NASHUA REGIONAL PLANNING COMMISSION

REGIONAL BICYCLE AND PEDESTRIAN PLAN

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Prepared by the

Nashua Regional Planning Commission

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CHAPTER I: INTRODUCTION

A. BACKGROUND

The automobile dominates the transportation network in the NRPC region. According to the 2000 U.S. Census, almost ninety-four percent of work-related trips in the region are done in motor vehicles. Nationwide, nearly eighty-seven percent of *all* trips, including personal and work-related, involve motor vehicles.[1] While the automobile provides an indispensable element of our transportation system, increasing congestion is making it difficult, time consuming and expensive to use. Travel by foot or bicycle, therefore, remains an essential element of the transportation system. These modes of travel are efficient, affordable, healthful and environmentally sound, and their increased usage will reduce competition among automobile users for limited roadways and parking spaces.

B. PURPOSE OF THE PLAN

The intent of this plan is to provide guidance for the planning, development, and implementation of safe, usable facilities for non-motorized transportation in the Nashua region. This plan will integrate bicycle and pedestrian travel into the regional transportation system, and it will serve as the bicycle and pedestrian element of the NRPC long-range transportation plan. This integrated system will benefit drivers because it will encourage biking and walking, which will result in less competition for limited roadway and parking space. Bikers and other non-motorized travelers will benefit from a safer and more enjoyable biking and walking environment. Additionally, all users of this integrated system will benefit from increased transportation options for both local and regional travel.

This plan encourages a shift from motorized to non-motorized travel for destination-oriented trips that are relatively short in length. The goal is to substitute bicycling and walking for driving the automobile for personal errands, as well as for visiting friends and the commute to work, where possible. Table 1-1 indicates that approximately 63% of personal trips in urban areas of this country are 5 miles in length or less. Chart 1-1 indicates that more than 81% of those trips are done via motor vehicle. These relatively short trips are the most likely to be replaced by bicycling or walking. Research has shown that where investment in bicycle facilities has occurred, rates of trip making by bicycle are significantly higher than the national average.[2] It is therefore reasonable to assume that some percentage of personal trips now being done via motor vehicle in the region could be shifted to non-motorized modes if proper facilities were provided.

[1] 2001 National Household Travel Survey.

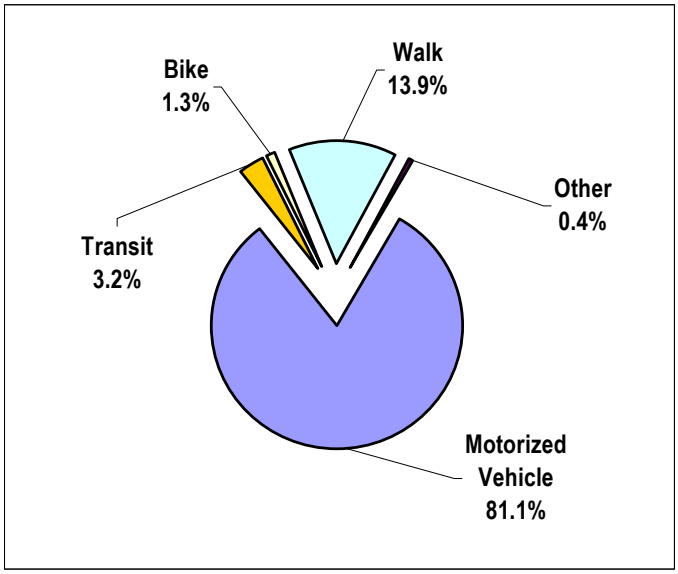
[2] Trails & Greenways: Commute Rates from the 2000 Census; Hugh Morris, Rails-to-Trails Conservancy, June, 2003.

Table 1-1: Percentage of Trips by Distance, Cumulative

Trip Length	Urban Areas	All Areas
0 - 1 mile	27.7%	22.2%
1 - 2 miles	12.9%	16.0%
2 - 3 miles	9.5%	9.0%
3 - 4 miles	6.4%	6.1%
4 - 5 miles	7.0%	7.0%
Total < 5 miles	**63.5%**	**60.3%**
> 5 miles	**36.5%**	**39.7%**

Source: National Household Transportation Survey, 2001

Chart 1-1: Mode of Transportation; Trips < 5 Miles in Length



Source: 2001 National Household Transportation Survey

This plan identifies a comprehensive bicycle and pedestrian system for the Nashua region. The recommendations encourage the development of a safe and enjoyable regional bicycle and pedestrian network that will encourage new users as well as better accommodate those who already make use of non-motorized means of travel. It is the intent of the NRPC that the plan be implemented and maintained by member communities.

The recommendations also serve to accomplish other objectives, such as air quality improvements. The NRPC region currently does not meet National Ambient Air Quality Standards for ground level ozone as defined by the 1990 Federal Clean Air Act Amendments. Motor vehicles produce nitrous oxides and hydrocarbons that combine with sunlight in warm temperatures to produce ground level ozone. This is a significant problem during the summer months. An increase in non-motorized travel during the time of year when most violations of the air quality standards occur would help to improve the region's air quality.

C. THE BENEFITS OF A SHIFT TO BICYCLING AND WALKING

Some of the benefits of increased cycling and walking include:

1. Economic Benefits

- **a.** The cost to operate an average automobile for one year is $7,654 [3]. In New Hampshire, that is over 15% of median household income.
- **b.** The cost to operate an average bicycle for one year is $120.[4]
- **c.** National health costs savings: The cost of health problems associated with obesity (just one of several diseases directly linked to a sedentary lifestyle) in the United States in 2000 was estimated at $117 billion.[5]

2. Health and Fitness Benefits

- **a.** 60% of Americans lead sedentary lifestyles and 40% are clinically overweight.[6] This lifestyle is directly linked to numerous chronic health problems. One reason for a sedentary lifestyle is that "walking and cycling have been replaced by the automobile for all but the shortest distances."[7]
- **b.** Increased physical activity, especially biking and walking, can often prevent heart disease (the Nation's # 1 killer) as well as diabetes, stroke, hypertension and depression.

3. Transportation Efficiency Benefits

- **a.** Cycling is often the fastest mode of transportation from door to door for distances up to 6 miles in the urban cores.[8],[9]
- **b.** Reduced traffic congestion.
- **c.** Reduced need for vehicle parking: Ten bicycles can be parked in the space required for a single automobile.[10]

4. Environmental Benefits

- **a.** Improved air quality:
  - Motor vehicles emit hydrocarbons and nitrous oxides which combine to form ground level ozone, a serious air pollutant. The largest percentage of these pollutants per mile are generated during the first few miles of travel because of the time it takes for the catalytic converter to heat up and become effective. Eliminating short motor vehicle trips will therefore improve air quality. These short trips have the greatest potential for being replaced by bicycling and walking.
  - Biking or walking create no air pollution.
  - Reduced noise pollution.

5. Social Benefits

- **a.** Walking and biking are low cost forms of transportation and therefore accessible to more people.
- **b.** Greater access to transportation ensures increased mobility thereby increasing individual choice and equality of opportunity.

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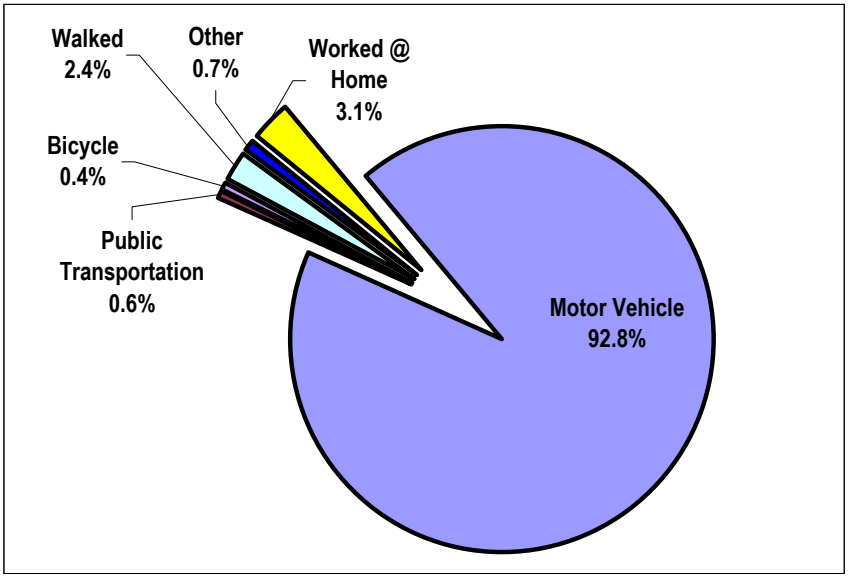
[3] American Automobile Association; Year 2000, based on 15,000 annual miles, includes insurance, license, registration, taxes, depreciation and finance charge.
[4] League of American Bicyclists.
[5] National Center for Bicycling and Walking.
[6] 1998 Report of the American Medical Association.
[7] October 27,1999; Journal of American Medical Association.
[8] U.S. National Biking & Walking Study, 1994.
[9] Toronto Bike Plan.
[10] Toronto Bike Plan, pg 1-2.

D. BICYCLING AND WALKING PARTICIPATION RATES

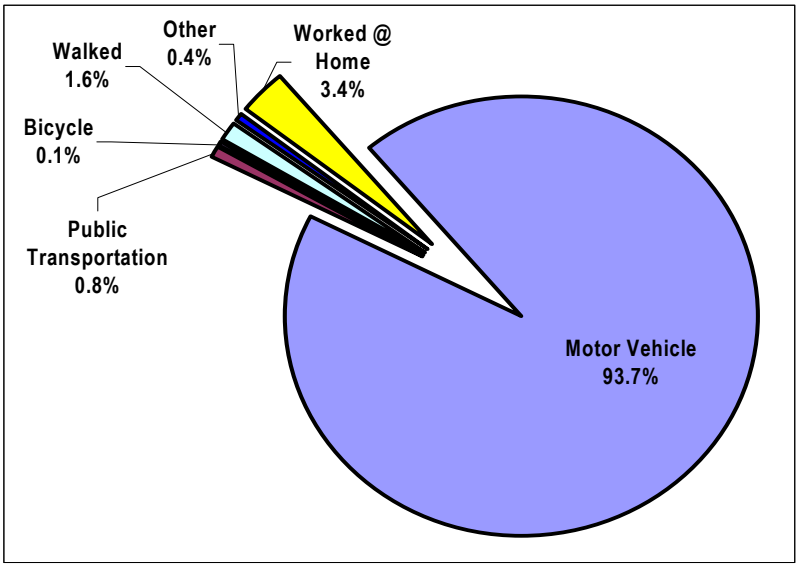
The 1990 Census data for the NRPC region indicates that 0.4% of trips to work were done via bicycle and 2.4% on foot (Chart 1-2). Data from the 2000 Census indicate that 0.1 % of trips to work were done via bicycle and 1.6% on foot (Chart 1-3). This means that the percentage of trips to work via bicycle has dropped by 0.3% and the percentage of trips to work on foot has dropped by 0.8% (Table 1-2). There has been a corresponding increase in trips to work via motor vehicle from 92.9% (1990) to 93.6% (2000). It is encouraging to note that trips via public transportation have increased from 0.6% (1990) to 0.8% (2000).

Chart 1-2: 1990 Mode of Trip to Work NRPC Region



Source: 1990 US Census

Chart 1-3: 2000 Mode of Trip to Work in NRPC Region



Source: 2000 US Census

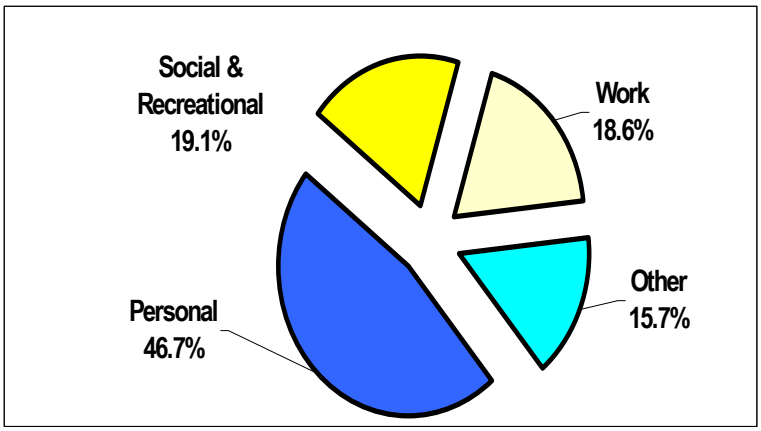
Table 1-2: Mode of Trip to Work

Mode of Trip	Census 1990	Census 2000	% Change
Motor Vehicle	92.9%	93.6%	+ 0.7
Worked at Home	3.1%	3.4%	+ 0.3
Public Transit	0.6%	0.8%	+ 0.2
Walked	2.4%	1.6%	- 0.8
Biked	0.4%	0.1%	- 0.3
Other	0.6	0.5%	- 0.1

Source: 1990 and 2000 US Census

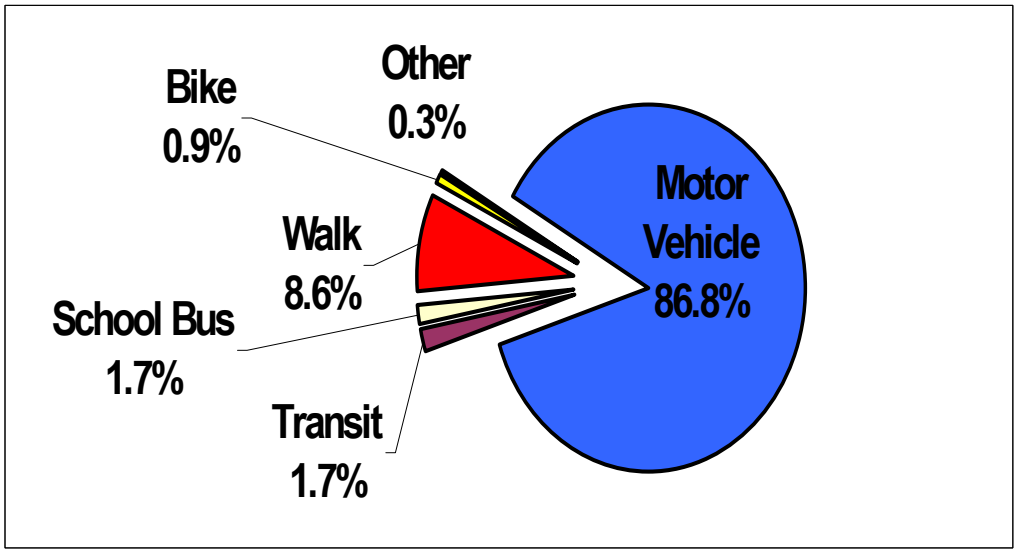
Traveling to work is not the only trip that individuals undertake on a daily basis. People also make trips for personal, recreational, and other reasons. The 2001 National Household Travel Survey (NHTS) says that work related trips make up only 18.6 % of all personal trips that take place on a daily basis (Chart 1-4). NHTS also says that trips undertaken for personal reasons account for 46.7% of daily trips, and trips for social or recreational purposes account for 19.1% of daily trips (Chart 1-4). When all trip purposes are considered, the percentage of trips done via bicycle or foot increases to a combined 9.5% of all trips, which is a significant number (Chart 1-5). This is an important distinction because it means that a person may be more likely to walk or ride a bike to do personal errands, visit friends or for other utilitarian reasons than they would be to walk or ride to work. The bicycle and pedestrian system should therefore be designed with this distinction in mind.

Chart 1-4 : Purpose of Trip



Source: 2001 National Household Travel Survey

Chart 1-5: Mode of Transportation for all Trip Purposes



Source: 2001 National Household Travel Survey

E. STRATEGY FOR INCREASING NON-MOTORIZED TRAVEL IN THE REGION

This plan is designed to provide guidance for the planning, development, and implementation of safe, usable facilities that will increase transportation by bicycle and other forms of non-motorized travel in the Nashua region. The National Bicycling and Walking Study emphasizes that the process for increasing bicycling and walking must be multi-disciplinary. Comprehensive efforts to increase the use of non-motorized transportation need to include public education efforts that promote bicycling and walking as viable modes of travel, as well as ways to make the transportation system itself safer and more convenient. These efforts will result in *physical improvements* to the transportation system as well as *behavioral change* in individuals. The "4E's" – **E**ngineering, **E**ncouragement, **E**ducation and **E**nforcement – are four distinct, yet related, ways to categorize types of improvement efforts.[11] Engineering efforts

[11] Massachusetts Pedestrian Transportation Plan, 1998.

promote physical improvements to the transportation system through changes in land use regulations, site planning, and facility design and maintenance. **E**ncouragement, **E**ducation and **E**nforcement efforts promote behavioral changes that will remind people how to bicycle, walk and drive safely and to try biking or walking as an enjoyable way to travel short distances.

Physical and behavioral improvements can be thought of as the two wheels of a bicycle, while engineering, education, encouragement and enforcement can be thought of as the spokes. If these components are well maintained, then the bicycle operates efficiently. The same can be said of an efficient regional bicycle system. If the components support the appropriate physical and behavioral infrastructure then the system will operate efficiently.

This plan is more than a proposed network of bicycle and pedestrian facilities because it is structured with the "4Es" in mind. These four key components are implemented through a common strategy and they work together to realize the mission statement of a bicycle and pedestrian friendly region. The plan sets out a vision for bicycling and walking that is supported by a comprehensive set of recommendations that address the need for the appropriate level of education, encouragement and enforcement, as well as the engineering of bicycle and pedestrian facilities. The implementation of the plan will encourage people to increase the number of personal trips taken on bicycles. The policies and programs proposed in this plan will also provide a framework that will encourage other forms of non-motorized travel, which will in turn lessen dependency on motor vehicles.

F. PLAN OVERVIEW

The NRPC Regional Bicycle and Pedestrian Plan has been developed to provide a blueprint that will guide municipalities as they work towards improved facilities, as well as increased awareness of the economic, environmental and social benefits of increased bicycling and walking. The components of the plan support a vision for non-motorized travel in the region that recognizes the need for improved education, encouragement and enforcement, as well as the need for improved bicycle and pedestrian facilities. These components also provide a framework and an implementation strategy to make the physical and behavioral improvements that are necessary to increase the incidence of bicycling and walking in the region. Implementation of the plan will encourage an increase in the number of personal trips undertaken on bicycles and by foot, which will in turn lessen dependency on the automobile.

MISSION STATEMENT

The NRPC Regional Bicycle and Pedestrian Plan will identify planning, development and implementation policies that will bring about change to both the transportation system and to public behavior, resulting in a bicycle and pedestrian friendly region and the increased use of non-motorized travel for everyday transportation.

The physical environment, social and economic factors influence the ways that people choose to get around the region. Each component of this plan, therefore, play's a role in promoting either physical improvements to the transportation infrastructure that encourage bicycling and walking, or behavioral improvements that remind bikers, walkers and motorists of their responsibilities and rights as vehicle operators. The perception of bicycling and walking as viable modes of transportation will be enhanced through these physical and behavioral improvements.

G. SUMMARY

The intent of this plan is to provide guidance for the planning, development, and implementation of safe, usable facilities for non-motorized transportation in the Nashua region. This plan will integrate bicycle and pedestrian travel into the regional transportation system, and it will serve as the bicycle and pedestrian element of the NRPC long-range transportation plan. This integrated system will benefit drivers because it will encourage biking and walking, which will result in less competition for limited roadway and parking space. Bicyclists and pedestrians will benefit from a safer and more enjoyable biking and walking environment. Additionally, all users of this integrated system will benefit from increased transportation options for both local and regional travel.

The remainder of this document describes the NRPC Regional Bicycle and Pedestrian Plan in detail. Chapter 2 addresses the engineering elements that impact the physical biking and walking environment. Chapter 3 addresses the policy and program elements that impact behavioral aspect of the biking and walking environment. Chapter 4 provides a comprehensive implementation strategy that addresses priorities, phasing, funding sources, monitoring and evaluation. Technical appendices provide details of the methodology used to develop the recommended bicycle and pedestrian facilities, as well as details of the designated routes.