Optimizing Travel:

Opportunities for the U of M Fort Garry Campus

by

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ABSTRACT

This thesis examines transportation planning at the University of Manitoba Fort Garry campus with the view to improving efficiency, equity and reducing economic loss. Through a broad approach of Transportation Demand Management (TDM) a number of avenues are explored including a comprehensive literature review of sustainable transportation planning; the documentation of selected university TDM programs including University of Colorado, University of British-Columbia and the University of Ottawa; a University of Manitoba commuter web survey, and key informant interviews. Cost-benefit analysis, geographical information systems and key informants interviews are used. Twelve key recommendations are outlined in the concluding chapter. The research suggests optimal solutions can be reached if there is strong leadership from the University of Manitoba central administration in Transportation Demand Management (TDM) including a more collaborative approach to transportation and land use planning, as well as working closely with its stakeholders in reforming current practices. A series of incremental changes can give higher priority to walking, cycling, transit, and car pooling ahead of those driving alone resulting in a more equitable and efficient transportation system and leading to a healthier population and a healthier environment for the University of Manitoba community. The author can be contacted by email at tompearce@hotmail.com

Keywords: Transportation Demand Management, University, Campus, Transportation, Winnipeg, Geographic Information Systems
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CHAPTER 1: INTRODUCTION

The city of Winnipeg is located in the province of Manitoba with a population of 633,000 people (Statistics Canada, 2006). The city is home to four universities including the Red River College, Mennonite University, University of Winnipeg and the University of Manitoba. The University of Manitoba’s has two main campuses in Winnipeg: the Fort Garry campus and the Bannatyne campus. The University of Manitoba Fort Garry campus is located approximately 13 kilometers south of downtown Winnipeg adjacent to the Red River on 274 hectares of land. The Fort Garry campus is considered the main university campus with over 60 major buildings, 10.3 kilometers of road and 6,300 parking spaces and is the main focus of this study (Public Affairs, 2007).

People arrive and depart the U of M Fort Garry campus by a variety of modes including by foot, by bicycle, by bus, by private vehicle and by truck. There are also approximately 1,160 students who live on campus. The volume and mode of commuters does vary depending on whether the university is in full session. There are approximately 27,000 students and 5,000 staff during full winter session (See Appendix A). Moreover there are approximately 32,000 cars which access the Fort Garry campus on a daily basis (CPDO 2003). The campus is generally considered a suburban campus with a trend toward driving and parking at the university.

The University of Manitoba Fort Garry campus is not unlike many universities across North America in that they are now beginning to address travel planning from a comprehensive Transportation Demand Management perspective. The following chapter outlines the research questions, details the purpose for this study, the methodology to be used and analysis to be done to further TDM at the U of M Fort Garry campus.
1.1 Research Questions

Four key questions which guide the research are noted below. The questions were derived through the identification of a gap in research in this area and in concert with my academic advisors.

1. What costs and benefits are imposed on the university and the society at large by travel activity to and from the U of M Fort Garry Campus?
2. How are transportation policy decisions made at the U of M Fort Garry Campus?
3. Where do students live and what is their travel time and mode of transportation in relation to the U of M Fort Garry Campus and how does this inform the transportation management programs?
4. What are the opportunities for reducing the number of single occupant vehicles going to and from the U of M Fort Garry Campus?

1.2 Purpose of the Thesis

The study aims to identify opportunities for optimizing travel coming to and from the Fort Gary campus and thereby reduce excessive economic, social and environmental costs. The movement of people to and from the campus provides significant benefits and costs to the University and to the larger community. To date these costs and benefits have not been addressed in a comprehensive manner. Moreover, the current geographical distribution of staff and students within the city and outside the city is largely unknown. It is also unclear how transportation decisions are made at the University of Manitoba Fort Garry campus. A copy of this thesis will be provided to the following key stakeholders: the University of Manitoba Central Administration, the University of Manitoba Parking and Shuttle Services, the University of Manitoba Student Union, the
City of Winnipeg, Winnipeg Transit, Province of Manitoba and Resource Conservation Manitoba. Moreover, this study will build upon the existing knowledge in the transportation planning field and help inform policy makers.

1.3 Scope of the Thesis

The scope of the thesis includes, but is not limited to, university campus policies, campus land use planning, on-campus housing, parking management, student and staff travel planning, telecommuting as well as the campus fleet vehicles at the U of M Fort Garry campus. The primary focus is however on student travel planning, as this group represents the largest group of users of the university.

1.4 Research Methods

The framework undertaken in this research is shaped by the literature in three main areas. They include a review of sustainable transportation planning goals; university campus transportation demand management programs; and travel planning analysis tools and evaluation. The cost-benefit analysis and geographical information systems (GIS) analysis is explained in more detail in the travel planning analysis tools and evaluation section. Each area will inform the research questions to be addressed.

1. Cost-benefit analysis of travel activity to the Fort Garry Campus.

2. Key informant interviews – interviews will focus on how transportation decisions are made as well as on opportunities for reducing single occupancy vehicles.

3. Commuter Web Survey – Travel time, travel mode and postal codes to be collected and analyzed in a GIS environment. Opportunities for reducing single occupancy vehicles will be assessed.
4. GIS analysis – GIS will be used to identify where clusters of students live in relation to the Fort Garry Campus and opportunities for reducing single occupancy vehicles will be assessed.

1.5 Importance of Study

The study evaluates TDM initiatives at the University of Manitoba Fort Garry campus. The study develops a number of recommendations which can be pursued by the appropriate stakeholders including University of Manitoba Central Administration, the University of Manitoba Parking and Shuttle Services, the student unions, staff and faculty unions, the City of Winnipeg, Resources Conversation Manitoba, Winnipeg Transit and the Province of Manitoba. The intended potential benefits of this study are improved efficiency, cost savings and more equitable travel options. Furthermore, the intended or potential benefits may include but not be limited to improved health from increased exercise and greenhouse gas reductions from the reduction in single occupancy vehicles.

1.6 Assumptions and Limitations

The study is limited in scope to the students, staff and faculty of the Fort Garry Campus in order to keep the project manageable. The population of Winnipeg, the population of the University of Manitoba Fort Garry campus and its policies is a moving target and represents a snapshot in time. The commuter travel survey is limited to November and December of 2007. The survey conducted is limited to respondents whose origin is home and whose destination is the University of Manitoba Fort Garry campus.

A variety of university TDM programs include specific strategies related to their fleet of vehicles, however the scope of the study does not specifically address the fleet of
over 50 campus vehicles (Physical Plant, 2007).

Improved travel efficiency and equity options will be identified through the research process; however, it will be up to the various transportation stakeholders to implement any or all recommendations identified in the thesis.

1.7 Summary

The University of Manitoba is Manitoba’s largest university and the Fort Gary campus is the largest campus. The Fort Garry campus is located 13 kilometers south of Winnipeg’s downtown. Transportation planning at the Fort Garry campus is moving toward a comprehensive transportation demand management strategy. The thesis intends to further these efforts through an examination of sustainable transportation planning, university TDM programs, cost-benefit analysis, key informant interviews, commuter web survey and GIS analysis. Chapter two begins by exploring sustainable transportation planning and its importance in planning and decision making. This is followed by a detailed examination of transportation and land use planning at the Fort Garry campus in chapter three which is then followed by several conclusions and recommendations in chapter four.
CHAPTER 2: SUSTAINABLE TRANSPORTATION PLANNING

A large body of literature exists on the subject of sustainable transportation planning. This body of literature draws from a number of inter-related disciplines including civil engineering, urban planning, urban design, geography, economics and environmental studies. The following chapter explores the literature on sustainable transportation planning by both identifying the goals of transportation planners as well as a number of tools used to analyze and evaluate transportation options. The topics addressed include the exploration and application of TDM. This is followed by a brief description of a number of public policy goals including traffic congestion, parking management, climate change, air quality, health benefits, collision reductions, increased walking and cycling commuting time. This is then followed by brief examination of analysis tools which is then followed by three case studies of TDM programs at selected universities.

2.1 TDM Explored and Applied

Most developed countries are increasingly dependent on the automobile for personal mobility. Levels of mobility and vehicle ownership have increased in recent history (Banister, 2000). Identifying ways to reverse these trends through sustainable transportation planning is essential to addressing the inequities and inefficiencies associated with single occupancy vehicles.

To better understand what is meant by sustainable transportation planning, it is useful to define the term. In fact, many academics and practitioners have defined sustainable transportation planning in many different ways. These definitions vary
Sustainable transportation planning is generally defined by indicators or goals of a given project or strategic plan. This is illustrated in the literature very well, for example, Kwok and Yeh define sustainable transportation planning in terms of energy consumption (Kwok and Yeh, 2004). Another definition expands on this one and includes sufficient fuel for the future, minimal pollution from that fuel, minimal fatalities and injuries from motor vehicle accidents and manageable congestion (Black, 2000). More common definitions include congestion, parking management, air quality, reductions in greenhouse gas emissions, healthy lifestyles, collisions reductions, and walkability. In the following section I will explore these goals. Each of these goals has and can be used to assess the transportation sustainability of a particular project, policy or regions development.

2.1.1 Defining the Goals

Defining the transportation goal(s) of a given project, policy or regions development is the first key step before the goals can be achieved. In many cases a project, policy or regions development will have multiple goals which may or may not be in conflict. Understanding the relationship between these goals is crucial to successful implementation. Conventional transport indicators mostly consider motor vehicles traffic conditions but may not fully evaluate other goals.

TDM offers additional solutions to transportation problems which are often cost effective compared with capacity expansion and are increasingly applied by various jurisdictions and organizations.
2.1.1.1 Congestion

Congestion is often cited by drivers as a common problem which needs to be resolved. Congestion reduces the efficiency of the road network and imposed significant costs both through ‘lost’ time, fuel that otherwise would have been unused and general wear and tear on vehicles. Essentially congestion can be described as decreasing the efficiency of the roadway and its ultimate capacity for its road users (Garrison and Ward, 2000).

There are several factors which may contribute to the growth in congestion over time. Sarzynski et al note the following as contributing factors to congestion: population size, growth rates and other demographic characteristics; pace and extent of road building and other transport network improvements; provision of public transport; and, patterns of land use (Sarzynski et al, 2005). Thus it is the interactions of all these factors which can be correlated to increased congestion but not necessarily imply a causal relationship.

As congestion reduction is a common goal of transportation authorities there is a tendency for civil engineers, transportation planners and policy makers to increase capacity of roadways which show signs of congestion to ‘fix’ the problem; however, there is significant evidence which suggests increases in capacity only have a short term effect on mitigating congestion. Long term solutions which incorporate TDM initiatives are often more efficient, equitable and more cost effective (Cervero, 2003; Litman, 2001).

For example, congestion charging, either a flat rate or variable based on time of day can distribute the peaks of traffic over a longer time period thus reducing the maximum congestion significantly. There are a variety of technologies which allow for congestion charges, such as vehicle transponders. Reducing the peak demand for road
space can also be alleviated through a variety of other TDM programs. For example, in the context of university travel planning minor modifications in class start times can reduce the peak demand for road space near universities. This practice is described in greater detail in section 2.2 which describes the University of British-Columbia comprehensive approach to travel planning.

2.1.1.2 Parking Management

The price and supply of parking can have a significant effect on travel behaviour (Toor and Havlick, 2004). Demand for new supply of parking can be a catalyst for TDM programs particularly when new parking demand triggers capital investment for new parking garages. Furthermore, when the acquisition cost of raw land is significant this can also trigger efforts towards TDM initiatives. Without a comprehensive parking management system other TDM strategies will not be as effective (Toor and Havlick, 2004).

In the context of university and college campuses the traditional response to demands for increased parking supply or neighbourhood spillover concerns has been to expand capacity (Toor and Havlick, 2004). Expansion of parking brings with it many challenges including land for new surface lots and/or financing for new parking structures. The estimated capital cost per new parking space in a parking structures is between $15 000 - $30 000 (Shoup, 1999). The estimated capital per space for surface lots is $1500 - $2500 in Winnipeg (Zurrin, 2007).

Recovering the capital costs of new parking facilities generally requires much higher parking fees than those which are typically charged at universities. Therefore, universities generally either subsidize the facilities through general revenue or spread the
cost of new parking facilities over existing users (Toor and Havlick, 2004). However, even when all the cost of providing parking are recovered through user fees, the construction costs of new parking structures can limit an institution’s capacity to borrow more money for new academic buildings. In most cases where parking structures are being actively considered, TDM measures are usually cheaper and more efficient (Toor and Havlick, 2004).

When all the cost for parking is reflected in the price for parking this can reduce demand by 10-30% on average compared to unpriced, or more commonly referred to as “free” parking (Litman, 2007). Charging consumers for parking is more economical efficient and more equitable. Unpriced parking subsidizes consumers who tend to drive more than average from those who drive less.

These kinds of subsidies and alternative transportation disincentives are described by Litman (Litman, 2007).

*When parking is priced, it is often leased by the month, with significant discounts compared with short-term pricing. This encourages motorists who pay the fee to drive in order to get their money’s worth. It is more efficient to rent parking in smaller time blocks (hourly or daily rates), or to prorate monthly leases by the portion of days parking facilities are used. For example, if full-time parking costs $50 per month, commuters who only drive 3 days a week should only pay $30. This gives motorists more options and a financial incentive to use alternative modes when possible. Similarly, some parking facilities offer “Early Bird Specials,” which favors long-term parking – such discounts are appropriate for less*
convenient parking facilities, but not for parking at prime locations, which should be reserved for people parking for short-term errands.

Donald Shoup, in his book, *The High Cost of Free Parking*, notes a number of guidelines for efficient parking pricing. Most notable, at a minimum, parking should be priced to recover all the costs of building, maintaining, and administering the parking facilities from the users. Prices may be higher to reflect opportunity cost of land and for profits. Moreover, he notes that the most convenient parking should be priced so that occupancy averages 85% - 90%. Use of variable fees should be used so that higher rates can be used during peak periods and lower rates during off peak periods (Shoup, 2005).

### 2.1.1.3 Air Quality

Transportation is known as a major contributor to air pollution. Exposure to air pollutants is known to be related to respiratory and cardiovascular diseases, and contains carcinogenic substances (Gorman, 2003). Air quality is a common public policy concern particularly in large urban centres like Toronto and Vancouver with frequent smog advisories. In smaller centres general air quality concerns are less of a public policy concern. Nevertheless, even small amounts of certain contaminants can be a public health concern. For example, particulate matter can be a good indicator of air quality exposure. Particulate matter has been associated with short term and long term increases in mortality (Dora, 1999).

### 2.1.1.4 Climate Change

Global warming or climate change as it is more accurately referred to, has gained traction in the last few years as an important political issue which needs to be addressed.
Many policy makers are looking to the transportation sector as both a major source of greenhouse gas emissions but also as an area where significant reductions in greenhouse gas emissions can be made. There is a clear recognition that road traffic contributes to climate change. European Union estimates suggest that 25% of all carbon dioxide results from the transportation sector (Dora, 1999). In Canada, Environment Canada estimates 30% of all carbon dioxide emissions come from the transportation sector (Environment Canada, 1995).

Many universities and colleges are addressing climate change in a variety of ways through comprehensive sustainability initiatives. These initiatives can and do include TDM, waste reduction, local food consumption and smart land use planning.

2.1.1.5 Health: Active Lifestyle

Positive health benefits are a significant motivator for switching to an active mode of transportation. Obesity and sedentary lifestyles are increasing problems among many young people and adults alike. One study of 30 000 men and women found that simply cycling to work decreased the risk of mortality by 40% even after leisure time physical activity had been accounted for (Anderson et al, 2000). Another study suggests that walking to work may in some cases represents a significant amount of total daily exercise for populations with minimal physical activity (Tudor-Locke et al, 2001). Tudor-Locke et al further note,

\textit{Intervention studies in working populations have demonstrated the efficacy and cost efficiency of promoting active commuting to work with regards to health and fitness outcomes.}

Despite all the positive health attributes of an active commute many still choose the
single occupant vehicle to go to and from work or school for a variety of reasons. There are a variety of physical characteristics which encourage walkers and cyclists on their commute which will be described in more detail in the *Walking and Cycling* section.

### 2.1.1.6 Collision Reductions

Collision reductions can be a significant cost savings both to insurance (vehicle and heath) providers and those that pay or contribute to the system. Reductions in collisions and subsequent reductions in injuries and fatalities occur with fewer drivers on the road. On study noted that one third of all road vehicle deaths involves people under the age of twenty-five (Dora, 1999).

### 2.1.1.7 Walking and Cycling

Pedestrian and cycling infrastructure can vary from jurisdiction to jurisdiction and even within a single municipality. Infrastructure may have been built anytime over a period of 100 years or more and to the standard of the day. Generally speaking, a city’s public works department tries to retrofit existing facilities to current standards, however with many pressing issues retrofitting older infrastructure particularly for walking and cycling may not be a priority of the mayor and council.

Walking services can include but not be limited to the presence or absence of sidewalks, crosswalks, push button activations as well as the quality there of. For example, how often or how quickly are the sidewalks swept of dust and dirt or cleared of snow? How quickly are cracks from frost heaving and water damage fixed? Are there curb cuts? How soon does the traffic light change after the push button has been activated? How wide are
the sidewalks? Is there any weather protection? Other characteristics can also be considered are street furniture, plantings, and other movable and immovable objects (Kim et al, 2006).

The pedestrian environment is an important element of the urban experience. It is much more than traveling from point A to point B, it takes into account a range of qualitative factors (Jaskiewicz, 2000). Jaskiewicz proposes nine measures to access the pedestrian level of service: enclosure/definition, complexity of path network, building articulation, complexity of spaces, transparency, buffer, shade trees, overhangs/awnings/varied roof lines, and physical components/condition. The nine categories are derived from a combination of safety issues, volume and capacity considerations, and qualitative design factors (Jaskiewicz, 2000).

Tolley suggests that one of the major obstacles to increasing the walking mode share is that walking in urban areas is taken for granted. He notes that the group of people general in charge of the transport system is males 25-60 who use walking to meet less of their travel requirements than any other age or gender group. He further notes that many planners don’t take walking seriously in part because it does not cause pollution, accidents, or congestion (Tolley, 1997).

Many of the same considerations that apply to pedestrian infrastructure also apply to cycling infrastructure: coherence, directness, comfort, safety, and attractiveness (UK department of Transport, 2004). In general, cycling infrastructure has not been a priority in many North American jurisdictions. Urban and suburban communities have been designed around the private automobile which has left many public rights of way uninviting to the bicycles as a legitimate mode of transportation. The Technical
Handbook of Bikeway Design produced by Vélo Quebec notes the following regarding cycling in Canada (Vélo Quebec, 1992).

*In many regions, the weather is a major and inescapable constraint several months a year. Even when winter is over, however, the effects of severe climatic conditions can still be felt: springtime cycling is often made dangerous by the cracks and potholes caused by the freezing and thawing of road surfaces. Climatic constraints must thus be taken into account when bikeways are designed and built.*

Balsas, moreover notes in the United States that with very few exceptions, formal education on bicycle and pedestrian planning for transportation planners is almost nonexistent in the US (Balsas, 2002). No detailed studies were found on Canadian Universities in this respect but it is likely this trend exist in Canada as well. Pucher et al note that efforts to promote bicycling in Canada must be complemented by a comprehensive program to make all roads more bike friendly, through physical design and adaptation. He further notes that bicycling in Canada lacks a tradition of cycling for utilitarian purposes and has a marginal legal, cultural and infrastructure status. He suggests that as longs as car travel remains cheap and transport policies favour the private automobile, growth of bicycles use will be limited in North America (Pucher et al, 1999)

Transport policies which favour the private automobile have also impacted people’s safety. In one study in particular, they note that American cities are much more dangerous to walk or cycle in when compared to vehicle travel. On a per kilometer basis, pedestrians were 23 times more likely to get killed than car occupants in 2001 (140 vs. 6 fatalities per billion kilometers), while bicyclists were 12 times more likely than car
occupants to get killed (72 vs. 6 fatalities per billion kilometers) (Pucher and Dijkstra, 2003).

University Campus populations are well suited to bicycle use however, one study US of 23 institutions found that 64 percent of students lived within one mile of campus, and 84 percent lived within five miles (Daggett and Gutkowski, 2002).

2.1.1.8 Smart Growth Land Use Development: Commuting Time

Commuting time can be a significant determinant of transportation mode choice. A time use general social survey administered by Statistics Canada in 2005 noted that average travel time between home and work in Canada increased when compared to 1992 and 1998 despite only a modest change in median travel distances. It found that in 2005 commuters spent an average of 63 minutes round trip between home and work whereas in 1992, only 54 minutes and in 1998, 59 minutes. In the prairies provinces it was found that the number of workers commuting less than an hour dropped from 71% to 56% between 1992 and 2005 (Statistics Canada, 2006).

There has been much speculation for the reasons for this upward trend in commuting time. Low density development with car-dependent communities is one reason, better known as urban sprawl. One U.S. study found that areas with higher population density were associated with lower commute times (Malpezzi, 1999). It was also noted in a Dutch study that level of urbanization is the most important determinant of modal choice after car ownership. The study noted that those in higher density neighbourhoods had lower commute times and had a greater likelihood of choosing an active mode of transportation (Schwanen et al, 2004). A Quebec City study attributes longer commutes in part to the decentralization of employment away from the central
business district (CBD). It notes, “policies aimed at reducing increases in commuting
distances, commuting times, and car emissions have to deal with an urban form”
(Vandersmissen et al, 2003). A Seattle study noted that municipal planning efforts urging
compact urban form and nodal development as a means to manage travel behaviour
would be successful in light of their findings (Krizek, 2003).

2.1.2 Analysis Tools and Evaluation

There are a variety of tools used to analyze and evaluate transportation planning. The cost-benefit analysis, hierarchy decision making and geographical information
systems (GIS) analysis are three tools used for evaluation and decision making. Each area
will inform the research questions to be addressed.

2.1.2.1 Cost Benefit

Cost benefit analysis (CBA) is one tool for evaluating a given project, policy or
plan throughout the world. Many economists argue that CBA is important tool in
decision making; however, CBA can fail to take account for social and environmental
externalities (Hanley, 2000). Moreover, another study suggests land use impacts are not
fully accounted for (Araya and Martinez, 2000). Many people, including those who
generally advocate for CBA agree that there are some issues which are not well suited for
CBA such as human rights and equity (Elvik, 2001). However, the economy has
important role in how decisions are made and informed. An efficient market economy
should reflect certain principles; consumer options, cost-based pricing and economic
neutrality (Litman, 2006). Transportation markets tend to ignore these market principles,
for example, land use development practices which create automobile dependant suburbs,
preference towards the automobile instead of non-motorized travel in planning practice and under-pricing of motorized travel. In combination these distortions tend to exacerbate congestion, accidents, accessibility for non drivers, consumer transportation costs, energy consumption, and pollution. Significant economic, social and environmental benefits can result from market reforms which remove distortions and improve efficiency (Litman, 2006). Litman further notes, “in a more efficient market, consumers would choose to drive less, rely more on alternative transport options and be better off overall as a result”.

Another recent study notes that metropolitan planning organizations (MPO) and state departments of transportation (DOT) in the United States are now incorporating traditional externalized costs into transportation planning processes early in the development to better inform decisions and reduce public controversy. The study notes, 

State DOTs and MPOs agree that air quality, land use, socio-economic, environmental justice, and community cohesion impacts are of greatest concern today, and will be so in 10 years.

CBA in combination with environmental analysis of plans, environmental performance measures, consideration of equity issues, new data and analysis tools, and innovative institutional partnerships are keys to success (Amekudzi and Meyer, 2006).

Another way to describe Cost-Benefit analysis is to compare total incremental benefits with total incremental costs; it is not limited to a single objective or benefit (Litman, 2009). It tends to consider marginal costs, long-run costs, and or total social costs. Specifically in relation to comprehensive transportation evaluation, categories included would be vehicle costs, travel time costs, roadway costs, traffic services, parking
costs, congestion impacts on other road users, delays to non-motorized travelers, accident costs, pollution emissions, land use impacts, and other environmental impacts (Litman, 2009).

2.1.2.2 Geographic Information Systems

Geographic information systems (GIS) is a tool which has emerged and gained momentum as a powerful tool for planners and others alike in the last ten to fifteen years. GIS is essentially an analysis tool for geographic information. GIS can be used to help answer a variety of complex spatial temporal questions. GIS has been used extensively in the natural sciences but increasingly in the multidisciplinary and multi-faceted sector of transportation including infrastructure, as well as route planning and the movement of people and freight (Thill, 2000). The type of questions that a GIS can answer depends in large part to the type of data available. Base data such as roads, rivers, contours, and census boundaries are generally readily available through the federal and provincial governments. Detailed data at lower levels of geography such as at the neighbourhood level can be more challenging to acquire and can require specific data gathering through surveys or interviews. In large part the richness of the output analysis depends in large part on the quality and level of detail of the input data.

GIS represents a significant tool for analysis and decision making for planners and the planning profession. There are numerous examples where GIS has been used in planning circles. For example, in a 1997 article notes the use of GIS in the analysis of 397 different bicycle commuter routes in Guelph Ontario. It describes GIS as a valuable tool for route analysis (Aultman-Hall et al, 1997). In another GIS study, it examined Portland household travel behaviour and noted the importance of GIS for understanding
policy response to urban travel reduction strategies (Buliung and Kanaroglou, 2006). In a third study, data for two southeastern US metropolitan areas were used in a GIS to investigate whether sprawl resulted in longer commute times and distances (Sultana and Weber, 2007). Each of the GIS studies highlighted uses a slightly different method: route analysis, policy response mapping, and sprawl impact on commute times, however the method used in this thesis employs a different method: raster density analysis. This method is one of variety of methods which can and are used by GIS. More and more GIS is being used in the planning profession as not only a tool which informs complex spatial relationships but also as a decision making tool.

2.1.2.3 Hierarchy Transportation Decision Making

Hierarchy transportation decision making is another tool which reflects a sustainable transportation policy direction. Hierarchy transportation decision making is also known as green transportation hierarchy. Many current planning practices of transportation system performance evaluation are based on roadway level-of-service, generous roadway funding, generous minimum parking requirements, and restrictions on land use density and mix favouring automobile transportation. Green hierarchy transportation decision making however favours more resource-efficient modes. This prioritization is often more cost effective in terms of infrastructure and helps correct past distortions favouring automobile travel. It is essentially a tool where decisions are evaluated and prioritized based on the following green hierarchy from top to bottom (Transportation Alternatives, 2001).
Figure 1 - The Green Transportation Hierarchy

This technique is based upon prioritizing pedestrians first followed by cyclists, then transit, then commercial vehicles, then high occupancy vehicles and finally then single occupancy vehicle. Although many jurisdictions do not specifically use this decision making tool, there are a number of jurisdictions which allude to this type of prioritization or are compatible with the construct of hierarchy decision making. Implementation of this might for example include widening or repaving sidewalks before increasing roadway capacity. Increasingly, local municipal governments and universities are using hierarchy transportation decision making as a decision making framework for transportation related decisions.

Unfortunately the academic literature has limited peer reviewed articles on hierarchy transportation decision making; however, there is considerable information at a
professional practice level. For example, the City of Vancouver, the City of Toronto and
the University of Colorado have all implemented the policy framework at varying levels.
Transportation systems can often be planned and built in incremental segments with no
overarching plan or integration between modes. An analysis of individual decisions over
time can better understand an organization’s priorities. It is described in the magazine
Transportation Alternatives as a system of prioritization which emphasizes efficient and
equitable travel options.

The United Kingdom department of transportation recommends hierarchy
transportation decision making as one element of good planning practice for local
transportation plans (UK Department of Transport, 2004). They note the following
concerning the objective of the framework:

> The objective of such a hierarchy is to ensure that the needs of the most
> vulnerable road users are fully considered in all highway schemes, but not
> necessarily to give priority to pedestrians and cyclists in every location.

Litman further notes that transportation prioritization explicitly allocates resources to
give higher value trips and lower cost modes priority over lower value, higher cost trips
(Litman, 2007).

### 2.2 TDM Programs at Selected Universities

To provide context to the overall study and to provide insight into the possibilities
for the University of Manitoba Fort Garry campus, a review of three other university
TDM programs is provided in the following chapter. Three campuses have been selected
for review: the University of Colorado at Boulder, the University of British-Columbia,
and the University of Ottawa. The University of Colorado at Boulder campus was
selected because of its innovative practice which has been implemented since the late 1990’s; the University of British-Columbia was selected because it is a large Canadian university with a suburban campus similarly to the U of M Fort Garry campus. The University of Ottawa is in a Canadian city with a similar campus population and climate to the University of Manitoba Fort Garry campus. All three universities had data readily available. Other notable University TDM Initiatives are noted in the final section of this chapter.

2.2.1 University of Colorado at Boulder

The University of Colorado at Boulder has a long history of innovation. Throughout the 1980’s and 1990’s the university began to implement programs designed to reduce the footprint of the university through reduction of waste, energy and water (Toor, 1999). Transportation planning really took shape during the early 1990’s in the reaction to the building of two new parkade structures without public consultation. Students began to get organized and questioned how decision and priorities were being made. The student group found that new demand for parking and traffic congestion simply resulted in the provision of more supply of parking. By the late 1990’s the primary focus was on managing demand by giving students and staff viable alternatives to vehicle use. Three factors led to the shift toward TDM at the University of Colorado at Boulder: pressure from local government, active student organizing and fiscal pressure related to the high cost of new parking structures (Toor, 1998). These three factor lead to the adoption of a progressive campus master plan with clear objectives and a comprehensive TDM program administered by the University.
2.2.1.1 U-Pass

The University of Colorado at Boulder has had a u-pass system since 1991. U-Pass is a universal bus pass for students. Since the initial start of the u-pass at the University of Colorado at Boulder back in 1991 it has since been expanded to include every permanent employee. The implementation of the u-pass was a collaborative effort between the University, the city and the transit agency and has led to major improvements of transit service (Toor, 1999).

A City of Boulder employee initially floated the idea with the student union and the vice chancellor at the university and it received initial approval. The vice chancellor then commissioned a Transportation Advisory Committee (TAC) to support the initiative and reflect on the green transportation hierarchy which had been formally adopted in the campus master two years earlier (Toor, 1999).

The student union had a referendum to self impose a $10 levy per semester for the u-pass which passed 4 to 1 in favour. The referendum was supported by TAC. The levy raises $550 000 a year. The initial price of $10 per semester was negotiated between the vice chancellor, student union, the city transportation department, and the transit agency. The city also contributed initial funding to the pass. The final price was substantially lower than initial transit agency price because the student union successfully argued that student schedules were very different than the average working public thus a substantial number of student riders could be absorbed at no extra cost (Toor, 1999).

2.2.1.2 Guaranteed Ride Home Program

The Guaranteed Ride Home Program is a program which provides pass holders (u-pass and employee ecopass) with a free taxi ride home in the event of an emergency or
work schedule change. The program is one of the services which are provided as part of the universal passes (University of Colorado, 2008).

2.2.1.3 Cycling

At the onset of TDM initiatives at the University of Colorado at Boulder, parking services expanded their commitment to bicycle parking on campus in response to student demand. However, adoption of bicycle routes on campus has been slow despite a significant number of trips made by bicycle (Toor, 1999). During the 1990’s bike trips increased from 20% to 31% (Toor, 2003).

2.2.1.4 Modal Split

Between 1990 and 1996 there were significant changes in modal split at the University of Colorado at Boulder as a result of TDM programs. The City of Boulder Center for Policy and Program Analysis noted, 35.9 % of all trips were on foot, 17.6% of all trips were taken by bicycle; 18.9 % by carpool; 23.8% by single occupant vehicle (SOV); 2.3 % by dorm shuttles, and 1.5% by transit in 1990. In 1996 39.8% were on foot; 19.9% by bicycle; 18.3% by carpool, 14.6% by SOV, 4.2% by transit, and 3.2% by dorm shuttle. The TDM programs significantly reduced the number of single occupancy vehicle trips and increased walking, biking and transit (Toor, 1999).

2.2.1.5 Campus Master Plan

The University of Colorado has a campus master plan which guides development and transportation planning on campus. One of the challenges has been addressing the relationship between land use and transportation. The University expanded to several sites which included a student housing complex and research park at the periphery;
however this has increased the walking distance across campus. One source notes that politics involving university land use decisions is highly charged, making good planning difficult (Toor, 1999).

The current master plan however, has a substantial section for transportation and recommends a car free central campus including the closing of two roads and removal of a small amount of parking. The proposal is stalled because the parking is used by many deans and heads of departments (Toor, 1999).

The campus master plan includes several transportation objectives (University of Colorado, 2001):

- Recognize that people have different needs and plan accordingly by improving all modes.
- Continue the policy begun in the 1990 Master Plan for on-campus travel preferences (in order, depending on what is feasible for each trip): (1) walking, (2) bicycling, (3) transit, and (4) driving.
- Consider the impact on the campus and community of proposed transportation improvements. For example: recognize that parking consumes a valuable land resource, recognize the impacts of vehicular fumes and noise, and reduce or mitigate conflicts between modes in order to maintain safety and minimize time delays and additional costs.
- Consider the relative cost per trip to both the individual and to CU-Boulder.
- Encourage better transit service for faculty and staff use with the intent of affecting the modal split to campus.
- Develop better data, combining both counts and surveys, for future modal split
2.2.2 University of British Columbia

The University of British-Columbia (UBC) has developed a comprehensive single occupancy vehicle reduction strategy. In the spring of 1997, the UBC Board of Governors decided that UBC should lead the region in promoting, researching, and integrating sustainable transportation alternatives. UBC entered into a memorandum of understanding (MOU) with the regional district and committed to reduce single occupancy vehicles by 20%, reduce truck traffic to and from campus, and improve transportation choices for members of the UBC community. The MOU called for the implementation of a comprehensive and integrated transportation management strategy to be updated every five years. These commitments were incorporated into UBC’s Official Community Plan. The UBC Trip Reduction, Research, Education, and Knowledge (TREK) Program Centre, a Department of Land and Building Services, was formed soon thereafter. The UBC TREK Program Centre is funded by parking revenues and through a municipal services levy (building tax). They have over a dozen partners and programs which they help administer (UBC TREK, 2007).

In 1999, a Strategic Transportation Plan (STP) was developed and approved by the UBC Board of Governors. Prior to approval UBC engaged in a long-term and in-depth community consultation process which included 5,000 on and off campus stakeholders over a period of 19 months. As part of in-depth community consultation process the university carried out a demographic and transportation survey that was emailed to 34,000 students, staff and faculty. A large portion of the data analysis was used in the STP. Fifty-five different strategies were noted in the guidelines and analysis.
recommendations of the STP. The STP is updated every five years (UBC, 2007).

The university also embarked on a number of other community planning initiatives which complemented the Strategic Transportation Plan. These initiatives included the provision of increased opportunity for people to live and work on campus as well as enhanced community services for UBC residents. A number of the strategies are outlined in the following sections (UBC, 2007).

2.2.2.1 U-Pass

U-Pass is a universal pass that all students at a university pay into and in return receive a discounted unlimited travel bus pass. In many cases U-Pass can include other features such as discounts at restaurants or occasional parking on campus. In general, the provision of additional features and services makes U-pass an easier sell to commuters who generally self imposed the fee through a student union referendum. In most cases a combination of funding sources is used to establish a U-pass price. Ongoing financers can include contributions from university administrations, transit agencies, student unions and can include a combination of other sources (e.g. private sponsorship or advertising revenues).

UBC noted that implementation of U-Pass was the initiative that most effected travel patterns. The universal pass was passed by a student referendum in 2003. Students pay $22 a month towards the mandatory pass. The university administration contributes $3 each month. The U-Pass offers students’ unlimited access to travel throughout the region as well as discounts on the West Coast Express commuter rail service. Discounts at participating merchants, and access to a variety of other transportation programs available on campus are also provided through the pass (UBC, 2005).
The transit agency increased the level of transit service during the implementation of U-pass and has subsequently added additional service and transit infrastructure. The transit agency remains at breakeven point despite unprecedented ridership growth of 18% to 45% modal share (UBC, 2007). UBC and the region’s transportation authority are now considering extending the U-Pass program to staff, faculty and residents on campus.

2.2.2.2 Class Start Times

Another strategy to manage transportation demand was the changing of class start times. UBC adjusted the start of their classes in September 2001 in an effort to spread the transit demand over a greater time period during the morning rush. Previously, the first classes in the morning all began at 8:30 a.m. This was changed so that some students begin classes at 8:00 a.m., some remained at 8:30 a.m., and others begin classes at 9:00 a.m. Subsequent analysis showed that the desired spreading of morning peak demands was achieved, and that as a result, 12% more transit trips per day were accommodated on the same number of buses (UBC, 2007). The two figures illustrate the change in both the person and automobile trips between 1997 and 2007.
Figure 2 - Weekday Traffic Volumes Across UBC in Person trips

Note: WB stands for Westbound and EB stands for Eastbound
2.2.2.3 Parking

UBC reduced the parking supply by 25% between 1997 and 2007 including the elimination of more than 3,000 stalls. During the same period UBC increased the costs of parking, for example surface lots increased from $2.00 to $4.50 per day. Additionally, UBC worked with its partners including regional and local government to enforce parking restrictions in nearby neighbourhoods and roadways (UBC, 2005).

2.2.2.4 Bicycle Facilities

Bicycle facilities at UBC have been incrementally added over the last ten years. They include new bike lanes on campus and leading to campus and a substantial upgrade.
to their end of trip facilities. The fall 2005 Strategic Transportation Plan notes the bike lane additions,

*Most notable is the conversion of University Boulevard west of Blanca, from two lanes in each direction to one travel lane and one bicycle lane in each direction.*

*Bicycle lanes were also added on Westbrook Mall, Thunderbird Boulevard and 16th Avenue.*

Furthermore, the end of trip facilities upgrade included the addition of 200 bicycle racks, a secure bicycle cage, bicycle lockers, showers and other support services. The end-of-trip-facilities program is administered by Trip Reduction, Research, Education, and Knowledge (TREK) centre who also administer the CanCart Loaners program. TREK also financially support the student run bike co-op and on campus repair shop.

The end-of-trip facilities are an important part of making cycling convenient and practical. Standards are currently being developed at UBC for secure bike parking options located close or adjacent to any new buildings or those buildings being retrofitted. One of the challenges is that secure bike parking and showers often get removed from plans when new buildings or retrofits are being designed (Jolly, 2007).

The other main cycling program that is administered by the UBC TREK Program Centre is the CanCart Loaner Program. It is a free program which is open to all members of the UBC community which allows use of a handcart or a bikecart for 1-3 days. They are commonly used for grocery trips and transporting materials between buildings or to and from campus. The program was initially funded by a Transport Canada grant. There are approximately 10-15 in the inventory as of February 2007. There were a number of challenges with this program during implementation. Initially they had a series of
decentralized locations across campus and as well as off campus. Theft and damage was a major concern, as of February 2007 they have one central depot on campus where they lend from, which has reduced theft and damage (Jolly, 2007).

Buses in the region are also equipped with bike racks all year round which give cyclists increased transportation choice (Jolly, 2007).

2.2.2.5 Car Pooling and other programs

UBC implemented a comprehensive carpooling program which includes preferred parking for carpoolers, an internet based ride matching service and a rewards program. UBC also have an emergency ride home program similar to University of Colorado at Boulder. As well as a car sharing program and the provision of additional campus shuttles and traffic calming measures (UBC, 2005).

2.2.2.6 Annual Monitoring Program

UBC carries out a significant monitoring program on a yearly basis. A number of different data collection methods are used. The data are collected in the fall every year in order to compare year to year data over time. Additional data collection is undertaken at other times of year to look at seasonal variations and local traffic volumes. Annual data collection activities are summarized below (UBC, 2005).
### Table 1 – UBC Annual Data Collection Activities

<table>
<thead>
<tr>
<th>Data Collection Activity</th>
<th>Locations</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screenline traffic counts</td>
<td>Screenline</td>
<td>Automatic counters (tubes) on road for 7 days, 24 hours/day</td>
</tr>
<tr>
<td>Campus traffic/speed counts</td>
<td>Roads throughout</td>
<td>Automatic counters (tubes) on road for 7 days, 24 hours/day</td>
</tr>
<tr>
<td>Intersection counts</td>
<td>Intersections</td>
<td>Manual observation for 8 hours (3 in AM, 2 in midday, 3 in PM) for one day</td>
</tr>
<tr>
<td>Vehicle occupancy and classification</td>
<td>Screenline</td>
<td>Manual observation for 8 hours (3 in AM, 2 in midday, 3 in PM) for one day</td>
</tr>
<tr>
<td>Transit ridership</td>
<td>Screenline</td>
<td>Manual observation from 6:00 AM to 4:30 AM for one day</td>
</tr>
<tr>
<td>Bicycles and pedestrians</td>
<td>Screenline</td>
<td>Manual observation for 8 hours (3 in AM, 2 in midday, 3 in PM) or 15 hours for one day</td>
</tr>
<tr>
<td>Heavy trucks</td>
<td>Screenline</td>
<td>Manual observation for 15 hours for one day each quarter</td>
</tr>
</tbody>
</table>

#### 2.2.2.7 Campus Planning and Housing

One part of UBC’s overall TDM strategy has been to develop additional on campus housing. The added housing has included additional student, staff, faculty and market housing. The additional housing has facilitated an increase in the number and range of services available on campus (UBC, 2005). UBC has a dedicated community
planning office which administers new development and the Official Community Plan in conjunction with the regional government.

2.2.3 University of Ottawa

The University of Ottawa has a more modest program compared to UBC; however, it has a number of different TDM programs branded under the HOP TO IT name and a TDM coordinator.

2.2.3.1 Bike Share program

One of the programs under the HOP TO IT brand is the bike share program, which facilitates cycling through a Bike-Share pilot project. Implemented in the summer and fall of 2007 the program is just in its initial stages. Bikes are loaned free of charge, to members of the University community for commuting and general use at the University of Ottawa.

To become a member of the bike share program users must pay a ten dollar refundable deposit and fill out a register form. Bicycles can be booked up to seven days in advance by phone or on location and are available for up to 6 hours at a time between 7 am and 10 pm. Members are given a hour an hour window to pick up their reserved bike before it becomes available to other members. Late returns result in termination from the program (University of Ottawa, 2008).

2.2.3.2 Semester Bus Pass

Although the University of Ottawa does not have a U-pass system at the time of writing, in part because students are commuting from different provinces, Ontario and Quebec, including two different transit agencies, it does have a semester bus pass. The
semester bus pass saves students time by not having to buy a bus pass each month. It helps the transit agency by providing a lump sum amount of money in advance and reduces administrative costs associated with monthly collection (Ottawa Transit, 2008).

In September 2009, the University of Ottawa launched a pilot U-Pass system at $125 per semester.

2.2.3.3 Car Pool Program

The carpool program is pilot project comprised of an extensive policy and several programs. A ride matching service is provided to staff and faculty through a subscription to an outside provided. There is also a ride matching service for students hosted by the university which requires a valid university ID (University of Ottawa, 2008).

There are several steps which need to be taken in order to be recognized as a formal carpool and receive program benefits such as preferential parking and an emergency ride home (University of Ottawa, 2008). Eligibility criteria for a formal carpool include:

- Carpool groups must always have a minimum of three active carpool members.
- Members must commute together at least four days per week, excluding weekends.
- Members must commit to carpooling for a minimum of three consecutive months.
- All members of a carpool group must live off-campus, beyond a five kilometre radius from the University of Ottawa.
- No member can be registered in more than one carpool group at a time.
- Carpoolers must be faculty or support staff of the University of Ottawa.
• The carpool group must choose a “carpool captain”.
• Only the carpool captain can purchase a carpool permit from the University of Ottawa. However, other members can hold a weekend or evening permit.

As the program is pilot project there will likely be some adjustment made to the carpool policy based on implementation. Some provisions may be too onerous to encourage carpooling or loop holes in the system may present themselves.

2.2.4 Other Notable University TDM Initiatives

There are a number of innovative TDM university programs across Canada, the United States and around the world which reduced the number of vehicles, vehicle trips or the kilometers driven (Toor & Havlick, 2004). Other notable Canadian university examples include the University of Victoria, Sherbrooke University and the University of Alberta. In the case of the University of Alberta they have just completed a TDM study including the identification of timeline (Bunt & Associates., 2005). Additional initiatives are also noted below.

2.2.4.1 Paid Not To Drive and Parking Cashing Out

Stanford University has a program which pays $160 per year for those who do not bring a car to campus. Programs where students or employees are paid not to drive are relatively new. John Crawford, an employee for the University of Utah’s parking and transportation services noted the following,

_We found it’s cheaper to pay folks not to park rather than build new parking. Furthermore you gain things that are harder to quantify: clean air, less congestion, a better quality of life, and good relations with_
neighbors. We’re convinced we’ve done a good thing with this. (Toor and Havlick, 2004).

Paying people not to drive is a variation on parking cashing out which is widely accepted as a TDM strategy and been extensively used in California. Parking cashing out means commuters who are offered subsidized parking, are also offered the cash equivalent if they use alternate modes (Shoup, 2005). Employers in California are required to provide parking cash out under legislation.

Parking cash out and universal passes e.g. u-pass and eco-passes results in reduced demand for parking and cost savings. Over the medium and long term reduced demand can facilitate space to accommodate growth or sell or lease land (Litman, 2007).

2.2.4.2 Letter Sent Home

At some institutions in the United States, letters are sent home to new students urging them to leave their cars at home. This has been in response to the knowledge gap of students and their parents to the full cost of operating an automobile and as a TDM measure to reduce parking demand. Toor and Havlick note that in general, the life cycle costs are essentially unknown to the general population, few users are aware of the operation and construction costs of road infrastructure. Letters are usually sent from the admissions office and in some cases, from the college or university president (Toor and Havlick, 2004).

2.2.4.3 Parking Management

A number of universities require users to give up their full time parking passes in order to receive discounted carpool parking, transit passes, or cash benefits but then offer
occasional parking permits (Toor and Havlick, 2004). For example, the University of Victoria has a program where staff is offered an occasional parking permit for use up to 12 days a month (University of Victoria, 2008).

### 2.2.4.4 Summary Comparing Universities

The following is a comparison summary of key university TDM strategies.

**Table 2 – University Comparison Table**

<table>
<thead>
<tr>
<th>TDM strategy</th>
<th>University of Colorado</th>
<th>University of BC</th>
<th>University of Ottawa</th>
<th>University of Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td>U-Pass</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Car pool Program</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Late Night Transit Service</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commuting Financial Incentive e.g. Parking Cashout</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bike Share Program</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Guaranteed Ride Home</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expansion of Housing on or near Campus</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Raise Parking Rates to Reduce Demand</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Alternative Modes</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve Infrastructure and have Programs to Encourage Walking and Cycling.</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Every tool or technique has its use depending on the given circumstances; however one key throughout the examination of all the different programs and initiatives across universities is strong leadership to trial and implement these types programs. Change is difficult for many people. In the case of UBC, it is strong vision at the highest level of the administration, in the case of the University of Colorado, it was student groups and the transit agency which showed strong leadership, and in the case of the University of Ottawa it is again the central administration similarly to UBC with the hiring of a TDM coordinator which has kick started activities. It should be noted however, it takes a multi-stakeholder comprehensive approach to reducing single occupancy vehicles. See Appendix B for more tips and techniques.

2.3 Summary

Sustainable transportation planning requires significant collaboration between various agencies and interest groups in order to facilitate a transportation system which is equitable and efficient. Goals of transportation planning can vary significantly and may be biased toward the private automobile.

There are a variety of analysis and evaluation tools which can help to address transportation planning including cost-benefit analysis, geographic information systems and hierarchy transportation decision making. Each tool has its strengths and weaknesses but can inform transportation issues.

Travel to and from universities represents the largest impact a university has on the earth. Travel by employees and staff is heavily influenced by institutional policies and planning decisions (Toor, 2003). Three university TDM programs were documented; University of Colorado, University of BC and the University of Ottawa, and all provide
insight into the possibilities for the University of Manitoba Fort Garry Campus. Relevant and binding campus plan, U-pass programs, bike share programs, car pool policies, guaranteed ride home programs, end-of-trip bicycle facilities, parking cashing out, smart growth campus planning are all part of the solution for the Fort Gary campus. It is the combination of information, facilities, support and incentives which are common to all of these TDM programs (Toor and Havlick, 2004).

2.4 Implications for the Study

There are number of initiatives which can be pursued at the University of Manitoba in light of the literature review and the review of university TDM programs to embrace sustainable transportation and smart growth planning on campus. The following chapter will provide greater perspective of what is being done at the University of Manitoba Fort Garry campus, who are the key stakeholders and how can travel be further optimized.
CHAPTER 3: TRANSPORTATION PLANNING AT THE U OF M

The University of Manitoba Fort Garry campus is located South of Winnipeg adjacent to the Red River on 274 hectares of land. The University of Manitoba’s has two major campuses in Winnipeg, however the Fort Garry campus is considered the main campus with over 60 major buildings, 10.3 kilometers of road and 6,300 parking spaces (Public Affairs, 2007). The volume and mode of commuters does vary depending on whether the university is in full session. There are approximately 27,000 students, 5,000 staff and 1,160 residence rooms for students (See Appendix A for more detailed demographics). Moreover there are approximately 32,000 cars which access the Fort Garry campus on a daily basis (CPDO 2003). This movement of vehicles imposes significant costs and benefits to the University and to the larger community.

3.1 Historical Documentation

A 2006 honours thesis examined transportation to and from the Fort Garry Campus with a focus on Transportation Demand Management. It provides a lot of valuable background information for further study. Some of the recommendations included in this report are listed below (Poklitar, 2006):

- Create a TDM position and steering committee.
- Investigate travel behaviour among staff and faculty.
- Invest a portion of the parking revenues into alternative transportation.
- Ensure all public transit buses entering the Fort Garry Campus have bike racks.
- Construct a bicycle shelter within the Parkade.
- Investigate the possibility of additional housing structures on Campus.
- Negotiate a U-Pass agreement and secure funding.
Many of the recommendations focus on possible opportunities for change, including the second recommendation listed above, “Investigate travel behaviour among staff and faculty”. Two other studies have looked at travel from an origin perspective, but have focused on the student population rather than staff or faculty (Koroluk, 1981) (Prochera, 1999). The 1981 study, *Fort Garry bikeway: a primer for city cycle commuters* was produced by the Department of Landscape Architecture and provides a general map of student origins at that time. The 1999 study, *An analysis of the transportation modes used by university students in Winnipeg: is the commute to school sustainable?* was a survey of student travel behaviour and provides modal split data, approximate travel time and origin data by region of the city. No mapping was conducted during this study. In 2004, Winnipeg Transit carried out another study. It consisted of a telephone survey which asked University of Manitoba students questions about travel behaviour as well as a universal bus pass or better known as U-Pass.

The telephone survey included students attending all University of Manitoba campuses; however 92% of respondents indicated they attended most of their classes at the Fort Garry Campus. The study identified that 90% of students lived in the City of Winnipeg while attending classes in 2004. It was also noted that 19% of students live in close proximity of campus in an area bordered by Jubilee Avenue, Waverley Street, the perimeter highway, and the Red River. A further eight percent live in the St. Vital and South St. Vital area (Poklitar, 2006).

The telephone study also identified the following travel modal split among students in 2004.

- 55% usually commute as a motor vehicle driver or passenger to school
Of those who commute in a vehicle to the Fort Garry Campus,
44% park in an assigned lot,
47% park in an unassigned lot, and
9% park off campus

(68% of students find it easy to park at the Fort Garry Campus)

- 34% usually commute using Transit to school
- 8% usually walk or cycle to school
- 3% usually commute other ways, including the inter-campus shuttle

The Campus Plan, another relevant document, was completed in 2003. The plan documents the history of the university and its development. Movement and access are specifically addressed in Section E of the plan. The plan projects population growth to increase from 30,000 to 45,000 in the years ahead; however, on-campus parking is expected to remain at current levels. The reduction in per capita demand for parking is expected to be met by three identified strategies: increased on-campus housing, a pedestrian bridge from St Vital, and a high speed transit link from the university to downtown (CPDO, 2003). The Campus Plan is however quite conceptual and does not necessarily reflect the strategic goals of the administration (Poklitar, 2006).

There were two Regional Economic Impact Analysis documents produced in March 2003 and March 2004 (VP of Admin 2007). These documents provide an overview of the economic activity produced by the University. Unfortunately transportation is not specifically addressed in these documents and impacts have likely increased since 2003. Moreover economic activity will likely continue to increase with the approval of the new stadium at the corner of University Crescent and Chancellor
3.2 Current Status

At the time of inquiry there were no specific TDM programs at the University of Manitoba. Parking Services, the University of Manitoba Student Union and the office of sustainability all have links to alternative transportation websites including carpool.ca and Winnipeg Transit but there are no funds dedicated to TDM programs.

3.2.1 Pedestrians

Walking is used to a lesser extent than other modes of travel however every mode choice including driving, transit, cycling uses a walking trip to some degree once they arrive on campus. Walking is also used as a commuting option by on campus residents and those who live in close proximity to campus. A network of tunnels also connects some buildings which are protected from inclement weather. Often pedestrians have to wait several minutes to cross at intersections such of Dafoe Rd at University Crescent. Walking distance to bus stops can also be significant from many buildings. Sidewalks can be flooded with water during spring thaw. No sidewalks exist or the most direct path is not cleared or paved in a several areas such as the East side of university crescent.

3.2.2 Cyclists

Cycling is very popular on campus particularly in the summer months. There are over 250 bike rack parking spaces. One of the main access roads to campus, University Crescent, was paved extra wide to provide for cyclists to campus although no bike lane exists (Office of Sustainability 2007). There are showers available for cyclists in a number of buildings across campus including the Frank Kennedy Centre and the Natural
Resources Institute. Access however, is not always easily available, for example, at the Frank Kennedy Centre showers are only available to staff and students with gym passes (Poklitar 2006). Lockers are available in most campus buildings. There is also an on campus student run bicycle repair centre operated by the University of Manitoba Recycling and Environmental Group (UMREG) (Office of Sustainability 2007). There have also been some discussions regarding a secure bicycle parking facility in the Parkade which is protected from the elements and guards against theft; however, funding has not been secured for this facility (Poklitar 2006). Accessing campus by bicycle can be treacherous with narrow roadways, poor maintenance of curb lanes, with limited dedicated bike routes making cycling unsafe and inconvenient for many.

3.2.3 Transit

Transit is another popular mode of travel to campus. The cornerstone of transit infrastructure at the University of Manitoba Fort Garry campus is the 10 bus routes which begin and end their routes on campus. Only a handful of the bus routes however operate seven days a week. Passes for post secondary students are available on campus at a discounted rate of $57 dollars. Full fare passes cost $71.25 and are available at a variety of locations in Winnipeg (Winnipeg Transit, 2007).

Following the survey in November 2004 and 2005 a negotiation between UMSU and Transit was carried out with the best price identified being $225 for eight months. This was without any University administration support unlike many other universities which financially partner with the student union to provide the U-pass program. (Table 3)

The 2004 survey noted the following about willingness to pay for a U-Pass at the U of M.
Table 3 – U-Pass Program – Willingness to Pay Levy

<table>
<thead>
<tr>
<th>Levy Amount</th>
<th>Overall</th>
<th>Fort Garry</th>
<th>H.S. C.</th>
<th>St. Bon</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th+</th>
<th>Full Time</th>
<th>Part Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>$100</td>
<td>76%</td>
<td>77%</td>
<td>71%</td>
<td>78%</td>
<td>81%</td>
<td>76%</td>
<td>73%</td>
<td>74%</td>
<td>78%</td>
<td>68%</td>
</tr>
<tr>
<td>$150</td>
<td>79%</td>
<td>69%</td>
<td>62%</td>
<td>78%</td>
<td>75%</td>
<td>67%</td>
<td>66%</td>
<td>67%</td>
<td>70%</td>
<td>59%</td>
</tr>
<tr>
<td>$200</td>
<td>64%</td>
<td>64%</td>
<td>62%</td>
<td>78%</td>
<td>68%</td>
<td>61%</td>
<td>62%</td>
<td>63%</td>
<td>65%</td>
<td>55%</td>
</tr>
<tr>
<td>$250</td>
<td>55%</td>
<td>55%</td>
<td>55%</td>
<td>56%</td>
<td>58%</td>
<td>53%</td>
<td>53%</td>
<td>54%</td>
<td>56%</td>
<td>47%</td>
</tr>
<tr>
<td>$300</td>
<td>35%</td>
<td>36%</td>
<td>43%</td>
<td>56%</td>
<td>40%</td>
<td>31%</td>
<td>35%</td>
<td>38%</td>
<td>38%</td>
<td>29%</td>
</tr>
<tr>
<td>$350</td>
<td>22%</td>
<td>22%</td>
<td>27%</td>
<td>33%</td>
<td>26%</td>
<td>19%</td>
<td>18%</td>
<td>22%</td>
<td>23%</td>
<td>15%</td>
</tr>
</tbody>
</table>

Legend
0-29% |
30-49% |
50-69% |
70-100% |

Winnipeg Transit noted that two-thirds of student body would be willing to pay $200; while 55% were willing to pay $250, thus they concluded that it would likely gain popular support in the 60% range. However, the student union felt the offer was not a significant improvement over a similar offer in the 1990’s despite rising inflation and didn’t put it to a referendum (UMSU, 2005).

Potential improvements to the quality of transit service include increased frequency, increase speed (rapid transit), better stops and stations, nicer vehicles and amenities such as WI-FI service.

3.2.4 Driving and Parking on Campus

Parking and Shuttle Services, a branch of the U of M’s Ancillary Services, administers parking passes and fines on the Fort Garry Campus. They also coordinate the free shuttle bus services for staff and students which services’ outlying surface parking lots and the Bannatyne campus. The mission statement of Parking and Shuttle Services is:
“To provide quality, economical parking to the University community on a cost-recovery basis, and to support quality shuttle bus services free to students and faculty. The department continually strives to maximize customer satisfaction through the efficient management of the parking operation, the regular maintenance of existing lots, the ongoing development of new parking facilities, and the providing of shuttle bus services.” (Parking Services, 2007)

There are about 40 surface parking lots of various sizes and one multi storey parkade. In total this includes close to 6200 spaces. 4900 spaces are dedicated to annual or eight month permits for staff and students. Another 1300 are dedicated to casual parking at the parkade, meters or ticket dispensers (Parking Services, 2007). The campus is designed to accommodate the influx of vehicles at the expense of other modes of transport (CPDO, 2003).

Parking permit prices are negotiated between the University Administration and the University of Manitoba Faculty Association (UMFA) and are written into employee contracts. Contracts are usually three years in length. Once the price for parking is set into contract for faculty, the equivalency is used to determine the price for students for an eight month period (Poklitar, 2006)(UMFA 2007). Prices for casual parking vary depending on location and time of day. Parking is free after 4:30 pm weekdays and on weekends and on holidays for all surface lots except those which are reserved 24 hour a day (Parking Services, 2007).

As a business practice Parking Services does not share its detailed financial statements (Zurrin, 2007). Annual parking revenues and expenses are however available in an aggregated form in the University of Manitoba Annual Financial Reports. Many line items in the annual financial reports are in summary form only or are located within different budgets, for example, parkade debt financing does not appear to be located
within the parking budget. There was approximately $4.9 million collected in parking revenue in 2004-2005 and a subsequent $2.5 million dollars declared in operating expenses including $272,000 in utilities (Financial Services, 2007). The costs to build new parking spaces at the Fort Garry Campus including planning, land, and construction, but not including maintenance, administration, or enforcement are $1500 per stall for a non-powered gravel lot, $3500 per stall for surface asphalt, and $20,000-$25,000 per stall for a parkade structure (Poklitar, 2006) (Zurrin, 2007). Detailed parking financial records could potentially be available through the Freedom of Information and Protection of Privacy Act (Fields, 2007), however there are some costs associated with the requests and no guarantees that any detailed information will be released. Irrespective of future research in this direction, the university administration should recognize the need for greater transparency in its operations as a public institution.

3.2.5 Park and Ride Services

Park and ride facilities were provided during the 1980s for staff and students. It is unclear why this service was discontinued or how this service was paid for. More recently, 2003-2004, Winnipeg Transit and the University of Manitoba student union explored starting up a park and ride services from shopping malls and other central nodes within the city to the University of Manitoba Fort Garry campus. This initiative dissolved because of lack of resources. Both parties suggested that one of the major hurdles of this initiative was finding the available space for those parking for the day. Shopping malls were generally unsupportive of the idea as it used up subsidized parking spaces which could have been used by other shoppers. It was thought that another site would have to be found if resources were to be made available (Menzies, 2007).
3.2.6 Campus Housing Options

There are several housing options available for those who wish to live on campus. These options include Mary Speechly Hall, Tache Hall, Arthur Mauro, University College and a number of smaller special interest residences. Each year over 1200 students live in residence on campus. There is also a new high rise development planned (360 units) on an existing structure (Pembina Hall). This new development is an excellent example of building in the core area of campus; however it will not add any new capacity as it is replacing Tache Residence. The 1200 housing spaces available represents approximately 4% of student body and staff where as UBC has on campus housing for approximately 19% of its population.

On campus living is a convenient alternative to living off campus and commuting daily to campus. The adjacent neighbourhood of Fort Richmond also is in close proximity to campus and houses a large number of students in single family dwellings. A number of higher density apartment blocks located near the major artery of Pembina Highway also accommodate a large number of students.

Despite the range of housing options on or near campus, there are limited amenities within close walking distance. Grocery stores, banking facilities, cafes, bars and restaurants are either a few kilometers away or have limited hours of operation for full time residents. Moreover, residence buildings cater primary to undergraduate while fewer housing types exist for graduate students, couples and families. Similar few options exist for staff and faculty who wish to live on campus.

3.2.7 Campus Fleet and Deliveries

Campus fleet management as well as delivery and service vehicles management
can and do form part of larger sustainability initiatives as seen in the review of other jurisdictions. These may include reducing the overall size of the fleet, reducing the number of trips through TDM, greening the fleet through procurement and alternative fuel use. As this is not the primary focus of this thesis only limited information is documented here.

In terms of greening the campus fleet, the University has partnered with Manitoba Hydro and is activity researching Plug-in Electric Hybrid Vehicles including use of one prototype. Part of this research is looking a vehicle to grid (V2G) technology which distributes vehicle battery power to the grid during peak demand times and charges vehicles batteries during low demand off peak times. Fuel efficiency of plug-in hybrids in cold weather climates is also being investigated. Fuel logs are also kept for each vehicle in the campus fleet (Physical Plant. 2007).

3.2.8 Organization Structure

The organizational structure at the University of Manitoba is different than many other leading university institutions with respect to sustainability and TDM initiatives. There is one coordinator for environmental sustainability at the Fort Garry campus. This position is located within the building and maintenance department “physical plant”. Although the position reports some issues to the central administration (Associate VP), the position reports directly to a middle manager within the “physical plant”. Many universities of comparable size such as UBC have a separate sustainability office with a full staff with a strong mandate, budget and a direct reporting structure to senior administration. In addition, many institutions have a TDM office and coordinator outside of the sustainability office with mode share targets. At the time of writing no TDM
coordinator had been hired at the University of Manitoba.

The lack of cooperation in the study was challenging as campus officials withheld detailed parking financial information and either refused to be interviewed or offered only a phone interview. This is consistent with an old paradigm of planning with limited transparency or openness.

3.3 Analysis

With the historical baseline data as a starting point and being informed by the literature, including the review of other university TDM programs this study uses three analysis tools to inform its conclusions and recommendations.

3.3.1 Cost-Benefits Explored

As identified in chapter two, cost benefit analysis is one evaluation tool which can help decision makers make informed decisions. Different types of evaluation use different perspectives and scope (Litman, 2009). Much of the detailed financial data at the University of Manitoba Fort Gary campus is publicly unavailable; a complete comprehensive analysis is not feasible or practicable; however it is useful to highlight here the various agency perspectives as it relates to the evaluation of transportation costs and benefits.

The parking authority at the University of Manitoba Fort Gary campus will generally identify the most cost-effective investment for increasing parking supply but it is unclear to what extent if any other options outside of their mandate and budget are evaluated. Increasing parking supply increases traffic congestion through making it more convenient to drive thus inducing higher demand. This has financial implications for the
City of Winnipeg transportation and transit departments requiring more resources to address higher levels of congestion in particular. Having a narrow mandate, such as the University of Manitoba Fort Garry Parking Authority, might result in the failure to implement parking solutions that achieve other objectives such as improved mobility for non-drivers, reductions in greenhouse gases, fewer accidents or land space within the core area of campus to develop more housing options (Litman, 2009). Litman has compiled a list of mobility management benefits which tend to be overlooked which are included as a reference in Appendix E.

3.3.2 Key Informant Interviews

Five key informant interviews were carried out over a period of two months in December 2007 and January 2008. Key informants represented a number of stakeholders including Winnipeg Transit, University of Manitoba Student Union, University of Manitoba sustainability coordinator, University of Manitoba central administration and Resource Conservation Manitoba.

The interviews were carried out to help inform the research questions: How are transportation decisions being made at University of Manitoba Fort Garry campus and what opportunities are there to reduce single occupancy vehicles? (See Appendix C for complete interview guide) Under the Ethics approval no one individual or organization can be identified relative to a single comment.

Respondents were asked a question related to the current status of transportation planning to both get a sense of their knowledge and expertise but also obtain a genuine assessment of current affairs at the university. Respondents differed slightly in their description of transportation planning at the U of M Fort Garry campus, the range of
comments included “extends only to parking management” to “TDM is relatively new on campus”. In general, respondents noted that comprehensive transportation planning does not exist yet, some were more hopeful than others for the near future.

When asked about past, current and future initiatives with respect to commuter travel, respondents noted a number of initiatives including a new Parking Advisory Committee which was established to handle complaints, suggestions, address the negative image of parking services and improve the carpool process. Other initiatives identified were the exploration of park and ride facilities, bike compound, gondola to St Vital and the U-Pass negotiations. The identification of these initiatives indicates there has some effort and thought that has been put toward TDM at the U of M Fort Garry campus. However, discussion of cycling and walking infrastructure, telecommuting, on campus housing, and higher density core set of buildings was very limited and few initiatives have been successful to date. Some respondents noted that a lack of financial resources was one of the reasons for failed initiatives.

When asked about how decisions which affect transportation choice were made and evaluated, respondents noted that transportation related decisions were general made behind closed doors without a transparent public process. Many respondents felt it was unclear how transportation decisions were being evaluated.

When asked if respondents thought health impacts and greenhouse gas emissions were being considered in the decision making process, most respondents thought that these externalities were not being considered by university administration.

When asked about what a comprehensive transportation plan would include, some respondents noted many of the programs identified in chapter two including a guaranteed
ride home, a U-Pass program, improved end-of-trip cycling facilities, improved pedestrian and cycling facilities, telecommuting, denser core campus, incentives and disincentives, and more on campus housing options. Other respondents noted the importance of collaboration among stakeholders as key to a comprehensive transportation plan.

When asked about greatest opportunity to reduce single occupancy vehicle, respondents noted light rapid transit from downtown to the university and U-Pass program as being the most likely candidates.

In general, respondents were receptive to the interview, although some expressed concern in being interviewed given the limited success of certain TDM initiatives on campus, e.g. U-Pass. Several respondents felt that the university administration needed to show greater leadership in transportation planning.

Respondents’ general knowledge about TDM varied widely. A TDM workshop may be useful for key stakeholders.

3.3.3 Web Survey

As identified in the research methodology section in chapter 1 the primary purpose of the web survey was twofold. First was to establish travel time for each mode of travel. Secondly, the survey was to establish the geographic distribution of commuters by each mode. Additionally, modal split information has been tabulated from respondents. An optional comment bank was also established to gather information about infrastructure suggestions. (See Appendix F for details).
3.3.3.1 Methodology

The established goal for the commuter survey prior to administering the survey was to have 40 respondents from each mode: walking, cycling, transit, carpooling (2 or more) and driving alone. An adaptive approach to surveying was established to maximize respondents from each group. At the onset of the project, an invitation E-Mail to complete the web survey was sent out to all graduate students (3270 graduate students) in early November 2007. The survey was publicly available for a two week period. The cycling mode share group was also directly targeted through a local cycling advocacy list serve Bike-to-the-Future and through tagging of bicycles parked on campus in the week prior to the distribution on the graduate student list serve. This methodology invariably introduced bias into the survey results, particular the optional infrastructure question and modal split comparison; however these goals were not the primary research questions. However, the survey responses can be considered representative of graduate students.

The question about infrastructure improvements was the primary focus of the open ended questions so this introduced some bias towards infrastructure improvements vs. other TDM initiatives.

Multiple entries from the same computer was technically possible, a review of the IP addresses, platform type and version, and web browser of completed surveys was done and there does not appear to be a significant breach of the integrity of the web survey by multiple entries from the same person or group of persons.

Other limitations of the survey were that the survey did not account for multiple stops (trip chaining) from home to work in terms of travel time moreover some respondents may have entered the round trip travel time as oppose to the one way
direction from home to the university although this does not appear to have been a problem. More specific instructions in the survey design could have avoided this confusion. It is unclear to what extent not accounting for trip chaining has resulted in an oversimplification of commuting behaviour; this is an area for future study.

The time of year (weather and academic year) is also a large determinant of mode choice. This was noted and can be further explored as further baseline data at other times of year are collected and analyzed.

3.3.3.2 Results

There were 600 hundred respondents to the survey in total; the majority of those were thought to be graduate students based on the timing of when the survey was emailed out (November 27, 2007) and the spike in completed web surveys received. Below is the time distribution of completed surveys received.

**Figure 4 – Distribution of Surveys Received**

An estimated 550 graduate students out of a possible 3270 students completed the web survey, a response rate of approximately 16.8%. General demographic information from respondents is noted below.
Table 4 – Web Survey Demographics

<table>
<thead>
<tr>
<th>Status</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time U of M student</td>
<td>438</td>
<td>73.1%</td>
</tr>
<tr>
<td>Part-time U of M student</td>
<td>117</td>
<td>19.5%</td>
</tr>
<tr>
<td>Full or part time Faculty or staff of the U of M</td>
<td>29</td>
<td>4.8%</td>
</tr>
<tr>
<td>Other</td>
<td>15</td>
<td>2.5%</td>
</tr>
</tbody>
</table>

Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>247</td>
<td>41.3%</td>
</tr>
<tr>
<td>Female</td>
<td>351</td>
<td>58.7%</td>
</tr>
</tbody>
</table>

Gender differences appear to be negligible (~1%) between full time students vs. all surveys received. More detailed gender analysis by mode was not completed due to time constraints of the study.

In the figure and table 5 below, we see one way travel time broken down by transportation mode and by status. These findings are analyzed in more detail in the following pages.

Figure 5 – Travel Time by Mode

One Way Travel Time by Mode to the Fort Garry Campus

Minutes

<table>
<thead>
<tr>
<th>Mode Choice November 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carpool</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
### Table 5 – Travel Time by Mode and Status

**All Records**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Carpool</th>
<th>Bicycle</th>
<th>Drive Alone</th>
<th>Shuttle</th>
<th>Transit</th>
<th>Walk</th>
<th>Total Records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minutes</td>
<td>27</td>
<td>21</td>
<td>27</td>
<td>35</td>
<td>35</td>
<td>24</td>
<td>N/A</td>
</tr>
<tr>
<td>Records</td>
<td>51</td>
<td>57</td>
<td>211</td>
<td>11</td>
<td>202</td>
<td>37</td>
<td>569</td>
</tr>
<tr>
<td>Mode Split</td>
<td>9.0%</td>
<td>10.0%</td>
<td>37.1%</td>
<td>1.9%</td>
<td>35.5%</td>
<td>6.5%</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Full-Time Students**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Carpool</th>
<th>Bicycle</th>
<th>Drive Alone</th>
<th>Shuttle</th>
<th>Transit</th>
<th>Walk</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minutes</td>
<td>23</td>
<td>21</td>
<td>25</td>
<td>35</td>
<td>35</td>
<td>24</td>
<td>N/A</td>
</tr>
<tr>
<td>Records</td>
<td>42</td>
<td>46</td>
<td>108</td>
<td>11</td>
<td>174</td>
<td>32</td>
<td>413</td>
</tr>
<tr>
<td>Mode Split</td>
<td>10.2%</td>
<td>11.1%</td>
<td>26.2%</td>
<td>2.7%</td>
<td>42.1%</td>
<td>7.7%</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Part-Time Students**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Carpool</th>
<th>Bicycle</th>
<th>Drive Alone</th>
<th>Shuttle</th>
<th>Transit</th>
<th>Walk</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minutes</td>
<td>68</td>
<td>22</td>
<td>30</td>
<td>0</td>
<td>44</td>
<td>37</td>
<td>N/A</td>
</tr>
<tr>
<td>Records</td>
<td>6</td>
<td>3</td>
<td>87</td>
<td>0</td>
<td>11</td>
<td>2</td>
<td>109</td>
</tr>
<tr>
<td>Mode Split</td>
<td>5.5%</td>
<td>2.8%</td>
<td>79.8%</td>
<td>0.0%</td>
<td>10.1%</td>
<td>1.8%</td>
<td>100%</td>
</tr>
</tbody>
</table>

**U of M Employees**

<table>
<thead>
<tr>
<th>Mode</th>
<th>Carpool</th>
<th>Bicycle</th>
<th>Drive Alone</th>
<th>Shuttle</th>
<th>Transit</th>
<th>Walk</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minutes</td>
<td>6</td>
<td>19</td>
<td>27</td>
<td>0</td>
<td>33</td>
<td>20</td>
<td>N/A</td>
</tr>
<tr>
<td>Records</td>
<td>2</td>
<td>3</td>
<td>9</td>
<td>0</td>
<td>12</td>
<td>2</td>
<td>28</td>
</tr>
<tr>
<td>Mode Split</td>
<td>7.1%</td>
<td>10.7%</td>
<td>32.1%</td>
<td>0.0%</td>
<td>42.9%</td>
<td>7.1%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Note 1: “Other” mode category is not included in totals or percentages. Generally “other” was transit in winter and cycle in summer but it only represented 2.5% of all records.

Note 2: Where there are only a few records within a specific status category, e.g. U of M employees, mode split and travel time is not accurate and should not be relied on.

Note 3: U of M employees includes faculty and staff.

Note 4: The type of respondents records don’t sum because of several records in the “other” respondent types e.g. both a student and an instructor.
Travel time of respondents averaged 21 minutes for cycling, 24 minutes for walking, 27 minutes for carpooling and driving alone, and 35 minutes for transit and the shuttle. This suggests cyclists are only willing to travel a shorter distance under current conditions relative to other mode choices. This also appears true in relation to pedestrians travel time. This baseline data can be a benchmark for the elasticity of different mode choices as TDM policy changes and investments are made at the university of Manitoba Fort Garry campus. The evidence suggests that those that car pool and those that drive alone have equal travel times on average suggesting that car pooling does not add significant travel time relative to those who drive alone. It is possible carpoolers have better access to parking facilities and/or that carpool origins tend to be in areas with less congestion at the outskirts of the city or near the perimeter highway thus the travel time is not significantly greater than those who drive alone. On average, transit and the inter campus shuttle at 35 minutes is eight minutes slower that those who drive or car pool, thus making transit and the shuttle the least desirable choice when comparing travel times.

One interesting finding when comparing travel times and mode choice by student status is that part time students are significantly more likely to drive compared to full-time students, a 30-40% mode shift from other modes to driving alone. There are several possible explanations for this difference. Part-time students are more likely to attend the Fort Garry campus during evenings and weekends when bus service is less frequent. It is possible that students that are part-time live further away from campus thus making occasional travel more feasible. Another possible reason is that part-time students are more likely to be working and more likely to be higher income and have access to a
vehicle. It is likely a combination of all of these things resulting in a mode shift which is so dramatic. The university should be cognizant of this when scheduling evening classes and promoting part-time programs on campus.

As noted in chapter two and three, travel time is an important determinant of travel behaviour and mode choice along with pricing and convenience. This was reinforced in the comment box of the web survey when respondents asked about suggested infrastructure, many described time limitations and convenience as the major reasons for driving alone to campus. Other key themes identified in the comment box are listed by mode

Key pedestrian themes:

- Implement improvements such as paving, lighting, wind breaks to key routes (University Crescent, Chancellor Matheson and Markham)
- Provide more marked crosswalks and pedestrians signage
- Build a sidewalk on the east side of university crescent

Key cycling themes:

- Provide a safe and convenient alternative to Pembina Highway.
- Implement on street bike lanes throughout the city
- Improved curbside maintenance and snow removal
- Fix specific problem intersections: Jubilee underpass, University crescent at Pembina(southbound), Pembina at Stafford turning left (northbound)

Key themes from transit users:

- Implement a rapid transit/express service
- Provide a cyclists alternative to Pembina Highway
• Provide a better service experience (shelters, less crowding, connections)

Key theme from carpoolers’ users:

• Provide direct buses from outlying areas such as Steinbach, Charleswood, Kildonan

Key theme from shuttle users

• Implement a summer shuttle service

Key themes from those that drive alone:

• Improved convenience of alternatives and I will use them.
• Provide a rapid transit service
• Fix congestion problems
• Implement an improved carpool website
• Consider time limitations when improving alternatives.

These themes are illustrated by a number of selected quotes from the comment bank below:

“I walk along the path that lines the university and Fort Richmond. It gets dark at night and very unsafe feeling. I would love to see lighting on that path. And snow clearing in the winter, that is a very highly used path of travel for students to and from campus.”

“Dedicated bicycle infrastructure would be my first suggestion. An example would be a maintained, paved path along the Rail lines running parallel to Pembina Hwy. Realizing that won't happen soon, more contiguous diamond lanes and education campaigns so that drivers respect those lanes is my second suggestion. Thirdly (and probably most likely to occur) is curb lane maintenance and higher standards for snow removal.”

“Transportation to the University is expensive and time consuming. For those of us who choose to live a minimal carbon lifestyle, there is little support from either the City of Winnipeg or the University of Manitoba. An increase in funding to public transportation rather than personal vehicles would be in line with
Kyoto targets and an important mitigation strategy for peak oil consequences."

"I own a car but choose to take transit because it is more convenient. No warming the car up, walking from a far away lot, dealing with traffic, etc. This is only true because I live very near a busy transit route -- if I had to transfer routes and/or wait for infrequent service then I might choose to drive."

"I would bicycle in a heartbeat if it were safe and comfortable to do so (with dedicated cycle lanes). Rapid transit would also be positive as it takes a long time for me to do the commute twice a day."

These examples illustrate the commuting challenges and the richness of the comment bank. Furthermore, it indicates the likely responsiveness to various quality improvements or incentives from commuters.

### 3.3.4 Geographic Information Systems

Using six digit alpha numeric postal code data from the University of Manitoba Office of Institutional Analysis a detailed representation of student commute origins is mapped in a GIS environment. The most readily available data was student data from 2005-2006 academic years. Full time and part time students attending the Fort Garry campus were used to produce this map.

Inherent with any GIS analysis is data quality; however no major problems were identified which might affect the reliability of the data or the conclusions. The figures below highlight the distributions of the student body and U of M cycling community. A density algorithm was used in GIS to produce both of these figures.
Figure 6 – Distribution of Fort Garry Campus Students Across The City

Note: Figure six is based on approximately 24,000 student records.
Figure 6 suggests most students live in the south of Winnipeg, relative close to the university. Distinct subdivisions such as Lindenwoods and Whyte Ridge can be identified. Other clustering occurs near (B) downtown, (A) Fort Richmond and (C) the St Vital area.
Figure 7 – Density Distribution of Fort Garry Campus Cyclists

Note: Figure 7 is based on 50 data points. Data was acquired from the November 2007 web survey.
Figure 7, we find clustering of cyclists near the University as we might expect but also near downtown. Two nodes of note include areas near Pembina and University Crescent as well as Pembina and Bison Drive. There appears to be a limited number of cyclist coming from the other side of Pembina Highway suggesting that improved linkage are needed for cyclists across the highway. Given the large number of cyclists coming from the downtown area and from Fort Richmond, we can conclude that infrastructure improvements such as bikeways and traffic calmed streets would be well used in those areas, particularly near entrances to the University such as Bison Drive, university crescent and Kings Drive.

Figure 8 below shows the distribution of carpool respondents including those who commute from area such as Charleswood and Kildonan on a regular basis. There is significant clustering (higher densities) in Figure 6 and 8 which suggests greater opportunities for car pooling, ride sharing and transit. Strategically locating park and ride facilities using density maps is recommended.
Figure 8 – Density Distribution of Fort Garry Campus Carpoolers –150k

Note: Figure 8 is based on 40 data points. Data was acquired from the November 2007 web survey.
Figure 9 – Density Distribution of Fort Garry Campus Walkers – 150k

Note: Figure 9 is based on 40 data points. Data was acquired from the November 2007 web survey.
Figure 9 suggests walkers travel much shorter distances relative to other modes and the river and the Bishop Grandin bridge is a significant barrier to more people choosing to walk.
Figure 10 – Density Distribution of Fort Garry Campus Transit Users – 150k

Data was acquired from the November 2007 web survey.
Figure 11 – Density Distribution of Fort Garry Campus Drivers (not carpooling)

Data was acquired from the November 2007 web survey.
Figure 10 – Transit users shows a higher level of clustering in the downtown and along Pembina Highway relative to Figure 11 – Driving alone which is a more disperse density pattern consistent with the expected density distribution of each mode.

3.4 Summary

Through a thorough examination of historical information and the collection of a significant amount of baseline data, transportation demand management at University of Manitoba Fort Garry campus can proceed without further studies. We found that through key informant interviews, and the web survey key information was identified and better understood including the identification of cycling routes, travel times by mode and status, infrastructure improvements and greater university leadership. The GIS provided a spatial representation that help gain an understanding of the patterns discovered through the commuter web survey and provided insight into the potential solutions. With this information an action plan can be created. The recommendations in Chapter 4 can form the basis for the action plan.
CHAPTER 4: OPPORTUNITIES FOR CHANGE

There are a number of opportunities for change which are identified in this chapter. Through the use of a web survey, GIS analysis and key informant interviews, a number of recommendations are developed.

4.1 Conclusions

In Chapter one, four research questions were identified:

1. What costs and benefits are imposed on the university and the society at large by travel activity to and from the U of M Fort Garry Campus?

2. How are transportation policy decisions made at the U of M Fort Garry Campus?

3. Where do students live and what is their travel time and mode of transportation in relation to the U of M Fort Garry Campus and how does this inform the transportation management programs?

4. What are the opportunities for reducing the number of single occupant vehicles going to and from the U of M Fort Garry Campus?

Question one was addressed primarily in the literature review, although further study could be done in this area to better quantify the costs and the benefits. Question two was answered primarily through key informant interviews and focused on policy decisions influencing commuter behaviour. Question three was addressed through the web survey and GIS analysis. Question four was informed by the entire study.

To achieve planning objectives such as congestion and emission reductions the university administration needs to be more proactive in Transportation Demand
Management. This will require improved cooperation with stakeholders. Mode shifts generally require a series of small changes which give priority to walking, cycling, transit, and car pooling ahead of those driving by themselves.

A more collaborative comprehensive approach to transportation planning and land use planning is more equitable, efficient, and can lead to a healthier population and a healthier environment.

4.2 Summary Recommendations

The following twelve recommendations are set out to provide further direction for the key stakeholders (lead groups) involved with transportation planning at the University of Manitoba.

<table>
<thead>
<tr>
<th>Lead Group</th>
<th>Recommendation #’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Administration</td>
<td>1-12, except 9</td>
</tr>
<tr>
<td>Physical Plant</td>
<td>7, 8</td>
</tr>
<tr>
<td>City of Winnipeg</td>
<td>4, 5, 7-12</td>
</tr>
<tr>
<td>Province of Manitoba</td>
<td>4, 9-12</td>
</tr>
<tr>
<td>Student Unions</td>
<td>3, 4, 12</td>
</tr>
<tr>
<td>Staff Unions</td>
<td>1-4, 6, 12</td>
</tr>
<tr>
<td>Local Residents</td>
<td>5, 7, 8, 12</td>
</tr>
</tbody>
</table>

**Lead Group(s):** Central Administration, Staff unions

1. A comprehensive transportation demand management strategy needs to be implemented as soon as possible which is modeled after other leading university TDM programs such as UBC or University of Colorado at Boulder.

2. At a minimum, a full time TDM coordinator with adequate funding needs to be hired to coordinate new programs and initiatives associated with a comprehensive university TDM strategy such as a safe ride home program, securing a U-Pass.
program, expanding end-of-trip facilities for cyclists, changing current land use policies and plans and implementing best management practices for parking.

**Lead Group(s):** Central Administration, Student and staff unions

3. Parking prices should vary based on location, time and demand. They should gradually be increased and expanded to included evenings and weekends in order to recover direct (e.g. parkade financing) and indirect costs, generate revenues to finance transportation improvements and encourage alternate modes such as walking, cycling, and transit.

**Lead Group(s):** Central Administration, City of Winnipeg, Province of Manitoba, Student and staff unions

4. Land use policy reforms can create a more accessible, multi-modal campus, reducing the need for driving. The core area of campus can have higher development densities for classroom, office space, residential buildings and support services (e.g. grocery stores). This would include more diverse housing options (particularly more multi-family housing) on the existing footprint of the core campus area such as the newly approved high rise residence. This should include building on parking lots or other open space in the core area (not the golf course) to create an urban village. This will require working more closely with the City of Winnipeg, students and faculty as well as university planning staff to reform the current campus plan, parking requirements and make it relevant and enforceable.

**Lead Group(s):** Central Administration, City of Winnipeg, Local residents

5. Any spillover parking problems in adjacent neighbourhoods and parks (e.g. Kings
Park) should be identified and addressed in collaboration with the City of Winnipeg through improved regulation and enforcement. Additional funds generated by local, on-street parking pricing should be spent back in the community (e.g. community centre or sidewalk improvements). Furthermore, a residential off street parking program for students and residents should be managed by the University and funds returned to the residents for selling their parking spaces during the daytime.

**Lead Group(s):** Central Administration, Staff unions

6. Employee parking should be cashed out, so employees receive a cash benefit each day they commute by alternate mode (walking, cycling, ridesharing, and public transit).

**Lead Group(s):** Central Administration, City of Winnipeg, Physical plant, Local residents

7. Key pedestrian corridors to the University need to be given higher traffic priority in terms of road space (wider sidewalks, higher standard of maintenance to fix cracks and pot holes, repaving), signal priority (traffic light changes automatically when pedestrian activated), traffic calming (bump outs and traffic circles) to make walking quicker, safer and more convenient. This will require dedicated funds from both the University of Manitoba and the City of Winnipeg.

8. Key cycling entrances and routes should be traffic calmed, snow cleared and prioritized for pedestrians and cyclists ahead of private vehicles. Cycling and walking should be made as convenient and as safe as possible through infrastructure investment incentive programs to facilitate higher mode shares. Key
walking and cycling entrances include: Kings drive, Bison Drive and University Crescent.

**Lead Group(s):** City of Winnipeg, Province of Manitoba

9. Pembina Highway needs to be reconfigured or an alternate route built in order to make it safe and convenient for cyclists who would otherwise drive as identified in the web survey with 600 respondents. Convenience and safety improvements should include a dedicated cycling route or lane, traffic calming, improved curbside maintenance.

**Lead Group(s):** Central Administration, City of Winnipeg, Province of Manitoba

10. Park and ride and carpool facilities should be secured by the university and priced so it is cheaper to park and ride vs. parking on campus. The service should be a partnership with Winnipeg Transit and other partners made available through a U-pass program. This will help ensure a U-pass referendum passes UMSU. A trial area in the North East part of the city should be used as a pilot as identified in the GIS map analysis.

**Lead Group(s):** City of Winnipeg, Province of Manitoba, Government of Canada, Central Administration

11. Improving rapid transit between downtown Winnipeg and the Fort Garry campus will help improve travel times and the customer experience for many commuters to the University Fort Garry campus. Key stops along the route should also be evaluated for possible transit oriented development, particularly for affordable housing suitable for students and staff.

**Lead Group(s):** City of Winnipeg, Province of Manitoba, Government of Canada,
Central Administration, Student and staff unions, Local residents

12. Successful TDM programs require leadership and cooperation between stakeholders, including the university administration, local government, students, staff and local residents. The success of other university TDM programs is in large part due to partnerships and breaking down traditional silos. The current piecemeal approach to parking management and facility planning is unlikely to result in optimal solutions.

4.3 Implications for Planning Practice

Collaborative planning and collaborative planning processes are not new concepts however strategies to overcome institutional and multi jurisdictional barriers are often discussed but rarely articulated. To be truly collaborative it takes buy-in from all stakeholders including a genuine willingness to work together. If there is one element that this thesis illustrates, it is the cross-jurisdictional and multi stakeholder mandate of transportation and land use planning at the University of Manitoba Fort Garry campus.

The use of geographical information systems (GIS) was used in this thesis to better understand the spatial relationships of the student body and their commuting patterns, although not new to planning, GIS can and should be used more frequently in planning practice to better understand those relationships and better inform decisions.

The web survey proved to be a successful tool of gathering information from a wide cross section of graduate students. This tool could be used more as a quick low cost tool for planners particularly when dealing with populations that are very technologically inclined or internet savvy.

Another implication for planning practice is the need to have a greater linkage
between transportation and land use. Although widely recognized as important in planning literature, professional practice remains behind in linking them closely to create more pedestrian friendly and sustainable communities.

4.4 Directions for Further Study

There are several areas of further study which could be pursued. Analysis could be done with respect to the existing development along the Pembina Highway corridor and what opportunities exist for more transit oriented development near campus. Another area of further study would be to do a more specific critique and alternate proposal for the campus plan which incorporated the vision of all stakeholders, highlighting different approaches to campus planning. The third area for further study is behaviour change. It plays an essential part in mode shift, this was not the focus of this study but this could be looked at more closely, particularly social marketing, trip chaining and incorporating those ideas into the recommendations of this study for the U of M.

Further GIS analysis could be done in terms of quantifying the portion of students within a convenient walking distance to frequent transit service to better understand the relationship between proximity and utilization and how might that information be used to predict transit ridership with such factors as land use and walkability. GIS could also be used to better evaluate a pedestrian bridge to St Vital.

Another direction for further analysis would be to assess parking cashout incentives amounts with a Fort Garry campus context and management comparison relative to other universities or other areas of the city – determination of equivalent rent for land, construction and operations of parking facilities.

Another direction for further study would be the development of a more technical
decision makers matrix including TDM strategies best suited for different perspectives.

Another direction for further study not directly related to the U of M is identifying specific incentives which result in a particular mode shift, i.e. a predictive tool for specific TDM incentives. This could look at university populations or at the general public population.
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Appendix A – Student and Staff Totals

Students, Graduates and Staff at the University of Manitoba

26,938 total enrolment (55.6% female, 44.4% male)
23,224 undergraduate students (18,467 full-time, 4,757 part-time)
3,270 graduate students (2,496 full-time, 774 part-time)
9.7% of students are international, representing 100 countries
5,018 total staff members (March 31, 2005)
2,348 academic staff (1,615 full-time, 733 part-time)
2,670 support staff (2,251 full-time, 419 part-time)
In addition 2,037 employed in casual positions

Note: This data was obtained from public affairs; more detailed data is also available from the Office of Institutional Analysis (Public Affairs, 2007) (Office of Institutional Analysis 2006).
### Appendix B – Tips and Techniques

Key demand management techniques and lessons learned from other institutions (Toor, 2003).

<table>
<thead>
<tr>
<th>Demand management techniques used by educational institutions include:</th>
<th>Smart Transportation Tips Following are a few of the lessons from institutions that have had some success:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• the provision of transit passes to students and employees allowing free access to bus and rail transit.</td>
<td>• Make sure to ask the right questions when developing transportation plans—and when hiring consultants to create these plans. A transportation plan should not simply examine how much parking to supply, but should look at how to provide access to campus at the lowest cost and environmental impact.</td>
</tr>
<tr>
<td>• developing high-frequency and late-night transit services.</td>
<td>• Make sure that your administrative structure supports your transportation goals. If all you have is a parking department, consider creating a broader transportation department.</td>
</tr>
<tr>
<td>• raising parking rates to reduce demand</td>
<td>• Pursue partnerships with local governments and transit agencies. Even if there is a history of conflict, there are many</td>
</tr>
<tr>
<td>ride home for employees who participate in transit pass or carpool programs;</td>
<td>opportunities to improve access to campus while also addressing the needs of surrounding communities.</td>
</tr>
<tr>
<td>• allowing compressed work weeks and telecommuting;</td>
<td>• If your campus does not yet have a transit pass program, seriously consider creating one. It is one of the simplest and most popular steps a campus can take to start managing demand.</td>
</tr>
<tr>
<td>• providing access to shared vehicles for some trips through nonprofit or commercial “carshare” programs or on-campus car rentals;</td>
<td>• Do not be afraid to use the power of the market. If there is excess demand for parking, consider raising the price.</td>
</tr>
<tr>
<td>• marketing alternative modes;</td>
<td>• Take non-motorized travel seriously. The short trip lengths and young, healthy populations at many campuses allow for high mode shares. These types of trips are the cheapest to serve and have the least environmental impact.</td>
</tr>
<tr>
<td>• improving infrastructure and programs to encourage walking and bicycling.</td>
<td>• Harness the power of students. Many of the programs mentioned in this article were initiated or funded by students, whether through student government action or by direct vote of the student body.</td>
</tr>
</tbody>
</table>
Appendix C – Interview Questions

1) Describe your role and responsibilities within your organisation?
2) How would you describe the current status of transportation planning at the U of M Fort Garry campus?
3) To the best of your knowledge what are some of the past/current/future transportation decision being contemplated with respect to commuter travel?
4) Can you describe, to the best of your knowledge, the decision making process used by the university to evaluate the various travel planning options? E.g. Walking, cycling, transit, driving alone and carpooling?
5) Do you think health impacts and greenhouse gas emissions are being considered in the decision making process? Why or why not?
6) What would your vision of comprehensive transportation plan for the university include?
7) Where are the greatest opportunities to optimize travel (e.g. reducing single occupancy vehicles) including at the U of M Fort Garry Campus?
8) What are some of the most common barriers to choosing alternative modes of transportation?
9) Any further questions?
Appendix D – Survey Questions

Transportation Survey

* Title of Study: Optimizing Travel: Opportunities for the U of M Fort Garry Campus Researcher: Tom Pearce, Researcher’s Supervisor: Dr. David vanVliet, --- You are being asked to participate in a research study. Please take your time to review this consent form and discuss any questions you may have with the investigator. You may take your time to make your decision. This consent form may contain wording that is not clear to you. Purpose of the study: The study aims to identify opportunities for optimizing travel coming to and from the Fort Gary campus and thereby reduce excessive economic, social and environmental costs. Commuters are being asked to identify travel mode, travel time and postal code for GIS analysis. You can receive a summary of the results by contacting the principal investigator by Email: tompearc@gmail.com or by entering your email address in the final question. Consent: The survey should take no more than two minutes. No payment or reimbursement will be provided for any expenses related to taking part in this study. Information gathered in this research study will be published as a thesis for the Faculty of Architecture, however your identity will not be revealed. If participants of the study refer to individuals by name or position, or in any way reveal the identity of someone, this information will remain confidential. Your decision to take part in this study is voluntary. You may refuse to participate or you may withdraw from the study at anytime. You are not waiving any of your legal rights by signing this consent form nor are you releasing the investigator from their legal and professional responsibilities. You are free to ask any questions as a participant. I have read this consent form. I understand that my participation in this study is voluntary and that I may choose to withdraw at any time. I freely agree to participate in this research study. I understand that information regarding my personal identity will be kept confidential. By completing this web survey I am giving Tom Pearce permission to use the information gathered during this survey under the conditions stated above for the purpose of researching transportation at the U of M Fort Gary Campus. --- Which of the following best describes you?  Full-time U of M student  Part-time U of M student  Full or part time Faculty or staff of the U of M  Other, please specify.

Which of the following statements best describes your average commute to the U of M Fort Gary campus?  I walk to campus  I cycle to campus  I take transit to campus  I drive by myself without passengers  I am a driver or passenger with others in the vehicle  I take the inter-campus shuttle  Other, please specify.

How much time does your average commute to the U of M Fort Gary Campus take in minutes?

What is your postal code?

(Optional) - Please provide any additional comments about your commute to the U of M Fort Gary campus and/or any suggested infrastructure improvements? Please be as specific as possible.

(Optional) - If you would like a summary of the analysis emailed to you, please enter your email address, it will not be used for any other purpose.
## Appendix E – Mobility Management Benefit Summary

<table>
<thead>
<tr>
<th>Category</th>
<th>Benefit</th>
<th>Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Congestion Reduction</strong></td>
<td>Reduced road and parking congestion delays, and additional fuel consumption and pollution emissions. Improved walking and cycling conditions. Deferring, reducing or avoiding the need to expand facility capacity to solve congestion.</td>
<td>Receives consideration, but not always considered when comparing road and parking facility expansion with mobility management options.</td>
</tr>
<tr>
<td><strong>Parking Cost Savings</strong></td>
<td>Parking facility construction and maintenance cost savings.</td>
<td>Parking costs receive little consideration in most transport planning analysis.</td>
</tr>
<tr>
<td><strong>Consumer Savings</strong></td>
<td>Reduced consumer costs, such as vehicle operation and ownership expenses.</td>
<td>Short-term vehicle operating costs considered but mileage-based depreciation and ownership costs are often overlooked.</td>
</tr>
<tr>
<td><strong>Transport Diversity (mobility options for non-drivers)</strong></td>
<td>Improved mobility and accessibility options, particularly for non-drivers. Reduced chauffeuring requirements by drivers. Support for equity objectives, such as the fair share of resources to non-drivers and affordability.</td>
<td>Some consideration, particularly the provision of walking facilities and basic transit services. Often overlooked when evaluating other types of planning decisions.</td>
</tr>
<tr>
<td><strong>Road Safety</strong></td>
<td>Reduced per capita traffic crashes.</td>
<td>Although safety receives consideration attention, increased vehicle mileage is not generally considered a risk factor and mileage reductions are not generally considered safety strategies.</td>
</tr>
<tr>
<td><strong>Energy Conservation</strong></td>
<td>Consumer cost savings. Reduced economic costs of importing petroleum. Reduced environmental costs of producing fuel.</td>
<td>Considered desirable, but not generally considered when evaluating individual projects.</td>
</tr>
<tr>
<td><strong>Pollution Reduction</strong></td>
<td>Reduced air, water and noise pollution emissions. Improved public health.</td>
<td>Some pollution impacts are considered in major transport planning.</td>
</tr>
<tr>
<td><strong>Public Health</strong></td>
<td>Increased walking and cycling increases fitness and health.</td>
<td>Considered desirable, but not generally considered when evaluating individual projects.</td>
</tr>
<tr>
<td><strong>Efficient Land Use (Smart Growth)</strong></td>
<td>Increased accessibility and improved travel options. Reduced public service costs. Reduced storm water management costs and heat island effects. Openspace and cultural resource preservation. Improved community cohesion.</td>
<td>Certain land use planning objectives are often considered during strategic transport planning, but not generally considered when evaluating individual projects.</td>
</tr>
</tbody>
</table>

Mobility management can provide a variety of economic, social and environmental benefits. Many of these tend to be overlooked in current transport planning. Litman 2009 - [http://www.vtpi.org/tdmben.pdf](http://www.vtpi.org/tdmben.pdf)
### Appendix F – Survey Comments

The following survey data was collected in November and December of 2007 as part of a web survey. Respondents were primarily grad students attending the U of M Fort Garry Campus. Respondents were from all areas of the city.

Survey Question: Please provide any additional comments about your commute to the U of M Fort Gary campus and/or any suggested infrastructure improvements? Please be as specific as possible.

#### Carpoolers

A couple general suggestions related to my commute: 1. Commutes to the UofM may have multiple intermediate destinations (ie carpool, dropping a passenger off at work). 2. Time of day of commute plays a significant role in the average commute time. Depending on which 15 minute interval I leave for the university (7:30, 7:45, 8:00, etc), my commute time can vary between 15 and 35 minutes. 3. I would consider using public transit if I did not have to transfer buses and walk two blocks to get to a bus stop. 4. My suggestion for infrastructure improvements would be to construct a vehicular bridge (with pedestrian access) from the newly developed Warde Ave extension at St. Mary's Rd that connects to the UofM campus. **I would be interested in reading your completed thesis and attending your defense.**

After nearly 2 years, it would be fantastic if the city could get off their ass and finish the bridge between St. Mary's and Pembina on the south perimeter.

Another parkade, closer to the other side of campus (Drake bldg area) so that people who need to be on campus for longer than 1-2 hours are not relegated to walk 15 minutes in 30 below weather to get to shelter. As a full-time graduate student, working and with children...public transportation is not an option (I have too many schedule issues to be able to work Transit's schedule with my own). Given that, I feel penalized for having to bring my car...no available parking spots (even though I put my name on a wait list in August), frequent tickets because I can't get to my car's meter in time from the distance my class is from the car, parkade often too full...

Bigger highways so I can go faster - no buses blocking the right lane

Cheaper and more plentiful parking would be appreciated. Also, a way to connect with potential carpools - the website endorsed just doesn't cut it.

Finish construction on the south perimeter bridge!!

I cycle in the summer but stop as soon as September comes because I often feel unsafe with the rush of cars (been cut off and almost rammed, repeatedly).

I cycle in the summer, but no during the normal school year, too many people.

I end up catching rides most days with my brother, who also attends the University of Manitoba, or my mother or father who work in the area. I do not own a vehicle myself. The reason I am reliant on them for rides is that public transport from Charleswood, where I live, is very inconvenient for reaching the U of M. While there is rapid transit to downtown Winnipeg, which I took often when I was a student at the U of W, the bus commute to the U of M is over an hour. The days that I do take public transit to the University of Manitoba, once every couple of weeks, I spend an hour and twenty minutes longer commuting then I do when I catch a ride. I do not know what the solution to this proble is, perhaps one morning express to the University through Charleswood/Tuxedo.
I live out of town so I cannot take public transit. The drive to school generally has no problems except for the construction on the overpass on the perimeter before Pembina. It is a relaxing drive compared to driving through the city!

I would like to see a bus run from Steinbach to the U of M at least 4 times a day. There are many students that would take it. My survey can be multiplied by 5 because there are 5 other students in my carpool.

If I take the Bishop Gr it would usually take 30min. I take Premeter, longer distance but shorter time.

If the bus service from North Kildonan was better, I think more people would use it. I bus half the time and get a ride the rest of the time but I would rather, for environmental reasons take the bus. One of the big downsides of taking the bus from my area is it takes a long time and this is discouraging especially in Winter if the connections are not good.

In order to facilitate flow of traffic on pembina hwy from downtown Winnipeg, remove parking on pembina hwy, there is enough side streets and parking lots on pembina hwy to accommodate the parked vehicles. Flow of traffic appears to get congested or back up when the "parking lane" has vehicle on it, usually this is one or two vehicles.

In warmer days, I walk to work. It takes about 25 minutes.

It would be nice if even classes started at 6:00 because it is hard to get away from school to get to Winnipeg by 5:30.

Lights at university crescent and Dysart should not be on both sides of the road, ie the side going into the university has no cross street and should just be left on permanent green light.

Lose the crosswalk separate from the lights and combine the two of them.

Parking is the big issue for us if we don't want to have to pay. And given tuition we should not have to.

Pembina highway can be a nightmare around confusion corner and jubilee. A lot of times we will take the highway to get to the North Kildonan area.

There should be more shuttles to the U of M. Taking the bus takes too long - if there were a drop off point that would then take you directly to the university that would be perfect and people would use it. Also, the parking situation needs to be addressed. (It's impossible to park)

This year, I have been driving to the University. This will change over the winter months when I anticipate I will be taking the bus. One this occurs, my commute time will increase to approximately an hour.

Traffic Light at University Crescent and Dysart Road: this light should have yellow blinking lights for the University Crescent traffic from 7:30-9:30am. Pembina to University Crescent is my regular route, and this light backs up traffic on University Crescent every morning during the specified time.

Would be nice to have a warm structure to wait for the bus inside during winter. Also, parking is brutal at the U of M. There needs to be easier access to more spots with metered parking.

**CYCLING**

Any route that avoids Pembina would be a great improvement to my commute.
As I live close by (Summerland Apartments) my preferred method of transport is bicycle. It is, like 5 minutes of biking, which is much, much faster than walking or taking the bus. I think that it is even faster than parking and walking if you can't park close by, as I can leave my bike right close to the door. I have 2 bikes. I put studded tires on an old bike which I use in winter, which is important for riding over ice. And my new bike is used only when there is no snow or ice. On the larger issue of getting more people to bike. That is a very tough one. I have a car, and I like to use it (I'm not saying that I am proud of it). The truth is it's not effective to bike in rain or snow, nor is it effective over longer distances. You can't carry much. Well, I normally wear a backpack, and I have saddlebags which hold surprisingly much, but, I almost never bike to go shopping. I don't think bus is a realistic alternative to car in Winnipeg. I think most people take the bus because they don't have a car available. Anyway, I am rambling.

Better cycling infrastructure is needed, especially for winter cycling. I am not sure whether I will commute by bicycle in the winter - I may revert to the bus in which case my commuting time will likely increase to over 30 minutes (30 minute bus ride, plus 5-10 min walk to bus stop + wait time for bus) Regarding cycling infrastructure, sections of Pembina are in very bad shape, though some parts are better now due to recent construction. In future cycling infrastructure should be taken into account when repairing/upgrading roads. I think divided bike lanes, sharrows or some other sort of cycling infrastructure is needed throughout the city. Another beef is getting stuck behind or playing leap-frog with buses, though I'm not sure how to address that problem.

Better snow removal and ice control along bike path route under Bishop Grandin Bridge

Bicycle paths from downtown to the campus would be a HUGE asset!!

Bike lanes

Bike lanes would be great, or a bicycle route that doesn't involve pembina at all, but I don't think that will happen.

BIKE LANES!! the city is pretty behind on its discrimination against a cleaner mode of transit.

Bike roads and/or lanes would make commuting safer, easier and more pleasant.

Dedicated bicycle infrastructure would be my first suggestion. An example would be a maintained, paved path along the Rail lines running parallel to Pembina Hwy. Realizing that won't happen soon, more contiguous diamond lanes and education campaigns so that drivers respect those lanes is my second suggestion. Thirdly (and probably most likely to occur) is curb lane maintenance and higher standards for snow removal.

I bike to the Fort Garry campus than hop on the shuttle to go to the Bannityne Campus.

I cycle Pembina, from Stafford to Plaza Drive. ANYTHING would be an improvement. (bike lanes, substantial diamond lanes, painted lines, signage, shared sidewalks, practical alternative routes,... almost anything at all) An example of a NON-improvement is the 30-metre diamond lane northbound at Jubilee, which takes me out of the flow of traffic and requires re-merging (and has a useless transit priority light that is not activated by bicycles).

I cycle primarily, however, when it to cold and icy I take the bus (December, Jan & Feb).
I cycle year-round, straight down Pembina. I think the fact that vehicular traffic is frequent on this road, it makes for easier winter travel/cycling, as the roads are always cleared and rarely covered in ice. I do feel, however, that it can be dangerous at times, since there are vehicles that drive by cyclists waay too closely, and it was frustrating to see that Pembina was fixed up this past summer without taking cyclists into account. I feel if there was any time to incorporate bike-friendly infrastructure into Pembina Highway, that would have been the time to do it!

I only cycle in summer months. In winter, I walk to Bannetyne campus and take the free shuttle. With reference to cycling, I would like to have street parking removed and the creation of full-time bus/bike lanes. I would also like to have increased information in the (MPI) Driver Handbook instructing drivers on how to share the road with cyclists and vice-versa. With the addition of bike lanes, the police should then ticket all cyclists riding on sidewalks to keep them safe for pedestrians.

I ride my bike in the summer and as soon as it snows I take the bus. The bus ride takes about 15 min.

I risk my life every time I commute down the Pembina Hwy gauntlet. A bike commuting path going from confusion corner to the perimeter would be grand, and some way to avoid Osborne by bike would be much appreciated as well.

I take the bus in winter. Rapid transit would be great.

I walk or cycle - cycle in the warmer months and walk when the snow flies.

I wish I didn't have to worry about being hit by a vehicle. A bicycle lane would be amazing - especially down University Crescent where everyone is so eager to run you over.

I would like to see a bike street or bike path that is not located on a main road (ie. Pembina Highway) with controlled intersections. (ie. like W7th Street in Vancouver)

I would like to see more places to secure bicycles on campus. Also, existing locations should not be plowed under with snow in the winter.

In winter time, I am a passenger with other vehicle. I strongly recommend the car pooling idea. It is comfortable for me.

In winter, I take the bus. Suggested Improvements: Dedicated bike lanes along Waverly, Pembina, Bishop Grandin (on hill), Bison Drive, McGillivray 78 Bus should operate on weekends Rapid transit from the University to Downtown along Pembina Having lived/ cycled in Ottawa/Hull, Paris and London, UK, the bike route system was efficient and safe, especially in London. They would be good models for Winnipeg. Good luck with your research!

It would be nice to have a bicycle lane on the roads on the U of M campus.

It would be nice to have bike routes designated on the campus. Trying to get your bike to one of the many bike racks at the University is really hard, especially between classes, when there are so many people walking that will not move for any circumstance to accomodate a cyclist, it is very frustrating. In general, it would be so much easier for many people to commute by cycling if there were designated cycling routes, I myself would NEVER ride my bike down Pembina, so for those that live just off Pembina and require that as a bike route, it can be a little intimidating, especially since the only other option really is the sidewalk. I would like to see a lot more improvements in the city for people that do cycle, to make it easier for everyone. I would use my bike more if there were designated routes, instead of my car.
It's my first winter here, I'm from Indonesia where there's no cold weather like this one! I like to challenge myself if I could try this crazy idea. It'll take me longer in the winter, because of the snow. When it's snowy I'd take the side-walk because it'd get dangerous on the road. But most of the time I'd ride on the road. I won't bike when it's windy or there's heavy snow, etc. Sometimes people think that cyclists don't have the right to be on the road. There should be a sort of space for cyclists on some main road.

Less cars on the roads would be nice, as well as more bike infrastructure, like bike lanes at least and separate bus/bike corridors at best. More buses more often that travel faster to school, to reduce the number of drivers.

maintaining the gravelled track along the southern edge of campus towards pembina through the winter will help keep commute down for cyclists and walkers.

More bike rakes.

My route is good, because I can avoid Pembina Hwy. We definitely need bike paths on Pembina Hwy.

need more bike lanes

Specifically, Pembina Hwy. could use designated or separated lanes for bicycles or at the very least, a well maintained curb lane (swept and pothole-free). Also, an alternative to having to cross four lanes of traffic to turn left onto University Cres. would be helpful.

The University of Manitoba is pathetic with respect to active transportation. The administration, by not advocating on behalf of cyclists and walkers, implicitly condones car and oil culture. Further, they do not support people wanting to make more environmental and health related transport, as bicycle racks and other infrastructure (e.g. bike compounds) are either lacking or non-existent. The University is a force in municipal politics. If they took a public stand on the need for rapid transit and bike lanes down Pembina Hwy this would have massive impacts on city governance. Yet, the University seems to preoccupied with revenues ascertained from parking at the University. In my experience, the University administration is solely focused on revenue generation, not the public good, or increasing services to staff and students. Given this conflict of interest, between making loads of cash on parking and being positioned as an excellent advocate for more sustainable transportation methods, it's clear why they are silent.

There is no good bike routes. Bike lanes/ bike paths would be very useful

There used to be a bike path beside the road on the East side of University Crescent. This bike path has since been paved over to increase the size of the shoulder. Not having that as a bike path anymore is inconvenient. I either have to cross the street and then contend with cars that endanger my life by simultaneously passing me and turning right when I want to go straight, or I have to break the law by cycling where the bike path used to be.

We need bike lanes, or a direct bike route where we can coexist with motorized vehicles and where we can all feel safe.

We really need a cycling corridor along pembina. Big time. Pembina is dangerous and difficult for cyclists. The buses crowd you out, the drivers are aggressive and the Stafford underpass is deadly. The Stafford underpass converges cars and bikes, its dark, slippery in Winter, and there's no room. Also, the turnoff to Stafford or Harrow from Pembina northbound is next to impossible. Pembina is a huge problem, and a lot of students cycle. I have been hit recently by the way. More people would cycle if this backwards city put some bike lanes in along major routes.
winter is horrible when I walked to the campus.

Would be great if the gravel pathway behind the commercial buildings of bison drive was cleared of snow in the winter.

Wow, it'd be nice if right-hand lanes were widened, especially on Pembina Hwy. The prevalence of parking zones in right-hand lanes throughout the city, makes establishment of bike lanes difficult. But it would make things much more simple if right-hand lanes were widened sufficiently to allow cyclists to get around parked cars with enough space to avoid crashing into opening car doors, but without having to merge into the next lane over. Parked cars in the right-hand lane also interfere with snow clearing in those lanes during winter. On Pembina, the right-most lanes are typically in worse shape than the others, and get loaded with leftover slush that subsequently freezes solid and presents a real hazard. The resurfacing of most of Pembina Hwy between Grant and University in the past couple of summers has made the commute much safer and more comfortable than it was prior to ~2006. But the rt. lane of northbound Pembina between Grant and Confusion corner is still truly awful. I don't typically use this section of the road on my commute though, unless I'm going from Fort Garry campus to some downtown destination. University Cres. has a number of problems: lack of sidewalks means pedestrian traffic on the shoulders, which are often used by cyclists as makeshift bike lanes. Not safe. "decoupling" of the traffic light at University and Sifton and pedestrian crosswalk just north of it creates huge traffic backups on southbound University Cres. during morning rush hour. -the timing cycle of the University/Sifton traffic light could be better harmonized with traffic patterns, which change dramatically at different times of the day and days of the week. In particular, I think flashing yellow and red on University and Sifton, respectively, could be used far more often. -currently, it's permissible to make left-hand turns onto University from the right-hand lane of Sifton. This can back up traffic in the right-lane when left-turners are stuck there during red lights. -the left-hand turn from southbound University onto Dysart is particularly dangerous for cyclists, as they're forced to share the middle lane with cars that may also turn right. (The city has also recently created a similar problem on Pembina by extending the right-turn lane on northbound Pembina at Jubilee into short diamond lane just before the underpass, which pits through-traffic cyclists against right-turning cars. I'm not convinced this is a preferable alternative to simply having cyclists just get out of that lane.) --- When I don't bike to school, I take the bus. This generally coincides with bad weather, when bus schedules often go out the window...

**Drive Alone**

- Improve routes that feed into the University... especially Route 90. Too much traffic, not enough lanes, too many traffic lights. The ideal would be to build a freeway of sorts with ramps and exits. That, in my mind, would ease the flow of traffic.

A small campus in Fort Frances would be nice, maybe some joint programs between U of M and Confederation, similar to the nursing program they are currently running.

All of my classes were in the evenings, so I would be commuting from work (not home) to the university. Now that I am finished classes, and am working on my thesis, I do not travel on a regular basis to the university.

As a full time student in undergrad I either carpooled or took the bus. Since I am leaving work (downtown) with time constraints, I am forced to drive.
As I live in a rural area, I have no option but to drive. And since I am in a Faculty with course times that don't resemble those of the rest of the campus, it's hard to car pool. One thing that I find really strange now is that there is no preference given to people who car pool. Thirty years ago when I did my undergrad, you got first choice of parking spots if you pooled and if you had a full car. So there was always a scramble to make sure you had five in the car. And it was a bonus if you had a senior student because they always got preferred lots and spots. But I guess that would just be too much work for admin, far easier to just let everyone have a spot on a first come first serve basis because admin's driver is to make as much money in the easiest fashion possible.

| Better bus routes and connections. I would rather take the bus than try to find parking on campus, but I would have to wait over 40 minutes in connection time. Does not seem worth it when I can get there in 20 minutes. |
| Come to U of M once a week from out of town |
| Course occurs once a week Evening course so parking rate is reasonable ($2.00) |
| Far |
| For the last two years, I have attended 1 or two night classes per week. Since Sept '07 only on campus on as-needed basis (about once per week). |
| For those who live in south St Vital, a walking/bicycle bridge would be useful to connect the campus to the areas of Normand Park/ Brittanica etc. |
| Get rid of traffic lights on perimeter Highway and twin the entire perimeter |
| Haven't had any major problems |
| Horrible public transit options - U of M needs to integrate a much better model for alternative transportation (as far as I can see, the only thing that they have done is made parking such a pain in the ass that they are hoping to frustrate students into alternative forms of transportation). |
| I am a driver with a mobility impairment. As a result, I require accessible parking. The Fort Gary campus does not have adequate accessible parking. This suggests that planers at the university think that persons with mobility impairments are being driven and dropped off at the university rather than driving themselves. |
| I am a part time student. I work on Scurfield Blvd, about 5 min drive from campus. I drive for my graduate classes and then drive home afterwards. |
| I am at the thesis-sage of my program, working mainly from home. I come into campus once or twice a month, and it is incredibly difficult to find parking near Duff Roblin and Fletcher. This seems to a problem at every University. Why not build another multi-level parkade instead of sprawling parking lots - eventually it would pay for itself and conserve space for future development. |
| I am currently at campus only once a week. If I was going every day, I would bus it. |
| I cycle 2-3 days / week in the warmer months. |
| I drive from a western suburb because it's not feasible for me to make multiple bus connections in winter. It would be nice if there were more shuttles from different parts of the city directly to the university. |
| I drive from work (postal code above is work) |
| I drive in the winter. I ride my bike 2 or 3 days per week from the time the snow is gone in the spring until it arrives in the fall. It takes me about the same amount of time to bike door to door as it does to drive, park and walk to my building. |
I generally drive to school because I go to work after class. The bus down Pembina is great, but the schedule to St. Vital mall would make me late for work. I would prefer to take the bus, and would do so, if there were better schedules for major routes.

I have a parking space on Bannatyne campus. More parking lots should be made reciprocal parking lots on Ft. Garry campus.

I have car polled when others in my area were also going into the U of M on similar days.

I have to commute alone because I go to work after school. I find parking to be extremely expensive for part time students as it cost too much to get a full time parking spot and metered parking expires during my 3 hour classes. So I park in the parkade and pay per hour. Students can't afford to pay that for parking, I would take the bus but I need to have a car as part of my job specifications.

I have tried driving Lagimodiere to Bishop Grandin and have also tried driving through downtown. Downtown tends to be really busy before my evening class.

I live out of town therefore walking, cycling are not options. My community is a hamlet with minimal opportunity for car pooling.

I live past the perimeter highway on Waverley St. where no bus service is available. Traffic usually moves smoothly up to Bison Drive and then backs up before the lights at Pembina Hwy.

I occasionally travel with a passenger in the car.

I often take the bus, but it is prohibitively time consuming typically taking 40 to 45 minutes each way. Faster dedicated bus line (or mass transit system) would increase my propensity to take public transit more frequently.

I only go for night classes so I really have no issues, there is not a lot of traffic.

I park at one of the offices in Smartpark, and walk 15 minutes to get to the campus.

I reside in Winnipeg, but teach in Winkler. Class start times have been a problem and I usually arrive late by the time I purchase/find parking.

I take both the bus and drive a car to get to and from campus. Mode of transportation varies depending on whether I have access to the family car.

I travel from Brandon 2 or 3 times a week. If I have days when I am able to stay in town (average, one in three occasions), I usually travel from my daughter's house in Fort Richmond area, Postal Code R3T 5H3, about a 7 minute commute.

I travel there infrequently. I work at the Bannatyne campus.

I use a combination of public transit and my automobile to and from work. My wife also works at the university and we share the commute on occasion.

I use my car as infrequently as possible, and often walk or take a bus. however, i'm usually unable to take public transit to the u of m because it takes up to an hour, at best 45 minutes, to get there by some combination of transit / walking versus driving, since the schedule for the rapid bus that goes down stafford is so seldom in accord with my schedule. i would certainly use public transit if there were a single bus or a form of rapid transit that ran throughout the day directly from a main artery near my home to the u of m fort garry campus.

I used to use transit, but when I would stay late, the bus service was horrible.

I usually drive my car and quite often take someone with me (girlfriend). I also sometimes take the bus, but more often drive. I wish that there was more parking closer to the campus (ie. toonie lot too far in winter)
I usually take Bishop Grandin to get to campus, and although they have attempted to improve the commute by timing their lights, this only is an improvement if you hit the lights just right. Also, there are a lot of semi-trucks and other vehicles on this road, and with only two lanes it can really slow traffic down. I don't know if this is pertinent to your study, but part of the frustration in my commute to the Fort Gary campus is the lack of parking on campus. I have circled campus and wasted time just trying to find a parking space, and this year's aurora system made trying to obtain a parking pass a daunting task.

I was hoping to take the bus from the Westwood area but a one-way trip is 70 minutes while travelling the perimeter is 25 minutes, door to door. Suggestions: buses that travel the perimeter or a more time-efficient way to use the bus in the city. I don't mean to be mean or sarcastic, but sometimes I think the city planners in this city (one of 6 in which we have lived) have never lived in a big city. To live in a city this size without a rapid transit system is unbelievable in this day and age, to say nothing of having train delays!!!

I work outside of the city and need to get there as fast as possible before and after class. My travel time is 40 min from home and 60 from work. I go to school days and evenings.

I would cycle if the bike path system were better (weather permitting)
I would cycle if there were better bike routes within Fort Garry

I would prefer public transit, but much expensive. In Calgary, students need to pay only approx. $100 for 8 months, however, here we have to pay $60 per month. By the way, I am not paying much for parking since I am parking just outside the campus in a church.

I would prefer to cycle to campus (weather permitting) and can cycle from Charleswood to Chevrier at either Pembina or Waverley on bike paths/routes, but the final mile or so (on Pembina or Waverley/Bison Drive) does not have a bike route and it is too scary to ride my bike there. It is frustrating to realize that I can get so close to the U of M from home by bike, but not close enough.

I would prefer to take the bus but I have a number of part-time jobs and realistically, I cannot manage them without a car due to my extremely rushed and cramped schedule. The time range depends on the location of my jobs. Shuttles to and from different U of M campuses would be very helpful or a carpooling site that is very detailed and flexible.

I would ride my bike but do not want to ride on Pembina Hwy.

I would take the bus but it takes almost twice as long from my neighborhood (although not always) and because of timelines (ie children must be picked up by a certain time) I don't have much flexibility. I would like to not drive but I am not sure what else I could do. Parking is also a HUGE issue. If like me you come for one or two classes a week it can be very difficult to find reasonably priced parking that is at all convenient for location

I would take the bus, but I do not have a bus stop near my house, so must drive. I the summer I often cycle.

I'd love to be able to take a train up to campus -- from downtown Terrible traffic going north on Pembina esp. 3:30 to about 5:00, starts at around the Safeway (stafford?) and goes to confusion corner (I go down Donald instead of Osborne)
If there were a genuine form of rapid transit I would definitely use it. I know there is a railroad corridor all the way from downtown to the Fort Garry campus area that just screams "Light Rail Transit". My concern is that with the massive Manitoba Hydro office building being tossed up downtown the increase in traffic flow will be ridiculous.

In order to arrive at the U of M, I am required to take either Bishop Grandin or the perimeter. The traffic on Bishop Grandin is horrendous in the mornings, especially at peak times which coincide with morning classes. It would be nice to have an extra lane to improve flow of traffic. The perimeter is usually reasonable with respect to flow of traffic but requires extra time if that route is chosen.

In spring and summer I commute by bike. There are great bike routes on campus but we require bike routes to connect communities north, east and west, of campus to campus.

In the morning, commutes into the university are extremely congested. This will become even more problematic once construction on the Bishop/Pembina bridge commences. There has been extensive development in the southeast part of the city while ignoring traffic flow problems on Bishop Grandin/Waverly.

It would take over an hour to bus to school from my house.

It's a pain in the butt! I am not a full time student, so it's not worth it to get a parking pass. Half of my commute is parking and walking from my spot.

Just more parking

Major log jam on Bishop Grandin - need an "exit" lane for Pembina Hwy.

More meter parking in needed, very hard to find a parking spot sometimes.

More public parking would be nice.

Most citizens would like to be environmentally friendly and try to reduce the carbon foot print. Wider roads (double lanes with minimal number of stop signs and overhead pedestrian crossings will reduce the burring of fuel by either idling/slowing down.

Most of the time I am going to university from my work site which is in downtown winnipeg.

My average time is 20 minutes however if I come during rush hour it is closer to 30 minutes. I have a flexible schedule and choose to drive during low-traffic times for the most part. My main route is Bishop - obvious infrastructure problem due to over use.

My commute is from the south. I drive 75 highway. It is a very simple drive.

My route to the U of M involves having to go down bishop grandin which seems to be a huge bottleneck for myself and everyone else I know. There are no alternative routes for me take to get to Pembina or the U of M campus, unless I take a very winding detour which is not worthwhile.

No huge surprises with these. 1. Additional "visitor" parking 2. Longer time options for meters
Parking at the university is awful. I would be happy to take people with me, but my class schedule doesn't coincide with others in my classes. Even though I live near Polo Park, I am too far away to walk. Therefore I would have to drive to Polo Park in order to bus, which may not be allowed by the mall. There is also no place to plug in in winter. I never use the big parking lot at the university. I would be more inclined if there was a better system to get from the lot to my building - LRT circuit. The critical decision for me is time. I am in the MBA program and we under such intense time constraints that I can't afford the time to bus or walk in from far-flung lots. Also, I would like to see a way for parking stalls to be shared - multiple car hangers so people can rent out their stalls when they're not using them, etc. Good luck!

Pembina is the worst. I don't know enough about city planning to suggest anything tangible, but it is crazy!

Please note I do not travel to the University from my home. Being a part-time MBA student I attend night classes after work. I was not sure if you were using the postal code to determine the distance of travel or the demographics of the respondent. If you are looking to calculate the distance of travel the postal code of my office is R3Y 1G4.

Rapid transit from rural places

Rapid transit, while realistically not an option right now, would be outstanding. More parking garages would also be great.

Relatively easy commute. Would like to see other commute options (i.e. light rapid transit, car pool lists, etc) from key locations within the city (St. Boniface Research Centre, downtown, etc.)

Remove traffic lights at Bishop Grandin and River Road. Replace with an overpass, such that traffic on Bishop Grandin does not have to stop for red lights.

so long, makes me not want to go to campus

subway system would be the best

The "foonie" lot (four dollar lot by the Bison stadium) is inconvenient. I was on a waiting list to get a parking pass and had to use this lot for 3 months. I dislike the fact that I needed cash, exact coins for the machines. They should set up a credit card machine. Another area of concern is that the shuttle buses should drive more frequently, like every 10 to 15 minutes. Now I am in the U lot and I am pleased I received a parking pass even if this is quite expensive, I rather enjoy this convenience than paying using coins.

the bus route from my place to the UofM is not good, especially at night, so it's easier to take my car. I know this is not environmentally friendly, but time is also a huge factor. Bus routes could be better, i.e. more express services more often.

The commute problem is during sever winter (5 months out of 8 months). The parking fee for student is ridiculously high and it is almost outside of campus. So, to make travel to campus a pleasant start of the day, a huge multi-story FREE parking in the middle of the campus is needed. I have tried bus travel, but it is useless for me as they are very irregular, especially in winter, and infrequent. I cannot dare biking and walking during winter.

The entrance to the campus does not seem to make sense in the overall plan and flow of traffic. I can’t help but think that the residents in the area do not appreciate the extra traffic in and out.

The repaving of Waverley was beneficial to a smoother commute. Train on Waverley just South of Taylor is still an issue.
The road systems in Winnipeg are a catastrophe. I moved here from the US, and this type of road structure would never work in a city this size in the US. I'm surprised that there are not more accidents here because of that - especially during the winter. There are MANY things about the infrastructure of this city that would improve my commute. A city of this size should have: traffic lights with protected left-hand turn signals at every major intersection, especially on Stafford; cars should NEVER be allowed to park on major streets such as Pembina Hwy. at ANY time of the day; and impose fines on bicyclists who insist on riding in the middle of major streets such as Pembina. Bicycle paths should be created so that they can ride their bikes in a safer way without jeopardizing their safety and without scaring the crap out of drivers trying to get to their destinations and without having to dodge them.

The roads in Winnipeg are congested and difficult to drive on. A light rail system from downtown, Osborne or Polo Park would be awesome.

The same commute takes 90 to 120 minutes by Winnipeg transit. I will have a passenger next term.

The surrounding residential area should be more student/sessional instructor parking friendly... like campuses in the U.S. and in other major Canadian cities. Major bus routes... with satellite boarding sites and a campus specific destination point need to be created to encourage use of transit.

There is a lot of unnecessary stopping at traffic intersections with out any cross direction traffic. If lights were "smartly controlled" ie using sensing equipment to monitor traffic, then inner city by-ways/trunk roads would move much faster.

This commute time may change next year when they work on the Bishop Grandin bridge as traffic will be limited to one lane before the Pembina exit.

Timing really depends on traffic. Because I am part-time, I find myself there on evenings and weekends more than during the business day. I am a grad student, so I am mostly going to use the Library.

Toonie lot better access this year than last

Traffic travelling (west?) on Bishop Grandin is always backed-up during the hours of 5:00 - 6:00, whereas Pembina hwy, past confusion corner, is usually quite good. Bit of a mystery to me, as one would expect traffic to be worse during rush hour on Pembina...

Travel time depends of when I start my day. Coming in early means a longer drive, due to traffic. Biking occurs in summer most days.

U of M is solely a commuting school. From my location in the city I do not have the opportunity to cycle. If given that opportunity, maybe through paved designated cycling lanes, I would cycle during spring, summer, and fall months. Transit would equally be an option if it became more efficient (ie transit trip home from university can take upwards of 2 1/2 hours)

U of M needs to build increased parkades closer to campus. Much land is wasted related to ground parking.

usually get stuck in traffic on Bishop Grandin at St. Mary's or on univeristy crescent very stressful drive, esp when entering the city from highway 59

We need more metered parking, and should be able to add more time to meters via cell phone. We need A LOT more parking available for those without parking passes.

When I attend classes I am leaving from work so I included my work postal code. My classes during the week are from 5:30 to 8:30 so getting there on time is a challenge due to traffic.
### SHUTTLE

I take public transit to Bannatyne Campus and rely on the inter-campus shuttle for my trips to Fort Garry. I travel to Fort Garry between one and three times per week, on average, for meetings with student associations and administration, usually after 4pm.

I take the Bannatyne/Fort Garry Campus Shuttle Bus daily. In addition to the 30 minutes to and from each campus, it takes 5-7 minutes to get to the Brodie Center. More frequent inter-campus shuttles would be helpful.

Sometimes I have to sit beside a smelly person. I think this may be due to lack of showering after a workout.

The inter-campus shuttle bus should be available during the summer months, at least during rush hours. There are many graduate students who don't have the summer off.

### TRANSIT

- Travel is easy if I do it in peak time. - If not, avg time is about an hour. - As a graduate student, I don't travel often during peak hours - One suggestion: please add more park & ride lots

3 days per week, I get dropped off on Pembina highway to catch a bus to campus. The other two days, I transfer from one bus to another.

75 Kildonan place 92 Lakeside meadows (construction on red river bridge on bishop slow traffic

A bike path or bike lane is needed from the downtown area to the university. I would like to bike but don't because riding on Pembina is not safe. I need to take two buses to get to and from the university. If I travel during non-peak hours my travel time can be longer than 60 min. because of wait times for a bus from the downtown to St. Boniface.

As of right now there is no direct bus route from Fort Rouge to the university of Manitoba. Unless I time catching the (at best infrequent) 95 just right, I have to backtrack for up to 15 minutes on the 16 to confusion corner in order to get to the Fort Garry campus. It would be nice if there was a more direct route.

Besides the busses not being on time and being way over crowded... I once plotted a course (straight line) from Portage and Main to the core of the UoFM campus. It went through many parks and over the river again and again. Seemed like a nice scenic route to work/school for an elevated light rail system. It continued to the Perimeter where there was a parking lot for commuters from the south. Then I woke up and it was just a dream.

Better timing at traffic lights, or better yet, sensor traffic lights which adjust to traffic volume instead of random timing which creates congestion

Bicycle paths on pembina needed; the 62 that goes to uof M should have a different number than the 62 that doesn't.

Bike lanes! pembina is enough to deter many cyclist. Increase transit regularity and frequency in winter, not the opposite (for instance the 61 from Osborne actually cuts BACK in the winter. what?!) Continue subsidized bus passes for students et al. Larger buses (i.e. double decker) for more popular routes as most popular times (no brainer), such as the 60 from 8-9am and 4-6pm.

Build light rail to the Fort Garry campus.

Bus lanes on Pembina would be good. During rush hour, the outside lane could be restricted to buses and cyclists. During the day, it could revert to parking.

bus lanes would be good. train system would be better.

BUS RAPID TRANSIT!!!!
Bus service is pretty good during the day, during the evening, not so much, but then of course there are less commuters. I would prefer to cycle to the U of M, and do sometimes in the summer, but in the winter (and frankly in the summer too) it is too dangerous to bike down Pembina and side streets are often not cleared sufficiently for bicycle travel. A good, safe, regularly cleared year-round bike route from downtown to the University would be fantastic.

Bus service past 7pm on weekdays and on the weekends is so sparse. An hour wait for a missed bus is extremely inconvenient. More buses would be more convenient. bus shelters.

Buses could be better deployed; often two will arrive at the same time with large gaps in between, especially in non-prime hours.

City needs to work on Rapid Transit for university students, as I travel from the north end and often spend 2 hrs of my day on the bus.

Commuting by transit is often frustrating. Transit seems to have reduced service (number of buses), but have increased costs. During peak hours, many buses are full beyond capacity and transit riders are left at bus stops on campus because the bus has no room left. Alternatively, later in the day, bus connections are poor and travel time greatly increases. I used to ride my bike in the summer, but after several close calls on Pembina Highway, I have stopped doing this. A safe, dedicated (not shared by cars with cell phone talkers behind the wheel), bike route from the centre of the city would be helpful. I have tried alternative cycling routes, but the increased distance has also increased my travel time. People who commute by bicycle have the same desire as people who drive a car -- that is to get to work/home in the shortest time possible.

Considering I live almost opposite of the Fort Garry campus, just south of the north perimeter hwy, my commute is short due to 2 express buses in the morning.

Considering the distance I live from the university, I think this a very reasonable route (78 via Kenaston). There is a bus stop right outside my condo, and it takes me directly to the university.

delay the time of the transit last trip from the campus in sundays.

Depending on what time I leave the house, it can take between 20 and 45 minutes to arrive, because of rush hour, etc.

Direct no stop transit from a major shopping center

Express buses are absolutely pointless if they only come twice per hour. Either eliminate the Express buses (to save money) or make the route much more frequent - at the MOST every 10 minutes during rush hours.

get rapid transit going more park n' ride spots

heat the bus shelters.

Heated Bus Shelters at Major Commuter Connection Points More Transit Priority Bus Lanes and Signals Rapid Transit!!

Heated Bus stops!

I admit to taking my car when I only have one class to attend that day. When I have a full day of classes I take the bus because parking is too expensive and inconvenient.

I bike in the summer, down Pembina Hwy., therefore a bike lane would definitely be an improvement.
I commute between Fort Garry and Bannatyne campus. Therefore I chose to live between the 2 sites in order to shorten my commute time. However, the shuttle bus is extremely limited and the transit on the west side of the city is also limited. It would be helpful if both the shuttle and the city buses to the U of M ran more frequently.

I cycle to school from april to october. Dedicated bike lanes along pembina would certainly make my commute safer.

I cycle when it is nice out and I take the shortest route.

I do bike in summer down Pembina, and find the commute not overly pleasurable. A bike path or bike lane would make this much less nerve racking especially under poor weather conditions. I have friends who would like to bike, but are not comfortable biking down Pembina so they end up driving or taking transit.

I find this transit system frustrating coming from a larger city center. I find that buses are more effective (time wise) during the day hours than evening ones.

I get off the bus by the Tim Hortons on Pembina Highway near Garwood Avenue. There are no cross walks nearby and at times it can take up to 10 minutes for me to cross the 2 lanes of traffic to get to the other side of Pembina. In terms of infrastructure I would suggest cross walks at bus stops to create a break in Traffic as in the winter the 10 minute wait can seem a lot longer.

I have to take the 78 from Polo Park, which runs down waverley. The train is a constant bother, and an over/underpass would help a great deal in relieving congestion during rush hour.

I like taking the bus, and it's extremely convenient for me because I live right next to a bus stop for the 61 Pembina Express. I would like to see the route from downtown to the Fort Garry campus made safer for cyclists, and to see better bus service from neighbourhoods that are not on the 61 route.

I live in Charleswood, a 20 minute drive to campus, the bus takes me 45 minutes and 2 buses. It would be nice to have something more direct, even one bus that takes 45 minutes is better than 2 and a transfer. If I drive it takes me about the same time considering that I have a 10 minute walk from where I park. Cycling is about 50 minutes, but takes me down Wilkes avenue which is not cycle friendly and I am afraid for my life on it.

I live in Crescent Park and need to take two buses to get to the University. The bus I take to reach Pembina Highway (94) is rare and only works at peak hours and weekdays. It should be good to have higher frequency and increased days of activity. More generally, a rapid transit and/or metro for the Pembina corridor is strongly advised, since Winnipeg relies too much on cars and this is unsustainable and unethical.

I live in osbourn village, and try to take the 61 bus, when i take that bus, it takes an average of 15 mins to get to the campus. Unfortunately this bus is always very full and claustrophobic. In the mornings there should be a express bus just as often as a 60 (approx. every 10 mins.). The 60 takes an average of 35 mins to get to the campus. Having more express buses in the morning would help a lot of people get to school and work more efficiently.

I live just across the river from campus. If there was a foot bridge from St. Vital (off of River Road south) over the river, I could walk to school in less time than it takes to ride the bus!

I moved 6 blocks from my old address and it now takes me twice as long to get to the University by transit due to poor service and timing of bus routes off of main routes like Pembina Hwy.
<table>
<thead>
<tr>
<th>I occasionally bike - more bike racks on campus would be great. Parking at the university is horrible - too expensive, and the cheapest is too far out. Transit is by far the easiest and most convenient.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I often take transit in the cold winter months but I am a fair-weather bike commuter. A bike lane along Pembina Hwy or would be of great benefit to cyclists especially from a safety perspective.</td>
</tr>
<tr>
<td>I own a car but choose to take transit because it is more convenient. No warming the car up, walking from a far away lot, dealing with traffic, etc. This is only true because I live very near a busy transit route -- if I had to transfer routes and/or wait for infrequent service then I might choose to drive.</td>
</tr>
<tr>
<td>I rather wish that the UofM shuttle made some stops at major transfer points for regular buses (in my case, Stafford and Pembina, which I know is on the shuttle route), and travelled more often (the main reason that I don't generally use it) but I don't know how feasible that would be.</td>
</tr>
<tr>
<td>I really wish that there was a bus running down St. Mary's road to the University of Manitoba. It's a major route, many people travel it to the university, and it would relieve congestion on the 75 that runs down Bishop Grandin.</td>
</tr>
<tr>
<td>I take the 61 express from Osborne village. I think it would be a good idea to have an university express bus that could service the Wolesley area too (at least stop along Sherbrook/ Maryland).</td>
</tr>
<tr>
<td>I take the Pembina 60 to the campus, and would prefer to ride my bike if the route was more bike friendly and I wasn't worried about being run down!</td>
</tr>
<tr>
<td>I take transit most of the time. Sometimes I need the car and bring it, and sometimes my husband will drive me (we're doing this less and less). My bus trip is short (can be as little as 30 minutes) but I have to transfer which I hate because its hard to read (or even zone).</td>
</tr>
<tr>
<td>I take two buses to get to the U of M, and poor connections can increase my travel time to 90min. A 'big' city such as Winnipeg needs to have better public transportation.</td>
</tr>
<tr>
<td>I think some kind of rapid transit/light rail system on Pembina would be brilliant (and overdue). A bike lane is required as well. If there were proper bike lanes, I would commute to the university on my bike in the Fall, Spring and Summer months.</td>
</tr>
<tr>
<td>I think we have very good transit service to and from the University. I really appreciate the express buses (36, 61)and the 78. It takes me two buses to get to University. Luckily, I live near Polo Park and have good bus options/connections. I prefer taking the bus to driving, not only for environmental reasons but because it is more convenient (always warm and no parking to worry about). I would ride my bike if there were bicycle paths and I did not have to ride in traffic and inhale car exhaust.</td>
</tr>
<tr>
<td>I used to live in Garden City and the Maples. We specifically moved to a more central location in the city to decrease overall (i.e. not just to the university) travel times. Interestingly, I lived in Burnaby (near Metrotown Station), BC for a couple of years and it took just as much time to get from Garden City to the U of M as it did to get from our home in Burnaby to UBC. It certainly eludes me why we do not have a mass transit system, particularly as our weather is not very kind.</td>
</tr>
<tr>
<td>I usually use routes 60 and 62. Route 62 doesn't come so often. In the cold weather and holidays, there is usually lots of delay for all routes.</td>
</tr>
<tr>
<td>I walk when it is nice out, but since I have a bus pass for work I'll bus for most of the winter.</td>
</tr>
</tbody>
</table>
I wish there were more express buses to and from campus throughout the day.  

I work three days a week, so often I walk 20

I would bicycle in a heartbeat if it were safe and comfortable to do so(with dedicated cycle lanes). Rapid transit would also be positive as it takes a long time for me to do the commute twice a day.  

I would cycle to and from school at least 50% of the time if Pembina Highway had a dedicated bike lane.  

I would like to cycle more, but the one direct route down Pembina is not amenable to cyclists. I recommend an elevated cycle path freeway with adjustable weather protection, along the river.

I would like to ride my bike to school from Osborne Village but find it to be too dangerous. There are hidden trails but why does it have to be a secret route that you make yourself? It should be a designated trail system and advertised by the school for alternate transportation rather than having HUGE parking lots taking up half of the campus.

I would like to ride my bike but I am concerned with it getting stolen. I think it would be useful if there was some sort of secure bike storage area. Maybe if for a small fee there was a guard checking that the bike matched the owner or something of that sort would be useful and increase the amount of bikers in the warmer months at least.

I would ride my bike but the ride down Pembina is too dangerous. Bike lanes are desperately needed!

I would ride my bike to campus every day if there was a route I could take that felt safe & not as polluted as Pembina.

I would ride my bike to work 8 months of the year if it was a safer experience. I do not want to ride my bike down Pembina Highway, as it is configured currently.

If the traffic is bad, it can take over an hour. Generally it takes 35 minutes. Confusion corner is still a mess and it seems like the problem will not be improved anytime soon. It seems quite strange that we should be putting traffic signals at every major intersection on Bishop Grandin and in my opinion, the bridge should be extended to 3 lanes each way. There is room for it on all sides. A simpler improvement would be to have a direct connection from University Crescent to Bishop Grandin rather than having to sort of merge with the Pembina Hwy traffic exiting to Bishop Grandin.

In addition to taking the bus, I drive once per week (down Pembina and then either University Crescent or Bison Drive). In the summer I started biking once or twice a week. I will continue this pattern next year. Establishing or expanding bike corridors would increase the amount of bike-commuting I would do. I would like to see bus & bike only lanes expanded all the way down Pembina to the U of M. This would reduce the risk of riding in traffic and likely encourage many more people to ride their bikes at least in summer. The city could make the curb lane on Pembina a seasonal bike/bus lane for the warm months (May - October) and a regular lane the rest of the year - similar to the seasonal 'snow route' parking restrictions. I believe there should also be a parking fee gradient where those living nearby (e.g. 30 minutes by bus) pay more and those living far (e.g. out of town or in the north or west regions of Winnipeg) pay normally (or less).

It takes me longer to commute to the U of M campus in 2007 than did in 1971, when UMSU rented a series of Wpg Transit buses, each of which looped an outlying part of the city and then travelled non-stop to the campus. A rapid transit corridor to the Fort Garry campus should have been built 30 years ago.
It would be great if the buses ran more frequently, particularly at peak travel times. Quite often, it is difficult to get a seat even when you get on at the Terminus (by Isbister) when leaving campus or in Osborne Village when going to campus. Also, there are very few buses in the early morning (~6 am) for those of us who actually arrive at that hour.

It would be much more convenient if the bus can always arrive on time.

It would take less time if the #60 bus came more often and in equal intervals. Sometimes they come in packs of two, and then no bus shows up for another 15 to 20 minutes.

It's fast and efficient, but the buses are sometimes so crowded that a lot of people are jammed in standing in the aisles. The express bus is fantastic-- it's so fast!

More bike lock-ups would be nice (fully enclosed ones - security). I take transit down Bishop Grandin - I can't help but notice that there will be some large construction taking place - I am wondering why this did not take place during the summer when the school daily population is drastically reduced - Bishop grandin is the ONLY way in or out for a large percentage of us travelling to the UM. I live about 10 minute drive but it is at least 40 minutes by transit. While I realize that traffic snarls always happen with construction, I am baffled as to why this appears to be happening when the UM population is largest (ie - bottleneck effect). I would like to travel by cycle in the near future but do not have a map of how to get there safely and shortest distance - again esp. since I can see the bridge closing will be a huge problem for traffic.

More bus shelters and doors for all of them would be appreciated.

More park and ride options by Winnipeg Transit if possible

More shelters are needed over Pembina

Move the campus downtown and improve the city core.

Need rapid transit, dedicated bicycle routes and walk bridges across the river

No Comments Please

Occasionally share automobile for night class. Dedicated bus lanes & bicycle lanes/paths are needed. There is a need for improved bus shelters (heated, greater capacity, more maintenance).

Quit stopping for other people and take me straight there. (i.e. create a system that incorporates buses and trains)

Rapid lane on Bishop Grandin, one that is respected by motorists.

Rapid Transit would be a bonus. A dedicated lane for transit services (whether it be for light rail or buses).

Rapid Transit, bike lanes and HOV lanes

sometimes I bike.

Street cars would bring a great improvement.

Takes too long by bus! Must take two buses.

The 61 express bus should expand its service by having more frequent busses running in both directions.

The bus (I can only speak for route 78) to UofM is always very full with the isles full of people standing every morning. More buses at prime time 073-0830 are needed.

The bus schedule accuracy in Winnipeg is terribly unreliable. I often wait twice as long for a scheduled bus, then finally get on one which has the same numbered bus right behind it empty.
The city needs to invest money in dedicated bike lanes and corridors. People's perceptions are that it is far too dangerous for people to cycle to work or school. These perceptions would change if commuters were offered bike lanes, and I believe that many more people would use active transportation to get to the U of M.

The connections into my area either from the Stafford Station or from the Broadway at Osborne Station (westbound) are not great. They have 30 minute wait times which is inconvenient. Although there are three bus routes from the Broadway station they all arrive a pretty much the same time leaving only 1 time slot for connections.

The Pembina & University Cres. intersection is a nightmare. People run thru the light a lot. During my time in undergrad & grad I've seen about half a dozen really bad accidents. I think they delayed the lights (one turns red, but the other doesn't go green for a few moments) but people just got used to it and count on the delay. I've been in the #60 and nearly been t-boned by speeding/sliding motorists that don't understand the concept of a stop line (northbound Pembina in front of the Petro-Canada). I started going to the U of M in 1998 and I used to be able to get to campus in ~10mins, and it's doubled to almost 30mins due to the horrendous traffic on University Cres. I hope this all helps!

The slowest part of my commute is getting down University Crescent - buses should have priority lanes.

The super express buses make all the difference to my commute and the attractiveness of using the transit system. I wish that there were super expresses that ran at night.

The transit system needs to be more efficient when common commuters must transfer buses. Either the transfer is too short and the commuter watches the bus drive away from across the street, or is waiting over 15 minutes.

There is little incentive for people living out in the west end to take the bus. It usually takes a little over an hour by bus, and around 20 minutes by car. If taking transit outside of peak hours (e.g. 7am-9am) there are long wait times between buses and few shelters.

There needs to be proper bike lanes the length of Pembina, and it would be nice to have a designated transit lane with no parking allowed on the street also.

They really need to get more bus 75's coming from Kildonan Place.

Transportation to the University is expensive and time consuming. For those of us who choose to live a minimal carbon lifestyle, there is little support from either the City of Winnipeg or the University of Manitoba. An increase in funding to public transportation rather than personal vehicles would be in line with Kyoto targets and an important mitigation strategy for peak oil consequences.

Typically, I commute to the campus by bus (40 min) from my office downtown and return to my home by bus after class (20 min).

We NEED a bike path/cycling lane along Pembina Hwy!!! I bike in the summer and it is like taking your life into your hands.

We wnt to have more Cubicalesmore at Bus stops
When I first began attending the University, I found the drive confusing once entering campus. Specifically, the one way on dafoe road - I never knew how to get around to the parking in the back of Fletcher. Parking was almost always full in the "Toonie Lot" and on more than one occasion, I had to park on the grass. As such, I almost always used transit. Since becoming a part time student, I tend to drive and only go on campus in the evenings and weekends, when parking is more readily available.

When I had a full class load, I always took the bus. I usually took #36 express which takes 15 mins, but if the schedule didn't work, I took #66 and #60, which took 30 mins. Now that I am finished my coursework, I am not on campus very often, and when I do go, I often drive by myself without passengers, which takes 15 mins.

When the weather is not too harsh--raining, windy, freezing, or very hot--I take the bus to the campus and usually walk home

Winnipeg transit should increase bus timings and frequencies. Also need shelters at the bus stops to make life easier.

**WALK**

a green walk way down chancellor matheson would make the university much more accessible to people walking and biking to the school.

Attach Tache and Arthur Mauro to tunnels.

Better walking and cycling paths along University Cresent would be nice. Most cyclists seem to be scared to bike in the bike lane, so they bike along the sidewalk, which is annoying.

i know there has been a lot of talk about a rapid transit route, which I think is a great idea that will reduce dependence of cars and sprawl within the city. It may also bring more people to live and work in winnipeg.

I live 1/2 a block from the Bannatyne campus on Bannatyne. I love it it is so convenient! I live in a rented house on the main floor.

I live across from Victoria Hospital. I walk thru the hospital's parking lots, to the new condo, through a hole in a fence, thru some bush, through another hole in a fence onto the football field, across the field, through another hole in the fence, across the soccer fields and onto Chancellor Matheson. I take this way (through the fields of geese and now snow) because it is less windy and I can't afford to take the bus. I wouldn't mind walking down Chancellor Matheson, if there was some type of effective wind break and people in vehicles paid more attention to pedestrians.

I walk along the path that lines the university and fort richmond. It gets dark at night and very unsafe feeling. I would love to see lighting on that path. And snow clearing in the winter, that is a very highly used path of travel for students to and from campus.

I would like to rollerblade but there is not much of an opportunity to do so because the sidewalks are to uneven and the roads are narrow on university cresent and do not seem safe enough (since I have seen people on bikes hit, I am sure that drivers would not stop for somebody rollerblading)

I would prefer to ride my bike to campus but locking my bike up outside has resulted in theft of parts so I have stopped riding. In the event that a bike compound was available (a monitored, fenced in area) I would much prefer to ride as it cuts the commute time to less than 10 minutes for me.

I also cycle and take the bus. I never drive the car.
<table>
<thead>
<tr>
<th><strong>If we can have one bus transit when the shuttle is not operating for summers or have the shuttle for the summers though I am not using the shuttle but I know a lot of people who will like to have one bus without transfers</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>It would be great to have more payable parking lots nearby main building for people like me that walk or bike to Uni. most of the time and need to bring car sometimes.</td>
</tr>
<tr>
<td><strong>Markham road needs to be paved and have improved lighting</strong></td>
</tr>
<tr>
<td>More marked crosswalks and pedestrian signage might make walking around campus a bit safer. Crossing University Crescent at the south end of the campus (where it goes into the Fort Richmond residential area near the hydro structure) is scary.</td>
</tr>
<tr>
<td><strong>Now that it's getting colder, I take the bus, which is about 15 minutes.</strong></td>
</tr>
<tr>
<td>Side walk on the east side of university crescent through the golf course is required. Also, side walk up the northern most one-way exiting campus will make it less likely that a pedestrian will be killed.</td>
</tr>
<tr>
<td>They need a shelter belt of trees along the south side of the field on the west end of the campus to protect those who walk along across the field from the wind.</td>
</tr>
<tr>
<td><strong>This time of year, tunnels would be fabulous!</strong></td>
</tr>
<tr>
<td><strong>OTHER, PLEASE SPECIFY</strong></td>
</tr>
<tr>
<td>Aside from the city being TOO cold, the transit bus schedules are not as easy to follow as they could be, and their online Navigo system is a great idea in theory, but is not always accurate time-wise. I would LOVE better and cheaper parking at school more than anything - i have to pay the costs of insurance and maintenance but can't park anywhere - and i could carpool with my roomates from an environmental stand point.</td>
</tr>
<tr>
<td><strong>Bike lanes on the streets are the best and most efficient. bike paths are for families and are slow for commuters.</strong></td>
</tr>
<tr>
<td><strong>Bike route please - the one proposed by Murray and canceled by Katz (the schmuck) would be fine</strong></td>
</tr>
<tr>
<td>Commuters from out of town should get first pick for parking spots and then those who live in the city as they could optimally use the bus when we can't.</td>
</tr>
<tr>
<td>Freedman Cr. west of King's Dr. is not cycler friendly--road is too narrow.</td>
</tr>
<tr>
<td>I bike most of the time which only takes 15 minutes from Ft.Richmond to the Wallace building then in winter I take the 62 or 72 bus which takes under 30 minutes with walking and waiting time so I don't have any problems with my commute to the university. The only time there is a problem is in winter weather transit is never on time with road and weather issues so I end up waiting extended periods of time. It can't really be changed since it is caused by roads and weather so not a big deal.</td>
</tr>
</tbody>
</table>
I commute via Pembina on bike since it is the fastest route. A useful infrastructure improvement would allow me to bike at the same pace but have a safer ride. On-street bike lanes would be a major improvement; a Letellier train route with right-of-ways would be ideal up to Bishop Grandin. I'd probably take university crescent rather than commuting as far as bison drive in that case. (Bison drive is a bit out of the way and would be annoying on windy days) I suppose a trail connecting the rail line to the bus intersection at University Crescent and Pembina would be perfect for me. With that in mind, the cycling improvements going West on University Crescent are great. I'd love to see an improvement to the other side too. The current path is discontinuous, not well marked, often is full of rubble, and is not cleared as thoroughly as the other side in the winter or cleaned as well in the spring. A good trail along the river would also be fantastic, but not as useful for high-speed commutes via road bike. I'd love to see both personally.

I cycle along Pembina Hwy. It would be nice to see increased safety as well as better road conditions near the curb.

I have a class each week at the U of W, so I commute from Fort Garry campus. I take the 60 or the 61 and the ride usually seems to take about half an hour, but that's probably not significantly longer than it would in a car. The most frustrating part about using the 60 and the 61 is that they're crowded at peak hours, and that the transit fare hike will add to the cost of each trip.

I live in Charleswood and taking the bus is extremely inconvenient as the transfer system is not efficient. I would take the bus to and from school but when I have to wait for my connecting bus sometimes it is 1/2 hr it is terrible.

It might be a good idea to give info re travelling by car with people who have to go your way anyway. It is a shame to drive alone when somebody somewhere could share the trip -- with or without contributing to gas and parking costs.

It would be great if there was another form of mass transit besides the bus. I am lucky to live where there are express busses, but even those can be packed during the week. It is also very difficult to ride a bicycle along Pembina because you have to deal with the bus or parked cars.

Parking cost at the UofM campus cost too much. I heard from friends that even the Toonie lot is longer $2/day, or more of us would choose to park there and take the intra-campus shuttle bus.

Parking in the streets near the university is restricted to one hour, which means the closest free parking is a 20 minute walk. (Not counting the gravel road near the golf course, which is always full). Is this an attempt to raise the University's parking revenues?

Parking is a problem.

Parking is difficult-yet I need to commute with my vehicle as I am working full-time and attending part-time university. It is a catch 22.

Pembina Hwy is horrible.

The inter-campus shuttle service could be greatly improved if the timing of the shuttles were coordinated with the differing schedules on M/W/F vs. T/Th. As it is, there is an invariant schedule every weekday.

The most dangerous part of a cycle commute is the double-left turn lane from University Crescent towards the Wallace Building. Cycling on the sidewalk is more dangerous than the road. Build a bike highway adjacent to the rail line that runs to the west of Pembina.

When I lived in Winnipeg, I commuted to campus every day from downtown by car.