12-1-1974

A Comparison Between Fargo and Grand Forks, North Dakota Citizens no Bicycle Usage and Attitudes

Michael Steven Schend

A COMPARISON BETWEEN FARGO AND GRAND FORKS, NORTH DAKOTA CITIZENS ON BICYCLE USAGE AND ATTITUDES

by

Michael Steven Schend

Bachelor of Science, North Dakota State University, 1972

A Thesis

Submitted to the Graduate Faculty

of the

University of North Dakota

in partial fulfillment of the requirements

for the degree of

Master of Science

Grand Forks, North Dakota

December
1974

This Thesis submitted by Michael Steven Schend in partial fulfillment of the requirements for the Degree of Master of Science from the University of North Dakota is hereby approved by the Faculty Advisory Committee under whom the work has been done.

(Chairman)

W. C. Koenig

John D. Williams

A William Johnson
Dean of the Graduate School

Permission

Title A COMPARISON BETWEEN FARGO AND GRAND FORKS, NORTH DAKOTA CITIZENS ON BICYCLE USAGE AND ATTITUDES

Department Physical Education

Degree Master of Science

In presenting this thesis in partial fulfillment of the requirements for a graduate degree from the University of North Dakota, I agree that the Library of this University shall make it freely available for inspection. I further agree that permission for extensive copying for scholarly purposes may be granted by the professor who supervised my thesis work or, in his absence, by the Chairman of the Department or the Dean of the Graduate School. It is understood that any copying or publication or other use of this thesis or part thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the University of North Dakota in any scholarly use which may be made of any material in my thesis.

Signature Michael Schrad

Date 12/3/74

ACKNOWLEDGMENTS

The writer wishes to express his sincere appreciation to Dr. LaVernia Jorgensen, Chairwoman of his graduate committee, for her valuable time, assistance and guidance.

A very special acknowledgment is extended to Gary Leppart, President of the North Dakota Bureau of Outdoor Recreation, for his support, assistance and financing the survey.

The writer would like to express his thanks to Dr. John Williams and Dr. Walter Koenig for their valuable assistance.

In addition, the writer would also like to extend a special word of thanks to Mrs. Lorraine Rose for the typing of the manuscript.

TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

The purpose of this study was to compare Fargo and Grand Forks residents on the status of bicycle usage and attitudes in order to determine the feasibility of bikeway implementation.

The survey method was employed in this study. One thousand questionnaires were sent to the residents of Grand Forks and Fargo, 500 to each city. However, 180 questionnaires were returned "address unknown." Therefore, 820 questionnaires were received by the addressees in both cities. Two hundred and thirty-three, or 28.4 per cent, individuals responded to the questionnaire. One hundred and ten, or 28.6 per cent, Fargoans and 123, or 28.2 per cent, Grand Forks residents responded to the questionnaire. The data obtained from the questionnaires were transferred to computer cards for analysis. The information was then arranged into tables for analysis and interpretation.

As a result of the findings obtained during the investigation the following conclusions appeared warranted:

1. Although Grand Forks citizens of all ages may ride bicycles, the typical rider is young, male and rides for one reason at a time. On the whole, all of the riders use their bikes for exercise, sport and pleasure, but are more serious about the transportation aspect. These serious riders use their bikes for short periods of time, usually to travel from one place to another.

2. Although many Fargo citizens of all ages ride bicycles, the typical rider is young and male. Bicycle usage is usually of the single interest type. All of the bicyclists use their bikes for exercise, sport and transportation. However, Fargo residents are more interested in riding for relaxation and enjoyment than Grand Forks riders. These pleasure riders use their bicycles for longer periods of time, usually for weekend jaunts through the parks.

3. On the whole, residents of both Fargo and Grand Forks possess a healthy attitude toward biking as a recreational activity. However, a provincial attitude prevails which limits biking activity to the confines of the city. Residents in both cities felt city parks and city streets should be developed for bike paths and bikeways before attention and money was given to other areas for development.

4. On the whole, many Grand Forks and Fargo residents ride their bicycles for intra-city usage. However, the idea of using their bicycles for longer periods of time and for long distances held their interest. Cross-country bikeway development was approved by the population. However, residents in both cities could be considered "home bodies" in 1974 and in no particular rush to venture beyond the city limits. They felt the future held more opportunities and if the facilities existed, they would probably use them.

5. On the whole, residents from Grand Forks and Fargo had a positive attitude toward all aspects of bicycling. However, there were those who were disturbed by the dangers involved. They felt that this aspect limited the potential of full participation in this type of recreational activity. And, until these problems were solved, it would be best to remain within the confines of the city.

CHAPTER I

INTRODUCTION

Bicycle popularity hit an all time high in the United States during the year of 1974. An estimated 61 million Americans rode bicycles. The use of bicycles for recreation and transportation has steadily increased during the 1970's with no signs of decreasing in the future. The increasing use of bicycles was verified by the level of new bicycle production and sales.

Projections of this future growth reflected five aspects in our culture: disposable income, population, mobility, leisure and urbanization. People have income in various amounts set aside for recreational purposes. Such an activity as bicycling supplied this recreation demand at a reasonable cost. The increase in population and urbanization has caused a demand for more recreational activities. Bicycling was a means whereby people could participate regardless of age and sex. The mobility of our population has not only increased, but it has caused people to search for different ways to reduce congestion and pollution. People in the 70's seemed to be more ecology minded than in previous years. This concern coupled with the energy crisis caused people to seek a cheaper means of transportation.

Bicycling has the potential to be a great leisure time activity and may be used to enjoy a weekend or holiday or other available time periods. Bicycling may be considered as a relaxing activity and means

of escape from all the social, economic and political forces that seem to harass people daily. Bicycling, as a leisure time activity, may provide pleasure, entertainment and a means of physical exercise. All of these aspects seemed to point to a continuation and acceleration of bicycling as an excellent recreational vehicle. It was anticipated that one-third of North Dakota's residents would be using bicycles for pleasure and transportation by 1980 (1). Fargo, Minot and Bismarck have begun to develop special areas for bicycle use. Everywhere communities surveyed and planned for bikeways to facilitate the increase of bicycles.

Carlson stated that anything to do with recreation should attempt to meet the individual and group needs and desires of the people (2). Since nearly everyone seems to attempt to continually seek new experiences, recognition and entertainment, perhaps bicycling has the potential of being an ideal recreational program for a community, state or nation. It could provide equal participation for all regardless of age, sex, race, social and economic status. Bicycling as an activity has no time barrier and people can use it at their convenience. Bikeways could be a type of facility that potentially has the capability of meeting the outdoor needs of people in the future more than any other public facility.

Knox felt that bicycling has not required great athletic prowess nor has it been considered a factor (3). Also, considering that over 61 million people owned and rode bicycles in 1974, biking seemed to be America's most popular outdoor sport. The number of people who owned bicycles made up almost one-third of the entire population of the United States. Yet, facilities to supply this demand were limited. Adult sales accounted for over 30 per cent of the seven million bikes sold in 1972, whereas only 10 per cent of the bike sales in 1971 were adult

sales (4). Bicycle demand in 1974 exceeded the supply. Schwinn's production schedule of 1.2 million bikes was up 37 per cent from 1970 and was sold out by May of 1971 (5).

American cyclists shared the road with motor vehicles, which was the law in most states, with some exceptions locally. As a result, the accident rates have increased drastically. Bicycling became a very dangerous sport. Lack of safety regulations prevented many from participation. Knox stated that 820 people died and 39,000 were injured as the result of bicycle and automobile collisions in 1969 (3). These figures have increased every year. Additional bikeways could perhaps alleviate this problem considerably.

There was also a need to create an efficient means for transporting people which would minimize noise, congestion, and air pollution. There was an extreme need for the development of alternate modes of transportation. The bicycle became an appropriate means of transportation in terms of the environmental consequences America faced. The topography of North Dakota seemed to be ideal for bikeways. A reasonable climate during the months of April through October have been considered ideal. Just as the United States, North Dakota's number one recreational activity was bicycling (6). There was no other outdoor activity that was repeated so often, in comparison to the percentage of people that participated, than bicycling. However, the most important aspect was the inadequacies of street and road systems for handling bicycles safely, and the need for providing bicyclists with the measure of protection to which they were entitled.

Purpose

The purpose of this study was to compare the usage and opinions of the people from Fargo and Grand Forks, North Dakota, on the subject of bicycling. The study was to determine if the amount of bicycle ownership and usage was a basis for future bikeway construction and implementation.

An attempt was made in this study to discover people's thoughts about different aspects of bicycling as well as to acquire needed general information about the people themselves. Then the aspects were placed and discussed in a perspective which might promote and attain a new approach to bicycling and its ramifications.

Need for the Study

A survey of bicycle usage and attitudes in North Dakota was warranted to determine current trends and needs. Furthermore, the researcher was of the opinion that, only through an analysis of North Dakota residents on the subject of bicycling, could plans be developed for bikeway implementation. It was hoped that the information formulated by this study would be used by the North Dakota Outdoor Recreation Agency in developing and constructing bikeways throughout the state. In addition, it was also hoped that this study would help other states and interested individuals begin bicycling programs.

The importance of the study was to attempt to set the stage for the development of a recreational facility that could benefit North Dakota citizens. It has been statistically shown that bikeways are needed because of the large number of participants, accidents and deaths that have occurred from unsafe conditions.

Delimitations of the Study

Delimitations included the following:

1. The instrument used to collect data for the study was a questionnaire.
2. The study was limited to 1000 residents from both Fargo and Grand Forks, North Dakota.
3. The study was limited by the number of people responding.
4. The study was restricted by the limitations of the survey method of collecting data due to time and expense.
5. The survey included the opinions of some respondents.
6. The method of sampling limited the study to only those subjects that had telephones and were listed in Grand Forks and Fargo telephone directories.

Definition of Terms

Bikeway.--A designated bicycle route.

Bike lane.--An off-street bikeway.

Exclusive bikeway.--Completely separate from roads of any kind.

Restricted bikeway.--Separated from traffic by stripping and signs to warn of bicycle presence.

Shared bikeway.--On the street and road systems without lane stripping, just signs to warn of bicycle presence.

Review of Literature

Staley and Miller stated that bicycling has been considered a very good activity to be used during periods of leisure (7). Leisure has been considered an individual feeling which took on three

functional aspects: relaxation, entertainment and development. The relaxation consisted of doing something free wheeling of a goal. Entertainment was the use of one's imagination to its fullest potential. Development increased the spiritual, physical, social and emotional aspects.

Historical Aspects

Aigner, Jensen, Powers and Wentworth stated that historically, man's first primitive impulses toward the bicycle were revealed in the sculptured bas-reliefs of a first century B.C. Middle Eastern Mervinian culture (8). In unmistakable detail, the relic shows a woman, dressed as a warrior, astride a two-wheel vehicle and holding onto a handlebar steering mechanism. The response, as to whom the invention of the first bicycle may be ascribed, varied from country to country. As early as 1418, Giovanni Fontana of Padua, Italy, designated a small carriage powered by a circle of rope running through a pulley. The rider supposedly sat in the wagon and pulled the rope, setting a system of gears into motion that made the wheels go round. More than three-hundred years later, in 1764, an Englishman named Overdon was among many inventors working on man operated carriages. His carriage was capable of traveling six miles per hour with ease and, with great exertion, up to ten miles per hour. Chevalier de Sivrac designed and built the earliest two wheeled, rider powered vehicle in France in 1790. It had no brakes, it could not be steered, and it could hardly corner. A bike was produced more to the public's liking in 1816 by Baron Karl Drais in Karlsruhe, Germany. It was a comfortable two-wheeled vehicle consisting of a wooden bar, with a saddle attached to

two medium sized wheels, that the rider propelled by pushing his feet backward against the ground. It was steered by a handle attached to the front axle. This vehicle weighed anywhere from 40 to 60 pounds and caught on very fast in England. It became known as the hobbyhorse and it attained status among fashionable young men, who even attended special schools to learn how to ride them. But, the craze only lasted four or five years.

The hobbyhorse was soon replaced by a better machine. In 1839, Kirkpatrick MacMillan developed a wooden bicycle complete with a saddle and rear wheel drive. After two and one-half years passed, MacMillan set out on a long distance ride. He was destined to achieve many firsts, but, his only achievement was the distinction of having the world's first bicycle accident! He knocked down a child and was fined five shillings for presenting danger to the public.

Until 1851, MacMillan reigned as the undisputed inventor of the bicycle. Then it was claimed that a peasant, known only as Artamonov of the Soviet Union, rode a bicycle of his own invention into Moscow in 1801. The news reports said that Artamonov was given the idea by other Russians who built three and four wheeled vehicles as far back as 1752.

In 1848, Parisians Pierre and Ernest Michaux introduced a bicycle with a rotating crank integral with the front hub. The Michaux machine was called a velocipede, more commonly known as a "boneshaker," because of the rough ride the iron rimmed wooden wheels provided when riding over cobblestone.

The 1860's were a time of advance. Solid rubber tires were put on the "boneshaker" in 1869 along with a chain drive. But the real advance was the first bicycle factory developed by the Michaux brothers.

By 1865, their factory was turning out four-hundred bicycles a year. One of their mechanics, Pierre Lallement, designed a much better machine and emigrated to the United States with his bike. He and a partner, James Carrol of Ansonia, Connecticut, took out the first American bike patent.

In the meantime, the Michaux brothers developed a sewing machine factory in England. In 1870, James Starley, a foreman and one of the founders of the factory, patented a tension spoked wheel for sewing machines in which the rim and the hub were connected by looped wire spokes. At the age of sixty-seven, he saw that this had other possibilities and, in the same year, designed a light bicycle with a large driving front wheel and a smaller rear wheel. The new model was named Ariel and was the first all metal bike. Starley's Ariel made bicycling a means of transportation, a popular pastime, and a sport. However, the Ariel was extremely hard to control. It caused many bruises, broken bones and even a few deaths. Thus, cycling enthusiasts started attempts to mechanically improve the bicycle for the sake of safety. The first innovation was the chain drive invented in 1879 by H. J. Lawson. But, still the high wheeler was dangerous, because the rider had to sit directly above the front wheel. If struck, the accident would send the rider over the handlebars and onto his head. The American Star reversed the position of the wheels by putting the big wheel in the back and the small balance wheel in the front. However, the people fell just as often, except this time they fell on their backs.

In 1885, John K. Starley made an alteration that has survived to this day. His model featured the diamond style frame and the rear chain drive. By 1888, John Boyd Dunlop of Belfast adapted the pneumatic tire to the bicycle. This adaptation signed the beginning of the sport of racing.

In 1890, the Broncho Light Roadster made both wheels the same size, but the pedals were still attached to the rear axle with the rider seated directly over them. By 1893, high wheel bikes were a thing of the past. The Starleys brought all innovations together in one machine, the Rover Safety. It had a lowered diamond frame with the seat set over the mid frame pedals, which drove wheels of equal diameter. It also had direct steering, coasters and brakes.

Problems started to mount for the bicycle. Sigmund Freud hated bicycles so much that he wrote a letter stating that Mondsee, France, was not acceptable as a vacation spot because of the number of cyclists on the road. He even went so far as to urge that everyone campaign against bicycles because of the dust they raised and the large number of children they injured.

A more widespread problem existed for women. Bicycling rose in popularity during the Victorian period, and this period confined women to wearing long full skirts that got caught in the wheels. Altering skirts proved too daring, so efforts were made to try and alter the bike. The period's emphasis on modesty had gone as far as it could. Working to preserve decency, a bike firm developed a bat-wing shield which hid the entire pedal mechanism. In 1890, the bloomer became acceptable dress for women and cycling soon lost most of its chauvinist aura and became a people's true pastime.

The bicycle has been at the mercy of the inventors. Water cycles were the first mutation to appear in the 1890's. Air cycles were developed but were not as successful as the water cycle. In Germany, in the 1930's, an air cycle made a jump of about two hundred yards. But then air cycles went into a slump until the 1960's when a

British industrialist, Henry Kramer, made a standing offer of $5,000 to go to the first flier to complete a figure eight over a distance of one mile.

So much for the sea and the air, it was on the land that monstrosities have flourished. During the 1890's a bicycle built for two was made by the Waltham Manufacturing Co. Also during the decade, there was a one and one-half ton tricycle produced. It had two eleven foot wheels and one six foot wheel and required eight men to operate it.

Financial

Bicycling, which has increased in popularity, has produced various attempts to finance bikeways. Numerous bills have been introduced in various state legislatures concerning bicycling. Aigner, Jensen, Powers and Wentworth stated that, in Oregon, a house bill was introduced by Don Stathos, and approved in May, 1971 (8). It provided for at least one per cent of the state highway money to be used for construction and maintenance of bikeways. A bill was introduced by Representative Mills of California to provide $720,000 annually to aid state agencies in funding bike and horse paths. Colorado, Iowa, Massachusetts and Ohio had pending legislation in 1974 on bicycling. These bills varied, but all of them attempted to provide needed money in order to encourage bicycling as a means of recreation and transportation.

The Recreation Digest revealed that national recognition of bicycling needs were reflected in a provision of the 1973 Federal Aid Highway Act. This Act permitted funds to be apportioned for urban and rural primary and secondary road systems, the urban systems, forest highways, forest development roads and trails, parkways, Indian

reservation roads and trails, as well as the construction of bicycle routes and pedestrian walkways (6). A maximum of $2 million per state per fiscal year was allowed for these projects. However, the federal act provided no special or additional Federal funding for bicycling purposes. If these authorized Federal funds were used for bicycling purposes, there would be that much less money available for highway improvements. There was additional Federal funding available through other sources. For instance, Heldreth stated that the Land and Water Conservation Fund Program was an agency under which bikeways could be constructed (4). This program provided a 50 per cent matching assistance to the states through their political sub-divisions for the acquisition or development of outdoor recreation facilities. The only stipulation was that the money had to be spent before it was matched.

Aigner, Jensen, Powers and Wentworth stated that on the national level, the Federal government encouraged bicycling (8). Since 1971, the responsibility for cycling has been shared by the Department of Interior, which managed the recreational aspects, and the Department of Transportation, which managed the traveling aspects. In the Department of Transportation, bicycling was to be handled by the Office of Environmental and Urban Systems, which was to look into such things as bike parking and transportation terminals. In one major move to encourage cycling, the Department of Transportation told the states that highway trust fund monies could be used for bikeways in conjunction with Federal highway projects. The National Trails Act of 1968 provided for three types of trails: One was the National Scenic Trails, which were established only by Congress; the second was Recreation Trails, which were designated by the Secretary of Interior or Agriculture, and the third,

connected trails, which were set up locally to link the other two systems. The Bureau of Outdoor Recreation also helped establish more trails for single and multiple uses.

There were certain amounts of money available to states for bicycling through the following:

1. Highway Trust Fund - Paths can be built with this money only along highway right-of-ways, so, if it's going through, there may as well be a bike path alongside of it.
2. Old Railroad Right-of-ways - The Interstate Commerce Commission has instituted railroad abandonment notification with the states. Check your state house for the name and location of the A-95 metropolitan and regional office.
3. "Legacy of Parks" Program - This is authorized by the Bureau of Outdoor Recreation and these grants provide states with funds on a fifty-fifty matching basis for acquisition, development, and planning outdoor recreational areas, including bike trails.
4. Urban Renewal Projects - This program can make money available for rehabilitation or redevelopment of slums and blighted areas. Bike paths can be included in this program, Administration through the Community Development section of the Department of Housing and Urban Development (HUD), bike paths can account for two-thirds to three-fourths of project cost.
5. Open Space Programs - Another program of HUD assists states in acquiring land for permanent open spaces. Roadways, signs, and landscaping are included in this program, and its application to bikeways should be investigated with state and local authorities. Funds are made available on a fifty-fifty matching basis (8).

The American Automobile Association stated that the cost of providing bikeway facilities varied with the type selected and design standards used (9). Cost of providing bikeways was generally more than most people presumed. One study in Santa Clara, California, made the following estimates for bikeways: exclusive bikeway (new construction and signs), $8,000 per mile; restricted bikeway (signs and lane stripping), $2,000 per mile and; shared bikeway (signs only), $1,500 per mile. Seven exclusive bikeways built in Oregon, covering 16 miles, which ranged in cost from $13,000 to $70,00 per mile. The average cost per

mile was $36,000, excluding structures. The Denver, Colorado, Bikeway plan stated that cost estimates for construction of bikeways (all types) included all materials and labor (5). The cost for signs included setting of a new pole. However, whenever possible, it was recommended that bikeway signs be placed on existing sign posts. The costs for Denver, Colorado, were similar to Santa Clara's, however, all figures esculated approximately 10 to 12 per cent every year.

What was also needed was exclusive financing for bike paths around major highway interchanges and freeways, linking them up with bike lanes along major city streets. Perhaps paths did not have to be constructed, for many states had enough paved land already that was not being used as extensively. Money for bikeway construction, if needed, should perhaps be provided on the national level from a fund such as the Highway Trust Fund. The bicycle Transportation Act of 1971 would also go a long way toward creating effective bike paths where needed. Some considerations that should be considered in any bikeway design were given by the Denver, Colorado Bike Plan. If the reader is interested in these criteria, which merit consideration in the development of bikeways, a copy may be found in Appendix C, page 117.

Safety

Wolfe stated that 42 of the United States had bicycle facilities in 1974 and plans for additional on and off-street routes (10). The cry for safe and well designed bicycle routes originated with the urban and suburban resident, who selected the bicycle as either a frequently used recreational activity or as a primary means of transportation. With more bicycle routes and ways being constructed, safety was of great

importance. Thus, with more and more bicycles on the streets and road systems, the potential hazards of accidents also became greater.

Yarber believed that bicycle programs in school too often only included classroom experience, such as a film and perhaps a lecture (11). Rarely were riding techniques ever taught and bike inspection was too frequently missing. A bicycle rodeo was invented to develop safety on bicycles. It was used for testing bike knowledge, riding ability and bike inspection. Further information on the Bicycle Rodeo may be found in Appendix D, page 120.

The National Safety Council did a study on bicycle safety (4). The results of the study showed that one-third of the children questioned were using bicycles too large for them. The council has a list of published rules for safe riding.

1. Always ride with traffic rather than against it.
2. Use proper hand signals when turning or stopping.
3. Obey all traffic laws, signs and signals.
4. Give pedestrians and motor vehicles the right-of-way.
5. Never hitch on to motor vehicles.
6. Travel in single file when in groups.
7. Watch for doors opening on parked cars.
8. Be particularly careful at intersections, walking bikes across dangerous ones, always staying inside the marked crosswalks.
9. Never carry big packages; use a basket or carrier for small ones.
10. Stop to check traffic before emerging from driveways, alleys or between parked cars.
11. Do not carry a baby on your bike unless you are an experienced, excellent and calm cyclist (4).

The National Safety Council has pointed out that a bicycle's size, in relation to its rider, was of great importance (8). Ralph W. Galen, president of the League of American Wheelman, suggested some safety procedures:

1. Never raise the stem of the handlebars to the extent that the split in the stem can be seen. A broken stem will leave the rider in a helpless condition.

2. When riding down a steep hill at high speed, keep the pedals horizontal to the ground and press your knees against the top bar. This will serve to dampen any vibration and or whip that might be set up in the frame. Once a vibration is set up, it is almost impossible to stop it without either coming to a complete stop or falling.
3. Check the quick release levers before going on a ride or trip. A quick release lever can become caught on another bicycle and the wheel loosened without the rider becoming aware of this condition until an emergency situation sets in.
4. Keep your equipment clean and in good condition. Regular care will not only keep your equipment looking new longer but will keep it running in better condition.
5. Once a wheel has been trued or the spokes adjusted following an accident or spoke replacement, always remove the tire to be certain that no spokes are protruding beyond the nipple head. A tube puncture from an extended spoke can not only be a nuisance but can also be the source of a serious accident (8).

Frankel showed statistically that 25 per cent of all bike accidents in the United States were caused by bicycles in bad repair (12). Seventy-five per cent of all bicycle and motor vehicle accidents occurred because the cyclists violated traffic rules and regulations. Causes of bike accidents stated by Frankel included:

1. Cyclists makes improper turn.
2. Cyclists fails to signal correctly.
3. Bike lacks proper controls (poor brakes, no head lamps, no rear reflectors, or rider fails to use them).
4. Carrying an extra rider.
5. Cyclists runs into open auto doors.
6. Excessive speed.
7. Cutting in between cars.
8. Hitching a ride.
9. Riding against traffic.
10. Not coming to full stop when riding down driveways to street.
11. Riding when cyclist does not feel well or is tired.
12. Carrying a person on the handle bars.
13. Making repairs on the road side.
14. Not riding on correct side of road.
15. Riding in busy sections (12).

Related Problems

Heller believed that the deteriorating environment was the product of extremely powerful social and economic forces (13). Conservationists should have taken on programs of much greater scope than they had in the

past. These programs might have adequately met the environmental needs. Most of the planning that was done by State and Federal governments remained narrowly single interest, such as industrialization and road construction. It seemed as though America was too busy to attempt to fully support a program that would clean up the air and help preserve the environment. Hanneman said that some people became more ecology minded and wanted to see the bicycle used more than it was (14). Bicycling was a way to reduce environmental hazards and at the same time allowed for outdoor activity. Former President Nixon stated, "The 1970's must be the years when America pays its debt to the past by reclaiming the purity of its air, its water, and our living environment. It is literally now or never."

The National Safety Council showed that the bicycle population has more than quadrupled since World War II (15). Bicycle deaths, resulting from collisions with motor vehicles, have also increased, but at a lesser rate. Fortunately such fatalities have not reached the pre-war high of 910 fatalities in 1941. Of particular concern was the fact that about two-thirds of the bicycle deaths occurred to children between the ages of five and fourteen. According to the 1969 edition of Accident Facts, there were 800 deaths and 38,000 injuries in 1968, which resulted from collisions between bicycles and motor vehicles (16). Of these, 500 deaths and nearly 29,000 injuries involved youngsters from five to fourteen years of age. Motor vehicle-bicycle accidents accounted for about 12 per cent of all these accidents. Forty-five per cent of bike accidents resulted from the cyclists falling to the ground and did not involve any collision with cars, trucks, other bikes or fixed objects. As would be expected, most cycling accidents

occurred during the spring and summer months, April through August, and accounted for nearly three-fourths of all the bike mishaps during the year. Twenty-nine per cent of these accidents occurred on Saturdays, which reflected a high bike usage on this day. Most reported accidents (83 per cent) occurred during daylight hours.

As more and more adult cyclists moved onto the scene, bikeways became an alternate form of transportation to move from one place to another (17). Hanneman believed that, if safe bicycle lanes and ways were set aside and if cyclists could find sufficient parking and security, bicycling might become even more widely used (14). With over 61 million bicycles in use, parking facilities became a problem. Bicycle sales exceeded 8.5 million dollars in 1971, and approximately 30 per cent of the bicycles sold were light weight, multi-speed models ranging in price from $70 to $500 (5). However, due to the current boom in bicycle use, bicycles were in short supply. These conditions have created a substantial black market for bicycles. Bicycle thefts across the nation increased at an enormous rate; New York City, up 25 per cent, Monrovia, California, up 250 per cent, Sacramento, California, up 100 per cent, and Philadelphia, up 500 per cent.

In conclusion, the administrative planning staff of Denver, Colorado discussed the advantages and disadvantages of bicycling (5). They found that there were as many advantages to bicycling as disadvantages, however, the planning staff believed that America's future progression would in time eliminate the disadvantages. A listing of the advantages and disadvantages may be found in Appendix E, page 123.

Summary of Related Literature

1. Bicycling as an activity was revealed from bas-reliefs from as far back as the first century B.C. However, the activity did not take effect until the 18th century. Bicycling has grown considerably through the years until eventually it became America's most popular outdoor sport. In the last decade it became an activity for all ages. It also allowed for either individual or group participation and became an inexpensive form of transportation.

2. The development and financing of bikeways was relatively new, but, many states had pending legislation on bicycling. The state and federal governments had many different funds available for bikeway implementation.

3. Bicycling became a dangerous sport and, with the some 61 million people who rode bicycles, accidents increased drastically. However, the number of deaths due to bicycling was also increasing, and occurred in a five to fourteen year old age group.

4. America detected the need for education in all aspects of bicycling in order to make it a safer activity for all concerned.

5. Bicycling, a non-polluting means of transportation, helped in preserving the environment about which so many Americans were concerned.

CHAPTER II

PROCEDURES

In conducting this study the survey method using the questionnaire technique was applied. The questionnaire method was used for the purpose of obtaining data concerning the present status of bicycling in Northeastern North Dakota.

In constructing and developing a questionnaire, one must follow a set of rules if the returns obtained are to be considered of good quantity and quality. Hillway stated that the effective and correct questionnaire should be constructed according to the following rules (18):

1. It should be brief as possible.
2. The information asked for must be otherwise inaccessible to the investigation.
3. The subject must not be a trivial one.
4. The questions ought to be aimed at obtaining factual data.
5. The wording of every item ought to be understandable and familiar.
6. The items should be arranged in a neat and logical order.
7. It should be conveniently planned and set up to take a minimum of the respondent's time.
8. Clear instructions must be included as to the way the answers are to be indicated.

In addition to the above suggestions Nixon stated the following (19):

1. The questionnaire should be placed on high quality paper.
2. Size should be selected for ease in folding and mailing in number seven and eight envelopes.
3. Colored paper is sometimes attractive and feasible.
4. It should be printed if feasible.
5. Offer a summary of the findings.
6. Include complete information about the recorder--full name, title and address.
7. Provide for more checking rather than written answers.
8. Arrange "yes"-"no" replies vertically.

AAPHER stated that interviews and questionnaires have much in common (20). They both are survey tools for obtaining data concerned with present status, practices, or opinions regarding a situation or problem. As a tool, a questionnaire should be used to obtain data where no other means are available. All biases must be eliminated. A questionnaire should be easily understood and made as simple as possible. However, all of the questions and responses to the questions must be able to be interpreted statistically. Davis stated that the survey's general purpose was "to reveal current conditions, to point up the acceptability of the status quo, and to show the need for change" (21).

With these criteria in mind the writer proceeded to develop a questionnaire suitable to the topic. In developing the first draft the writer investigated other survey studies, and consulted with his advisor. A pilot study was conducted within the city limits of Grand Forks, North Dakota, after corrections and additions had been made to the questionnaire. The questionnaire was sent to the Bureau of Outdoor Recreation for its corrections, suggestions and recommendations. These criticisms were used in developing the final draft of the questionnaire. The reliability for the questionnaire was measured by the test-retest method. The subjects responding from the pilot study were administered a second questionnaire, which was exactly the same as the initial questionnaire. The subjects answered equally well on both questionnaires, thus, the questionnaire was termed reliable. All the questions could be answered by checking rather than written answers. The questionnaire was printed on light green paper by the University of North Dakota Press so to help insure a greater return.

The selection of the subjects was completed from the randomization procedure, using the systematic random sampling method. A random sample of 1000 North Dakota residents from Fargo and Grand Forks were selected through the cities' telephone directories. Both Fargo and Grand Forks received equally 500 questionnaires through the U.S. Postal Service. In late August, 1974, the questionnaire (Appendix A) and a letter of transmittal (Appendix B), which presented the background concerning the purpose and need for the study was sent. A stamped, self-addressed envelope also accompanied the questionnaire. A follow-up letter to obtain a greater return was not sent since it would be rather costly in terms of time and expense. It was felt any additional return would not be great enough to enhance the statistics.

The questionnaire was constructed in such a manner that it would take the respondent about 10 minutes to complete. The questionnaire was divided into two parts, A and B. Part A consisted of general information, such as: the respondent's name, address, age, sex, number of bicycles owned and a listing of family members that rode bikes. Part B consisted of specific information, such as: usage, time, preferences, opinions and comments.

CHAPTER III

ANALYSIS OF DATA

This chapter presented the analyzed data obtained by the use of the questionnaire. The information obtained was arranged and presented for interpretation by the University of North Dakota Computer Center. The information from 233 Fargo and Grand Forks, North Dakota, residents has been summarized through the use of tables, discussion and conclusions. The information acquired from the questionnaire was set up into tables for analysis and interpretation to indicate the amount of bicycle usage, as well as attitudes, in order to help determine the feasibility of bikeway implementation.

General Information

Table 1 presented the number and percentage of the residents that received the questionnaire and the individuals responding. The first column indicated the total number of individuals that received the questionnaire, both from Fargo and Grand Forks. The second column presented the number of individuals that responded to the questionnaire. The third column showed the number of males and females that responded to the questionnaire according to age groups. The fourth column indicated the number of bicycles that were owned by the respondents. The fifth column showed the percentages of all the previous columns.

TABLE 1

NUMBER AND PERCENTAGE OF RESPONDENTS, ACCORDING TO CITY, SEX, AGE AND THE NUMBER OF BICYCLES OWNED

Communities	Number of Individuals That Received Questionnaires	Number of Individuals Responding to Questionnaires	Number of Males and Females Responding	Number of Bicycles Owned by the Respondents	Percentage of Individuals Responding
Total Population	820	233			28.4
CITIES					
Grand Forks	436	123			28.2
Fargo	384	110			28.6
SEX		233			
Males			132		56.6
Females			101		43.4
AGE					
Males		132			
18-21			8		6.0
22-25			16		12.1
26-28			15		11.4
30-33			15		11.4
34-37			16		12.1
38-41			7		5.3
42-45			11		8.3
46-49			18		13.6
50 above			26		19.7

TABLE 1--Continued

	Number of Individuals That Received Questionnaires	Number of Individuals Responding to Questionnaires	Number of Males and Females Responding	Number of Bicycles Owned by the Respondents	Percentage of Individuals Responding
AGE					
Females		101			
18-21			7		6.9
22-25			18		17.8
26-28			13		12.9
30-33			11		10.9
34-37			7		6.9
38-41			9		8.9
42-45			8		7.9
46-49			14		13.9
50 above			14		13.9
NUMBER OF BICYCLES		233			
none				49	21.0
one				47	20.2
two				60	25.8
three				37	15.9
four				16	6.9
five				14	6.0
six				5	2.2
seven above				5	2.2

One thousand questionnaires were sent to the residents of Grand Forks and Fargo, 500 to each city. However, 180 questionnaires were returned "address unknown." Therefore, 820 questionnaires were received by the addressees in both cities. Two hundred and thirty-three, or 28.4 per cent, individuals responded to the questionnaire. One hundred and ten, or 28.6 per cent, Fargoans and 123, or 28.2 per cent, Grand Forks residents responded to the questionnaire. Males appeared to respond better than females with a total of 132. Table 1 revealed that the largest percentage of individuals, who responded to the questionnaire, were in the age groupings 22-33 and 46-50 or older. The table also showed that 49 individuals, or 21.0 per cent, did not own a bicycle. However, five respondents stated that they owned seven or more bikes.

Table 2 presented the number and percentage of the 233 respondents' family members that rode bicycles, according to sex and age. The table revealed that there were 457 family members. The table also revealed that most of the riders in the family were male, with a total of 244, or 53.4 per cent. As compared to Table 1, Table 2 showed that most of the riders were found in the age groups of seven to 28 years of age. Less than seven per cent of the family members, who rode bikes, were fifty years of age or older.

Table 3 presented the information the respondents gave to question number 1 in part B of the questionnaire. This question asked the respondents to specify and rank the reasons for using their bicycles.

An examination of Table 3 revealed that 157, or 67.4 per cent, used their bicycles more for "exercise" than any other reason. The respondents used their bicycles almost as frequently for "transportation" and "pleasure" as they did for "exercise." However, the reason

TABLE 2

NUMBER AND PERCENTAGE OF THE RESPONDENT'S FAMILY MEMBERS THAT RODE BICYCLES, ACCORDING TO SEX AND AGE

Sex and Age	Total Number of Family Members	Number of Family Members	Percentage of Family Members
Total Population	457		
Sex	457		
Males		244	53.4
Females		213	46.6
Age	457		
1-6		29	6.3
7-17		128	28.0
18-28		143	31.3
29-39		87	19.0
40-50		40	8.8
51 above		30	6.7

TABLE 3

PERCENTAGE OF RESPONDENTS THAT USE THEIR BICYCLES FOR TRANSPORTATION, EXERCISE, SPORT AND PLEASURE ACCORDING TO CITY, SEX, AGE: AS COMPARED TO THE RANKING OF USES

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Rank No. 1		Rank No. 2		Rank No. 3		Rank No. 4		No Response	
				No.	%	No.	%	No.	%	No.	%	No.	%
Total Population	233												
Transportation		147	63.0	67	28.8	21	9.0	28	12.0	31	13.3	86	36.9
Exercise		157	67.4	51	21.9	59	25.3	32	13.7	15	6.4	76	32.6
Sport		134	57.5	29	12.4	32	13.7	33	14.2	40	17.2	99	42.5
Pleasure		148	63.5	65	27.9	36	15.4	28	12.0	19	8.2	85	36.5
Total Population--City													
Fargo:	110												
Transportation		68	61.8										
Exercise		72	65.4										
Sport		62	56.4										
Pleasure		67	60.9										
Grand Forks:	123												
Transportation		79	64.2										
Exercise		85	69.1										
Sport		72	58.5										
Pleasure		81	65.8										
Total Population--Sex													
Females:	101												
Transportation		75	74.2										
Exercise		74	73.3										
Sport		55	54.4										
Pleasure		67	66.3										
Males:	132												
Transportation		81	61.4										
Exercise		92	69.7										
Sport		76	57.6										
Pleasure		87	65.9										

TABLE 3--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Rank No. 1		Rank No. 2		Rank No. 3		Rank No. 4		No Response	
				No.	%	No.	%	No.	%	No.	%	No.	%
Total Population--Age Groups													
18-21:	14												
Transportation		14	100.0										
Exercise		10	71.4										
Sport		10	71.4										
Pleasure		11	78.6										
22-25:	33												
Transportation		28	84.8										
Exercise		28	84.8										
Sport		26	78.8										
Pleasure		23	69.7										
26-28:	27												
Transportation		21	77.7										
Exercise		24	88.8										
Sport		22	81.4										
Pleasure		23	85.2										
30-33:	25												
Transportation		19	76.0										
Exercise		21	84.0										
Sport		18	72.0										
Pleasure		23	92.0										
34-37:	22												
Transportation		14	63.6										
Exercise		17	77.3										
Sport		14	63.6										
Pleasure		17	77.3										
38-41:	14												
Transportation		6	42.8										
Exercise		7	50.0										
Sport		8	57.1										
Pleasure		7	50.0										

TABLE 3--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Rank No. 1		Rank No. 2		Rank No. 3		Rank No. 4		No Response	
				No.	%	No.	%	No.	%	No.	%	No.	%
42-45:	18												
Transportation		10	55.5										
Exercise		10	55.5										
Sport		9	50.0										
Pleasure		11	61.1										
46-49:	30												
Transportation		15	50.0										
Exercise		16	53.3										
Sport		12	40.0										
Pleasure		14	46.6										
50 above:	38												
Transportation		13	34.2										
Exercise		9	23.7										
Sport		8	21.0										
Pleasure		11	28.9										
Grand Forks													
Sex (Males)	72	72	58.5										
Transportation		48	66.6	18	25.0	8	11.1	12	16.7	10	13.9	24	33.3
Exercise		54	75.0	17	23.6	22	30.6	12	16.7	3	4.2	18	25.0
Sport		46	63.8	7	9.7	11	15.3	12	16.7	16	22.2	26	36.1
Pleasure		52	72.2	21	29.2	13	18.1	9	12.5	7	9.7	22	30.6
Age (Males)													
18-21	14												
Transportation		5	35.7	2	40.0			2	40.0	1	20.0		
Exercise		5	35.7	2	40.0	2	40.0	1	20.0				
Sport		5	35.7	1	20.0	2	40.0	1	20.0	1	20.0		
Pleasure		5	35.7	1	20.0	3	60.0			1	20.0		

TABLE 3--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Rank No. 1		Rank No. 2		Rank No. 3		Rank No. 4		No Response	
				No.	%	No.	%	No.	%	No.	%	No.	%
22-25:	33												
Transportation		5	15.2	1	12.5			3	37.5	1	12.5	3	37.5
Exercise		5	15.2	1	12.5			2	25.0	2	25.0	3	37.5
Sport		5	15.2	1	12.5	3	37.5	1	12.5			3	37.5
Pleasure		4	12.1	2	25.0			1	12.5	1	12.5	4	50.0
26-28:	27												
Transportation		8	29.6	2	25.0	2	25.0			4	50.0		
Exercise		8	29.6	4	50.0	2	25.0	2	25.0				
Sport		7	25.9	2	25.0	2	25.0	3	37.5			1	12.5
Pleasure		7	25.9	2	25.0	2	25.0	2	25.0	1	12.5	1	12.5
30-33:	25												
Transportation		2	8.0	1	33.3	1	33.3					1	33.3
Exercise		2	8.0			1	33.3			1	33.3	1	33.3
Sport		2	8.0	1	33.3	1	33.3					1	33.3
Pleasure		2	8.0	1	33.3			1	33.3			1	33.3
34-37:	22												
Transportation		3	13.6	2	66.7			1	33.3				
Exercise		2	9.0	1	33.3			1	33.3			1	33.3
Sport		3	13.6					1	33.3	2	66.7		
Pleasure		2	9.0	1	33.3	1	33.3					1	33.3
38-41:	14												
Transportation		2	14.2							2	100.0		
Exercise		1	7.1	1	50.0							1	50.0
Sport		1	7.1	1	50.0							1	50.0
Pleasure		1	7.1	1	50.0							1	50.0
42-45:	18												
Transportation		4	22.2	1	16.7	1	16.7			2	33.3	2	33.3
Exercise		3	16.6			1	16.7	2	33.3			3	50.0
Sport		4	22.2	2	33.3			1	16.7	1	16.7	2	33.3
Pleasure		3	16.6	2	33.3	1	16.7					3	50.0

TABLE 3--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Rank No. 1		Rank No. 2		Rank No. 3		Rank No. 4		No Response	
				No.	%	No.	%	No.	%	No.	%	No.	%
46-49:	30												
Transportation		7	23.2	4	36.4			1	9.1	2	18.2	4	36.4
Exercise		6	20.0	2	18.2	3	27.3	1	9.1			5	45.5
Sport		5	16.6	1	9.1	1	9.1			3	27.3	6	54.5
Pleasure		6	20.0	2	18.2	1	9.1	2	18.2	1	9.1	5	45.5
50 above:	38												
Transportation		5	13.2	2	15.4	1	7.7	1	7.7	1	7.7	8	61.5
Exercise		6	15.8	4	30.8	2	15.4					7	53.8
Sport		5	13.2	1	7.7	1	7.7	2	15.4	1	7.7	8	61.5
Pleasure		5	13.2	2	15.4	1	7.7	1	7.7	1	7.7	8	61.5
Sex (Females)	51	51	41.4										
Transportation		31	60.8	18	35.3	7	13.7	2	3.9	4	7.8	20	39.2
Exercise		31	60.8	13	25.5	8	15.7	8	15.7	2	3.9	20	39.2
Sport		26	51.0	8	15.7	7	13.7	5	9.8	6	11.8	25	49.0
Pleasure		31	60.8	18	35.3	6	11.8	5	9.8	2	3.9	20	39.2
Age (Females)													
18-21:	14												
Transportation												2	100.0
Exercise												2	100.0
Sport												2	100.0
Pleasure												2	100.0
22-25:	33												
Transportation		8	24.2	6	66.7	1	11.1			1	11.1	1	11.1
Exercise		8	24.2	1	11.1	1	11.1	4	44.4	2	22.2	1	11.1
Sport		7	21.2	1	11.1	3	33.3	1	11.1	2	22.2	2	22.2
Pleasure		7	21.2	3	33.3	2	22.2	2	22.2			2	22.2
26-28:	27												
Transportation		4	14.8	3	75.0	1	25.0						
Exercise		4	14.8	2	50.0	2	50.0						
Sport		4	14.8	1	25.0	1	25.0	2	50.0				
Pleasure		4	14.8	1	25.0			1	25.0	2	50.0		

TABLE 3--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Rank No. 1		Rank No. 2		Rank No. 3		Rank No. 4		No Response	
				No.	%	No.	%	No.	%	No.	%	No.	%
30-33:	25												
Transportation		5	20.0	1	14.3	3	42.9	1	14.3			2	28.6
Exercise		5	20.0	4	57.1			1	14.3			2	28.6
Sport		5	20.0	2	28.6	1	14.3	1	14.3	1	14.3	2	28.6
Pleasure		6	24.0	4	57.1	2	28.6					1	14.3
34-37:	22												
Transportation		2	9.0	1	33.3			1	33.3			1	33.3
Exercise		2	9.0			2	66.7					1	33.3
Sport		2	9.0							2	66.7	1	33.3
Pleasure		2	9.0	1	33.3			1	33.3			1	33.3
38-41:	14												
Transportation		1	7.4							1	16.7	5	83.3
Exercise		2	14.3			1	16.7	1	16.7			4	66.7
Sport		2	14.3			1	16.7	1	16.7			4	66.7
Pleasure		2	14.3	2	33.3							4	66.7
42-45:	18												
Transportation												1	100.00
Exercise												1	100.0
Sport												1	100.0
Pleasure		1	5.5										
46-49:	30												
Transportation		4	13.3	1	16.7	1	16.7			2	33.3	2	33.3
Exercise		3	10.0	2	33.3			1	16.7			3	50.0
Sport		4	13.3	3	50.0	1	16.7					2	33.3
Pleasure		4	13.3	4	66.7							2	33.3
50 above:	38												
Transportation		4	10.5	4	50.0							4	50.0
Exercise		3	7.9	1	12.5	2	25.0					5	62.5
Sport		1	2.6							1	12.5	7	87.5
Pleasure		3	7.9	1	12.5	1	12.5	1	12.5			5	62.5

TABLE 3--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Rank No. 1		Rank No. 2		Rank No. 3		Rank No. 4		No Response	
				No.	%	No.	%	No.	%	No.	%	No.	%
Fargo													
Sex (Males)	60	60	54.5										
Transportation		33	55.0	17	28.3	2	3.3	8	13.3	6	10.0	27	45.0
Exercise		38	63.3	9	15.0	20	33.3	4	6.7	5	8.3	22	36.7
Sport		30	50.0	4	6.7	6	10.0	9	15.0	11	18.3	30	50.0
Pleasure		37	61.6	14	23.3	10	16.7	7	11.7	6	10.0	23	38.3
Age (Males)													
18-21:	14												
Transportation		3	21.4	2	66.7					1	33.3		
Exercise		3	21.4	1	33.3	1	33.3	1	33.3				
Sport		2	14.2			1	33.3	1	33.3			1	33.3
Pleasure		2	14.2			1	33.3			1	33.3	1	33.3
22-25:	33												
Transportation		7	21.2	5	62.5			1	12.5	1	12.5	1	12.5
Exercise		7	21.2	1	12.5	5	62.5	1	12.5			1	12.5
Sport		6	18.2	1	12.5			3	37.5	2	25.0	2	25.0
Pleasure		5	15.2	1	12.5	3	37.5	1	12.5	1	12.5	2	25.0
26-28:	27												
Transportation		4	14.8	2	25.0			2	25.0			4	50.0
Exercise		6	22.2			3	37.5	1	12.5	2	25.0	2	25.0
Sport		5	18.5			1	12.5			4	50.0	3	37.5
Pleasure		6	22.2	2	25.0	2	25.0	1	12.5	1	12.5	2	25.0
30-33:	25												
Transportation		4	16.0			1	16.7	2	33.3	1	16.7	2	33.3
Exercise		6	24.0	1	16.7	2	33.3	1	16.7	2	33.3		
Sport		4	16.0	1	16.7	2	33.3			1	16.7	2	33.3
Pleasure		6	24.0	4	66.7			1	16.7	1	16.7		
34-37:	22												
Transportation		6	27.3	4	44.4			1	11.1	1	11.1	3	33.3
Exercise		7	31.8	2	22.2	4	44.4			1	11.1	2	22.2
Sport		6	27.3					3	33.3	3	33.3	3	33.3
Pleasure		7	31.8	1	11.1	3	33.3	1	11.1	2	22.2	2	22.2

TABLE 3--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Rank No. 1		Rank No. 2		Rank No. 3		Rank No. 4		No Response	
				No.	%	No.	%	No.	%	No.	%	No.	%
38-41:	14												
Transportation		1	7.1							1	33.3	2	66.7
Exercise		2	14.3	2	66.7							1	33.3
Sport		2	14.3			1	33.3	1	33.3			1	33.3
Pleasure		2	14.3			1	33.3	1	33.3			1	33.3
42-45:	18												
Transportation		2	11.1	1	25.0			1	25.0			2	50.0
Exercise		2	11.1			2	50.0					2	50.0
Sport		2	11.1					1	25.0	1	25.0	2	50.0
Pleasure		3	16.6	3	75.0							1	25.0
46-49:	30												
Transportation		1	3.3	1	16.7							5	83.3
Exercise		2	6.6	1	16.7	1	16.7					4	66.7
Sport												6	100.0
Pleasure		1	3.3					1	16.7			5	83.3
50 above:	38												
Transportation		4	10.5	2	16.7	1	8.3	1	8.3			8	66.7
Exercise		2	5.3	1	8.3	1	8.3					10	83.3
Sport		2	5.3	1	8.3	1	8.3					10	83.3
Pleasure		3	7.9	3	25.0							9	75.0
Sex (Females)	50	50	45.4										
Transportation		35	70.0	14	28.0	4	8.0	6	12.0	11	22.0	15	30.0
Exercise		34	68.0	12	24.0	9	18.0	8	16.0	5	10.0	16	32.0
Sport		32	64.0	10	20.0	8	16.0	7	14.0	7	14.0	18	36.0
Pleasure		30	60.0	12	24.0	7	14.0	7	14.0	4	8.0	20	40.0
Age (Females)													
18-21:	14												
Transportation		4	28.5	2	50.0			2	50.0				
Exercise		4	28.5			3	75.0			1	25.0		
Sport		3	21.4							3	75.0	1	25.0
Pleasure		4	28.5	1	25.0			1	25.0	2	50.0		

TABLE 3--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Rank No. 1		Rank No. 2		Rank No. 3		Rank No. 4		No Response	
				No.	%	No.	%	No.	%	No.	%	No.	%
22-24:	33												
Transportation		8	24.2	3	37.5	3	37.5	2	25.0				
Exercise		8	24.2			3	37.5	4	50.0	1	12.5		
Sport		8	24.2	1	12.5			3	37.5	4	50.0		
Pleasure		6	18.2	3	37.5	2	25.0			1	12.5		
26-28:	27												
Transportation		5	18.5	2	28.6			1	14.3	2	28.6	2	28.6
Exercise		6	22.2	1	14.3	3	42.9	2	28.6			1	14.3
Sport		6	22.2			2	28.6	2	28.6	2	28.6	1	14.3
Pleasure		6	22.2	3	42.9	1	14.3	1	14.3	1	14.3	1	14.3
30-33:	25												
Transportation		8	32.0	4	44.4	1	11.1	1	11.1	2	22.2	1	11.1
Exercise		8	32.0	2	22.2	3	33.3	2	22.2	1	11.1	1	11.1
Sport		7	28.0	1	11.1	1	11.1	3	33.3	2	22.2	2	22.2
Pleasure		9	36.0	4	44.4	2	22.2	1	11.1	2	22.2		
37-37:	22												
Transportation		3	13.6			1	14.3	1	14.3	1	14.3	4	57.1
Exercise		6	27.3	2	28.6	3	42.9	1	14.3			1	14.3
Sport		3	13.6			1	14.3	1	14.3	1	14.3	4	57.1
Pleasure		6	27.3	3	42.9	2	28.6	1	14.3			1	14.3
28-41:	14												
Transportation		2	14.3			2	66.7					1	33.3
Exercise		3	21.4	1	33.3	1	33.3	1	33.3				
Sport		3	14.3	1	33.3	1	33.3			1	33.3		
Pleasure		2	21.4					2	66.7			1	33.3
42-45:	18												
Transportation		4	22.2	1	14.3			2	28.6	1	14.3	3	42.9
Exercise		5	27.7	3	42.9	2	28.6					2	28.6
Sport		3	16.6	1	14.3	1	14.3	1	14.3			4	57.1
Pleasure		4	22.2	2	28.6	1	14.3	1	14.3			3	42.9

TABLE 3--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Rank No. 1		Rank No. 2		Rank No. 3		Rank No. 4		No Response	
				No.	%	No.	%	No.	%	No.	%	No.	%
46-49:	30												
Transportation		3	10.0	2	28.6					1	14.3	4	57.1
Exercise		5	16.6	4	57.1	1	14.3					2	28.6
Sport		3	10.0	2	28.6	1	14.3					4	57.1
Pleasure		3	10.0	1	14.3	1	14.3	1	14.3			4	57.1
50 above:	38												
Transportation												5	100.0
Exercise												5	100.0
Sport												5	100.0
Pleasure												5	100.0

for bicycle usage that was considered the least important was for "sport." Actually, there was little significant difference between the reasons that individuals checked for riding bicycles, less than a 10 per cent difference.

Table 3 revealed that 85, or 69.1 per cent, of Grand Forks riders used their bicycles for "exercise" as compared to Fargo riders with 72, or 65.4 per cent. The difference, 3.7 per cent, was relatively small, however. Furthermore, there was very little difference between Grand Forks and Fargo riders as far as their reasons for riding a bicycle were concerned.

Table 3 also indicated that there were more male bicycle riders in Grand Forks as proportionately compared to male riders in Fargo. However, just the opposite was shown for the females. There were 51, or 41.5 per cent, females riding bikes in Grand Forks as compared to 50, or 45.4 per cent, females who rode bikes in Fargo.

Table 3 revealed that "pleasure" was the main reason both males and females in Grand Forks rode their bicycles. However, "transportation" was considered the major reason in bicycle usage for both male and female respondents in Fargo. However, both Fargo and Grand Forks males and females agreed that riding bicycles for the "sport" was the least important of the reasons for using their bicycles.

Table 4 presented information the respondents gave to question number 2 in part B of the questionnaire. The respondents were asked to answer the question by indicating the number of days and hours per week that they used their bicycles.

An examination of Table 4 showed that 113, or 48.5 per cent, preferred "Saturday" for bicycle riding. However, "Friday" was the

TABLE 4

NUMBER AND PERCENTAGE OF RESPONDENTS THAT RIDE THEIR BICYCLES ON SPECIFIC DAYS OF THE WEEK, ACCORDING TO CITY, SEX, AGE: AS COMPARED TO THE NUMBER OF HOURS THAT THEY RIDE

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Hours																No Response	
				1		2		3		4		5		6		7		8		9			
				No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Total Population	233																				
Monday		105	45.0	62	26.6	27	11.6	7	3.0	4	1.7	3	1.3	1	0.4			1	0.4			128	54.9
Tuesday		107	45.9	64	27.5	28	12.0	5	2.2	5	2.2	3	1.3	1	0.4			1	0.4			126	54.0
Wednesday		108	46.4	66	28.3	25	10.7	7	3.0	4	1.7	2	0.9	3	1.3			1	0.4			125	53.6
Thursday		109	46.7	64	27.5	28	12.0	7	3.0	5	2.2	3	1.3	1	0.4			1	0.4			124	53.2
Friday		103	44.2	58	24.9	29	12.4	7	3.0	5	2.2	2	0.9	1	0.4			1	0.4			130	55.8
Saturday		113	48.5	48	20.6	43	18.4	8	3.4	5	2.2	4	1.7	1	0.4			2	0.8	1	0.4	120	51.5
Sunday		106	45.5	43	18.4	36	15.4	15	6.4	4	1.7	4	1.7	1	0.4			2	0.8	1	0.4	127	54.5
Total Population--City																					
Fargo:	110																				
Monday		43	39.0																		
Tuesday		41	37.3																		
Wednesday		46	41.8																		
Thursday		42	38.2																		
Friday		43	39.0																		
Saturday		50	45.4																		
Sunday		45	40.9																		
Grand Forks:	123																				
Monday		62	50.4																		
Tuesday		66	53.6																		
Wednesday		62	50.4																		
Thursday		67	54.5																		
Friday		60	48.8																		
Saturday		63	51.2																		
Sunday		61	49.6																		

TABLE 4--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Hours																No Response	
				1		2		3		4		5		6		7		8		9			
				No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Total Population--Sex																							
Females:	101																						
Monday		45	44.5																				
Tuesday		48	47.5																				
Wednesday		47	46.5																				
Thursday		53	52.5																				
Friday		44	43.6																				
Saturday		49	48.5																				
Sunday		46	45.5																				
Males:	132																						
Monday		60	45.4																				
Tuesday		59	44.7																				
Wednesday		61	46.2																				
Thursday		61	46.2																				
Friday		59	44.7																				
Saturday		64	48.5																				
Sunday		60	45.4																				
Total Population--Age Groups																							
18-21:	14																						
Monday		11	78.6																				
Tuesday		11	78.6																				
Wednesday		11	78.6																				
Thursday		11	78.6																				
Friday		11	78.6																				
Saturday		11	78.6																				
Sunday		12	85.7																				

TABLE 4--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Hours																No Response	
				1		2		3		4		5		6		7		8		9			
				No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
22-25:	33																						
Monday		18	54.5																				
Tuesday		17	51.5																				
Wednesday		17	51.5																				
Thursday		17	51.5																				
Friday		16	48.5																				
Saturday		20	60.6																				
Sunday		20	60.6																				
26-28:	27																						
Monday		15	55.5																				
Tuesday		15	55.5																				
Wednesday		16	59.2																				
Thursday		14	51.8																				
Friday		16	59.2																				
Saturday		17	62.9																				
Sunday		15	55.5																				
30-33:	25																						
Monday		16	64.0																				
Tuesday		17	68.0																				
Wednesday		17	68.0																				
Thursday		18	72.0																				
Friday		17	68.0																				
Saturday		16	64.0																				
Sunday		16	64.0																				
34-37:	22																						
Monday		10	45.4																				
Tuesday		9	40.9																				
Wednesday		10	45.4																				
Thursday		10	45.4																				
Friday		10	45.4																				
Saturday		9	40.9																				
Sunday		7	31.8																				

TABLE 4--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Hours																No Response	
				1		2		3		4		5		6		7		8		9			
				No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
38-41:	14																						
Monday		5	35.7																				
Tuesday		8	57.1																				
Wednesday		6	42.8																				
Thursday		7	50.0																				
Friday		5	35.7																				
Saturday		5	35.7																				
Sunday		8	57.1																				
42-45:	18																						
Monday		6	33.3																				
Tuesday		7	38.8																				
Wednesday		6	33.3																				
Thursday		7	38.8																				
Friday		6	33.3																				
Saturday		8	44.4																				
Sunday		8	44.4																				
46-49:	30																						
Monday		10	33.3																				
Tuesday		10	33.3																				
Wednesday		10	33.3																				
Thursday		10	33.3																				
Friday		8	26.6																				
Saturday		10	33.3																				
Sunday		10	33.3																				
50 above:	38																						
Monday		8	21.0																				
Tuesday		8	21.0																				
Wednesday		9	23.6																				
Thursday		8	21.0																				
Friday		9	23.6																				
Saturday		8	21.0																				
Sunday		6	15.8																				

TABLE 4--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Hours																No Response	
				1		2		3		4		5		6		7		8		9			
				No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Grand Forks																					
Sex (Males)	72	72	58.5																		
Monday		35	48.6	19	26.4	9	12.5	2	2.8	2	2.8	1	1.4	1	1.4			1	1.4	37	51.4
Tuesday		36	50.0	21	29.2	8	11.1	1	1.4	3	4.2	1	1.4	1	1.4			1	1.4	36	50.0
Wednesday		35	48.6	19	26.4	8	11.1	3	4.2	2	2.8	1	1.4	1	1.4			1	1.4	37	51.4
Thursday		37	51.4	22	30.6	8	11.1	1	1.4	3	4.2	1	1.4	1	1.4			1	1.4	35	48.6
Friday		34	47.2	19	26.4	7	9.7	3	4.2	2	2.8	1	1.4	1	1.4			1	1.4	38	52.8
Saturday		36	50.0	16	22.2	11	15.3	1	1.4	1	1.4	4	5.6	1	1.4			2	2.8	36	50.0
Sunday		35	48.6	15	20.8	8	11.1	7	9.7			3	4.2	1	1.4			1	1.4	37	51.4
Age (Males)																					
18-21:	14																				
Monday		5	35.7	1	20.0	2	40.0	1	20.0	1	20.0										
Tuesday		5	35.7	1	20.0	2	40.0			2	40.0										
Wednesday		5	35.7	1	20.0	2	40.0	1	20.0	1	20.0										
Thursday		5	35.7	1	20.0	2	40.0			2	40.0										
Friday		5	35.7	1	20.0	2	40.0	1	20.0	1	20.0										
Saturday		5	35.7			3	60.0					1	20.0					1	20.0		
Sunday		5	35.7			2	40.0	1	20.0					1	20.0			1	20.0		
22-25:	33																				
Monday		4	12.1	2	25.0	1	12.5			1	12.5									4	50.0
Tuesday		4	12.1	3	37.5					1	12.5									4	50.0
Wednesday		4	12.1	2	25.0	1	12.5			1	12.5									4	50.0
Thursday		4	12.1	3	37.5					1	12.5									4	50.0
Friday		4	12.1	3	37.5					1	12.5									4	50.0
Saturday		5	15.1	3	37.5	1	12.5					1	12.5							3	37.5
Sunday		5	15.1	2	25.0			3	37.5											3	37.5
26-28:	27																				
Monday		4	14.8	4	57.1															3	42.9
Tuesday		4	14.8	4	57.1															3	42.9
Wednesday		4	14.8	4	57.1															3	42.9
Thursday		4	14.8	4	57.1															3	42.9
Friday		4	14.8	4	57.1															3	42.9
Saturday		3	11.1	2	28.6	1	14.3													4	57.1
Sunday		2	7.4	2	28.6															5	71.4

TABLE 4--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Hours																No Response	
				1		2		3		4		5		6		7		8		9			
				No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
30-33:	25																				
Monday		3	12.0	2	33.3	1	16.7													3	50.0
Tuesday		2	8.0	1	16.7	1	16.7													4	66.7
Wednesday		3	12.0	2	33.3	1	16.7													3	50.0
Thursday		2	8.0	1	16.7	1	16.7													4	66.7
Friday		3	12.0	2	33.3	1	16.7													3	50.0
Saturday		4	16.0	1	16.7	1	16.7	1	16.7	1	16.7									2	33.3
Sunday		3	12.0			1	16.7			2	33.3									3	50.0
34-37:	22																				
Monday		5	22.7	4	44.4			1	11.1											4	44.4
Tuesday		4	18.2	3	33.3			1	11.1											5	55.6
Wednesday		5	22.7	4	44.4			1	11.1											4	44.4
Thursday		5	22.7	4	44.4			1	11.1											4	44.4
Friday		5	22.7	4	44.4			1	11.1											4	44.4
Saturday		3	13.6	1	11.1	1	11.1	1	11.1											6	66.7
Sunday		2	9.0	1	11.1	1	11.1													7	77.8
38-41:	14																				
Monday		2	14.2							1	33.3	1	33.3							1	33.3
Tuesday		2	14.2							1	33.3	1	33.3							1	33.3
Wednesday		2	14.2							1	33.3	1	33.3							1	33.3
Thursday		2	14.2							1	33.3	1	33.3							1	33.3
Friday		2	14.2							2	66.7									1	33.3
Saturday		2	14.2							1	33.3			1	33.3					1	33.3
Sunday		2	14.2							1	33.3	1	33.3							1	33.3
42-45:	18																				
Monday		1	5.5			1	25.0													3	75.0
Tuesday		2	11.1	1	25.0	1	25.0													2	50.0
Wednesday		1	5.5			1	25.0													3	75.0
Thursday		2	11.1	1	25.0	1	25.0													2	50.0
Friday		1	5.5			1	25.0													3	75.0
Saturday		3	16.6	2	50.0	1	25.0													1	25.0
Sunday		3	16.6	2	50.0	1	25.0													1	25.0

TABLE 4--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Hours																No Response	
				1		2		3		4		5		6		7		8		9			
				No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
46-49:	30																						
Monday		5	16.6	3	27.3	2	18.2															6	54.5
Tuesday		5	16.6	3	27.3	2	18.2															6	54.5
Wednesday		5	16.6	3	27.3	1	9.1	1	9.1													6	54.5
Thursday		5	16.6	3	27.3	2	18.2															6	54.5
Friday		4	13.3	2	18.2	2	18.2															7	63.6
Saturday		6	20.0	3	27.3	3	27.3															5	45.5
Sunday		5	16.6	2	18.2	2	18.2	1	9.1													6	54.5
50 above:	38																						
Monday		2	5.3	2	15.4																	11	84.6
Tuesday		2	5.3	2	15.4																	11	84.6
Wednesday		2	5.3	2	15.4																	11	84.6
Thursday		2	5.3	2	15.4																	11	84.6
Friday		2	5.3	2	15.4																	11	84.6
Saturday		2	5.3	2	15.4																	11	84.6
Sunday		2	5.3	2	15.4																	11	84.6
Sex (Females)	51	51	41.4																				
Monday		27	52.9	17	33.3	6	11.8	2	3.9	1	2.0	1	2.0									24	47.1
Tuesday		30	58.8	19	37.3	7	13.7	2	3.9	1	2.0	1	2.0									21	41.2
Wednesday		27	52.9	17	33.3	6	11.8	2	3.9	1	2.0	1	2.0									24	47.1
Thursday		30	58.8	19	37.3	7	13.7	2	3.9	1	2.0	1	2.0									21	41.2
Friday		26	50.9	13	25.5	9	17.6	2	3.9	1	2.0	1	2.0									25	49.0
Saturday		27	52.9	10	19.6	14	27.5	1	2.0	1	2.0									1	2.0	24	47.1
Sunday		26	50.9	9	17.6	13	25.5	3	5.9											1	2.0	25	49.0
Age (Females)																							
18-21:	14																						
Monday		1	7.1			1	50.0															1	50.0
Tuesday		1	7.1			1	50.0															1	50.0
Wednesday		1	7.1			1	50.0															1	50.0
Thursday		1	7.1			1	50.0															1	50.0
Friday		1	7.1			1	50.0															1	50.0
Saturday																						2	100.0
Sunday																						2	100.0

TABLE 4--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Hours																No Response	
				1		2		3		4		5		6		7		8		9			
				No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
22-25:	33																						
Monday		3	9.0	2	25.0			1	12.5													5	62.5
Tuesday		3	9.0	2	25.0			1	12.5													5	62.5
Wednesday		3	9.0	2	25.0									1	12.5							5	62.5
Thursday		3	9.0	2	25.0			1	12.5													5	62.5
Friday		3	9.0	2	25.0	1	12.5															5	62.5
Saturday		4	12.1	4	50.0																	4	50.0
Sunday		5	15.2	2	25.0	1	12.5											1	12.5			4	50.0
26-28:	27																						
Monday		6	22.2	6	75.0																	2	25.0
Tuesday		4	14.8	4	50.0																	4	50.0
Wednesday		7	25.9	7	87.5																	1	12.5
Thursday		4	14.8	4	50.0																	4	50.0
Friday		6	22.2	6	75.0																	2	25.0
Saturday		6	22.2	3	37.5	3	37.5															2	25.0
Sunday		5	18.5	2	25.0	2	25.0	1	12.5													3	37.5
30-33:	25																						
Monday		1	4.0	1	33.3																	2	66.7
Tuesday		1	4.0	1	33.3																	2	66.7
Wednesday		1	4.0	1	33.3																	2	66.7
Thursday		1	4.0	1	33.3																	2	66.7
Friday		1	4.0	1	33.3																	2	66.7
Saturday		1	4.0			1	33.3															2	66.7
Sunday		1	4.0	1	33.3																	2	66.7
34-37:	22																						
Monday		2	9.0	1	33.3	1	33.3															1	33.3
Tuesday		2	9.0	1	33.3	1	33.3															1	33.3
Wednesday		2	9.0	1	33.3	1	33.3															1	33.3
Thursday		2	9.0	1	33.3	1	33.3															1	33.3
Friday		2	9.0	1	33.3	1	33.3															1	33.3
Saturday		2	9.0	1	33.3	1	33.3															1	33.3
Sunday		2	9.0	1	33.3	1	33.3															1	33.3

TABLE 4--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Hours																No Response	
				1		2		3		4		5		6		7		8		9			
				No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
38-41:	14																						
Monday																						2	100.0
Tuesday		1	7.1	1	50.0																	1	50.0
Wednesday																						2	100.0
Thursday		1	7.1	1	50.0																	1	50.0
Friday																						2	100.0
Saturday																						2	100.0
Sunday		1	7.1	1	50.0																	1	50.0
42-45:	18																						
Monday		2	11.1	2	33.3																	4	66.7
Tuesday		2	11.1	2	33.3																	4	66.7
Wednesday		2	11.1	2	33.3																	4	66.7
Thursday		2	11.1	1	16.7	1	16.7															4	66.7
Friday		2	11.1	2	33.3																	4	66.7
Saturday		2	11.1	1	16.7	1	16.7															4	66.7
Sunday		2	11.1	2	33.3																	4	66.7
46-49:	30																						
Monday																						7	100.0
Tuesday		1	3.3	1	14.3																	6	85.7
Wednesday		1	3.3	1	14.3																	6	85.7
Thursday		1	3.3	1	14.3																	6	85.7
Friday																						7	100.0
Saturday																						7	100.0
Sunday		1	3.3	1	14.3																	6	85.7
50 above:	38																						
Monday																						5	100.0
Tuesday																						5	100.0
Wednesday																						5	100.0
Thursday																						5	100.0
Friday																						5	100.0
Saturday																						5	100.0
Sunday																						5	100.0

TABLE 4--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Hours																No Response	
				1		2		3		4		5		6		7		8		9			
				No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Fargo																							
Sex (Males)	60	60	54.5																				
Monday		25	41.6	13	21.7	8	13.3	2	3.3	1	1.7	1	1.7									35	58.3
Tuesday		23	38.3	11	18.3	8	13.3	2	3.3	1	1.7	1	1.7									37	61.7
Wednesday		26	43.3	14	23.3	8	13.3	2	3.3	1	1.7	1	1.7									34	56.7
Thursday		24	40.0	12	20.0	8	13.3	2	3.3	1	1.7	1	1.7									36	60.0
Friday		25	41.6	13	21.7	8	13.3	2	3.3	2	3.3											35	58.3
Saturday		28	46.6	12	20.0	9	15.0	4	6.7	2	3.3			1	1.7							32	53.3
Sunday		25	41.6	9	15.0	10	16.7	1	1.7	4	6.7	1	1.7									35	58.3
Age (Males)																							
18-21:	14																						
Monday		2	14.3	1	33.3	1	33.3															1	33.3
Tuesday		2	14.3	1	33.3	1	33.3															1	33.3
Wednesday		2	14.3	1	33.3	1	33.3															1	33.3
Thursday		2	14.3	1	33.3	1	33.3															1	33.3
Friday		2	14.3	1	33.3	1	33.3															1	33.3
Saturday		2	14.3	1	33.3			1	33.3													1	33.3
Sunday		2	14.3	1	33.3					1	33.3											1	33.3
22-25:	33																						
Monday		3	9.0	2	25.0			1	12.5													5	62.5
Tuesday		3	9.0	2	25.0			1	12.5													5	62.5
Wednesday		3	9.0	2	25.0			1	12.5													5	62.5
Thursday		3	9.0	2	25.0			1	12.5													5	62.5
Friday		3	9.0	2	25.0			1	12.5													5	62.5
Saturday		4	12.1	2	25.0	1	12.5	1	12.5													4	50.0
Sunday		4	12.1	2	25.0	1	12.5	1	12.5													4	50.0
26-28:	27																						
Monday		4	14.8	2	25.0	2	25.0															4	50.0
Tuesday		3	11.1	1	12.5	2	25.0															5	62.5
Wednesday		5	18.5	3	37.5	2	25.0															3	37.5
Thursday		3	11.1	1	12.5	2	25.0															5	62.5
Friday		4	14.8	2	25.0	2	25.0															4	50.0
Saturday		5	18.5	4	50.0	1	12.5															3	37.5
Sunday		5	18.5	3	37.5	2	25.0															3	37.5

TABLE 4--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Hours														No Response	
				1		2		3		4		5		6		7		8		9			
				No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
30-33:	25																						
Monday		8	32.0	4	44.4	2	22.2	1	11.1			1	11.1									1	11.1
Tuesday		8	32.0	4	44.4	2	22.2	1	11.1			1	11.1									1	11.1
Wednesday		8	32.0	4	44.4	2	22.2	1	11.1			1	11.1									1	11.1
Thursday		9	36.0	5	55.6	2	22.2	1	11.1			1	11.1										
Friday		8	32.0	4	44.4	2	22.2	1	11.1			1	11.1									1	11.1
Saturday		7	28.0	3	33.3	1	11.1	1	11.1	1	11.1	1	11.1									2	22.2
Sunday		7	28.0	2	22.2	2	22.2	1	11.1			2	22.2									2	22.2
34-37:	22																						
Monday		2	9.0	1	14.3													1	14.3			5	71.4
Tuesday		2	9.0	1	14.3													1	14.3			5	71.4
Wednesday		2	9.0	1	14.3													1	14.3			5	71.4
Thursday		2	9.0	1	14.3													1	14.3			5	71.4
Friday		2	9.0	1	14.3													1	14.3			5	71.4
Saturday		3	13.6	1	14.3	1	14.3											1	14.3			4	57.1
Sunday		2	9.0	1	14.3	1	14.3															5	71.4
38-41:	14																						
Monday		1	7.1	1	33.3																	2	66.7
Tuesday		2	14.2	2	66.7																	1	33.3
Wednesday		1	7.1	1	33.3																	2	66.7
Thursday		2	14.2	2	66.7																	1	33.3
Friday		1	7.1	1	33.3																	2	66.7
Saturday		1	7.1	1	33.3																	2	66.7
Sunday		3	21.4	3	100.0																		
42-45:	18																						
Monday		3	16.6	1	14.3	2	28.6															4	57.1
Tuesday		3	16.6	1	14.3	2	28.6															4	57.1
Wednesday		3	16.6	1	14.3	2	28.6															4	57.1
Thursday		3	16.6	1	14.3	2	28.6															4	57.1
Friday		3	16.6	1	14.3	1	14.3	1	14.3													4	57.1
Saturday		3	16.6	1	14.3	1	14.3					1	14.3									4	57.1
Sunday		3	16.6	1	14.3	1	14.3					1	14.3									4	57.1

TABLE 4--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Hours																No Response	
				1		2		3		4		5		6		7		8		9			
				No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
46-49:	30																						
Monday		1	3.3			1	16.7															5	83.3
Tuesday		1	3.3			1	16.7															5	83.3
Wednesday		1	3.3			1	16.7															5	83.3
Thursday		1	3.3			1	16.7															5	83.3
Friday		1	3.3			1	16.7															5	83.3
Saturday		1	3.3			1	16.7															5	83.3
Sunday		1	3.3			1	16.7															5	83.3
50 above:	38																						
Monday		3	7.9	2	16.7	1	8.3															9	75.0
Tuesday		3	7.9	2	16.7	1	8.3															9	75.0
Wednesday		3	7.9	2	16.7	1	8.3															9	75.0
Thursday		3	7.9	2	16.7	1	8.3															9	75.0
Friday		3	7.9	2	16.7	1	8.3															9	75.0
Saturday		3	7.9	1	8.3	2	16.7															9	75.0
Sunday		2	5.2			2	16.7															10	83.3
Sex (Females)	50	50	45.4																				
Monday		18	36.0	13	26.0	4	8.0	1	2.0													32	64.0
Tuesday		18	36.0	13	26.0	5	10.0															32	64.0
Wednesday		20	40.0	16	32.0	3	6.0							1	2.0							30	60.0
Thursday		18	36.0	11	22.0	5	10.0	2	4.0													32	64.0
Friday		18	36.0	13	26.0	5	10.0															32	64.0
Saturday		22	44.0	10	20.0	9	18.0	2	4.0	1	2.0											28	56.0
Sunday		20	40.0	10	20.0	5	10.0	4	8.0									1	2.0			30	60.0
Age (Females)																							
18-21:	14																						
Monday		3	21.4			3	75.0															1	25.0
Tuesday		3	21.4	1	25.0	2	50.0															1	25.0
Wednesday		3	21.4	1	25.0	2	50.0															1	25.0
Thursday		3	21.4			3	75.0															1	25.0
Friday		3	21.4			3	75.0															1	25.0
Saturday		4	28.5			1	25.0	2	50.0	1	25.0												
Sunday		2	14.2			1	25.0	1	25.0													2	50.0

TABLE 4--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Hours																No Response	
				1		2		3		4		5		6		7		8		9			
				No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
22-25:	33																				
Monday		8	24.2	6	66.7	2	22.2													1	11.1
Tuesday		7	21.2	5	55.6	2	22.2													2	22.2
Wednesday		7	21.2	5	55.6	2	22.2													2	22.2
Thursday		7	21.2	5	55.6	2	22.2													2	22.2
Friday		6	18.2	2	22.2	4	44.4													3	33.3
Saturday		6	18.2	2	22.2	4	44.4	1	11.1											2	22.2
Sunday		7	21.2	1	11.1	6	66.7													2	22.2
26-28:	27																				
Monday		2	7.4	2	50.0															2	50.0
Tuesday		3	11.1	3	75.0															1	25.0
Wednesday		2	7.4	2	50.0															2	50.0
Thursday		3	11.1	3	75.0															1	25.0
Friday		2	7.4	1	25.0	1	25.0													2	50.0
Saturday		3	11.1	1	25.0	2	50.0													1	25.0
Sunday		3	11.1	1	25.0			2	50.0											1	25.0
30-33:	25																				
Monday		4	16.0	2	28.6	2	28.6													3	42.9
Tuesday		6	24.0	4	57.1	2	28.6													1	14.3
Wednesday		5	20.0	3	42.9	2	28.6													2	28.6
Thursday		6	24.0	4	57.1	2	28.6													1	14.3
Friday		5	20.0	3	42.9	2	28.6													2	28.6
Saturday		5	20.0	2	28.6	3	42.9													2	28.6
Sunday		5	20.0	2	28.6	3	42.9													2	28.6
34-37:	22																				
Monday		1	4.5	1	33.3															2	66.7
Tuesday		1	4.5	1	33.3															2	66.7
Wednesday		1	4.5	1	33.3															2	66.7
Thursday		1	4.5	1	33.3															2	66.7
Friday		1	4.5	1	33.3															2	66.7
Saturday		1	4.5			1	33.3													2	66.7
Sunday		1	4.5			1	33.3													2	66.7

TABLE 4--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding	Hours																No Response	
				1		2		3		4		5		6		7		8		9			
				No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
38-41:	14																				
Monday		2	14.2	1	16.7					1	16.7									4	66.7
Tuesday		3	21.4	2	33.3					1	16.7									3	50.0
Wednesday		2	14.2	1	16.7					1	16.7									4	66.7
Thursday		2	14.2	1	16.7					1	16.7									4	66.7
Friday		2	14.2	1	16.7					1	16.7									4	66.7
Saturday		2	14.2	1	16.7															4	66.7
Sunday		3	21.4	2	33.3															3	50.0
42-45:	18																				
Monday																				1	100.0
Tuesday																				1	100.0
Wednesday																				1	100.0
Thursday																				1	100.0
Friday																				1	100.0
Saturday																				1	100.0
Sunday																				1	100.0
46-49:	30																				
Monday		3	10.0	1	16.7			1	16.7			1	16.7							3	50.0
Tuesday		3	10.0	1	16.7			1	16.7			1	16.7							3	50.0
Wednesday		3	10.0	1	16.7			1	16.7			1	16.7							3	50.0
Thursday		3	10.0	1	16.7			1	16.7			1	16.7							3	50.0
Friday		3	10.0	1	16.7			1	16.7			1	16.7							3	50.0
Saturday		3	10.0	1	16.7	1	16.7			1	16.7									3	50.0
Sunday		3	10.0	1	16.7	1	16.7	1	16.7											3	50.0
50 above:	38																				
Monday		3	7.9	3	37.5															5	62.5
Tuesday		3	7.9	3	37.5															5	62.5
Wednesday		4	10.5	4	50.0															4	50.0
Thursday		3	7.9	3	37.5															5	62.5
Friday		4	10.5	4	50.0															4	50.0
Saturday		3	7.9	2	25.0	1	12.5													5	62.5
Sunday		2	5.2	1	12.5	1	12.5													6	75.0

day of the week least used for bicycle riding. About 44 per cent of the riders used Tuesday to ride bicycles. The remaining days of the week were used for riding almost equally. However, little significant difference was determined between the remaining days the riders selected for bicycle usage.

Table 4 revealed that Grand Forks had higher percentages of individuals riding during the week as compared to Fargo. The table showed that 63, or 51.2 per cent, Grand Forks riders used their bicycles on "Saturday" as compared to Fargo with 50, or 45.4 per cent, riders.

Table 4 revealed that Fargo bicycle riders used their bikes more often on Wednesday and Saturday than on any other day of the week. However, the table showed that Grand Forks riders preferred Tuesday and Thursday. The table also showed that Grand Forks females rode their bicycles more on weekends than did Fargo females. However, males from both Fargo and Grand Forks rode their bicycle proportionately equal on weekends, but the males from Grand Forks used their bicycles for longer periods of time. The table showed that seven, or 9.7 per cent, of males from Grand Forks rode their bicycles on Sunday for three hours. However, the table also showed that only 1, or 1.7 per cent, of males from Fargo rode their bicycles on Sunday for three hours. The same also held true for the females.

Table 5 presented the responses to question number 3 in part B of the questionnaire. The question requested that the respondents indicate what priority areas they would prefer to be developed for bikeways and bike paths.

TABLE 5

NUMBER AND PERCENTAGE OF RESPONDENTS THAT INDICATED WHICH PRIORITY AREAS THEY PREFERRED TO BE DEVELOPED WITH BIKEWAYS, ACCORDING TO CITY, SEX AND AGE

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Total Population	233		
City parks		169	72.5
County parks		78	33.5
State parks		111	47.6
National parks		88	37.8
State forest		59	25.3
City streets		162	69.5
County roads		58	24.9
State highway		82	35.2
Total Population-City			
Fargo	110		
City parks		81	73.6
County parks		36	32.7
State parks		49	44.5
National parks		39	35.4
State forest		28	25.4
City streets		78	70.9
County roads		24	21.8
State highway		36	32.7
Grand Forks	123		
City parks		88	71.5
County parks		42	34.1
State parks		62	50.4
National parks		49	39.8
State forest		31	25.2
City streets		84	68.3
County roads		34	27.6
State highway		46	37.4
Total Population-Sex			
Females	101		
City parks		75	74.2
County parks		26	25.7
State parks		48	47.5

TABLE 5--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Total Population-Sex			
Females			
National parks		35	34.6
State forest		27	26.7
City streets		76	75.2
County roads		29	28.7
State highway		36	35.6
Males	132		
City parks		94	71.2
County parks		52	39.4
State parks		63	47.7
National parks		53	40.1
State forest		32	24.2
City streets		86	65.2
County roads		29	21.9
State highway		46	34.8
Total Population-Age Groups			
18-21	14		
City parks		7	50.0
County parks		6	42.8
State parks		9	64.3
National parks		5	35.7
State forest		5	35.7
City streets		9	64.3
County roads		3	21.4
State highway		9	64.3
22-25	33		
City parks		29	87.8
County parks		10	30.3
State parks		19	57.6
National parks		16	48.5
State forest		12	36.4
City streets		29	87.9
County roads		8	24.2
State highway		13	39.4

TABLE 5--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Total Population-			
Age Groups			
26-28	27		
City parks		23	85.2
County parks		13	48.1
State parks		17	62.9
National parks		14	51.8
State forest		7	25.9
City streets		23	85.2
County roads		11	40.7
State highway		11	40.7
30-33	25		
City parks		19	76.0
County parks		10	40.0
State parks		15	60.0
National parks		16	64.0
State forest		11	44.0
City streets		21	84.0
County roads		6	24.0
State highway		9	36.0
34-37	22		
City parks		19	86.4
County parks		6	27.3
State parks		8	36.4
National parks		5	22.7
State forest		2	9.0
City streets		18	81.8
County roads		4	18.2
State highway		11	50.0
38-41	14		
City parks		7	50.0
County parks		1	7.1
State parks		4	28.6
National parks		3	21.4
State forest		2	14.2
City streets		7	50.0
County roads		2	14.2
State highway		4	28.6

TABLE 5--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Total Population-			
Age Groups			
42-45	18		
City parks		12	66.6
County parks		6	33.3
State parks		8	44.4
National parks		7	38.8
State forest		5	27.7
City streets		9	50.0
County roads		4	22.2
State highway		5	27.7
46-49	30		
City parks		23	76.6
County parks		12	40.0
State parks		16	53.3
National parks		9	30.0
State forest		9	30.0
City streets		18	60.0
County roads		11	36.6
State highway		8	26.6
50 above	38		
City parks		23	60.5
County parks		12	31.6
State parks		12	31.6
National parks		9	23.7
State forest		4	10.5
City streets		17	44.7
County roads		6	15.8
State highway		8	21.0
Grand Forks			
Males (Sex)	123	72	58.5
City parks		51	70.8
County parks		28	38.9
State parks		39	54.2
National parks		31	43.1
State forest		18	25.0
City streets		46	63.9
County roads		20	27.8
State highway		26	36.1

TABLE 5--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Males)			
18-21	14		
City parks		1	7.1
County parks		3	21.4
State parks		4	28.6
National parks		3	21.4
State forest		3	21.4
City streets		3	21.4
County roads		1	7.1
State highway		3	21.4
22-25	33		
City parks		8	24.2
County parks		2	6.0
State parks		6	18.2
National parks		6	18.2
State forest		3	9.0
City streets		6	18.2
County roads		1	3.0
State highway		2	6.0
26-28	27		
City parks		6	22.2
County parks		4	14.8
State parks		4	14.8
National parks		3	11.1
State forest		3	11.1
City streets		7	25.9
County roads		3	11.1
State highway		2	7.4
30-33	25		
City parks		8	32.0
County parks		4	16.0
State parks		6	24.0
National parks		6	24.0
State forest		5	20.0
City streets		9	36.0
County roads		3	12.0
State highway		5	20.0

TABLE 5--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Males)			
34-37	22		
City parks		6	27.3
County parks		4	18.2
State parks		5	22.7
National parks		3	13.6
State forest		0	
City streets		5	22.7
County roads		0	
State highway		4	18.2
38-41	14		
City parks		3	21.4
County parks		0	
State parks		1	7.1
National parks		2	14.2
State forest		0	
City streets		3	21.4
County roads		2	14.2
State highway		3	21.4
42-45	18		
City parks		4	22.2
County parks		3	16.6
State parks		4	22.2
National parks		4	22.2
State forest		2	11.1
City streets		3	16.6
County roads		2	11.1
State highway		1	5.5
46-49	30		
City parks		7	23.3
County parks		5	16.6
State parks		5	16.6
National parks		2	6.6
State forest		2	6.6
City streets		5	16.6
County roads		5	16.6
State highway		3	10.0

TABLE 5--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Males)			
50 above	30		
City parks		7	18.4
County parks		2	5.3
State parks		4	10.5
National parks		2	5.3
State forest		0	
City streets		4	10.5
County roads		2	5.3
State highway		2	5.3
Females (Sex)	123	51	41.4
City parks		37	72.5
County parks		14	27.5
State parks		23	45.1
National parks		18	35.3
State forest		13	25.5
City streets		38	74.5
County roads		14	27.5
State highway		20	39.2
Age (Females)			
18-21	14		
City parks		1	7.1
County parks		0	
State parks		1	7.1
National parks		0	
State forest		0	
City streets		1	7.1
County roads		1	7.1
State highway		1	7.1
22-25	33		
City parks		8	24.2
County parks		1	3.0
State parks		5	15.2
National parks		4	12.1
State forest		3	9.0
City streets		9	27.3
County roads		3	9.0
State highway		6	18.0

TABLE 5--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Females)			
26-28	27		
City parks		4	14.8
County parks		3	11.8
State parks		4	14.8
National parks		3	11.1
State forest		2	7.4
City streets		4	14.8
County roads		2	7.4
State highway		4	14.8
30-33	25		
City parks		6	24.0
County parks		4	16.0
State parks		4	16.0
National parks		5	20.0
State forest		3	12.0
City streets		6	24.0
County roads		2	8.0
State highway		2	8.0
34-37	22		
City parks		3	13.6
County parks		0	
State parks		0	
National parks		0	
State forest		0	
City streets		3	13.6
County roads		0	
State highway		1	4.5
38-41	14		
City parks		2	14.2
County parks		0	
State parks		1	7.1
National parks		0	
State forest		0	
City streets		1	7.1
County roads		0	
State highway		0	

TABLE 5--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Females)			
42-45	18		
City parks		0	
County parks		0	
State parks		0	
National parks		0	
State forest		0	
City streets		0	
County roads		0	
State highway		0	
46-49	30		
City parks		5	16.6
County parks		2	6.6
State parks		4	13.3
National parks		3	10.0
State forest		3	10.0
City streets		5	16.6
County roads		3	10.0
State highway		2	6.6
50 above	38		
City parks		6	15.8
County parks		3	7.9
State parks		3	7.9
National parks		1	2.6
State forest		0	
City streets		5	13.2
County roads		2	5.3
State highway		2	5.3
Fargo - Males	110	60	54.5
Sex			
City parks		43	71.7
County parks		24	40.0
State parks		24	40.0
National parks		22	36.7
State forest		14	23.3
City streets		40	66.7
County roads		9	15.0
State highway		20	33.3

TABLE 5--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Males)			
18-21	14		
City parks		2	14.2
County parks		1	7.1
State parks		2	14.2
National parks		1	7.1
State forest		1	7.1
City streets		2	14.2
County roads		0	
State highway		2	14.2
22-25	33		
City parks		6	18.2
County parks		5	15.2
State parks		4	12.1
National parks		4	12.1
State forest		4	12.1
City streets		7	21.2
County roads		1	3.0
State highway		1	6.0
26-28	27		
City parks		5	18.5
County parks		3	11.1
State parks		2	7.4
National parks		3	11.1
State forest		0	
City streets		5	18.5
County roads		2	7.4
State highway		2	7.4
30-33	25		
City parks		4	16.0
County parks		2	8.0
State parks		3	12.0
National parks		3	12.0
State forest		1	4.0
City streets		5	20.0
County roads		1	4.0
State highway		1	4.0

TABLE 5--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Males)			
34-37	22		
City parks		7	31.8
County parks		2	9.0
State parks		3	13.6
National parks		2	9.0
State forest		1	4.5
City streets		8	36.3
County roads		3	13.6
State highway		5	22.7
38-41	14		
City parks		2	14.2
County parks		1	7.1
State parks		2	14.2
National parks		1	7.1
State forest		2	14.2
City streets		1	7.1
County roads		0	
State highway		1	7.1
42-45	18		
City parks		4	22.2
County parks		1	5.5
State parks		2	11.1
National parks		1	5.5
State forest		0	
City streets		2	11.1
County roads		0	
State highway		2	11.1
46-49	30		
City parks		5	16.6
County parks		3	10.0
State parks		3	10.0
National parks		3	10.0
State forest		2	6.6
City streets		2	6.6
County roads		0	
State highway		0	

TABLE 5--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Males)			
50 above	38		
City parks		8	21.0
County parks		6	15.8
State parks		3	7.9
National parks		4	10.5
State forest		3	7.9
City streets		7	18.4
County roads		2	5.3
State highway		4	10.5
Fargo - Females	110	50	45.4
Sex			
City parks		38	76.0
County parks		12	24.0
State parks		25	50.0
National parks		17	34.0
State forest		14	28.0
City streets		38	76.0
County roads		15	30.0
State highway		16	32.0
Age (Females)			
18-21	14		
City parks		3	21.4
County parks		2	14.2
State parks		2	14.2
National parks		1	7.1
State forest		1	7.1
City streets		3	21.4
County roads		1	7.1
State highway		3	21.4
22-25	33		
City parks		7	21.2
County parks		2	6.0
State parks		4	12.1
National parks		2	6.0
State forest		2	6.0
City streets		7	21.2
County roads		3	9.0
State highway		2	6.0

TABLE 5--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Females)			
26-28	27		
City parks		8	29.6
County parks		3	11.1
State parks		7	25.9
National parks		5	18.5
State forest		2	7.4
City streets		8	29.6
County roads		4	14.8
State highway		3	11.1
30-33	25		
City parks		1	4.0
County parks		0	
State parks		2	8.0
National parks		2	8.0
State forest		2	8.0
City streets		1	4.0
County roads		0	
State highway		1	4.0
34-37	22		
City parks		3	13.6
County parks		0	
State parks		0	
National parks		0	
State forest		1	4.5
City streets		2	9.0
County roads		1	4.5
State highway		1	4.5
38-41	14		
City parks		0	
County parks		0	
State parks		0	
National parks		0	
State forest		0	
City streets		2	14.2
County roads		0	
State highway		0	

TABLE 5---Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Females)			
42-45	18		
City parks		4	22.2
County parks		2	11.1
State parks		2	11.1
National parks		2	11.1
State forest		3	16.6
City streets		4	22.2
County roads		2	11.1
State highway		2	11.1
46-49	30		
City parks		6	20.0
County parks		2	6.6
State parks		4	13.3
National parks		2	6.6
State forest		2	6.6
City streets		6	20.0
County roads		3	10.0
State highway		3	10.0
50 above	38		
City parks		2	5.3
County parks		1	2.6
State parks		2	5.3
National parks		2	5.3
State forest		1	2.6
City streets		1	2.6
County roads		0	
State highway		0	

Table 5 revealed 169, or 72.5 per cent, of the respondents wanted "parks" developed for bike paths. Nearly 70 per cent of the respondents felt "city streets" should be zoned for bikeways. Fifty-nine, or 25.3 per cent, of the respondents thought "forest areas" should have developed bike paths. Only 25 per cent of the

individuals, who responded, indicated that "county roads" should include bike paths.

Table 5 showed that Fargo and Grand Forks respondents had similar preferences for development of bikeways or bike paths in all eight priority areas. For example, 88, or 71.5 per cent, of the Grand Forks residents thought "city parks" should have bike paths as compared to 81, or 73.6 per cent, of the Fargo residents.

Table 5 also revealed that both males and females from both Fargo and Grand Forks had similar preferences for bike paths and ways in all the priority areas. The responses were also similar according to the ages of the respondents. However, it was interesting to note that, in some age groups, the percentage of respondents varied considerably in their preference of area to be developed. For example, the table showed that only 25 per cent of the Grand Forks males in the 22-25 year old age group wanted "county parks" developed. Whereas, nearly 63 per cent of Fargo males, 22-25 years old, preferred "county parks" be developed for bike paths.

Table 6 presented information concerning question number 4 in part B of the questionnaire. This question asked the respondents to agree or disagree about the need for cross-country bikeways in the Fargo and Grand Forks area. The respondent also had a third choice which was to answer, "in the future."

Table 6 revealed that of the 233 respondents, 88, or 37.7 per cent, gave a "yes" response. However, 97, or 41.6 per cent, gave a "no" answer to the question. But, it was interesting to note that 48, or 20.6 per cent, of the respondents agreed that cross-country bikeways

TABLE 6

NUMBER AND PERCENTAGE OF RESPONDENTS THAT AGREED OR DISAGREED ABOUT THE NEED FOR CROSS-COUNTRY BIKEWAYS, ACCORDING TO CITY, SEX, AGE

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Total Population-	233		
Yes		88	37.7
No		97	41.6
Future		48	20.6
Total Population-City			
Fargo	110		
Yes		35	31.8
No		52	47.3
Future		23	20.9
Grand Forks	123		
Yes		53	51.4
No		45	33.3
Future		25	15.3
Total Population-Sex			
Females	101		
Yes		35	34.6
No		41	40.6
Future		25	24.8
Males	132		
Yes		53	40.2
No		56	42.4
Future		23	17.4
Total Population-Age Groups			
18-21	14		
Yes		7	50.0
No		3	21.4
Future		4	28.6
22-25	33		
Yes		11	33.3
No		16	48.5
Future		6	18.2

TABLE 6--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Total Population-			
Age Groups			
26-28	27		
Yes		12	44.4
No		13	48.1
Future		2	7.4
30-33	25		
Yes		12	48.0
No		8	32.0
Future		5	20.0
34-37	22		
Yes		9	40.9
No		5	22.7
Future		8	36.4
38-41	14		
Yes			35.7
No			50.0
Future			14.3
42-45	18		
Yes		6	33.3
No		6	33.3
Future		6	33.3
46-49	30		
Yes		11	36.6
No		14	46.6
Future		5	16.6
50 above	38		
Yes		12	31.6
No		20	52.6
Future		6	15.8
Grand Forks			
Males (Sex)	123	72	58.5
Yes		37	51.4
No		24	33.3
Future		11	15.3

TABLE 6--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Males)			
18-21	14		
Yes		4	28.6
No		0	
Future		1	7.1
22-25	33		
Yes		3	9.0
No		4	12.1
Future		1	3.0
26-28	27		
Yes		3	11.1
No		3	11.1
Future		1	3.7
30-33	25		
Yes		8	32.0
No		1	4.0
Future		0	
34-37	22		
Yes		4	18.2
No		1	4.5
Future		2	9.0
38-41	14		
Yes		3	21.4
No		0	
Future		0	
42-45	18		
Yes		2	11.1
No		2	11.1
Future		3	16.6
46-49	30		
Yes		5	16.6
No		4	13.3
Future		2	6.6
50 above	38		
Yes		5	13.1
No		7	18.4
Future		1	2.6

TABLE 6--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Females (Sex)	123	51	41.4
Yes		16	31.4
No		21	41.2
Future		14	27.4
Age (Females)			
18-21	14		
Yes		1	7.1
No		1	7.1
Future		0	
22-25	33		
Yes		1	3.0
No		5	15.2
Future		3	9.0
26-28	27		
Yes		4	14.8
No		0	
Future		0	
30-33	25		
Yes		1	4.0
No		2	8.0
Future		4	16.0
34-37	22		
Yes		1	4.5
No		0	
Future		2	9.0
31-41	14		
Yes		1	7.1
No		5	35.7
Future		0	
42-45	18		
Yes		0	
No		1	5.5
Future		0	
46-49	30		
Yes		3	10.0
No		2	6.6
Future		1	3.3

TABLE 6--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Females)			
50 above	38		
Yes		2	5.3
No		3	7.9
Future		3	7.9
Fargo - Males	110	60	54.5
Sex			
Yes		16	26.7
No		32	53.3
Future		12	20.0
Age (Males)			
18-21	14		
Yes		1	7.1
No		2	14.2
Future		0	
22-25	33		
Yes		4	12.1
No		4	12.1
Future		0	
26-28	27		
Yes		1	3.7
No		7	25.9
Future		0	
30-33	25		
Yes		1	4.0
No		4	16.0
Future		1	4.0
34-37	22		
Yes		2	9.0
No		3	13.6
Future		4	18.2
38-41	14		
Yes		1	7.1
No		1	7.1
Future		1	7.1

TABLE 6--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Males)			
42-45	18		
Yes		2	11.1
No		1	5.5
Future		1	5.5
46-49	30		
Yes		0	
No		6	20.0
Future		0	
50 above	38		
Yes		4	10.5
No		6	15.8
Future		2	5.2
Fargo - Females (Sex)	110	50	45.4
Yes		19	38.0
No		20	40.0
Future		11	22.0
Age (Females)			
18-21	14		
Yes		1	7.1
No		0	
Future		3	21.4
22-25	33		
Yes		3	9.0
No		3	9.0
Future		2	6.0
26-28	27		
Yes		4	14.8
No		3	11.1
Future		1	3.7
30-33	25		
Yes		2	8.0
No		1	4.0
Future		0	

TABLE 6--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Females)			
34-37	22		
Yes		2	9.0
No		1	4.5
Future		0	
38-41	14		
Yes		0	
No		1	7.1
Future		1	7.1
42-45	18		
Yes		2	11.1
No		2	11.1
Future		2	11.1
46-49	30		
Yes		3	10.0
No		2	6.6
Future		2	6.6
50 above	38		
Yes		1	2.6
No		4	10.5
Future		0	

should be developed in the future. Therefore, in reality, over half of the respondents gave positive responses.

Table 6 showed that a larger percentage of the respondents believed that cross-country bikeways should be developed. However, the difference was really very small, just a little over one-half per cent.

The table also revealed that the females from Fargo and Grand Forks answered the question similarly. Sixteen, or 31.4 per cent, of

Grand Forks females and 19, or 38.0 per cent, of the Fargo females gave a "yes" response. However, it was interesting to note that 37, or 51.4 per cent of the males from Grand Forks wanted cross country bikeways. Whereas, only 16, or 26.7 per cent, of the Fargo males responsed positively.

In further examination of Table 6, it was shown that the largest percentages of "yes" answers came from the 18-22 year old age group. However, it was even more interesting to note that the large number of "no" answers did not come directly from the elderly groups.

Table 7 presented the responses to question number 5 in part B of the questionnaire. The question asked the respondent to follow-up question number 4. It requested the respondents to "agree" or "disagree" if they would use the cross-country bikeway if it existed. The respondent also had a third choice which was to answer, "in the future."

Table 7 revealed that 52, or 22.3 per cent, of the respondents gave a "yes" response to the question. However, 149, or 63.9 per cent, of the individuals said they would not use the facility if it existed. However, it was interesting to note that 32, or 26.0 per cent, of Grand Forks respondents stated they would use the bikeways as compared to 20, or 18.2 per cent, of the Fargo respondents.

The table also revealed that a comparable percentage of females from Fargo and Grand Forks would use "cross-country bikeways" if they existed. However, it was interesting to note that 22, or 30.6 per cent, of the males from Grand Forks wanted cross-country bikeways. Whereas, 13, or 21.7 per cent, of the Fargo males responsed with a "yes" answer.

TABLE 7

NUMBER AND PERCENTAGE OF RESPONDENTS THAT WOULD USE THE CROSS-COUNTRY BIKEWAY IF IT EXISTED, ACCORDING TO CITY, SEX, AGE

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Total Population-	233		
Yes		52	22.3
No		149	63.9
Future		32	13.7
Total Population-City			
Fargo	110		
Yes		20	18.2
No		77	70.0
Future		15	13.6
Grand Forks	123		
Yes		32	26.0
No		77	58.5
Future		19	15.4
Total Population-Sex			
Females	101		
Yes		17	16.8
No		68	67.3
Future		16	15.8
Males	132		
Yes		35	26.5
No		81	61.4
Future		16	12.1
Total Population-Age Groups			
18-21	14		
Yes		8	57.1
No		1	7.1
Future		5	37.7
22-25	33		
Yes		11	33.3
No		19	57.6
Future		3	9.0

TABLE 7--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Total Population-			
Age Groups			
26-28	27		
Yes		6	22.2
No		18	66.6
Future		3	11.1
30-33	25		
Yes		5	20.0
No		14	56.0
Future		6	24.0
34-37	22		
Yes		3	13.6
No		11	50.0
Future		8	36.4
38-41	14		
Yes		2	14.3
No		10	71.4
Future		2	14.3
42-45	18		
Yes		3	16.6
No		8	44.4
Future		7	38.8
46-49	30		
Yes		7	23.3
No		23	76.6
Future		0	
50 above	38		
Yes		5	13.2
No		24	63.2
Future		9	23.6
Grand Forks			
Males (Sex)	123	72	58.5
Yes		22	30.6
No		39	54.2
Future		11	15.3

TABLE 7--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Males)			
18-21	14		
Yes		3	21.4
No		0	
Future		2	14.2
22-25	33		
Yes		4	12.1
No		4	12.1
Future		0	
26-28	27		
Yes		2	7.4
No		4	14.8
Future		1	3.7
30-33	25		
Yes		4	16.0
No		3	12.0
Future		2	8.0
34-37	22		
Yes		0	
No		5	22.7
Future		2	9.0
38-41	14		
Yes		1	7.1
No		0	
Future		2	14.2
42-45	18		
Yes		2	11.1
No		4	22.2
Future		1	5.5
46-49	30		
Yes		3	10.0
No		8	26.6
Future		0	
50 above	38		
Yes		3	7.9
No		9	23.6
Future		1	2.6

TABLE 7--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Females (Sex)	123	51	41.4
Yes		10	19.6
No		33	64.7
Future		8	15.7
Age (Females)			
18-21	14		
Yes		1	7.1
No		1	7.1
Future		0	
22-25	33		
Yes		2	6.0
No		5	15.2
Future		2	6.0
26-28	27		
Yes		3	11.1
No		1	3.7
Future		0	
30-33	25		
Yes		0	
No		3	12.0
Future		4	16.0
34-37	22		
Yes		1	4.5
No		1	4.5
Future		1	4.5
38-41	14		
Yes		0	
No		6	42.8
Future		0	
42-45	18		
Yes		0	
No		0	
Future		1	5.5
46-49	30		
Yes		2	6.6
No		4	13.3
Future		0	

TABLE 7--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Females)			
50 above	38		
Yes		0	
No		0	
Future		0	
Fargo - Males	110	60	54.5
Sex			
Yes		13	21.7
No		42	70.0
Future		5	8.3
Age (Males)			
18-21	14		
Yes		3	21.4
No		0	
Future		0	
22-25	33		
Yes		2	6.0
No		5	15.2
Future		1	3.0
26-28	27		
Yes		0	
No		7	25.9
Future		1	3.7
30-33	25		
Yes		1	4.0
No		5	20.0
Future		0	
34-37	22		
Yes		2	9.0
No		4	18.2
Future		4	18.2
38-41	14		
Yes		1	7.1
No		2	14.2
Future		0	

TABLE 7--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Males)			
42-45	18		
Yes		1	5.5
No		3	16.6
Future		0	
46-49	30		
Yes		0	
No		6	20.0
Future		0	
50 above	38		
Yes		2	5.3
No		10	26.3
Future		0	
Fargo - Females	110	50	45.4
Sex			
Yes		7	14.0
No		35	70.0
Future		8	16.0
Age (Females)			
18-21	14		
Yes		1	7.1
No		0	
Future		3	21.4
22-25	33		
Yes		3	9.0
No		5	15.2
Future		0	
26-28	27		
Yes		1	3.7
No		6	22.2
Future		1	3.7
30-33	25		
Yes		0	
No		3	12.0
Future		0	

TABLE 7--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Females)			
34-37	22		
Yes		0	
No		1	4.5
Future		2	9.0
38-41	14		
Yes		0	
No		2	14.2
Future		0	
42-45	18		
Yes		0	
No		5	27.7
Future		1	5.5
46-49	30		
Yes		2	6.6
No		5	16.6
Future		0	
50 above	38		
Yes		0	
No		5	13.2
Future		0	

Table 8 presented information concerning question number 6 in part B of the questionnaire. The question requested a "yes" or "no" answer on whether any of their family members would use cross-country bikeways if they existed. The respondents had a third choice which was to answer, "in the future."

Table 8 revealed that 59 individuals, or 25.3 per cent, answered "yes" to the question. Whereas, 129, or 55.4 per cent, responded with a "no" answer. However, it was interesting to note that 45 respondents,

TABLE 8

NUMBER AND PERCENTAGE OF RESPONDENT'S FAMILY MEMBERS THAT WOULD USE THE CROSS-COUNTRY BIKEWAY IF IT EXISTED, ACCORDING TO CITY, SEX, AGE

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Total Population-	233		
Yes		59	25.3
No		129	55.4
Future		45	19.3
Total Population-City			
Fargo	110		
Yes		25	22.7
No		69	62.7
Future		16	14.5
Grand Forks	123		
Yes		34	27.6
No		60	48.8
Future		29	23.6
Total Population-Sex			
Females	101		
Yes		24	23.8
No		60	59.4
Future		17	16.8
Males	132		
Yes		35	26.5
No		69	52.3
Future		28	21.2
Total Population-Age Groups			
18-21	14		
Yes		7	50.0
No		6	42.8
Future		1	7.1
22-25	33		
Yes		10	30.3
No		18	54.5
Future		5	15.2

TABLE 8--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Total Population-			
Age Groups			
26-28	27		
Yes		9	33.3
No		15	55.5
Future		3	11.1
30-33	25		
Yes		4	16.0
No		10	40.0
Future		9	36.0
34-37	22		
Yes		4	18.2
No		5	22.7
Future		13	59.0
38-41	14		
Yes		4	28.6
No		7	50.0
Future		3	21.4
42-45	18		
Yes		6	33.3
No		7	38.9
Future		5	27.8
46-49	30		
Yes		7	23.3
No		22	73.3
Future		1	3.3
50-	38		
Yes		5	13.2
No		31	81.6
Future		2	5.2
Grand Forks			
Males (Sex)	123	72	58.5
Yes		22	30.6
No		31	43.0
Future		19	26.4

TABLE 8--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Males)			
18-21	14		
Yes		3	21.4
No		1	7.1
Future		1	7.1
22-25	33		
Yes		4	12.12
No		3	9.0
Future		1	3.0
26-28	27		
Yes		2	7.4
No		4	14.8
Future		1	3.7
30-33	25		
Yes		3	12.0
No		2	8.0
Future		4	16.0
34-37	22		
Yes		0	0.0
No		2	9.0
Future		5	22.7
38-41	14		
Yes		2	14.3
No		0	0.0
Future		1	7.1
42-45	18		
Yes		2	11.1
No		1	5.5
Future		4	7.7
46-49	30		
Yes		4	13.3
No		6	20.0
Future		1	3.3
50 above	38		
Yes		2	5.3
No		10	26.3
Future		1	2.6

TABLE 8--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Females (Sex)	123	51	41.4
Yes		12	23.5
No		29	56.8
Future		10	19.6
Age (Females)			
18-21	14		
Yes		1	7.1
No		1	7.1
Future		0	
22-25			
Yes	33	0	
No		6	18.2
Future		3	9.0
26-28	27		
Yes		4	14.8
No		0	
Future		0	
30-33	25		
Yes		1	4.0
No		3	12.0
Future		3	12.0
34-37	22		
Yes		1	4.5
No		0	
Future		2	9.0
38-41	14		
Yes		1	7.1
No		5	35.7
Future		0	
42-45	18		
Yes		0	
No		0	
Future		1	5.5
46-49	30		
Yes		1	3.3
No		5	
Future		0	

TABLE 8--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Females)			
50 above	38		
Yes		0	
No		7	18.4
Future		1	2.6
Fargo - Males	110	60	54.5
Sex			
Yes		13	21.7
No		38	63.3
Future		9	15.0
Age (Males)			
18-21	14		
Yes		2	14.2
No		1	7.1
Future		0	
22-25	33		
Yes		2	6.0
No		5	15.2
Future		1	3.0
26-28	27		
Yes		0	
No		7	25.9
Future		1	3.7
30-33	25		
Yes		0	
No		9	16.0
Future		2	8.0
34-37	22		
Yes		2	9.0
No		3	13.6
Future		4	18.2
38-41	14		
Yes		1	7.1
No		1	7.1
Future		1	7.1

TABLE 8--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Males)			
42-45	18		
Yes		2	11.1
No		2	11.1
Future		0	
46-49	30		
Yes		0	
No		6	20.0
Future		0	
50 above	38		
Yes		3	7.8
No		9	23.7
Future		0	
Fargo - Females	110	50	45.4
Sex			
Yes		12	24.0
No		31	62.0
Future		7	14.0
Age (Females)			
18-21	14		
Yes		1	7.1
No		3	21.4
Future		0	
22-25	33		
Yes		4	12.1
No		4	12.1
Future		0	
26-28	27		
Yes		1	3.7
No		5	18.5
Future		2	7.4
30-33	25		
Yes		0	
No		1	4.0
Future		2	8.0

TABLE 8--Continued

	Total Number of Individuals Responding	Number of Individuals Responding	Percentage of Individuals Responding
Age (Females)			
34-37	22		
Yes		1	4.5
No		0	
Future		2	9.0
38-41	14		
Yes		0	
No		1	7.1
Future		1	7.1
42-45	18		
Yes		2	11.1
No		4	22.2
Future		0	
46-49	30		
Yes		2	6.6
No		5	16.6
Future		0	
50 above	38		
Yes		0	
No		5	13.2
Future		0	

or 19.3 per cent, agreed that cross-country bikeways should be developed for the future. Therefore, nearly 50 per cent of the respondents felt that their family members would use cross-country bikeways, if not today, surely "in the future."

The table also showed that a larger percentage of Grand Forks residents predicted that their family members would use the facility. However, there was only about a five per cent difference between the

two cities. Table 8 revealed that a greater percentage of males thought their family members would use cross-country bikeways.

Table 8 also revealed that the largest percentage of "yes" answers came from the 18-21 year old group. Whereas, the largest number of "no" answers came from the people over 50 years of age.

Table 9 presented information the respondents gave to question number 7, which requested the respondent to comment on any further aspect of bicycling the individual considered important. Table 9 showed that almost one-half of the 233 respondents, who answered the questionnaire, commented on some aspect of bicycling. However, it was interesting to note that well over one-half of the comments were concerned with two major areas, "safety" and "city bike routes." The remaining smaller portion of the comments were concerned with "cross-country bikeways," "bikeway support," "financing" and "other related areas."

Table 9 revealed that 33 respondents, or 32.4 per cent, commented about "city bike routes." However, not all of the respondents were concerned about the same thing. The table showed that 11 respondents, or 33.3 per cent, stated that the greatest concern was the development of bike routes on heavily traveled city streets. Another group of respondents (21.2 per cent) thought that bike routes should be in city parks. Furthermore, it was also interesting to note that about six per cent of the respondents opposed bike routes on heavily traveled city streets. Fifteen per cent of the individuals believed city bike routes should be developed before cross-country bikeways. A smaller percentage of the respondents had opinions about connecting routes, two-way bike traffic and bike routes in college towns.

TABLE 9

NUMBER AND PERCENTAGE OF RESPONDENTS THAT COMMENTED ON ASPECTS OF BICYCLING

Comments	Number of Individuals Commenting	Percentage of Individuals Commenting	Number of Individuals Commenting in Related Areas	Percentage of Individuals Commenting in Related Areas
Total Population	102			
Safety, rules and regulations should be the primary consideration for improving bicycling	31	30.39		
A. The strict rules now used are satisfactory.			1	3.22
B. Bikeways should be developed for the health and safety of all concerned.			3	9.67
C. Programs should be developed on bicycle safety.			9	29.03
D. Programs should be developed to educate both bicyclists and motorists on aspects of safety.			6	19.35
E. Bicycling is a dangerous activity.			2	6.45
F. More restrictions should be put on bicyclists.			7	22.58
G. All bicyclists should be licensed.			1	3.22
H. Motorists should be educated on the rights of bicycles.			2	6.45
Total			31	

TABLE 9--Continued

Comments	Number of Individuals Commenting	Percentage of Individuals Commenting	Number of Individuals Commenting in Related Areas	Percentage of Individuals Commenting in Related Areas
Bikeways in metropolitan areas should be the main point of concern.	33	32.35		
A. Bikeways should connect the North-South, East-West of the cities.			4	12.12
B. Bikeway development should have more emphasis in cities rather than highways.			5	15.15
C. There is a great need for bike routes on heavily travelled streets.			10	30.30
D. Bike routes should be established in city parks.			6	18.18
E. Bike routes should not be developed on heavily travelled city streets.			2	6.06
F. Bikeways in cities should be wider for two-way traffic.			2	6.06
G. Bikeways should be developed in cities that have colleges.			2	6.06
Total			33	

TABLE 9--Continued

Comments	Number of Individuals Commenting	Percentage of Individuals Commenting	Number of Individuals Commenting in Related Areas	Percentage of Individuals Commenting in Related Areas
Cross-country bikeways should be considered in North Dakota	14	13.72		
A. Cross-country bikeways would be a feasible idea for the future.			2	14.28
B. Cross-country bikeroutes are not necessary.			4	28.57
C. There is a definite need for cross-country bikeways.			5	35.71
D. Cross-country bikeways should intersect the same facilities used by motorists.			3	21.42
Total			14	
Bikeways are an excellent idea and should be supported.	11	10.78		
A. If assistance is needed feel free to contact me.			2	18.18
B. Very pleased, keep up the good work.			4	36.36
C. Everything that has been done is appreciated and we use the existing facilities.			2	18.18
D. Every effort should be made to promote and develop bikeways.			3	27.27
Total			11	

TABLE 9--Continued

Comments	Number of Individuals Commenting	Percentage of Individuals Commenting	Number of Individuals Commenting in Related Areas	Percentage of Individuals Commenting in Related Areas
Bikeways should be eliminated, because there is enough tax burden.	7	6.86		
A. There is enough tax burden, tax only those who will use it.			2	28.57
B. Do not waste yours and our money.			3	42.85
C. With costs the way they are it would not be wise.			2	28.57
Total			7	
Sidewalks as an alternate route for bicycles.	2	1.96		
A. Bicycles should be allowed on sidewalks where pedestrian flow is low.			1	50.00
B. Bicycles should not be allowed on sidewalks because of the danger involved.			1	50.00
Total			2	
Wilderness areas should be a major consideration in planning bikeways.	2	1.96		
A. Bikeways should be developed in national parks and forested areas.			1	50.00
B. Bikeways should not be developed where roads are nonexistent. Preserve our wilderness.			1	50.00
Total			2	

TABLE 9--Continued

Comments	Number of Individuals Commenting	Percentage of Individuals Commenting	Number of Individuals Commenting in Related Areas	Percentage of Individuals Commenting in Related Areas
More planning and construction should be given to bicycles in the planning and construction of roads.	1	.98		
A program should be presented to the legislature on the subject of biking.	1	.98		

Table 9 indicated that 31 respondents, or 30.4 per cent, commented about the subject area of "bicycle safety." The table showed that over one-half of the respondents were concerned about safety education programs. However, the comments varied according to which party was to be educated, the motorist or the bicyclist. Nearly 30 per cent of the respondents recommended bicycle safety programs. Nearly 23 per cent of the respondents were concerned about bicycle education. However, it was interesting to note that a little over six per cent of the respondents thought the motorist should be educated. A little over 19 per cent of the individuals felt both the bicyclist and the motorist should be educated. The remaining opinions were concerned with health, the danger involved in bicycling, licenses and rules.

An examination of Table 9 revealed that 14 respondents, or 13.7 per cent, commented about "cross-country bikeways." The opinions were for the most part of a positive nature. However, most of the comments pertained to future "cross-country bikeways."

Table 9 also showed that 11 respondents, or 10.8 per cent, were in complete support of the efforts to develop bikeways. However, it was interesting to note that out of all the support given, only 2, or 18.2 per cent, offered any assistance. The table also showed that nearly seven per cent were completely against bikeway development. However, the reasoning behind the opposition was financial.

Table 9 revealed that two per cent of the respondents felt that sidewalks could be used as alternate bike routes. However, it was shown that 50 per cent of the respondents were in favor and 50 per cent were opposed to the idea of sidewalks as an alternate bike route.

In further examination of Table 9, two per cent of the respondents suggested wilderness areas for bikeway implementation. However, 50 per cent supported the idea and 50 per cent were opposed.

CHAPTER IV

DISCUSSION

The writer believed a study designed to investigate the present status of bicycling in North Dakota was the best means by which to determine the current trends and needs of its citizens. Very little work had been done in planning and developing bicycle facilities throughout North Dakota. Through this study, the writer hoped to give recreational agencies the information needed so that planning and developing of bikeways could get under way. The study was done also to help interested communities meet their present and future recreational needs.

The writer chose to obtain data for this study through the use of a questionnaire. The questionnaires were mailed to 1000 Fargo and Grand Forks, North Dakota residents.

Through an examination of the responses given by the North Dakota residents the writer was able to make certain generalizations about the status of bicycling in Northeastern North Dakota. These generalizations and personal opinions may be found in the following pages.

Overall, it would appear that most of the residents in North Dakota have had little contact with the aspects of recreational facilities such as bikeways and bike paths. From the responses received, it seemed as though both Fargo and Grand Forks lacked the bicycle facilities necessary to accommodate the total bicycle population.

This lack in a particular facility has often been considered as a "gap." Recreationists have felt that "facility gap" has hindered the development of recreational programs as well as public participation. Again, it was thought that a study such as this would help North Dakota recreational program planners. Through the questionnaire medium, the public could speak out and indicate the recreational facilities that were limited as well as those they would like to have.

A large number of questionnaires were returned which indicated the addressee no longer lived at the address given in the 1973 phone directory of each city. The population in the Fargo and Grand Forks area must be very mobile. The lack of responses from this population accounted for part of the mediocre return. No follow-up letter was sent out to remind the residents to return the questionnaire. Therefore, it could be assumed that many individuals forgot or threw the instrument away because of lack of interest. It was also possible that the random sample produced addresses of individuals who did not own or ride bicycles. There would have been little added significance in comparison to the costs in terms of time and money. Therefore, it was felt that the return was a good sample and would give a fairly accurate picture of bike usage and opinion.

The study has brought to light a number of interesting factors about bicycling in North Dakota and about the future of bikeway construction for the state. Such specific information that was received was very useful in formulating a clearer picture of the current and future recreational needs for North Dakota. It was felt throughout the study that more evaluations should take place in all North Dakota

communities to continually upgrade their recreational facilities and meet present needs. From the comments received, it seemed that people wanted to be heard and given the opportunity to express opinions about the future.

This study revealed that more people responded from Grand Forks than from Fargo. This may be a typical distribution, because Grand Forks does not have the bicycle facilities that Fargo possesses. Therefore, the writer expected this type of return, because the people of Fargo currently have bike routes and are presently planning for more.

The study also showed that more males than females answered the questionnaire. This factor was not so easily interpreted. It did not necessarily mean that there was more male bike riders than female bike riders or that more males answer questionnaires than females. A logical explanation could be found in the fact that questionnaires were sent in care of the name that was in the telephone directory. If one predicted that the majority of the people in the telephone books were married, then it would be logical that the address would be in care of the male occupant. If it was addressed to the male of the residence, more than likely it would be opened by that person. However, this did not necessarily mean that the male filled out the questionnaire. Thus, all the writer can surmise is that the larger number of males answering the questionnaire was due to the manner in which the questionnaires were sent.

The age groups of the respondents who answered the questionnaire also proved to be interesting. The questionnaire was divided into nine age groupings, and since the addresses were chosen at random, a normal

distribution could be expected. However, it was not the case in this study. The study showed that a small, but significant, number of the respondents were in the 18-21 year old age group. At the other end of the distribution, the largest number of respondents were in the 50 and above group. However, perhaps there would have been a normal distribution if the age groups would have extended beyond 50 years. The mean age of the respondents was 33-34 years of age.

Other important factors that were produced from the study were the number of bicycles and the family members that rode them in Grand Forks and Fargo. The study showed that a large number of respondents owned a bicycle. It was also interesting to note the large number of individual families who owned five or more bicycles. The study revealed that there was an average of two bicycles per family or per respondent. In contrast to an earlier comment about male and female bicycle riders, the study showed that, within the family there were definitely more male bike riders than female. This factor may reinforce sociologists' research about the mobility of young males at an earlier age away from the home. Whereas, girls have been protected and kept near the home until a later age.

The use of the bicycle has been limited much the same as other modes of riding. The study showed that both Fargo and Grand Forks residents used their bicycles mainly for transportation and pleasure. The people of Fargo have a much greater opportunity to use bicycle routes for transportation and pleasure than do the people of Grand Forks. However, it was interesting to note that a larger percentage of male, Grand Forks, bike riders used their bicycles more for transportation than did Fargo male riders. Perhaps there were more male

bike riders in Grand Forks than in Fargo. Or, there may be bicycle parking problems in Fargo, which forced the people to find another means of transportation. Or perhaps, the safety problem was worse in Fargo than in Grand Forks.

The writer believed that bicycling, as an activity was hindered by the safety aspect. If the people have no safe places to ride, few will participate in this type of recreational activity. Perhaps, if more and safer bikeways were developed, more people would use their bicycles. A large number of individuals had opinions about safety and bicycling. Many felt it was too dangerous. Others thought their families would participate more if safer bikeways and bike paths were provided.

The study showed a high correlation between the use of bicycles for "sport" and "exercise" and between the use of bicycles for "exercise" and "pleasure." Perhaps this correlation could be expected, since most riders out for "exercise" or "sport" were usually riding for personal enjoyment and not necessarily trying to get to some special destination. However, this may be true only for this area, because many people use cross-country riding for "exercise" and "transportation" combined.

Bicycle usage may also be related to the amount of time it was used. The study showed that the amount of time spent riding bicycles, on the average, was approximately three-fourths of an hour for week days and approximately one hour for the weekends. The study also showed that bicycle riders in Fargo preferred to ride on Saturday and Wednesday. However, the bike riders in Grand Forks rode bikes

chiefly on Tuesday and Thursday. Since more men used their bicycles for "transportation" in Grand Forks, it was understandable that Tuesday and Thursday would be the most popular days on which to ride. Fargo riders used their bicycles more for "pleasure" on the weekend. A weekend of this type of relaxation and activity was certainly possible with the bicycle facilities that run through Fargo's parks and streets. Although the average amount of time per day was one hour or less, there were those that indicated that they rode bicycles eight and nine hours on a given day. Those who rode bicycles one hour or less per day perhaps rode only for "pleasure." Riders, who were on their bike for eight or nine hours per day, may have been practicing for competition, improving endurance, or engaged in a strenuous program of "exercise."

In bicycle usage there must be places to ride, thus, this study attempted to locate those priority areas that should be developed for bikeways. The most requested areas were "city parks" and "city streets." It appeared that, overall, people wanted facilities close to home. It was interesting to note that there was a larger percentage of people from Fargo requesting "city streets" be developed than there was from Grand Forks. However, more bike routes may be needed in Fargo because of population differences. Perhaps the Fargo people were merely showing their approval of what had already been developed. Development of bikeways and bike paths in state parks and state highways was requested by a number of the respondents. Were these people seeking alternate modes of transportation for weekends or vacations?

Both Fargo and Grand Forks residents gave opinions concerning a "cross-country" bikeway between the two cities. Over half of all the

respondents gave a positive answer. However, they are not in a hurry. It can be developed in the future. It was chiefly the younger respondents who wanted such a development. Perhaps the idea of riding such a distance has little appeal for the older bicycle rider. Perhaps most riders in Fargo and Grand Forks were more interested in local developments for the present. When local needs have been completed, priorities for "cross-country" bikeways might become inevitable. The writer believes that within the next decade there will be a great demand for this type of facility, not only between Fargo and Grand Forks, but everywhere the population demands it.

CHAPTER V

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to compare the present bicycle usage and attitudes of Fargo and Grand Forks residents. In order to make these comparisons, data on usage and opinions were obtained from Northeastern North Dakota bicycle riders. The writer felt this information and comparisons would aid recreational agencies and interested communities/individuals as they planned and developed bicycle facilities in the future.

The subjects responding to the study were 233 Fargo and Grand Forks residents. A questionnaire consisting of 14 questions was sent out and returned by September of 1974. The data from the questionnaire was subjected to computer analysis and responses were organized into tables for analysis and interpretation to indicate the comparisons between Fargo and Grand Forks on bicycle usage and attitudes.

Findings

1. A total of 1000 questionnaires were sent and 233 Fargo and Grand Forks residents responded. The questionnaires were distributed equally between Fargo and Grand Forks showing a return of 110, or 28.6 per cent, and 123, or 28.2 per cent, respectively. Male respondents were considerably more numerous than females in the communities.

2. The 233 respondents reported 457 family members that rode bicycles. Slightly over 50 per cent of these riders were male members of the family. Over 30 per cent of the respondent's family members were in the age group of 18-28.

3. Bicycle uses of "transportation" and "pleasure" were indicated as the most widely used reasons for riding. Grand Forks respondents chose "transportation" as the major reason for riding bicycles. Fargo respondents indicated "pleasure" as the chief reason for bicycle usage. There was a larger percentage of males riding bicycles for "transportation" than females.

4. Saturday was the most widely used day of the week for riding bicycles from both Fargo and Grand Forks. Nearly 50 per cent of the respondents rode bicycles on Tuesday. Fargo residents used their bicycles chiefly on Saturday and Wednesday. However, Grand Forks citizens rode their bicycles mainly on Tuesday and Thursday. A larger percentage of males rode bicycles for transportation reasons on week days than did female riders.

5. Almost 73 per cent of the respondents from Fargo and nearly 70 per cent from Grand Forks indicated that they would prefer to see city parks and city streets developed with bike paths and routes. Approximately 35 per cent of both females and males indicated that they would like to see state highways developed for bikeways. Younger age groups were considerably more in favor of state highways being developed for bikeways than were the older age groups.

6. Nearly 38 per cent of all respondents gave a "yes" answer to the issue of developing "cross-country" bikeways. Nearly 21 per cent indicated that cross-country bikeways should be developed in the

future. Therefore, over one-half of the respondents gave positive responses re the development of "cross-country" bicycle routes. Over one-half of the respondents from Grand Forks gave a "yes" response to the development of "cross-country" bikeways. The younger age groups were more interested in "cross-country" bikeway implementation than the older age groups in both cities.

7. Nearly 64 per cent of the individuals from both cities indicated that they would not use the "cross-country" facilities if they existed. Twenty-six per cent of the individuals from Grand Forks stated they would use the "cross-country" bikeways if they existed; whereas only 18.2 per cent of the Fargo residents would use this facility. Younger age groups were more interested in the "cross-country" bikeways than the older age groups in each city.

8. Slightly over 25 per cent of the respondents indicated that their family members would use "cross-country" bikeways if they existed. Nearly 28 per cent of the individuals from Grand Forks stated that their family members would use the facilities. Approximately 23 per cent of the Fargo respondents and family would use such a facility. Younger age groups showed considerably more support for cross-country bikeways than did the older age groups in both cities.

9. The individuals, that commented on aspects of bicycling in their communities, showed a great deal of concern about the development of city bike routes and about safety education.

Conclusions

1. Although Grand Forks citizens of all ages may ride bicycles, the typical rider is young, male and rides for one reason at a time.

On the whole, all of the riders use their bikes for exercise, sport and pleasure, but are more serious about the transportation aspect. These serious riders use their bikes for short periods of time, usually to travel from one place to another.

2. Although many Fargo citizens of all ages ride bicycles, the typical rider is young and male. Bicycle usage is usually of the single interest type. All of the bicyclists use their bikes for exercise, sport and transportation. However, Fargo residents are more interested in riding for relaxation and enjoyment than Grand Forks riders. These pleasure riders use their bicycles for longer periods of time, usually for weekend jaunts through the parks.

3. On the whole, residents of both Fargo and Grand Forks possess a healthy attitude toward biking as a recreational activity. However, a provincial attitude prevails which limits biking activity to the confines of the city. Residents in both cities felt city parks and city streets should be developed for bike paths and bikeways before attention and money was given to other areas for development.

4. On the whole, many Grand Forks and Fargo residents ride their bicycles for intra-city usage. However, the idea of using their bicycles for longer periods of time and for long distances held their interest. Cross-country bikeway development was approved by the population. However, residents in both cities could be considered "home bodies" in 1974 and in no particular rush to venture beyond the city limits. They felt the future held more opportunities and if the facilities existed, they would probably use them.

5. On the whole, residents from Grand Forks and Fargo had a positive attitude toward all aspects of bicycling. However, there

were those who were disturbed by the dangers involved. They felt that this aspect limited the potential of full participation in this type of recreational activity. And, until these problems were solved, it would be best to remain within the confines of the city.

Recommendations

1. It is recommended that new and/or additional bicycle facilities be developed in city parks and on city streets in Fargo and Grand Forks.

2. It is recommended that a similar study on bicycle usage and attitudes be administered to these communities by local or state recreational agencies in 1980.

3. It is recommended that recreational and educational agencies examine and develop joint safety education programs which would benefit both motorists and bicyclists, improve attitudes and lower the accident statistics.

4. It is recommended that local, county and state agencies that plan future bikeways, bike paths and routes, investigate existing and accepted standards for development.

5. It is recommended that bike paths be developed along scenic areas and points of interest.

6. Recreational agencies should promote programs which will educate the public. Bicycle riders need to develop skills, abilities and knowledges in the areas of safety techniques, courtesies, laws and camping.

7. Recreational agencies should develop bike clubs to promote further interest and involvement in the pleasure and sport of bicycling.

8. Grand Forks and Fargo should develop bike routes which would connect all major areas of the city, east-west, north and south.

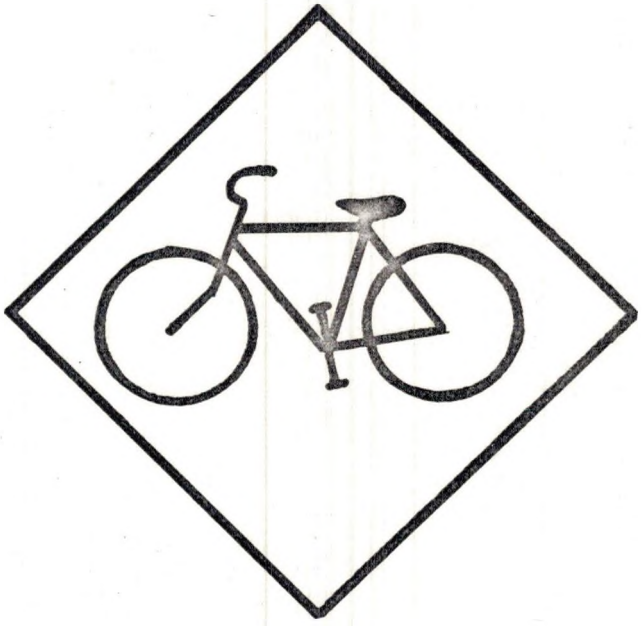
9. Bicycle parking facilities should be implemented and available in all places of interest, major stopping points, schools and downtown areas.

10. It is recommended that public schools, colleges and universities consider bicycling as a sport (cross-country and speed racing) and added to physical education curriculums.

APPENDIX A

QUESTIONNAIRE

A Survey to Determine Bicycle Usage for North Dakota Citizens



Instructions for Completing the Questionnaire

Part A - GENERAL INFORMATION

Please check or fill in the space with the information which is appropriate to your family situation under this part.

Part B - SPECIFIC INFORMATION

This part of the form should be checked in relation to the respondent's (individual) bike riding habits.

A. GENERAL INFORMATION

1. Name _____

2. Address: Street _____ City _____ Zip _____

3. Parent _____ or Guardian _____

4. Male _____ Female _____

5. Age:

	18-21 _____		34-37 _____
	22-25 _____		38-41 _____
	26-28 _____		42-45 _____
	30-33 _____		46-49 _____
			50 above _____

6. Number of Bicycles Owned Within Family:

None	_____	Four	_____
One	_____	Five	_____
Two	_____	Six	_____
Three	_____	Other	_____

7. Family Members Who Ride Bicycles:

	Age	Male	Female
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____

B. SPECIFIC INFORMATION

1. Rank the use of *your* bicycle in order of the most frequent and personal reasons for riding:

Use	1	2	3	4
Transportation	_____	_____	_____	_____
Exercise	_____	_____	_____	_____
Sport	_____	_____	_____	_____
Pleasure	_____	_____	_____	_____
Other	_____	_____	_____	_____

2. Indicate the days you ride your bicycle and the approximate number of hours per day:

Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
Other _____							

3. Indicate all those priority areas, outside and within your community, which you feel should be developed for riders of bicycles:

   a. city parks _____
   b. county parks _____
   c. state parks _____
   d. national parks _____
   e. state forest areas _____
   f. city streets _____
   g. county roads _____
   h. state highways _____
   i. other (specify) _____

4. Do you feel there is a *need* for a cross county bicycle route (perhaps paralleling existing State Highway 81) between Grand Forks and Fargo?

   Yes _____
   No _____
   In the Future _____

5. If such a cross country route existed, would you use the facility?

   Yes _____
   No _____
   In the Future _____

6. If such a cross country route existed, would any member(s) of your family use the facility?

   Yes _____
   No _____
   In the Future _____

7. Any comments you might have concerning any aspect of city, county, or state bikeways would be appreciated.

_____

_____

_____

_____

_____

APPENDIX B

LETTER OF TRANSMITTAL

Dear Bicyclist:

I am conducting a survey in Eastern North Dakota to determine the ways and amount of bicycle usage. Through this study it is hoped that citizens groups will become interested and bicycle trails and routes may be developed. This study is being conducted under the sponsorship of the North Dakota Bureau of Outdoor Recreation in Bismarck, and the Department of HPER at the University of North Dakota. It is through your cooperation that this study will become a success and bicycling may become a more enjoyable and safer activity.

This questionnaire has been designed in such a way that it should only take a few minutes of your time. Your name will be kept completely confidential and will be used only to designate geographical areas. Your cooperation in filling out this questionnaire immediately will be greatly appreciated.

Thank you for your cooperation.

Sincerely yours,

Michael S. Schend

cmh
Enclosure

APPENDIX C

BIKEWAY DESIGN CONSIDERATIONS

BIKEWAY DESIGN CONSIDERATIONS

Directness of Route - to conserve energy, the bicyclists should be provided the shortest route possible, giving due consideration for safety.

Topography - Denver's topography does not pose a great problem for the bicyclist. Gentle slopes preominate over large portions of the city. The maximum grade negotiable by a bicyclist is variable, depending on length. A long gradual grade is more tiring than a short steep climb. For short distances of 300 to 400 feet, a 20% grade is the maximum advised. Long uphill grades should not exceed 8%.

Air Pollution - All bicycle routes should avoid heavily traveled streets where high concentration of air pollutants are presnet.

Bike land or Path Width - The most workable width for bike lanes and off-street paths is 8 feet. On a 36 foot local street, presuming an 8 foot parking lane on one side only, the automobile lanes are then 10 feet. This 8 foot bicycle lane allows sufficient space for bicycle flow and safety. Off-street paths should also be 8 feet in width to accommodate two-way bicycle traffic, pedestrians and maintenance vehicles.

Bridges - Criteria for the selection of bridges for bicycle routes:

1. The absence of lengthy and complicated bridge ramp approaches.
2. Sidewalks of adequate width on both sides; one exclusively for pedestrians, the other for cyclists.

Surfacing - Off-street bicycle paths should provide a ride which is safe and smooth as possible. Hard, smooth, durable and non-skid surfaces are necessary. Alternative materials available are concrete, hot-mix asphaltic concrete and standard asphalt. Concrete is the most durable and smoothest but can be slippery, has the highest tendency to crack and is the most expensive. Asphaltic concrete has a non-skid surface, is fairly durable and less expensive than concrete but is not as strong. Standard asphalt is least expensive to lay and repair and is pliable but is soft when hot and deteriorates more rapidly. In practice, standard asphalt is most accepted and is recommended for off-street bicycle paths in parkway medians, in parks, along gulches, river and canal banks, etc. Asphalt is also proposed for sidewalk bicycle ways since it is least expensive and provides a smooth riding surface. However, appearance, durability and lower maintenance dictates that standard concrete sidewalk construction is preferable.

Curb Cuts - The development of sidewalk and parkway bikeways must include ramps at intersections for a smooth transition from the sidewalk or bicycle path to street level.

Signing - Route signing must be carefully done to provide adequate information to the cyclist and warnings for both the cyclist and motorist. Where feasible, signs should be placed on existing sign standards to prevent cluttering the streets with signage.

Painting - All on-street bicycle lanes, as well as all intersections involving either an on-street or off-street bicycle route, will require various pavement markings of a bright white paint. These markings will aid both the bicyclist and motorist in safely negotiating an intersection. A 5" white strip will separate an on-street bicycle lane from

the automobile lanes. Bicycle street messages (stencils) will also be provided for additional marking of lanes and/or paths. These street messages will be located at the beginning of each block in the direction of the bike lane.

APPENDIX D

BICYCLE RODEO CONSIDERATIONS

BICYCLE RODEO CONSIDERATIONS

1. Publicity - The Bicycle Institute of America (BIA) gives out free posters.

2. Participation - Entry blanks should be distributed to all students.

3. Importance - A letter to the parents should also be distributed describing the purposes, stressing its importance, and asking for parental cooperation.

4. Education - Films on technique and bike care should be shown. Films may be acquired through BIA or any educational film companies.

5. Education - Pamphlets describing hand signals and rules for safety should be distributed. These pamphlets may be obtained from the American Automobile Association, American Insurance Association, and BIA.

6. Informing - The rodeo must be described to the students, so that they know what is expected of them.

7. Testing - A written test should be administered consisting of 15 true and false questions from the pamphlets handed out, and a score of 11 to be the minimum for passing.

8. Testing - A written test should also be administered on what parts of the bike should be inspected and how to get those parts into shape. This information can be acquired through BIA, a pamphlet called Helpful Hints on Bicycle Care for Safer Riding.

9. Testing - After both written tests have been passed, a skills test should be administered. To assure that each student will do his best, a bike safety sticker or bike registration sticker should be awarded at the end of the completed program. The stickers may be obtained by any local

police department. The skills for the test may be obtained in a book called Safety Education.

APPENDIX E

THE ADVANTAGES AND DISADVANTAGES OF BICYCLING

THE ADVANTAGES AND DISADVANTAGES OF BICYCLING

Advantages of bicycling:

1. Travel time for the bike rider is often an advantage. For distance up to five miles, the bicyclist can travel as fast or faster than an automobile when traffic is heavy. Quite frequently, door to door travel is further reduced since he does not have to locate a parking space and then walk to his destination.
2. The initial cost of a bicycle (comparable to the annual automobile insurance premium) and the extremely low maintenance costs make bicycling economically advantageous. Again, there is no parking fees.
3. The bicycle commuter contributes toward the reduction of noise and air pollution, automobile traffic congestion, and the parking problem.
4. Bicycling is a good source of exercise and enjoyment.

Disadvantages of bicycling:

1. While the bicyclists does not contribute to air pollution, he is adversely affected by it. Not being enclosed as is the automobile driver, he is in direct contact with automobile emissions of hydrocarbons and carbon monoxide. He is also exposed to photochemical exodants which are produced in the atmosphere from the hydrocarbons acted on by solar emissions. Carbon monoxide and photochemical oxidants have the greatest effect on health.
2. Other disadvantages to the bicyclist are conditions which present the danger of serious accidents. A bicyclist riding next to parked cars runs the risk of collision with a quickly opened car door. By avoiding this opened door, he swerves into the traffic lane and possibly into the path of an automobile approaching him from behind. Glass, tree branches, and other litter on the street are of much more consequence to the bike rider than to the motorist.
3. Another disadvantage to riding a bicycle on the existing streets is encountered when a bicyclist passes over a storm sewer grate.
4. Finally, the bicycle is not advantageous for long distance travel (greater than 5 miles), if the rider wishes to make efficient time.

REFERENCES

1. Grand Forks Planning Commission. Grand Forks Master Park and Open Space Plan, Grand Forks: Bureau of Governmental Affairs, 1974, Chapter 5, 71-80.

2. Edgar Reynold Carlson. "Guiding Principles for Planning." Recreation in American Life. Belmont, California: Wadsworth Publishing Company, 1972, p. 394.

3. Gerald Knox. "How to Bicycle Sensibly and Safely." Better Homes and Gardens, July, 1972, p. 12.

4. Harold Heldreth. "Hooray for the Bicycle Boom!" Parents, April, 1972, p. 48.

5. Planning Office Administrative Staff of Denver, Colorado. The Bikeway Plan, August, 1973. Denver: Denver Planning Commission.

6. Walter R. Hjelle. "Bicycling." North Dakota State Outdoor Recreation Agency. Recreation Digest. Bismarck: North Dakota Recreation Agency, January, 1974, Vol. 9, No. 1.

7. Edwin J. Staley and Norman P. Miller. Leisure and the Quality of Life. Washington: The American Association for Health Physical Education and Recreation, 1972.

8. Hal Aigner, Bob Jensen, Charles Powers, and Lucky Wentworth. The Clear Creek Bike Book. New York: New American Library Times Mirror, 1972, pp. 21-41, 133-153.

9. American Automobile Association. Planning Criteria for Bikeways. Chicago: American Automobile Association, 1972.

10. Frederick L. Wolfe, Denver Regional Planner. Exclusive Bike Lane Operating Experience on Denver Streets. 53rd Highway Research Annual Meeting. Denver: Denver Planning Commission, January, 1974.

11. William Yarber. "Elementary Bicycle Safety Rodeo." JOPHER, September, 1970, p. 32.

12. Lillian Frankel and Godfrey Frankel. The Bicycle Book. New York: Sterling Publishing Co., Inc., 1972, p. 112.

13. Alfred Heller. "Comprehensive Planning: Where is It?" Issues in Outdoor Recreation. Minneapolis: Burgess Publishing Company, 1972, p. 217.

14. Ralph Hanneman. "Pedal Power." Parks and Recreation, January, 1971, p. 29.

15. National Safety Council, Bicycles. Safety Education Data Sheet No. 1. New York: National Safety Council, 1972.

16. National Safety Council. Bicycle Accidents Fact Sheet. Chicago: Bureau of Governmental Affairs, 1973.

17. Proctor Mellquist. "Here Come the Bikeways." Sunset, October, 1972, p. 94.

18. Tyrus Hillway. Introduction to Research. Boston: Houghton Mifflin Company, 1956.

19. John Erskina Nixon. "The Mechanics of Questionnaire Construction." Journal of Educational Research, XLVII (March, 1954), pp. 482-486.

20. AAPHER. Research Methods in Health, Physical Education, Recreation. Washington: AAPHER, 1972.

21. Elwood C. Davis. "The Survey and Professional Preparation in Physical Education." Research Quarterly, December, 1932, pp. 21-32.