

# Birch Hill Elementary School Safe Routes to School Travel Plan

December 2009



Prepared by the  
 Nashua Regional Planning Commission

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## BIRCH HILL ELEMENTARY SCHOOL SAFE ROUTES TO SCHOOL TRAVEL PLAN

### A. BACKGROUND

The purpose of the Birch Hill Safe Routes to School Travel Plan is to develop a strategy for encouraging a greater number of students to walk and bicycle to and from school. The U.S. Department of Health and Human Services recommends at least 60 minutes of physical activity for children every day. The reason this is important is because physical exercise, such as biking and walking, can help prevent heart disease, as well as other chronic diseases such as diabetes, hypertension and depression. Physical activity also helps to build and maintain healthy bones and muscles and promotes psychological well-being. Developing a healthy physical lifestyle at an early age tends to stay with individuals throughout their lifetimes.

Despite these benefits, the Centers for Disease Control and Prevention (CDC) report that of children age 9 to 13 years, 62% do not participate in any organized physical activity and 23% do not participate in any free-time physical activity outside of school hours.



The Safe Routes to School (SR2S) program encourages children to bike or walk to school through education and incentives that remind children how much fun biking and walking can be. The program also addresses the safety concerns of parents by encouraging greater enforcement of traffic laws, exploring ways to create safer streets and educating the public about safe biking, walking and driving practices. The Safe Routes program uses a combination of education, encouragement, enforcement, engineering and evaluation (the 5E's) activities to help achieve the goal of increased physical activity among children. The 5E's will be more fully discussed later in this report.

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### B. BIRCH HILL ELEMENTARY SCHOOL

Birch Hill Elementary School is located in the northwest section of Nashua, New Hampshire (Maps 1-1a, 1-1b). It is part of a "neighborhood" school system and is therefore surrounded by a network of residential streets that are generally pleasant and walkable. Dublin Avenue however, presents a significant barrier to walking or biking for children who live to the east of the school.

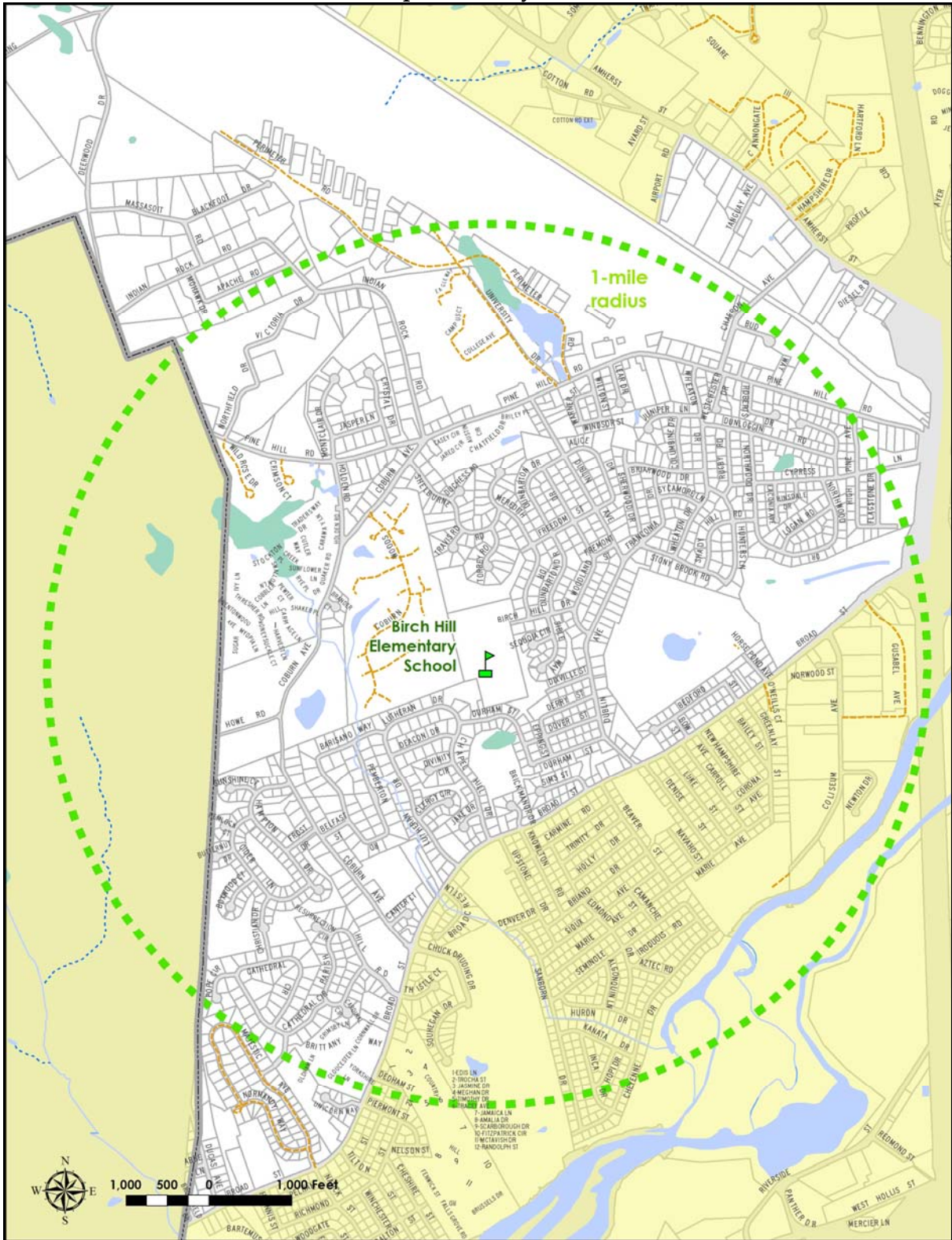


The school has an enrollment of approximately 500 students in grades K-5. Approximately 90 students (18%) are considered walkers, the rest are assigned to a bus. Children who live within the one-mile radius are considered "walkers" and are technically not eligible to ride the bus to school.

Map 1-1a shows the border of the Birch Hill Elementary School neighborhood. Children who live within the un-shaded area attend Birch Hill. Map 1-1b shows a closer view of the school and includes an aerial view of sidewalks, crosswalks, paths and the school driveway.

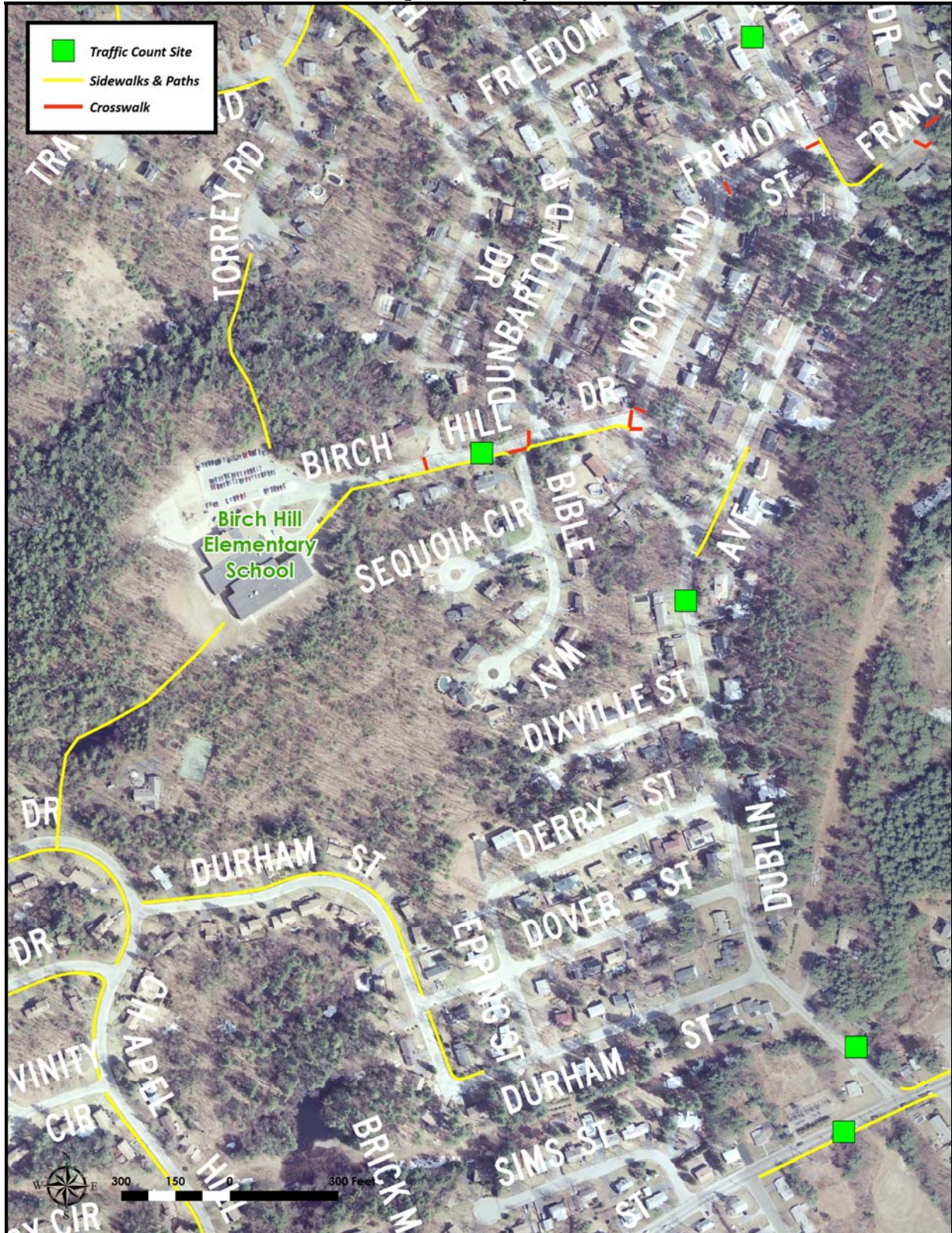


Map 1-1a: Study Area





Map 1-1b: Study Area



## C. GOALS OF THE STUDY

There are several major goals of this study:

- To increase the number of students who use non-motorized transportation to get to and from school
- To ensure the safety of students on their way to and from school;
- To improve children's fitness and health;
- To provide recreation and fitness opportunities close to home; and
- To protect the environment by reducing dependency on motor vehicles.



## D. STUDY PROCESS

The study process was designed to gather information from students and their parents regarding the trip to and from school. A physical inventory of the existing traffic and sidewalk conditions was also conducted. Input from the community was also gathered with the help of the Birch Hill Safe Routes Task Force, PTO, SAU safety committee and the City of Nashua. The specifics of the study process are as follows:

- An in-class survey was administered to all students in grades 3 through 5 in early March, 2009. Approximately 135 students were surveyed. The purpose of the surveys was to gather specific information regarding students' trips to and from school, as well as children's attitudes regarding the trip.
- Students were also given a take-home mapping exercise to complete with the assistance of their parents. The map was of the Birch Hill neighborhood and the students were asked to draw their route to school on the map, regardless of the mode (walk, bike, car, bus) of transportation. Students were also asked to indicate on the map locations that were perceived to be dangerous.
- Parent surveys were sent home along with the mapping assignment. The parents were asked various questions regarding how their children get to and from school, why their child uses that particular mode of transportation, and parents general attitudes about biking and walking. Parents were also asked how *they* got to school as children and how they would like to see their children get to school in an "ideal" Nashua.
- NRPC conducted a field survey of the existing sidewalk conditions within walking distance (approximately 1-mile) of the school. The inventory was conducted during the month of June, 2009.
- Comments on the draft report were requested from City of Nashua Community Development Division, Division of Public Works and SAU Safety Committee.
- Preliminary findings were presented to the Birch Hill Safe Routes to School Task Force on September 10, 2009.
- Final report will be presented to the Birch Hill Parent Teacher Organization Board of Directors on November 12<sup>th</sup>, 2009.





## E. STUDY FINDINGS

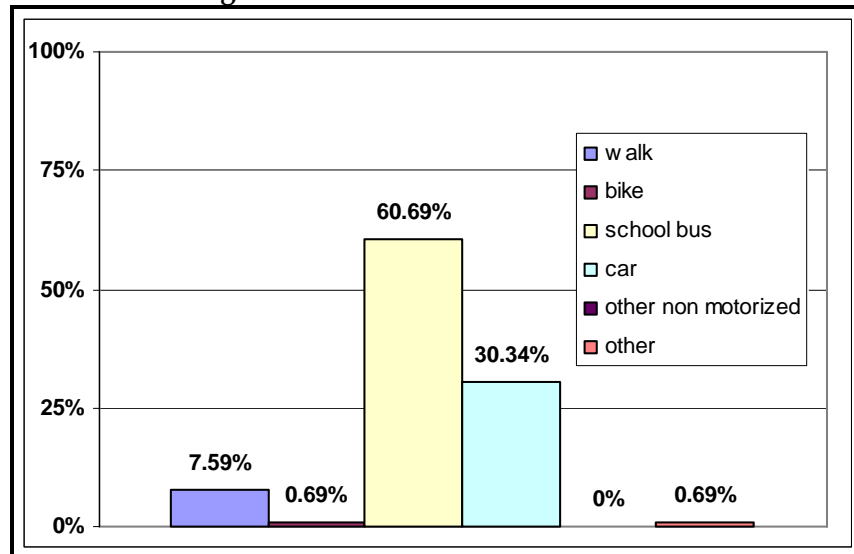
### 1. Student Attitudes and Travel Patterns

When students were asked how they typically get *to* school in the morning, 8% said they walk, 1% ride bikes, 61% ride the bus and 30% are driven (Figure 1-1). When asked how they get *home* from school in the afternoon, 8% said they walk, 1% bike, 67% ride the bus and 23% are driven (Figure 1-2).

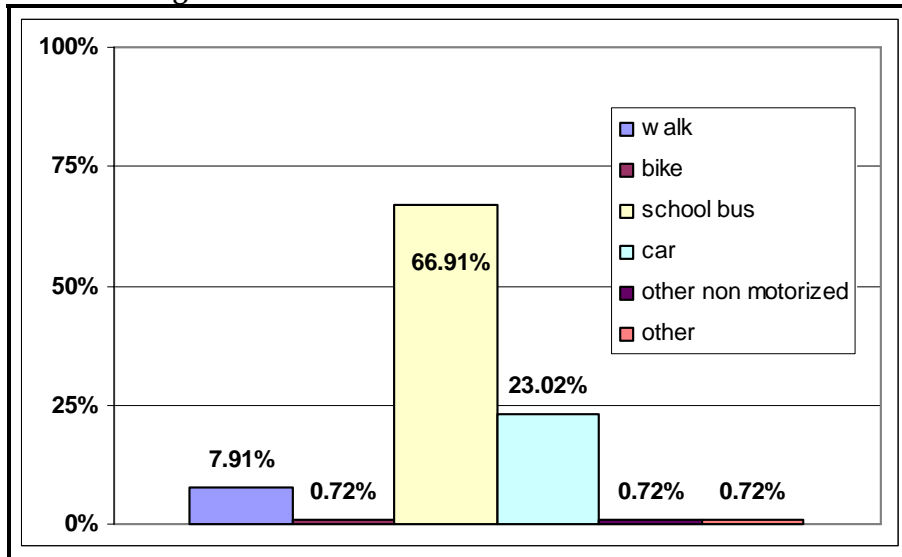
When students were asked how they would *like* to get to school (Figure 1-3), 9% said they would prefer to walk, 16% bike, 36% take the bus, 20% would like to be driven and 17% said some other non-motorized (inline skate, skateboard) mode.

Currently, only about 9% of students use non-motorized transportation to get to school as opposed to 42% who say they would *like* to walk, ride their bike, or use some other form of non-motorized transportation to get to school.

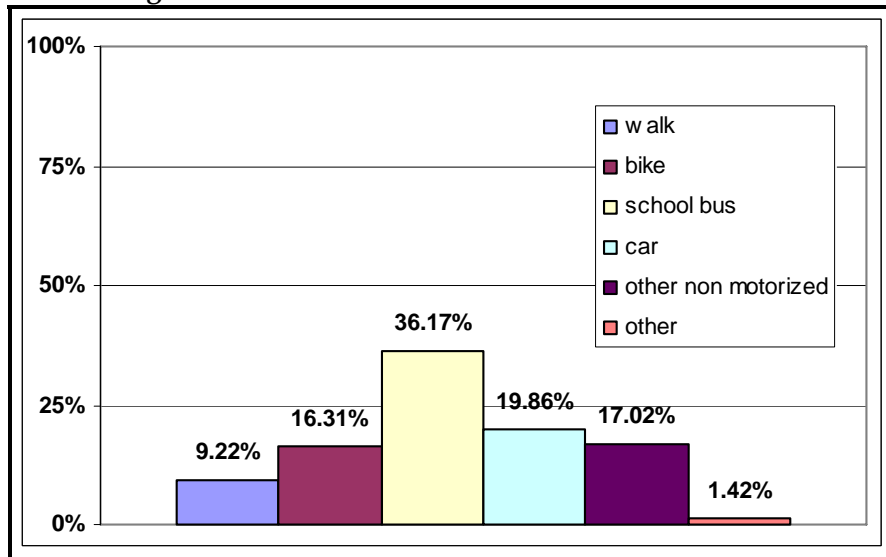
Figure 1-1: How Do You Get to School



**Figure 1-2: How Do You Get Home From School?**



**Figure 1-3: How Would You Like To Get To School?**





When the students were asked if walking is fun or boring 72% said fun and 28% said boring. (Fig.1-4). When asked if walking is cool or not cool 71% said it is cool and 29% said not cool (Fig. 1-5).

Figure 1-4: Walking is Fun/Boring

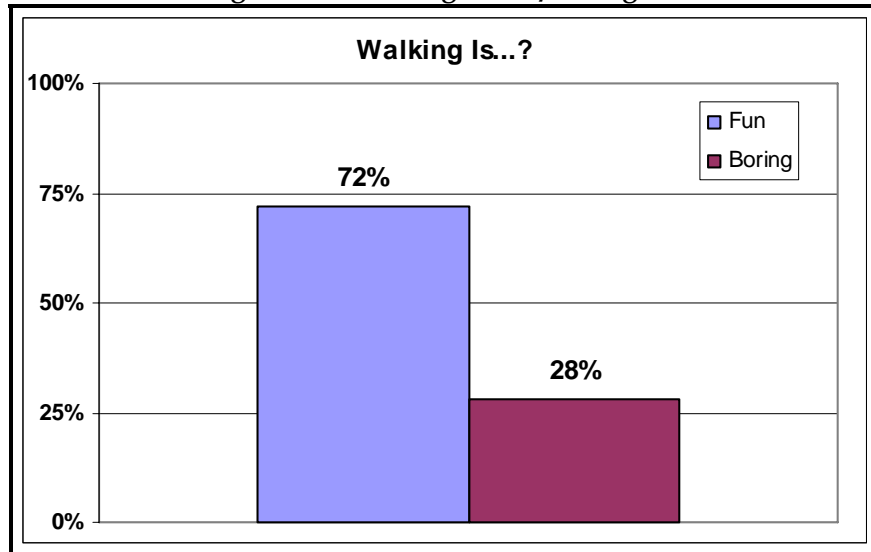
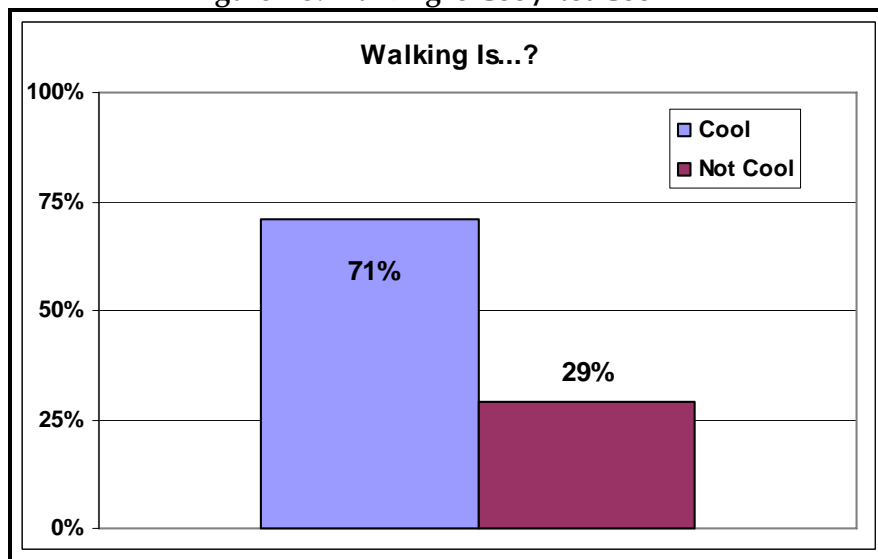


Figure 1-5: Walking is Cool/Not Cool





When the students were asked if biking is fun or boring 93% said fun and 7% said boring. (Fig.1-6). when asked if biking is cool or not cool 88% said it is cool and 12% said not cool (Fig. 1-7).

Figure 1-6: Biking is Fun/Boring

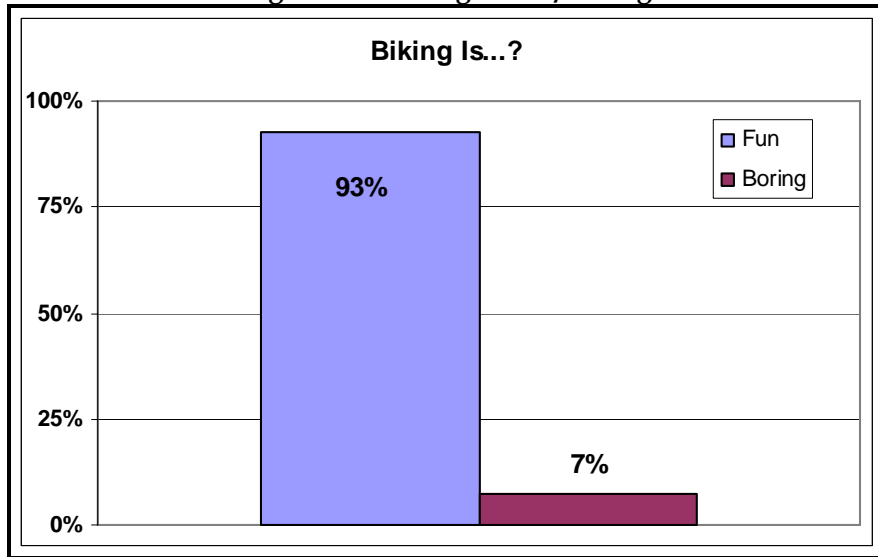
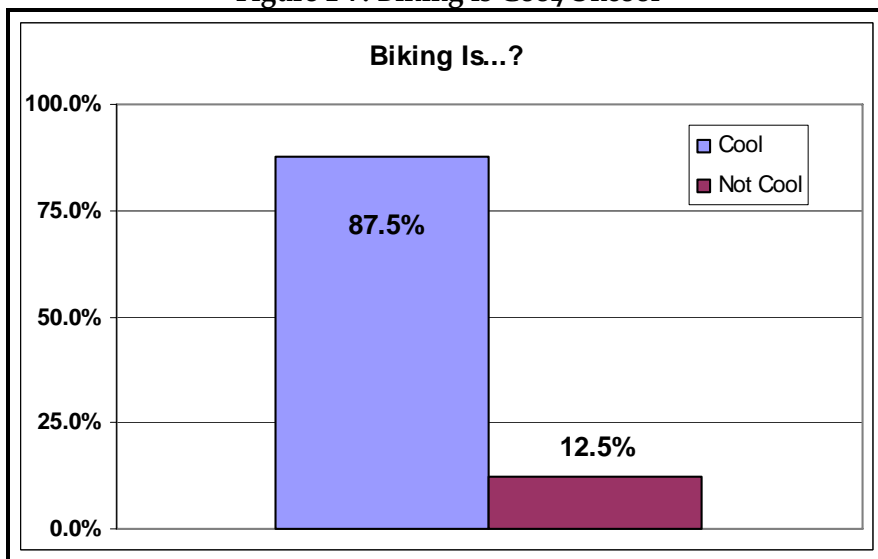


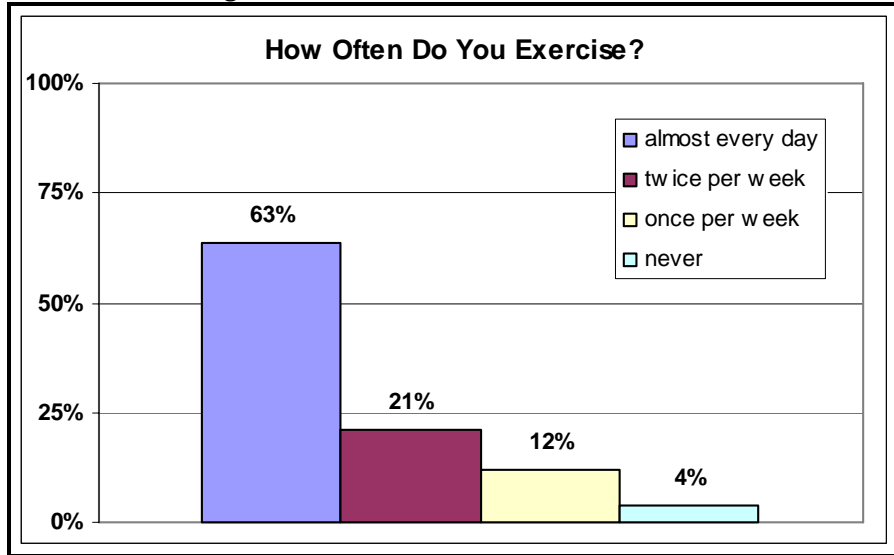
Figure 1-7: Biking is Cool/Uncool





When the students were asked how often they exercise when not at school, 63% said they exercise every day (Figure 1-8). This combined with 42% saying they would like to use non-motorized transportation to get to school, is a clear indication that students are willing and able to bike or walk to school more often than they do at this time.

Figure 1-8: How Often Do You Exercise?

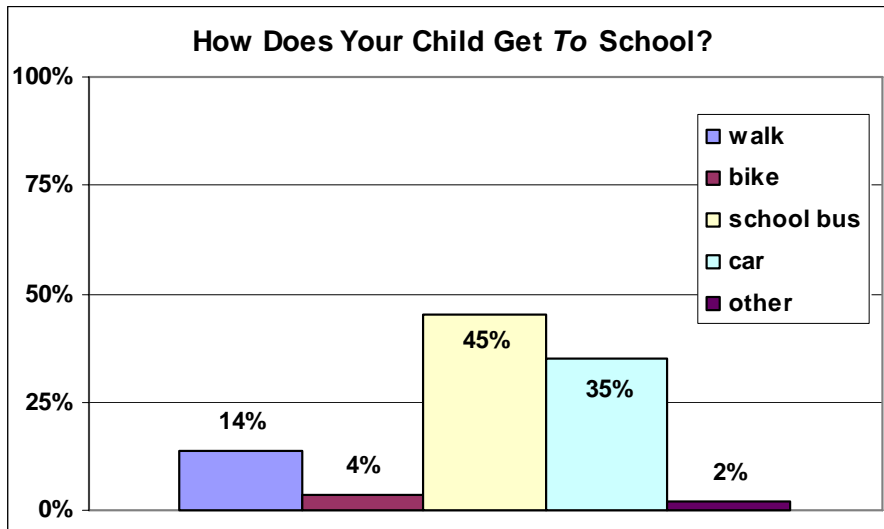




## 2. Parent Attitudes and Concerns

When parents were asked how their children travel to school, 14% said their child walks, 4% bike, 45% take the bus and 35% are driven in the family vehicle (Figure 1-9).

Figure 1-9: How Does Your Child Get To School?



When parents were asked how *they* got to school as children 38% of parents say they walked (only 14% of *their* children walk), 47% took the school bus and only 9% were driven in a car (Figure 1-10).

Figure 1-10: How Did Parent Get To School?

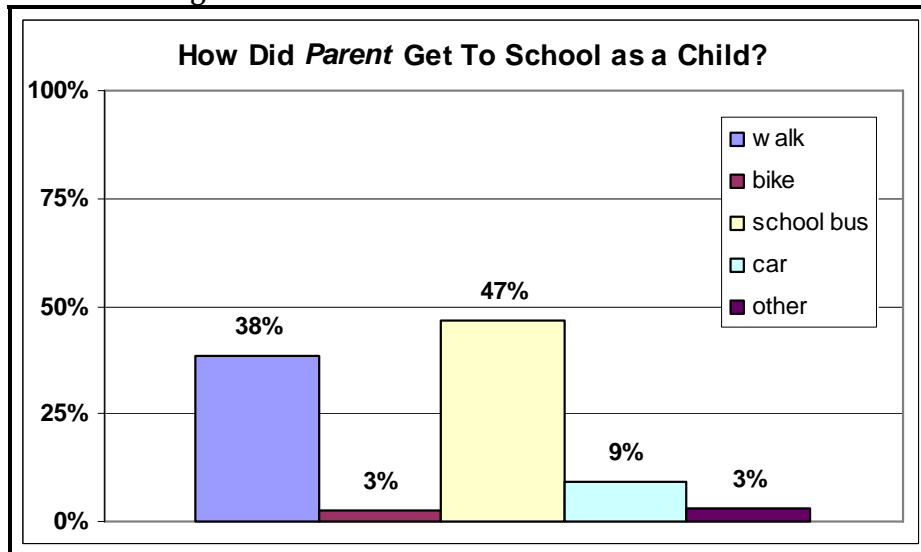




Figure 1-11 indicates that most parents believe that walking and biking to school is dangerous. Parents were asked why they consider this to be true; 26% cited traffic concerns (traffic speed, volume), 28% sidewalk conditions (gaps in sidewalk system/sidewalks in disrepair/sidewalks not plowed in winter), 16% cited danger crossing the street (no crossing guard, sight distance), and 14% cited fear of crime, strangers and bullies (Figure 1-12).

Figure 1-11: Is Walking/Biking to School Safe?

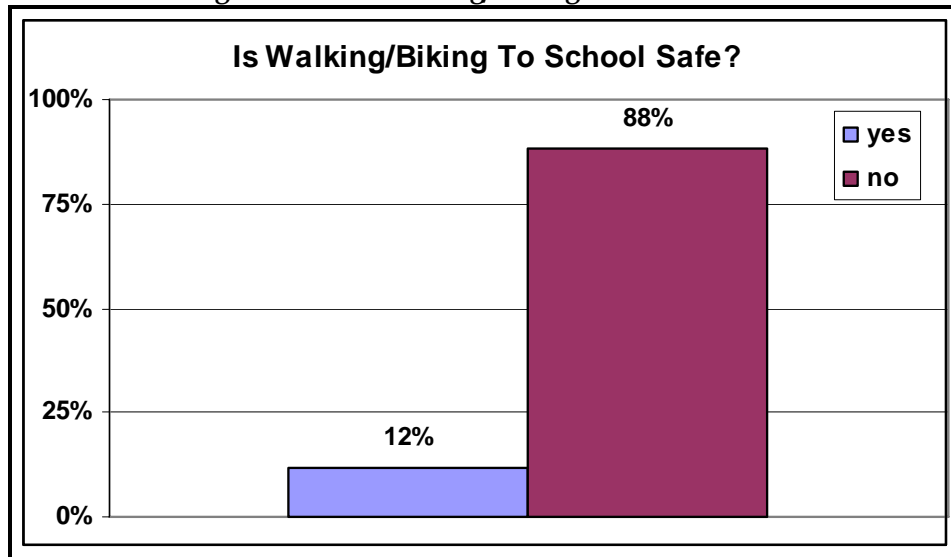
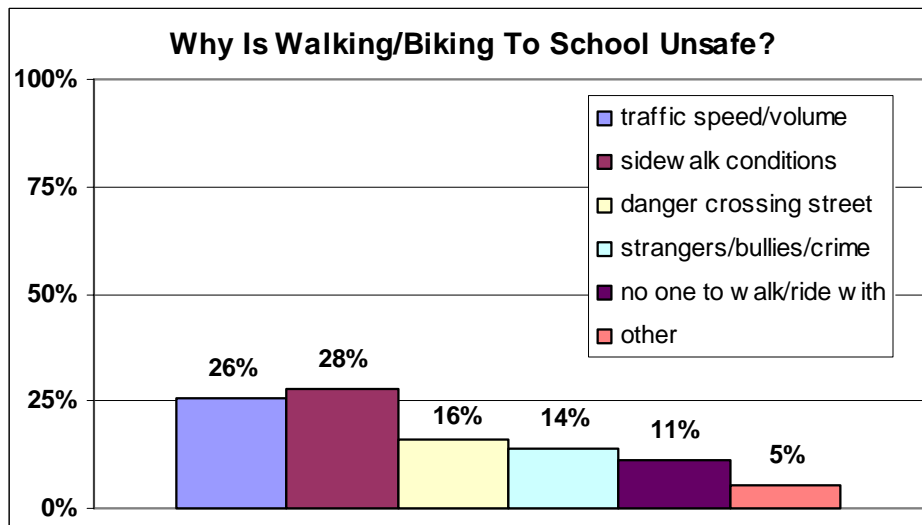


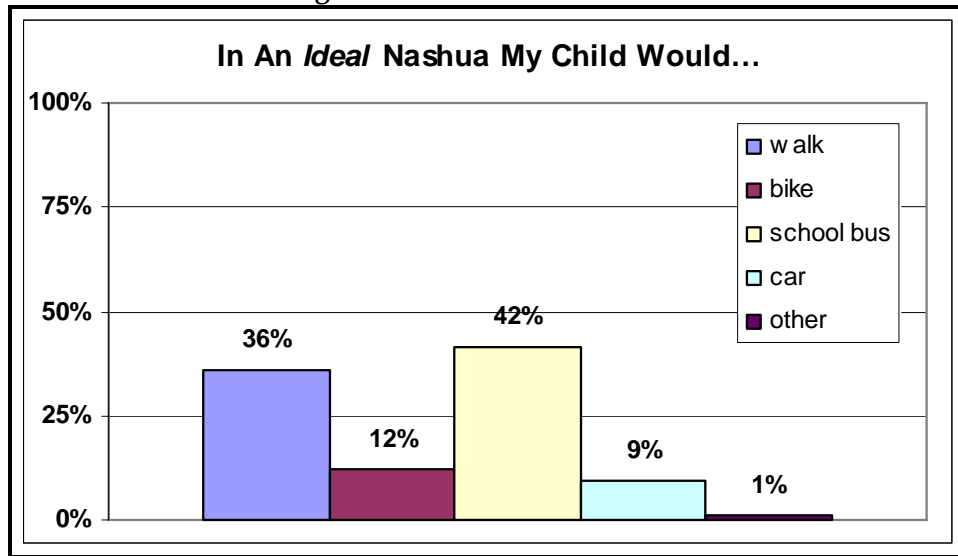
Figure 1-12: Why is Walking/Biking Unsafe?



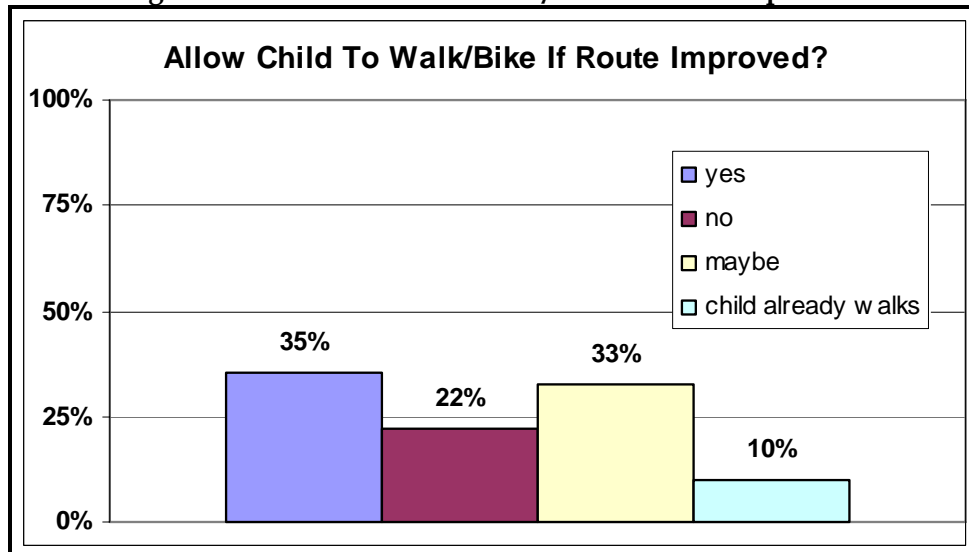
Even though parents have significant concerns about the safety of walking and biking to school given existing conditions, when asked how they would *like* their children to get to school (in an ideal Nashua), 42% would like them to take the bus and only 9% would prefer to drive them (Figure 1-13). A significant percentage (48%) of parents surveyed said they would prefer their child walk or ride a bike to school.

Additionally, 35% of parents said they would allow their child to walk to school if the route were to be improved, and 33% said they would “maybe” allow them to walk if the route were improved (Figure 1-14). Combined with the fact that 42% of children said they would prefer to walk/bike/skateboard to school, there seems to be an opportunity for increasing the number of students who would travel to school in a non-motorized fashion.

**Figure 1-13: In an Ideal Nashua**



**Figure 1-14: Allow Child to Walk/Bike if Route Improved?**





Parents were also asked how they feel about the potential developmental health benefits of walking and biking to school. When asked if they agree or disagree that walking and biking help to increase alertness in school, 51% said they agree or strongly agree and only 11% said they disagree or strongly disagree (Figure 1-15).

When asked if they agree or disagree that walking and biking at an early age helps develop a healthy lifestyle 81% either agree or strongly agree and only 12% disagree or strongly disagree.

When asked if they agree or disagree that walking and biking help develop a sense of self-reliance 73% either agree or strongly agree and only 13% disagree or strongly disagree.

Figure 1-15: Walking/Biking Increase Alertness?

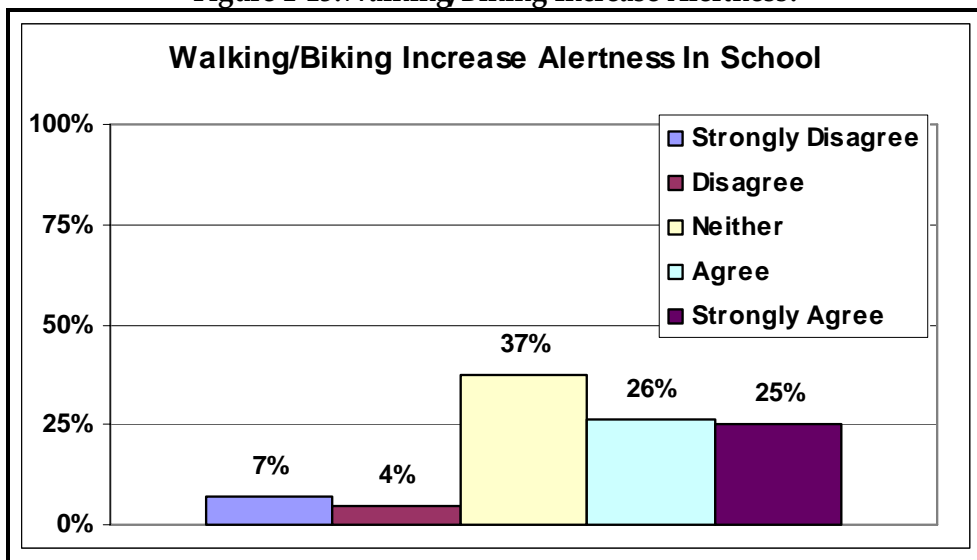


Figure 1-16: Walking/Biking Help Develop a Healthy Lifestyle?

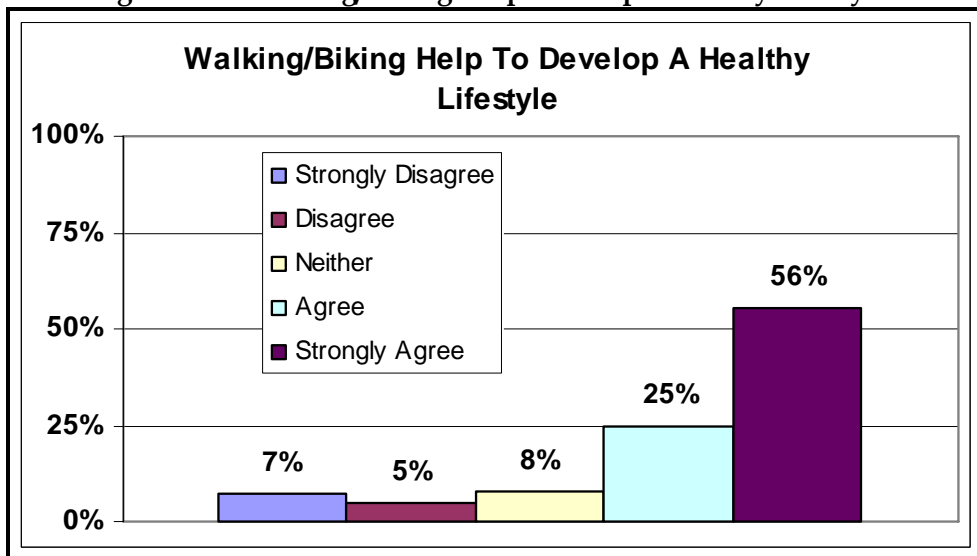
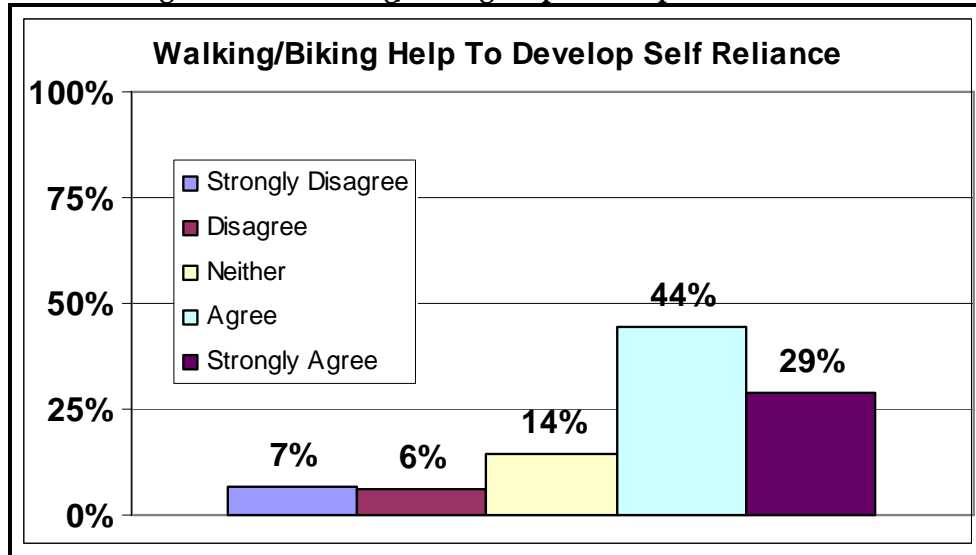


Figure 1-17: Walking/Biking Help Develop Self Reliance?



### 3. Routes Used for Traveling to School

Students were given a take-home mapping exercise to work on with their parents. They were asked to draw on the map the route by which they walked or rode their bike to school. Students who were driven or rode the bus to school were also asked to draw their route to school on the map. Students were also asked to indicate what they considered dangerous intersections, as well as other dangerous places along the way. Map 1-2 summarizes the most popular routes used by students who walk or ride their bikes. The symbols on the map indicate places that are perceived to be dangerous.

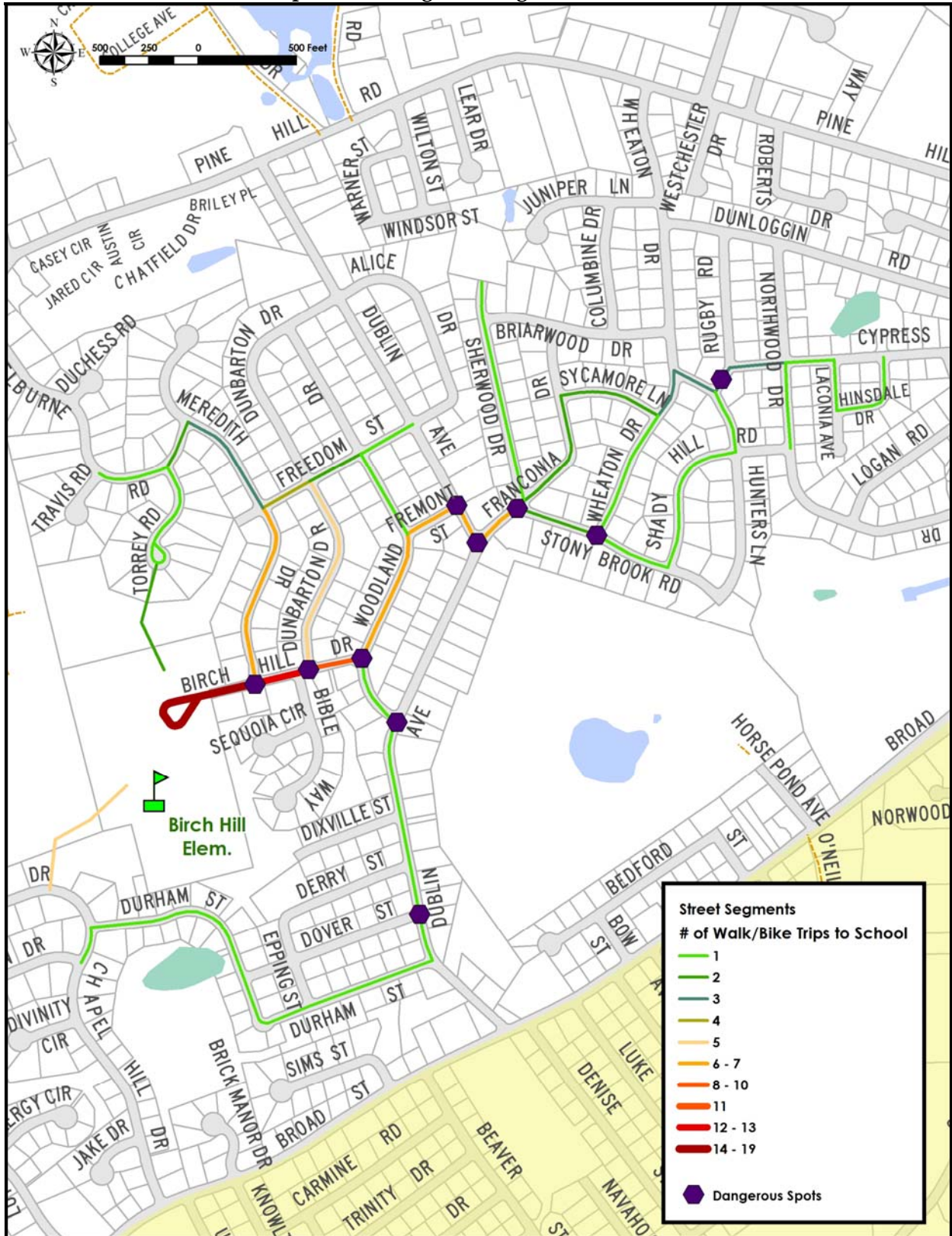
The map indicates that most of the walkers arrive on Birch Hill Drive via Meredith, Dunbarton and Woodland Drives. It can also be seen that some of the walkers travel to Birch Hill from the area near Franconia Drive via Freemont Street and Woodland Drive. Approximately 5 students use the path that connects Chapel Hill Drive with the southwest side of the school.

The map also indicates areas that are perceived to be dangerous. These locations generally coincide with places where children are required to cross the street.

The implications of these dangerous locations are discussed in the Key Issues (Section F) section later in this report.



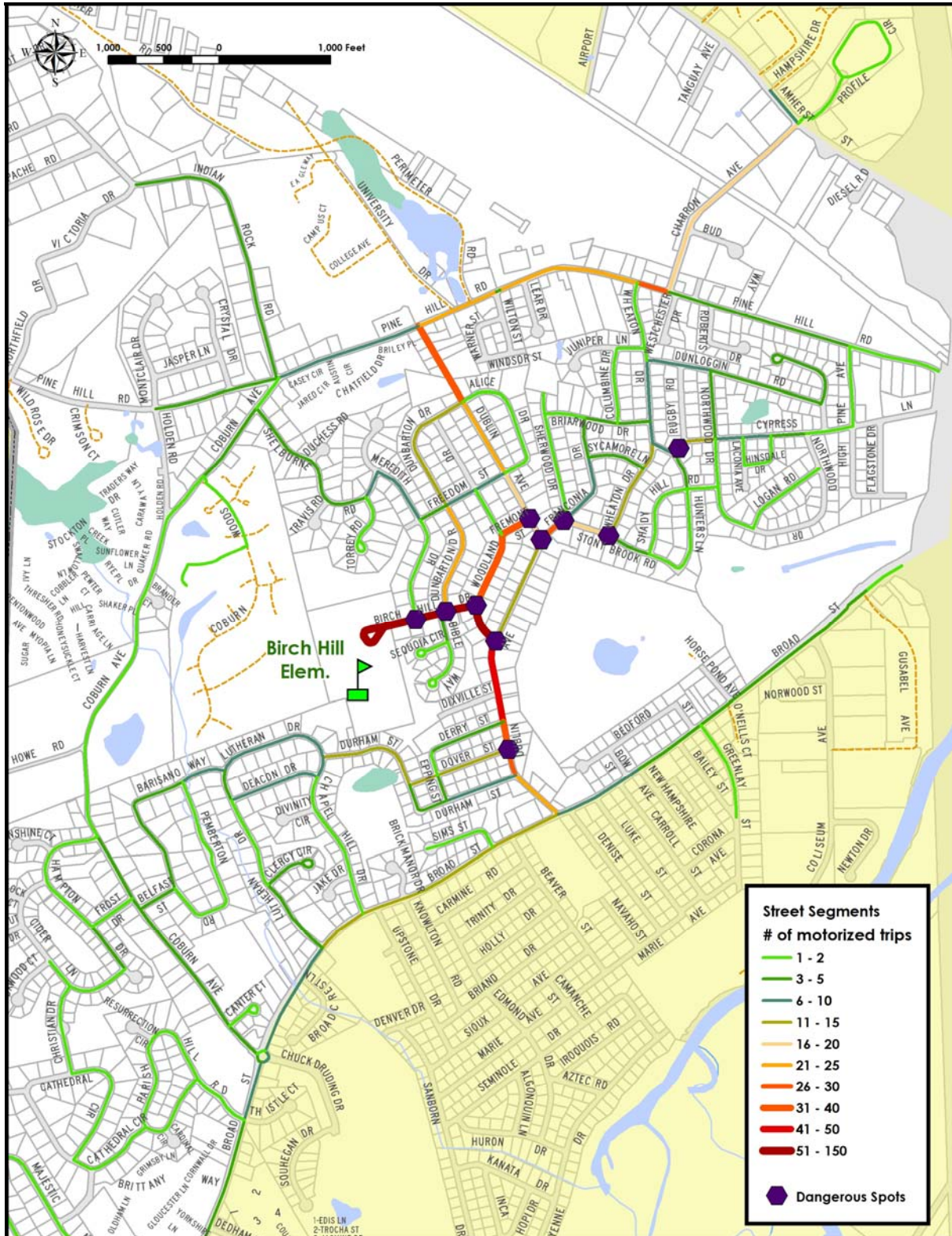
Map 1-2: Walking & Biking Routes to School





Map 1-3 summarizes the routes taken by students who travel to school in motor vehicles.

Map 1-3: Motor Vehicle Routes to School





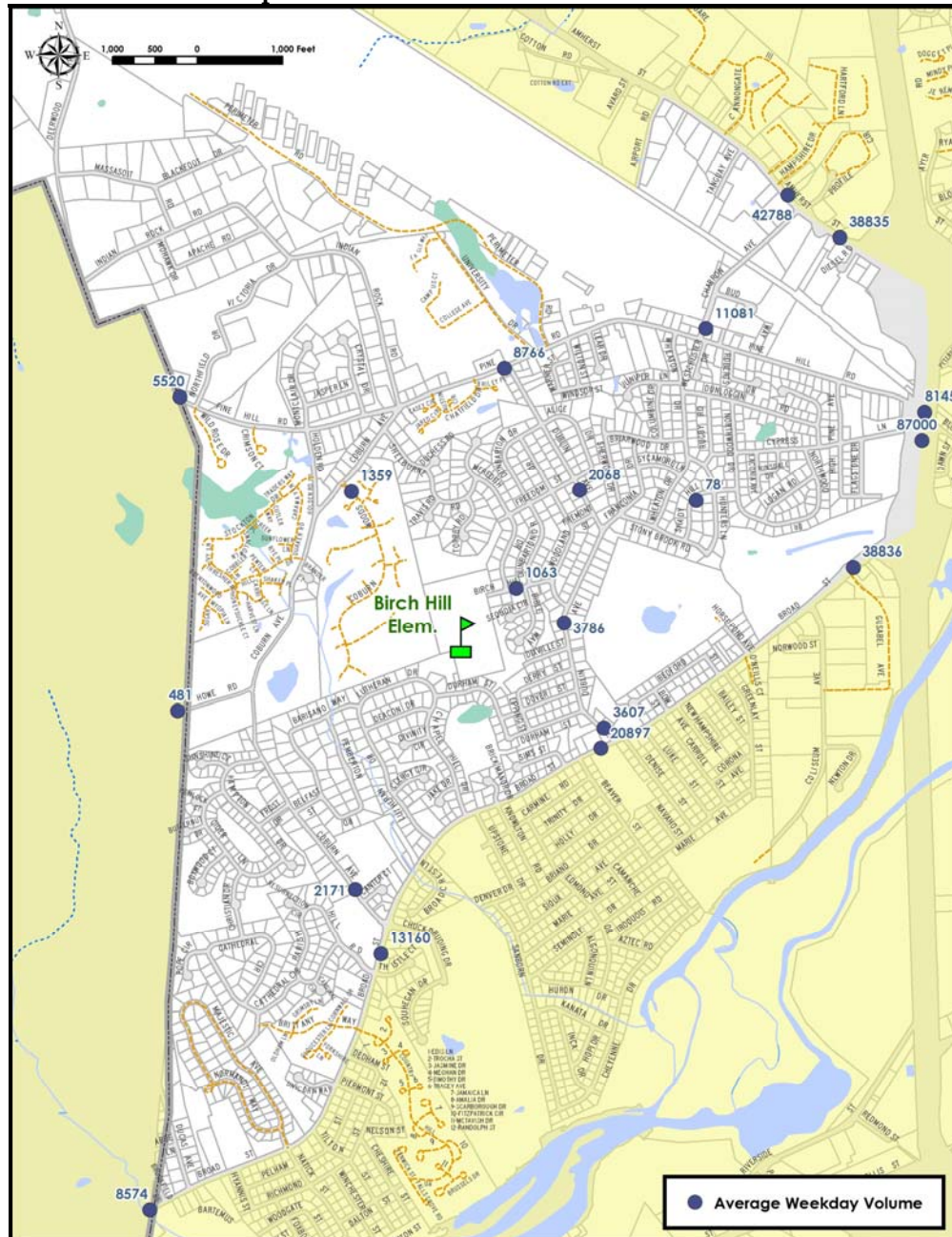
#### 4. Traffic Count History

##### a. Historical Traffic Count Data

NRPC maintains a database of 24-hour traffic volume counts throughout the region. The database includes several locations in the vicinity of the school. Map 1-4 documents the locations and the most recently recorded volumes.

Additional traffic counts were conducted at key locations in the Birch Hill neighborhood specifically for this report. These counts recorded speed of vehicles as well as volume of traffic. The data collected at those locations is described later in this section.

Map 1-4: Historical Traffic Count Locations





**b. Traffic Count Data at Other Key Locations**

NRPC staff conducted additional traffic counts at key locations specifically for this study at the following locations:

- Birch Hill Drive
- Dublin Avenue south of Woodland Drive
- Dublin Avenue north of Franconia Drive

**Birch Hill Drive**

NRPC staff measured traffic volume on Birch Hill Drive specifically for this study during the week of May 18<sup>th</sup>, 2009. Birch Hill Drive terminates at the school and is essentially the school driveway, though it is a public road lined with private homes. The average weekday traffic during the counting period was 1,044 vehicles per day (Table 1-1). The peak periods of traffic were between 8-9am in the morning and 3-4pm in the afternoon, which coincides with pick-up and drop-off times at the school.

**Table 1-1  
Traffic Volume - Birch Hill Drive**

Time Period	Tuesday May 19, 2009	Wednesday May 20, 2009	Thursday May 21, 2009	Friday May 22, 2009
12-1AM	0	0	0	1
1-2AM	0	0	0	0
2-3AM	0	2	0	0
3-4AM	5	0	0	0
4-5AM	0	3	5	4
5-6AM	0	2	0	0
6-7AM	13	12	16	16
7-8AM	42	44	42	39
8-9AM	302	315	278	316
9-10AM	78	56	61	108
10-11AM	32	12	25	29
11-12AM	90	86	94	92
12-1 PM	70	68	49	46
1-2PM	23	28	27	38
2-3PM	46	37	31	44
3-4PM	241	234	216	230
4-5PM	48	60	68	19
5-6PM	58	66	41	24
6-7PM	28	15	25	4
7-8PM	18	7	12	5
8-9PM	6	5	26	8
9-10PM	2	6	2	4
10-11PM	4	4	6	7
11-12PM	1	1	0	4
<b>Total</b>	<b>1107</b>	<b>1063</b>	<b>1024</b>	<b>1038</b>



**Dublin Avenue south of Woodland Drive and north of Franconia Drive**

NRPC staff also recorded traffic volume on Dublin Avenue specifically for this study during the week of May 18<sup>th</sup>, 2009. The average weekday traffic at these locations during the counting period was slightly more than 2,000 vehicles per day (Table 1-2) near Woodland and slightly more than 3,000 vehicles per day near Franconia. This is a relatively low volume of traffic although there is some evidence of speeding as well as limited sight distance on segments of this roadway. It should be possible to address these concerns given the volume of traffic and neighborhood atmosphere in the area.

**Table 1-2  
Traffic Volume  
Dubin Avenue South of Woodland Drive**

Time Period	Tuesday May 19, 2009	Wednesday May 20, 2009	Thursday May 21, 2009	Friday May 22, 2009
12-1AM	9	5	6	13
1-2AM	3	3	0	6
2-3AM	0	0	3	2
3-4AM	2	2	2	2
4-5AM	5	6	6	4
5-6AM	9	24	19	15
6-7AM	43	40	48	44
7-8AM	91	91	108	97
8-9AM	141	158	117	127
9-10AM	122	98	119	124
10-11AM	110	99	102	95
11-12AM	139	137	128	132
12-1 PM	118	148	138	132
1-2PM	115	130	129	148
2-3PM	145	124	161	153
3-4PM	184	167	172	208
4-5PM	167	156	168	178
5-6PM	180	179	165	182
6-7PM	138	161	163	130
7-8PM	115	100	107	113
8-9PM	77	105	120	88
9-10PM	69	66	50	64
10-11PM	31	29	28	40
11-12PM	10	19	17	24
Total	2,023	2,047	2,068	2,021



December 2009

**Table 1-3**  
**Traffic Volume**  
**Dubin Avenue North of Franconia Drive**

Time Period	Tuesday May 19, 2009	Wednesday May 20, 2009	Thursday May 21, 2009	Friday May 22, 2009
12-1AM	16	9	9	19
1-2AM	1	9	2	12
2-3AM	1	4	5	3
3-4AM	4	3	2	6
4-5AM	7	6	5	7
5-6AM	33	44	32	31
6-7AM	105	91	89	89
7-8AM	219	200	220	206
8-9AM	323	320	295	347
9-10AM	239	215	202	234
10-11AM	199	158	167	188
11-12AM	240	226	218	241
12-1 PM	229	236	199	206
1-2PM	194	196	207	268
2-3PM	288	245	273	279
3-4PM	381	333	322	396
4-5PM	283	300	301	278
5-6PM	343	336	335	300
6-7PM	257	293	284	220
7-8PM	216	175	201	195
8-9PM	144	156	201	134
9-10PM	108	110	113	115
10-11PM	57	48	64	76
11-12PM	24	31	40	52
Total	3,911	3,744	3,786	3,872



## 5. Speed of Motor Vehicles

NRPC staff also measured the speed of vehicles at the locations on Dublin Avenue south of Woodland Drive and north of Franconia Drive. The posted speed on this roadway is 30 mph.

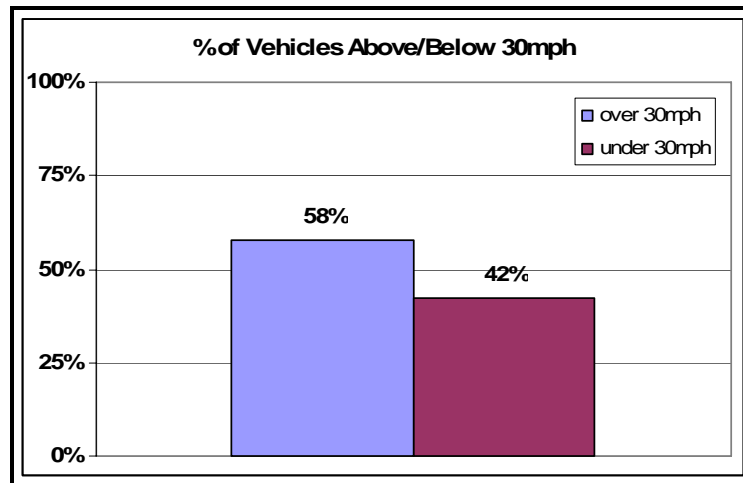
### Dublin Avenue South of Woodland Drive

- It can be seen in Table 1-4 and Figure 1-18 that 58% of all vehicles exceeded the speed limit during this period.

**Table 1-4**  
**Vehicles vs. Speed Limit**  
**Dublin Avenue S. of Woodland Drive**

Speed (mph)	% of Total
< 30 MPH	42%
> 30 MPH	58%
Total	100%

**Figure 1-18**  
**Vehicles vs. Speed Limit**  
**Dublin Avenue S. of Woodland Drive**





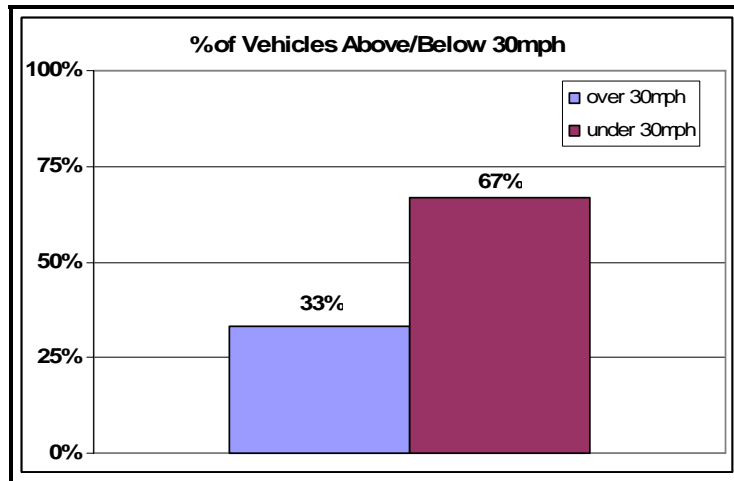
**Dublin Avenue North of Woodland Drive**

- It can be seen in Table 1-5 and Figure 1-19 that 67% of all vehicles travelled below the speed limit during this period.

**Table 1-5  
Vehicles vs. Speed Limit  
Dublin Avenue N. of Franconia Drive**

Speed (mph)	% of Total
< 30 MPH	67%
> 30 MPH	33%
Total	100%

**Figure 1-19  
Vehicles vs. Speed Limit  
Dublin Avenue N. of Franconia Drive**



## 6. Accident History

NRPC obtained traffic accident data from the City of Nashua Police Department. During the period from 2006-2009 there was one reported motor vehicle-pedestrian accident in the vicinity of the school (intersection of Birch Hill Drive and Woodland Drive). This accident occurred in 2007. The conditions at the time of the incident were not included in the police report. The incident involved a crossing guard being struck by a school bus. The crossing guard received a red mark on face.

## 7. Sidewalk Inventory

NRPC staff conducted a field survey of all sidewalks within Birch Hill Elementary School neighborhood. Staff “located” each sidewalk using Geographic Positioning System (GPS) equipment, and then developed a map using Geographic Information System (GIS) software (Map 1-5). NRPC also used information from the City of Nashua sidewalk GIS layer.

### Inventory Parameters

A sidewalk inventory “data dictionary” was developed for the GPS for this project. The data dictionary includes parameters normally used for sidewalk inventory. The overall condition of each sidewalk segment was determined using the following parameters:

- Sidewalk surface (Asphalt, concrete, etc)
- Condition of sidewalk surface (surface cracking, drainage, roots)
- Width of the sidewalk (visual estimate of the segment, wheelchair friendly)
- Obstructions (utility poles, vegetation, signs)
- Ramps at intersections (smooth wheelchair transition from sidewalk to road pavement)
- Crosswalks (presence of crosswalk, condition of paint, signalized pedestrian crossings)
- Sight distance
- Gaps in the sidewalk network



### Field Observations

#### i. Surface Material

The type of material and the width of any space between the road and sidewalk (buffer) were noted.

- Sidewalks in the vicinity of the school are made of asphalt. Many are curbed and have grass buffers of varying widths.

#### ii. Surface Condition

- The overall condition of the sidewalk surface was rated good, fair or poor. Three criteria were used: cracking, roughness (bumps, depressions), and loose aggregate (sand, stone, trash). Sidewalks in the vicinity of the school are in generally good condition.



**iii. Width**

The American with Disabilities Act (ADA) requires that sidewalks be at least 5 feet in width and be handicapped accessible at intersections. No sidewalks in the study area averaged less than 4 feet and many averaged 5 feet in width.

**iv. Obstructions**

There were several instances of overgrown vegetation blocking the sidewalk but most sidewalks in the study area were free of obstructions.



**v. Ramps at Intersections**

All intersections with sidewalks were observed for ramps that allow handicapped persons smooth access between the sidewalk and the road.

- All sidewalks had adequate ramps.

**vi. Crosswalks**

All of the crosswalks in the vicinity of the school averaged 8 feet wide and were painted on the pavement. Several had a faux-brick (pressed) painted surface and others had a smooth painted surface. There were crosswalks at the following locations:

- Intersection of Birch Hill Drive and the Meredith Drive Path.
- Intersection of Birch Hill Drive, Bible Way and Dunbarton Drive.
- Intersection of Birch Hill Drive and Woodland Drive.
- Intersection of Fremont Street and Woodland Drive.
- Intersection of Franconia Drive and Stonybrook Road.
- Intersection of Franconia Drive and Sherwood Drive.

**vii. Sight Distance**

Sight distance was considered fair overall. The sight distance along the northbound Dublin Avenue approaching Fremont Street is limited.

**viii. Gaps in the Sidewalk System and Sidewalk Connectivity**

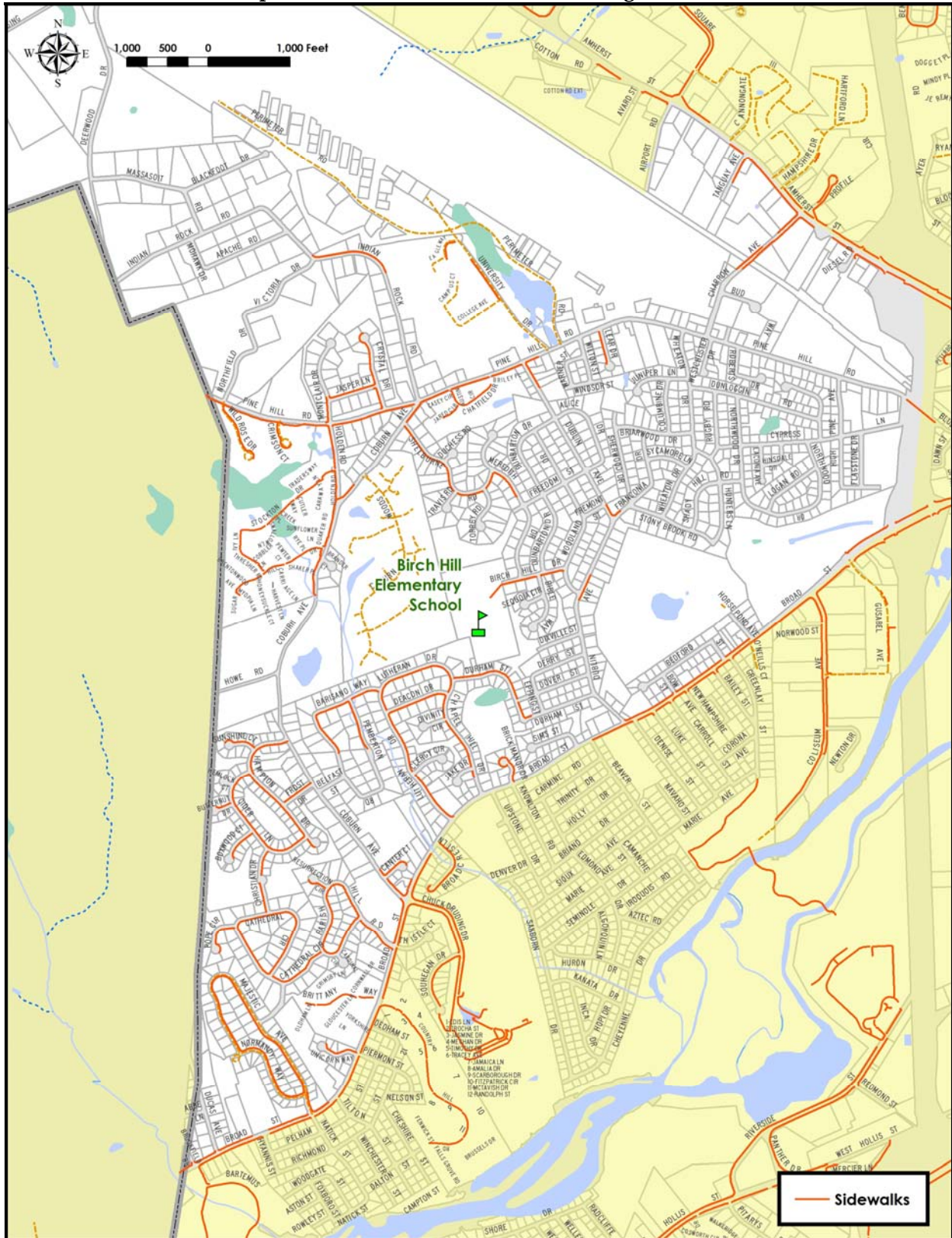
Map 1-5 indicates the location of existing sidewalks as well as areas where sidewalks do not exist.

There are no sidewalks along Fremont Street and Woodland Drive. There is no sidewalk on Meredith between Freedom Street and Birch Hill Drive. Meredith Drive is also not paved all the way to Birch Hill which leaves children to negotiate a uneven washed out path through a short stretch of woods.

The sidewalk system in the Lutheran Drive, Deacon Drive, and Durham Street neighborhood takes an indirect route to school. Therefore, very few children walk to school from this neighborhood. A more direct connection to the school would increase the walkability of this area.



Map 1-5: Sidewalks in the Birch Hill Neighborhood



## F. KEY ISSUES

The key issues identified in the course of this study include:

- *Traffic conditions along Dublin Avenue.* There is a fairly significant volume of motor vehicle traffic along Dublin Avenue. The intersection with Franconia Drive is skewed and some survey respondents noted that traffic is unpredictable as it veers onto Franconia from Dublin Avenue. For traffic moving northbound on Dublin Avenue, the crosswalk at Dublin Avenue and Freemont appears just after a significant curve in the road and is not visible until then.

The motor vehicle speed data that was collected by the NRPC indicates some evidence of speeding on Dublin Avenue. There are also segments of the road where sight distance is limited.

- *Traffic conditions on Birch Hill Drive.* The average daily traffic on Birch Hill Drive of less than 1,100 vehicles is a relatively low volume of traffic. It should therefore be possible for children to safely travel to and from school along Birch Hill Drive on foot or on bicycle.

A significant percentage of the daily traffic occurs during drop off and pick up time at the school. NRPC staff observed drop off and pickup at the school during the week of May 18<sup>th</sup>. Motor vehicle operators were generally courteous during these periods. However, some were on cell phones and others rolled through stop signs. The close proximity of walkers and bikers to this behavior is potentially a safety issue.



- *Gaps in sidewalk system.* Map 1-2 indicates that one of the more common walking routes to school is along Franconia Drive to Fremont Street to Woodland Drive to Birch Hill Drive. There are no sidewalks, however, along Fremont and Woodland.

Another common walking route is along Meredith Drive. There is no sidewalk on Meredith between Freedom Street and Birch Hill Drive. Meredith Drive is also not paved all the way to Birch Hill which leaves children to negotiate a uneven washed out path through a short stretch of woods.

- *Sidewalk connectivity.* Very few children walk to school from the Lutheran Drive, Deacon Drive, and Durham Street neighborhood. One reason is that the sidewalk system takes an indirect route along Durham Street (and ends near the intersection of Durham and Epping Streets). This is an indirect route to school at best, and anyone who takes this route adds time and distance to the trip. This added time and distance discourage walking and biking to school from this neighborhood. The possibility of enhancing the path from Lutheran Drive to the southwest corner of the Birch Hill campus should be explored (see recommendations). This would create a more direct route to the school.
- *Clearing sidewalks of snow.* The policy of the Nashua DPW is to clear snow from all sidewalks within 1,000 feet of the front door of a school as soon as possible. However, sidewalks are not always cleared of snow in a timely fashion because of obstructions in the sidewalks.
- *Childrens desire to walk or bike to school.* When given the choice, 42% of children surveyed indicate a desire to travel to school in some non-motorized fashion. 72% said walking is fun and 93% said biking is fun. 71% said walking is cool and 88% said biking is cool.
- *Worries about children's safety while traveling to school in an unsupervised fashion.* 88% of parents say walking /biking to school is unsafe; around 70% of those say it is unsafe because of some safety concern (busy streets, sidewalk conditions, dangerous crossings).



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35% of parents said they would let their child walk to school if the route were to be improved; and an additional 33% would “maybe” let their child walk if the route were improved.

- *Parents attitudes about biking and walking.* 48% of parents said that in an “ideal” Nashua they would let their child bike or walk to school. 51% of parents either agree or strongly agree that biking and walking increase alertness during the school day. 81% either agree or strongly agree that biking and walking help develop a healthy lifestyle.
- *Access to school busses.* Parents clearly consider the trip to school via school bus to be inherently safer than walking or biking. In fact, nearly 42% would like their children to travel to school on the bus. The reason that more kids don’t take the bus is because school policy requires children who ride the bus to live more than a mile from school.

## G. BARRIERS TO CHANGE

Parents clearly prefer that their children get to school in a supervised fashion, either in the family car or on the bus. This is generally due to safety concerns. In order to achieve the goal of increasing biking and walking amongst children at the school it will be necessary to convince parents that their children will be able to do so safely. School administration and teachers generally seem willing to promote increased biking and walking of students, but translating this willingness into policies and programs will require a significant effort. Physical improvements to streets and sidewalks in the neighborhood will require coordination with the City Division of Public Works and to a lesser extent the Community Development Division. The individuals in these departments have historically shown the highest level of dedication to public safety and well being. However, the traditional sources of funding for physical improvements to City infrastructure are limited at this time. It will therefore require creativity in order to attract adequate revenue to accomplish the tasks at hand. The NHDOT Safe Routes to School funding program is a potential source of funding for improvements suggested in this report.

## H. OPPORTUNITIES

Students expressed a desire to travel to school by walking, biking or some other means of non-motorized travel. This is a likely indicator that students would be interested in programs and curriculum that promote biking and walking.

It was also observed that the school administration, staff and teachers are highly dedicated public servants working towards the goal of providing the best education they can to the students in their care. Their comments show their understanding that kids who get plenty of exercise are happier and more willing to learn than kids who do not exercise. It is therefore likely that administration, staff and teachers will be willing to support the recommendations in this report.

Securing funding for the improvements to City infrastructure that have been identified in this study may prove difficult. However, as noted earlier, the City of Nashua employs staff who have expressed a strong desire to improve conditions for bicycling and walking in the neighborhood.

## I. THE 5 E'S

The “5E’s” are an important component of the Safe Routes to School Program. Communities use many different approaches to make it safer for children to walk and bicycle to school and to increase the number of children who do so. Safe Routes programs use a combination of education, encouragement, enforcement and engineering activities to help achieve their goals. Another important element is evaluation, which is incorporated into each of these areas<sup>1</sup>. The following is an explanation of the 5E’s.

### **Education**

Education activities target parents, neighbors and other drivers in the community to remind them to yield to pedestrians, to drive safely and to take other actions to make it safer for pedestrians and bicyclists. Parents serve as role models for their children and play an important role in teaching them pedestrian and bicycle safety. Education activities also teach students how to walk and bicycle safely and the benefits of doing so.

### **Encouragement**

Encouragement strategies generate excitement about walking and bicycling safely to school. Children, parents, teachers, school administrators and others can all be involved in special events like International Walk to School Day and ongoing activities like walking school buses. Encouragement strategies can often be started relatively easily with little cost and a focus on fun.

### **Enforcement**

Enforcement activities by police can help to change unsafe behaviors of drivers, bicyclists and pedestrians. They can increase driver awareness of laws, and they also can improve driver behavior by reducing speeds and increasing yielding to pedestrians. In addition, enforcement activities teach pedestrians and bicyclists to walk and bicycle safely and to pay attention to their environment. Enforcement, however, doesn’t just involve police officers; many different community members take part in making sure everyone follows the rules, including students, parents, school personnel and adult school crossing guards.

### **Engineering**

Engineering addresses the built environment with tools that can be used to create safe places to walk or bicycle and can also influence the way people behave. Transportation engineers, city planners, and architects use methods to create safer settings for walking and bicycling while recognizing that a roadway needs to safely accommodate all modes of transportation. Such improvements can include maintenance and operational measures as well as construction projects with a range of costs. When such projects are properly implemented, they may not only improve safety for children, but they also may encourage more walking and bicycling by the general public.

### **Evaluation**

Evaluation is used to determine if the aims of the strategies are being met and to assure that resources are directed towards efforts that show the greatest likelihood of success.

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<sup>1</sup> Description of 5Es provided by the National Center for Safe Routes to School.  
<http://www.saferoutesinfo.org/index.cfm>

## J. RECOMMENDATIONS

The following recommendations resulted from surveys of students and parents, and discussions with school administration, teachers, and City of Nashua Divisions of Public Works and Community Development. The recommendations are grouped into three broad areas. The first has to do with the Birch Hill Safe Routes to School Steering Committee. The steering committee will be responsible for guiding the implementation of most of the recommendations of this study.

The second set of recommendations is about the physical improvements that need to be made to the streets and sidewalks in the Birch Hill neighborhood. The steering committee will implement these recommendations by consulting and coordinating with the SAU and those departments of the City who are responsible for physical improvements to the infrastructure.

The third set of recommendations has to do with encouragement, education and enforcement policies and programs that will encourage bicycling and walking.

All of these recommendations are listed in the Bicentennial Safe Routes Action Plan that can be found later in this report.

### 1. Birch Hill Safe Routes to School Steering Committee

The steering committee will provide the leadership and structure that will be necessary to implement the Action Plan.

- The committee already exists and includes parents, teachers and school administration.
- It is important that the steering committee continue to be made up of individuals who are committed to making the decisions that will benefit the Birch Hill community.
- The committee will oversee implementation of the Action Plan that appears at the end of this report.

### 2. Engineering/Safety Measures

The following recommendations will help to enhance the bicycle and pedestrian friendliness of the Birch Hill neighborhood through physical improvements to the streets and sidewalks. These recommendations will also improve safety and therefore encourage parents to consider allowing their children to bike or walk to school more often.

#### a. Traffic Calming Measures

- Implement traffic calming measures along Dublin Avenue, Birch Hill Drive and elsewhere in study area through improved signage and pavement markings (all signage and pavement markings should conform to the Manual of Uniform Traffic Control Devices [MUTCD]):
  - Signage in the school zone should be upgraded and should be as brightly painted as allowable;
  - The City of Nashua should review its school zone pavement marking policy to insure that it provides the best protection for pedestrians in the school zone.
  - Crosswalks should be marked with the brightest material allowable and should also include a supplemental crosswalk device (a portable "people in crosswalk" sign);
  - A speed feedback radar sign should be installed on Dublin Avenue south of Woodland Drive intersection to warn northbound motorists of an approaching school zone.
  - Accuated "Pedestrian in crosswalk" warning signs should be located on Dublin Avenue to indicate crosswalk at Fremont Street is approaching.



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- b. Gaps in sidewalk system.
  - One of the most common walking routes to school is along Franconia Drive to Fremont Street to Woodland Drive to Birch Hill Drive. There are gaps in this sidewalk system along Fremont Street and Woodland Drive. Installing sidewalks along these two segments would create a more continuous sidewalk system. Division of Public Works will determine most appropriate side of street to install sidewalks;
  - Another common walking route is along Meredith Drive. There is no sidewalk on Meredith between Freedom Street and Birch Hill Drive. This segment of sidewalk should be completed and the path that connects the end of Meredith Drive should be upgraded. The steep grade near Meredith and Birch Hill Drive would need to be considered.
- c. Increase Connectivity of Sidewalk System
  - A feasibility study to investigate the possibility of enhancing the path from Lutheran Drive to the southwest corner of the Birch Hill campus should be undertaken;
  - A feasibility study to investigate the possibility of enhancing the path that connects the end of Torrey Road with the school should be undertaken;
  - There is no Right of Way available at this time and would need to be acquired from landowners;
  - There may also be wetlands issues with respect to connection from Lutheran Drive.
- d. Identify/Designate Safe Routes
  - There are no officially designated "Safe Routes" to School in the study area.
  - The most common walking/biking routes that children are currently taking to school should be enhanced with pavement markings, brush clearing, etc as noted in this section.
  - Signage should be installed along the designated routes to indicate that those routes are "Safe Routes".
  - There should be outreach to the community, including those without school age children, in the vicinity of the school. The objective should be to develop a program where children who are on designated Safe Routes are never out of the line of sight of a responsible individual.
- e. Sidewalk Conditions.
  - Sidewalks that are cracked and uneven should be upgraded to ADA specifications. Specific segments of sidewalk will be determined at future date. Funding for these upgrades should be sought in a future round of Safe Routes funding.
- f. Clear Sidewalks of Snow
  - The snow clearing policy of the City of Nashua is to clear all sidewalks within 1,000 feet of the front door of a school as soon as possible after a storm. This is not always done in a timely fashion. The City has recently reviewed this program and is in the process of purchasing four additional pieces of equipment to aid in this effort.

### 3. Education, Encouragement and Enforcement Measures

The following recommendations will help provide a balanced approach (beyond physical improvements to the roads and sidewalks) to the goals of this plan by providing a strong educational element as well as promoting biking and walking as a fun and healthy way to get to school.

- a. Educate students about lawful and responsible bicycling and walking.
  - Develop a classroom curriculum,
  - Sponsor a safety fair or bike rodeo during bike and walk to school week each October.



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- b. Encourage children to walk or bike to and from school. Encouragement efforts can take the form of events, promotions and programs. These efforts can serve to re-inspire kids who are already interested in biking and walking, as well as encourage new participants.
- National bike to school day takes place every year on the first Wednesday in October. Birch Hill School should develop its own bike and walk to school day to coincide with the national event. Thereafter, there should be a bike and walk to school day each month.
  - A “walking bus” program should be developed. A walking bus is where a group of children walk to school by a predetermined route with two parent volunteers. This will give parents the opportunity to share responsibility on a rotating basis. Since the surveys showed that parents want their kids to travel to school in a supervised fashion, this program will address those concerns.
  - Recruit parents to assist in managing the morning and afternoon congestion period one day per week. They may serve as traffic monitors, crossing guards and take traffic counts. This calls attention to the issues that occur during the time students are dropped off and picked up, parents invest in the process, and drivers and students are educated about safe drop-off and pick-up procedures.
  - Identify and promote the best and safest way to walk or ride bikes to school. Signs, posters and “trail days” can be encouraged to draw attention to the recommended routes.
  - Develop programs that children can buy into and have fun participating in. For example, a program called “It all adds up to clean air” could be developed. Kids would document how much air pollution they are preventing by not travelling to school in a motor vehicle. If developed in lesson plan format, this could help the school meet state and federal performance standards.
  - Develop a worksheet that will track and record walking and biking activities. Children could be rewarded for reaching certain goals. For example, a prize for walking to school 3 times in one week.
  - Develop specific safety initiatives such as a “Watch for Bikes” campaign. This program offers decals that can be attached to side view mirrors that remind drivers to look behind them before opening a car door or pulling away from the curb.
- c. Assuming that bicycling and walking increase as a result of the Safe Routes program, children, parents and motorists in the Birch Hill community will benefit from increased awareness and enforcement of bicycle and pedestrian-related rules and regulations. Increased awareness of these rules and regulations will lead to better compliance among bicyclists, pedestrians and motorists. Police and community enforcement programs should be developed and include the following ideas:
- Enlist the help of the Police Department to aggressively enforce traffic and parking laws (including and warnings and citations) during the first two weeks of school each fall, and also develop a strategy for enforcement during the rest of the year.
  - Enlist the help of the Police Department to provide safety talks at a bike rodeo during bike and walk to school day.
  - Work with Police Department to review and modify youthful violator procedures. For youngsters, crashes between bicycles and motor vehicles most often result from young cyclists violation of basic traffic laws. However, since they have not taken driver training, they seldom know how the traffic system works. As a result, ticketing young children is an unnecessarily harsh approach to handling their violations.



## **K. BIRCH HILL ELEMENTARY SCHOOL ACTION PLAN**

The recommendations that have been identified in this study will combine to create a system of policies, programs and physical improvements that will encourage increased bicycling and walking among the students at Birch Hill School. In order for the goals of this study to be achieved, an Action Plan is necessary. The action plan is an implementation strategy, which assumes that the proposed recommendations can be achieved in three phases; short-term (less than 6 months), mid-term (1-2 years), long-term (greater than 2 years).

The Action Plan lists the recommendations as they appear in the text of this plan, and assigns each recommendation to a particular phase in the implementation strategy. The recommendations build on each other to bring about the changes that are necessary to increase the level of bicycling and walking to the school. The Action Plan appears at the end of this report.

### **Recommendation:**

- Use the Action Plan to coordinate implementation of the recommendations in this study.



**ACTION PLAN**

<b>Recommendation</b>	<b>Comment</b>	<b>Target Date</b>
<b><u>Parents, Community, School Administration</u></b>		
<b>1</b>		
<ul style="list-style-type: none"> <li>Enhance the Birch Hill Safe Routes Steering Committee</li> </ul>	Steering committee must involve parents, teachers, school staff and administration.	Short-term
<b><u>Physical Improvement Measures</u></b>		
<b>2</b>		
<ul style="list-style-type: none"> <li>Implement traffic calming measures through improved signage and pavement markings</li> </ul>	Examples are listed on page 29 of this study	Short-term
<ul style="list-style-type: none"> <li>Eliminate gaps in sidewalk system where practical</li> </ul>	Examples are listed on page 30 of this study	Mid-term
<ul style="list-style-type: none"> <li>Enhance connectivity of sidewalk system</li> </ul>	Feasibility study described on page 30 of this study	Mid-term
		Feasibility study: Short-term Construction: Mid-long term
<ul style="list-style-type: none"> <li>Improve sidewalk conditions</li> </ul>	Sidewalks that are cracked and uneven should be upgraded to ADA specifications	Mid-term
<ul style="list-style-type: none"> <li>Snow should be cleared from sidewalks in a more timely fashion. DPW policy is to clear snow as quickly as possible</li> </ul>	Work with DPW to clarify policy and strategies for clearing sidewalks more quickly	Short-term
<b><u>Education, Encouragement and Enforcement Measures</u></b>		
<b>3</b>		
<ul style="list-style-type: none"> <li>Teach youngsters important bicycling skills. <ul style="list-style-type: none"> <li>- develop a classroom curriculum,</li> <li>- sponsor a bike rodeo during bike/walk to school week.</li> </ul> </li> </ul>	Studies have shown that children's mistakes tend to involve a limited set of basic errors and these errors can be corrected through education.	Mid-term, then ongoing
<ul style="list-style-type: none"> <li>Promote a bike-to-school day and week (first week in October)</li> </ul>	Should coincide with national bike to school day	Short-term
<ul style="list-style-type: none"> <li>Develop a "Walking Bus" program.</li> </ul>	Gives parents the opportunity to share responsibility on a rotating basis.	Short-term
<ul style="list-style-type: none"> <li>Recruit parents to assist in managing the morning and afternoon congestion period one day per week.</li> </ul>	Parents may serve as traffic monitors, crossing guards and take traffic counts	Mid-term
<ul style="list-style-type: none"> <li>Identify and promote the best and safest way to walk or ride bikes to school</li> </ul>	Develop a map of the routes	Mid-term
<ul style="list-style-type: none"> <li>Develop programs that children can buy into &amp; have fun participating in.</li> </ul>	Example: "It all adds up to clean air"	Short-mid term



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**ACTION PLAN**

<b>Recommendation</b>	<b>Comment</b>	<b>Target Date</b>
<ul style="list-style-type: none"> <li>Develop a worksheet that will track and record walking and biking activities.</li> </ul>	Children could be rewarded for reaching certain goals. For example, a prize for walking to school 3 times in one week.	Mid-term
<ul style="list-style-type: none"> <li>Develop specific safety initiatives such as a “Watch for Bikes” campaign.</li> </ul>	Decals on side view mirrors that remind motorists to look before opening car door or pulling away from the curb.	Mid-term
<ul style="list-style-type: none"> <li>Enlist the help of the Police Department to aggressively enforce traffic and parking laws during 1<sup>st</sup> two weeks of school</li> </ul>	Develop strategy for enforcement the rest of the year	Mid-term
<ul style="list-style-type: none"> <li>Enlist the help of the Police Department to provide safety talks at a bike rodeo</li> </ul>	Could be scheduled during bike and walk to school day in October	Short-term
<ul style="list-style-type: none"> <li>Work with Police Department to review and modify youthful violator procedures</li> </ul>	Children have not taken drivers training courses & therefore seldom know how the traffic system works	Short-term

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## APPENDIX A STEERING COMMITTEE

<b>NAME</b>	<b>AFFILIATION</b>
Cheryl Lindner	PTO President/Parent - Birch Hill School
Karen Quinlan	Parent
Sarah Searles	Parent
John Richard	Principal - Birch Hill School
Mark Lucas	Assistant Principal - Birch Hill School
Stacy Hynes	Nashua School District - Director, Grants & Community Development
Jeanne Walker	Nashua Department of Public Works - Deputy Manager of Engineering
Shawn Smith	Nashua School District - Plant Operations Director
Ed Lecius	Nashua Police Department - Community Policing Director
Lucy St. John	City of Nashua - Deputy Planning Manager
Matt Waitkins	Nashua Regional Planning Commission - Transportation Planner

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## APPENDIX B STUDENT SURVEYS

**Question 1: How do you get to school?**

Walk	11	8%
Bike	1	1%
School Bus	88	61%
Car	44	30%
Other non-motorized	0	0%
Other	1	< 1%
<b>Total</b>	<b>145</b>	<b>100%</b>

**QUESTION 2: HOW WOULD YOU MOST LIKE TO GET TO SCHOOL?**

Walk	13	9%
Bike	23	16%
School Bus	51	36%
Car	28	20%
Other non-motorized	24	17%
Other	2	1%
<b>Total</b>	<b>141</b>	<b>100%</b>

**QUESTION 3: HOW DO YOU GET HOME SCHOOL?**

Walk	11	8%
Bike	1	1%
School Bus	93	67%
Car	32	23%
Other non-motorized	1	< 1%
Other	1	< 1%
<b>Total</b>	<b>139</b>	<b>100%</b>

**QUESTION 4: HOW WOULD YOU MOST LIKE TO GET HOME SCHOOL?**

Walk	19	13%
Bike	22	16%
School Bus	45	32%
Car	30	21%
Other non-motorized	20	14%
Other	5	4%
<b>Total</b>	<b>141</b>	

**QUESTION 5: HOW SAFE DO YOU THINK YOUR TRIP TO SCHOOL IS?**

Very safe	67	50%
OK	65	49%
Dangerous	2	1%
<b>Total</b>	<b>134</b>	



**QUESTION 6: WHAT WOULD MAKE BIKING/SALKING TO SCHOOL BETTER?**

Companion to walk with	82	22%
Less cars	32	8%
Continuous sidewalks	32	8%
No strangers/bullies	71	19%
Safe crossings	48	13%
Snow removed form sidewalks	39	10%
Bike Racks	14	4%
Other	59	16%
Total	377	

**QUESTION 7: HOW DO YOU FEEL ABOUT WALKING?**

	fun	72	Boring	28
	Safe	36	Not Safe	20
	Not healthy	1	healthy	74
	cool	37	Not cool	15

**QUESTION 8: HOW DO YOU FEEL ABOUT BIKING?**

	fun	87	Boring	7
	Safe	37	Not Safe	16
	Not healthy	1	healthy	64
	cool	49	Not cool	7

**QUESTION 8: HOW OFTEN DO YOU PLAY SPORTS/EXERCISE WHEN NOT @ SCHOOL**

	Almost every day	85	63%
	Twice per week	28	21%
	Once per seek	16	12%
	never	5	4%
	Total	134	100%



## APPENDIX C PARENT SURVEYS

**Question 1: HOW DOES YOUR CHILD GET TO SCHOOL?**

Walk	48	14%
Bike	13	4%
School Bus	155	45%
Car	121	35%
Other	7	2%
<b>Total</b>	<b>344</b>	

**QUESTION 2: HOW DOES YOUR CHILD GET HOME IN THE AFTERNOON?**

Walk	47	14%
Bike	11	3%
School Bus	153	46%
Car	111	33%
Other	10	3%
<b>Total</b>	<b>332</b>	

**QUESTION 3: HOW DID PARENT GET TO SCHOOL WHEN YOU WERE IN ELEMENTARY SCHOOL?**

Walk	89	38%
Bike	6	3%
School Bus	108	47%
Car	22	9%
Other	7	3%
<b>Total</b>	<b>232</b>	

**QUESTION 4: IN AN IDEAL NASHUA HOW WOULD YOUR CHILD GET TO SCHOOL?**

Walk	78	36%
Bike	26	12%
School Bus	90	42%
Car	20	9%
Other	2	1%
<b>Total</b>	<b>216</b>	

**QUESTION 5: IS WALKING/BIKING TO SCHOOL SAFE?**

Yes	23	12%
No	176	88%
<b>Total</b>	<b>199</b>	

**QUESTION 6: WHY IS BIKING/WALKING TO SCHOOL UNSAFE?**

Traffic speed/volume	132	26%
Sidewalk conditions	141	28%
Danger crossing street	81	16%
Strangers/bullies/crime	72	14%
No one to walk/bike with	58	11%
Other	26	5%
<b>Total</b>	<b>510</b>	



**QUESTION 7: WALKING/BIKING TO SCHOOL INCREASES ALERTNESS:**

Strongly Disagree	11	7%
Disagree	7	4%
Neither	58	37%
Agree	41	26%
Strongly Agree	39	25%
<b>TOTAL</b>	<b>156</b>	

**QUESTION 8: WALKING/BIKING TO SCHOOL DEVELOPS A HEALTHY LIFESTYLE:**

Strongly Disagree	12	7%
Disagree	8	5%
Neither	13	8%
Agree	41	25%
Strongly Agree	93	56%
<b>TOTAL</b>	<b>167</b>	

**QUESTION 9: WALKING/BIKING TO SCHOOL DEVELOPS SELF RELIANCE**

Strongly Disagree	10	7%
Disagree	9	6%
Neither	22	14%
Agree	68	44%
Strongly Agree	44	29%
<b>TOTAL</b>	<b>153</b>	


**QUESTION 10: IF ROUTE WERE IMPROVED WOULD YOU CONSIDER ALLOWING YOUR CHILD TO WALK/BIKE TO SCHOOL?**

Yes	61	35%
No	38	22%
Maybe	56	33%
Already walks	17	10%
<b>Total</b>	<b>172</b>	