The University of Auckland
Tel: 3737 599 extn. 88453

The Head of Department is:
Dr Willie Smith
School of Geography, Geology and Environmental Science
The University of Auckland
Tel: 3737 599 extn. 85284

For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Office of the Vice Chancellor, Private Bag 92019, Auckland 1142. Telephone 09 373-7599 extn. 87830.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 11 April 2007 for three years. Reference Number 2007/Q/007

SCHOOL OF GEOGRAPHY & ENVIRONMENTAL SCIENCE
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The University of Auckland
Private Bag 92019
Auckland, New Zealand

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Participant Information Sheet

Title: The affect of information and communication technologies on migrants' interactions with their country of origin and with organisations and individuals in the Auckland region.

To:

My name is Phillipa Mitchell. I am a student at the University of Auckland carrying out my PhD in the School of Geography and Environmental Science. The aim of my thesis is to explore the way information and communications technologies (ICTs) e.g. email, mobiles, the internet, are affecting people's everyday lives. I am also investigating how this may influence the way they think about time and space, as many people comment on how the pace of life has increased and the world is getting smaller due to ICTs. As part of this research I would like explore migrants' use of ICTs. I am interested in how ICTs affect the way migrants are settling into life in the Auckland region. This research is being funded by a University of Auckland Doctoral Scholarship and the School of Geography and Environmental Science.

You are invited to participate in my research due to your situation as a South African/Korean (*one option removed before giving to participant*) immigrant who has lived in the Auckland region for over ten years or less than five years. The purpose of this interview is to develop a picture of your use technologies such as email, mobile phones and the internet to both keep in touch with your country of origin and to interact with organisations and individuals in the Auckland region. My research is interested in the types of communication strategies you have developed using these technologies for example how you found out information about living in Auckland both prior to arriving and after you arrived, what contacts you have maintained with your country of origin and what contacts you have made in Auckland, and New Zealand.

I would like to conduct the interviews at a time convenient to you either at your home or at a suitable café. The interview should take no more than one to two hours. You are under no obligation at all to be interviewed. The interview will be conducted in English; however, if you require it, a translator can be present during the interview. If you choose to use a translator your anonymity cannot be guaranteed but the translator will have signed a confidentiality agreement to ensure the information you provide is treated confidentially. I would prefer to audio tape the interview but this would only be done with your consent and could be turned off at any time. Two weeks after the interview a copy of the tape will be available for you. The information you supply can be withdrawn any time up to 1 December 2006. The data will be stored for six years in a locked filing cabinet at the office of the researcher after this time it will be shredded.

If the information provided from this interview is reported or published it will identify that your country of origin was Korea and that you have lived in the Auckland region for over ten years or less than five years but it will not identify you specifically as the source of the information.

Thank you very much for your time and help in making this study possible. If you have any queries or wish to know more please phone or write to me at:

School of Geography and Environmental Science
Attn: Phillipa Mitchell
The University of Auckland
Private Bag 92019
Auckland
Tel: 3737 599 extn. 84607 (at University) or 021 361 370 (mobile)

My supervisor is:

Professor Richard Le Heron
School of Geography and Environmental Science
The University of Auckland
Tel: 3737 599 extn. 88453

The Head of Department is:
Dr Willie Smith
School of Geography and Environmental
Science
The University of Auckland
Tel: 3737 599 extn. 85284

If you have any concerns of an ethical nature you can contact the Chair of the University of Auckland Human Participants Ethics Committee at 373-7599 extn. 87830.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 12 July 2006 for three years from 14 July 2006 to 14 July 2009 Reference Number 2006/239

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CONSENT FORM – South African/Korean Migrants

THIS CONSENT FORM WILL BE HELD FOR A PERIOD OF SIX YEARS

Title: The affect of information and communication technologies on migrants' interactions with their country of origin and with organisations and individuals in the Auckland region.

To:

Researcher: Phillipa Mitchell, School of Geography and Environmental Science

I have been given and have understood an explanation of this research project. I have had the opportunity to ask questions and have them answered.

I agree to take part in this research and am willing to participate in the semi structured interview at a time convenient to myself either at my place of residence or at a suitable café.

I agree/do not agree (please delete one) that I will be audio taped and understand that, even if I agree, I may choose to have the recorder turned off at any time.

I would like/ would not like (please delete one) a copy of the audio tape sent to me two weeks after the interview. Please send the copy of the tape to:

_____

_____

_____

I would like/ would not like (please delete one) a translator to be present during the interview.

I understand that if request the presence of a translator during the interview my anonymity cannot be guaranteed but that the translator will have signed a confidentiality agreement ensuring confidentiality for the information I provide.

I understand that although my country of origin, and the length of time I have lived in the Auckland region will be clearly identified in this research, my identity is strictly confidential and will not be disclosed either directly or indirectly.

I understand that the data will be stored for six years in a locked filing cabinet at the office of the researcher after which it will be shredded.

I understand that that I have the right to withdraw any of the information/data I have provided up to the 1 December 2006.

Signed: _____

Name: _____ **Date:** _____
(Please print clearly)

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Participant Information Sheet - 참여자를 위한 정보

주제: 정보통신기술이 이민자의 고국 혹은 오클랜드 지역내의 단체와 개인간의 교류에 미치는 영향

_____ **귀하**

안녕하십니까? 저의 이름은 필리파 미첼 (Phillipa Mitchell)입니다. 저는 오클랜드 대학교 지리환경 과학부에서 박사 과정을 밟고 있으며 그 일환으로 본 연구를 지휘하고 있습니다. 저의 논문의 목표는 이메일이나 핸드폰, 인터넷과 같은 정보통신기술이 어떻게 사람들의 일상 생활에 영향을 미치는지 조사하고 있습니다. 많은 사람들이 정보통신기술로 인해 빨라진 삶의 흐름과 점점 작아지는 세계에 대해 언급함에 따라 저는 어떻게 정보통신기술이 사람들의 시간과 공간에 대한 사고에 영향을 미치는지 조사하고 있습니다. 저는 저의 연구의 일부로 이민자들의 정보통신기술의 사용을 조사하고 싶습니다. 저는 어떻게 정보통신기술이 이민자들의 오클랜드 삶의 정착에 영향을 미치는지 조사하고 싶습니다. 본 연구는 오클랜드 대학교 박사 장학금과 지리환경 과학부의 기금으로 보조를 받고 있습니다.

여러분은 한국 이민자들로 오클랜드 지역에 10년이상 또는 5년미만으로 거주하고 있으므로 본 연구에 초대되셨습니다. 본 인터뷰의 목적은 여러분이 고국과의 연락 혹은 오클랜드 지역내의 단체와 개 개인간의 교류의 수단으로 이용되어지는 이메일이나 핸드폰, 인터넷과 같은 기술의 사용실태를 파악하고자 합니다. 저는 연구는 여러분들이 이러한 기술들을 발달시켜 사용하고 계시는 정보통신 수단 종류에 중점을 두고 있습니다. 예를 들면 이민 오기 전이나 후에 어떻게 오클랜드 생활에 관한 정보를 찾으셨는지, 여러분들의 고국에 어떻게 연락을 하고 계시는지, 뉴질랜드에서는 어떻게 연락을 취하고 계시는지 알고 싶습니다.

본 인터뷰는 여러분이 원하시는 시간에 여러분이 편안하신데로 여러분들의 가정이나 커피샵에서 하실 수 있습니다. 인터뷰는 한 시간에서 두 시간 정도 걸리겠습니다. 이 인터뷰에 참여하지 않을 권리가 있음을 알려드립니다. 본 인터뷰는 영어로 시행되어집니다만 만약 필요하시다면 통역사를 동행시켜드릴 수 있습니다. 통역사의 동행시 여러분의 익명은 완전히 보장되지는 않지만 통역사는 여러분들이 제공하신 정보를 비밀에 한다는 기밀동의서에 서명 할 것입니다. 저는 본 인터뷰를 녹음하기를 원하지만 여러분들의 동의하에서만 녹음할 것이며 녹음중에도 여러분이 원치않으시면 녹음을 중단할 수 있습니다. 인터뷰가 끝나고 2주 후에 원하시면 녹음 복사본을 보내드릴 수 있습니다. 부득이하게 응하신 인터뷰 내용을 취소시키고자 하실때는 2006년 12월 1일 이전까지 이유 제시없이 가능함을 알려드립니다. 이 연구의 자료는 연구소의 보관소에서 향후 6년간 안전하게 보관되어질 것이며 그 이후 삭제될 것입니다.

인터뷰에서 제공하신 정보는 여러분의 고국이 한국이라는 점 그리고 오클랜드 지역에서 10년이상 또는 5년 미만동안 살고 계시다는 점과 함께 발표될 것이며 여러분의 이름이 거론되지는 않을 것입니다.

본 연구가 가능하게 시간을 내서 도와주셔서 대단히 감사합니다. 혹시 이연구에 관히 문의 점이 있으시거나 더 자세히 알고 싶으시면 아래로 연락을 주십시요.

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Professor Richard Le Heron
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Tel: 3737 599 extn. 88453

학과장님 연락처
Dr Willie Smith
School of Geography and Environmental Science
The University of Auckland
Tel: 3737 599 extn. 85284

윤리적인 사항으로 문의가 있을시에는 오클랜드 대학교Human Participants Ethics Committee 회장에게(373-7599를 누른 후 87830) 연락주시기 바랍니다.

"본 서류는 2006년 7월 12일 오클랜드 대학교AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE의 3년 동안의 (2006년 7월 14일 ~ 2009년 7월 14일) 승인을 받았습니다. 참고 번호 2006/239"

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CONSENT FORM – 동의서

본 동의서는 향후 6년간 보관되어질 것 입니다.

주제: 정보통신기술이 이민자의 고국 혹은 오클랜드 지역내의 단체와 개인간의 교류에 미치는 영향

_____ **귀하**

연구원: 필리파 미첼 (Phillipa Mitchell), 지리환경 과학부

저는 본 연구의 설명을 받았고 이해하였습니다. 저는 질문의 할 기회와 대답을 들을 권리를 부여받았습니다.

본 연구에 참여하는데 동의하며 제가 원하는 시간에 제가 원하는 데로 저의 집이나 커피샵에서 인터뷰에 응하겠습니다.

저는 제가 응답한 내용이 녹음이 된다는 것을 알고 있으며 동의 하에 녹음을 하는 중에도 제가 원치 않으면 녹음을 중단할 수 있다는 것에 동의합니다./ 동의 하지 않습니다. (원하지 않는 쪽을 지워주십시요.)

저는 인터뷰 2주 후에 입터뷰 녹음 복사본을 다음의 주소로 받고 싶습니다./ 받고 싶지 않습니다. (원하지 않는 쪽을 지워주십시요.): 주소

_____
_____
_____

저는 인터뷰 동안 통역사를 원합니다./ 원치 않습니다. (원하지 않는 쪽을 지워주십시요.)

저는 통역사의 동행시 제 익명은 완전히 보장되지 않지만 통역사가 제가 제공한 정보를 비밀에 한다는 기밀 동의서에 서명한다는 것을 알고 있습니다.

저는 저의 고국과 제가 오클랜드에 거주한 시간이 본 연구를 통해 정확히 발표되지만 제 신원이 직접적으로 혹은 간접적으로 거론되지 않음을 알고 있습니다.

저는 제가 인터뷰에서 제공한 정보와 자료들을 1006년 12월 1일까지 취소할 권리가 있음을 알고 있습니다.

서명:_____

성함: _____
(글씨를 명확하게 적어주십시요)

일시:_____

"본 서류는 2006년 7월 12일 오클랜드 대학교AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE의 3년 동안의 (2006년 7월 14일 ~ 2009년 7월 14일) 승인을 받았습니다. 참고 번호 2006/239"

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TRANSLATOR CONFIDENTIALITY AGREEMENT

THIS CONFIDENTIALITY AGREEMENT WILL BE HELD FOR A PERIOD OF SIX YEARS

Title: The affect of information and communication technologies on migrants' interactions with their country of origin and with organisations and individuals in the Auckland region.

To: *(The name of the Translator and the organisation they belong to will be entered.)*

Researcher: Phillipa Mitchell, School of Geography and Environmental Science

I agree as translator on this project not to use the interviewee information for any other purpose than conducting the translation of this material from Korean/Afrikaans *(one will be deleted)* into English.

I agree as translator on this project to keep the interviewee information confidential and not to discuss the identity of the interviewee or the contents of interview with anyone except the Principal Investigator Phillipa Mitchell and to take reasonable security precautions to protect this information from unauthorised use or disclosure.

Signed:_____

Name: _____
(Please print clearly)

Date:_____

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 12 July 2006 for three years from 14 July 2006 to 14 July 2009 Reference Number 2006/239

Appendix B: Interview Guides and Questionnaires

Contents of this Appendix

Auckland ICTs Platforms: The Local Government Experience
- Questions for commercial participants
- Questions for government department participants
- Questions for local council participants involved in ICT management and website development
- Questions for local council participants involved in the management and planning of utilities

Experience of the RTPISP System
- Questionnaire – Real Time Passenger Information Case Study

The E-learning Experiences at the University of Auckland University
- Anonymous Questionnaire 1 – GEO103 Digital Worlds 2006
- GEO103 Digital Worlds: Focus Group Question Outlines
- Anonymous Questionnaire 1 – GEO103 Digital Worlds 2007
- GEOG105 Natural Hazards in New Zealand 2007 - Anonymous Questionnaire

Transnational Migrant's Experiences
- Semi Structured Interview Question Guideline for All Migrants

Phase 1: Developing the Auckland Context

Questions for semi structured in depth interviews are listed below. These will not necessarily be asked in the order provided here and potential follow up questions are listed subsequently using bullet points.

Questions for commercial participants:

It is anticipated that primary statistical data of a commercially sensitive nature will be obtained from the participant. This may occur prior to, during, or after the interview. The questions will therefore need to be altered according to what information has been provided.

- What is your role within the organisation?
- How would you define information and communication technologies?
- What role has legislation played in the development of ICTs in New Zealand/Auckland? (From your perspective and from your organisations perspective)
  - Any restrictions or limitations?
  - Any particularly useful pieces?
  - What areas are well developed/ lacking?
  - Influence of competition and market regulation?

- How would you describe the ICT environment in New Zealand/Auckland?
  - Positive/Negative aspects?
  - Geographical location i.e. on the edge of the world?
  - Auckland's role as the largest city?

- How do you think Auckland will be influence by ICT developments in the future?
- What about the rest of the country?
- Will Auckland still dominate?
- How does your organisation deal with the constant technological innovations and changes in the market place?

Questions for government department participants:

The various legislative documents associated with ICT in New Zealand would have been reviewed prior to these interviews.

- What is your role within the organisation?
- How would you define information and communication technologies?
- What role has legislation played in the development of ICTs in New Zealand/Auckland? (From your perspective and from your organisations perspective)
  - Any restrictions or limitations?
  - Any particularly useful pieces?
  - What areas are well developed/ lacking?
  - Influence of competition and market regulation?
- What legislations changes are occurring to develop/regulate ICTs in New Zealand?
- How do you develop new legislation?
- How do you deal will the rapid changes in ICT innovations?
- What specific initiatives or action plans have been put in place to reinforce the legislation?
- The role of ICTs in education?
- Will the 'Kiwi Share' mechanism be retained?
- Do you see competition increasing/ decreasing?
- How would you describe the ICT environment in New Zealand/Auckland?
  - Positive/Negative aspects?

  - Geographical location i.e. on the edge of the world?
  - Auckland's role as the largest city?
- How does your organisation deal with the constant technological innovations and changes in the market place?

Questions for local council participants involved in ICT management and website development:

- What is your role within the organisation?
- How would you define information and communication technologies?
- How would you describe the ICT environment in New Zealand/Auckland?
- What role has legislation and policies both local and national played in the development of ICTs in Auckland?
  - Any restrictions or limitations?
  - Any particularly useful pieces?
  - What areas are well developed/ lacking?
  - Geographical location i.e. on the edge of the world?
  - Auckland's role as the largest city?

- What are the aims and objectives of the website?
  - How are these being fulfilled?
  - What assessment methods are used to check these?
- What interactive mechanisms are provided?
- What public services are provided via the website e.g. paying parking fines…?
- Do different parts of the council use the website in different ways e.g. online surveys?
- How well used is the website by staff members/ by the public?
- What are the future plans for the website?
- Is there any regional coordination for the provision of online services between Auckland's local councils?
- How does your organisation deal with the constant technological innovations and changes in the market place?

Questions for local council participants involved in the management and planning of utilities:

- What is your role within the organisation?
- How would you define information and communication technologies?
- How would you describe the ICT environment in New Zealand/Auckland?
- What role has legislation and policies both local and national played in the development of ICTs in Auckland?
  - Any restrictions or limitations?
  - Any particularly useful pieces?
  - What areas are well developed/ lacking?
  - Geographical location i.e. on the edge of the world?
  - Auckland's role as the largest city?

- Is there any regional coordination regarding the management and planning of Auckland's ICTs between the regions local bodies?
- How does your organisation deal with the constant technological innovations and changes in the market place?

QUESTIONNAIRE – Real Time Passenger Information Case Study

Date: _____
Time: _____
Bus Stop Name:_____

1. Gender (This question will not be asked)
   Male ☐ Female ☐

2. Which of the following best describes your age group? (Ensure the respondent is over 16, if they aren't cease the questionnaire)
   17- 25 ☐ 25-50 ☐ 50+ ☐ Declined ☐

3. How often do you catch the bus during the week?
   Once or Twice ☐ Three or Four times ☐ Everyday ☐

4. What is your main purpose for catching the bus?
   Going to work ☐ Going to study ☐ Other ☐

5. Is this your usual bus stop?
   Yes ☐ No ☐

6. Do you use this bus stop because of the electronic sign?
   Yes ☐ No ☐ Already used the bus stop before the sign ☐

7. What did you think when you first saw the sign?
   _____
   _____
   _____
   _____

8. Did you know that the sign displayed in real time the actual arrival of the bus?
   Yes ☐ No ☐

8a Could you please rate how much trust you place in the signs providing you with correct information on a scale of 1-5, 1 being don't trust at all, 5 being trust completely?

1 2 3 4 5

Real time signs are used around the world for public transport. It has been said that they may change the behaviour of the people catching the bus.

9. Do you find that knowing in real time when the bus is coming changes how you feel about waiting for the bus i.e. does the time pass quicker, slower?
   Quicker ☐ Slower ☐

10. Which one of the following statements best describes your use of the electronic sign at the bus stop, do you:

    a) Check what time the next bus is due and sit and wait.

    b) Check what time the next bus is due and then do something else while you are waiting e.g. go to the dairy.

c) Check what time the next few buses that you are wanting are due and plan you activities around that.

d) Do not use the sign, just sit at the bus stop.

11. If you know reliably that the bus is more than 10 minutes away do you feel this gives you choice as to what you do with that time, i.e. go to the dairy, rush back home if you have forgotten something?

_____
_____
_____
_____

12. If the bus arrives and there is only standing room do you feel happier to wait for the next bus as you know when it is coming?
Yes ☐ No ☐

13. If a bus is completely full and goes straight past does knowing when the next one is coming make the experience less frustrating?
Yes ☐ No ☐

14. Do you find that knowing how long you have to wait for the bus changes your perceptions about

a) The environment of the bus stop i.e. more or less aware of shops, quality of the shelter.

_____
_____
_____
_____
_____
_____
_____

b) The frequency and reliability of buses

_____
_____
_____
_____
_____
_____
_____

Thank you.

Anonymous Questionnaire 1 – GEO103 Digital Worlds 2006

The Digital Worlds paper deals with the interaction of technology and space. One of the key themes is that as technology changes and evolves these changes manifest themselves in different ways in space. For example transportation technologies reduce physical distance, communication technologies compress time for exchanging information and increase the range of ways that information can be represented.

This anonymous questionnaire has been given to you at the beginning of the paper to ascertain your understanding of the interactions between technology and space with particular relation to tertiary learning. Increasingly universities are exploring the use of technologies such as the internet and email in tertiary learning environments.

15. Have you come across the concept of 'virtual learning' or 'e learning' and if so what is your understanding of it?

    _____
    _____
    _____
    _____

16. Have you had any experience of 'virtual learning' e.g. tertiary courses run online?
    Yes ☐ No ☐

17. Do you find attending lectures a good way to learn information? Why/ why not?

    _____
    _____
    _____
    _____

18. If you had a choice between attending lectures or receiving the lecture information online which would you choose and why?

    _____
    _____
    _____
    _____
    _____

19. If you had a choice between attending tutorials or conducting the tutorials online with the ability to email the tutor questions, which would you choose and why?

    _____
    _____
    _____
    _____
    _____
    _____

PLEASE TURN OVER…

20. Through Cecil the University provides students with the option to use a chat forum to discuss the course they are enrolled in with other students, the lecturer and tutors. Have you been involved in a course that used this mechanism? If so did you use it and how did you find it?

_____
_____
_____
_____
_____

21. Have you had any experience with internet chat rooms besides Cecil?
Yes ☐ No ☐

22. If an internet chat room, separate from Cecil, was set up to discuss ideas about a course with fellow students, tutors and lecturers would you use it? Why / why not?

_____
_____
_____
_____
_____
_____

23. The lecturer has provided you with the ability to txt him questions during and after lectures, would you consider using this option?
Yes ☐ No ☐

Could you please explain briefly why you would/wouldn't use this option?

_____
_____
_____
_____
_____

Thank you for completing this questionnaire.

Could you please place your completed anonymous questionnaire in the box provided in the School of Geography and Environmental Science Student Centre before **4pm on Friday 13 January.**

FOCUS GROUP INVITATION

If you would like to partake in a focus group discussing these ideas in more detail please see the attached sheet.

Digital Worlds GEO 103

Focus Group Invitation

Please separate this page from the attached questionnaire to maintain the anonymity of the questionnaire.

If you are interested in the ideas this questionnaire has raised and would like to discuss these further the researcher, Phillipa Mitchell, would like to invite you to attend a focus group on the Wednesday 15 January 2006 at a time and place to be confirmed

Could you please supply your name and email address for ethical purposes so that the researcher can supply you with a Participant Information Sheet and Consent Form prior to the focus group, and also to advise you if the are any changes of date, time or venue for the focus group discussion.

Name: _____

Email: _____

If you have any questions relating to the focus group discussion please contact the me through one of the following means

Phillipa Mitchell
Email: p.mitchell@auckland.ac.nz
Phone: 3737 599 xt 84607
Room: 438, School of Geography and Environmental Science
Human Science Building, 10 Symonds St, City Campus

GEO103 Digital Worlds: Focus Group Question Outlines

(Please note only one focus group was run using a combination of these questions and it was unsuccessful see Chapter 4)

First Focus Group

This will be held shortly after the first questionnaire has been distributed, in the first week of the course. The participants will have expressed an interest to participate in the focus groups on the questionnaire.

The following is a guide to the questions that may be asked during the focus group session.

Virtual or E learning is the use of technologies such as the internet to provide more choice and flexibility in how and where you learn.

- Have you heard of this concept? Can you name any examples?
- What is your understanding of this type of learning?
- Have any of you experienced this? What was it like?

It has been argued that new information and communications technologies such as email, mobiles, the internet, are giving people more choices and more flexibility in how they live. In terms of tertiary learning there is a belief that online learning may allow students to learn in new ways giving them more flexibility and options to do different things rather than the more traditional methods of lecturing and tutorials/labs.

- Do you feel constrained by the formal lectures and tutorials you have to attend?
- Would you consider the addition of online information, tutoring and chat rooms provides you with more choice as to how you manage your time?
- Some of the literature raises the idea that University's will use an increasing amount of online learning and that physical campuses will slowly become obsolete. What do you think of this idea?
- The idea of co-learning through communications technologies puts more onus on the student to be self motivated as it relies on them accessing the information to do the work?
- What do you think of this statement?
- Do you think that this may be a good/bad aspect to E learning?

Second Focus Group

This will be held shortly after the second questionnaire has been distributed at the end of the course, some 4 weeks later. Again the participants will have expressed an interest to participate in the focus groups on the questionnaire.

Now that you have had a taste of some of the ways in which technology can play a role in learning what do you think of:

- Txting the lecturer?
- Using the Cecil Chat Room?
- The use of electronic forms email for labs?
- The use of the web for finding information for readings and assessments?
- Autonomous U-labs and field based learning??

Have your perceptions of Virtual or E learning changed since the beginning of the course?

It has been argued that new information and communications technologies such as email, mobiles, the internet, are giving people more choices and more flexibility in how they live. In terms of tertiary learning there is a belief that online learning may allow students to learn in new ways giving them more flexibility and options to do different things rather than the more traditional methods of lecturing and tutorials/labs. In light of your experiences in GEO103

- Do you feel constrained by the formal lectures and tutorials that you have to attend?
- Would you consider the addition of online information, tutoring and chat rooms provides you with more choice as to how you manage your time?
- Some of the literature raises the idea that University's will use an increasing amount of online learning and that physical campuses will slowly become obsolete. What do you think of this idea?

The idea of co-learning through communications technologies puts more onus on the student to be self motivated as it relies on them accessing the information to do the work? In light of your experiences in GEO103

- What do you think of this statement?
- Do you think that this may be a good/bad aspect to E learning?

The government released a strategy called 'Taking the Next Step: The interim e learning framework' in 2004. They believe that E Learning is crucial to the future direction of NZ tertiary institutions. Two key aspects they are focussing on are the ability to supply a flexible learning environment and target marginalised learners who may lack access.

- From you experiences and understanding what do you think of the future of E learning in NZ's tertiary institutions?
- More specifically what do you think of the focus of the framework on supplying a flexible learning environment and targeting of marginalised learners?

Anonymous Questionnaire 1 – GEO103 Digital Worlds 2007

The Digital Worlds paper deals with the interaction of technology and space. One of the key themes is that as technology changes and evolves these changes manifest themselves in different ways in space. For example transportation technologies reduce physical distance, communication technologies compress time for exchanging information and increase the range of ways that information can be represented.

This anonymous questionnaire has been given to you at the beginning of the paper to ascertain your understanding of the interactions between technology and space with particular relation to tertiary learning. Increasingly universities are exploring the use of technologies such as the internet and email in tertiary learning environments.

24. Have you come across the concept of 'virtual learning' or 'e learning' and if so what is your understanding of it?

    _____
    _____
    _____
    _____

25. Have you had any experience of 'virtual learning' e.g. tertiary courses run online?
    Yes ☐ No ☐

26. Do you find attending lectures a good way to learn information? Why/ why not?

    _____
    _____
    _____
    _____

27. If you had a choice between attending lectures or receiving the lecture information online which would you choose and why?

    _____
    _____
    _____
    _____
    _____

28. If you had a choice between attending tutorials or conducting the tutorials online with the ability to email the tutor questions, which would you choose and why?

    _____
    _____
    _____
    _____
    _____
    _____

PLEASE TURN OVER…

29. Through Cecil the University provides students with the option to use a chat forum to discuss the course they are enrolled in with other students, the lecturer and tutors. Have you been involved in a course that used this mechanism? If so did you use it and how did you find it?

_____
_____
_____
_____
_____

30. Have you had any experience with online discussion forums besides Cecil?
Yes ☐ No ☐

31. If an online discussion forum, separate from Cecil, was set up to discuss ideas about a course with fellow students, tutors and lecturers would you use it?
Why / why not?

_____
_____
_____
_____
_____
_____

32. Which of the following technologies would you consider using to communicate with lecturers on this course? Please tick yes or no and explain your answer.

Email Yes ☐ No ☐
Why?_____
_____

Text Message Yes ☐ No ☐
Why?_____
_____

Phone Yes ☐ No ☐
Why?_____
_____

Thank you for completing this questionnaire.
Could you please place your completed anonymous questionnaire in the box provided in the School of Geography and Environmental Science Student Centre before **4pm on Friday 12 January.**

GEOG105 Natural Hazards in New Zealand 2007 - Anonymous Questionnaire

GEOG105 uses a CD for the lab programme component of the paper. This CD is a form of e-learning. This questionnaire in interested in your experience of using the CD and communicating with the tutors and lecturers on the course.

33. Have you come across the concept of ‘e learning’ or ‘virtual learning’ before, and if so what is your understanding of it?

    _____

    _____

    _____

34. Have you had any experience of ‘virtual learning’ e.g. tertiary courses run online?
    Yes ☐ No ☐
    Please identify what courses

    _____

    _____

The GEOG105 course provides a CD containing the lab exercises which take you on a virtual field trip. This is a form of e-learning as it provides a more flexible and open learning environment.

35. What did you feel were the benefits of using the CD to conduct your labs in terms of learning flexibility and time management?

    _____

    _____

    _____

    _____

36. What did you feel were the problems associated with using the CD to conduct your labs?

    _____

    _____

    _____

    _____

37. How did you feel about the absence of face to face contact?

    _____

    _____

    _____

    _____

38. Did you attend any of the drop in lab times provided?
    Yes ☐ No ☐

Why did you/didn't you attend these?

_____

_____

_____

39. How did you find navigating the information on the CD, was there anything in particular you thought was good?

_____

_____

_____

_____

40. Did you have any problems navigating the CD either technically or in terms of how the information was structured?

_____

_____

_____

_____

41. Did you find all the information on the CD relevant to the lab exercises and the wider course; was there anything that could have been improved?

_____

_____

_____

_____

The labs required you to print of a PDF document from the CD, fill this out and physically submit this to the SGGES Student Centre.

42. Did you have any problems with this process?

_____

_____

_____

43. What do you think of having electronic lab answer sheets which could be submitted via email, please explain?

_____

_____

_____

44. How did you communicate with the lecturers and tutors on the course?

Email ☐
Phone ☐
In Person ☐

45. What is your preferred method of communication with lecturers on the course and why?

_____
_____
_____
_____

46. What is your preferred method of communication with tutors on the course and why?

_____
_____
_____
_____

Thank you for completing this questionnaire.

Could you please place your completed anonymous questionnaire in the yellow GEOG105 Survey Hand in Box provided either in class time or the School of Geography, Geology and Environmental Science Student Centre before 4pm on Friday 18 May 2007.

Semi Structured Interview Question Guideline for All Migrants

When did you move to New Zealand?

Why did you move to New Zealand i.e. for the education, for a job, for the lifestyle etc?

- Did you have any family here already?

Why did you choose to live in Auckland?

Do you go back/how regularly do you go back to your country of origin?

Have you taken out NZ citizenship? Why/ why not?

- Do you consider yourself to be a Korean/ New Zealand-Korean or a New Zealander?

Before coming to NZ how did you undertake to discover information about the country?

- Did you use the internet? What sort of websites did you look at? Did you register for any online information services?
- Did you know anyone in NZ that you contacted by phone, letter, email…

When you first arrived in Auckland how did you find out information to help you settle e.g. buying a house, schools, transport…

- Did you use the internet? What sort of websites did you look at? Did you register for any online information services?
- Did you already know someone living in NZ that was able to help you? Did you contact them by email/ph…
- Did you contact your local cultural organisation e.g. the Korean Society of New Zealand? How did you make contact with them?

Are you a member of any cultural organisations in NZ e.g. The Korean Society of New Zealand?

What sort of information and communications technology's did you have available to you when you first arrived in Auckland? Where were these located and how frequently would you access/use each of these?

- At home? e.g. computer, phone
- At work?
- At other locations around Auckland e.g. organisations you are members of, friends, family…

What sort of problems did you encounter when first using these technologies in Auckland?

What sort of information and communications technology's do you have available to you now? Where were these located and how frequently would you access/use each of these?

- At home? e.g. computer, phone
- At work?
- At other locations around Auckland e.g. organisations you are members of, friends, family…

What sort of problems do you now encounter when using these technologies in Auckland?

How often are you in contact with people living back in you country of origin via
- Email
- Phone
- Mobile
- Internet eg Voice over IP, Message Boards

Could you please describe your social network e.g. where your family and friends are located and their nationalities?

- Who are the people you most commonly interact with and where are they located?
- How do you most commonly communicate with each of these groups (Family/Friends/Business Associates)?

Are you involved in any business activities back in your country of origin?

- How do you communicate?
- How do you undertake business transactions?
- How regularly do you go back to you country of origin for business purposes?

Could you please describe where you buy items such as food, clothing etc?

- Do you prefer to buy items from places operated by other members of the Korean?
- Do you ever buy things online?
- Do you order things you can't get in NZ online/by email?

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