

Small Urban University Transit: A Tri-Campus Case Study

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Abstract

University campuses have unique transportation requirements that may be characterized with a high concentration of trips during multiple peak periods (i.e., morning, lunch, and afternoon). These campuses are often the largest employers in small-to-medium size cities and it is therefore critical to coordinate campus mobility needs with the overall transportation system. Many colleges and universities recognize transit as an effective mode for meeting campus mobility and have developed transit systems to serve those needs. However, successful campus transit systems include factors such as careful planning, understanding user preferences, efficient design of system services, and coordination with existing city transit service. Universities are not homogenous (i.e., enrollment levels, campus location, size of community), so they will have different needs. This paper focuses on the mobility needs of Fargo-Moorhead's universities, students, faculty and staff. It is part of a larger study that examines student mobility needs. In this paper we will present the results of an on-line survey administered during the 2002-03 school year. The results of this study are based on the responses of students, faculty and staff.

Introduction

University campuses have unique transportation requirements that may be characterized with a high concentration of trips during multiple peak periods (i.e., morning, lunch and afternoon). These campuses are often one of the largest employers in small- to medium-size cities and it is therefore critical to coordinate campus mobility needs with the overall transportation system. Many colleges and universities recognize transit as an effective mode for meeting campus mobility and have developed transit systems to serve those needs. We are aware of at least 48 colleges and universities in the United States that have some type of campus transit program. Successful campus transit systems include factors such as careful planning, understanding user preferences, efficient design of system services, and coordination with existing city transit service. Universities are not homogenous (i.e., enrollment levels, campus locations, size of community), so they will have different needs. This study examines these factors for three campuses in the twin city area of Fargo, ND and Moorhead, MN. The study began as an analysis of North Dakota State University, but with interest from the Council of Governments and the other campuses the study expanded to include the three major campuses. The campuses are major employers in the Fargo-Moorhead area

North Dakota State University

At North Dakota State University there are approximately 2,000 faculty and staff who travel to campus nearly every day to teach, conduct research, and facilitate information exchange for North Dakota and beyond. NDSU has experienced a recent surge of on-campus growth which impacts personal mobility on campus. The growth is due to a number of factors including: 1) development of new graduate programs which draw more students and requires more faculty, 2) the development of the Technology Park on campus, and 3) the new research programs being implemented. These factors have required the expansion of the land used to house the buildings and programs, requiring students and faculty to travel longer distances on campus. Further, the architecture, landscape architecture and visual arts program utilize buildings in downtown Fargo, requiring students and faculty to travel to off-campus sites to take and teach classes.

The growth occurring on-campus is not met without growing pains. Mobility has become a greater issue. The additional students and faculty need to travel greater distances on campus. Parking has not increased at the same rate. Parking is typically a problem for most universities, but the growth at NDSU has accentuated the problem. To address these issues, the Small Urban & Rural Transit Center (SURTC), a research program at the Upper Great Plains Transportation Institute on the NDSU campus, designed a research project. The overall project will address the transportation needs of the campus.

In fall 2002, President Joseph Chapman sent an e-mail message to NDSU faculty and staff requesting they complete a campus transit survey developed by SURTC. The objective of the survey was to identify transportation needs of campus employees to better meet needs as employees travel to and from campus as well as around campus. Approximately 695 faculty and 1,052 staff received the e-mail notice.¹ Three hundred nineteen faculty and staff responded to the on-line survey, providing an 18 percent response rate. Of these

¹Numbers acquired from Mr. James Silvernagel, Pagecenter Specialist with Information Technology and Mr. Richard Jacobson, NDSU IT Security Officer, respectively.

responses, approximately 40 percent indicated they are classified as faculty and 60 percent indicated their classification as staff.

Concordia College

Concordia College is a private, accredited four-year liberal arts institution of the Evangelical Lutheran Church in America. The college offers 80 majors in 42 academic areas. The campus is located in Moorhead, MN. There are approximately 2,750 students attending college. Of those, approximately 60 percent live on-campus.

Concordia traditionally keeps student enrollment below 3,000 to ensure a smaller student-to- teacher ratio. The campus is expanding through the addition of a tri-college graduate program in nursing.

Parking is somewhat underutilized in two lots further from campus. Certainly students want to park as close to their class or dorm as possible.

Thomas Iverson, director of campus security, sent the students two different surveys asking questions about transportation. The first survey pertained to the use of the MAT bus around the Fargo-Moorhead community. The second survey inquired about students' perceptions of adding a taxi service to the campus. The taxi service would potentially be available in the evening when the bus service is not running. Students would be able to take the taxi service anywhere within the FM area for a designated price. NDSU and MSUM already have this type of service available. Both surveys received a response rate greater than 16%.

Minnesota State University Moorhead

Minnesota State University Moorhead (MSUM) is public four-year university in Moorhead, MN. MSUM offers over 130 majors along with numerous graduate programs. More than 7,500 students are enrolled at MSUM and with roughly 1,600 living on-campus.

Les Bakke sent out separate surveys to both students and faculty and staff. Questions asked pertained to the use of the Metro Area Transit (MAT) in the Fargo-Moorhead area and around campus. Also, all respondents were asked their perceptions of the current parking conditions at MSUM and what they felt could be done to alleviate parking congestion. MSUM is "locked" within the city of Moorhead leaving very little room to expand parking areas for all students, faculty, and staff. MSUM is opening a new health center along with a new science lab in the fall of 2004 as well. These new developments will only increase the demand for already limited parking on and around campus. The survey included responses from 476 students (7%) and 155 faculty and staff (21%).

Public Transit in University Communities: A Literature Review

North Dakota State University (NDSU) is a vibrant, growing, research university. As such, it serves as a major economic catalyst for its community and the state. However, the benefits of this growth also bring challenges in the form of increased demand for classroom, office, research, and housing facilities and the attendant increases in parking demand. NDSU, like other universities, is meeting these demands by building more facilities on the main Fargo campus, and by expanding into other areas such as the research park adjacent to campus and downtown. Further, the university is building new facilities that in some cases displace existing parking, and in all cases create demand for more parking.

One way universities can address this need for more parking and improve access to university facilities is to start or expand on-campus and regional transit services. By reducing reliance on the private automobile, university planners can develop the campus more intensively, and can reduce the cost of providing additional parking and roadway capacity. Further, universities are better able to manage land use, preserve open spaces, and maintain or improve the ambiance of the campus environment. The surrounding community also benefits from better transit services if these services result in less congestion on surrounding streets, and by lowering the demand for university-related parking on town streets and in non-university parking facilities. Furthermore, better transit services increase the housing, shopping, and employment options available to university-related individuals.

Another recent trend is for a regional transit system to provide transit services for student, faculty, and staff at a number of universities within an urban area. This trend has been evident in large urban areas in an attempt to reduce auto travel and the attendant air pollution, but is also found in smaller communities such as Fargo-Moorhead where several campuses are served by a transit system. Institutions in the Fargo-Moorhead area that are interested in improved transit services include NDSU, MSUM, and Concordia College.

As a starting point to this campus transit study, we conducted a literature review of the state of the practice in university transportation today, especially as it relates to services, policies, and issues similar to those of the Fargo-Moorhead areas. The literature on campus transit services includes several surveys of the current status of campus transit in the United States, case studies and descriptions of individual systems, and cross-cutting studies that examine issues such as unlimited access transit, transit and parking, and service design. The first part of this literature review identifies key documents and resources that were identified through this review the second part of this chapter discusses key findings on topics of importance to the Fargo-Moorhead area.

Overview Information on Campus Transit Systems

Interest in transit solutions for college and university communities has increased greatly within the past 10 years. This interest has led to the publication of a number of overview studies and surveys of campus transit, as well as information on specific systems and issues. One sign of this increased activity has been the attention given to campus transit services by the American Public Transportation Association (APTA), the national trade association representing urban and rural bus and rail systems. APTA has sponsored three

speciality conferences on campus transit (1998, 2000, 2002), In addition, APTA has created a special page of links to university transit web sites (13) that lists more than 80 campus transit services operated by universities. In addition, campus transit services are provided by regional transit services and information on these systems can be obtained through another APTA link that lists local and state transit organizations (14).

In addition to this online information about specific transit systems, several studies in the past few years have surveyed and synthesized information about a number of the more fully developed campus transit operations. One of the earliest surveys of campus transit systems was prepared by the Mid-Atlantic Universities Transportation Center in 1991 for a Transportation Research Board subcommittee on campus transit (6). This inventory of campus transit systems identified nearly 200 university-based transit services that ranged from a one or two-van late night escort services to very large bus systems that served both the campus and the surround region. Information from this inventory was used as the starting point for perhaps the most comprehensive of these overview surveys, the Transit Cooperative Research Program (TCRP) Synthesis of Transit Practice that was published in 2001.(7) This report summarizes the findings of a survey of 30 campus transit systems and presents data on their operation. The systems surveyed provided public transportation to universities with enrollments ranging from 11,000 to nearly 50,000 students. Further, these systems operated between 7 and 95 buses.

The TCRP synthesis also addresses the state of the practice on a number of topics including unlimited-access transit systems, organizational issues including governance and management of campus transit operations, operational details such as the use of students as employees of campus transit services, and how transit can be part of a broader transportation demand management program. Information presented in this synthesis will be reported in more detail later in this chapter in the sections on policy and operating issues.

In addition to the TCRP synthesis, two other recent multi-system survey reports are those prepared by the University of Colorado (10) and the University of California - Los Angeles (2). Both reported on the increasingly widespread adoption of unlimited-access transit services, i.e., those public transit services that provided prepaid, unlimited use transit service to students, and/or faculty and staff.

Another policy topic addressed by several sources is the role of public transit services in a broader transportation demand management strategy for university communities. A 10-year old study by the University of Wisconsin-Milwaukee (5)(8) reports on universities that tie parking, land-use, and transit policies together to reduce auto travel and increase transit, bike, and walking choices. More recent case studies of universities that have adopted aggressive transportation-demand management strategies include Cornell University and its innovative parking fee structure program (3) and the University of Washington's comprehensive UPASS program in Seattle that includes unlimited- access transit and incentives to choose non-auto modes of travel (11, 12) .

Finally, case studies describing the history and current status of several older well-established systems have been reported in the literature. These case studies include information on the systems at Iowa State University (1), the University of Illinois – Champaign-Urbana (9), and the University of Wisconsin - Milwaukee (8).

The remainder of this chapter provides background from the literature and current state of the practice concerning issues of importance to the development of university-related transit in the Fargo-Moorhead areas. Four topics to be discussed in more detail include the organization and governance of transit systems serving university communities, how to pay for campus transit, the role of transit in a comprehensive

demand-management strategy and finally, a discussion of the major trend in campus transit toward unlimited-access systems for transit services on campus and in the university community.

GOVERNANCE AND OPERATION OF CAMPUS TRANSIT SERVICES

One of the most difficult institutional issues to be addressed when setting up or expanding a campus transit service is the ownership, management, and governance of the transit operation. The issue is whether the university should set up a separate transit system to serve its needs or contracts with the local public transit agency. The way a particular university is organized and the governance system established to direct the transit service depend on state law, the history of town-gown relations, the relative capabilities of the university to operate a transit system versus a separate agency, and circumstances when the decisions were made. In the past, universities set up their own services because no local transit agency existed or the existing organization did not wish to provide the service. Sometimes, however, universities set up their own systems to avoid entanglements with the local community and to maintain control over the cost and quality of the transit services. For all of the reasons listed above, no single form of ownership and operation is dominant. Table 2.1 shows the results from TCRP survey and lists ownership, operation, and policy governance choices for the 30 systems that responded to the 2000 survey. As can be seen, about half of the universities own and operate their campus services, while the other half enjoy services provided by the regional system.

In cases where the transit agency is administratively and legally separate from the university, important issues of cost sharing and governance must be resolved. As can be seen from Table 2.2 data collected in the TCRP survey indicate that the most common way that universities interact with the local transit agency is through service contracts. Universities are represented by voting members at only three of the fourteen campuses which reported having transit service provided by a separate agency. However, thirteen of the fourteen say they maintain a regular dialog with the transit providers.

Universities apparently prefer to have a cordial, but nevertheless arms-length, relationship with the transit agency rather than be directly involved in guaranteeing the solvency and success of the transit system. Participation on a transit board by university officials might be construed by elected officials or members of the local community to mean that the university feels a responsibility to provide transportation, not only on campus, but perhaps in the community. University officials usually do not want to take on this additional burden.

Students are obviously a key to the success of a campus transit operation in terms of ridership, but students also play key roles in the governance of the transit systems. Two of the 30 transit systems responding to the TCRP survey are run by the student government. Furthermore, students play a key role in advocating improved transit paid through student fees. Either because of the requirements of the student fees, or because the transit agency wants the student input, students are represented on advisory boards for both university and local transit agency-operated systems. In one transit agency-run system, a student is a member of the board of directors; in three others students serve on advisory boards.

Table 2.1. Governance and Policymaking Characteristics of Campus Transit Systems Source: (7)

University Name	Transit System	Who Operates the Service?	Who Owns the Asset?	If a part of the part of the university, who approves fares, routes, etc?
University of Arkansas	Razorback Transit	University	University	Traffic, Parking, Transit Committee
Stanford University	Marguerite Shuttle	Private Contractor	Private Contractor	Assoc Provost
U of California -- Davis	UC Davis - Unitrans	Student Govt	University	Joint committee student govt and city representatives
U of California -- Santa Cruz	TAPS Shuttles	University	University	Advisory Committee, student Referendum on fares, regents approve
U of California--San Diego	Shuttle	University	University	Shuttle Dept
Colorado State University	Transfort	Local Govt.	Local Govt.	
Florida State University	Taltrans	Local Govt.	Local Govt.	
University of Georgia	Campus Transit System	University	University	Regents
Northern Illinois University	Huskie Bus Line	Student Govt	Private Contractor	Student Association Mass Transit Board
U of Ill. Champaign-Urbana	Champaign-Urbana MTD	Transit Agency	Transit Agency	
Western Illinois University	Go West Transit	Private Contractor	University/Private Contractor	Transit Board
Indiana U -- Bloomington	Bloomington Transit	Transit Agency	Transit Agency	
Indiana U -- Bloomington	Campus Bus	University	University	University Administrators
Purdue University	City Bus	Transit Agency	Transit Agency	
Iowa State University	CyRide	Local Govt.	Local Govt.	
University of Iowa	Cambus	University	University	Dept Head and Vice President
Louisiana State University	Campus Transit	Transit Agency	Transit Agency	
U of Massachusetts -- Amherst	UMASS Transit Service	University	Transit Agency	Transit Dept of university and Transit Auth. Approves
Michigan State University	Capitol Area Trans. Auth.	Transit Agency	Transit Agency	
U of Michigan -- Ann Arbor	Ann Arbor Trans. Auth.	Transit Agency	Transit Agency	
University of New Hampshire	Wildcat Transit	University	University	Transportation Policy Committee

University Name	Transit System	Who Operates the Service?	Who Owns the Asset?	If a part of the part of the university, who approves fares, routes, etc?
Cornell University	TCAT	Joint Agency	Univ/Local Govt	Board of Directors
East Carolina University	ECU Student Transit Auth.	University	University	Transit Advisory Board
North Carolina State U	Wolfline	Private Contractor	Private Contractor	University - student senate and Trans dept
Penn State University	Centre Area Trans. Auth.	Transit Agency	Transit Agency	
Clemson University	Clemson Area Transit	Local Govt	Univ/Local Govt	Board
Texas A & M University	Bus Operations	University	University	Dept Director
University of Texas	Shuttle Bus-- Capitol Metro	Transit Agency	Transit Agency	
American University	AU Shuttle	University	University	Asst. VP
U of Wisconsin -- Madison	Madison Metro	Local Govt.	Local Govt.	

North Dakota State University has chosen to contract for services with Fargo-Moorhead Metropolitan Area Transit (MAT), the local transit provider, for campus services and to pay MAT for unlimited access for students on the regional service. This pattern is very common and an increasingly preferred option. Even in cases where two separate systems once existed, in the past few years several large university systems have merged with the regional system or given up the campus service to the regional provider. For example, Penn State University once operated its own on-campus services, but as part of a broader TDM program, transferred the service to the local transit provider and agreed to provide significant financial support to allow unlimited access transit on campus. Likewise, Michigan State University ceased operations of its own service and entered into a contract with the local transit provider.

PAYING FOR CAMPUS TRANSIT SERVICES

Public transit systems, whether serving large or small urban areas, vibrant university communities or declining rural areas, depend on a variety of funding sources to pay for the desired levels of service.

One of the key policy issues facing a community is to determine how to pay for the desired transit services knowing that the needs for transit will always exceed available funding. Until the 1960s, public transit was predominately a private sector activity with all costs paid by passengers. However, over the past 30-40 years, a partnership has been formed between users and non-users to pay for public transportation. A major activity of transit managers and policy boards has been piecing together this funding puzzle involving user fees (fares), state, federal, and local government contributions. In addition, university transit systems have creatively used non-traditional funding sources such as student fees, parking revenues, and other sources.

Table 2.2. University -- Transit Agency Relationships and Student Involvement on Transit Authority Policy and Operating Boards Source: (7)

University Role	Percent of Respondents (N=14)
University has official representative on transit system policy board	21.4%
University influences decisions through contracts for service	85.7%
University and transit system maintain regular dialog concerning service issues	92.9%
Student Role	
Students participate as member of transit system policy board	7.7%
Students participate on advisory committee to transit board	28.6%

The TCRP Synthesis found that the specific sources of funds used by campus transit systems vary widely and depend on a variety of local factors. First, if the transit system is considered a public transit agency eligible for state and federal funds as is the transit service in the Fargo-Moorhead area, these important operating assistance resources, when combined with local government matching funds, provide a major portion of the transit system’s income. According to the TCRP survey, 20 of the 28 systems reporting financial data include federal, state, or local operating assistance in their revenue mix. All 8 of the systems not using government transit funding are departments within a university and either have not requested or have not been offered use of these funds. The latter case is the more likely situation since a regional transit agency in the same area is often the “designated recipient” for the grant funding and uses all funding available for its operation. Furthermore, access to these government funds is one of the major motivating factors for university-run transit systems to either merge or turn over their campus transit operations to the regional provider.

Obviously, campus transit systems that do not use federal, state, or local transit funds to support their service need to develop other income sources; student fees and parking permit revenue are the most common sources in these cases. However, student fees and parking revenue also provide significant funding for systems that do receive government operating assistance. These fees substitute for farebox revenue for systems that offer prepaid, unlimited-access service. As can be seen from Table 2.3, 90 percent of the TCRP survey respondents had some form of prepaid or unlimited access service, so these alternate sources of funding are key to their operations. Table 2.4 identifies the proportion of transit income these systems receive from non-transit grant sources.

Table 2.3. Payment Method For Campus Transit Systems Source: (7)

Payment Method	Percent of Respondents (N=30)
All passengers pay a fare	3.3%
All passengers ride “free” because service is prepaid	53.3%
Students and faculty/staff ride free, other pay fare	20.0%
Students and faculty/staff ride at reduced fares	6.6%
Other (No fare on campus only, no fare for students but not faculty staff, no fare for undergraduate students, but graduates and faculty/staff pay)	20.0%

Student Fees

Student fees represent a form of funding unique to college and university communities. Table 2.5 summarizes the fee information obtained from the survey respondents and includes information on 17 systems that reported using student fees to partially or totally fund unlimited access services. As can be seen, these fees represent from 11 to 100 percent of a system's income and range from \$8 to more than \$50 per semester.

In most cases student fees designed to support transit must win the approval of students in some form of referendum. Each university has different rules regarding the way these referenda are proposed and the exact voting rules that are applied. Nevertheless, these student votes are often one of the most important, yet time consuming parts of an effort to expand transit services using student fees. Finally, the TCRP survey respondents were asked if the student fees that were used to support their systems needed to be periodically renewed by referendum. Fifteen systems that imposed student fees answered this question and were about evenly split in their responses. Eight of the 15 did not require a referendum to periodically renew the student fee; seven did.

Table 2.4. Sources of Revenue for Campus Transit Operations Source: (7)

University	Transit System	Source of Prepaid Revenue for Transit System				
		Student Fees	Parking Permit Revenue	Parking Fines	University General Funds	Student Apartment Passes
University of Arkansas	Razorback Transit	25.0%	3%	25%	8%	
Stanford University	Marguerite Shuttle		75%			
U of California -- Davis	UC Davis - Unitrans	58.0%		1%		
U of California -- Santa Cruz	TAPS Shuttles	93.0%		7%		
U of California--San Diego	Shuttle		Yes	Yes		
Colorado State University	Transfort	11.0%				
Florida State University	Taltrans	10.0%	61%	29%		
University of Georgia	Campus Transit System	100.0%				
Northern Illinois University	Huskie Bus Line	100.0%				
U of Ill. Champaign-Urbana	Champaign-Urbana MTD	15.0%				
Western Illinois University	Go West Transit	80.0%				
Indiana U -- Bloomington	Bloomington Transit	na	na	na	na	na
Indiana U -- Bloomington	Campus Bus	na	na	na	na	na
Purdue University	City Bus				100.0%	
Iowa State University	CyRide	28.5%			7.2%	
University of Iowa	Cambus	45.0%	20.0%			
Louisiana State University	Campus Transit	100.0%				
U of Massachusetts -- Amherst	UMASS Transit Service	10.0%	17.0%		1.0%	
Michigan State University	Capitol Area Trans. Auth.		Yes			
U of Michigan -- Ann Arbor	Ann Arbor Trans. Auth.	na	na	na	na	na
University of New Hampshire	Wildcat Transit	20.0%	50.0%	19.0%	10.0%	1.0%

University	Transit System	Source of Prepaid Revenue for Transit System				
		Student Fees	Parking Permit Revenue	Parking Fines	University General Funds	Student Apartment Passes
Cornell University	TCAT					
East Carolina University	ECU Student Transit Auth.	90.5%	1.0%		8.5%	
North Carolina State U	Wofline	80.0%				
Penn State University	Centre Area Trans. Auth.				10.0%	5.0%
Clemson University	Clemson Area Transit		100.0%			
Texas A & M University	Bus Operations	23.0%				
University of Texas	Shuttle Bus -- Capitol Metr	na	na	na	na	na
American University	AU Shuttle	na	na	na	na	na
U of Wisconsin -- Madison	Madison Metro		Yes, no stats			

Table 2.5. Summary of Student Transit Fees for Prepaid and/or Unlimited Access Systems Source: (7)

University Served	Transit System Name	Student Fee as Percentage of Total Revenue	Fee	Per Time Period and other notes
University of Arkansas	Razorback Transit	25.0%	\$8.00	semester
UC -- Davis	UC Davis - Unitrans	58.0%	\$24.50	quarter, \$6.00 summer
UC -- Santa Cruz	TAPS Shuttles	93.0%	\$59.00	semester, \$177/year
Colorado State University	Transfort	11.0%	\$23.00	year
University of Georgia	Campus Transit System	100.0%	\$48.00	semester, \$32 summer
Northern Illinois University	Huskie Bus Line	100.0%	\$60.00	
Univ. of Illinois Champaign-Urbana	Champaign-Urbana Mass TD	15.0%	\$30.00	semester
Western Illinois University	Go West Transit	80.0%	\$22.00	semester
Indiana University -- Bloomington	Bloomington Transit		\$21.20	semester, adjusted for part-time students
Iowa State University	CyRide	28.5%	\$19.73	
University of Iowa	Cambus	45.0%	\$13.50	
Louisiana State University	Campus Transit	100.0%	\$23.00	semester, \$10 summer
Univ. of Massachusetts -- Amherst	UMASS Transit Service	10.0%	\$26.00	year
East Carolina University	ECU Student Transit Authority	90.5%	\$57.00	year
North Carolina State University	Wolfline	80.0%	\$34.00	semester, \$68/yr. \$14 summer
Texas A & M University	Bus Operations	23.0%	\$50.00	semester, \$150/yr., \$65 summer
University of Texas	Shuttle Bus -- Capitol Metro		\$48.00	semester
University of Wisconsin -- Madison	Madison Metro		\$19.00	semester

Transit as Part of a Comprehensive Transportation Demand Management (TDM) Strategy

Campus transit systems formed in the 1970s and 1980s principally to provide safe, affordable mobility for students. These systems were designed to connect remote housing and parking locations with central campus and to provide safe nighttime transportation throughout campus and the university community. More recently, however, campus transit systems have been seen by university administrators and planners as a part of a larger land use and transportation demand management (TDM) strategy. Improved transit services are being developed both in large and small urban university settings to reduce auto travel thus reducing congestion, pollution, and the need for increasingly expensive parking. Transit solutions also allow universities and their surrounding communities develop more intensely by reducing the need for space devoted to parking or wider roadways.

TDM, a coordinated set of policy and operating strategies that include a combination of incentives and disincentives, emphasizes alternatives to single-occupant-vehicle (SOV). These strategies involve ways to increase the cost of driving or parking and are offered in conjunction with programs to encourage the use of other modes including transit, bicycling, and walking. Universities in both large urban and small “college town” communities have embraced such strategies to cope with increasing congestion and, in the case of smaller communities, the increased demand for parking due to university growth. Universities, because they can control key elements of TDM, especially parking availability, parking rates, and land-use control, are able to more easily implement coordinated programs of incentives and disincentives to single occupant vehicle travel.

One of the earliest pioneers to use transit as part of a comprehensive TDM strategy was Cornell University in Ithaca, NY. Motivated primarily by the desire to reduce the cost and space requirements of increased parking, Cornell implemented a comprehensive TDM program that includes charges to faculty and staff for parking at rates that approximate the true cost of the parking and then discounts on those rates to encourage ride sharing. Further, the university was the leader in establishing a region-wide transit system that offers high-quality, low-cost transit services to not only the students, faculty and staff of Cornell, but also to residents of the surrounding communities. (3)

Williams and Petrait, in their review of the University of Washington U-Pass program, a very comprehensive and effective TDM program, identified several lessons learned from the Washington experience that directly apply to this issue of what is required for a successful TDM program(11) First, they observe that a balanced TDM program should include both benefits and disincentives. The University of Washington would not have been able to sell a disincentive to driving by significantly raising parking rates had their TDM strategy not included the transit and other commute option incentives. Cornell University also cites the role of incentives as key to gaining acceptance for parking rate increases and parking restrictions (3). Free transit and/or parking options with price or location incentives to encourage ridesharing are essential elements of a comprehensive program.

A second lesson learned from the Washington experience is that to gain public acceptance the commuting options offered must be flexible. People cannot always commute by the same mode every day. The U-Pass program recognizes this reality and therefore provides limited parking passes to persons that ride the bus at least three days a week. Likewise, it issues free U-Pass transit passes to purchasers of parking permits in the hope that these single-occupant vehicle operators will choose transit whenever possible.

A third lesson from the U-Pass TDM effort is that parking fees are an essential component of a TDM program both because raising fees serves as a disincentive to SOV use, but also because high parking fees can generate the revenue needed to fund other elements of the TDM program. In the University of Washington's case, parking revenue provides about a third of the total program budget. Williams and Petrait also stress the role that parking plays in a TDM effort. Free or low-cost parking encourages SOV use and thwarts efforts to reduce congestion and parking demand.

TDM has become a popular concept that has been applied and misapplied to a wide variety of transportation activities. In some cases, universities and regional organizations call their transportation activities a Transportation Demand Management program when, upon closer scrutiny, the TDM title is just an umbrella name given to a group of related, but independent activities, such as transit and parking. Even at the planning stage, what used to be called a campus transportation plan study is now often called a Transportation Demand Management Plan. Certainly grouping related activities under one organization is the first step toward coordinating transportation policy and operations, but without substantial integration of program elements, especially transit services and parking rates and availability, achieving the goals of TDM is unlikely. Programs such as the U-Pass program at the University of Washington and the Cornell University program meet the definition of effective TDM efforts .

The TCRP synthesis study survey concluded that universities in large urban areas such as Seattle and Milwaukee are embracing TDM, but so are universities like NDSU that are located in smaller communities. The following universities responded in the TCRP survey that their transit systems were part of a larger TDM strategy:

- Colorado State University
- Florida State University
- Northern Illinois University
- University of Illinois Champaign-Urbana
- University of Massachusetts -- Amherst
- University of Michigan -- Ann Arbor
- University of New Hampshire
- Cornell University
- East Carolina University
- Penn State University
- Clemson University
- University of Wisconsin -- Madison

In summary, a comprehensive TDM strategy that includes policy actions related to parking availability and cost, promotion of non-auto travel, and considers the transportation implications of land-use decisions is likely to result in the most successful transit service with the best service and highest ridership. Furthermore, universities that have adopted a TDM approach have been the most successful in reducing the cost of mobility to, from, and on campus and the negative impacts of growth.

UNLIMITED-ACCESS TRANSIT

Each time transit riders travel they are usually required to drop a fare, in the form of exact change, into the farebox. Contrast this situation with motorist traveling in their own private vehicles who can jump in the car, turn the key, and go their own way. While motorists know that automobile travel is expensive, the variable costs of a particular trip are very small. On the other hand, when a transit rider pays a cash fare to use transit, not only are transit's costs immediately obvious, they are seen to be directly related to the number of trips taken.

For decades, transit proponents have identified this disparity of the way users pay for their transportation as a major obstacle to increased transit use. Consequently, most transit systems have developed pass programs, and other prepaid, unlimited use options so that transit riders can have unlimited ridership for a given period of time (usually one month) and avoid the fare payment hassles of a cash fare. These passes are also usually discounted to encourage regular ridership. More recently, smart card technology is being introduced that makes this fare payment method more flexible and easier to administer for the transit system and more convenient for the customer. However, all of these schemes still require the individual user to make a decision to incur a regular outlay to use transit.

“Free” transit has often been proposed as a way to encourage transit use. Proponents of this approach do not really mean that the transit service is free to provide; rather, they propose that the cost of providing transit services be prepaid either from tax revenues or other sources. For large transit systems, this prepaid scheme has seemed an unattainable goal because of the fiscal implications of losing all farebox revenue while having to cover the cost of increased service needed to meet demand that would be expected when fares were abolished.

Though believed to be impractical in large urban areas, prepaid transit that would allow users unlimited access to high-quality transit has been tried and proven in university communities throughout the country. As early as the late 1960s, some universities either started their own unlimited access systems or partnered with local transit agencies to offer bus services that were open to all students, and usually faculty and staff. High quality transit services resulted in high ridership, and these systems were great successes.

However, although many examples of prepaid, unlimited-access transit existed throughout the country, adoption of the concept moved slowly during the 1980s. The 1990s, however, have witnessed an explosion in the number of universities, both in traditional “college towns” and large urban areas, that have implemented unlimited-access systems. Several factors account for the accelerated implementation rate in recent years. Three of the most significant ones are described below.

One reason for the growth of unlimited-access systems is that the transit systems serving campus communities have matured and have the organizational, managerial and operating capability to provide expanded high quality service. Another reason for the recent move to unlimited-access transit is the funding situation for public transit. The earliest unlimited-access systems were started in the 1960s and 1970s when state and federal funds helped university communities respond to concerns about safety and mobility. The 1980s, however, was a period of retrenchment for many transit systems both in large urban areas and in small university communities. The fiscal uncertainties of this period dissuaded transit managers and policymakers from advocating transit expansions such as those required with unlimited-access systems. However, the funding picture has been much more positive since the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991 and The Transportation Equity Act for the 21st Century

(TEA-21) in 1997 that provided significant increases in federal transit funding that has also been matched by many states with increased state funding. Transit systems are now in a position to experiment with new services.

A third reason for the increased interest in unlimited access systems is the promise and, in many cases, the proven contribution that transit can make to addressing a number of objectives shared by both students and university administrators. Extensive transit services that are used by most students and a significant portion of faculty and staff can help a university in the following ways:

- reduce the demand for more parking,
- increase students' access to housing and employment,
- reduce congestion on campus and in the surrounding communities.

NDSU has instituted unlimited access transit using the MAT system. Students can show their ID cards and ride “free” because the university pays the transit system a modest fee to provide the unlimited access service. However, unlike many of the unlimited-access systems reported in the TCRP and other reports, the level of transit service provided to the NDSU students, faculty, and staff, has not significantly increased as a part of the unlimited access policy. Therefore, the frequency and hours of operation of the MAT service are not typical of those found in most unlimited-access situations. Nevertheless, the MAT/NDSU version of unlimited access has begun the process of improving mobility in the area without greatly increasing the cost of service and thus avoiding some of the difficult funding issues faced by other universities adopting the unlimited access model. The data reported below was taken from the TCRP synthesis survey and provides some background data that may be useful to NDSU officials as they consider the merits of expanding the current service.

The most fundamental decision in designing an unlimited access system is determining the categories of potential users who will be afforded the unlimited access. In the context of campus communities, the most obvious riders will be students. Brown, Hess, and Shoup, in their 1999 survey of 31 unlimited-access systems determined that just over half of the systems (16 of 31) provided unlimited access service only to students. The other half provided unlimited access to students, faculty and staff (2). In addition, the survey results identified at least one example, Clemson University, where the transit system offered unlimited access to all residents of the community, not just those affiliated with the university.

The decision to limit participation in the unlimited-transit option can most closely be tied to funding. If only student fees are used to support the transit system, then equity concerns might arise if other categories of users, such as faculty and staff, are given access to the transit system. Universities often address this equity concern by funding the faculty and staff use of the system by providing university general funds or revenue from parking permit fees. Systems such as the one at Clemson University that are open to the general public receive state and federal transit operating assistance or other source of funds contributed by local governments.

Another reason to limit participation in an unlimited-access transit program is a concern for system capacity. However, because students have been shown to be the primary users of the unlimited access system, opening the service to faculty and staff will add relatively little additional demand. Universities have often sought to limit eligibility for transit service as they transition from a more traditional fare payment method to an unlimited-access option because of concerns for excessive demand that will lead to added service beyond the financial resources in place at the time the service is implemented.

Ridership growth upon implementing unlimited access has, in some cases, been 200-300 percent. Table 2.6 shows the ridership gains reported at the start of unlimited access service for several campus systems. Faced with this possibility, university and transit system administrators have chosen to implement unlimited access incrementally by either restricting eligibility or by restricting the services offered in the unlimited-access program. For example, Penn State recently introduced unlimited access on its campus loop shuttle routes but has hesitated to expand the concept to the entire regional system used primarily by students, faculty and staff. This hesitation stems from capacity constraints facing the transit operator, and more important, possible financial exposure from opening the entire regional system. Likewise, in the fall of 2000, Indiana University began a three-year phase-in of an unlimited-access program by opening the Bloomington Transit system to all students but by delaying the same expansion for the Campus Bus-operated routes.

Table 2.6. Ridership Increases Experienced when Unlimited Access Service is Introduced - Source: (7)

University	Year Service Began	Ridership Increase	Comments
Cal. State - Sacramento	1992	71%	
U of Calif. - Davis	1990	79%	
U of Wisc. - Madison	1996	104%	
U of Ill. -- Champaign-Urbana.	1989	193%	
U of Colorado - Boulder	1990	200%	
Penn State U.	1999	160%	unlimited access only on Campus Loop routes
U. of Pittsburgh	1998	164%	Converted to unlimited access from discounted \$.50 fare
U. of Wisc. – Milwaukee	1994	100%	Percentage of students using transit to campus rose from 12% to 25%
U. of Florida	1998	50%	figure reported to Penn State

Student-only unlimited access systems, once successfully implemented, usually add faculty and staff as eligible users because these groups see the benefits of the service, and the university administration recognizes the value of the transit service as an employee commuting option. Another factor that may accelerate the move toward adding university employees as eligible recipients of unlimited access services is the recent change to the federal Commuter Choice program. Under this program, employers can provide up to \$100 per month to reimburse transit expenses for their employees and the benefit is not taxed. Employees save federal, state, and local income taxes and FICA contributions and employers also save FICA and other taxes. The federal government now provides this commuting benefit to all of its employees. Private firms along with state and local governments are also adding this benefit for their

employees. Given these trends, universities are likely to be asked to offer the same benefit to remain competitive with other employers, and they can do so through a properly structured contribution to the unlimited-access program on their campus.

One of the most difficult negotiations involved in setting up an unlimited access system is to determine the fairest way to pay for it. As can be seen from Table 2.7, the TCRP survey concluded that nearly two thirds of the unlimited-access systems used student fees to pay for the service and more than a third used parking fees. University general funds were used in nearly a quarter of the systems.

Table 2.7. Sources of Revenue for Campus Transit Systems Source: (7)

Revenue Source	Percent of Respondents* (N=30)
Student Fees	63.3%
Parking Permit Revenue	36.7%
Parking Fine Revenue	13.3%
University General Funds	23.3%
Student Apartment Passes	6.6%

Where student fees are used, the amount varies largely with the amount of service provided and the additional sources of funding available to support the campus service. Table 2.5 shown earlier summarizes the fee levels reported in the TCRP survey.

One final issue related to unlimited access systems that will be important to the continuation and possible expansion of the unlimited access system at NDSU and other universities in the Fargo-Moorhead area is the way in which the revenue generated from the sources described above are provided to the transit operator to offset operating and capital expenses. Even in cases where the university directly provides the unlimited-access service, the parties responsible for providing the funds usually insist on some objective method for determining the amount of funds required. In cases where a separate transit agency or private provider operates the service, a formal contract is required.

Several workable reimbursement models have been widely used. In the case where the transit provider is a department of the university, the method for determining annual contributions from the various funding sources can be negotiated annually or be based on predetermined cost-sharing basis that might, for example, call for student fees to cover 75 percent of all costs, and parking revenues the other 25 percent. The transit budget would be developed according to university procedures and might include review and approval by a policy board that includes student representatives.

If the transit provider is a separate agency, as in the case of NDSU and MAT, the transit system can be reimbursed for service in one of three ways. The first would be a negotiated fixed amount that is not specifically tied to the number of riders or amount of service provided. Several transit systems reported in

the TCRP synthesis study that the transit system and the university negotiated a specific dollar amount that the university was willing to contribute to the unlimited-access program. This amount often represented what the university had spent previously to provide its own transit service prior to the transition to unlimited access service provided by the regional operator.

The other two ways that transit systems might be reimbursed are based on either the amount of service provided or the number of persons using the service. Payment based on the amount of service is most common, but the per-ride or per-passenger basis is gaining popularity in large urban areas. Payment based on service is usually negotiated either explicitly by setting an hourly rate, or implicitly by having both sides consider the amount of service required as they negotiate specific dollar amounts. An example of the explicit statement of a per-hour rate can be found in the contract used by Michigan State University and the Capital Area Transportation Authority that details a costing methodology to determine the cost per hour for both fixed-route and paratransit services. It also prescribes the procedure to be used to add or reduce hours of service.

The per-trip or per-pass reimbursement method for unlimited access system may call for the university to pay the transit provider based on a predetermined per-trip payment. Alternately, the reimbursement method may be to purchase passes for students and employees according to a fee schedule that often reflects a discount over the general public pass price. Quantity discount incentives to encourage universities to promote the transit program may also be included in the arrangement. Sometimes a combination of these per-trip or per-pass arrangements are used by the same transit system. For example, Port Authority Transit in Pittsburgh began its U-Pass program with the University of Pittsburgh by negotiating a per-trip reimbursement. Once the university and the transit system gained operating experience, the contract between the two agencies became a fixed-price contract that did not depend on ridership. In addition to fixed-price contracts with Pitt and Carnegie Mellon University, PAT offers discounted monthly passes to smaller colleges in its service area.

Summary

NDSU has recognized the benefits of high-quality public transportation both on campus and between the surrounding community and the ever-expanding university campus. As such, it joins many other progressive universities around the country that use the many policy options available to improve land use, reduce the negative impact of single-occupant vehicle travel, and provide for mobility to a growing population without destroying the ambiance of the small-town university community. The information reported in this chapter, especially related to unlimited access systems, governance, and student fees, should help local decision makers formulate transit plans that will benefit both the university and surrounding community and provide for an equitable way of paying for the needed services.

Campus Transit Research Methods

This report is based on data collected from three university and college campuses in the Fargo-Moorhead area; North Dakota State University (NDSU) in Fargo; Minnesota State University at Moorhead (MSUM), MN; and Concordia College (CC) also in Moorhead, MN. Surveys were sent via e-mail to students at each of the three campuses and to the faculty and staff of NDSU and MSUM. This chapter contains the description of the data collection, the survey instrument design, and the mailings.

To better understand the perceptions of students and faculty and staff towards the use of public transportation, surveys were developed for:

1. North Dakota State University
2. Minnesota State University Moorhead
3. Concordia College

Survey Instrument Design

There were basically three surveys developed for this study. However, modifications were made to two of them to serve the purposes of each campus. The first survey developed pertained to use of the public transit bus ridership and travel behaviors. This survey was modified for each campus as well as for students and faculty. The questions on the survey will be described in this section. The second survey was to determine if students and faculty at NDSU would participate in a carpool program if the university implemented one. The third survey was to evaluate if Concordia students would support the implementation of a taxi service in the late night hours on its campus. The questions on that survey will also be explained in this section.

Transit Bus Survey

The survey design was quite similar among the three campuses. Only minor changes were made such as changing parking lot names to coincide with each campus and removing questions that were not relevant or acceptable to the campus administration. Very similar questions were asked of students, faculty, and staff.

There were three main sections to the questionnaire. The first section contained demographic questions such as gender, student classification, employment status, and whether the student lives on or off-campus. The second section was specifically designed for students that lived off-campus. The students were asked to approximately how far they live from campus, the time periods they spend on campus, the locations they travel from prior to coming to campus, e.g., home, work shopping, etc. and how many one-way trips they make to campus per day.

The third section was relevant to all students. The questions related more to travel patterns, experiences, and preferences. There were also several questions pertaining to the students' use of the Metropolitan Area Transit (MAT) serving the Fargo-Moorhead area. Most of the questions were asked to determine the students' willingness to use public transit, their experiences with it, and ways to improve service to attract them to ride more regularly. Further, questions were asked about the need for additional bus shelters and preferences for heated shelters. The NDSU survey contained additional questions regarding the campus circulator that has a designated route serving the campus. Questions were asked about the use of the circulator and students, as well as faculty and staff, were asked about suggested changes for the service.

Mailings

Electronic mail was used to administer each of the surveys to each of the campuses. An official from each campus assisted in the mailings by sending an electronic letter to the students and faculty and staff asking them to complete the survey at the given web link. The survey was posted on SURTC’s website to make data collection and analysis more convenient. The following paragraphs describe the mailings sent by each of the campuses.

NDSU (Fall)

North Dakota State University had support from the student body and President Chapman. An email message was sent to students, faculty, and staff asking them to complete the questionnaire.

Table 2.1. Response Rate for North Dakota State University			
	Number Sent	Number Returned	Response Rate (%)
Transit Bus			
Students	10,154	1,665	16.4
Faculty	1,747	319	18.3
Carpool			
Students	10,154	801	8.4
Faculty	1,747	279	7.9

MSUM (Winter)

Les Bakke at MSUM sent an e-mail message to the students, faculty, and staff asking them to complete the questionnaire.

Table 2.2 Response Rate for Minnesota State University – Moorhead			
	Number Sent	Number Returned	Response Rate (%)
Transit Bus			
Students	7,000	476	7.0
Faculty	750	155	20.7

Concordia (Spring, Summer)

Mr. Thomas Iverson sent the students the questionnaire via email asking about transportation. The survey pertained to the use of the MAT bus around the Fargo-Moorhead community.

Table 2.3. Response Rate for Concordia College			
	Number Sent	Number Returned	Response Rate (%)
Transit Bus Survey			
Students	2,750	452	16.4
Taxi Service Survey			
Students	2,750	574	20.9

Response rates were poor to fair for all campuses. NDSU and Concordia had a much higher response rate than MSUM, which had a dismal 7% response rate.

Mobility of NDSU Students: Transit Survey Results

Transit services are important to the North Dakota State University community. A transit survey was developed in fall 2002 to determine students' specific transportation needs and to explore options and opportunities in meeting those needs. The Small Urban and Rural Transit Center (SURTC), a research program within the Upper Great Plains Transportation Institute (UGPTI), and NDSU student government developed the transit survey.

Student Government President James Burgum e-mailed a letter asking NDSU students to participate in the survey. A direct link to the survey was included in the e-mail. The survey was designed to investigate a number of issues regarding campus transit use, user perceptions and user opinions about the quality of services provided by Metropolitan Area Transit (MAT) and the Campus Circulator. The results of this survey are intended to help plan the transit services provided on and to the university campus.

This preliminary report is a snapshot of survey results. The report is divided into six sections: 1) student demographics, 2) movement demands of campus students, 3) student perceptions of MAT services, 4) student perceptions of parking issues, 5) demand for the NDSU Circulator, and 6) campus accommodations for transit. SURTC received responses from 1,665 students who completed the 35-question survey. Their information provides insight into many transit issues including behavioral response to current land use and transit services. This will be important to monitor changes in student perceptions in response to changes in transit services and design through future surveys. A more detailed report will be published this spring.

Of the 1,665 students who responded, 941 or 56.5 percent were female, and 724 or 43.5 percent were male. In checking registration records, campus enrollment is 43.4 percent female and 56.6 percent male. The percentage of women who responded to this survey is proportionately higher than the percentage of women attending NDSU.

It is not possible with an electronic on-line survey to ensure equal participation from all student classifications. Nevertheless, there was distribution among all class levels from freshman through graduate level (Table 1). The junior class had the lowest proportion of representation, and graduate students and freshman responders were slightly greater than actual class proportions.

Table 3.1 Survey Response Distribution Compared to Actual Class Distribution

Classification	Actual Class Distribution (%)	Class Number	Response from Class (%)	Survey Number
Freshmen	23.2	2587	20.9	348
Sophomores	19.7	2205	19.8	329
Juniors	16.7	1864	22	367
Seniors	26.4	2940	26.6	443
Grad Students	11.4	1272	9.8	163
Non classified	2.5	278	1.0	15
Total	100	11,146	100	1665

The most disproportionate representation for students who completed the survey was between full-time and part-time students. Of the respondents, 95 percent were full-time students, while only 79.6 percent of the student body has full-time status. Just over 98 percent of the freshmen and sophomores who completed the survey were full-time students. This may indicate full-time students are more interested in transit than their part-time counterparts. There could be a number of reasons for this including financial considerations, scheduling, convenience and saving time.

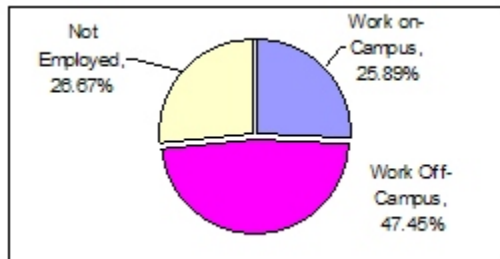


Figure 3.1 Student Work Status

Student’s employment status almost always has an impact on their response to personal environmental issues. About one-fourth of the survey respondents were not employed (Figure 3.1). Almost half of the respondents work off-campus, while one-fourth work on-campus. Just over 26 percent of NDSU students are not employed. There are some noted differences in the behavior of employed and not-employed students that will be discussed throughout this report.

A further breakdown shows that on campus there is an even split between male and female employees, however, off-campus more women than men work (Figure 3.2). There is no survey information available to explain this difference.

Whether students live on or off-campus was another explored variable. The survey respondents were divided, with two-thirds living off-campus and one-third living on campus. According to the Campus Life office, there is dorm capacity for about 29 percent of students. It was also determined that 59 percent of students living off campus considered their address temporary.

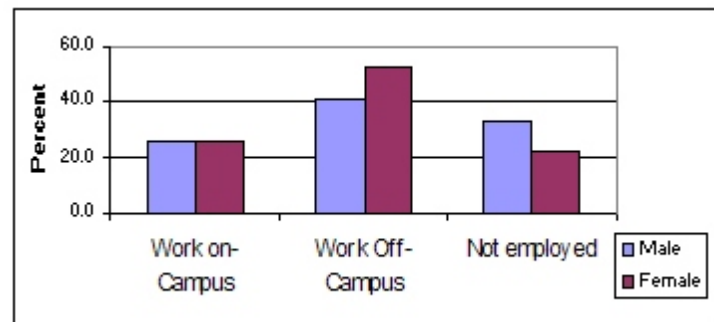


Figure 3.2 Employment by Gender

This may imply that a large percentage of the students living off campus are from outside the Fargo-Moorhead area.

We received a good distribution across many categories. The class distribution was within six percentage points and the students living on and off-campus was within four percentage points. We were unable to get off-campus employment numbers for that comparison.

Movement Demands of Campus Students

This section will show movement patterns of NDSU students, to, from, and around campus. The survey results in this section tell how far students live from campus, where they are coming from, what time period they spend on campus, how they most often travel to campus, how many have access to motor vehicles, what determines their mode of travel and whether their mode changes in the winter. This information is helpful in determining what services can be offered that will fit into the normal movement activity of the student body.

Students live at various distances from campus (Figure 3.3). When dividing the respondents by gender, more male students live within a mile of campus than female. This may explain why a higher proportion of women responded to the survey than men. The overall response showed about 52.6 percent lived within two miles of campus.

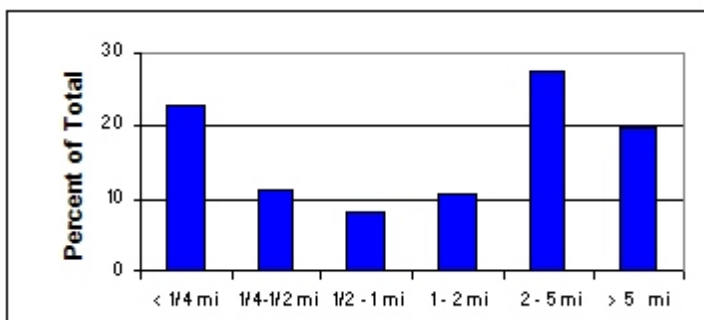


Figure 3.3 Distance Students Live from Campus

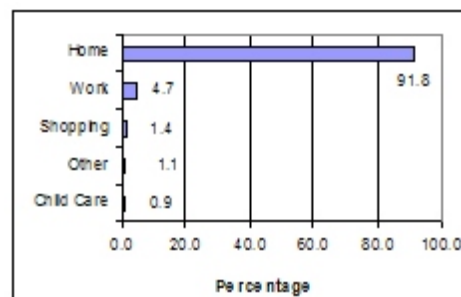


Figure 3.4 Where Students Leave From Before Arriving on Campus

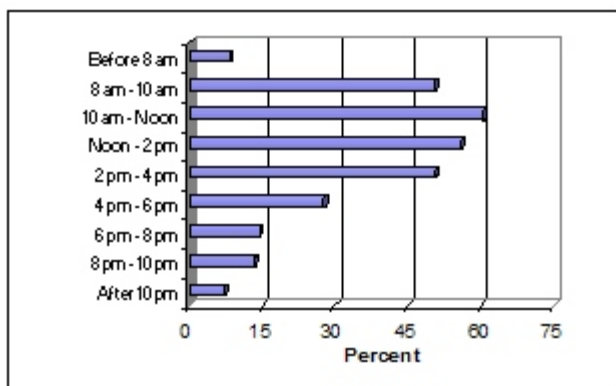


Figure 3.5 Times When Students are on Campus

Even though about 75 percent of students are employed, almost 92 percent of the responding students are coming to campus from home, 4.72 percent are coming from work and the rest (3.5 percent) from other places. Evidently a large percentage of students work either at night or on days when they don't have class. For students arriving for afternoon classes, just over 12 percent are coming from work.

The majority of responding students are on campus from 8 a.m. till noon (Figure 3.5). The 10 a.m.

until noon time period is when the highest concentration of students is on campus. The 8 a.m. to 4 p.m. time period relates to normal classroom schedules, which are during the normal work day of 8 a.m. to 5 p.m.

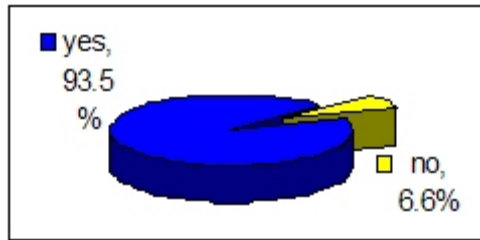


Figure 3.6 Students with Cars

NDSU students are very mobile, with 93.5 percent having access to motor vehicles (Figure 3.6). According to Independent Insurance Agents of America and College Parents of America, nearly 70 percent of college students have either their own or use of their parents' car at school. This means NDSU is well above the national average.

The majority of students go to and from campus either once (two one-way trips) or twice a day (four one-way trips) (Figure 3.7). Twice as many students in upper-college class levels make two trips a day than students in lower college class levels. Whether they work on- or off-campus makes very little difference in trip frequency.

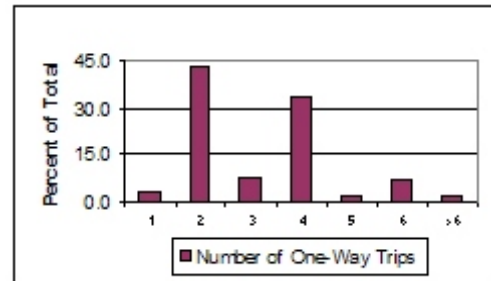


Figure 3.7 Number of One-Way Trips

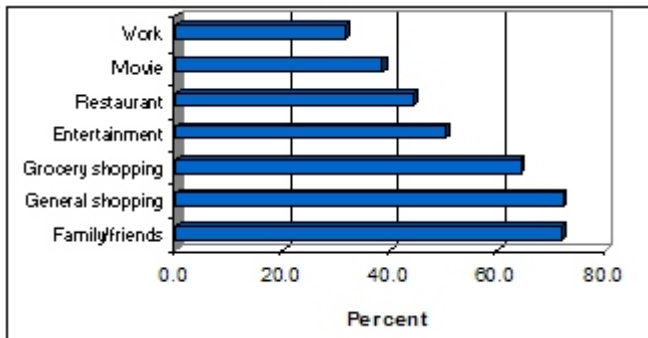


Figure 3.8 Why On-Campus Students Leave

Students who live on-campus were asked why they most often leave campus. Visiting family and friends, and general shopping are the two most common reasons (Figure 3.8). Not-employed students who work on campus most often leave to go shopping, while the students employed off campus most often leave to go to work.

By far the majority of students either drive or walk to campus, probably in large numbers each day. About 10 percent of students ride a bicycle from time to time. Only 5.7 percent of students said they most often use the MAT bus when traveling to campus (Figure 3.9). When respondents were divided between living on and off campus, only 6.34 percent and 5.46 percent respectively indicated they use MAT services.

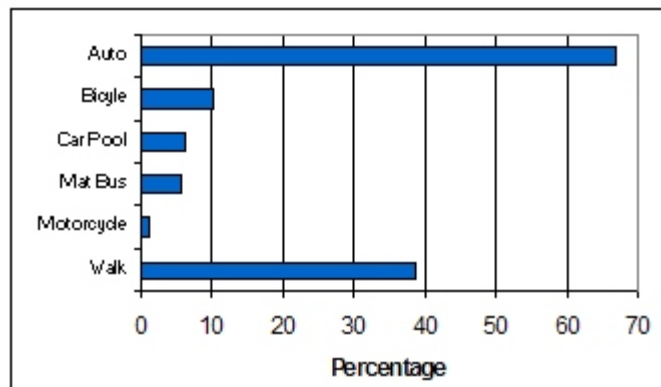
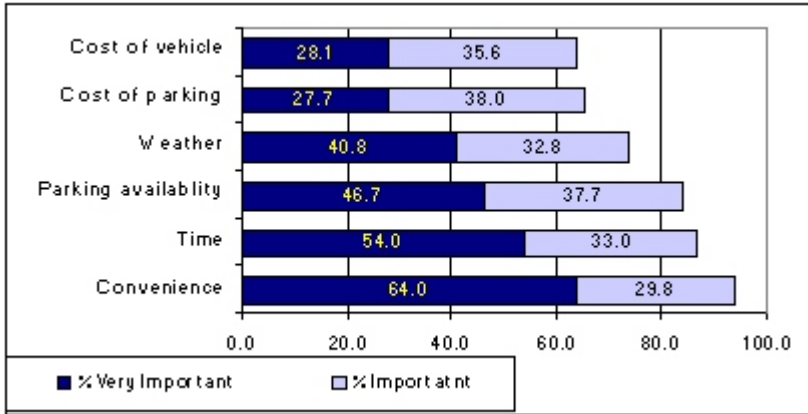


Figure 3.9 Students Mode of Travel to Campus

The survey asked the respondents to indicate how important the following factors were in deciding on their mode of travel: convenience, cost of vehicle, cost of parking, weather, parking availability and time element. Students clearly indicated that time and convenience are the two most important factors (Figure 3.10). The cost of parking and the



cost of vehicles are the least important; however, the availability of parking has some influence on the decision-making process. The important factor here is that more than 90 percent of the respondents indicated that convenience is important in deciding what mode of transportation to use.

Figure 3.10 What Influences Mode of Travel

If a student has a car, he or she can travel any time of the year regardless of the outdoor temperature. However, if a student walks or rides a bicycle, the weather may influence the choice of mode. Results showed that 23.3 percent of the students choose their mode of travel because of weather (Figure 3.11). Considering only 12.8 percent of the student respondents indicated they use the bus, there appears to be a window of opportunity to address the transit needs of more students. It may not be realistic for transit to expect to be able to capture all of these students, but it does seem there is room for growth in ridership.

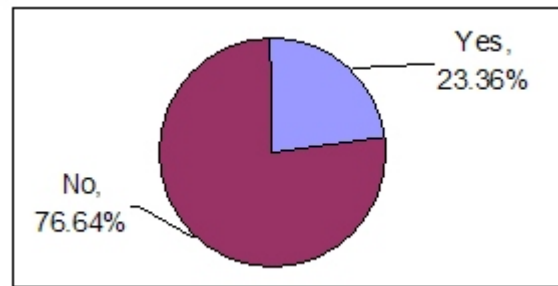


Figure 3.11 Weather Influences Mode of Travel in Winter

Students were asked how far is too far to walk to campus in differing temperatures. In above-freezing temperatures, the response was mixed between 1/4 mile to one mile (Figure 3.12). In below-freezing temperatures, the majority said 1/4 mile or less. North Dakota winters can be harsh, with 20- to 50-below-zero wind chills. These conditions make it difficult for anyone, even appropriately dressed for the cold, to walk or stand outside for an extended period walking to school or waiting for a bus.

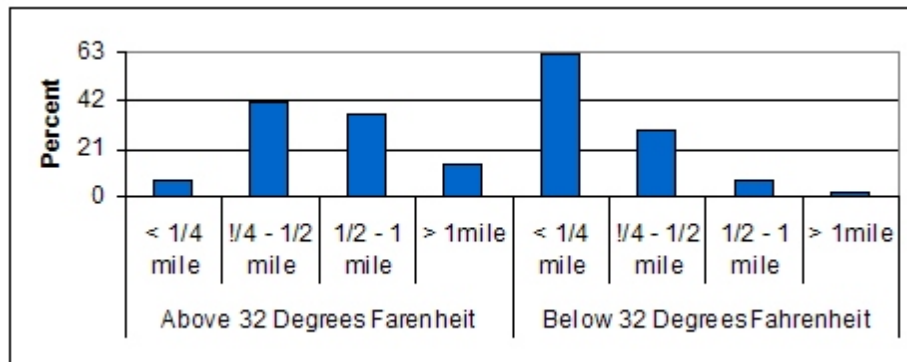


Figure 3.12 Reasonable Walking Distance by Temperature

The survey has shown us some interesting facts about NDSU student movement activities. This data reveals 47.4 percent of students travel more than two miles to campus; almost 92 percent travel from their homes and they are on campus from 8 a.m. to 4 p.m.; 93.4 percent have access to vehicles; almost 45 percent of students make only one trip daily to campus and a majority prefer to drive. Convenience and time have a major influence in the decision on what mode of travel and approximately 23 percent change their mode of travel in the winter. The large percentage of students who have access to vehicles on campus is probably a negative for transit even though parking is a problem. Also, the large supply of parking slots and parking permits on campus encourage the use of the automobile and discourage the use of transit.

Student Perceptions of MAT Services

This section of the report focuses on the student respondent’s perceptions about the quality of MAT transit system services. The quality of service is measured by responding to the following questions: the benefits of public transit, whether students have used MAT, why students use MAT, what keeps students from using MAT, what MAT characteristics were important, what their last experience was like, how long students were willing to wait for MAT, willingness to use MAT for Tri-College attendance and willingness to pay for MAT services. This type of investigation reflects real perceptions about the services offered by MAT. Some of these are tangible items that MAT administration can react to, or at least be aware of, when designing promotional campaigns and organizing routes.

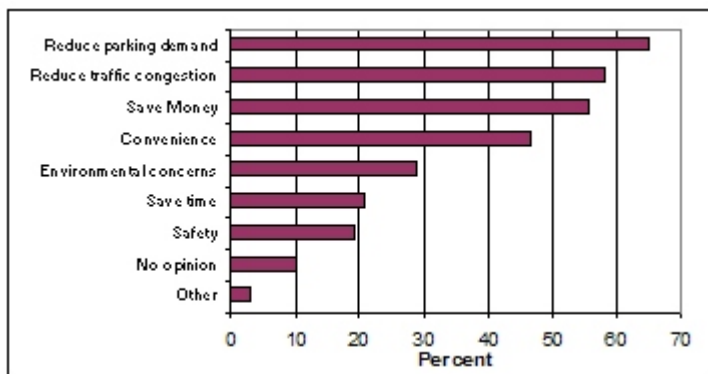


Figure 3.13 Benefits to Riding Public Transit

There are many benefits to public transportation. The students were given the following list of benefits and were asked which were the most important to them: 1) safety, 2) convenience, 3) reduced traffic congestion, 4) environmental concerns, 5) saving time, 6) saving money, and 7) reduced parking demand for the slots. On the NDSU campus, reduced parking demand is seen as the most important benefit for public transit (Figure 3.13). Environmental concerns were fifth in importance for NDSU students. This seems to be a more

important issue at other universities. Emissions from commuter traffic by individuals’ vehicles going to and from work is one of the leading causes of the decline in air quality from the production of dioxides by our vehicles. (Campus Transit 2000: Analyzing Student Attitudes) As the community’s population continues to grow, environmental issues may assume a higher profile.

Four issues that may be beneficial for the NDSU Circulator to publicize as benefits to using public transit are reduced parking demand, reduced traffic congestion, saving money, and convenience. Reduced parking demand and traffic congestion are the two major benefits to transit use by NDSU students. This indicates how issues and problems within local communities dictate the reasons people use transit.

Students indicated that reducing parking demand was the most common reason for using MAT . NDSU receives from MAT the total ridership numbers for each month. However, those numbers do not reflect

the percent of student body that may have ridden the MAT bus. Survey results show that 19.88 percent of the student body have ridden the MAT bus (Figure 3.14). Projecting that percentage to the entire student body would mean approximately $(11,146 \times 19.88 = 2216)$ 2,216 students have ridden the MAT bus. Whether students live on or off campus does not influence the percentage of students using MAT. The results do show that 42.9 percent of the graduate students have used the MAT bus, while 15.8 percent of the freshmen and sophomores and 18.3 percent of the juniors and seniors have used the MAT bus.

An important issue is what motivates students to use MAT. Survey respondents were asked to state their most important reasons for using MAT from among the following choices: to get around campus, to go to and from campus, going to another campus, shopping, going to and from work, and visiting family and friends. The response, “to get to and from campus,” was the leading reason for using MAT. The convenience of getting around campus was the second reason. This signals that MAT routes should focus on getting services to the students who go from home to campus. As was noted, 47.3 percent of the students living off-campus live two or more miles from campus. A much higher percentage of students who work on campus use MAT – 32.8 percent; those who work off campus – 16.4 percent; and of those who are not employed, 12.9 percent use MAT.

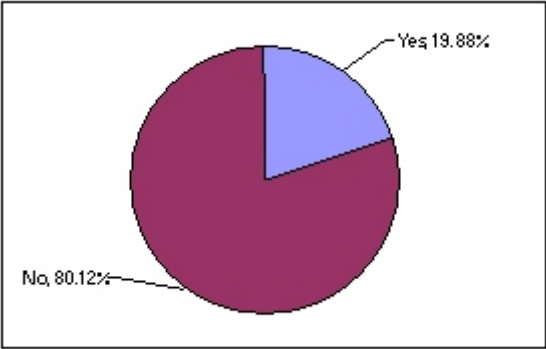
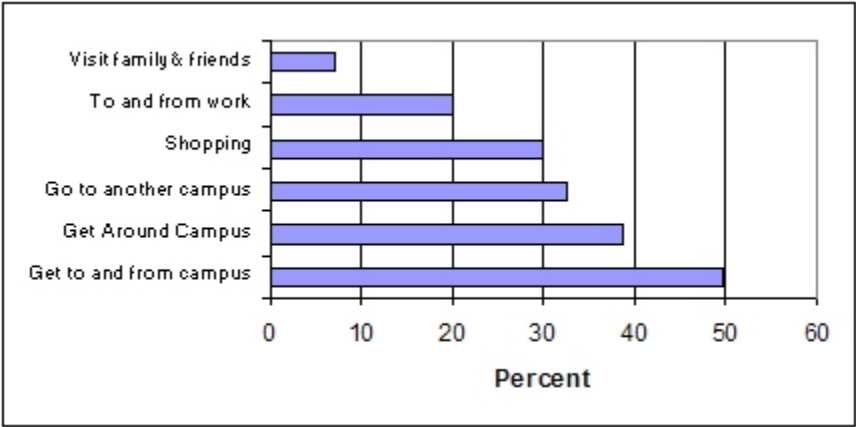


Figure 3.14 Students Using MAT

The students were to identify the reasons that keep them from riding MAT. We provided six potential reasons and asked students to indicate how strongly they agreed, or disagreed on a scale of 1 to 5. The



Likert scale is 1 to 5 where 1=strongly agree, 2=agree, 3=neutral, 4=disagree, and 5=strongly disagree. The selected reasons were: 1) preference to drive or walk, 2) buses are not “cool,” 3) lack of information, 4) lack of routes to destinations, 5) unreliability, and 6) rides taking too long.

Figure 3.15 Reason Students use MAT

Figure 3.16 shows respondents who strongly agreed (shown in the first section of the bar) agreed (shown in the second section of the bar), or were neutral (shown in the third section of the bar). The primary reason students do not ride transit is their desire to drive, walk or ride bicycle. These modes tend to offer the students more freedom to go directly where they choose. The second reason is the rides take too long. This suggests that MAT has to look for the most direct routes possible for students and work on developing realistic customer expectations. Lack of information is the third most mentioned reason for not riding the MAT transit system in the community.

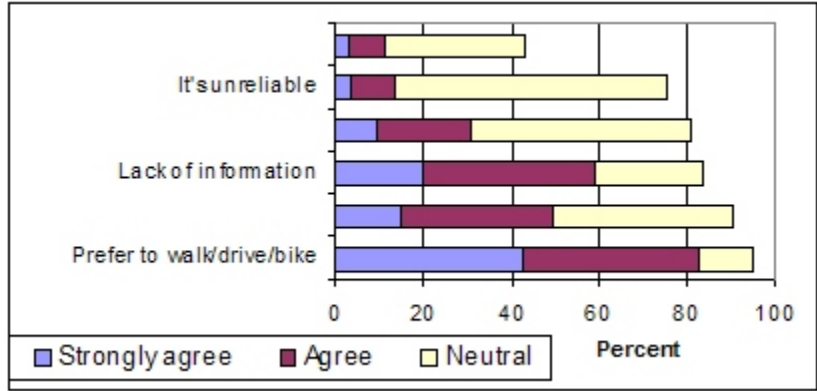


Figure 3.16 What Influences Mode of Travel

Lack of information is the third most mentioned reason for not riding the MAT transit system in the community.

The characteristics of transit services that are important to customers are analyzed next. To accomplish this we looked at a number of value characteristics such as free service, less stress than driving, convenience, comfortable ride, friendly drivers, arriving on time, environmental friendliness and serving the Fargo-Moorhead area. The respondents could agree, be neutral or disagree with the characteristic statements. The following were the four most important ridership characteristics that NDSU students valued from MAT:

- free service,
- larger than campus service,
- being reliable, and
- environmental friendliness.

It can be noted from this survey that all of these characteristics have a great deal of value to the MAT customers at NDSU. MAT should look at promoting these benefits, noting the importance of paying for service by some indirect revenue source, the importance of timeliness, and emphasizing there are fewer emissions from transit than from individual cars in morning and evening commutes.

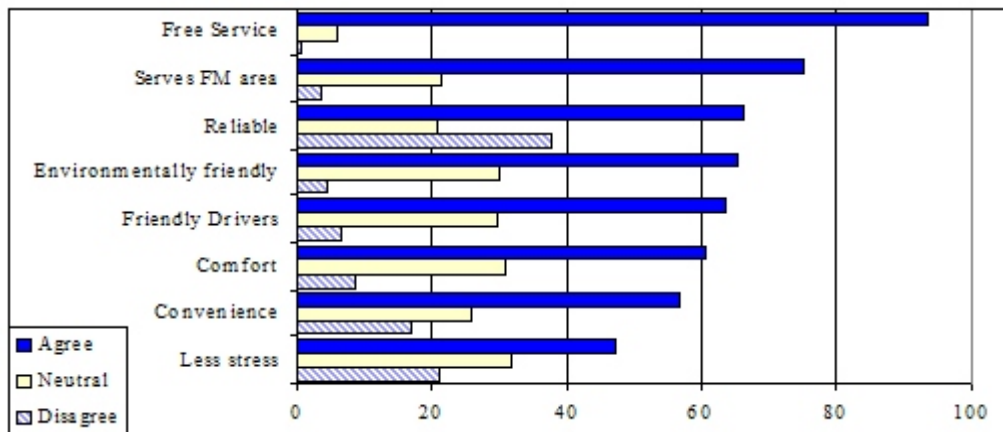


Figure 3.17 Important Characteristic Values of Public Transportation by NDSU.

It is helpful to be aware of how customers perceive their previous MAT service experiences. This section tells us what the customers value, and if MAT services are living up to its customer's expectations. MAT received the lowest rating for meeting schedules, which means either they are late or they are giving the customers incorrect information. Providing a clean bus is a customer expectation that MAT is close to achieving. MAT received high ratings for buses being easy to use.

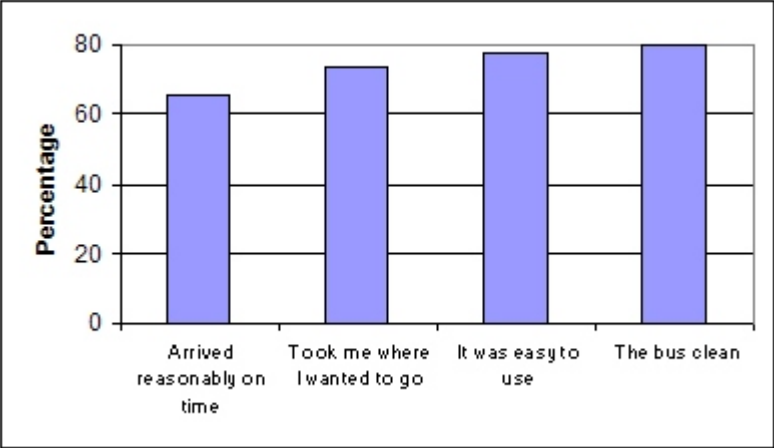


Figure 3.18 Explanation of Experiences

In the transit business, buses are always trying to make schedules. This is important because many people have definite time schedules they are following. Americans live in a fast-paced society and are not willing to wait very long. A wait of more than 15 minutes will have a huge negative affect on ridership (Figure 3.19). The fact that buses may run behind schedule causes anxiety for people with full agendas.

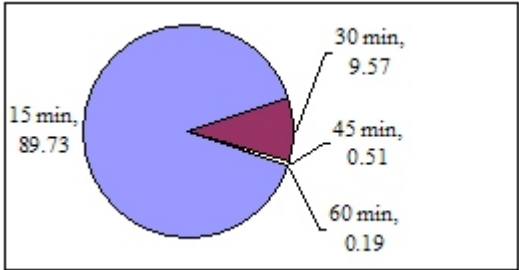


Figure 3.19 Percent of respondents willing to wait a given time

One of the main factors that determine the value of a service is if the customer is willing to pay and how much is he or she is willing to pay for the service. The fact that more than 47 percent of the survey respondents are willing to pay \$10 or more for MAT services reveals high appreciation for the services.

The survey contained three questions regarding the Tri-College system. First, students were asked if they plan to take Tri-College courses. If they responded yes, the second question they were asked is if the courses would be during the daytime or evening. Third, the students were asked if they would take MAT to attend these courses. Nine percent (152 respondents) of the surveyed students intend to take Tri-College courses next year. If that number is projected out over the whole student body (11,146 x .0919 = 1,024), that equates to approximately 1,024 students. The majority plan to take daytime classes (79.6 percent); 46 percent indicated they would use MAT to attend Tri-College courses; and 25.7 percent indicated “maybe.” It is difficult to project Tri-College ridership because of many uncertainties in students’ schedules. Minnesota State University of Moorhead (MSUM) and Concordia students may want to use the MAT bus for Tri-College courses, thereby increasing ridership.

We learned from this set of questions that students tend to use MAT more for going to and from campus and going to and from classes on campus. It is important for the buses to have the free pass for the students, serve the Fargo-Moorhead area, be reliable or on time, and there is also some value in being environmentally friendly. MAT buses are clean and easy to use, according to customers' evaluations. The two main reasons students do not use MAT is they prefer to walk, drive or bike, and that MAT takes too long. The majority of people are willing to wait up to 15 minutes for the MAT buses, and 47 percent of the respondents would be willing to spend \$10 for MAT services. The main reasons for using public transit are to reduce parking demand and reduce traffic congestion. The answers to these questions gave insight to ways MAT can improve services.

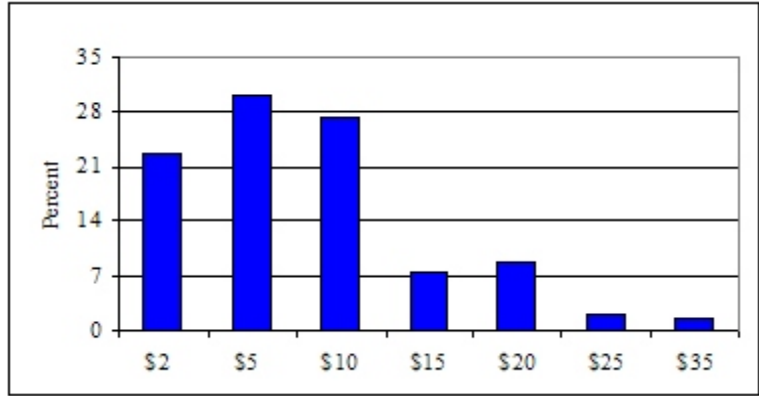


Figure 3.20 How Many are Willing to Pay More

Student Perceptions of Parking

Parking is generally a major issue on most campuses. We addressed parking in this survey to identify what percent of students own parking permits, and students views on the cost of parking and the convenience of parking on the NDSU campus. Given what we have learned, the most promising ways for MAT to capture new ridership by improving services are to increase the convenience of the system with more routes and more frequent service and increase marketing.

About two-thirds of survey respondents have parking permits. If this number is representative of the student body then 6,944 permits were issued (11,146 students x 62.3%). However, according to Tim Lee, campus police, there are only 5,439 regular and 260 temporary parking permits on campus totaling 5,699. University parking statistics indicates there are 2,085 parking spots for student residents, 14 for resident hall directors, 1,410 for off-campus residents, 571 for married students at student housing, and 77 designated disabled parking spots throughout campus. These numbers equal 4,157, or about 79 percent of the total parking permits sold.

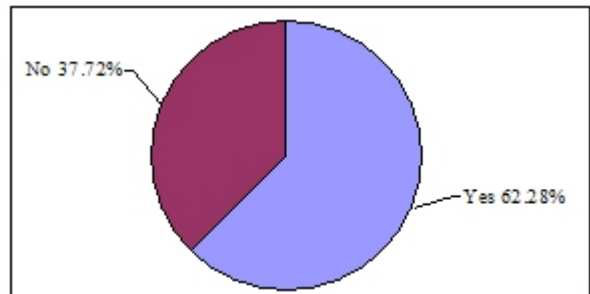


Figure 3.21 Students with Parking Permits

As we found out earlier, 62 percent of the student body had parking permits. If this percent is projected to the entire student body, it would yield almost 6,900 parking permits. This indicates there are close to 2,800

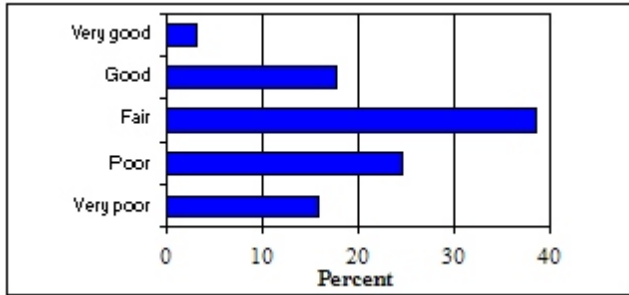


Figure 3.22 Parking Convenience

more parking permits sold than slots available. An over-sold condition may explain why students are not happy with the parking accommodations; just under 5 percent rated convenience as very good (Figure 3.22). Conversely, these results show that more than 45 percent of the respondents rated parking accommodations either poor or very poor. For students who live off campus, just over 84 percent rated parking convenience as fair or poor, and 80 percent of students who work off campus rated parking fair or poor. This may be favorable for transit.

Parking affordability has the same shaped graph as parking convenience. A fair rating is a little higher at more than 40 percent of the respondents. When analyzing by classification, the upper classes, junior through graduate, graded even higher percent poor on affordability than the lower classes, freshmen and sophomores. Theoretically, this should be advantageous to transit usage when students perceive parking as unaffordable. It also could mean students may be willing to pay more if assured that a parking spot is available when needed.

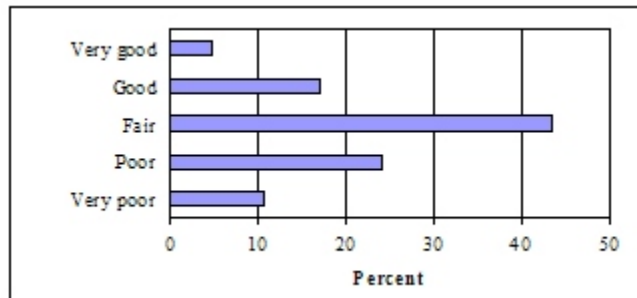


Figure 3.23 Parking Affordability

One of the complaints by many students is their inability to find parking slots when needed. The oversold condition explains this dilemma. Both parking affordability and parking convenience have a high percentage of fair or poor rating. A poor and very poor rating for convenience and affordability is just above 30 percent, and the very good rating for both is less than 5 percent. These low approval ratings should be favorable for transit.

Demand for the NDSU Circulator

Four questions were asked to help identify the current demand for the NDSU Circulator. We wanted to gain insight into student familiarity with the circulator, the usage of the circulator, whether there are additional locations on campus where students want the circulator to stop because the distance is too far to walk, and how long students would be willing to wait for the circulator. Responses to these questions gave good indications of the value of the NDSU Circulator.

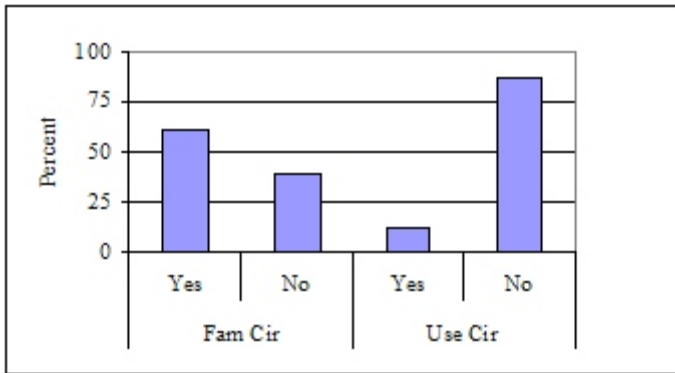


Figure 3.24 Students Who are Familiar With or Use the Circulator

A little more than half of the students indicated they were familiar with the campus circulator, but when asked if they used the circulator the number dropped to only 12.8 percent. Some of the comments from students indicated the circulator needs to stop at more locations, schedules were not convenient for users to access, people were unfamiliar with the bus schedules, and there is a need for more bus shelters. Most of these concerns deal with promotion of the service and understanding of available services on the Circulator. This may imply the need to develop routing that is better coordinated with student movement.

In the comment section of the survey, a number of students mentioned a need for additional bus stops. However, in the survey question regarding additional bus stops, only 15.5 percent of the respondents indicated a need for more stops. Almost half, 46.6 percent, of the students said there are locations on campus which are too far apart for walking. When questioned on using the campus circulator, only 12.8 percent indicated they had ridden on the circulator. This percent difference would indicate there is room for growth in ridership with improved services. It also appears that there are services currently available that students are not fully utilizing. A more extensive marketing program may be needed to convey the information to interested students on availability of NDSU Circulator.

Some students are patient and are willing to wait up to 10 minutes for the circulator, but the majority are only willing to wait seven minutes (Figure 3.25). Because of campus class schedules, the circulator needs to strive to be dependable and on time. Information pertaining to the scheduled times the bus will arrive at each bus stop must be posted at all locations and readily available to the whole student body at all times. When dividing the student body into

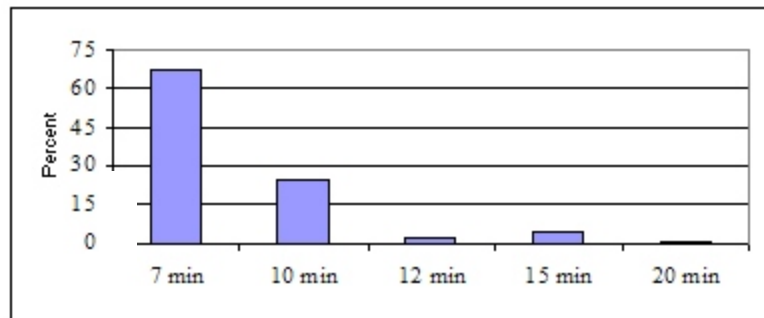


Figure 3.25 Time Students are Willing to Wait for Circulator

three classification groups (graduate; freshman and sophomore; and junior and senior), a higher percent of the graduate students were willing to wait up to 10 minutes than either of the other two groups.

Demand for the NDSU Circulator can be identified by looking at the number of students familiar with, and the number of students using, the circulator. There seems to be a large disparity between the two percentages, yet, at the same time a number of students indicated there are a number of locations on campus located too far apart for comfortable walking. The largest percentage of students are willing to wait up to seven minutes for the circulator. This implies how important it is for the circulator to be on schedule.

Campus Transit Accommodation

This section includes the last three questions answered by the survey respondents. The questions were about the number of shelters on campus, whether heated shelters were desired and the need for additional bus stops.

We asked students if they thought NDSU should have more shelters and if they should be heated shelters (Figure 3.26). The two responses on shelters appear in Figure 26. The results showed that 43 percent of students wanted more shelters and 50 percent of students wanted heated shelters. This response indicates additional investment into shelters and heated shelters would be well received by a large number of students. It is important that transit developers be sensitive to the needs of the users because transit is competing with the comfort and ease of private vehicles.

The last issue had to do with additional bus stops. Just over 15 percent of the respondents indicated more stops/locations were necessary. The survey respondents made the following suggestions: Churchill, Dakota Drive apartments, the Fargodome, Dolve Hall, FA lot, Memorial Union, music building, parking lots, Reed-Johnson Hall, Stockbridge, T-lot, University Village and Wellness Center. The circulator already stops at some of these places so this may imply there is some communication gap between the information available to student users and what the students perceive as available services of the NDSU Circulator.

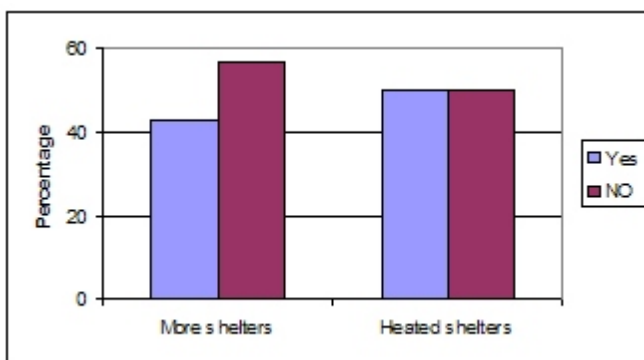


Figure 3.26 Desires for More and Heated Shelters

The last set of questions may imply that transit services on campus are in fact better than many students perceive them to be. Nevertheless, the students would appreciate an increase in the number of bus shelters, both heated and unheated, and they would also like more bus stops.

Mobility of NDSU Faculty and Staff Transit Survey Results

Introduction

University campuses have unique transportation requirements that may be characterized with a high concentration of trips during multiple peak periods (i.e., morning, lunch and afternoon). These campuses are often one of the largest employers in small- to medium-size cities and it is therefore critical to coordinate campus mobility needs with the overall transportation system. Many colleges and universities recognize transit as an effective mode for meeting campus mobility and have developed transit systems to serve those needs. In the United States at least 48 colleges and universities have some type of campus transit program. Successful campus transit systems include several factors such as careful planning, understanding user preferences, efficient design of system services and coordination with existing city transit service. Universities are not homogenous (i.e., enrollment levels, campus locations, size of community) so they will have different needs. This study examines these factors for North Dakota State University (NDSU).

North Dakota State University is a major employer in the Fargo-Moorhead area. There are approximately 2,000 faculty and staff who travel to campus nearly every day to teach, conduct research, and facilitate information exchange for North Dakota and beyond. NDSU has experienced a recent surge of on-campus growth, which impacts personal mobility on campus. The growth is because of a number of factors including: 1) development of new graduate programs which draw more students and requires more faculty, 2) the development of the Technology Park on campus, and 3) the new research programs being implemented. These factors have required the expansion of the land used to house the buildings and programs requiring students and faculty to travel longer distances on campus. Further, the architecture, landscape architecture and visual arts program are using buildings in downtown Fargo, requiring students and faculty to travel to off-campus sites to take and teach classes.

The growth occurring on campus is not met without growing pains. Mobility has become a greater issue. The additional students and faculty need to travel greater distances on campus. Parking has not increased at the same rate. Parking is typically a problem for most universities, but the tremendous growth at NDSU has accentuated the problem. To address these issues, the Small Urban & Rural Transit Center (SURTC), a research program at the Upper Great Plains Transportation Institute on the NDSU campus, designed a research project. The overall project will address the transportation needs of the campus. This paper is a portion of the overall project. It contains the results of a survey conducted with the faculty and staff. There is also another paper that addresses the mobility needs of the students. The final product of this study will contain a literature review; additional methodology; the results from students, faculty and staff; conclusions and recommendations. The final report will be available this spring.

In fall 2002, President Joseph Chapman sent an e-mail message to NDSU faculty and staff requesting they complete a campus transit survey developed by SURTC. The objective of the survey was to identify transportation needs of campus employees to better meet needs as employees travel to and from campus as well as around campus. There were approximately 695 faculty and 1,052 staff who received the e-mail

notice.² There were 319 faculty and staff who responded to the on-line survey, providing an 18 percent survey response rate. Of these responses, approximately 40 percent indicated they are classified as faculty and 60 percent indicated their classification as staff.

The results for the faculty and staff are presented in five main sections. These sections include: 1) location questions such as distance faculty and staff live from campus; 2) current mobility issues such as access to motor vehicles; 3) campus circulator; 4) utilization of MAT; and 5) campus accommodations for transit.

Location Results

Six location type questions were asked of faculty and staff categorized as “location type” questions. The questions include 1) how far they live from campus; 2) locations the respondents travel from when going to campus; 3) time periods spent on campus; 4) the number of one-way trips taken to campus each day; 5) how they most often travel to campus; and 6) how they decide on the travel mode taken.

Distance from Campus

The survey results revealed that 66 percent of the respondents live less than five miles from campus (Figure 4.1). A high percentage, (38 percent) live between two and five miles while nearly 34 percent of respondents live more than five miles from campus. In general, given the size of the Fargo-Moorhead area, residents who live within a five-mile radius of the NDSU campus should have access to the Metropolitan Area Transit (MAT) routes. However, residents may choose not to take transit, which was investigated in this study.

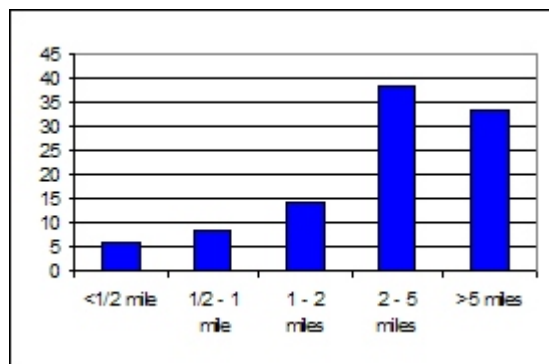


Figure 4.1 Distance Faculty & Staff Live from Campus.

Locations Traveling From

The majority of faculty and staff indicated they travel from home before arriving on campus (94.04 percent). There were 3.76 percent who reported they travel from childcare locations. Because NDSU has a childcare facility on campus, it is possible that a portion of the 94.04 respondents reporting they travel from home may drop children at the childcare facility on campus. Given the one-stop destination of home to campus, public transportation has the potential to play an important role in mode choice of faculty and staff. Certainly, faculty and staff may want to make stops after work to the supermarket, etc., which makes using public transportation more challenging. However, with proper planning, faculty and staff could reduce the number of “drive days” they take their automobile to campus and take advantage of public transportation serving NDSU.

It would be beneficial for NDSU to work more closely with the Metropolitan Area Transit (MAT) to be certain that faculty and staff (along with students) have direct access to campus. SURTC attempted to gather

²Numbers acquired from Mr. James Silvernagel, Pagecenter Specialist with Information Technology and Mr. Richard Jacobson, NDSU IT Security Officer, respectively.

the addresses of NDSU faculty and staff from Payroll and Human Resources, but they indicated this information was not available. We wanted to map the addresses to compare where faculty and staff live to the current MAT routes to ensure proper coverage. In addition to analyzing MAT routes, we could use the information to develop car pools for those commuting to campus. Car pools could work wonderfully for those faculty and staff who may live near one another and spend similar hours on campus. We did ask faculty and staff about the hours they spend on campus, which is presented next.

Hours Spent on Campus

There are 47 percent of faculty and staff who reported being on campus before 8:00 a.m. (Figure 4.2). Some workers regularly arrive as early as 4:00 a.m. to take care of the university grounds and buildings. More than 90 percent of the faculty and staff indicated they are on campus between 8:00 a.m. and 4:00 p.m., and 80 percent reported still being on-campus between 4:00 p.m. and 6:00 p.m. Approximately 10 percent of the faculty and staff are on campus until 10:00 p.m. The faculty and staff who are on campus between 8:00 a.m. and 6:00 p.m. would have access to MAT, which serves the NDSU campus between the hours of 7:00 a.m. and 10:00 p.m. Further, the similar time patterns also indicate a possibility of successful car pools.

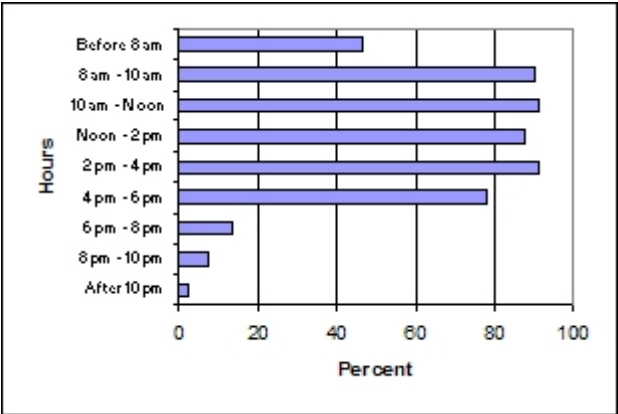


Figure 4.2 Times When Faculty are On Campus

Travel Mode to Campus

We asked three questions relevant to travel mode to campus. First, we asked faculty and staff how they most frequently travel to campus. Second, we asked if their travel mode changed during the winter. Third, we asked what factors influenced their travel mode choice.

It was evident faculty and staff value their independence because 91 percent reported they travel to campus by automobile (Figure 4.3). This number is equivalent to the number of respondents who reported they have access to a motor vehicle, so it is evident that a large number of employees use their autos to commute to campus. However, 10 percent of respondents indicated they ride their bicycle to campus and nearly 12 percent indicated they walk to campus. Given 14 percent of respondents live fewer than two miles from campus, several of them may choose to walk or ride bicycle. About 2 percent reported they ride MAT to campus (Figure 4.3), which is surprisingly low.

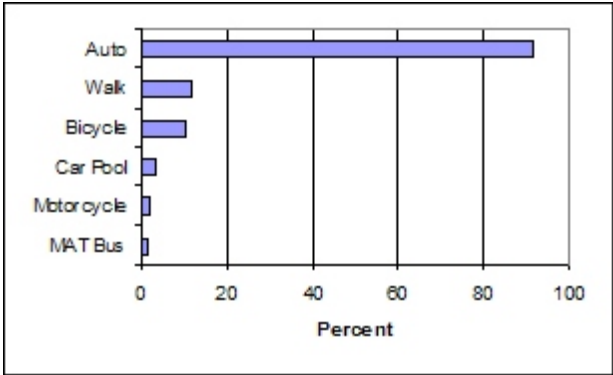


Figure 4.3 Travel Mode to Campus

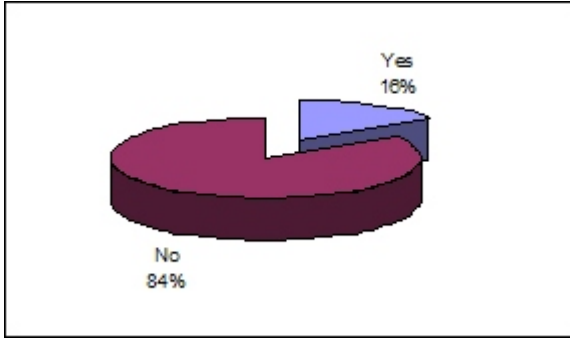


Figure 4.4 Change Mode During Winter

Nearly 16 percent of respondents indicate they chose a different mode of travel during the winter (Figure 4.4). Therefore, some of those who ride bicycles during the spring, summer and fall may opt to ride MAT or drive their automobile during the winter months. There are a number of reasons that individuals chose their mode of travel.

Convenience, time and parking availability are the greatest factors that influence the mode choice of faculty and staff (Figure 4.5). The question on the survey asked faculty and staff to indicate the level of

importance each of the factors had on influencing mode choice to and from campus. It is not surprising that nearly 100 percent of the respondents indicated that convenience was very important, important, or at least somewhat important. Time (97 percent) and parking availability (96 percent) were also high in influencing mode choice to and from campus. The cost of the vehicle and the cost of parking were viewed as very important and important by 51 percent and 49 percent, respectively. The high level of importance of convenience, time and parking availability exemplifies the suggestion made earlier to map the addresses of faculty and staff to better coordinate with the MAT routes as well as identify car pool opportunities. Of course, the number of daily trips individuals make to and from campus can play a major role in their decision to take MAT or car pool.

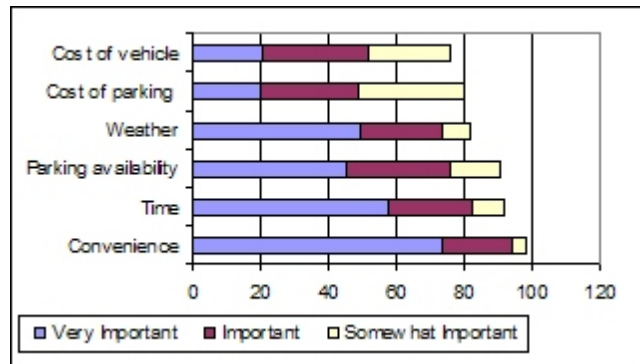


Figure 4.5 Influences on Mode of Travel

Number of Daily Trips to Campus

Only about 20 percent of faculty and staff make multiple trips to campus. Nearly 80 percent reported two one-way trips to campus, which equates to one round trip to and from campus. Using public transportation or riding in car pools would be more accommodating for those faculty and staff making one round trip to and from campus.

Current Mobility

We asked questions to gain insight into faculty and staff current mobility. This section contains the responses to questions about access to motor vehicles, ownership of parking permits, attitudes toward parking convenience and cost.

Access to Vehicle and Parking

Most of the faculty and staff surveyed have access to a vehicle (92 percent) (Figure 4.6). This accessibility may seem imperative to some faculty and staff. They may need access to an automobile in case of emergencies such as ill children, etc. Addressing these emergencies without an automobile can be difficult so it is understandable why some faculty and staff rely on their autos. Further, some faculty teach courses certain hours of the day allowing time to run errands during their day, making their auto even more appealing. Nearly 93 percent of the faculty and staff indicated they own a parking permit (Figure 4.6), which is slightly higher than the number who indicated they have a vehicle.

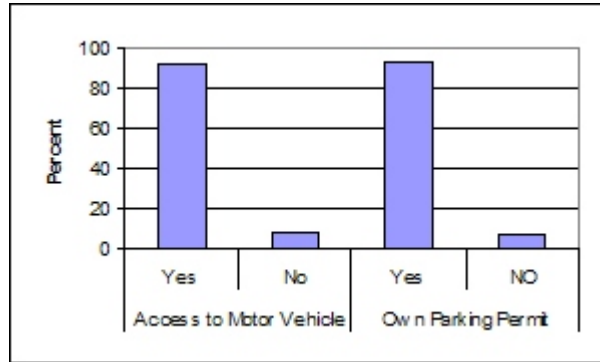


Figure 4.6 Faculty and Staff with Vehicle Access and Parking Permit

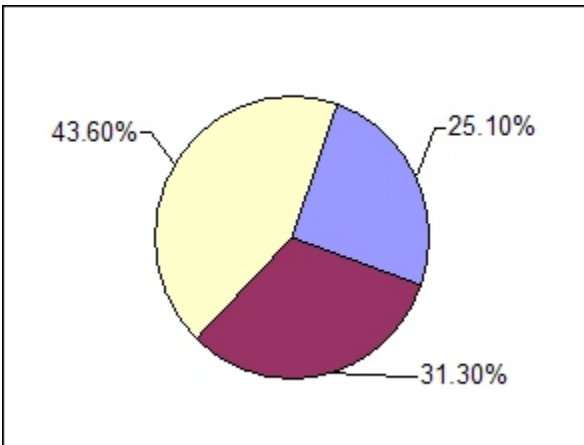


Figure 4.7 Parking Convenience

We probed to learn how faculty and staff felt about the convenience and cost of parking on campus. We asked them to rate both parking convenience and parking costs. They could rate them as either very good, good, neutral, poor or very poor. For reporting purposes, we combined very good and good, and also very poor and poor. Nearly 43 percent of the faculty and staff feel parking convenience on campus is very good or good while 25 percent feel that parking convenience is very poor or poor, with 31 percent being neutral (Figure 4.7). The individuals who perceive parking convenience as poor may park a great distance from their building or experience overcrowding in their lot, making it difficult to find a parking spot.

Of the respondents, 45 percent viewed parking costs as very good or good while 18 percent felt parking costs are very poor or poor, and 31 percent viewed them as neutral (Figure 4.8). Parking permits at NDSU cost \$60 annually, which is relatively inexpensive compared to other campus parking that can cost more than \$400 annually.³ There are some mixed feelings with regard to parking convenience and costs. Some good planning on the part of NDSU in regard to transit could potentially reduce the demand for parking. Some individuals may be enticed to ride public transportation or car pool, particularly if there is convenient service for them. This is further justification for mapping where faculty and staff live, and trying to develop the best MAT routes to serve their residential areas. This shift would help reduce the demand for parking and address problems of over-crowded lots (e.g., PP).

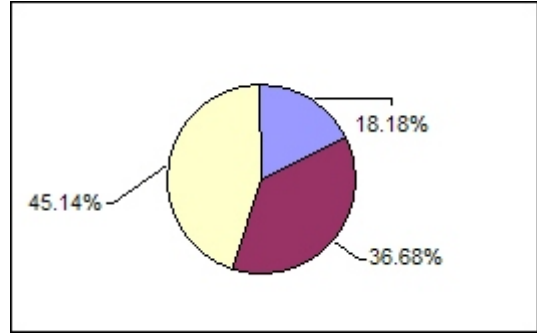


Figure 4.8 Parking Cost

Campus Circulator

The NDSU Campus Circulator is in its second year serving the campus. It serves the campus to moves students, faculty and staff between the T-lot, the Technology Park, the Wellness Center and the Memorial Union/Library area. We asked the faculty and staff some questions to determine if they are making use of the circulator or if they have suggestions to modify the service to better meet their needs.

With a few modifications, we may entice the faculty and staff to ride the circulator. Sixty-one percent reported familiarity with the campus circulator, but only 8 percent reported using it (Figure 4.9). Faculty and staff certainly may not need to use the circulator as much as students do, however, they may be able to take advantage of it more often. Faculty and staff working in the Technology Park may prefer to jump in their vehicle and go off-campus for lunch yet they could easily take the circulator, which stops near the Memorial Union, for lunch or to attend meetings elsewhere on campus. Several faculty and staff wrote in comments they did not know the schedule of the circulator nor the route. More faculty and staff may begin to ride the circulator with some additional marketing such as flyers introducing the service and making the routes and schedules readily accessible. The route and schedule is on the NDSU Web page. However, a more direct link or banner would draw attention to the service.

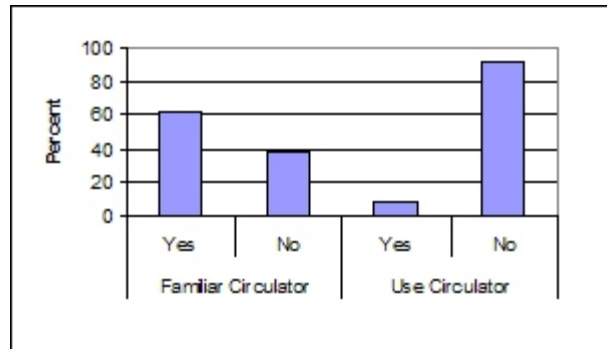


Figure 4.9 Faculty and Staff Familiar With or Using the Circulator

³ Dr. James Miller. *Transportation on College and University Campuses: A Synthesis of Transit Practice*. TCRP Synthesis 39, Transportation Research Board – National Research Council. National Academy Press, Washington, D.C., 2001.

Sixteen percent of the respondents indicated they would like the circulator to stop at additional on-campus locations. These locations mentioned include: Alumni Center, Arby's, Architecture Building, NDSU Downtown, Old Main, Skills & Technology Training Center (on 19th Avenue), and parking lots.

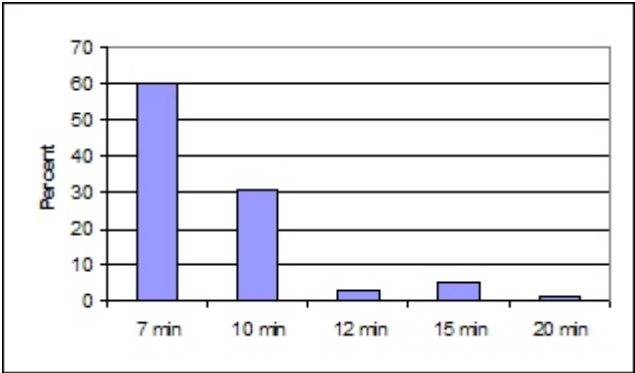


Figure 4.10 Time Faculty and Staff are Willing to Wait for Circulator

Faculty and staff were also asked how long they would be willing to wait for the circulator and 60 percent reported they would wait for seven minutes while 30 percent reported they would wait for up to 10 minutes. The willingness of faculty and staff to wait declines after 10 minutes. However, five percent are willing to wait up to 15 minutes (Figure 4.10). In general, many people can walk to many locations on campus within 10 minutes; therefore, they will not want to wait long for the circulator. It is important to meet the expectations and needs with a short wait time for the next round of the circulator. Last year the circulator route took approximately 10 minutes.

However, the route was expanded and the time frame expanded to approximately 15 minutes. This is longer than faculty and staff indicated they are willing to wait for the circulator.

Distance Willing to Walk Given Temperature

We asked faculty and staff the distance they are willing to walk in above-freezing temperatures and below-freezing temperatures. The numbers varied substantially. In above-freezing temperatures, 32 percent were willing to walk between 0.25 to 0.50 miles and 36 percent were willing to walk between 0.5 to one mile (Figure 4.11). However, when temperatures plummet to below freezing, 59 percent of respondents are willing to walk less than 0.25 miles. Certainly the circulator seems to have more appeal during the winter months when the temperatures can be below freezing for weeks and even months.

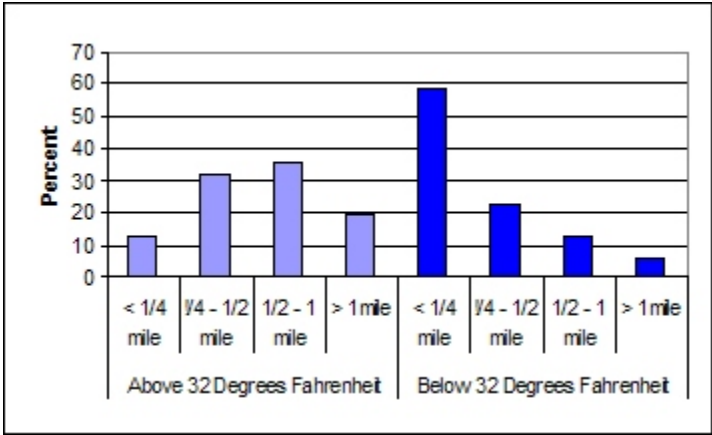


Figure 4.11 Distance Willing to Walk Given Temperature

Utilization of MAT

A number of questions were asked to discern how faculty and staff viewed public transportation. We wanted a better understanding of their perceptions of the benefits of public transit and if they had ever ridden public transportation. We asked those who had ridden the MAT system in Fargo-Moorhead about their experiences. We also asked what important characteristics they value about public transportation, what factors may discourage them from riding MAT, and how long they are willing to wait for MAT.

Benefits of Public Transportation

Faculty and staff were asked to identify what they believed were the benefits of public transportation on campus. They believed there were a number of benefits, which are illustrated in (Figure 4.12). The top benefits include: reduced parking demand (77 percent); reduced traffic congestion (75 percent); and environmental concerns (46 percent). From their responses, a good transit planning and marketing campaign would seem to entice them to public transportation and reduce the parking demand.

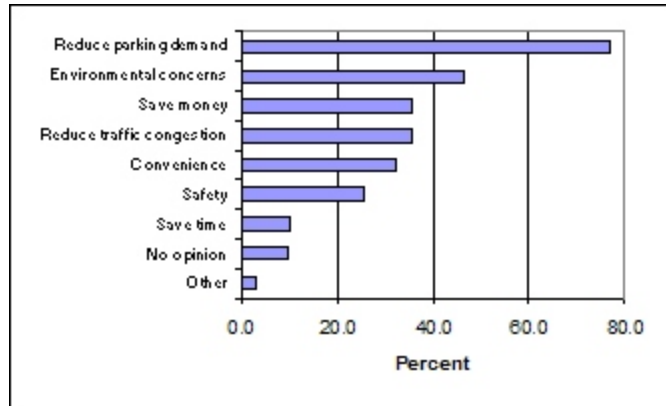


Figure 4.12 Benefits to Riding Public Transit

Experiences Riding MAT

Twenty-eight percent (90 respondents) of faculty and staff reported using the MAT bus. Those who used the system were asked to explain their experiences using MAT. Of those 28 percent riding, 82 percent said the bus was clean; 78 percent said the bus took them where they wanted to go; and 77 percent said the bus arrived reasonably on time (Figure 4.13).

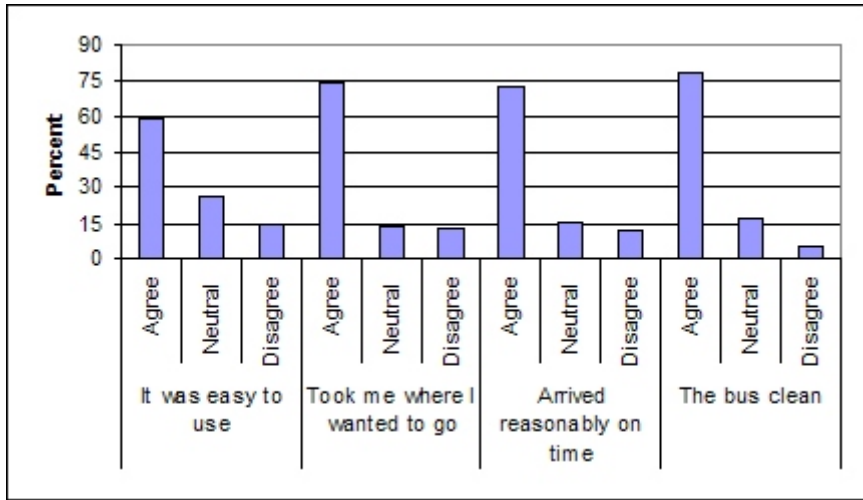


Figure 4.13 Faculty and Staff Experiences Riding MAT

We asked the respondents about characteristics they might value as important for riding MAT. We listed eight potential characteristics and asked respondents to identify if they agreed, were neutral, or disagreed if the characteristic was important.

The characteristics included: 1) free service; 2) less stress than driving; 3) convenience; 4) comfort; 5) drivers are friendly; 6) reliable/on-time; 7) environmentally friendly; and 8) serves the Fargo-Moorhead area. Figure 4.14 contains the results of the respondents. The characteristic “serves the Fargo-Moorhead area” received the highest number of individuals viewing that as important followed closely by “reliable service,” and “friendly drivers.”

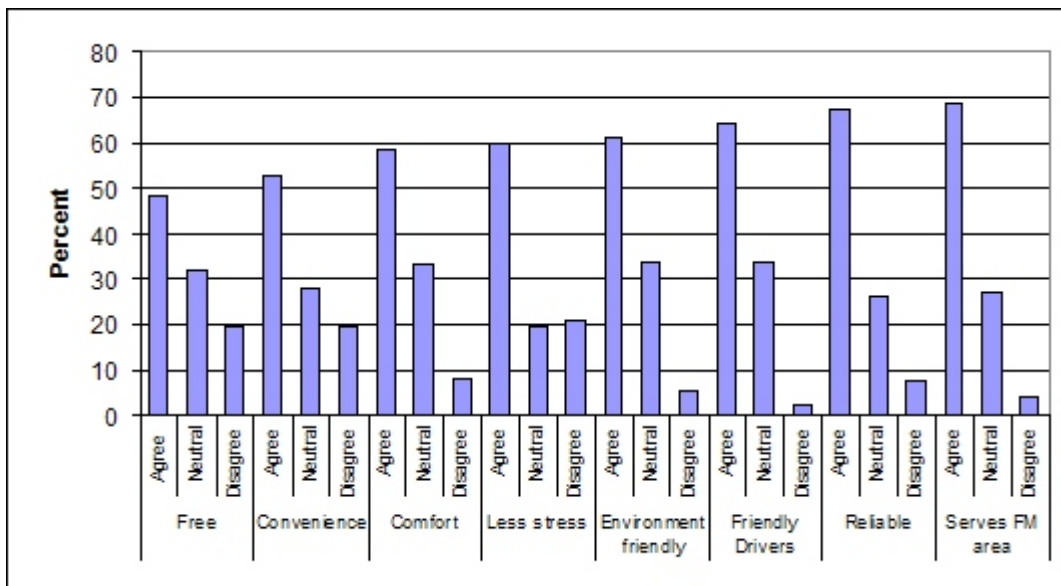


Figure 4.14 Important Characteristic Values of Public Transportation

Factors that Discourage Use of MAT

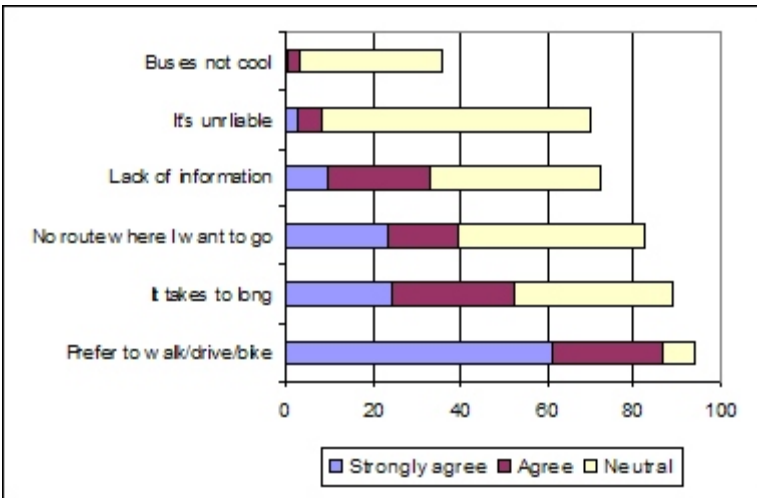


Figure 4.15 Factors that Discourage Use of MAT

Faculty and staff were asked what keeps them from using the MAT bus service. The highest reported reason (87 percent) was their preference to drive, walk or ride their bike. Approximately 52 percent said the bus took too long while 40 percent indicated there was no route where they needed to go. Thirty-three percent reported they believed there was a lack of information (Figure 4.15). These responses further substantiate the importance of mapping where faculty and staff live and offering route recommendations to MAT officials.

Respondents were asked how long they would wait for MAT. Ninety-one percent reported 15 minutes while 7 percent reported 30 minutes (Figure 4.16). MAT often has a 30-minute headway serving the NDSU campus. It may be worthwhile to investigate the cost of having a 15-minute headway during the peak morning and afternoon travel hours.

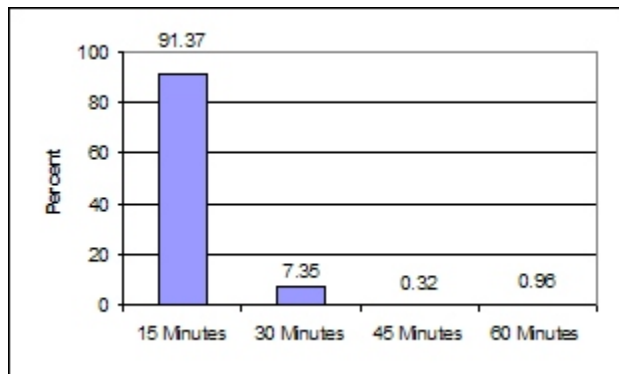


Figure 4.16 Time Willing to Wait for MAT

We asked faculty and staff to identify reasons they would ride MAT in the Fargo-Moorhead area. They were presented potential reasons and they were to reply “yes” or “no” for each possibility. The possibilities included: to go to another campus, to visit family and friends, shopping, to go to and from campus and to get around campus.

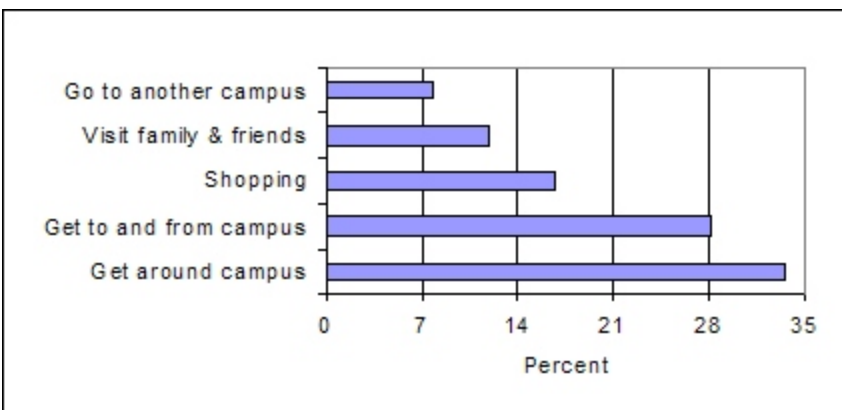


Figure 4.17 Reasons to Use MAT

Nearly 34 percent indicated they would take MAT to get around campus (Figure 4.17). Closely following, 28 percent indicated they would take MAT to get to and from campus. Almost 17 percent indicated they would take MAT to go shopping. Faculty and staff could conveniently ride MAT to go shopping at West Acres using Gold Route 20 during the noon hour or during another break during the day.

Campus Accommodations for Transit

Transit accommodations can make riding the bus more appealing. We asked the faculty and staff about accommodations including shelters and fees. We first asked respondents if they would like to see more shelters on campus. Fifty-five percent reported they would like more shelters on the NDSU campus. The most frequently suggested locations for the shelters included Memorial Union, Library, Old Main, Bison Sports Arena, Fargodome, and 12th Avenue-Albrecht-Bolley. We also asked if they would like heated shelters on campus and if so, where they should be located. Fifty-seven percent reported they would like heated shelters on campus (Figure 4.18). The top locations suggested for heated shelters included Memorial Union, Old Main, Fargodome, at the current shelters and wherever there is no building/shelter in which to currently wait.

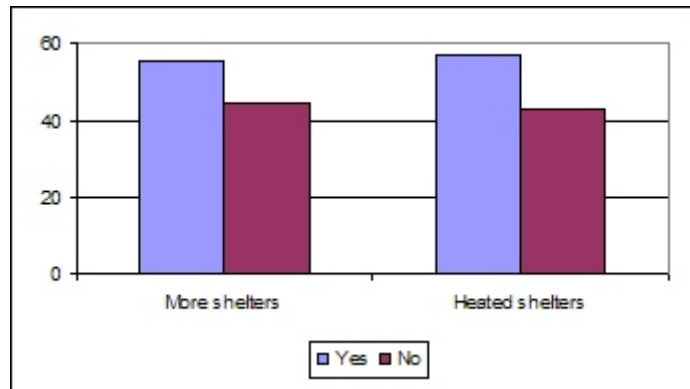


Figure 4.18 Desire for More and Heated Shelters

We asked respondents if they would be willing to ride the MAT bus if administration provided a monthly pass at a reduced rate. More than one-third of respondents reported they would ride MAT at a reduced rate. We further asked if they would ride MAT if administration provided a free monthly pass. Fifty-three percent reported they would ride MAT if provided a free monthly pass. The high percentage of individuals who indicated they would take MAT with a free pass is positive for campus. If more faculty and staff shift their mode choice to public transportation, it will reduce parking demand to help alleviate the overcrowding of the parking lots. Further, it will allow the University to focus more on developing buildings to hold the new programs and serving the education and research needs of the campus.

Mobility of MSUM Students

It is not possible with an electronic on-line survey to ensure equal participation from all students. However, there was proportionate representation from all undergraduate and graduate class levels (Table 1). The senior class had the highest representation while the sophomore and graduate student classes had the lowest representation.

Table 5.1 Survey Response Distribution Compared to Actual Class Distribution

Classification	Actual Class Distribution (Fall 00')	Class Number	Response from Class	Survey Number
Freshmen	19.88%	1475	19.33%	92
Sophomores	18.05%	1339	18.07%	86
Juniors	17.83%	1323	25.21%	120
Seniors	28.55%	2118	33.19%	158
Graduate	3.07%	228	3.57%	17
Non-degree	12.60%	935	0.63%	3
Total	100.00%	7418	100.00%	476

Student employment status has a vital impact on student responses regarding public transportation. Nearly 22 percent of the student respondents indicated they were unemployed (Figure 5.1). Almost 60 percent of the students who do work, work off-campus. Transit preferences are evident in the differing behaviors among employed and unemployed students.

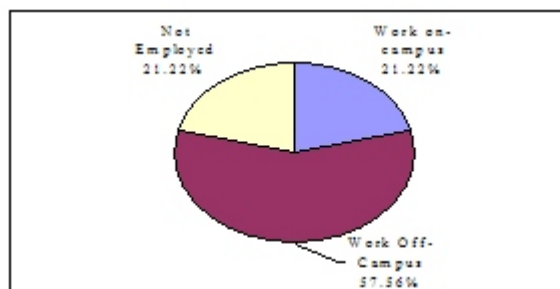


Figure 5.1 Student Work Status (n=476)

Whether students live on or off campus was also evaluated. Nearly three-fourths of students surveyed indicated they live off campus. A good distribution was received across these categories as both the class and students living on and off campus distributions were within 7 percentage points. We were unable to get off-campus employment numbers for that comparison.

Movement Demands of Campus Students

This section will show movement patterns of MSUM students, to, from, and around campus. This information is helpful in determining what services can be offered that will fit into the normal travel activity of the student body.

Students live at various distances from campus (Figure 5.2). Less than 30 percent of students live within one mile of campus, and almost one-third of MSUM respondents live five miles or further from campus. This shows a diverse student body location wise, demanding different transportation modes at various times. With nearly 60 percent of students living more than two miles from campus, public transportation can play a prominent role in transporting students from their residence to campus.

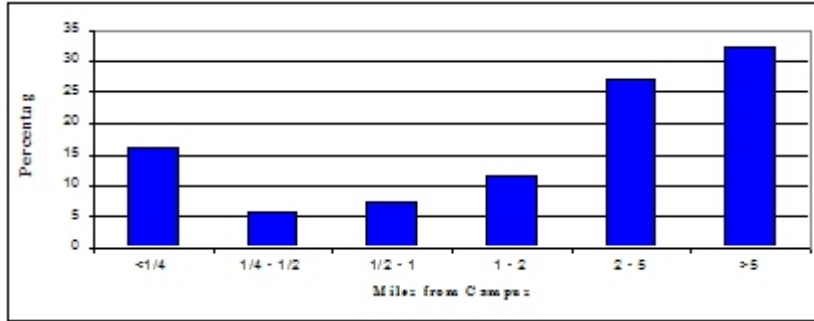


Figure 5.2 Distance Students Live from Campus (n=476)

More than 90 percent of respondents indicated they travel to campus from home (Figure 5.3). Less than 8 percent travel to school from work and the remaining 2 percent travel to campus from other various locations. This shows that most MSUM students follow a traditional college schedule with classes in the morning and early afternoon and work in the evening as almost 60 percent of respondents indicated they work off-campus, but very few come from work to school.

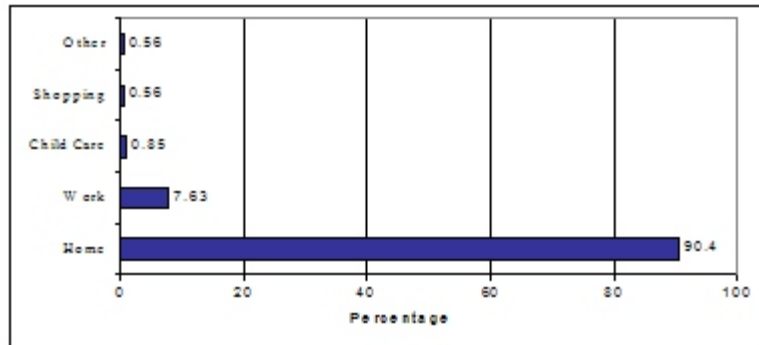


Figure 5.3 Students Depart From to Arrive on Campus (n=354)

The majority of student respondents indicated they are on campus between 8 a.m. and 4 pm, following the normal semester class schedule (Figure 5.4). Between 10 a.m. and noon represents the highest concentration of students on campus. Sixty percent of respondents indicated they are on campus between 10 a.m. and noon.

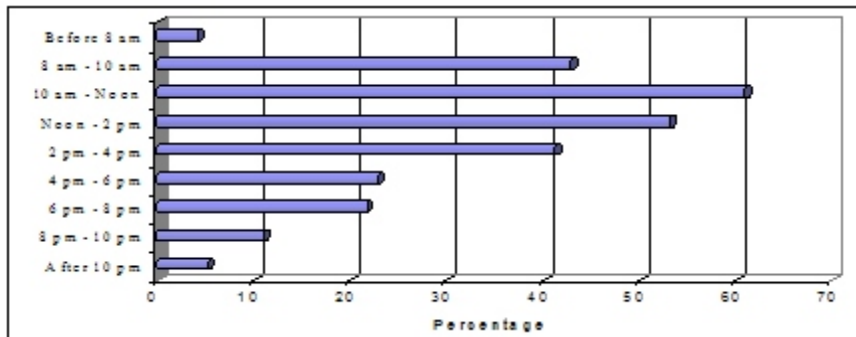


Figure 5.4 Times When Students are on Campus (n=354)

More than 94 percent of respondents indicated they have access to motor vehicles. MSUM is well above the national average according to Independent Insurance Agents of America and College Parents of America who have indicated that nearly 70 percent of college students have either their own or use of their parents' car at school.

The majority of student respondents travel to campus once (two one-way trips) a day (Figure 5.5). Many students also travel to campus twice a day (four one-way trips). The distance that many students live from campus does not allow them to make frequent trips on average.

Convenience, time, and parking availability are the three top influences on student modes of travel (Figure 5.6). Convenience as an influence on travel mode received the highest rating as 68.91 percent of respondents consider convenience very important when choosing their mode of transportation. Fifty five percent of respondents indicated that time and parking availability were very important in choosing their mode of transportation. To make public transportation a viable option at MSUM, all influences on student modes of travel must be taken into consideration.

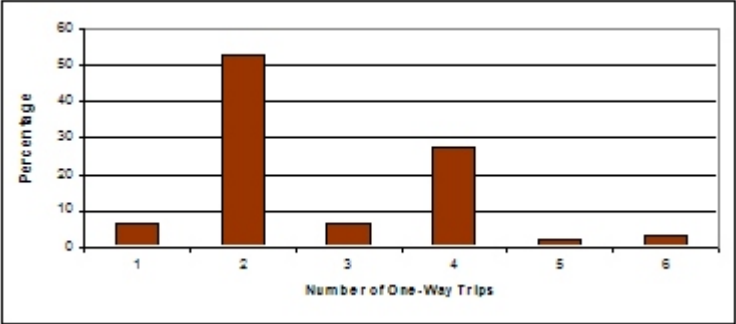


Figure 5.5 Number of One-Way Trips (n=354)

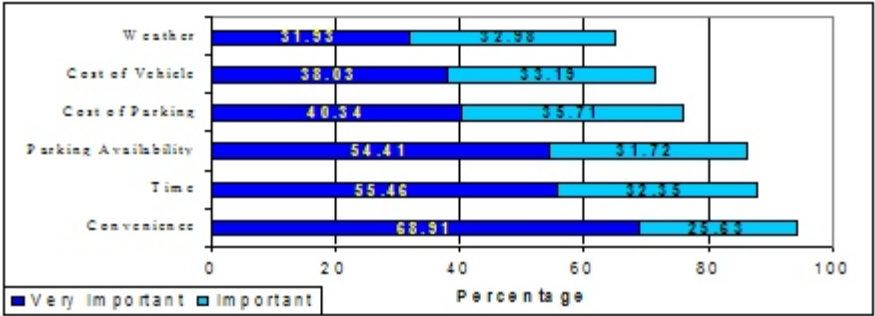


Figure 5.6 What Influences Mode of Travel (n=476)

Students who live on-campus were asked why they most often leave campus. To get to and from campus, going to another campus, and shopping were the main reasons students indicated they leave campus (Figure 5.7).

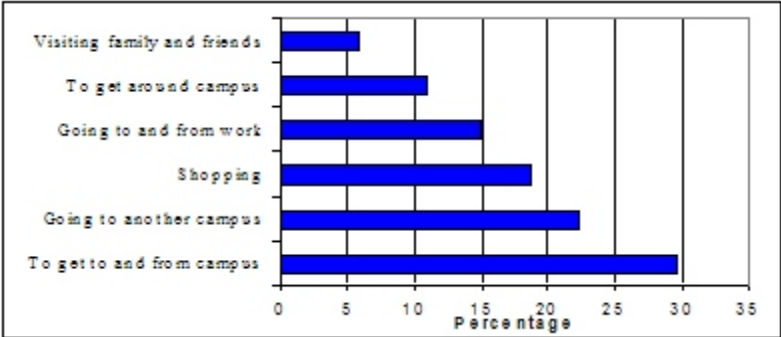


Figure 5.7 Why On-Campus Students Leave Campus (n=476)

The majority of student respondents either walk or drive to campus (Figure 5.8). Less than 7 percent of students carpool and roughly 5 percent ride bicycle. Students previously indicated that convenience, time and parking availability were main factors in choosing their means of getting to and from campus. Therefore, a relationship exists between respondents who indicated walking, driving, and carpooling as transportation modes, all which provide convenience, short travel times, or a relief from parking congestion.

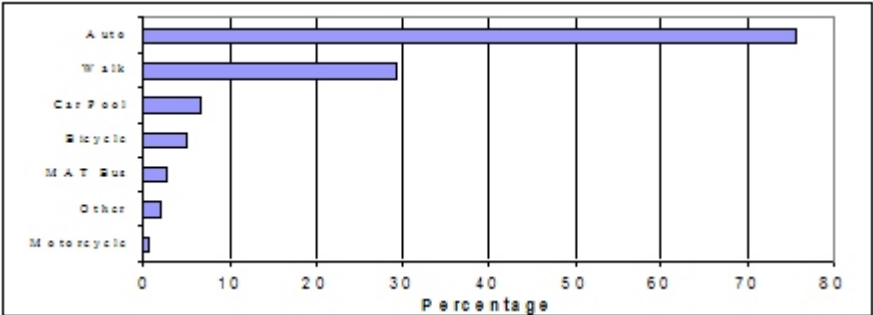


Figure 5.8 Student Mode of Travel to Campus (n=476)

If a student has a car, he/she can travel any time of the year regardless of the outdoor temperature. Results show that more than 17 percent of students choose their mode of travel because of weather (Figure 5.9).

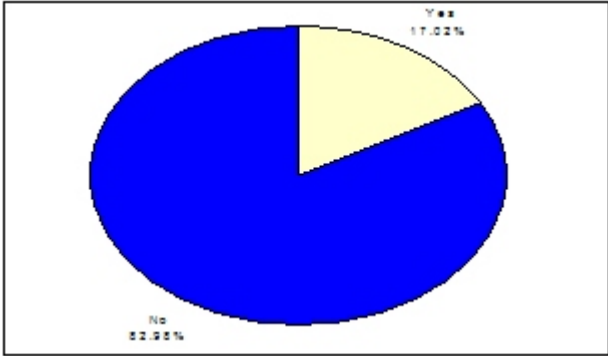


Figure 5.9 Weather Influence Mode of Travel in Winter (n=476)

Students were asked how far is too far to walk to campus in differing temperatures. Weather had a large influence on walking distance (Figure 5.10).

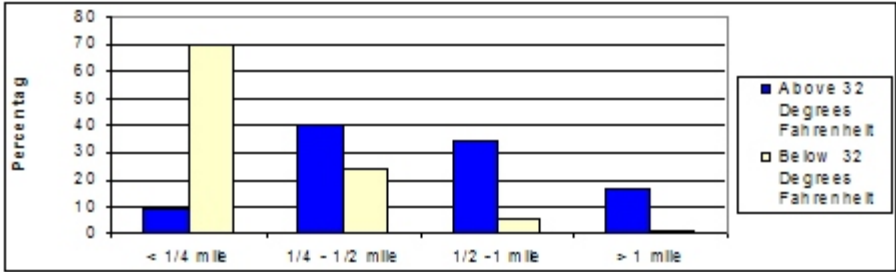


Figure 5.10 Reasonable Walking Distance by Temperature (n=476)

Student Perceptions of MAT Services

This section of the report focuses on the student respondent's perceptions of the quality of MAT transit system services.

There are many benefits to using public transportation. The following (Figure 5.11) is a list of benefits the students identified as most important to them including reduced parking demand, save money, reduce traffic congestion, environmental concerns convenience, safety, save time, and no opinion.

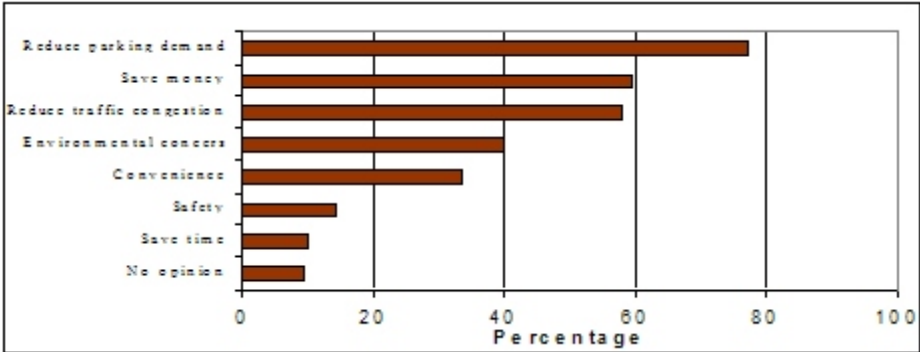


Figure 5.11 Benefits to Riding Public Transportation (n=89)

The following (Figure 5.12) are the student respondents who use MAT services. Less than 20 percent of respondents indicated that they use MAT services.

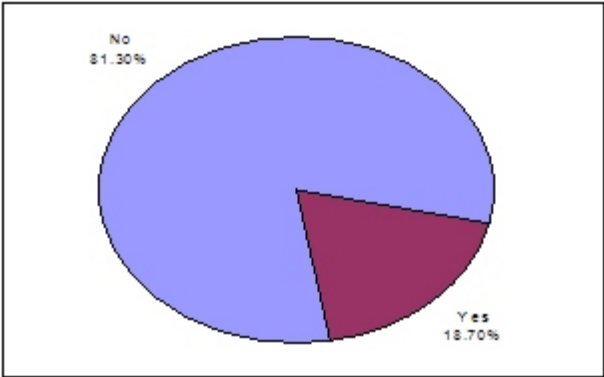


Figure 5.12 Students Using MAT (n=476)

An important issue is what motivates students to use MAT. Survey respondents were asked to state their most important reasons for using MAT from among the following choices (Figure 5.13).

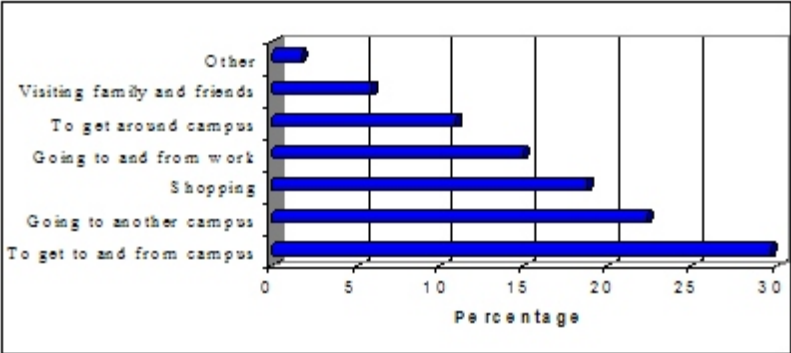


Figure 5.13 Reasons Students Use MAT (n=387)

SURTC asked students to identify the reasons that keep them from riding MAT. We provided potential reasons and asked students to indicate how strongly they agreed, were neutral or disagreed. The primary reason students do not ride transit is their desire to drive, walk, or ride bicycle (Figure 5.14).

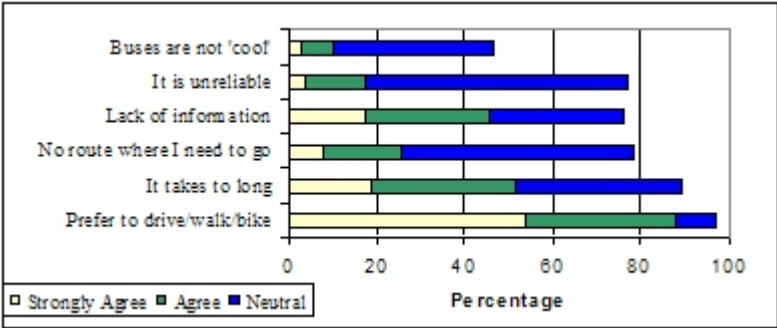


Figure 5.14 What Influences the Mode of Travel (n=387)

The characteristics of transit services that are important to customers are analyzed next. To accomplish this we looked at a number of value characteristics such as free service, convenience, friendly drivers, and environmentally friendly characteristics. Friendly drivers, reliable, free and serves the Fargo/Moorhead area were the greatest agreed upon characteristics among respondents (Figure 5.15).

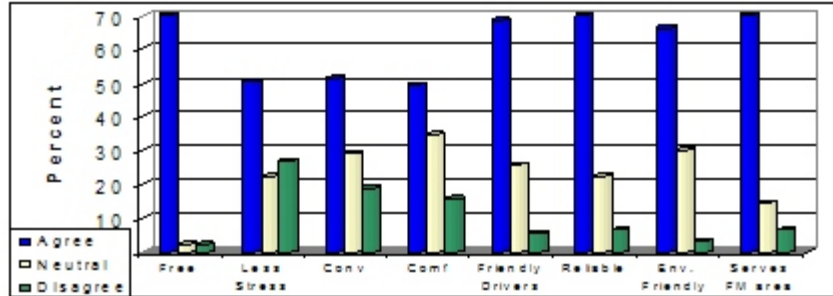


Figure 5.15 Characteristic Values of Public Transportation (n=89)

It is helpful to be aware of how customers perceive their previous MAT service experiences. Arriving reasonably on-time was the worst experience indicated by respondents as less than 70 percent felt MAT buses were reasonably on-time (Figure 5.16).

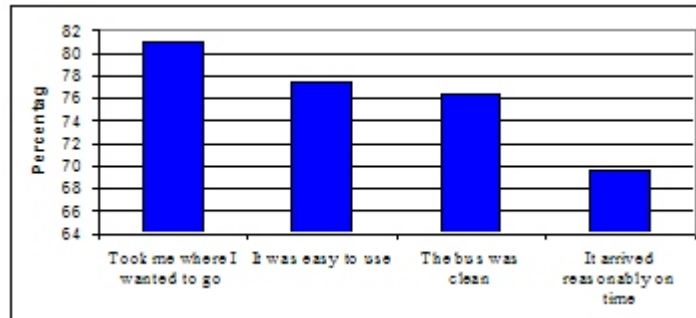


Figure 5.16 Explanation of Experiences (n=89)

In the transit industry, wait times for customers are of utmost importance. According to respondents, a wait time longer than 15 minutes will have a negative influence on ridership (Figure 5.17).

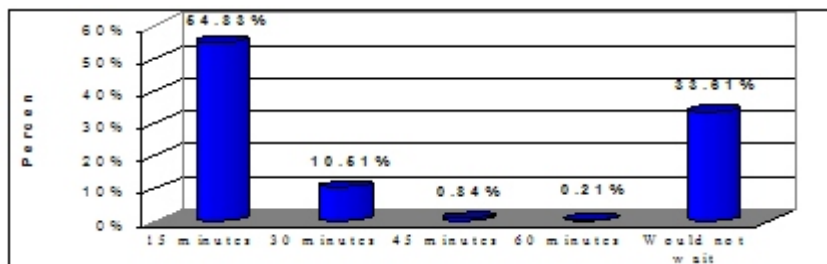


Figure 5.17 Willful Wait Time for MAT bus (n=387)

Student Perceptions of Parking

Parking is generally a major issue on most college campuses. We addressed parking in this survey to identify how many students own parking permits, the cost and the convenience of parking on the MSUM campus.

Just under 60 percent of student respondents indicated they own parking permits (Figure 5.18).

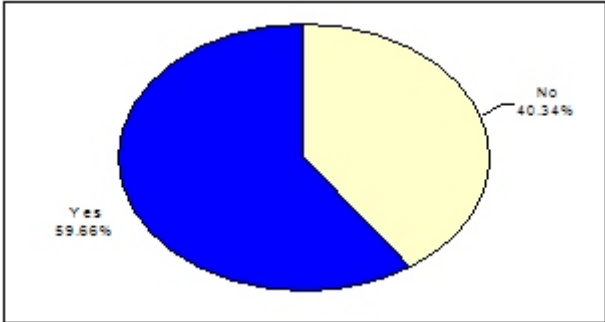


Figure 5.18 Students with Parking Permits (n=476)

The highest number of parking permits issued on the MSUM campus was in the A and A-1 lots respectively (Figure 5.19).

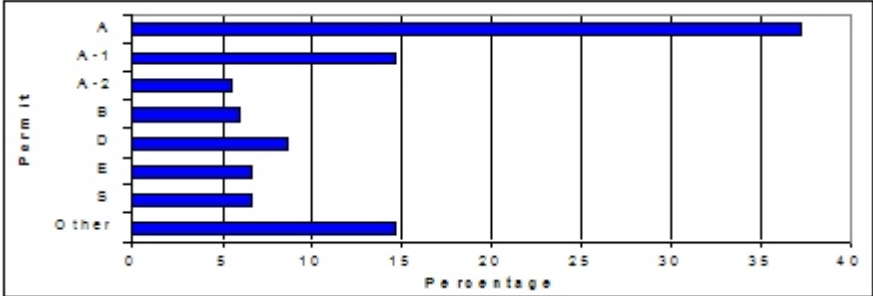


Figure 5.19 Parking Lots Used by Survey Respondents (n=354)

MSUM students are not happy with on-campus parking spaces (Figure 5.20). Nearly 45 percent of student respondents rate MSUM’s parking convenience as either poor or very poor, whereas less than 3 percent of respondents rate the MSUM parking convenience as very good.

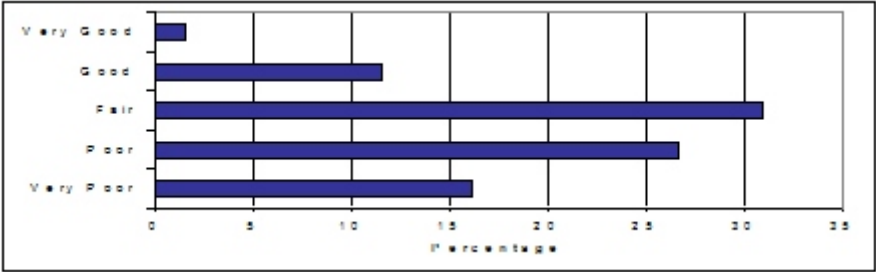


Figure 5.20 Parking Convenience (n=354)

MSUM students are not happy with parking permit prices as well. Nearly 54 percent of respondents rate parking affordability at MSUM either poor or very poor. Less than 15 percent of respondents rated parking affordability as either good or very good (Figure 5.21).

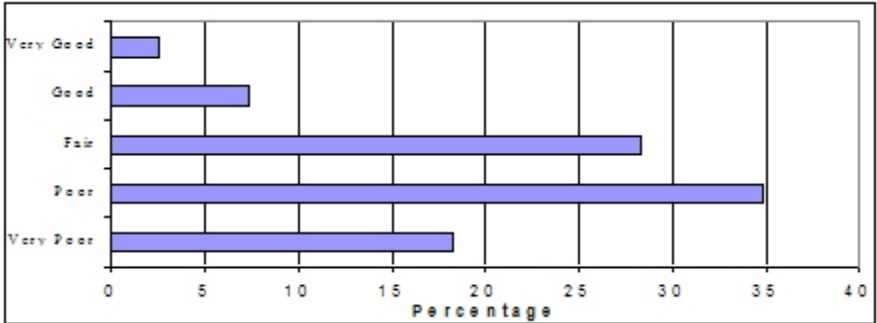


Figure 5.21 Parking Affordability (n=354)

Campus Public Transportation

Three questions were asked to help identify the current demand for MSUM public transportation and where services could be added. First, students were asked if they planned to take Tri-College classes with 431 out of 476, greater than 90 percent, respondents indicated they do not plan to take Tri-College classes. Second, those who answered yes to taking Tri-College classes were asked if they would consider using the MAT bus system to get to and from Tri-College classes. Less than 30 percent of respondents indicated they would consider taking MAT buses to Tri-College classes with greater than 35 percent indicating they would not consider taking MAT buses (Figure 5.22).

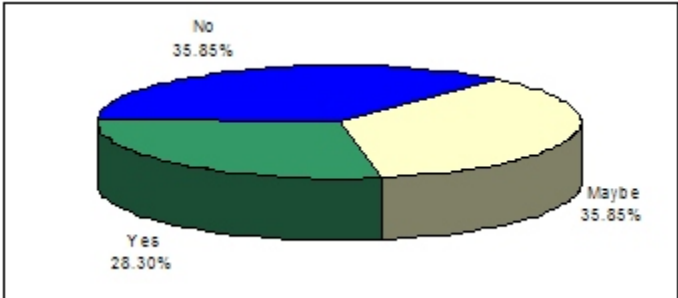


Figure 5.22 Tri-College Students Who Would Consider Taking the MAT Bus (n=476)

Finally, students were asked if they would use a MAT circulator serving the MSUM and Concordia campuses that runs with approximately 15 minute intervals (Figure 5.23). Less than 19 percent of student respondents indicated they would use the circulator, and 37 percent specified that they would not use a campus circulator.

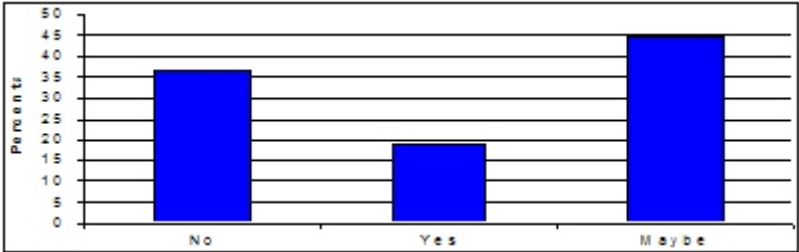


Figure 5.23 Students Who Would Use a MAT Circulator Bus Around MSUM and Concordia if Available (n=162)

Campus Transit Accommodation

The final two questions of the survey pertained to the desire for more heated shelters on campus and the willingness of the respondents to pay an activity fee for additional transit services. Thirty-eight percent of respondents indicated they would like to see more bus shelters on campus, and 43 percent said they would like heated shelters (Figure 5.24).

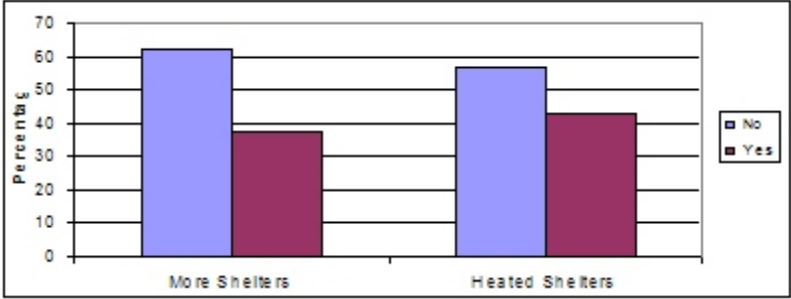


Figure 5.24 Desire for More and Heated Shelters (n=476)

One of the main factors that determine the value of service is if the customer is willing to pay and how much is he/she willing to pay for the service. Slightly more than 22 percent of respondents indicated they were willing to pay \$15 or more for MAT transit service (Figure 5.25).

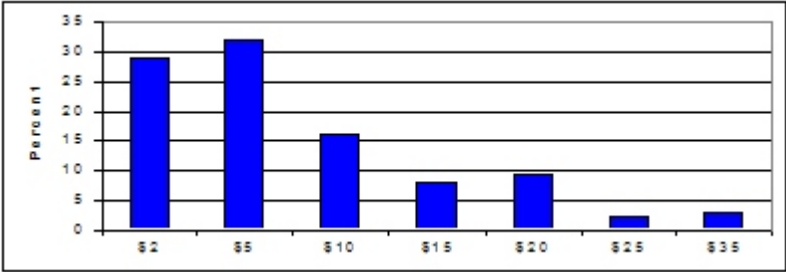


Figure 5.25 How Much Students are Willing to Pay for MAT Service (n=476)

Finally, students were asked if they would be willing to pay an activity fee for free, unlimited use of the MAT bus around campus and the Fargo-Moorhead area. Less than 70 percent of respondents indicated they not be willing to pay additional activity fee for unlimited MAT transportation (Figure 5. 26).

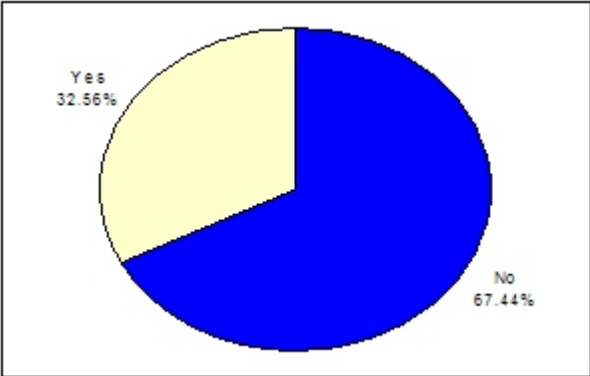


Figure 5.26 Students Willing to Pay Activity Fee (n=476)

Mobility of MSUM Faculty and Staff

Minnesota State University Moorhead (MSUM) is a major employer in the Fargo-Moorhead area. A transit survey was developed to determine faculty and staff transportation needs and to explore options and opportunities in meeting those needs. A letter was then emailed asking MSUM faculty and staff to participate in the survey. Response to the survey included 115 respondents consisting of almost exactly half faculty and half staff members.

The results for the faculty and staff are presented in four main sections. These include: 1) location questions such as distance faculty and staff live from campus; 2) current mobility issues such as access to motor vehicles; 3) utilization of MAT; and 4) campus accommodations for transit.

Location Results

The survey results revealed that greater than 75 percent of respondents live less than five miles from campus (Figure 6.1). A high percentage, (35 percent), live between two and five miles and given the size of the Fargo-Moorhead area, residents who live within a three-mile radius of the MSUM campus should have access to the Metropolitan Area Transit (MAT) routes.

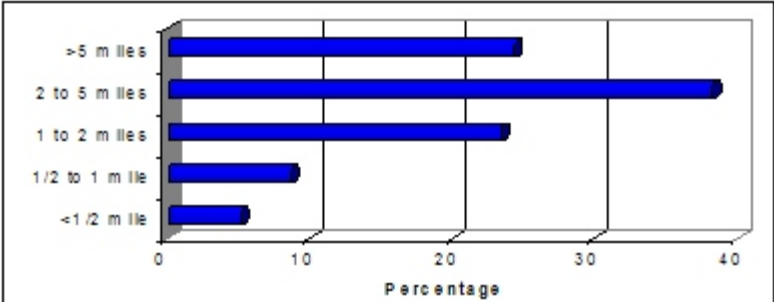


Figure 6.1 Distance Faculty & Staff Live from Campus (n=115)

The majority of faculty and staff indicated they travel from home before arriving on campus (95.65 percent), and almost all of the other respondents (2.61 percent) indicated they travel to MSUM from child care locations (Figure 6.2).

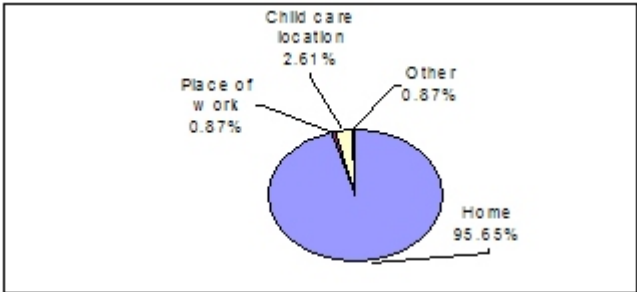


Figure 6.2 Locations Most Often Traveled From (n=115)

Thirty-four percent of faculty and staff reported being on-campus before 8 a.m. (Figure 6.3). More than 90 percent of faculty and staff indicated they are on-campus between 8 a.m. and 4 p.m.

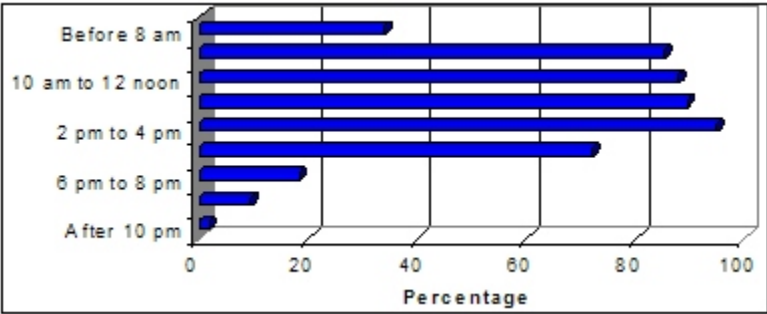


Figure 6.3 Times When Faculty/Staff are On Campus (n=115)

We asked three questions relevant to travel mode to campus. First, we asked faculty and staff how they most frequently travel to campus. Second, we asked if their travel mode changed during the winter. Finally, we asked what factors influenced their mode choice.

Almost 90 percent of respondents indicated they drive their vehicle to campus (Figure 6.4). Fewer than 14 percent of survey respondents indicated they bike or walk to campus and just over 5 percent indicated they take a MAT bus to campus.

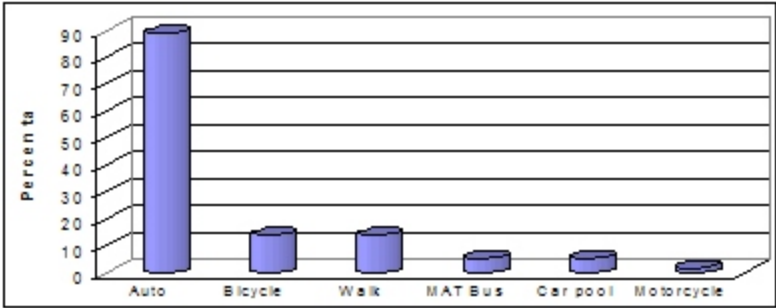


Figure 6.4 Travel Mode to Campus (n=115)

Almost 25 percent of faculty/staff respondents indicated they choose a different mode of travel during the winter (Figure 6.5). Some may choose to ride the MAT as opposed to riding their bike or walking during the winter months.

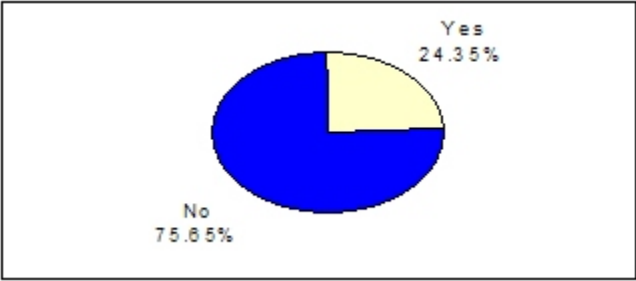


Figure 6.5 Percent That Change Mode During Winter (n=115)

Convenience, time and parking availability are the greatest factors that influence the mode choice of MSUM faculty and staff (Figure 6.6). The survey question asked faculty and staff to indicate the level of importance each of the factors had on influencing mode choice for travel to and from campus.

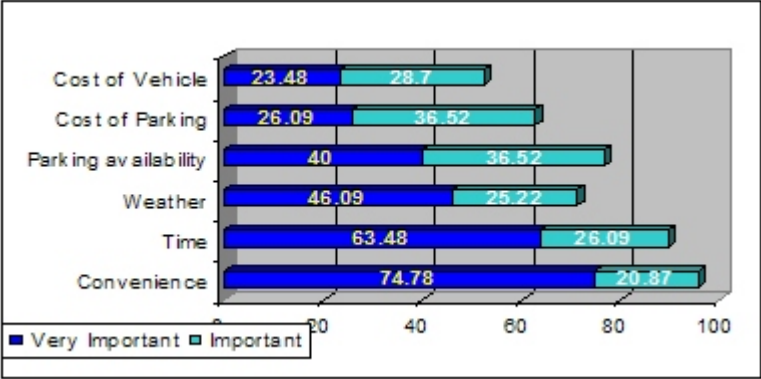


Figure 6.6 Influences on Mode of Travel (n=115)

Seventy-five percent of faculty and staff respondents make two one-way trips to campus per day, equivalent to one round-trip each day. Using public transportation or riding in car pools, would be more accommodating for those faculty and staff making one round trip to and from campus per day.

Parking lots used by surveyed faculty and staff members (Figure 6.7) show that the C and W1 lots are used by more than 50 percent of respondents.

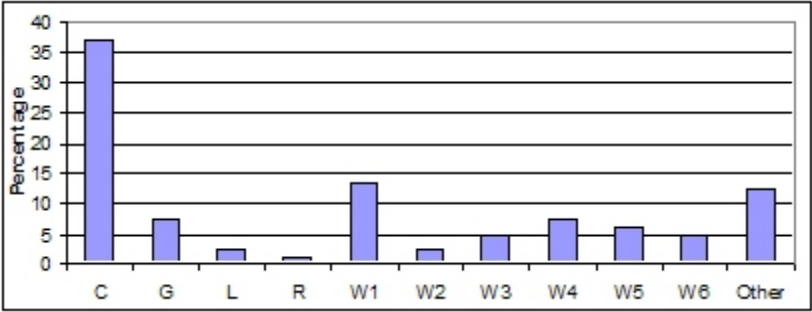


Figure 6.7 Parking Lots Used by Survey Respondents (n=81)

Current Mobility

We asked questions to gain insight into faculty and staff current mobility. This section contains responses to questions about access to motor vehicles, ownership of parking permits, attitudes toward parking convenience and cost.

Most of the faculty and staff surveyed have access to a motor vehicle (95 percent). Sixty-nine percent of respondents indicated they owned parking permits. This shows that many faculty and staff do not park in the MSUM parking lots either choosing not to or due to a lack of available parking permits.

Faculty and staff perceptions toward parking convenience were then analyzed. Approximately 60 percent of respondents indicated they felt parking convenience on campus was good, whereas 43 percent of respondents indicated parking convenience was either poor or fair (Figure 6.8).

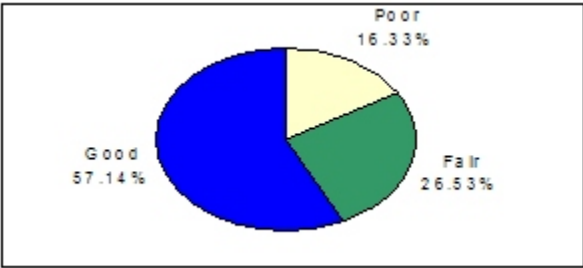


Figure 6.8 Parking Convenience (n=115)

Approximately 35 percent of respondents indicated they thought parking costs were affordable, whereas 36 percent considered parking affordability poor with 29 percent considering parking affordability fair (Figure 6.9).

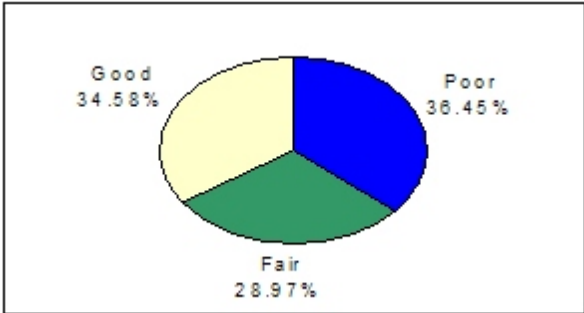


Figure 6.9 Parking Cost (n=115)

Utilization of MAT

A number of questions were asked to discern how faculty and staff view public transportation. We wanted a better understanding of their perceptions of the benefits of public transit, and to learn if they had ever ridden public transportation.

First, survey respondents were asked if they have used and were familiar with the MAT. Less than 36 percent of respondents specified that they were familiar with MAT (Figure 6.10). This shows a large untapped market among MSUM faculty and staff.

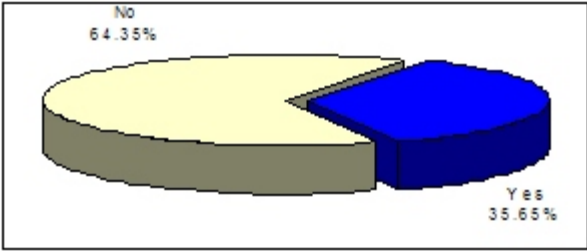


Figure 6.10 Respondents Familiar with MAT (n=115)

Faculty and staff were asked to identify what they believed were the benefits of public transportation on the MSUM campus. The top benefit among respondents was reduced parking demand, followed by reduced traffic congestion, and environmental concerns (Figure 6.11).

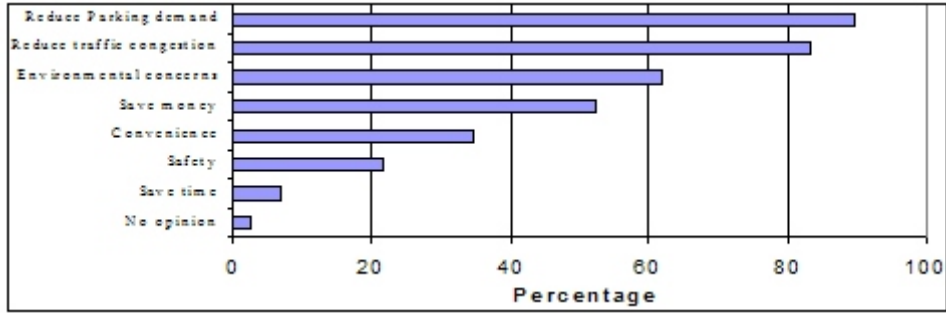


Figure 6.11 Benefits to Riding Public Transportation (n=115)

Among faculty and staff who have ridden a MAT bus, the outlook is quite positive. More than 90 percent felt that the bus was clean, and almost 80 percent of respondents rated the other characteristics as favorable (Figure 6.12). We also asked respondents about characteristics they might value as important for riding MAT. Reliability scored highest among categories at 90 percent followed by it serves the Fargo-Moorhead area (78 percent) and the drivers are friendly (78 percent) (Figure 6.13).

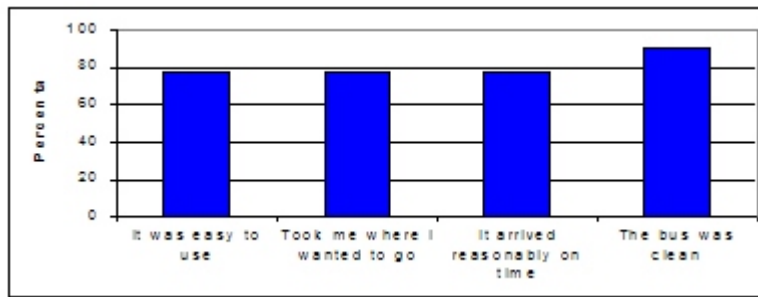


Figure 6.12 Faculty and Staff Experiences Riding MAT (n=41)

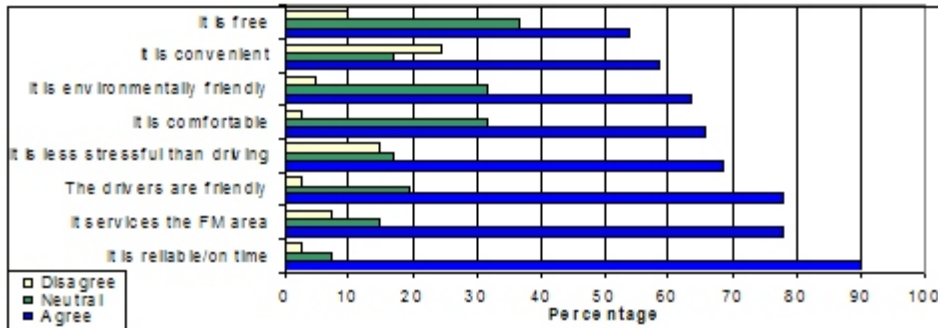


Figure 6.13 Valuable Characteristics of MAT (n=41)

Faculty and staff were asked what keeps them from using MAT bus service. The highest reported reason was their preference to drive, walk or ride their bike. It takes too long was the next answer of choice followed by no route where I need to go (Figure 6.14).

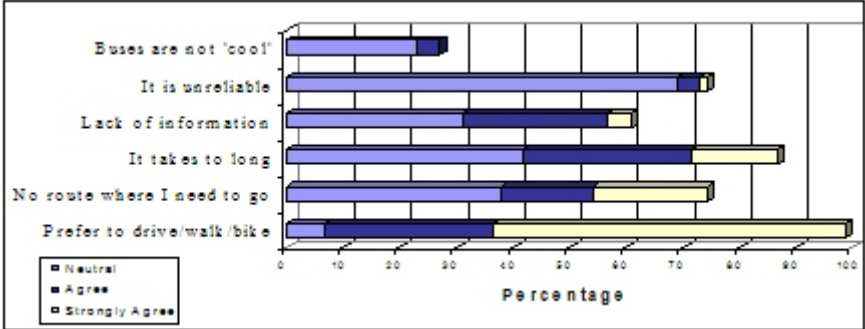


Figure 6.14 Factors that Discourage Use of MAT (n=74)

Respondents were asked how long they would wait for MAT. Fifty-nine percent reported they would wait 15 minutes, 14 percent would wait 30 minutes, and 27 percent would not wait for a MAT bus (Figure 6.15).

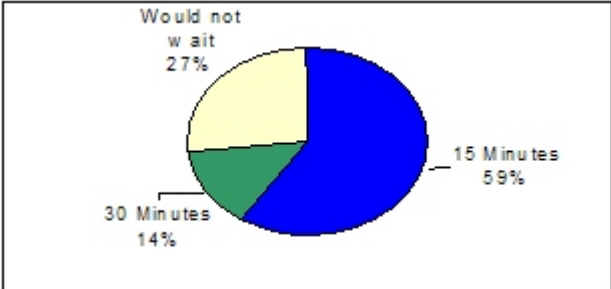


Figure 6.15 Time Willing to Wait for MAT (n=115)

We asked faculty and staff to identify reasons they would ride MAT in the Fargo-Moorhead area. They were presented potential reasons and they were to reply “yes” or “no” for each reason. Just under 30 percent of respondents indicated they would use MAT to get around campus, and 16 percent indicated they would use MAT to get to and from campus (Figure 6.16).

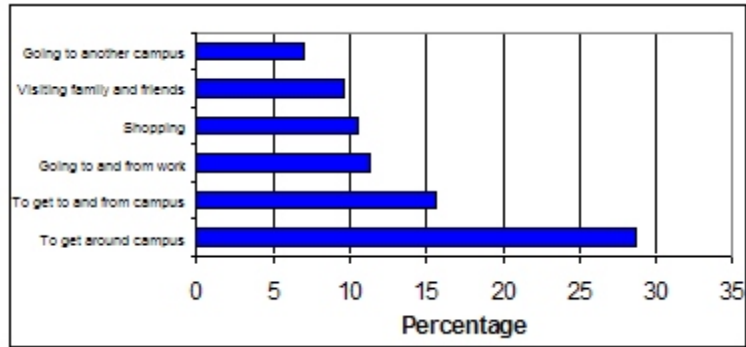


Figure 6.16 Reasons to Use MAT (n=115)

Finally, faculty and staff were asked what they consider reasonable walking distance given a temperature above 32 degrees and above 32 degrees. Discrepancies began to occur at the half-mile to one-mile walking distance (Figure 6.17). Forty percent of respondents indicated they would walk between one-quarter and one mile if the temperature was above 32 degrees, but only 11 percent indicated they would walk the same distance in temperatures below 32 degrees. On-campus transit could increase ridership during winter months according to these results.

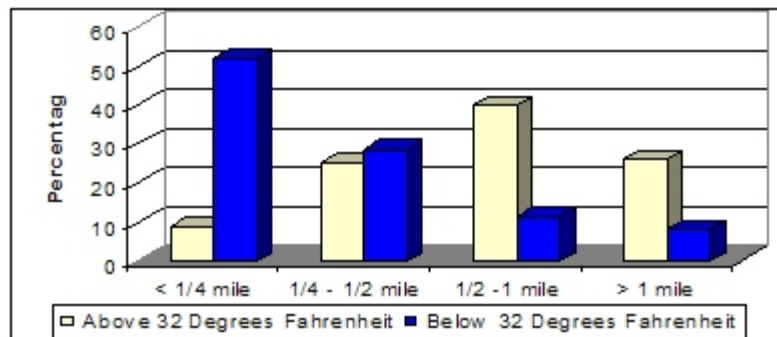


Figure 6.17 Reasonable walking distances in given temperatures (n=115)

Campus Accommodations for Transit

Transit accommodations can make riding the bus more appealing. We asked faculty and staff three questions including: their desire for more and heated shelters, if they would ride a campus circulator with 15 minute intervals, and their willingness to ride MAT buses at a reduced rate or for free.

Fifty-two percent of respondents indicated they would like to see more bus shelters on campus and 46 percent specified they would like the shelters to be heated (Figure 6.18).

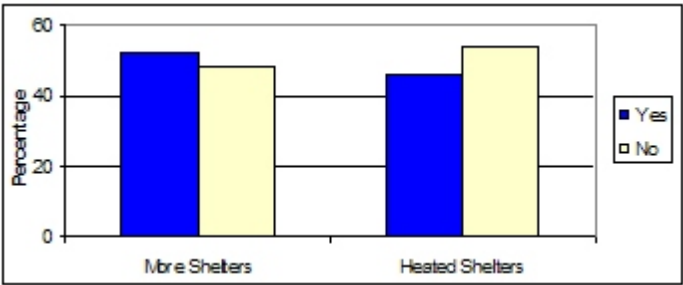


Figure 6.18 Desire for More and Heated Shelters at MSUM (n=115)

Next, faculty and staff were asked if they would use a campus circulator to get around the MSUM campus. Thirty-two percent of respondents specified they would use a campus circulator and 68 percent said they would not use the circulator (Figure 6.19).

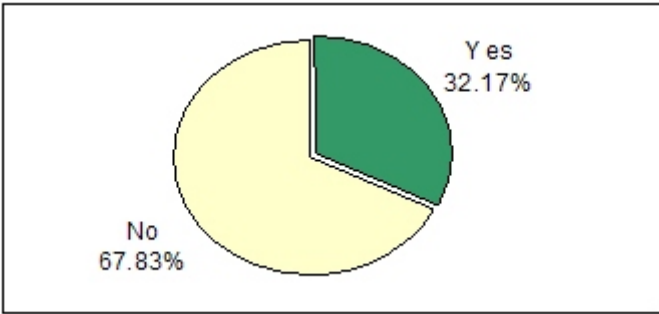


Figure 6.19 Willingness to Use Circulator (n=115)

Finally, faculty and staff were asked their willingness to ride a MAT bus at a reduced rate or for free (Figure 6.20). Thirty-six percent of respondents indicated they would ride a MAT bus if a reduced price monthly pass was offered, and 50 percent specified they would ride the MAT if it were free.

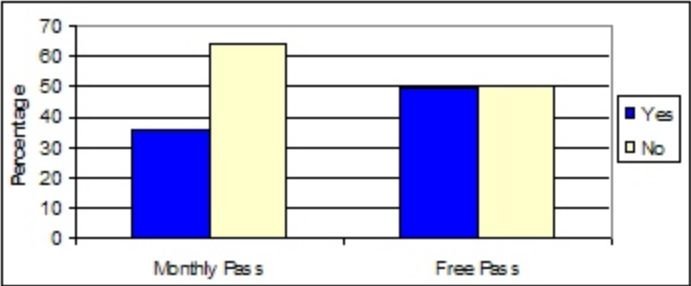


Figure 6.20 Willingness to Ride MAT for a Reduced Rate or Free (n=115)

Mobility of Concordia Students

It is not possible with an electronic on-line survey to ensure equal participation from all students. However, there was proportionate representation from all undergraduate class levels (Table 7.1). The sophomore class had the highest representation with the senior class being the lowest class level represented.

Table 7.1 Survey Response Distribution Compared to Actual Class Distribution

Classification	Actual Class Distribution (99) (%)	Class Number	Response from Class (%)	Survey Number
Freshmen	27.8	829	24.6	111
Sophomores	24.7	735	31.6	143
Juniors	21.6	644	22.1	100
Seniors	23.0	684	20.1	91
Non classified	2.9	87	1.6	7
Total	100	2979	100	452

Student employment status has a vital impact on student responses regarding public transportation. Almost one-fourth of the students were unemployed (Figure 7.1). Nearly half of respondents work on-campus, while less than 30 percent work off-campus. There are noticeable differences in the behaviors of employed and unemployed students that will be discussed throughout this report.

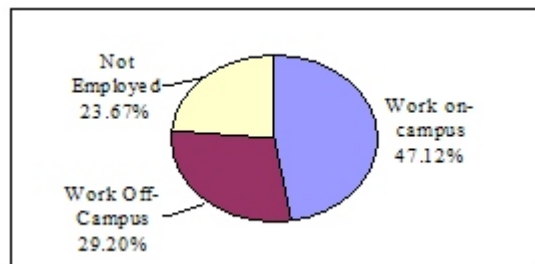


Figure 7.1 Student Work Status

A further breakdown shows that on campus there are more women employed than men (Figure 7.2). This is also true of off-campus student employment. However, more males are unemployed than females. There is no survey information available to explain this difference.

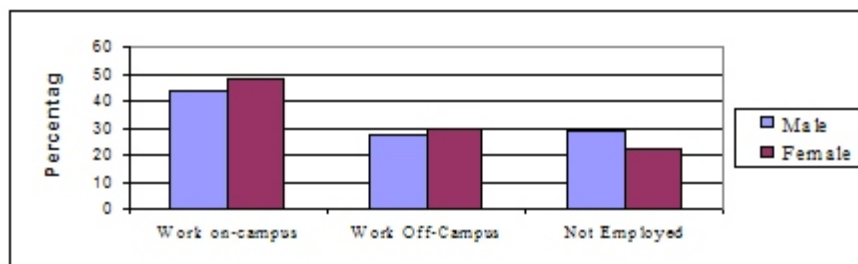


Figure 7.2 Employment by Gender (n=452)

Whether students live on or off-campus was also evaluated. Nearly three-fourths of students surveyed indicated they live on-campus. We received a good distribution across many categories. The class distribution was within nine percentage points and the students living on and off-campus was within seven percentage points. We were unable to get off-campus employment numbers for that comparison.

Movement Demands of Students on Campus

This section will show movement patterns of Concordia students, to, from, and around campus. Survey results in this section tell how far students live from campus, where they are coming from, what time period they spend on campus, how they most often travel to campus, how many have access to motor vehicles, what determines their mode of travel and whether their mode of preference changes in the winter. This information is helpful in determining what services can be offered that will fit into the normal travel activity of the student body.

Students live at various distances from campus (Figure 7.3). Nearly half of student respondents live within one-fourth mile from campus. This illustrates the tight-knit Concordia College community. However, almost 30 percent of respondents indicated they live greater than two miles from campus showing an untapped market sector for public transportation.

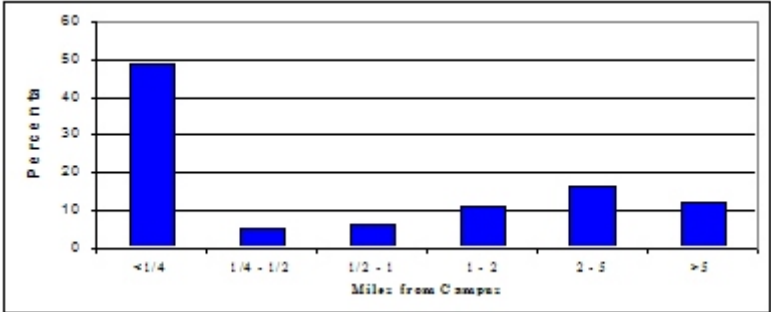


Figure 7.3 Distance Students Live from Campus (n=176)

Almost 87 percent of respondents indicated they normally travel to campus from home (Figure 7.4). About 5 percent travel to school from work and the remaining 8 percent arrive from other places. This shows that most Concordia College students follow a traditional college schedule with classes in the morning and early afternoon and work in the evening as nearly 30 percent indicated they work off-campus, but very few come from work to school.

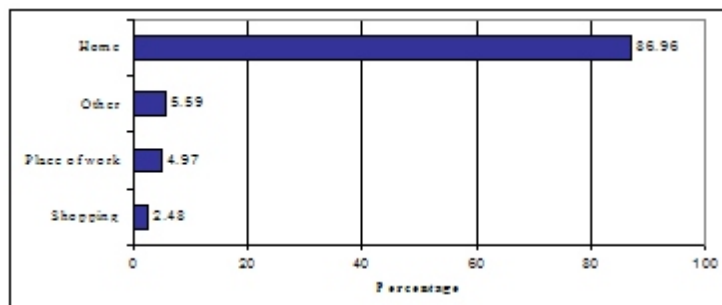


Figure 7.4 Where Students Depart From to Arrive on Campus (n=161)

The majority of student respondents indicated they are on campus between 8 a.m. and 4 p.m., following the normal semester class schedule (Figure 7.5). Between 10 a.m. and noon represents the highest concentration of students on campus. One-third of students indicated they are on campus between noon and 2 p.m.

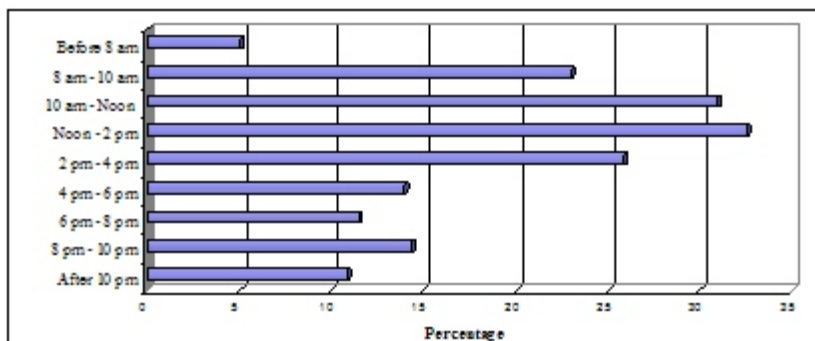


Figure 7.5 Times When Students are on Campus (n=452)

Almost 82 percent of respondents indicated they have access to motor vehicles. Concordia College is well above the national average according to Independent Insurance Agents of America and College Parents of America who have indicated that nearly 70 percent of college students have either their own or use of their parents' car at school.

The majority of respondents travel to school twice (four one-way trips) a day (Figure 7.6). A large number of students also go to school once a day (two one-way trips). Fifteen percent of respondent indicated they make three trips (six one-way trips) to school each day. The proximity of many students to campus allows for the movement from campus to home often for classes or on-campus jobs.

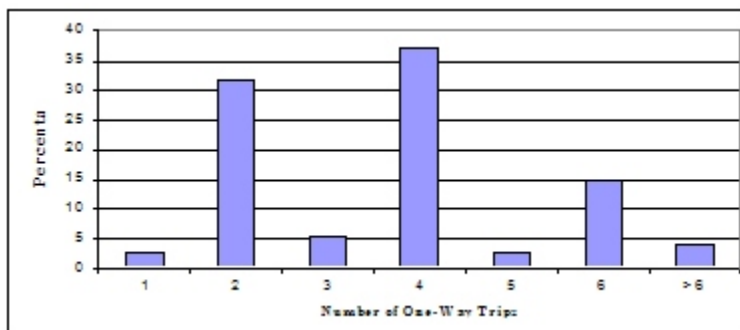


Figure 7.6 Number of One-Way Trips (n=154)

Convenience, time, and parking availability are the three top influences on student modes of travel (Figure 7.7). Convenience as an influence on travel mode received the highest rating as 63.5 percent of respondents consider convenience very important when choosing their mode of transportation. More than 50 percent of respondents indicated that time and parking availability were very important in choosing their mode of transportation.

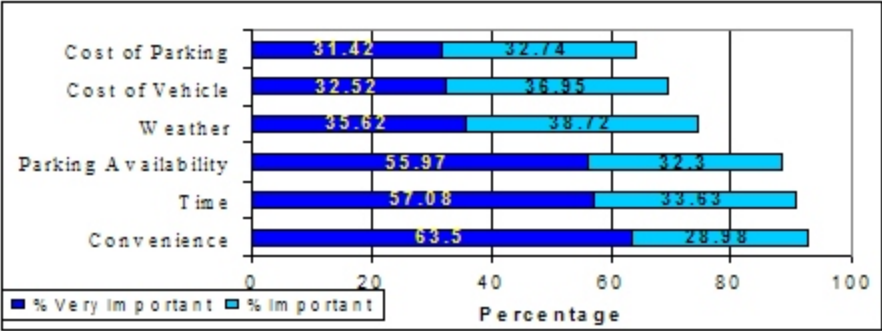


Figure 7.7 Student Modes of Travel

Students who live on campus were asked why they most often leave campus. General shopping, grocery shopping, visiting family and friends, and eating out at restaurants were the main reasons students indicated they leave campus (Figure 7.8).

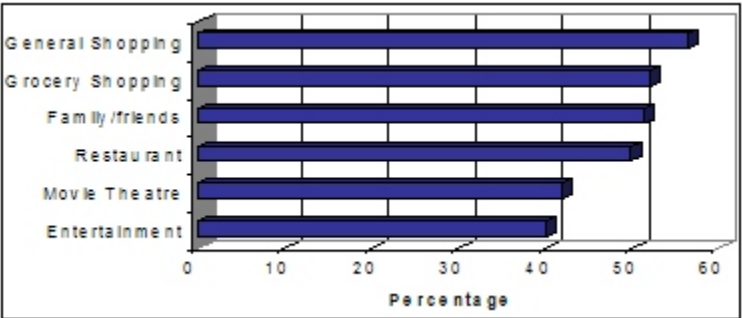


Figure 7.8 Why On-Campus Students Leave Campus (n=452)

The majorities of student respondents either walk or drive to campus, 83 percent (Figure 7.9). Almost 10 percent of students carpool, which leaves only a select few riding bike, taking public transit or getting to school by some other means. Students previously indicated that convenience, time and parking availability were main factors in choosing their means of getting to and from campus. Therefore, a relationship exists between respondents indicated walking, driving, and carpooling as transportation modes, all which provide convenience, short travel times, or a relief from parking congestion.

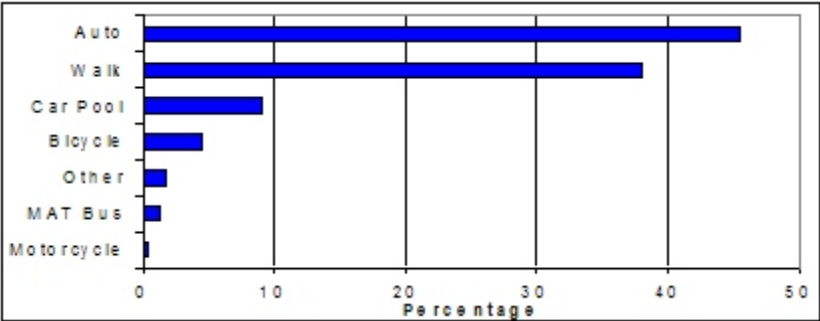


Figure 7.9 Students mode of Travel to Campus (n=452)

If a student has a car, he/she can travel any time of the year regardless of the outdoor temperature. Results show that more than 34 percent of students choose their mode of travel because of weather (Figure 7.10). Students were asked how far is too far to walk to campus in differing temperatures. Weather had a large influence on walking distance (Figure 7.11). Almost 40 percent of respondents indicated one-half to one mile was reasonable walking distance in above freezing temperatures, whereas less than 7 percent of respondents considered the same distance walkable in below freezing temperatures.

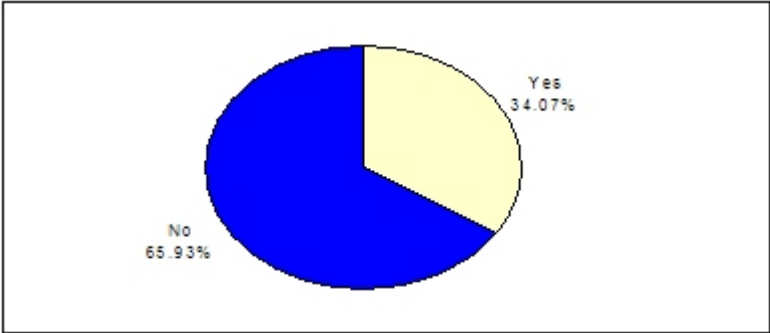


Figure 7.10 Weather Influences Mode of Travel in Winter (n=452)

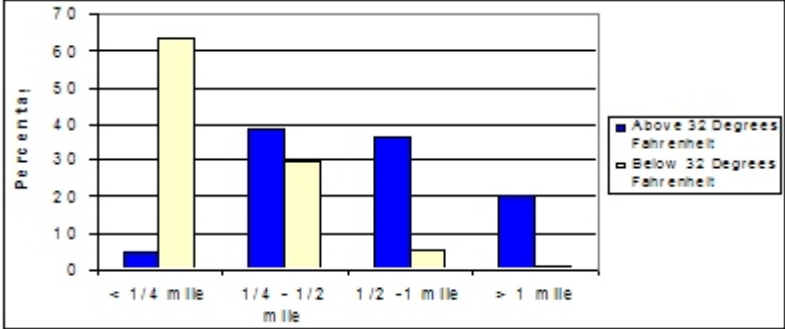


Figure 7.11 Reasonable Walking Distance by Temperature (n=452)

Student Perceptions of MAT Services

This section of the report focuses on the student respondent's perceptions of the quality of MAT transit system services.

There are many benefits to public transportation. The following (Figure 7.12) is a list of benefits the students identified as most important to them which included reducing parking demand and reducing traffic congestion as the two greatest benefits.

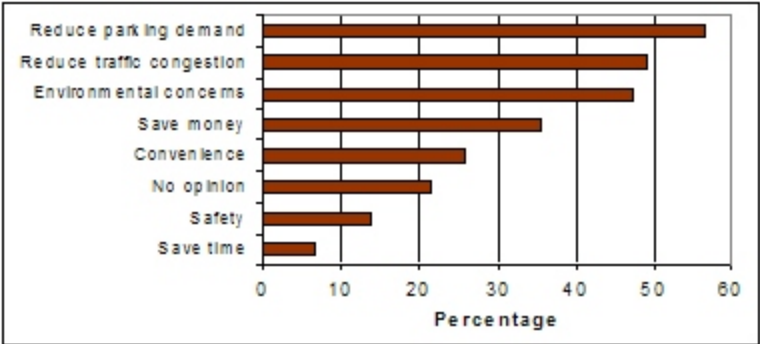


Figure 7.12 Benefits to riding Public Transit (n=445)

The following (Figure 7.13) are the student respondents who use MAT services with less than 25 percent indicating they use MAT to travel in the community.

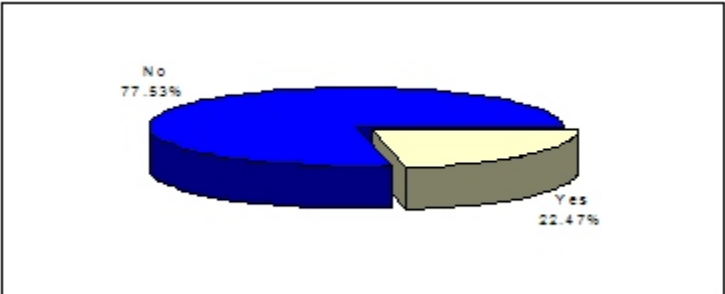


Figure 7.13 Students Using MAT (n=445)

An important issue is what motivates students to use MAT. Survey respondents were asked to state their most important reasons for using MAT from among the following choices (Figure 7.14). Shopping and going to another campus were the main reasons Concordia students use MAT.

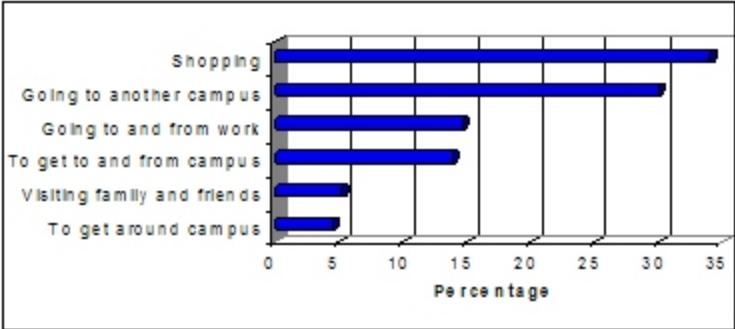


Figure 7.14 Reason Students use MAT (n=445)

We asked students to identify the reasons that keep them from riding MAT. We provided potential reasons and asked students to indicate how strongly they agreed, were neutral or disagreed. The primary reason students do not ride transit is their desire to drive, walk or ride bicycle (Figure 7.15).

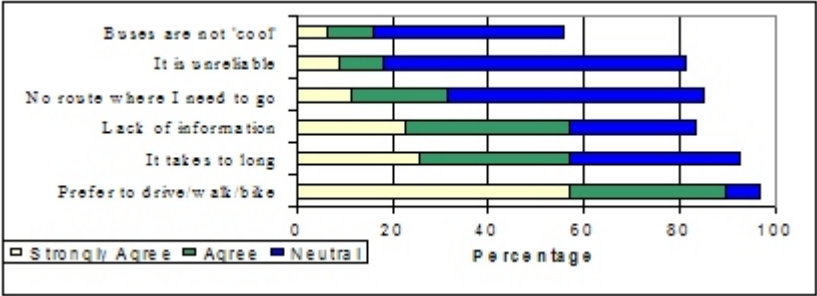


Figure 7.15 Reasons Students Do Not Ride MAT (n=345)

The characteristics of transit services that are important to customers are analyzed next. To accomplish this we looked at a number of value characteristics such as less stress, convenience, friendly drivers, and environmentally friendly characteristics. Serves the Fargo-Moorhead area and reliability were the greatest agreed upon values among respondents (Figure 7.16).

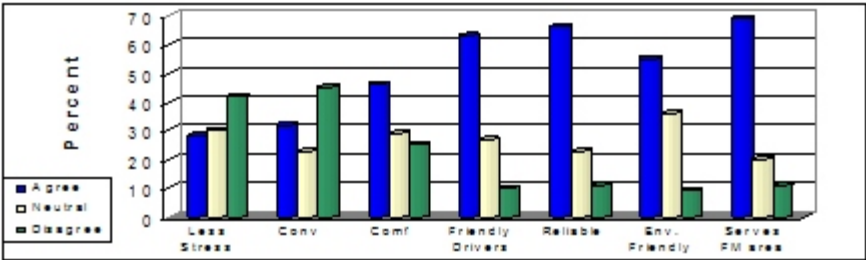


Figure 7.16 Important Characteristic Values of Public Transportation (n=100)

It is helpful to be aware of how customers perceive their previous MAT service experiences. This response shows if MAT services are living up to expectations (Figure 7.17). Eighty-one percent of respondents indicated that MAT bus service took them to their desired destination indicating current route locations are well positioned.

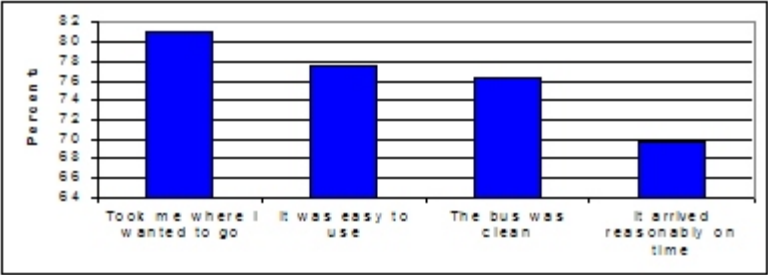


Figure 7.17 Explanation of Experiences (n=100)

In the transit industry, wait times for customers are of utmost importance. According to respondents, a wait time longer than 15 minutes will have a negative influence on ridership (Figure 7.18).

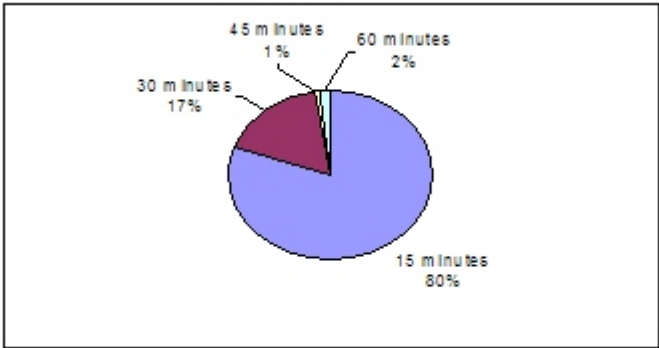


Figure 7.18 How Long People are Willing to Wait (n=445)

One of the main factors that determine the value of service is if the customer is willing to pay and how much is he/she willing to pay for the service. More than 70 percent of respondents indicated they are willing to pay \$10 or more for MAT services (Figure 7.19). This shows high appreciation for the service.

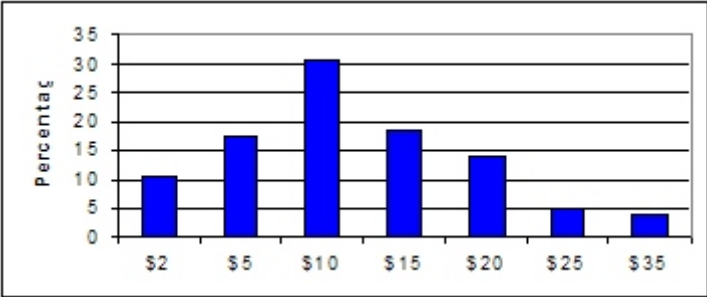


Figure 7.19 How Many are Willing to Pay More (n=201)

Students Perceptions of Parking

Parking is generally a major issue on most campuses. We addressed parking in this survey to identify how many students own parking permits, the cost of parking and the convenience of parking on the Concordia College Campus.

Slightly more than 75 percent of survey respondents have parking permits (Figure 7.20).

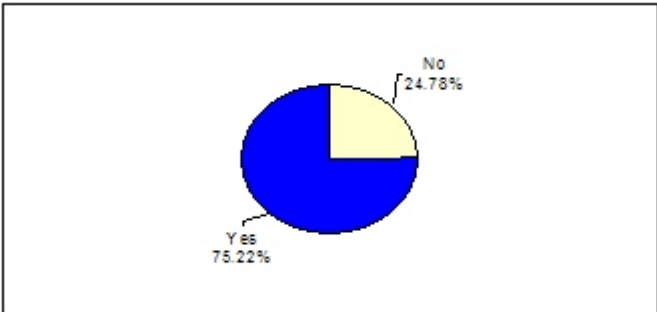


Figure 7.20 Students with Parking Permits (n=452)

The highest concentration of parking permits issued on the Concordia campus were in the FP and C lots, according to respondents (Figure 7.21).

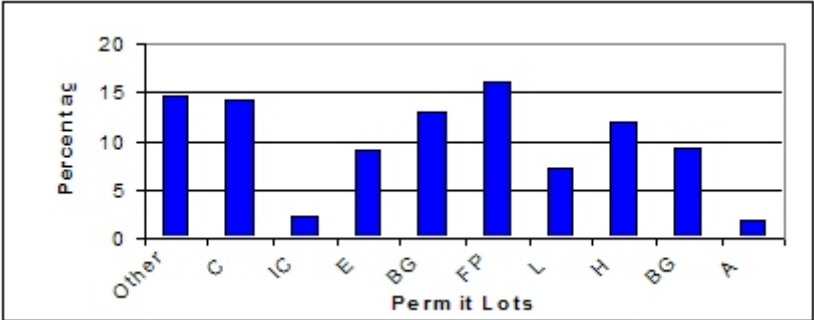


Figure 7.21 Parking Lots Used by Survey Respondents (n=343)

Concordia students are not happy with on-campus parking conditions (Figure 7.22). Greater than 50 percent of respondents rate Concordia’s parking convenience as either poor or very poor, whereas less than 3 percent of respondents rate the parking convenience very good.



Figure 7.22 Parking Convenience (n=452)

Parking affordability is perceived differently. More than 54 percent of respondents rate parking affordability as either very good or good, and less than 5 percent rate affordability either poor or very poor (Figure 7.23).

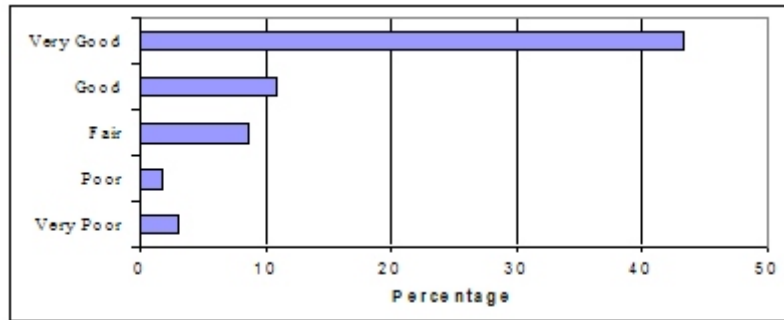


Figure 7.23 Parking Affordability (n=452)

Campus Public Transportation

Three questions were asked to help identify the current demand for Concordia public transportation and where services could be added. First, students were asked if they planned to take Tri-College classes. Only 50 of the 445 respondents indicated they planned to take Tri-College classes. Second, those who answered yes to taking Tri-College classes were asked if they would consider using the MAT bus to get to and from Tri-College classes. Just under 40 percent of respondents indicated they would consider taking MAT buses to Tri-College classes with roughly the same percentage indicating they would not consider taking the MAT bus (Figure 7.24).

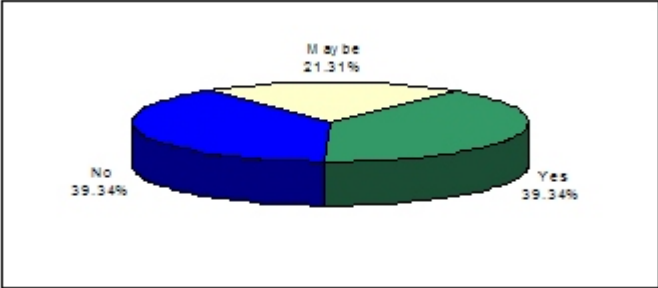


Figure 7.24 Tri-College students who would consider taking MAT bus (n=445)

Finally, students were asked if they would use a MAT circulator route serving the MSUM and Concordia campuses that runs with approximately 15 minute intervals (Figure 7.25). Twenty percent of respondents indicated they would use the MAT circulator and almost 50 percent indicated they may use the circulator.

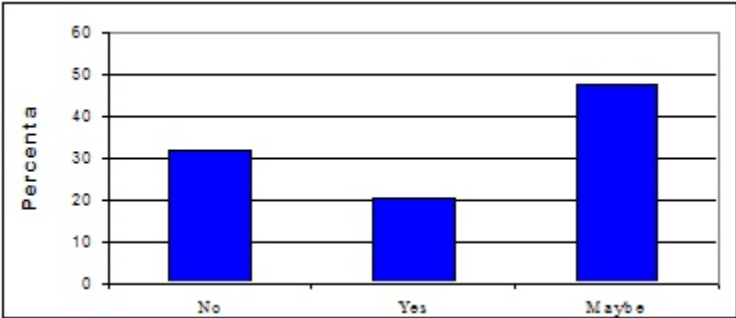


Figure 7.25 Students who would use MAT Circulator bus around MSUM and Concordia if available (n=445)

Campus Transit Accommodation

The final two questions of the survey pertained to the desire for more heated shelters on campus and the willingness of the respondents to pay an activity fee for additional transit services. Twenty-five percent of respondents indicated they would like to see more bus shelters on campus, and 40 percent said they would like heated shelters (Figure 7.26).

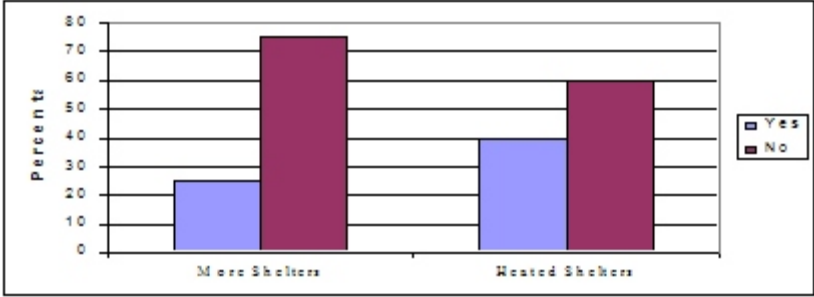


Figure 7.26 Desire for More and Heated Shelters (n=445)

Finally, students were asked if they would be willing to pay an activity fee for free unlimited use of the MAT bus around campus and the Fargo-Moorhead area. Just under 60 percent indicated they would not be willing to pay additional activity fee for unlimited MAT transportation (Figure 7.27).

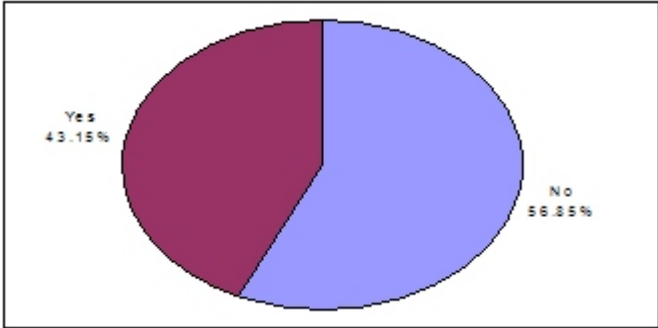


Figure 7.27 Students Willing to Pay Activity Fee (n=445)

Results and Findings

Five separate groups were surveyed within this study. They included students representing North Dakota State University (NDSU), Minnesota State University Moorhead (MSUM), and Concordia College along with faculty and staff from NDSU and MSUM respectively. Findings among the student groups as well as the faculty and staff groups were very uniform. This was a hypothesized finding at the outset of the study as demographically, all three higher learning institutions are statistically consistent.

Student respondents gave very useful information about themselves, including demographics regarding the student body, an idea of current student movement around campus, the value of the current MAT services, their perceptions of the parking situation on campus, and opinions about the current accommodations for transit on campus. NDSU student respondents also provided useful insight regarding its campus circulator.

The next step is for the campuses to respond to the viewpoints of the student body. Responding in a positive manner will encourage growth in transit use, while no response or a negative response will stifle growth of transit on each respective campus. Increasing the convenience of transit services on all campuses will lead to the most substantial increase in student ridership. The convenience of public transit will never rival that of the personal automobile, but by increasing the frequency of service along designated routes, students will have more options when considering their travel to and from campus as well as their travel within the entire metro area. Greater marketing efforts on the part of MAT will aid in improving ridership as well.

This study found that faculty and staff are very reliant upon their personal automobiles. However, there does appear to be openness to public transportation, but the more efficient routes need to serve the residential areas of both the NDSU and MSUM employees and provide more direct service to campus in an attempt to reduce travel time. Further, it appears there is a need for better marketing of the bus schedules and service to campus faculty and staff. For example, more than 60 percent of MSUM faculty and staff were unfamiliar with the service that MAT provides. Making public transit convenient and easy to use can address both campuses' mobility growing pains. Convenience and ease of use are aspects of MAT service that must also be addressed to increase the utilization of public transportation on the MSUM and NDSU campuses and throughout the entire Fargo-Moorhead area.

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