Safe Routes to School Travel Plan

Bernice A. Ray Elementary School
Frances C. Richmond Middle School
Hanover, New Hampshire

SafeRoutes
New Hampshire Safe Routes to School

March, 2013

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Safe Routes to School Travel Plan

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Introduction

School children walking between the Ray and Richmond Schools on Dresden Road.

This Travel Plan has been prepared as part of a collaborative effort by the Town of Hanover and the School Administrative Unit (SAU) 70 to improve walking and bicycling to the Bernice A. Ray Elementary School (Ray School) and Frances C. Richmond Middle School (Richmond School). The plan was guided by a Task Force including parents, students, teachers, school administrators and Town staff which provided input, guidance, oversight and decisions relative to the preparation of this plan. The goal of this Travel Plan is to identify recommended physical improvements, educational programs and community efforts that will encourage walking and biking within a two-mile radius of the Richmond and Ray Schools.

Overview

Safe Routes to School (SRTS) is a national program that promotes walking and bicycling to school. The central mission of the program is to improve children's safety while creating opportunities for walking and bicycling to school. Other goals include promoting healthy active living through increased physical activity and the development of safe walking and bicycling habits, promoting environmental health through less driving and congestion, and supporting a stronger sense of community through the involvement of the schools, parents, students and neighbors in walking and bicycling activities. The Safe Routes to School program emphasizes a comprehensive approach to walking a bicycling that encompasses the five (5) E's: Education, Encouragement, Evaluation, Enforcement and Engineering, as follows:

Bicyclist leaving the Richmond Middle School.

Bike lane on Lyme Road.

Education programs target children, parents and caregivers in teaching walking and bicycling safety as well as outreach to drivers on how to drive more safely around pedestrians and bicyclists. Education programs can also incorporate health and environmental considerations associated with walking and bicycling as well as safety.

Encouragement activities promote walking and bicycling to school to children, parents and community members. Events such as Walk to School Day, contests such as Frequent Walker and biker challenges, or on-going programs such as organized walking school buses and bike trains can promote and encourage walking and bicycling as a popular way to get to school.

Evaluation strategies involve collecting data before and after program activities or projects to track which strategies are most and less successful and should be modified for better results.

Enforcement programs increase safety by helping to change unsafe behaviors of drivers, walkers and bicyclists.

Engineering strategies create safer environments for walking and bicycling through improvements to the infrastructure surrounding the schools. These improvements focus on reducing motor vehicle speeds and conflicts with pedestrians and bicyclists, and establishing safer and full accessible crossings, walkways, trails and bikeways.

Planning Process

Preparation of this Travel Plan has been a collaborative effort between the Town of Hanover and the Special Administrative Unit #70. A Task Force including school and town officials, parents and students, met on a monthly basis to review information and provide direction on the plan recommendations. Parent online surveys were collected through the schools. In addition, a broadly noticed community workshop was held on October 19, 2012 to obtain input from the larger community about ways to improve walking and bicycling to school.

Why Plan for Safe Routes to School?

In 1969, forty-eight percent of all children aged 5 to 14 years walked to school regularly; in 2009, 13% of children aged 5 to 14 years walked to school.[1] The reasons for this precipitous decline are varied and have become established over four decades. Reasons range from low density community growth patterns to school siting requirements that encourage school development in outlying areas to increased traffic and parental concern about safety. Traffic engineering practices that have focused almost exclusively on convenient and free-flowing motor vehicle traffic movement, often to the detriment of pedestrians and bicyclists, have played a role as well. As a result, we often find ourselves caught in what seems to be a self-perpetuating cycle of safety concerns for pedestrians and bicyclists, which leads to more driving, traffic and congestion around the schools, reinforcing safety concerns and a pattern of less walking and bicycling.

1 The National Center for Safe Routes to School (2011). How Children Get to School: School Travel Patterns from 1969 to 2009. Accessed April 12, 2012. Available: http://saferoutesinfo.org/sites/default/files/resources/NHTS_school_travel_report_2011_0.pdf.

Attitudes about transportation are changing, however. Presently, Americans report that they want to walk more and drive less and Hanover is no exception. In a 2008 PTO transportation survey, 75% of Ray School parents who drove their students to school reported that they would prefer that their students walk, bike or ride the bus but for concerns about these alternatives. Changes that would be necessary as identified by parents include:

- Reduced travel time on the bus (34.8%)
- Sidewalks along the route (25.5%)
- Bike lanes along the route (19.5%)

This plan provides a multi-faceted approach to improving walking and bicycling to school by addressing the environment around, and the routes leading to, the schools. In addition, identifying programs to encourage walking and bicycling to school and evaluating our progress are additional aspects of the plan. The scope of this plan (set by federal program guidelines) is on pedestrian and bicycle movement; reduced travel time on the bus is also a worthy point of discussion, but remains beyond the scope of this effort.

Benefits of a Safe Routes to School Program

Safe Routes to School programs directly benefit schoolchildren, parents, and teachers by creating a safer travel environment near schools and reducing motor vehicle congestion at school drop-off and pick-up areas. Students that choose to walk or bike to school are rewarded with the health benefits of a more active lifestyle, as well as the responsibility and independence that comes from being in charge of the way they travel. Emerging research also suggests that children that walk and bike to school have greater concentration in school (see 'The Link Between Kids Who Walk and bike to School and Concentration' in the Appendix). Safe Routes to School programs offer additional benefits to neighborhoods by helping to slow traffic and provide infrastructure improvements that facilitate walking and bicycling for everyone. Identifying and improving routes for students to safely walk and bicycle to school can also reduce weekday morning traffic congestion and auto-related pollution around schools.

In addition to safety and traffic improvements, a Safe Routes to School program helps to integrate physical activity into the everyday routine of school children. Since the mid-1970's the number of children who are overweight has roughly tripled from five percent to almost 17 percent. While this is a multi-faceted problem, sedentary lifestyles are one contributor and have become the focus of statewide and national efforts to reduce health risks associated with being overweight. Children who walk and/or bike to school have an overall higher activity level than those who are driven to school, even through the journey to school may make only a small contribution to overall activity levels.

Above, bus riders at the Ray School. Below, pedestrians negotiate the fence at the end of Dresden Road.

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Middle school students performing walking audits.

Travel Plan Context

Overview of Hanover Schools and Their Setting

The Bernice A. Ray School (Ray School) and Frances C. Richmond School (Richmond School) are located in the Town of Hanover, New Hampshire, a town with a 2010 population of 8,480.

The Bernice A. Ray School has 457 (2012-2013 enrollment) students in grades kindergarten through fifth grade and the Richmond Middle School has 401 students in grades six through eight. The two schools are located approximately one-quarter mile apart in the Lyme Road Village neighborhood of Hanover. The Ray School serves kindergarten through fifth grade children in Hanover and the Richmond School serves Hanover's 6th through 8th graders and 7th and 8th graders from Norwich, Vermont.

The Ray School is located on Reservoir Road, a residential street that experiences some problems with speeding. This is due primarily to the street geometry, namely a straight road with a downhill grade and broad shoulders leading up to the school. The town has posted a police officer at the school in the past and has posted school zone warning signs with a flashing beacon during school arrival and departure times. The Dartmouth Child Care Center (DCCC) is located across the street from the school, and some Kindergarten children are walked to the DCCC after dismissal (Kindergarten is currently a half-day only).

The Richmond School is located on Lyme Road (NH Route 10), a busy road that traverses the communities on the east side of the Connecticut River and is a gateway to downtown Hanover and Dartmouth College. When the Richmond

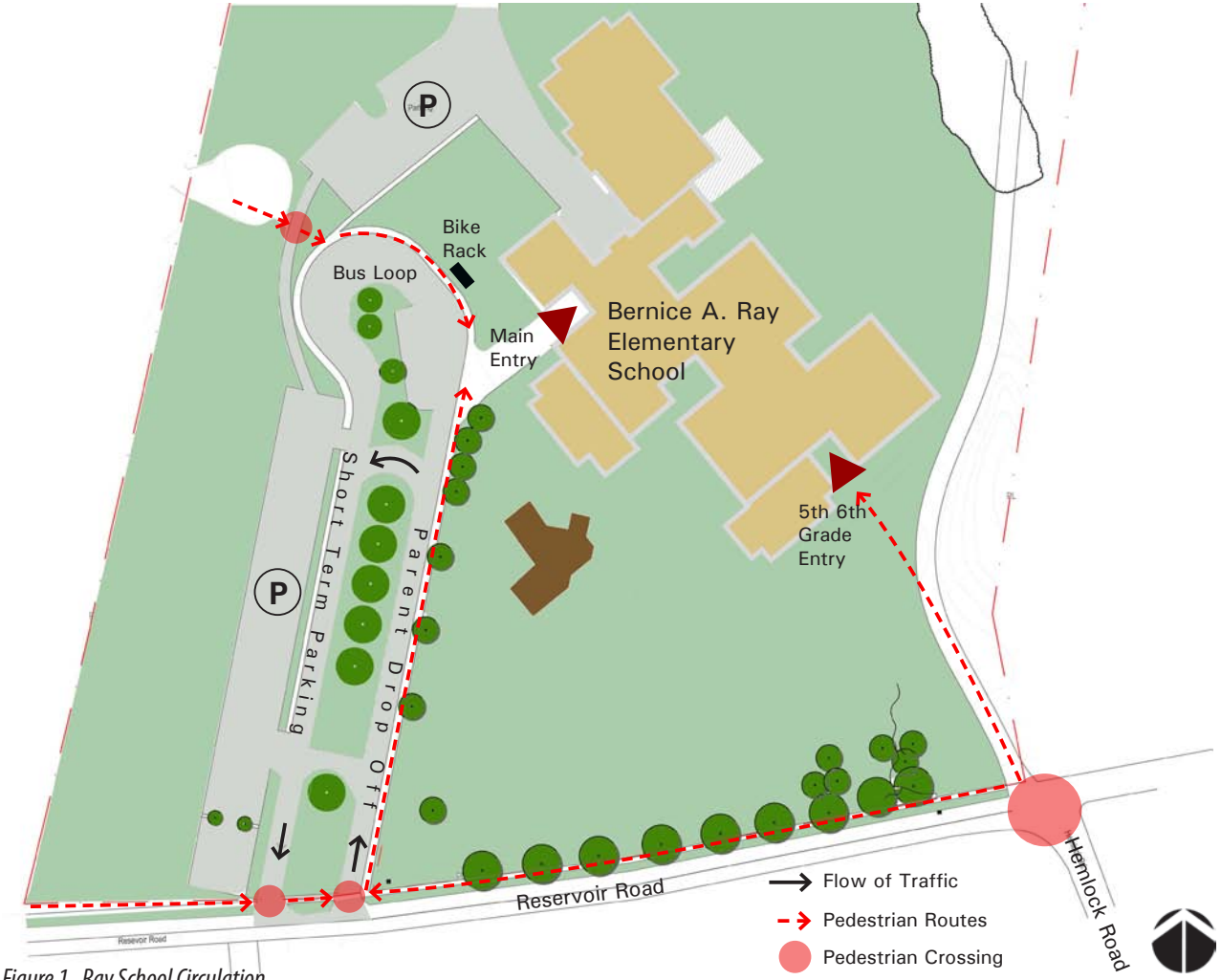


Figure 1. Ray School Circulation

Pedestrian entry to the Ray School from Dresden Boulevard.

Bicyclist approaching Ray School from Hemlock Road.

School Arrivals and Departures

Ray School. Circulation at the Ray School is presented in Figure 1. The Ray School Handbook contains policies related to school transportation to ensure safe and orderly arrival and dismissal procedures. The handbook is available on the school's website and parents are reminded of procedures as

School was constructed in 2005, the Town implemented traffic calming and streetscape improvements on Lyme Road that have greatly helped to slow traffic, improve walkability and accommodate school drop-off traffic patterns in the vicinity of the Richmond School. The Richmond School is part of a mixed-use neighborhood center which includes employment, small retail shops and senior housing. Garipay Fields, large recreational field complex owned by Dartmouth College is also nearby. For special activities, middle school students are able to walk to these various neighborhood uses (recreation fields, Coop market and senior housing developments) as a part of their class work.

Ray School entry at afternoon pick-up time.

Ray School primary sidewalk entry from Reservoir Road adjacent to parent drop-off spaces, with the bus turnaround beyond.

needed in weekly newsletters. School doors open at 8:00 am; supervision is provided at the playground at 7:45 am. The school has two entries, the main entry and the 5th and 6th grade entry off the playground on the east side of the school building.

Bus Arrivals and Departures. At the Ray School, there is a designated bus boarding area at the head of the entry driveway nearest the main school entry. Cars may not enter the bus boarding area except to access the few handicap parking spaces. Several school buses serve both the Richmond and Ray Schools; in the morning buses drop-off students at the Richmond School and travel to the Ray School; in the afternoon buses pick-up from the Ray School first and travel to the Richmond School. Sidewalks connect the bus boarding area to the playground and front entries of the school. In the morning, playground supervision is provided once buses arrive. At school dismissal, bus riders queue up in lines organized by bus at the entry plaza and wait to be allowed to board the bus.

Pedestrian and Bicycle Arrivals and Departures. Students walking to school arrive via Reservoir Road, Hemlock/Rip Road and Dresden Road. There is a sidewalk on the north side of Reservoir Road from the Ray School west to Lyme Road and a sidewalk on Dresden Road. There are no sidewalks east of the Ray School. The lack of sidewalks east of the school and the configuration of the crosswalk and intersection of Hemlock and Reservoir Road have been noted in the past as a concern by both parents and school officials. Pedestrians cross the busy entry intersection of the school when approaching the school from the west via Reservoir Road. The school has 'coned off' the section of the entry sidewalk (so that cars do not park at that location) primarily to accommodate bus turning movements, but this assists pedestrians as well by essentially providing a clear zone where pedestrians cross the driveway. Finally, pedestrians entering from Dresden Road cross the driveway between the two parking areas.

Students may bicycle to school with written parental permission. Bicyclists were observed entering from Rip Road, the Grasse Road area and the Dresden neighborhood. Bike racks are located on a grass area near the main entry.

Parent Drop-Off. Student drop-off is allowed along the east side of the entry driveway where a sidewalk leads to the school's main entry. This curb

Figure 2. Richmond School Circulation

Richmond School students arrive on a foggy morning.

RMS bike racks on October 2012 Walk and bike to School Day.

space is for drop-off only and parking is not allowed at this location. For safety reasons, students are to be picked-up and dropped-off on the curbside of the entry drive only. Cars may only stop along the sidewalk for loading or unloading only. Spaces are provided on the west side of the exit drive for short term parking (15-minutes) for brief visits to the school. All of the drop-off areas are 'no-idling' zones. All other parking during school hours is allowed only in the main parking lot which is to the west of the main entry. Managing the parent drop-off zone is an ongoing concern for the school. Due to the volume of cars arriving and departing within a compressed time period the system can be thrown off by one errant car. The parent handbook encourages parents to have their student ride the bus, walk or bicycle to school whenever possible to reduce traffic and associated safety issues around the school grounds.

Richmond School. Richmond School circulation is presented in Figure 2. All students and visitors must enter the Richmond School through the main lobby of the building.

Ray School students arrive at Richmond Middle School for after school programs.

Bus Arrivals and Departures. The turnaround at the main entry of the school is for the exclusive use of school buses during in the morning arrival and afternoon dismissal periods. Like the Ray School, there are handicap parking spaces at this location as well. The bus turnaround is connected by sidewalks to the main building lobby.

Pedestrian and Bicycle Arrivals and Departures. Pedestrians and bicycles arrive via Dresden Road or Lyme Road. Sidewalks are in place on both sides of Lyme Road in both directions from the school. Crossing guards are on duty to assist crossing the street at two locations: the driveway entry to the school and at the intersection of Dresden and Lyme Roads. The street closure of Dresden Road that was implemented as a part of the school development provides a traffic calmed entry for bicyclists and pedestrians from the adjoining neighborhood. Bike lanes exist on Lyme Road above and below the school; in front of the school a shared lane configuration exists at the parent drop-off zone. Bicyclists can enter the school via the Dresden Road driveway or travel along Lyme Road into the school entry zone. Although Lyme Road can be congested at arrival and dismissal periods, the traffic is very slow at these periods due to the crossing guards and the cars stopping alongside the curb to drop-off or pick-up students.

Parent Drop-Off. Drop-off and pickup by car is exclusively handled curbside on both sides of Lyme Road. Pedestrians that need to cross the street are assisted at two crosswalks by crossing guards. Cars may proceed to turn around, if necessary, to roundabouts located one block in either direction from the school.

Existing Travel Characteristics

In the Fall of 2008, a bus ridership study conducted by the Dresden School district found that 54% of Ray School students and 57% of Richmond School students ride the bus. In June 2009, both schools conducted in-class Safe Routes to School surveys regarding travel to school. Analysis of the in-class surveys revealed the following modal split by school:

Travel to School by Mode

June 2009

Bernice A. Ray Elementary School

Walk:	9%
Bike:	3%
School Bus:	45%
Family Vehicle:	38%
Carpool:	4%
Transit:	0%
Other (scooter, etc.):	1%

Frances C. Richmond Middle School

Walk:	6%
Bike:	2%
School Bus:	57%
Family Vehicle:	31%
Carpool:	1%
Transit:	3%
Other (scooter, etc.):	0%

In-class surveys will be conducted annually in June to obtain data that is comparable by season. For this reason in-class surveys were not collected as a part of this study.

Middle school students perform walking audits on Dresden Road.

Parent Perceptions

A parent online survey was conducted as a part of this planning effort in October of 2012. Although the response rate was low (22 responses from Richmond School parents and 2 responses from Ray School parents) the responses and comments generally reinforce the findings from the previous studies. Some points of interest from parents that responded to the survey:

- Parents thought that walking and bicycling to school was healthy and fun;
- Their children had asked to walk or bike to school;
- Several comments noted the traffic on Rip Road or other streets as an issue;
- Several observed that if more kids biked to school it would make it safer for others;
- A couple of parents at the middle school level noted the hindrance of heavy school backpacks for walking and bicycling to school.

All of the results of the parent surveys are included in the Appendix.

Student Perceptions

Input about walking and bicycling was also collected from students. Richmond School students conducted walking and bicycling audits on the streets around the school as a part of their Physical Education classes leading up to Walk and Bike to School Day. The issues most commonly noted by students (five or more mentions):

Lyme Road South (South of Roundabout):

- Heavy and/or fast moving traffic
- Cracked or broken pavement
- Dangerous drain grates, utility covers or metal plates
- Slippery surfaces when wet
- Too long of a wait to cross intersection
- More grass, flowers or trees needed

Lyme Road North (North of Roundabout):

- Cracked or broken pavement
- Uneven surfaces or gaps

Curtiss / Reservoir Road

- Cracked or broken pavement

It is interesting to note that the recently traffic calmed section of Lyme Road (north) had few problems noted by the students compared to the south segment.

Schools and Neighborhood Context

Figure 3 illustrates the Hanover neighborhoods within a two-mile radius of both schools. Approximately half of Hanover Ray and Richmond School students live within a two-mile radius of the schools. This is the primary planning area for walking and bicycling to school, although students from greater distances participate in Walk and Bike to School day events as well. Figure 3 also presents the geographic distribution of students within each neighborhood in order to gain an understanding regarding the potential 'market' for improvements to each route to school. Approximately 250 students live within the Lyme Road Village, Grasse Road, Hillside North and South neighborhoods, which are 'prime' areas for walking and bicycling to school based on distance and fewer barriers posed by arterial streets with higher volumes (e.g., West Wheelock, Lyme Road, North and South Parks Streets).

Primary Routes

Primary routes to school, including both paths and streets are shown in Figure 3 as well (in green). The primary routes are described as follows:

Distribution of Ray and Richmond Students (HANOVER ONLY)

	Number	Percent of Total w/in 2 Mile Radius	Percent of In Town
Students w/in 2 mile radius	**376**	**53%**	
Lyme Road Village	63		17%
Hillside North	61		16%
Grasse Road	44		12%
Hillside South	80		21%
East End	22		6%
South End and Sand Hill	50		13%
West End	41		11%
Occom Pond	15		4%
Outside 2 Mile Radius	**329**		
Etna / Hanover Center	148	21%	
Greensboro / Gile	63	9%	
Hanover North	96	14%	
Hanover South	22	3%	
All Hanover Students	**705**		

Source: 2011-2012 School Directories

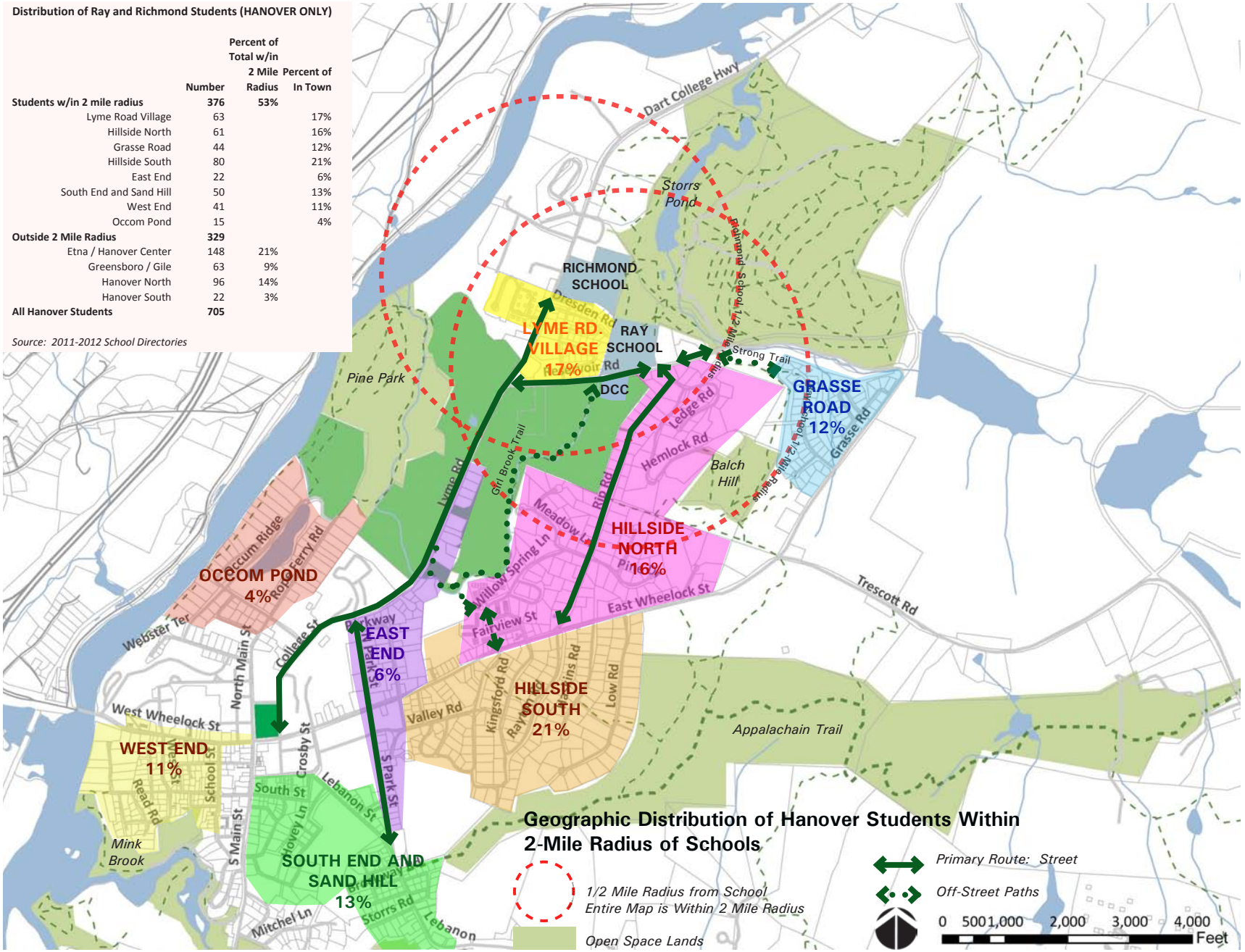


Figure 3. Geographic Distribution of Hanover Students within 2-Mile Radius of the Ray and Richmond Schools.

Hanover Safe Routes to School Travel Plan

ENGINEERING VENTURES PC

Landscape Architects & Planners

SafeRoutes New Hampshire Safe Routes to School

Reservoir Road leading to the Ray School.

Lyme Road in front of the Richmond Middle School.

Streets:

Reservoir Road. Reservoir Road is a two lane road with shoulders that assist periodic parking demands for school events. Bicycles and joggers also use Reservoir Road shoulders. Reservoir Road is 30-feet wide curb to curb. School zone signage including flashing beacons during school arrival and dismissal hours are in place on Reservoir Road.

Lyme Road. Lyme Road (NH Route 10) is a two-lane state highway and major circulation connection within Hanover. A portion of Lyme Road, from Park Street to Reservoir Road is a very wide roadway (45-feet wide curb-to-curb). There is a five-foot wide sidewalk on the west side of the road. North of Reservoir Road, the highway was narrowed to include two 11-foot travel lanes, 5-foot bike lanes, tree lawns and sidewalks on both sides of the street. School zone signage including flashing beacons during school arrival and dismissal hours are in place on Lyme Road.

Rip Road. Rip Road is a narrow two-lane street through the Hillside neighborhoods south of the schools. The street is 20-feet in width and is a prime connector to the schools. As one of the prime links to the schools Rip Road is heavily used by cars driving children to schools in the morning which has long raised concerns of neighbors regarding walking and bicycling to school. Speed tables have been constructed on the street to calm traffic.

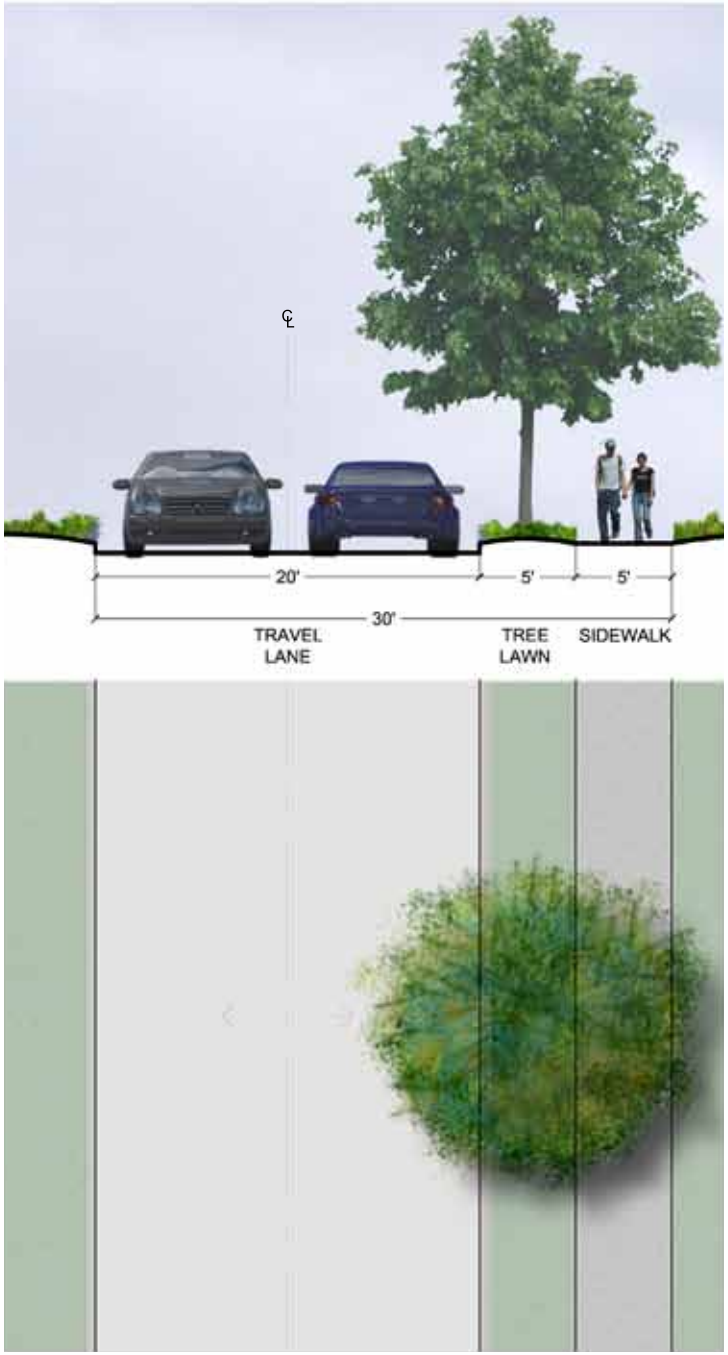
Hemlock Road. Hemlock is a narrow two-lane road that connects Rip Road and the Ray School.

Dresden Road. Dresden Road is a narrow, low volume residential street that provides a neighborhood bicycle and pedestrian connection between the two schools.

Paths:

Strong Trail. The Strong Trail is a town trail provided along a sewer easement that connects Reservoir Road and the Grasse Road neighborhood.

Girl Brook Trail. The Girl Brook Trail is an unimproved path that connects between Verona Road and Reservoir Road. The trail is on a sewer easement over land owned by Dartmouth College.



Plan Recommendations

The following section of the plan sets forth recommendations for the Town of Hanover, and the Hanover School District, parents and the larger community to implement to improve conditions for walking and bicycling to school. The recommendations follow the five E's of Education, Encouragement, Evaluation, Enforcement and Engineering. We have identified implementation partners for many of the non-engineering recommendations, acknowledging that improved walking and bicycling to school is of interest to parents, and broader community organizations including the Hanover Bike and Pedestrian Advisory Committee, Sustainable Hanover, and the Upper Valley Trails Alliance.

EDUCATION STRATEGIES

Educational strategies focus on teaching traffic, pedestrian and bicycle safety to students and parents, increasing awareness of the health and environmental benefits of walking and bicycling, and improving understanding of Safe Routes to School programs.

Walking and Bicycling Physical Education (PE) / Health Unit. Walking and bicycling safety educational units have been developed for PE classes at both schools and are typically paired with Walk and Bike to School Day (October) or Earth Day (April). These programs should be continued and enhanced under the supervision of the Ray and Richmond School PE teachers.

Middle School students take a break from preparing walking and bicycling audits.

Note: Walk and Bike to School Day was strongly promoted this year at the Richmond School and was extremely successful with 50 percent of the students participating despite weather delays. In class, students learned about the health benefits of walking and bicycling, were taught walking and bicycling safety skills, performed walking and bicycling audits around the school, and were offered rewards and snacks organized by the student council. A bike train rode in from Norwich, lead by the school principal, and many RMS staff and parents participated. To be inclusive, bus riders were allowed to get off the bus at the Garipay Fields parking lot and walk to school. This educational unit received very high ratings from students for practical use in their PE course evaluations. This was a successful and fun event that brought together educational and encouragement programs.

Other educational opportunities, such as writing letters to the editor and posters for walk and bike to school day are encouraged as well. There are many other educational resources available from the National Center for Safe Routes to School www.saferoutesinfo.org.

Development of Walking and Bicycle Safety 'Tip Sheet' for Students and Parents. An illustrated tip sheet that provides tips for safe walking and bicycling that could be used as a class handout and made available on the school website would help with education of students, parents and the larger community.

Bicycle Rodeo. A bicycle rodeo provides children with basic understanding of the rules of the road and educates both children and parents about bicycling basics. Bicycle rodeos are often organized by age and include skills appropriate to a particular age group. An annual bicycle rodeo should be offered through the Hanover Recreation Department and may include other partners as well (Hanover Police, Hanover After School Program (HASP), Dartmouth College, local bike / sport shops, etc.).

For more information see: www.bike.cornell.edu An Organizer's Guide to Bicycle Rodeos, 2005.

ENCOURAGEMENT STRATEGIES

Encouragement strategies are organized events and programs that promote walking and bicycling through raising awareness, incentives, and fun!

Regular Walk and Bike to School Days. Both schools have participated in Walk and Bike to School Days in the fall and the spring. This year, with the concurrent timing of the travel planning effort and educational units at the middle school, the event was very successful, with 50% of RMS students and 20% of Ray School students participating. In the case, and going forward, high rates of participation are greatly assisted by organization and parent and community support. Due to the younger ages of the Ray School students, in particular, additional support by parents in walking and biking with children is necessary.

The next step would be to increase the number of walk and bike to school days from twice per year to weekly. A regular 'Walking Wednesdays' or similar promotion using the meeting spots developed for the October 2012 Walk and Bike to School Day would need parent support to be effective with a network of parents committing to lead walking and bicycling groups to school each week. This should be organized through the Ray School PTO and RMS staff. An organizational structure with email communication to change plans due to inclement weather or for special events would be crucial.

Suggested Routes to School Map. A map which identifies walking and bicycling routes to the schools (particularly once improvements are made), and meet-up times for organized walking and bicycling groups is a helpful tool that assists school officials, parents and students plan walking a bicycling routes to school. It is also a simple, one-page informational sheet that can be distributed to help promote walk and bike to school days. A map was initiated for the October 2012 Walk and Bike to School Day (see appendix) and can be modified as necessary to support ongoing walk and bike to school programs. A large scale version of this map could be displayed on the wall at the entrances of the school so kids and parents could see the meet up times and locations as they visit.

Walking / Bicycling School Programs. There are many possible educational activities that could be added to reinforce walking and bicycling, such as tallying the number of miles walkers and bikers log each day/week/month and plotting that distance on maps which also can reinforce geography, math and cultural education skills. These types of programs can be fun, educational and reinforce regular walk and bike to school days.

Frequent Walking / Bicycling to School Club. Walking and bicycling to school using a frequent users 'punch card' and periodic club activities to create a strong club spirit is another possible encouragement program. Walking and bicycling to school can be promoted through the existing walking clubs and/or through the popular Passport to Winter Fun program (sponsored by the Upper Valley Trails Alliance).

Improved Bike Parking. Both schools would benefit by better or expanded bike parking, covered if possible. At the Ray School, a bike rack secured to a concrete pad near the current location is needed. At the Richmond School an additional bike rack, again covered if possible, by the gym / playfield would be convenient for students coming in from Dresden Road and/or attending sports events at the playfield. A roof structure could possibly be attached to the building wall at this location to shelter the rack.

Walk and Bike to School Committee. A group that oversees and coordinates activities and collects data is needed to keep walking and bicycling to school programs moving forward. This may be a stand-alone committee or part of the existing PTO or sustainability committees that are already established at each school.

Variable Message Board. The Town has a variable message board which could be used on Walk and Bike to School Days to warn motorists to expect young walkers and bicyclists and to drive carefully. The variable message board can also be used to alert drivers when street and intersection changes are undertaken.

EVALUATION STRATEGIES

Evaluation strategies help us understand how well we are doing, and track what programs are most successful. Evaluations should be used to enhance encouragement programs as needed.

Annual Student Travel Tallies. In-class student travel tallies should be collected each year and annual progress should be evaluated.

Parent Survey. The online parent survey should be collected annually to obtain the opinions and perceptions of parents as new programs are implemented.

An Implementation Calendar for the Education, Encouragement, Evaluation and Enforcement Strategies is presented in Table 1.

ENFORCEMENT STRATEGIES

Enforcement strategies would be enacted by the Hanover Police and are intended to reinforce greater participation and safer walking and bicycling to school.

Investigate Sidewalk Riding Amnesty Period. Currently, children under 12 (roughly 6th-7th graders) are allowed to ride on Town sidewalks. During school commute hours, a 'grace period' that would allow those middle school kids that may be 13 or 14 and are uncomfortable riding in the street to use the sidewalks.

Speed Trailers. Periodic use of the town's speed trailer, particularly at Reservoir Road leading to the Ray School, to provide feedback to drivers on their speed, would help remind drivers to watch their speed within the school zone.

Table 1: Education, Encouragement, Evaluation and Enforcement Implementation Calendar

Activity	Coordinator	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13
Education Strategies													
Walking Bicycling PE / Health Unit	PE Teachers			Plan	Imp.					Plan	Imp.		
Walking Bicycling Tip Sheet	SR2S Committee								Plan	Imp.			
Bicycle Rodeo	HPR				Plan		Imp.						
Encouragement Strategies													
Int'l Walk and Bike to School Day/	Schools/PTO			Plan	Imp.					Plan	Imp.		
Earth Day													
Weekly Walk and Bike to School Day	SR2S /PTO/SH/HBP				Plan	Implement				Implement			
Walking / Bicycling Route Map	SR2S/PTO				Plan	Imp.							
Walking / Bicycling School Programs	Schools	On Going											
Walking Bicycling to School Club	Schools					Plan			Implement				
Improved Bike Parking	SR2S/District					Plan		Implement					
Walk and Bike to School Committee	SR2S				Plan	Imp.							
Variable Message Board	Town of Hanover	As Needed											
Evaluation Strategies													
Annual Student In-Class Surveys	SR2S Committee						Imp.						
Annual Online Parent Survey	SR2S										Imp.		
Enforcement Strategies													
Investigate Sidewalk Riding Amnesty	Hanover Police	As Needed											
Speed Trailers	Hanover Police	As Needed											

Notes:
HBP = Hanover Bike and Pedestrian Advisory Committee
HPR = Hanover Parks and Rec
SR2S = Safe Routes to School Committee
SH = Sustainable Hanover
PTO = Ray PTO / Richmond PTO

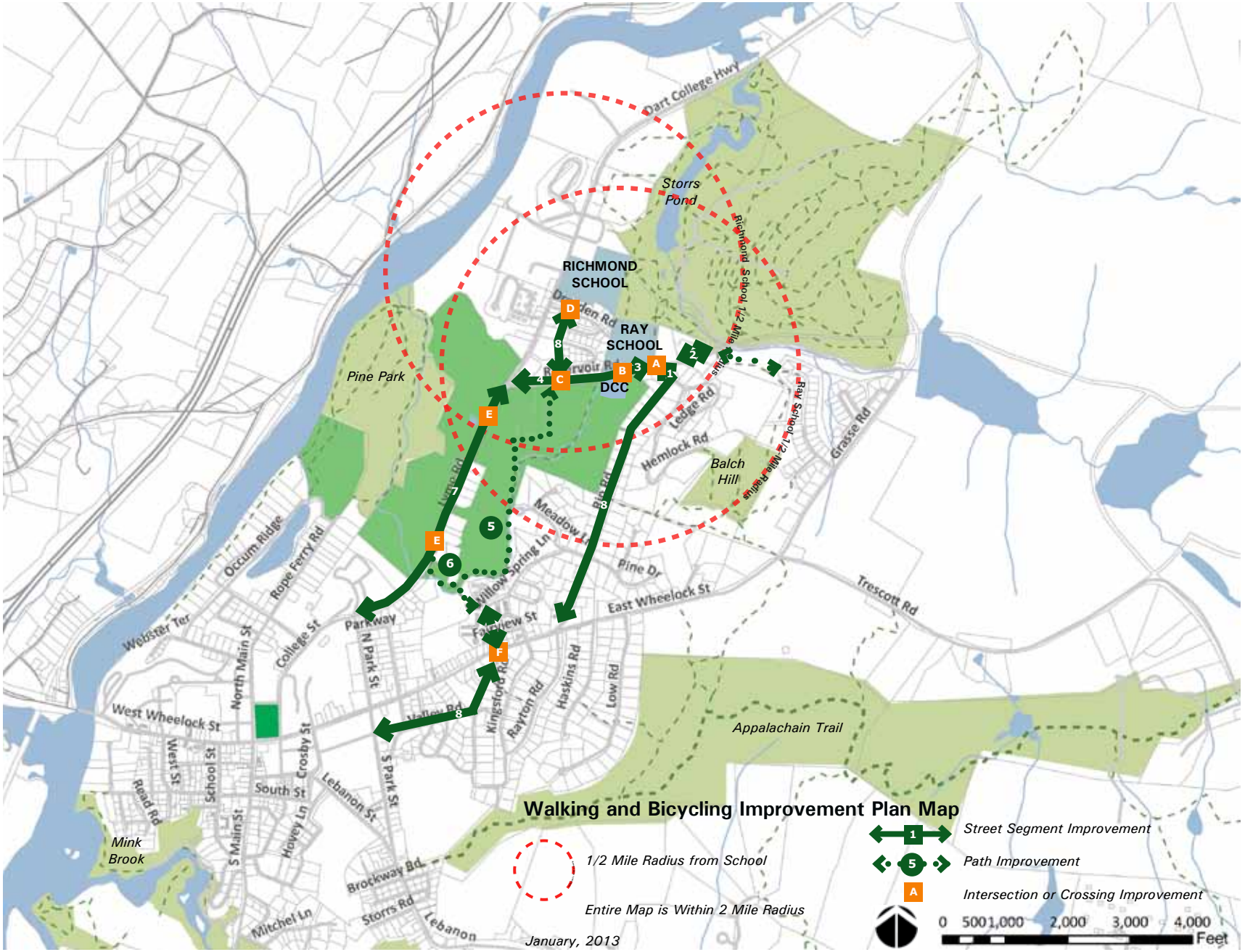


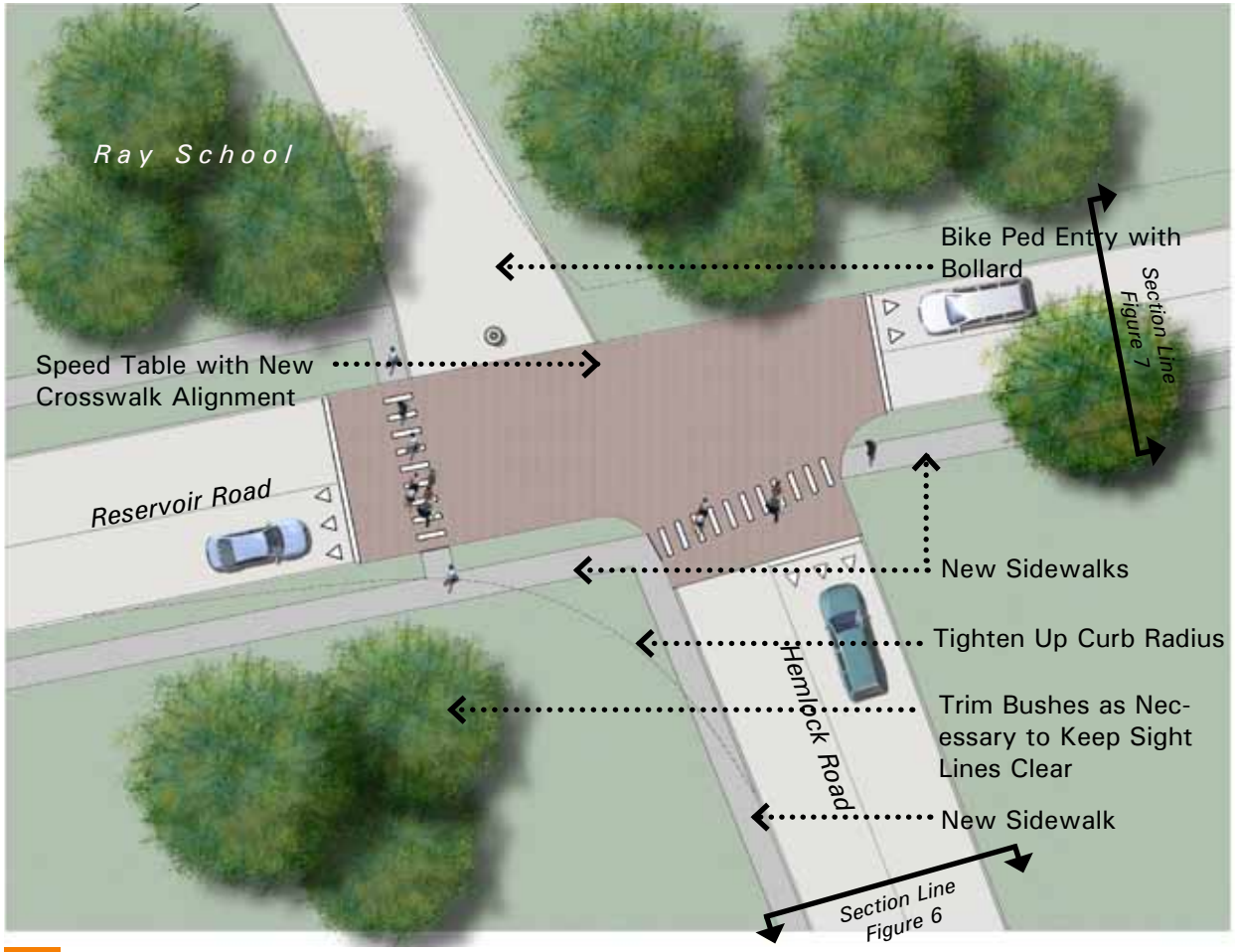
Figure 4. Walking and Bicycling Improvements Key Map

Hanover Safe Routes to School Travel Plan

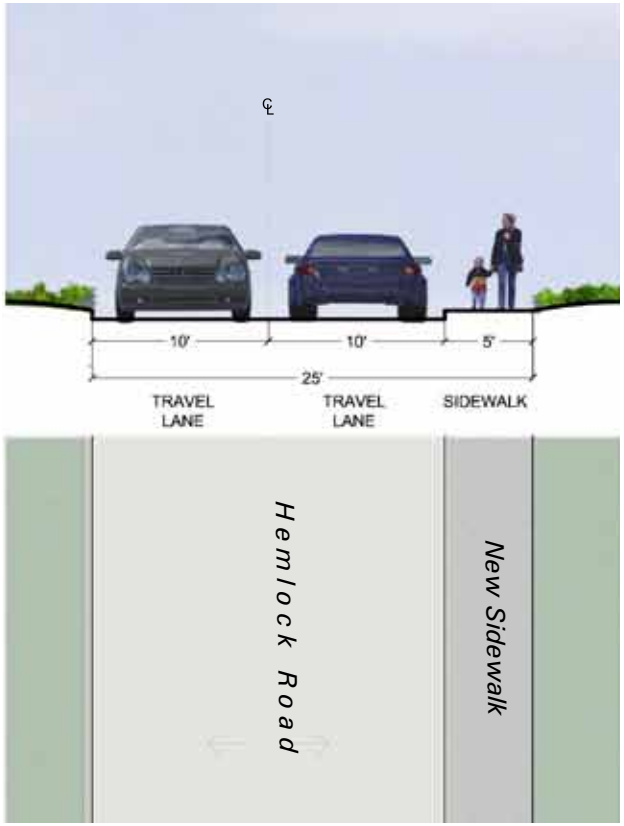
ENGINEERING VENTURES PC

Landscape Architects & Planners

SafeRoutes New Hampshire Safe Routes to School



A *Figure 5. Conceptual Plan: Hemlock and Reservoir Road Intersection Improvements*



1 *Figure 6. Conceptual Section and Plan: Hemlock Road Sidewalk*

ENGINEERING STRATEGIES

Engineering Strategies include physical improvements to make walking and bicycling to school safer and more attractive. These are planning level recommendations that may require further engineering design, analysis, and public input for implementation. Proposed engineering improvements are described in Figure 4, which serves as a key map to the conceptual plans and sections that follow in this discussion.

Preliminary costs estimates have been prepared for each improvement. The estimates are based on the plan level information contained in the project descriptions that follow are based on recent (2012) construction costs. Costs and quantities may change and items may be added or subtracted as more information is known about each project. The cost estimates include materials, construction, labor and engineering costs as well as a 25% contingency. Costs will be lower if constructed by Town crews. It is anticipated that these improvements will be primarily implemented by the Town through the Capital Improvement Program. Grants and private funding may be pursued as well.

How to read these plans: The orange boxes refer to *intersection or pedestrian crossing improvements* at the location indicated on Figure 4. The green boxes refer to *street segment improvements* and the green circles refer to *off-street path* improvements for the segments located in Figure 4.

Conceptual sections and plans illustrate street and path improvements with the section showing a cross-sectional view of the street and the plan looking down from above. The sections and plans are to scale.

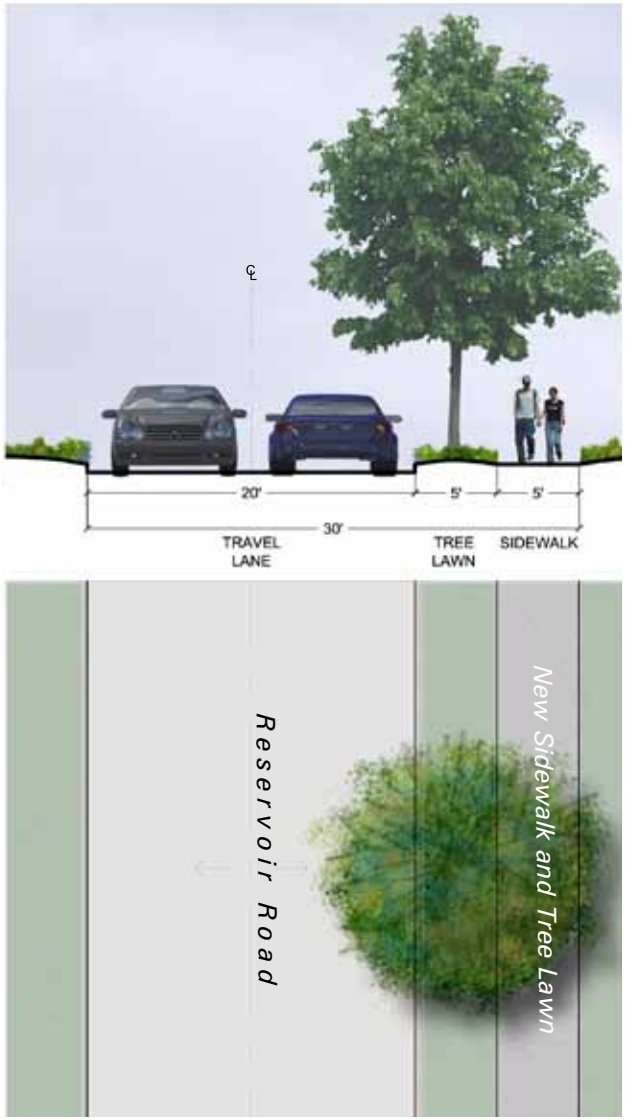
Implementation timing is estimated as short term, or one to five years, and mid term, five years or more.

1 A ***Hemlock Sidewalk and Squared-Up Intersection at Reservoir Road and Improved Crossing***: This involves a new sidewalk with curbs from Rip Road to Reservoir Road along the west side of Hemlock, squaring up the intersection and placing new crosswalks across Hemlock and Reservoir. Cooperation of the adjoining property owner on Hemlock will be required due to the narrow right of way. A speed table crossing for additional traffic calming and safety is recommended.

Implementation Lead: Town of Hanover

Time Frame: Short Term

Estimated Cost: $ 60,000



2 *Figure 7. Conceptual Section and Plan: Reservoir Road Sidewalk*

2 ***Reservoir Road: Sidewalk from Hemlock to Strong Trail***. The existing ROW allows a five-foot sidewalk with a five-foot tree lawn from Hemlock east to the Strong Trail.

Implementation Lead: Town of Hanover

Time Frame: Short Term

Estimated Cost: $ 62,000

3 ***Reservoir Road: Sidewalk from Hemlock to Dartmouth Child Care Center Driveway***. This involves the extension of the Hemlock sidewalk to the Dartmouth Child Care Center driveway.

Implementation Lead: Town of Hanover

Time Frame: Short Term

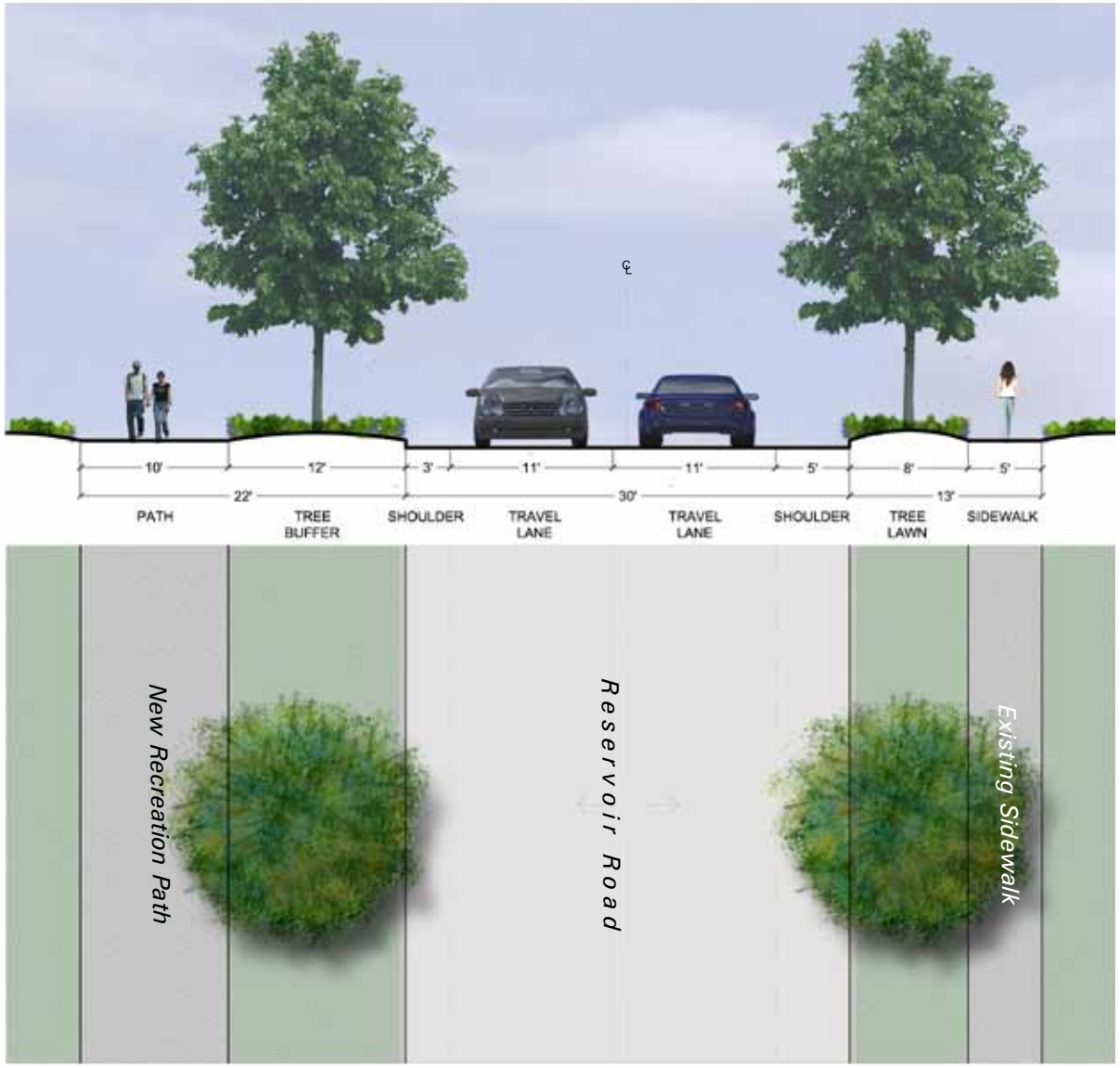
Estimated Cost: $ 92,350

B ***Reservoir Road: Speed Table at Ray School Driveway***: A speed table crossing at the Ray School driveway at Reservoir Road to calm at the school, promote greater awareness of the crosswalks across the driveway and across Reservoir Road to the Dartmouth Child Care Center.

Implementation Lead: Town of Hanover

Time Frame: Short Term

Estimated Cost: $ 16,200



4 *Figure 8. Conceptual Section and Plan: Reservoir Road Path*

4 ***Reservoir Road: Path on South Side from the Roundabout to Curtiss Road***: Extension of the sidewalk from the roundabout as a ten-foot shared use path to Curtiss Road. The Town should work with the adjoining property owner, Dartmouth College to implement an attractive walkway that provides a planted tree lawn between the path and the street, if possible.

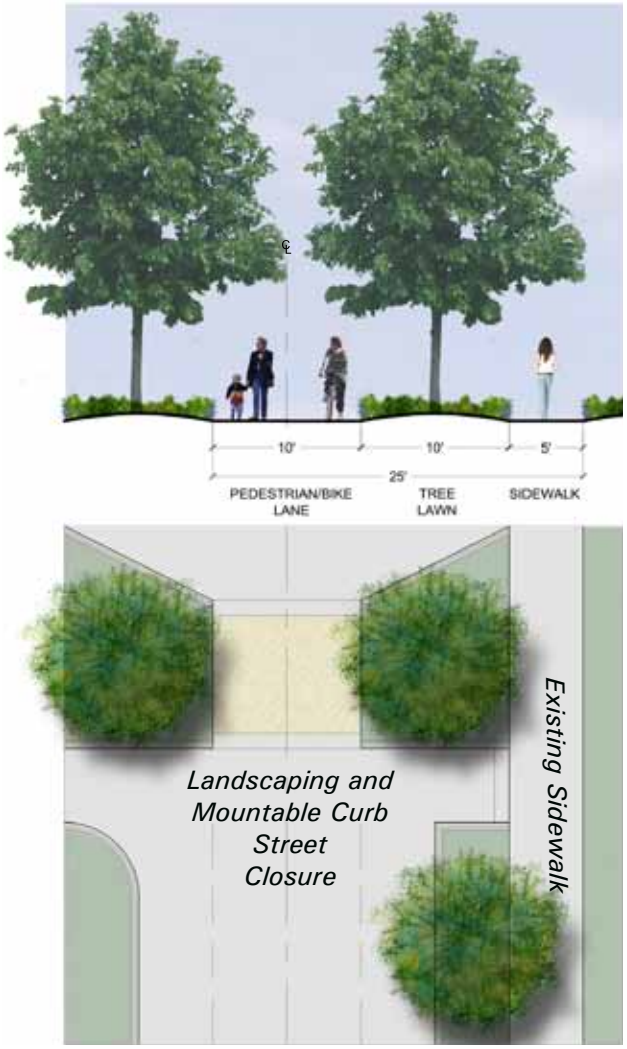
Implementation Lead: Town of Hanover

Implementation Partner: Dartmouth College (Property Owner)

Time Frame: Mid-Term

Estimated Cost: $ 83,000

Bikes at Dresden Road (above and below).



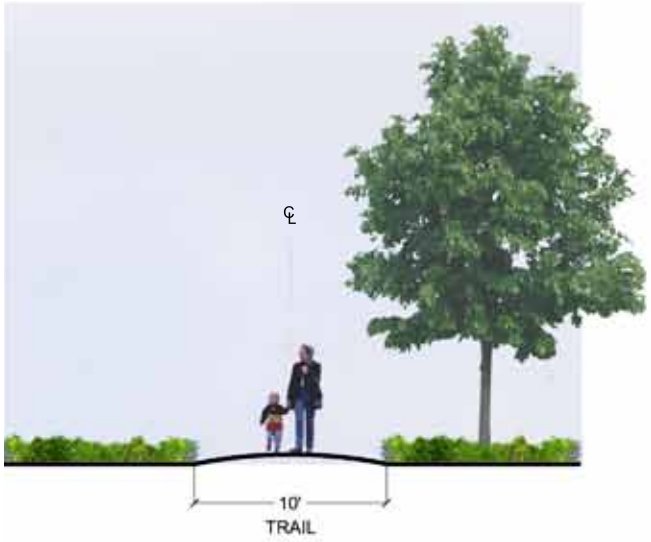
D *Figure 9. Conceptual Section and Plan: Dresden Road Bike Boulevard Closure*

D ***Dresden Road Bike Boulevard Closure***: Remove fence and replace with islands, landscaping, signage and break away bollard or mountable sidewalk. This change would improve bicycle accessibility, ADA access and emergency vehicle access. This would require review by the Planning Board.

Implementation Lead: Town of Hanover

Time Frame: Short Term

Estimated Cost: $ 4,450



5 6

Figure 10. Conceptual Section and Plan: Girl Brook Path (above)

5 6

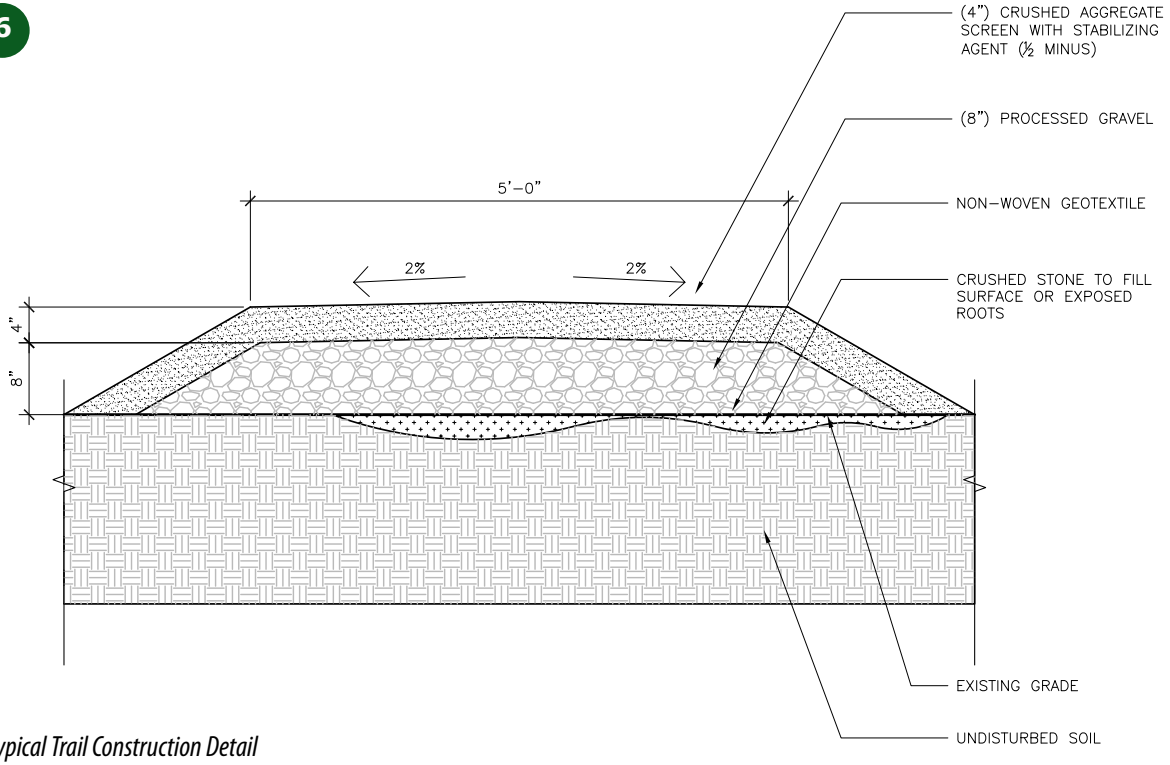


Figure 11. Typical Trail Construction Detail

5

Girl Brook Trail: Reservoir Road to Verona Road: A ten-foot wide path from Verona Road to Reservoir and Curtiss Roads. Crushed stone over a geotextile base (see typical detail section). One bike/ ped golf course type bridge – total span of 44' could be broken into two 10' sections (boardwalk) and a 24' bridge section with handrails. With placement of fill at the Verona Road entrance we estimate the trail can be developed to an approximate 8% grade over 180 feet of run. The trail crossing of the brook would be moved to align better with the sewer easement. Landscaped sitting area at Verona Road with benches. Note: the trail alignment would need to be shifted west of its current location to line up with Curtiss Road. It is assumed that a side-walk on Verona Road from East Wheelock to Willow Spring will be constructed as is currently planned.

Implementation Lead: Town of Hanover, Dartmouth College

Time Frame: Mid-Term

Estimated Cost: $ 234,800

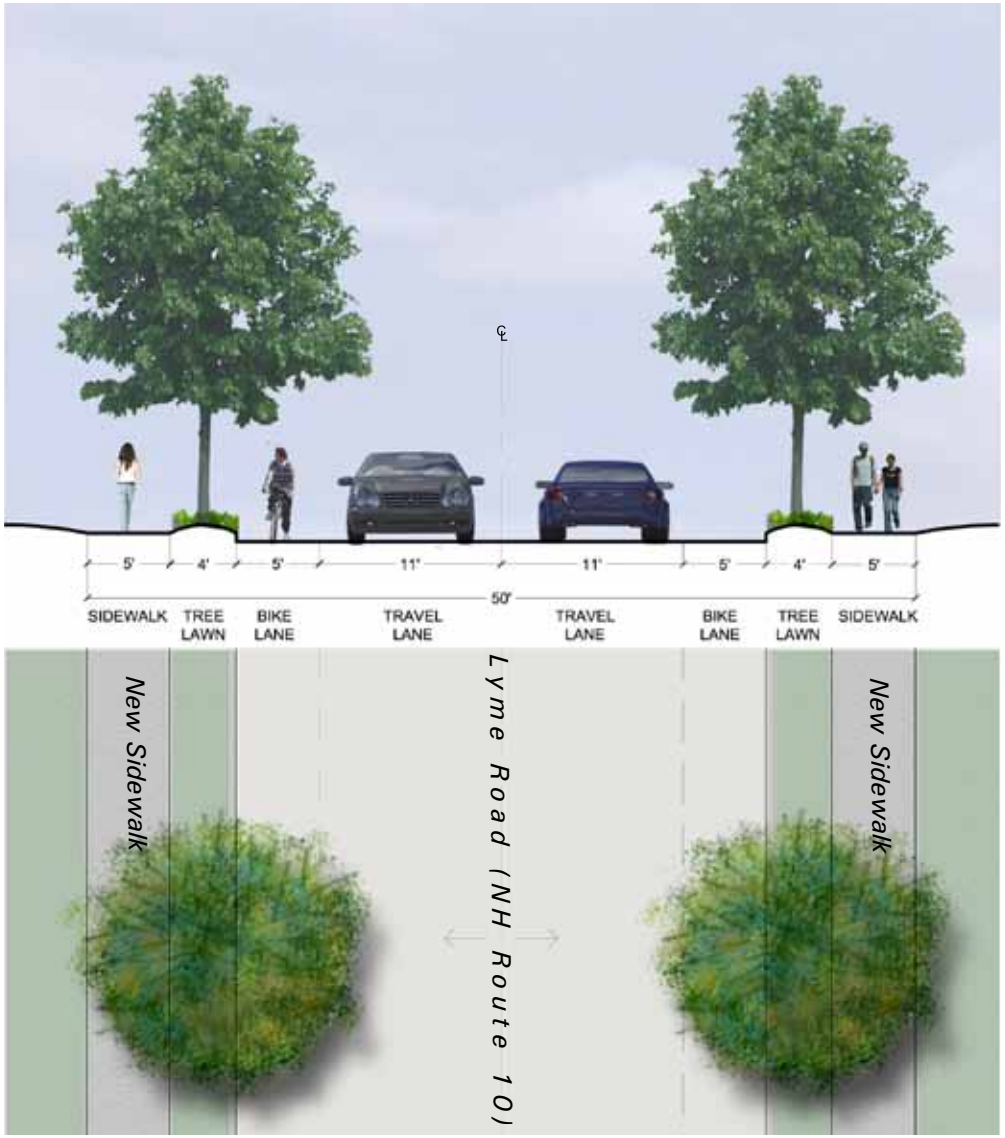
6

Girl Brook Trail: Spur Trail to Lyme Road. This spur trail leads to Lyme Road and provides connection to Pine Park trails as well as the Lyme Road bike lanes.

Implementation Lead: Town of Hanover, Dartmouth College

Time Frame: Mid-Term

Estimated Cost: $ 39,600



7 *Figure 12. Conceptual Section and Plan: Lyme Road Sidewalks, Bike Lanes and Tree Lawns*

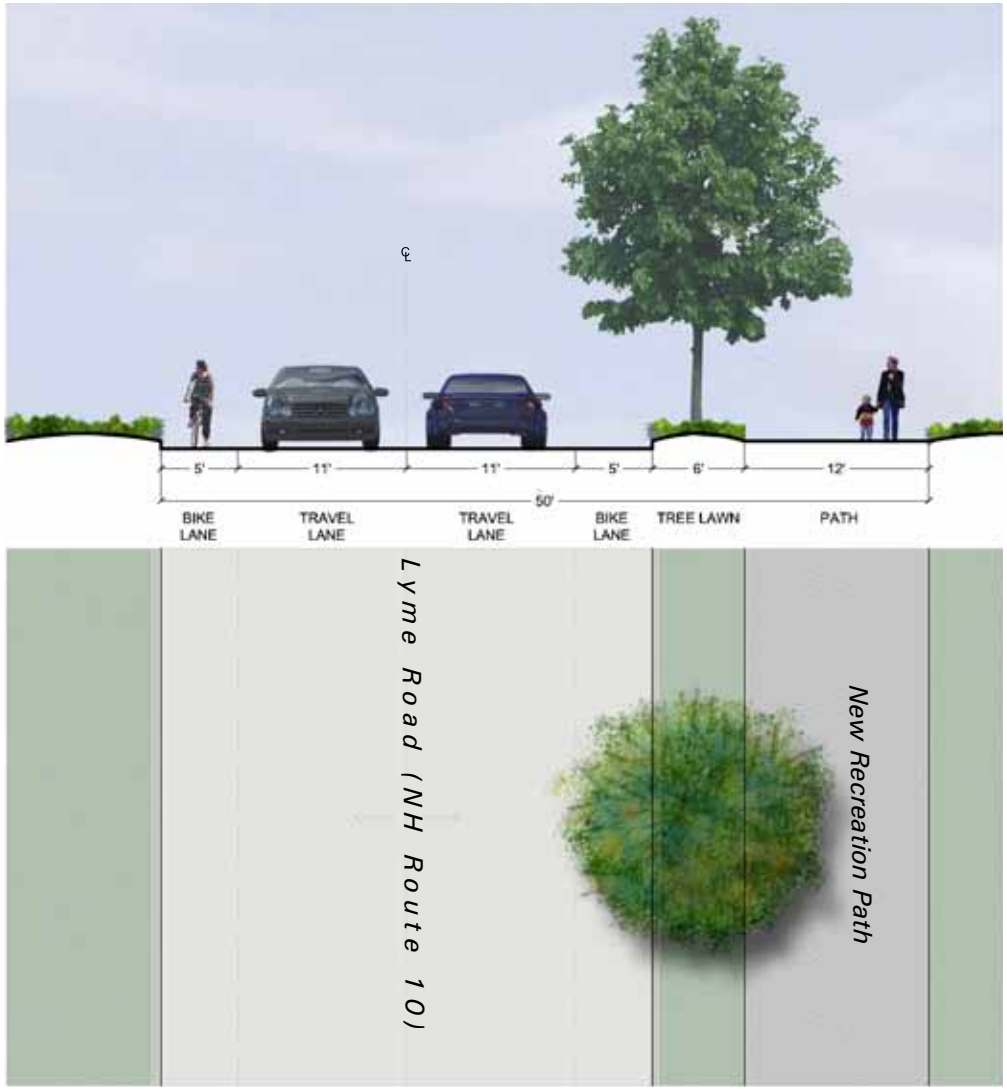
7 ***Lyme Road: North Park/College/Dewey Field Road to Roundabout***: The preferred configuration of Lyme Road is for sidewalks and bike lanes on both sides of the street, like the configuration above the roundabout. Because this segment of Lyme Road connects the schools to the core of Hanover and because the road carries relatively high volumes of cars, separate facilities for pedestrians and bicyclists are most desirable. The recommended option of sidewalks and bike lanes on both sides of the street presumes that the Girl Brook Path is developed to be a path that is suitable for children riding bikes (primarily with respect to grades). If this path appears infeasible, the option for a recreation path on the west side of Lyme Road should be considered.

Note: Lyme Road is approximately 50' wide at the 'pinch point' between the guardrails. The conceptual road sections (Figures 12 and 13) respond to this dimension. There are areas where the ROW is wider, and could accommodate a wider sidewalk or tree lawn. These details will need to be worked out more specifically prior to construction. For the most part the changes that add sidewalks, bike lanes and landscaping involve narrowing the existing paved roadway to slow traffic and provide a multi-modal street.

Implementation Lead: Town of Hanover

Time Frame: Mid-Term

Estimated Cost: $ 1,545,000



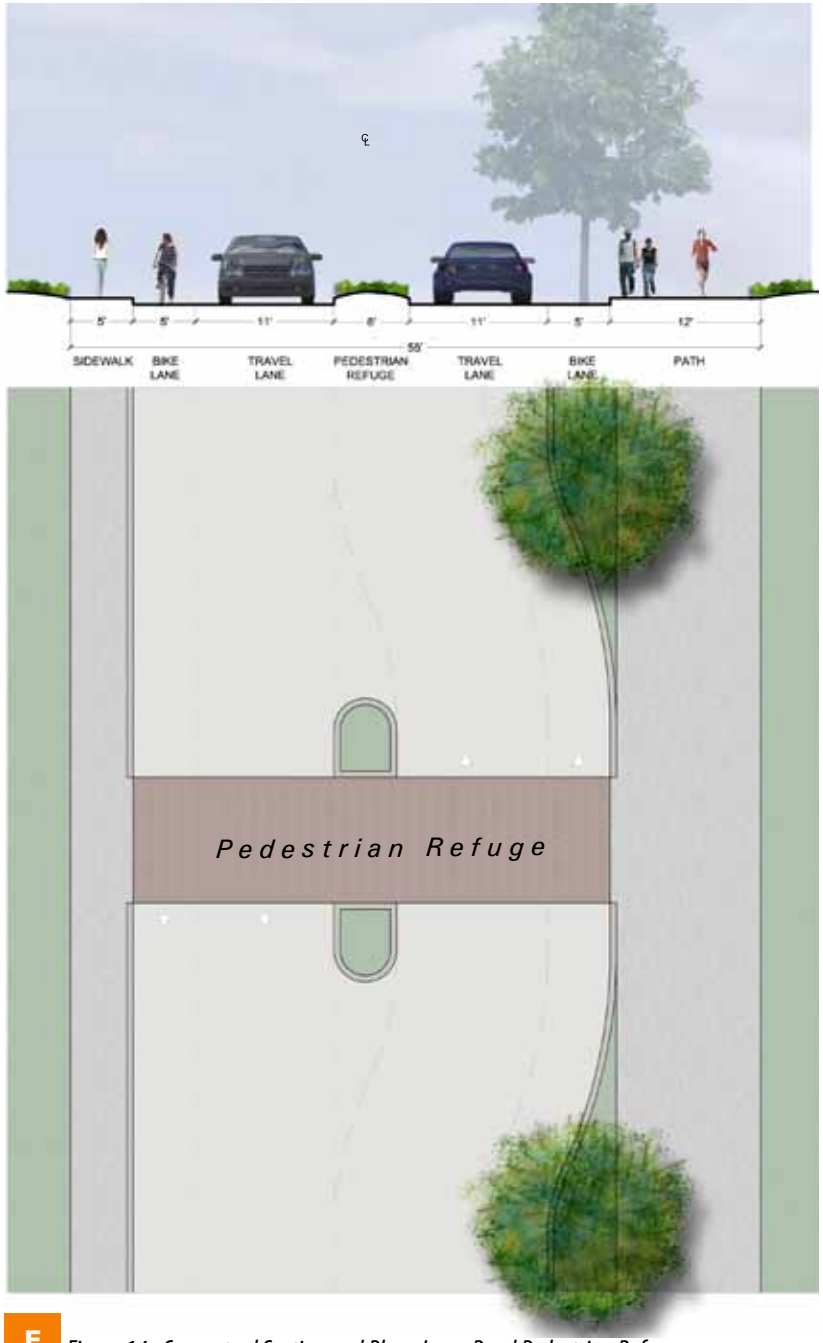
7 *Figure 13. Conceptual Section and Plan: Lyme Road Recreation Path Option*

7 ***Alternative: Recreation Path and Bike Lanes***. 12' bituminous asphalt recreation path on west side, 6' tree lawn, striped stenciled bike lanes.

Implementation Lead: Town of Hanover

Time Frame: Mid-Term

Estimated Cost: $ 1,596,000



E *Figure 14. Conceptual Section and Plan: Lyme Road Pedestrian Refuge*

E ***All Options: Pedestrian Refuges at Crossings***. Two pedestrian refuges are recommended at the pedestrian crossings of Lyme Road to calm traffic and provide additional support for crossing pedestrians.

Implementation Lead: Town of Hanover

Time Frame: Mid-Term

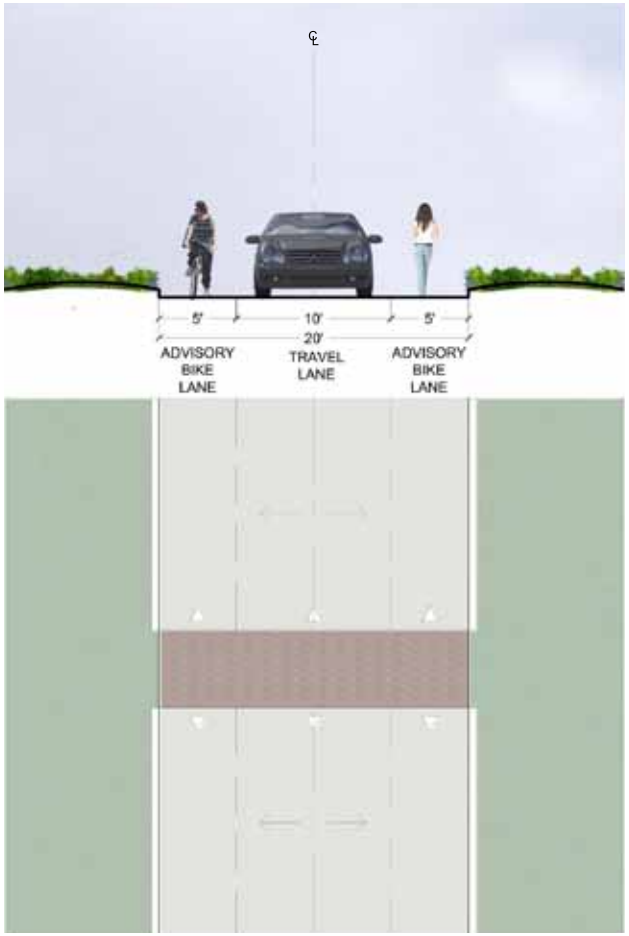
Estimated Cost: $ 20,000

F ***East Wheelock / Valley / Verona Roads Intersection***: This intersection should be improved for pedestrian crossings including high visibility signage and crosswalk striping.

Implementation Lead: Town of Hanover

Time Frame: Short Term

Estimated Cost: $ 2,000



8 *Figure 15. Conceptual Section and Plan: Shared Street Treatment with traffic calming speed table*

8 *Figure 16. Conceptual Signage: Shared Street Treatment*

8 ***Neighborhood Shared Street Treatment***: Rip Road, Curtiss, Valley Roads. This involves five-foot striped shoulders and a shared two-way center lane of ten feet coupled with speed tables for traffic calming and unique signage that 'brands' the street as a neighborhood bike and pedestrian priority street. Note: This is an innovative treatment that should be tested first and implemented further if tests prove successful. Neighborhood outreach and public education is an aspect of this as well. Local ordinances may require amendments as well. The outreach should be assisted by the Hanover Pedestrian and Bicycle Advisory Committee.

Implementation Lead: Town of Hanover

Time Frame: Short Term

Estimated Cost: $ 18,650

Appendices

Online Parent Survey Results

- **Ray School**
- **Richmond School**

Bike and Walk to School Map

- **October 2012 Walk and Roll to School Day**

Articles

- **The Link Between Kids Who Walk and Bike to School and Concentration, Atlantic Cities, February 5, 2013**

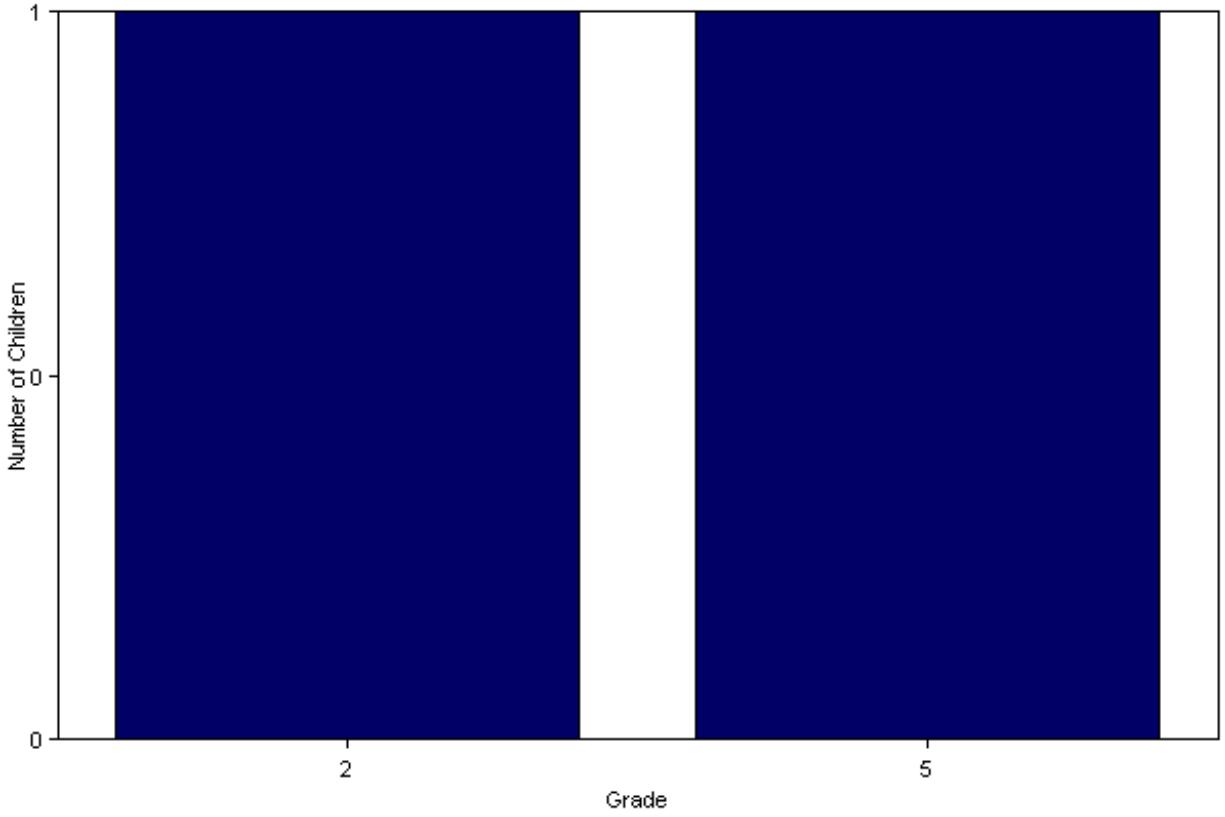
Parent Survey Summary

Program Name:	Hanover Safe Routes to School Travel Plan	**Month and Year Collected:**	October 2012
School Name:	Bernice A. Ray Elementary School	**Set ID:**	8646
School Enrollment:	457	**Date Report Generated:**	11/01/2012
Enrollment within Grades Targeted by SRTS Program:	457	**Number of Questionnaires Analyzed for Report:**	2
Number of Questionnaires Distributed:	457		

This report contains information from parents about their children's trip to and from school. The report also reflects parents' perceptions regarding whether walking and bicycling to school is appropriate for their child. The data used in this report were collected using the Survey about Walking and Biking to School for Parents form from the National Center for Safe Routes to School.

**Because less than 30 questionnaires are included in this report, each graph and table display counts rather than percentage information.

Grade levels of children represented in survey

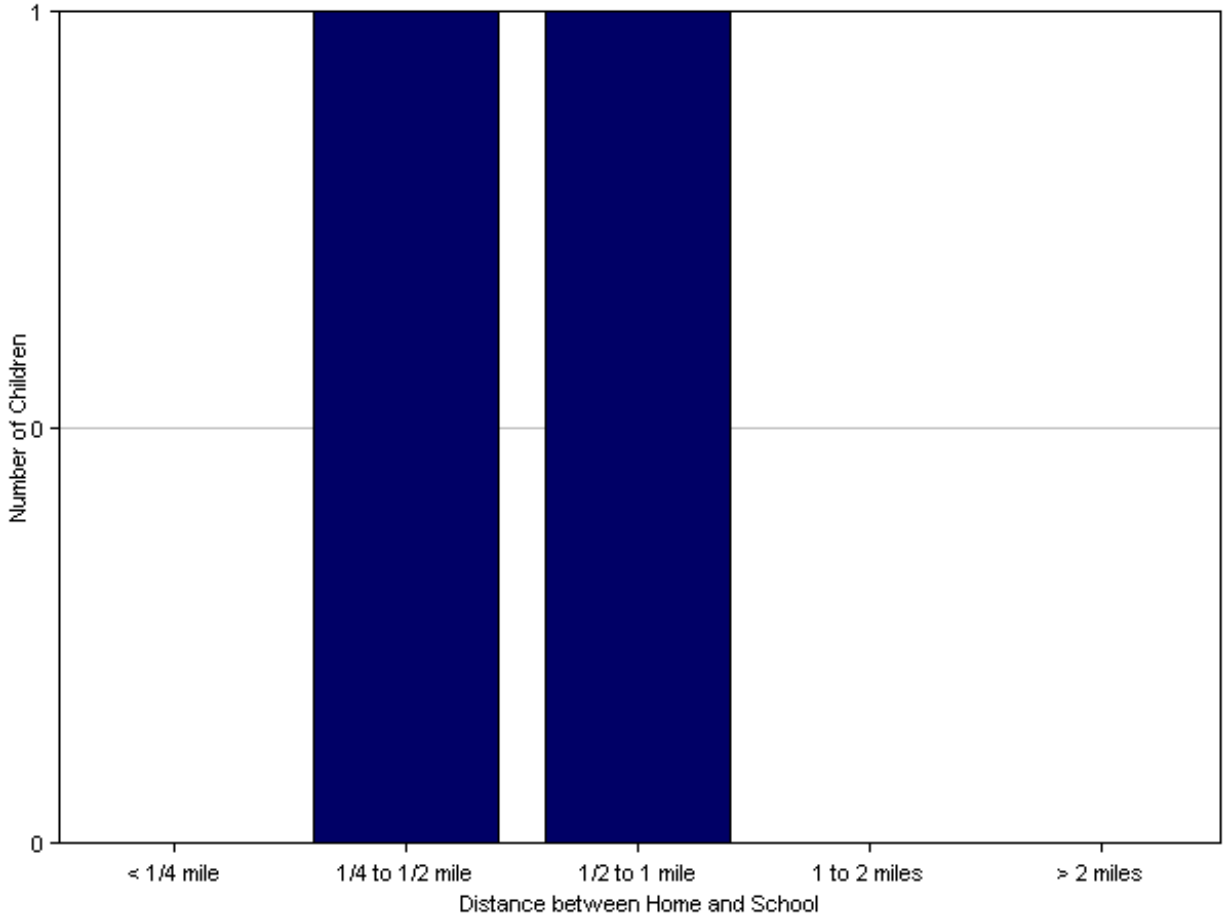


Grade levels of children represented in survey

Grade in School	Responses per grade
	Number
2	1
5	1

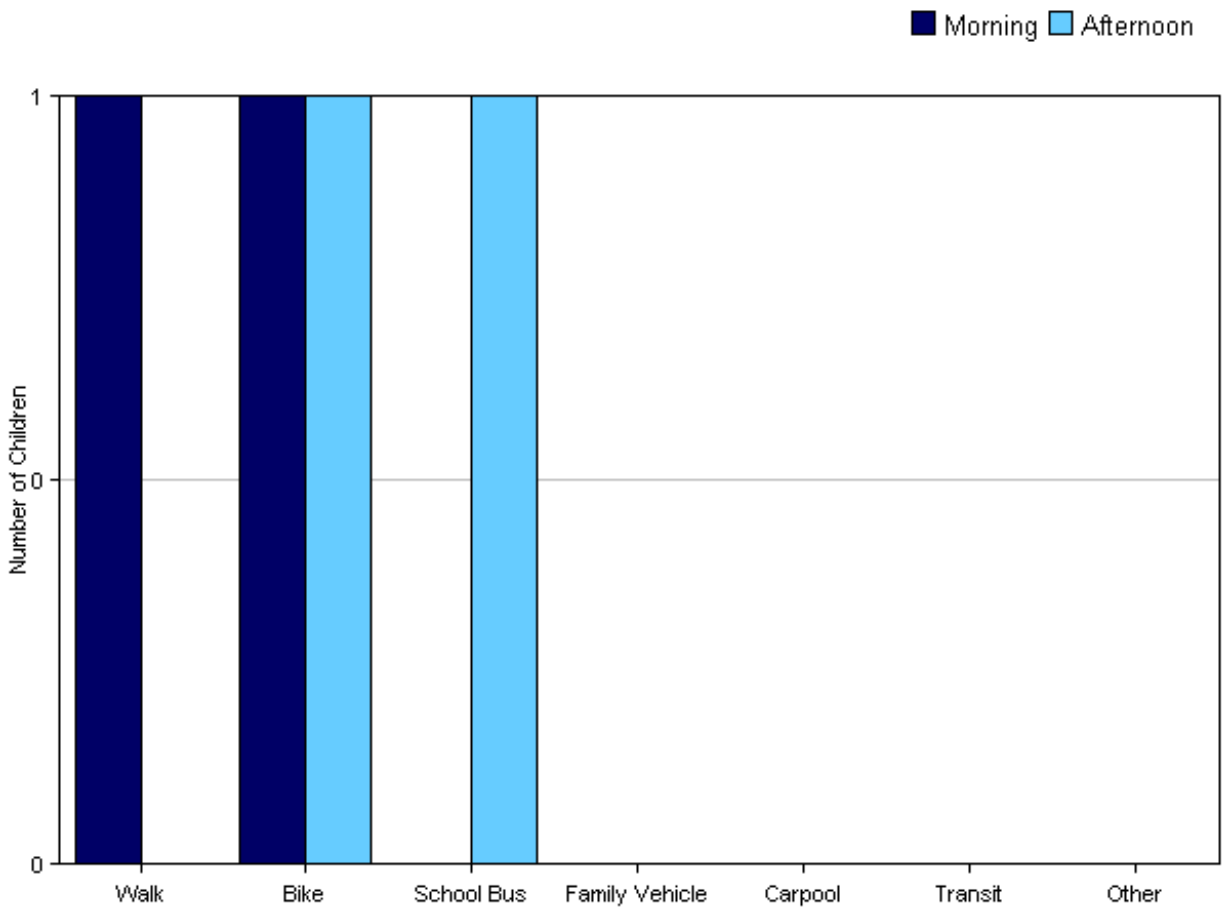
No response: 0
Numbers rather than percents are displayed because the number of respondents for this question was less than 30.

Parent estimate of distance from child's home to school



Distance between home and school	Number of children
Less than 1/4 mile	0
1/4 mile up to 1/2 mile	1
1/2 mile up to 1 mile	1
1 mile up to 2 miles	0
More than 2 miles	0

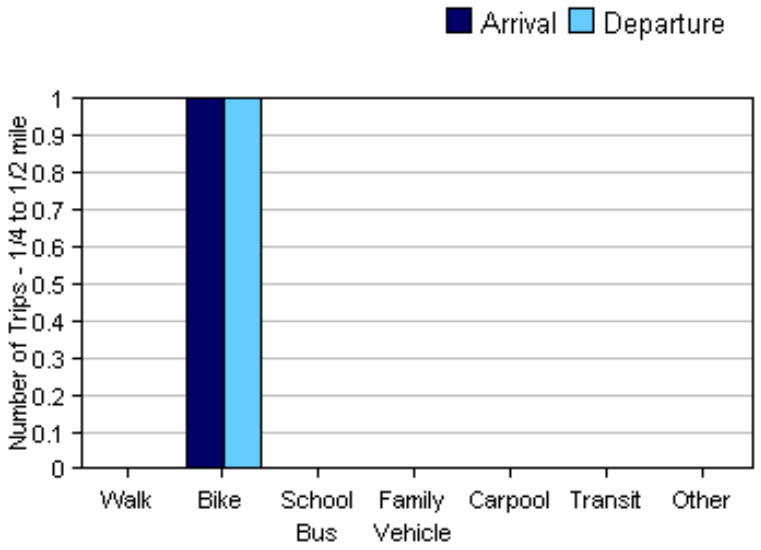
Typical mode of arrival at and departure from school

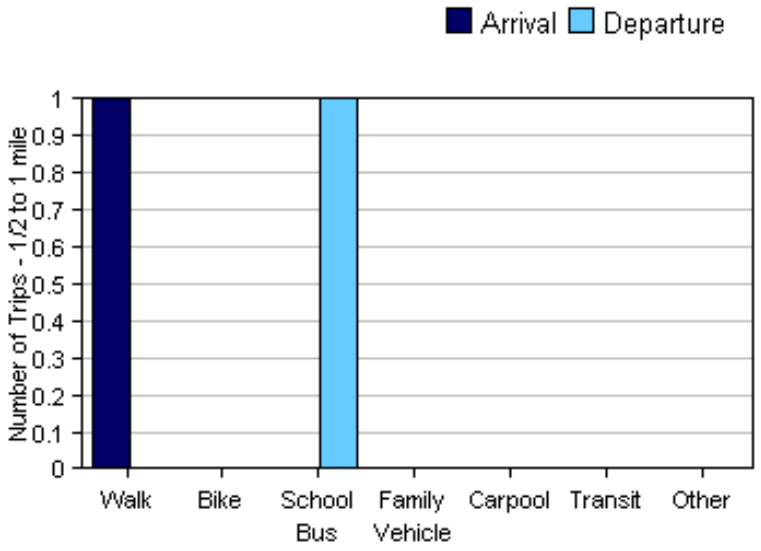


Time of Trip	Number of Trips	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Morning	2	1	1	0	0	0	0	0
Afternoon	2	0	1	1	0	0	0	0

No Response Morning: 0
No Response Afternoon: 0
Numbers rather than percents are displayed because the number of respondents for this question was less than 30.

Typical mode of school arrival and departure by distance child lives from school





Typical mode of school arrival and departure by distance child lives from school

School Arrival

Distance	Number within Distance	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Less than 1/4 mile	0	0	0	0	0	0	0	0
1/4 mile up to 1/2 mile	1	0	1	0	0	0	0	0
1/2 mile up to 1 mile	1	1	0	0	0	0	0	0
1 mile up to 2 miles	0	0	0	0	0	0	0	0
More than 2 miles	0	0	0	0	0	0	0	0

Don't know or No response: 0
Numbers rather than percents are displayed because the number of respondents for this question was less than 30.

School Departure

Distance	Number within Distance	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Less than 1/4 mile	0	0	0	0	0	0	0	0
1/4 mile up to 1/2 mile	1	0	1	0	0	0	0	0
1/2 mile up to 1 mile	1	0	0	1	0	0	0	0
1 mile up to 2 miles	0	0	0	0	0	0	0	0
More than 2 miles	0	0	0	0	0	0	0	0

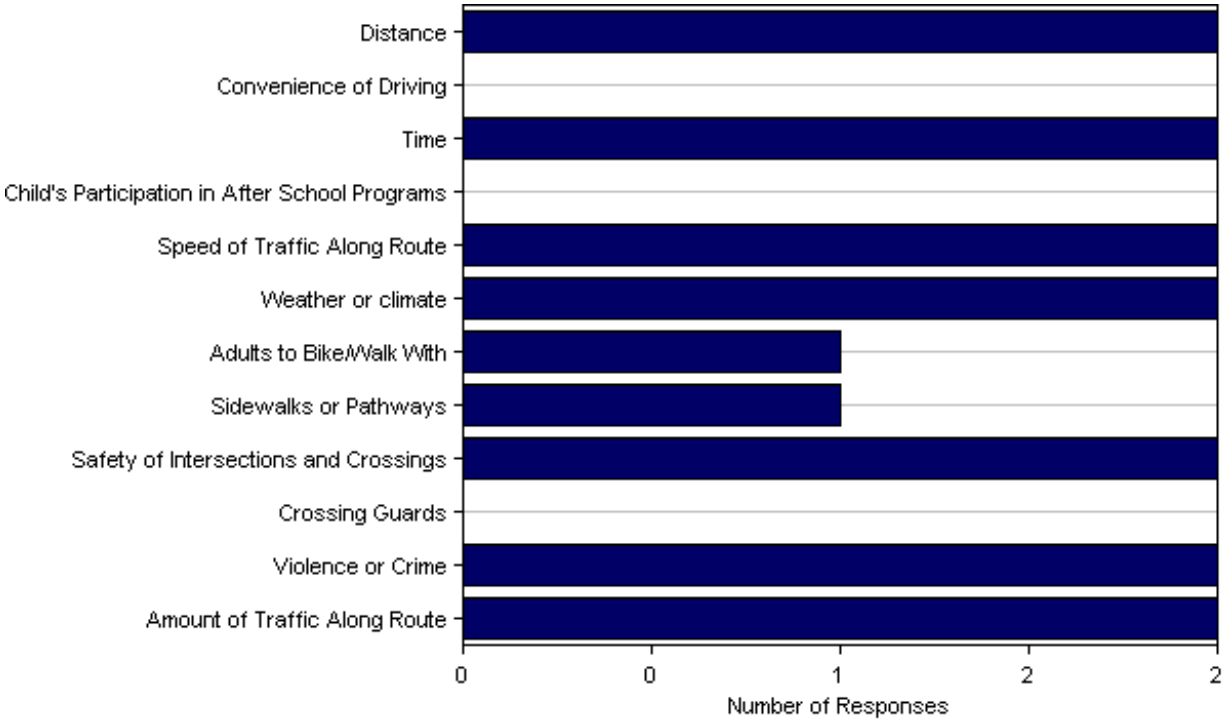
Don't know or No response: 0
Numbers rather than percents are displayed because the number of respondents for this question was less than 30.

Number of children who have asked for permission to walk or bike to/from school by distance they live from school

Asked Permission?	Number of Children	Less than 1/4 mile	1/4 mile up to 1/2 mile	1/2 mile up to 1 mile	1 mile up to 2 miles	More than 2 miles
Yes	2	0	1	1	0	0
No	0	0	0	0	0	0

Don't know or No response: 0
Numbers rather than percents are displayed because the number of respondents for this question was less than 30.

Issues reported to affect the decision to allow a child to walk or bike to/from school by parents of children who already walk or bike to/from school



Issues reported to affect the decision to allow a child to walk or bike to/from school by parents of children who already walk or bike to/from school

Issue	Child does not walk/bike to school	Child walks/bikes to school
Distance	0	2
Convenience of Driving	0	0
Time	0	2
Child's Participation in After School Programs	0	0
Speed of Traffic Along Route	0	2
Weather or climate	0	2
Adults to Bike/Walk With	0	1
Sidewalks or Pathways	0	1
Safety of Intersections and Crossings	0	2
Crossing Guards	0	0
Violence or Crime	0	2
Amount of Traffic Along Route	0	2
Number of Respondents per Category	**0**	**2**

No response: 0
Note:
--Factors are listed from most to least influential for the 'Child does not walk/bike to school' group.

Parents' opinions about how much their child's school encourages or discourages walking and biking to/from school

Level of support	Number of children
Strongly Encourages	1
Encourages	1
Neither	0
Discourages	0
Strongly Discourages	0

Parents' opinions about how much fun walking and biking to/from school is for their child

Level of fun	Number of children
Very Fun	1
Fun	1
Neutral	0
Boring	0
Very Boring	0

Parents' opinions about how healthy walking and biking to/from school is for their child

How healthy	Number of children
Very Healthy	1
Healthy	1
Neutral	0
Unhealthy	0
Very Unhealthy	0

Comments Section

SurveyID	Comment
912200	The road our daughter bikes along has no sidewalks but the traffic is generally mindful of school traffic. It would be fantastic if more children walked/biked to school but given that they have to get up even earlier in order to do that makes it harder to adopt.
908790	Once the weather gets cold and dark, that will affect my child walking (or rather not walking) more than any other factor.

Richmond School Responses

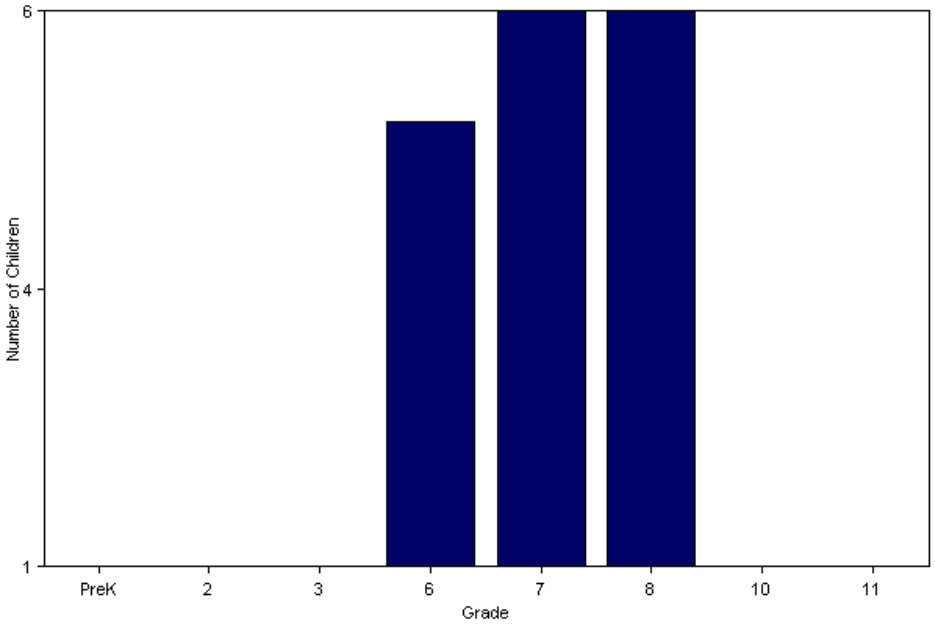
Parent Survey Summary

Program Name:	Hanover Safe Routes to School Travel Plan	**Month and Year Collected:**	October 2012
School Name:	Frances C. Richmond Middle School	**Set ID:**	8664
School Enrollment:	398	**Date Report Generated:**	10/31/2012
Enrollment within Grades Targeted by SRTS Program:	398	**Number of Questionnaires Analyzed for Report:**	22
Number of Questionnaires Distributed:	398		

This report contains information from parents about their children's trip to and from school. The report also reflects parents' perceptions regarding whether walking and bicycling to school is appropriate for their child. The data used in this report were collected using the Survey about Walking and Biking to School for Parents form from the National Center for Safe Routes to School.

**Because less than 30 questionnaires are included in this report, each graph and table display counts rather than percentage information.

Grade levels of children represented in survey

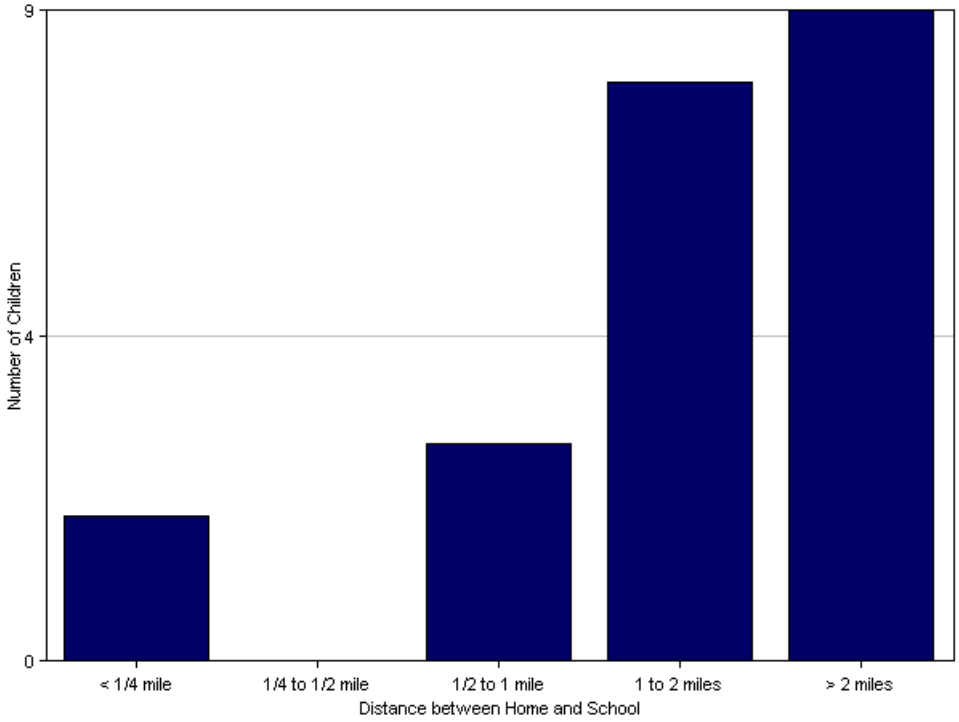


Grade levels of children represented in survey

Grade in School	Responses per grade
	Number
PreK	1
2	1
3	1
6	5
7	6
8	6
10	1
11	1

No response: 0
Numbers rather than percents are displayed because the number of respondents for this question was less than 30.

Parent estimate of distance from child's home to school

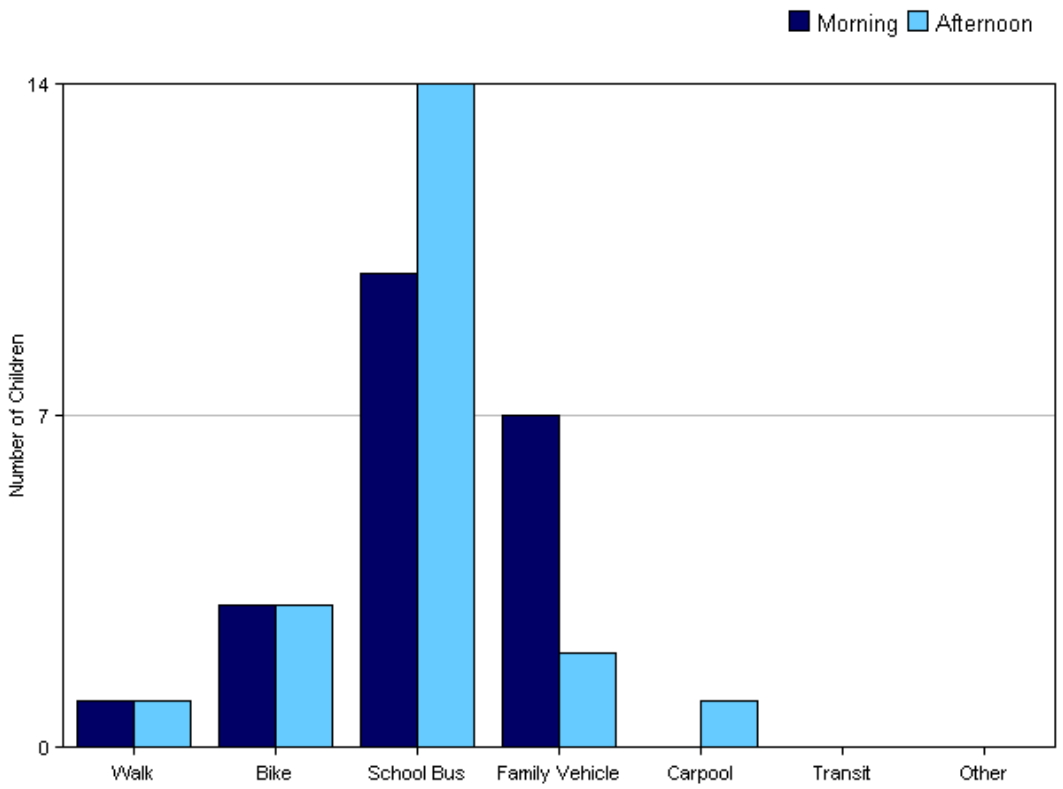


Parent estimate of distance from child's home to school

Distance between home and school	Number of children
Less than 1/4 mile	2
1/4 mile up to 1/2 mile	0
1/2 mile up to 1 mile	3
1 mile up to 2 miles	8
More than 2 miles	9

Don't know or No response: 0
Numbers rather than percents are displayed because the number of respondents for this question was less than 30.

Typical mode of arrival at and departure from school

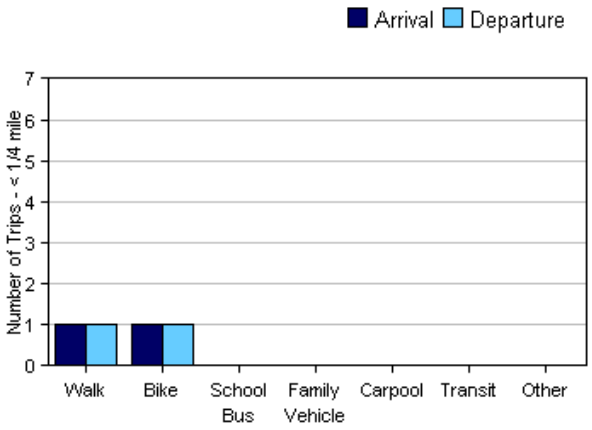


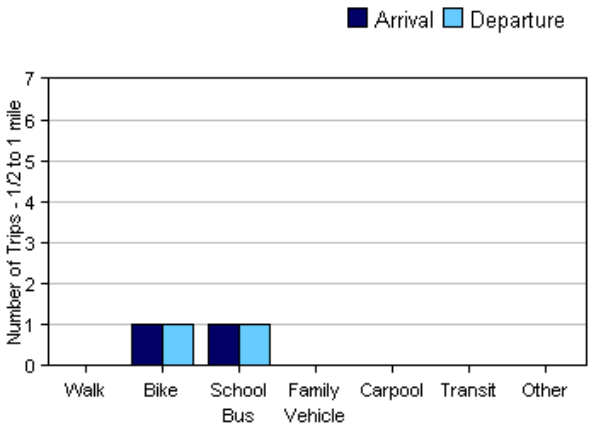
Typical mode of arrival at and departure from school

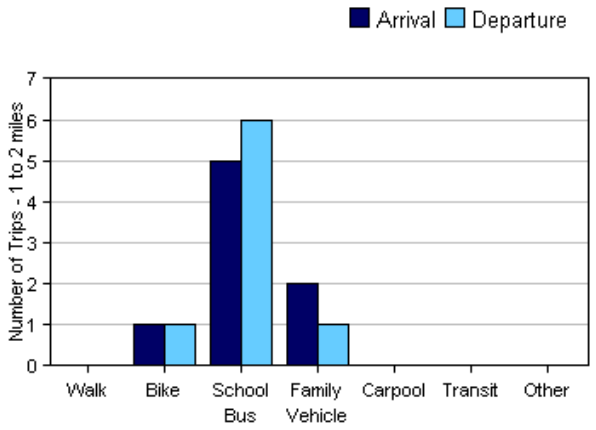
Time of Trip	Number of Trips	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Morning	21	1	3	10	7	0	0	0
Afternoon	21	1	3	14	2	1	0	0

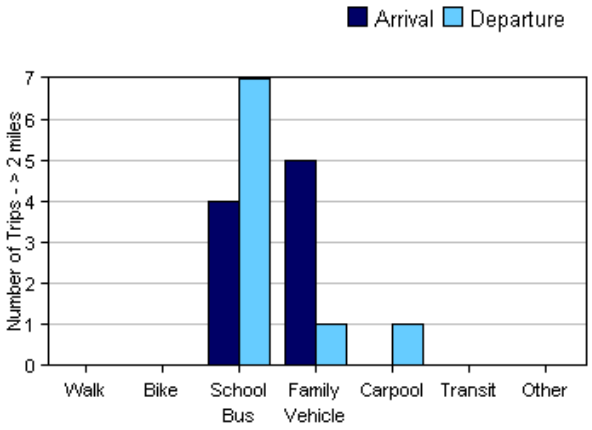
No Response Morning: 1
No Response Afternoon: 1
Numbers rather than percents are displayed because the number of respondents for this question was less than 30.

Typical mode of school arrival and departure by distance child lives from school









Typical mode of school arrival and departure by distance child lives from school

School Arrival

Distance	Number within Distance	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Less than 1/4 mile	2	1	1	0	0	0	0	0
1/4 mile up to 1/2 mile	0	0	0	0	0	0	0	0
1/2 mile up to 1 mile	2	0	1	1	0	0	0	0
1 mile up to 2 miles	8	0	1	5	2	0	0	0
More than 2 miles	9	0	0	4	5	0	0	0

Don't know or No response: 1
Numbers rather than percents are displayed because the number of respondents for this question was less than 30.

School Departure

Distance	Number within Distance	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Less than 1/4 mile	2	1	1	0	0	0	0	0
1/4 mile up to 1/2 mile	0	0	0	0	0	0	0	0
1/2 mile up to 1 mile	2	0	1	1	0	0	0	0
1 mile up to 2 miles	8	0	1	6	1	0	0	0
More than 2 miles	9	0	0	7	1	1	0	0

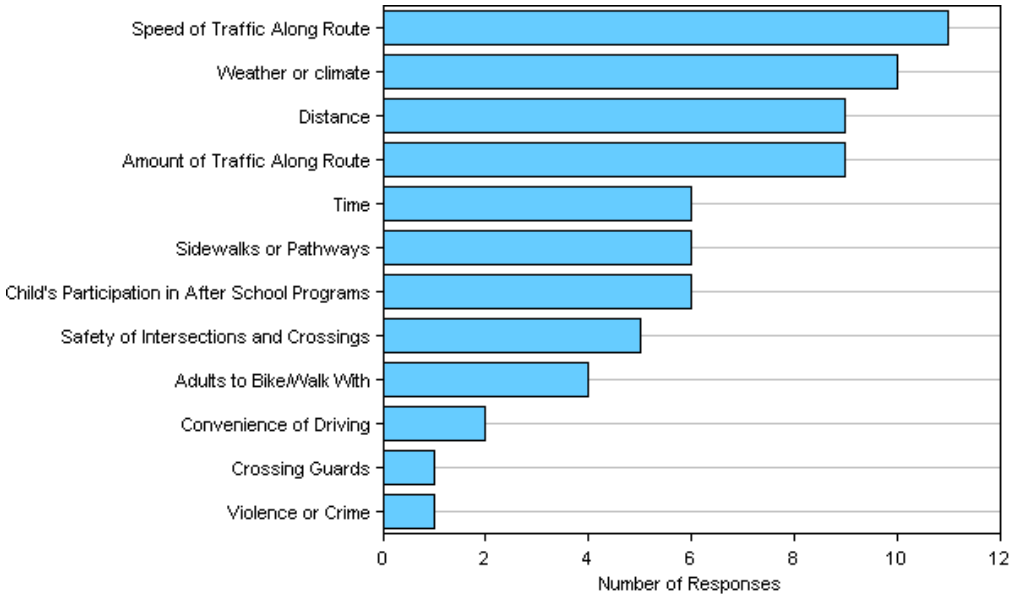
Don't know or No response: 1
Numbers rather than percents are displayed because the number of respondents for this question was less than 30.

Number of children who have asked for permission to walk or bike to/from school by distance they live from school

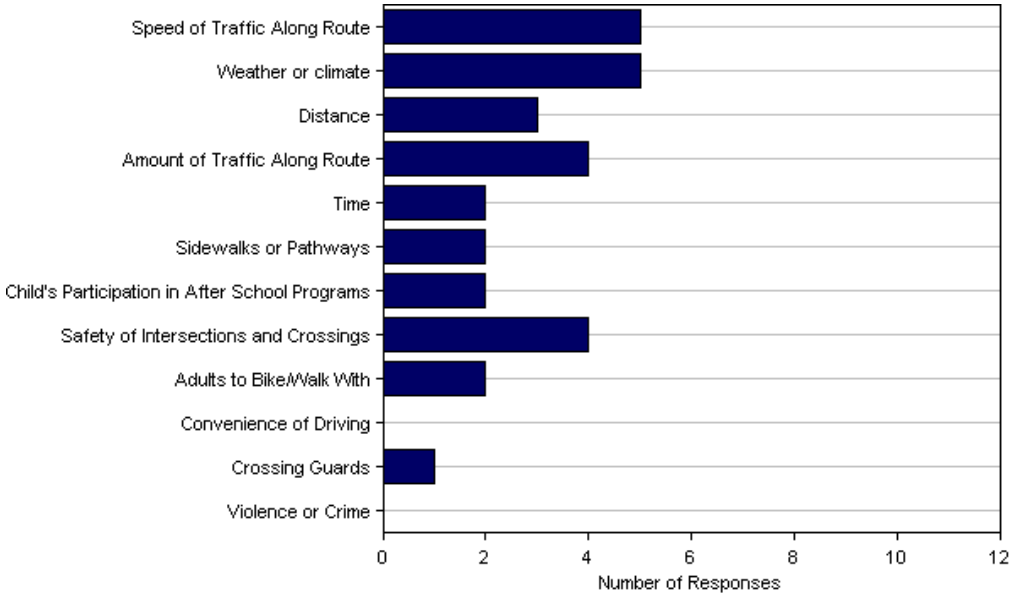
Asked Permission?	Number of Children	Less than 1/4 mile	1/4 mile up to 1/2 mile	1/2 mile up to 1 mile	1 mile up to 2 miles	More than 2 miles
Yes	14	2	0	2	6	4
No	7	0	0	0	2	5

Don't know or No response: 1
Numbers rather than percents are displayed because the number of respondents for this question was less than 30.

Issues reported to affect the decision to not allow a child to walk or bike to/from school by parents of children who do not walk or bike to/from school



Issues reported to affect the decision to allow a child to walk or bike to/from school by parents of children who already walk or bike to/from school



Issues reported to affect the decision to allow a child to walk or bike to/from school by parents of children who already walk or bike to/from school

Issue	Child does not walk/bike to school	Child walks/bikes to school
Speed of Traffic Along Route	11	5
Weather or climate	10	5
Distance	9	3
Amount of Traffic Along Route	9	4
Time	6	2
Sidewalks or Pathways	6	2
Child's Participation in After School Programs	6	2
Safety of Intersections and Crossings	5	4
Adults to Bike/Walk With	4	2
Convenience of Driving	2	0
Crossing Guards	1	1
Violence or Crime	1	0
Number of Respondents per Category	**14**	**7**

No response: 1
Note:
--Factors are listed from most to least influential for the 'Child does not walk/bike to school' group.

Parents' opinions about how much their child's school encourages or discourages walking and biking to/from school

Level of support	Number of children
Strongly Encourages	1
Encourages	5
Neither	15
Discourages	0
Strongly Discourages	0

Parents' opinions about how much fun walking and biking to/from school is for their child

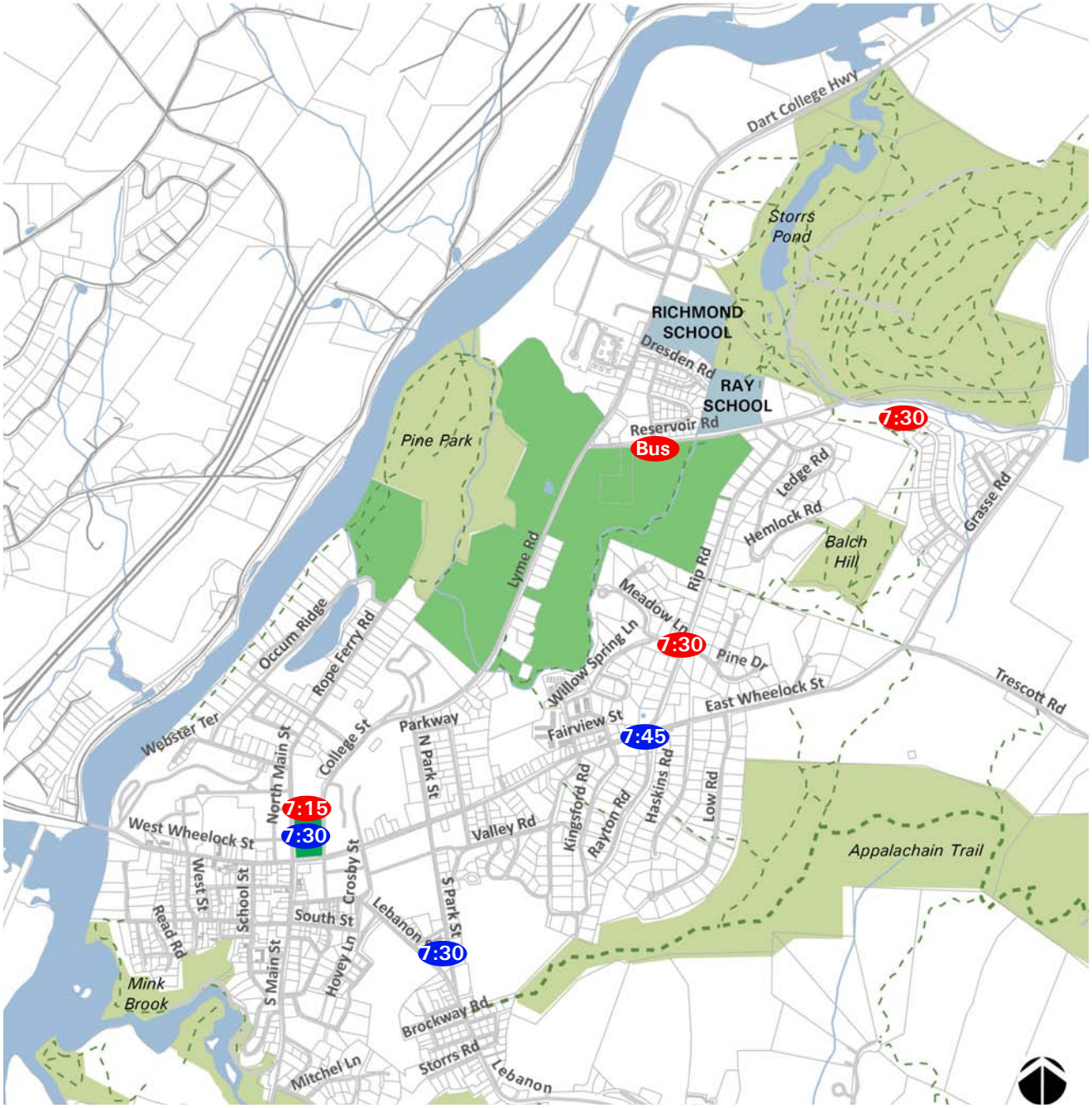
Level of fun	Number of children
Very Fun	6
Fun	8
Neutral	5
Boring	1
Very Boring	0

Parents' opinions about how healthy walking and biking to/from school is for their child

How healthy	Number of children
Very Healthy	18
Healthy	3
Neutral	0
Unhealthy	0
Very Unhealthy	0

Comments Section

SurveyID	Comment
907417	We used to walk to school every day when living in our previous town and the distance was shorter (2/3 of a mile). Now, with being more than 2 miles from school and having public transportation, we choose to walk to the bus stop, play around there and let them take the bus to school. SRTS is a great program!
912196	I'd love for my 3 kids to be able to bike to school,particularly as they have a 35 minute bus ride, despite our proximity to school (less than 2 miles). It's not just the traffic on Rip Rod that is a factor however--it is the constant presence of landscaping and other trucks too. Alternatively, it would also be great if Girl Brook Trail were a bikeable option.
907393	I wish we could get parents to stop driving their kids to school. If it's too far to walk/bike, use the school bus!
907403	The traffic on Rip Rd makes walking and biking to and from school dangerous at times. My child was actually hit by the side view mirror of a car that got too close to him as he walked because it did not yield to an oncoming car. This is an ongoing and very frustrating issue for the families with kids on Rip Rd.
911977	Traffic is a big problem. There are too many parents rushing to get their kids to school on time and they go fast. There are more and more kids who are now old enough to bike, so having more kids on bikes helps force drivers to slow down and make it easier.
912043	One of the biggest issues is the heavy school bag - big hindrance to walking/ biking long distances for my child.
912201	My child bikes almost 20 miles per week just by going to school and back on his bike for 20 minutes total a day! It is such a benefit to my child as his legs are much stronger for skiing in the winter and he feels apart of his community and is better rested and more focused because of the exercise.
912205	If more students from our neighborhood biked, it would encourage my son to bike, and I would be slightly more comfortable about him doing so because I would feel that drivers along his route would be more accustomed to watching for young cyclists.
907952	Lack of sidewalks and volume and speed of traffic on Rip Road are my biggest worries. If people stopped driving their kids to and from school on Rip Road, I believe safety would increase for all walkers and bikers.
912195	An additional factor in walking and biking to school is the weight of my child's backpack. I would love if this issue could be addressed.



Walk and Bike to School Day
October 3, 2012

Richmond and Ray School students (and parents/guardians) are welcome to join Walking School Buses and Rolling Bike Trains led by school teachers and staff for a bit of fun, fresh air and exercise on the way to school.

Walking School Bus and Bike Train Designated Meeting Points and Meeting Times

7:30 Walking School Buses

Hanover Green (College and Wentworth)	7:15
Pine Drive and Rip Road	7:30
End of Macdonald Drive (Strong Trail)	7:30

Rugby House - Students may get off the bus at the Dartmouth Rugby House and walk to school with Ray and Richmond School staff

7:30 Rolling Bike Trains

Norwich Green*	7:10
Hanover Green	7:30
R.W. Black Center (So. Park Street)	7:30
Rayton Road / E. Wheelock	7:45

*Richmond School Students Only

Rain Date: October 4th, 2012

the Atlantic CITIES
PLACE MATTERS

The Link Between Kids Who Walk or Bike to School and Concentration

SARAH GOODYEAR 8:13 AM ET 20 COMMENTS

Every day outside my son's Brooklyn school, no matter what the weather, you will see a distinctive pale blue bicycle locked to the rack. It belongs to a 7th-grade girl from a Dutch family whose members have stuck with their traditional practice of riding to school each day, despite finding themselves in the not-so-bike-friendly United States for a few years. This lovely blue city bike was a gift from the parents to their eldest child, who is now almost as tall as a grown woman. She has graduated from riding with her parents, and deserves a first-class vehicle to get to class each day. She is fiercely proud of it.

According to the results of a Danish study released late last year, my Dutch friends are giving their daughter a less tangible but more lasting gift along with that bicycle: the ability to concentrate better. The survey looked at nearly 20,000 Danish kids between the ages of 5 and 19. It found that kids who cycled or walked to school, rather than traveling by car or public transportation, performed measurably better on tasks demanding concentration, such as solving puzzles, and that the effects lasted for up to four hours after they got to school.

The study was part of "Mass Experiment 2012," a Danish project that looked at the links between concentration, diet, and exercise.

Niels Egelund of Aarhus University in Denmark, who conducted the research, told AFP that he was surprised that the effect of exercise was greater than that of diet:

> "The results showed that having breakfast and lunch has an impact, but not very much compared to having exercised," Egelund told AFP.
>
> "As a third-grade pupil, if you exercise and bike to school, your ability to concentrate increases to the equivalent of someone half a year further in their studies," he added.

The process of getting yourself from point A to point B has cognitive effects that researchers do not yet fully understand. I wrote last year about Bruce Appleyard's examination of cognitive mapping, in which he compared children who were driven everywhere with those who were free to navigate their neighborhoods on their own. His work revealed that the kids whose parents chauffeured them had a much poorer comprehension of the geography of the places they lived, and also a less fine-grained knowledge of the landscape around them.

In an article about the Danish study from the Davis Enterprise, Egelund says that he thinks there is a deep connection between the way we move our bodies and the way our minds work:

> "I believe that deep down we were naturally and originally not designed to sit still," Egelund said. "We learn through our head and by moving. Something happens within the body when we move, and this allows us to be better equipped afterwards to work on the cognitive side."

Lots of parents drive their kids to school because walking or driving on streets and roads designed exclusively for cars makes the journey prohibitively dangerous for anyone, especially children. That problem is not easily solved, especially since schools are increasingly being built on the edges of sprawling development, rather than in a walkable context. [PDF]

But many other parents drive their kids because it's easier, or seems to be easier. They often frame it as a kindness to the child to spare them "trudging" all the way to school, even if that trek is only half a mile long. As these short driving trips become the societal norm, it gets more and more difficult for families to deviate from them. School traffic begets school traffic.

So what could turn the trend around? The connection between active transportation and better physical fitness is well-documented and intuitively easy to draw, and yet apparently not compelling enough. As the Davis Enterprise article points out, even in a U.S. city with relatively good bicycle infrastructure such as Davis, California, parents continue to drive their children to school in huge numbers. More than 60 percent of elementary students in that city arrive for class each morning with their parents behind the wheel. Nationally, as of 2009, only 13 percent of kids in the United States walked or biked to school, down from 50 percent in 1969.

But if more parents realized that packing the kids into the back seat actually affects their ability to learn, would they change their ways? Advocate for building schools in more walkable locations? Demand improved bicycle and pedestrian infrastructure? Or simply make the time and effort required to get to the kids to school under their own steam, accompanying them if need be?

Many parents pay for test prep and after-school enrichment programs to make their kids more academically competitive, and go to great lengths to schedule time for those activities. Imagine if they invested those resources instead in something as simple as helping their children to travel safely from home to school on foot or by bike, arriving ready to learn.

Top image: Sandra Gligorijevic/Shutterstock.com

Keywords: Parenting, Education, Children, Pedestrian Infrastructure, bicycle commuting

Sarah Goodyear has written about cities for a variety of publications, including Grist and Streetsblog. She lives in Brooklyn. All posts »