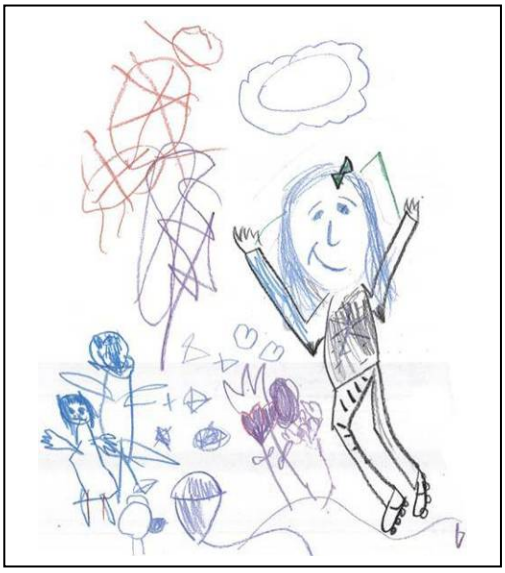
SAFE ROUTES TO SCHOOL ACTION PLAN

Portsmouth, New Hampshire



February 2010

ACKNOWLEDGEMENTS

Safe Routes to School Committee

Deborah Finnigan, City Engineer, Portsmouth DPW
Rebecca Emerson, Committee Chair, Portsmouth School Board
Brendan Cooney, Vice-Chair, Traffic & Safety Board
Ed McDonough, Superintendent of Schools
Christine Woodman Casa, Dondero School Representative
Jean Ward, St. Patrick School Representative
Kirsten Barton, Little Harbor School Representative
Nancy Novelline Clayburgh, City Councilor

Prepared for:

City of Portsmouth Department of Public Works

Steve Parkinson, Director

Prepared by:

Alta Planning + Design
Jeff Olson, Principal
Phil Goff, Project Manager
Joshua Poppel, Project Planner

with:

Richardson & Associates Landscape Architects
Ken Studtmann, Project Designer

TND Engineering
Chester "Rick" Chellman, Project Engineer

alta PLANNING + DESIGN

Richardson & Associates Landscape Architects

TND ENGINEERING
designing for tomorrow with the technology of today and the lessons of the past

Table of Contents

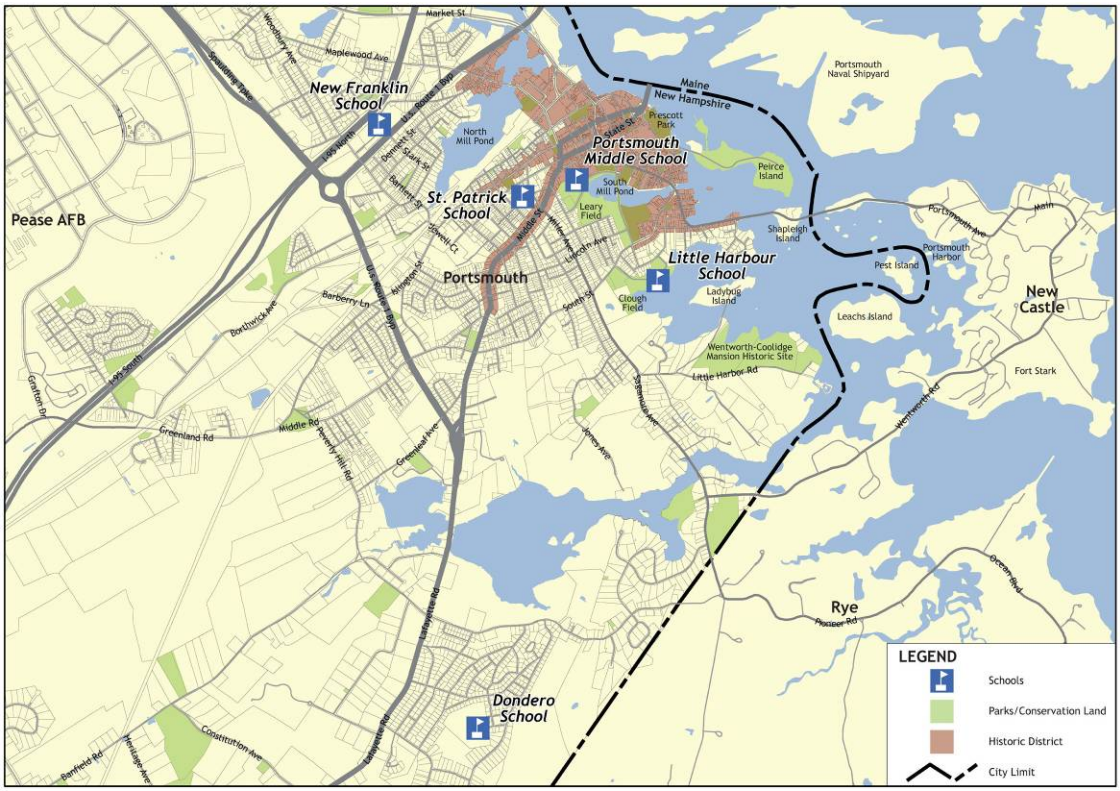
Contents

I. Safe Routes to School Overview

1.1 Introduction

The goal of this Action Plan is to identify potential physical improvements and operational measures and programs for five school sites and the surrounding blocks. It will help further develop safe routes to the five schools in the City of Portsmouth (not including the high school): Dondero Elementary, Little Harbour Elementary, New Franklin Elementary, St. Patrick Catholic School, and Portsmouth Middle School. A key to ongoing success will be a dedicated and active Safe Routes to School (SRTS) Committee, as well as parents committed to making walking and biking more integral to the lives of their children, their friends and neighbors. It will also be important for each school to have a "champion", a teacher, administrator, parent, and/or community volunteer committed to making the recommendations happen at each school.

This Action Plan is available for use by the City, the SRTS Committee, the Superintendent's office and the school's champion as a framework to guide successful next steps, both in the short and long term. It will also be the guiding document from which the City will seek federal SRTS funds for infrastructure projects and other programs recommended in the Action Plan. Included with each recommended project or program in this document are suggestions about which city agency or partner can be involved in its implementation and the role each can play to help ensure its success.



City Context Map

Portsmouth, NH
Safe Routes to School Travel Plan Study
Source: Data obtained from the City of Portsmouth, NH
Author: Robin Wilcox
Date: 9/30/2009

1.2 Safe Routes to School Program Overview

Safe Routes to School (SRTS) is a national program that creates safe, convenient and fun opportunities for children to walk and bicycle to and from their schools. With the increasing need to improve the health and safety of children, SRTS can improve communities by making walking and bicycling safe ways to get to school and by encouraging more children to do so. To accomplish this goal, a comprehensive program must be established to create an environment that enhances, supports, and sustains walking and cycling as viable options for travel. With this in mind, SRTS emphasizes a holistic approach to create change that encompasses the five "E" approach: Engineering, Enforcement, Encouragement, Education and Evaluation.

Walking to school benefits children's health and the environment

- **Engineering**: physical improvements to the environment such as crosswalks, sidewalks, bike lanes and signals.
- **Education**: methods to teach children, parents and neighbors about the benefits of walking and cycling to school as well instructing age-appropriate walking, driving and cycling behaviors to support safe travel in the school zone.
- **Encouragement**: programs such as Walk to School Day, the Walking School Bus, contests and other initiatives to entice children (and their parents or guardians) to walk or bicycle to school.
- **Enforcement**: incorporates law enforcement efforts to ensure drivers, bicyclists and pedestrians obey traffic laws and practice appropriate behavior near schools.
- **Evaluation**: uses measurements or indicators such as the number of children walking or bicycling to school to ascertain the success of any SRTS program.

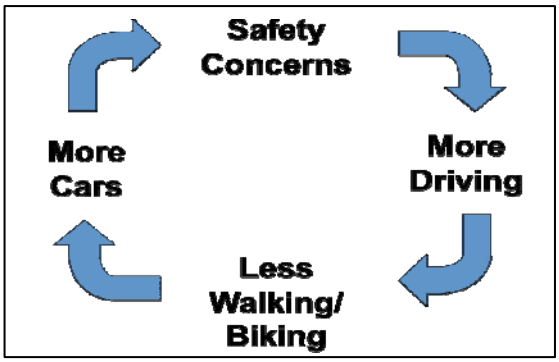
1.3 Why are Safe Routes to School Important?

Although most students in the United States walked or biked to school prior to the 1980s, since then, the number of students walking or bicycling to school has sharply declined. Statistics show that 42% of all students between five and 18 years of age walked or bicycled to school in 1969, including 87% of students who lived within one mile of the school they attended. In 2001 fewer than 16% of students walked or bicycled any distance to get to school[1]. This decline is due to a number of factors, including urban growth patterns and school-siting requirements that encourage school development in outlying areas, increased traffic and parental concerns about safety. The situation is self-perpetuating: as more parents drive their children to school, there is increased traffic at the school site, resulting in more parents becoming concerned about traffic and driving their children to school.

[1] U.S. Centers for Disease Control and Prevention. Barriers to Children Walking to or from School United States 2004, Morbidity and Mortality Weekly Report September 30, 2005. Available: www.cdc.gov/mmwr/preview/mmwrhtml/mm5438a2.htm. Accessed: December 28, 2007.

According to a 2004 national survey by the Center for Disease Control, parents whose children did not walk or bike to school cited the following barriers:

- Distance to school: 61.5%
- Traffic-related danger: 30.4%
- Weather: 18.6%
- Crime/Danger: 11.7 %
- Opposing school policy: 6.0%
- Other reasons (not identified): 15.0%



The downward spiral of walking and bicycling to school

A comprehensive Safe Routes to School program addresses many of the reasons for reductions in walking and biking through a multi-faceted approach that uses education, encouragement, engineering and enforcement efforts to develop attitudes, behaviors and physical infrastructure that improve the walking and biking environment.

1.4 Benefits of a Safe Routes to School Program

Safe Routes to School programs directly benefit schoolchildren, parents, staff and teachers by creating a safer travel environment near schools and reducing motor-vehicle congestion at school drop-off and pick-up zones. Students that choose to walk or bike to school are rewarded with the health benefits of a more active lifestyle, the responsibility and independence that come from being in charge of the way they travel, and can learn at an early age that walking and biking can be safe, enjoyable and good for the environment. Safe Routes to School programs offer additional benefits to neighborhoods by helping to slow traffic and provide infrastructure improvements that facilitate walking and biking for everyone. Identifying and improving routes for students to safely walk and bicycle to school is one of the most cost-effective means of reducing weekday morning traffic congestion and can help reduce auto-related pollution.

To many children, walking and biking are as important as birds and sunshine

In addition to safety and traffic improvements, a Safe Routes to School program helps integrate physical activity into the everyday routine of school children. Since the mid-1970s, the number of children who are overweight has more than tripled from 5% to almost 17%. Health concerns related to sedentary lifestyles have become the focus of statewide and national efforts to reduce health risks associated with being overweight. Children who walk or bike to school have an overall higher activity level than those who are driven to school, even though the journey to school makes only a small contribution to activity levels.[2]

[2] Cooper A, Page A, Foster L, Qahwaji D. Commuting to school: are children who walk more physically active? American Journal of Preventive Medicine. 2003 November; 25(4):273-6.

1.5 SRTS Action Plan Public Process

As part of the public-outreach process for the Portsmouth Safe Routes to School Action Plan effort, community meetings were held at each of the five schools in October 2009 to discuss current walking and bicycling conditions around each school and to gather ideas for improvements. Included in the discussions was coming to agreement on the overall project goals for the Action Plan (see following page). After an introductory slide presentation at the beginning of each meeting, parents and other attendees gathered in small groups for more detailed discussions. Children attended some of the meetings and contributed SRTS-themed artwork for this report.

Parents discuss current conditions and other issues at the Little Harbour School meeting

After the initial round of public meetings, consultants developed an array of streetscape-improvement options as well as suggested changes to traffic patterns. These were presented to the entire community at a subsequent meeting at the Portsmouth Middle School. Prior to the citywide meeting, a meeting was attended by over a dozen Portsmouth High School students to provide input on routes to the various schools within the City. Then the Portsmouth High School students helped facilitate a separate meeting with the Middle School students concerning the same routes during the citywide meeting. This community meeting preceded the citywide 2009 Walk and Bike to School event the following day.

PROJECT GOALS

1. Encourage a healthy and active lifestyle at an early age by making non-motorized transportation to school an attractive option
2. Increase safety for those traveling to school on foot or by bike through enhancements to streets, sidewalks and intersections
3. Provide street-level signage, maps and other information on appropriate walking and biking routes
4. Encourage community groups, parents and school administrators and staff to get involved
5. Reduce vehicle speeds on the streets adjacent to the five schools
6. Help position the city to apply for future SRTS planning and implementation grants
7. Partner with the police department, schools and parents to ensure proper enforcement of traffic and drop-off zone regulations
8. Educate parents and children that the benefits of walking or biking to school can extend into a more active lifestyle through adulthood

Dondero Elementary School community meeting

Numerous children attended the Little Harbour Elementary School community meeting

One of the many drawings developed by children at the community meetings in October

1.6 SRTS Standard Student Survey

As part of the district-wide survey conducted in 2007, students from each of the five schools were asked a series of questions about their travel patterns to and from school. The portion of the data and a brief analysis are shown below.

Dondero Elementary School has approximately 370 students, which is down from a high of 500 students in 2000. It is a 1970s-era school that is located in a suburban subdivision. Its setting allows for easy walking for those students living within the subdivision, but other students attending the school must cross or travel on busy Route 1 to get to the school. Despite the challenges that Route 1 presents, the school still sees a fairly high walking and biking percentage as indicated in the survey results listed below. Nearly 25% of students arrive at the school in the morning by walking or biking and more than 30% students return home by walking or biking.

Dondero Elementary School

Question 5: How far does your child live from school?

	<1/4	1/4 to 1/2	1/2 to 1	1 to 2	>2	don't know	Total
Responses	10	10	10	12	12	0	54
percentage	18.18%	18.18%	18.18%	21.82%	21.82%	0.00%	98%

Question 6: On most days, how does your child arrive at school and leave for home after school?

Arrive at School

	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other	No Answer	Total
Responses	8	5	21	26	2	0	1	0	63
percentage	14.55%	9.09%	38.18%	47.27%	3.64%	0.00%	1.82%	0.00%	115%

Leave for Home

	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other	No Answer	Total
Responses	12	6	20	22	1	0	1	1	63
percentage	21.82%	10.91%	36.36%	40.00%	1.82%	0.00%	1.82%	1.82%	115%

Little Harbour Elementary School is the closest elementary school to downtown Portsmouth and has approximately 460 students. It is surrounded by 19th and early 20th century walkable neighborhoods which lead to a very high level of multi-modal activity. Nearly 60% of the students regularly walk or bike to school and the bike rack is consistently filled to capacity, with overflow bikes locked to the trees lining the sidewalk.

Little Harbour Elementary School

Question 5: How far does your child live from school?

	<1/4	1/4 to 1/2	1/2 to 1	1 to 2	>2	don't know	Total
Responses	10	12	32	11	6	1	72
percentage	13.51%	16.22%	43.24%	14.86%	8.11%	1.35%	97%

Question 6: On most days, how does your child arrive at school and leave for home after school?

Arrive at School

	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other	No Answer	Total
Responses	21	22	10	17	1	1	2	0	74
percentage	28.38%	29.73%	13.51%	22.97%	1.35%	1.35%	2.70%	0.00%	100%

Leave for Home

	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other	No Answer	Total
Responses	23	22	9	17	1	0	2	0	74
percentage	31.08%	29.73%	12.16%	22.97%	1.35%	0.00%	2.70%	0.00%	100%

New Franklin Elementary School is surrounded by I-95 and the Route 1 Bypass, creating a less-than-ideal walking and biking environment for the approximately 300 students who attend the school. The percentage of children walking to the school remains fairly high at around 20%, but the steep bridge over the Route 1 Bypass and the busy traffic on Woodbury Avenue leads to few students biking to school.

New Franklin Elementary School

Question 5: How far does your child live from school?

	<1/4	1/4 to 1/2	1/2 to 1	1 to 2	>2	don't know	Total
Responses	19	16	8	11	15	1	70
percentage	26.03%	21.92%	10.96%	15.07%	20.55%	1.37%	96%

Question 6: On most days, how does your child arrive at school and leave for home after school?

Arrive at School

	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other	No Answer	Total
Responses	14	1	38	19	1	0	0	0	73
percentage	19.18%	1.37%	52.05%	26.03%	1.37%	0.00%	0.00%	0.00%	100%

Leave for Home

	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other	No Answer	Total
Responses	16	1	44	9	3	0	0	0	73
percentage	21.92%	1.37%	60.27%	12.33%	4.11%	0.00%	0.00%	0.00%	100%

St. Patrick School is the only private school in Portsmouth. It has less than 200 students who travel from all over the region to get to school. The school is located in a very urban context, but given the increased distance that most children live from the school, it is not surprising that few students walk or bike.

St. Patrick School

Question 5: How far does your child live from school?

	<1/4	1/4 to 1/2	1/2 to 1	1 to 2	>2	don't know	Total
Responses	3	4	3	5	28	0	43
percentage	6.98%	9.30%	6.98%	11.63%	65.12%	0.00%	100%

Question 6: On most days, how does your child arrive at school and leave for home after school?

Arrive at School

	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other	No Answer	Total
Responses	3	0	2	33	4	0	0	1	43
percentage	6.98%	0.00%	4.65%	76.74%	9.30%	0.00%	0.00%	2.33%	100%

Leave for Home

	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other	No Answer	Total
Responses	2	0	0	37	3	0	0	1	43
percentage	4.65%	0.00%	0.00%	86.05%	6.98%	0.00%	0.00%	2.33%	100%

Portsmouth Middle School is located in a historic building downtown and has approximately 580 students. More than 50% of the survey respondents live less than two miles from the school, which leads to many students walking and biking to school. The bike rack at the school is often filled to capacity, with many students utilizing the bike rack at the adjacent library.

Portsmouth Middle School

Question 5: How far does your child live from school?

	<1/4	1/4 to 1/2	1/2 to 1	1 to 2	>2	don't know	Total
Responses	12	10	11	17	56	7	113
percentage	10.62%	8.85%	9.73%	15.04%	49.56%	6.19%	100%

Question 6: On most days, how does your child arrive at school and leave for home after school?

Arrive at School

	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other	No Answer	Total
Responses	18	9	47	35	2	0	1	1	113
percentage	15.93%	7.96%	41.59%	30.97%	1.77%	0.00%	0.88%	0.88%	100%

Leave for Home

	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other	No Answer	Total
Responses	29	8	55	16	3	0	1	1	113
percentage	25.66%	7.08%	48.67%	14.16%	2.65%	0.00%	0.88%	0.88%	100%

Overall Results

All Schools

Question 5: How far does your child live from school?

	<1/4	1/4 to 1/2	1/2 to 1	1 to 2	>2	don't know	Total
Responses	44	50	64	52	113	21	344
percentage	12.29%	13.97%	17.88%	14.53%	31.56%	5.87%	96%

Question 6: On most days, how does your child arrive at school and leave for home after school?

Arrive at School

	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other	No Answer	Total
Responses	64	37	118	130	10	1	4	2	366
percentage	17.88%	10.34%	32.96%	36.31%	2.79%	0.28%	1.12%	0.56%	102%

Leave for Home

	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other	No Answer	Total
Responses	82	37	128	101	11	0	4	3	366
percentage	22.91%	10.34%	35.75%	28.21%	3.07%	0.00%	1.12%	0.84%	102%

All Schools

Question 11: Would you probably let your child walk or bike to/from school if this problem were changed or improved?

	Q10	Q11			
ISSUE	Checked Choice	YES	NO	NOT SURE	Total
Distance	231	76	41	23	140
	64.53%	32.90%	17.75%	9.96%	60.61%
Time	96	23	20	9	52
	26.82%	23.96%	20.83%	9.38%	54.17%
Convenience of Driving	19	5	7	4	16
	5.31%	26.32%	36.84%	21.05%	84.21%
Before/After School Activities	50	10	12	7	29
	13.97%	20.00%	24.00%	14.00%	58.00%
Speed of traffic	225	93	47	34	174
	62.85%	41.33%	20.89%	15.11%	77.33%
Amount of traffic	214	89	43	30	162
	59.78%	41.59%	20.09%	14.02%	75.70%
Adult to walk/bike with	87	35	7	2	44
	24.30%	40.23%	8.05%	2.30%	50.57%
Sidewalk/Pathway	164	75	18	18	111
	45.81%	45.73%	10.98%	10.98%	67.68%
Intersection & Crossing Safety	204	94	35	23	152
	56.98%	46.08%	17.16%	11.27%	74.51%
Crossing Guards	86	32	12	5	49
	24.02%	37.21%	13.95%	5.81%	56.98%
Voilence	123	36	23	15	74
	34.36%	29.27%	18.70%	12.20%	60.16%
Weather	148	34	25	19	78
	41.34%	22.97%	16.89%	12.84%	52.70%
Q 11: bikes or walks to school		97			
		27.09%			
Total Surveys	*358*				

Response percentage

II. Safe Routes Recommendations

2.1 Physical Improvements

Engineering measures such as pedestrian refuge islands can improve real and perceived safety.

Engineering measures for Safe Routes to School include the design, construction and maintenance of physical infrastructure that can improve the safety and comfort of students who are walking and biking to school. This infrastructure includes signage, road stencils and traffic-control devices such as stop signs, bulb-outs, sidewalks, paths, bike lanes and trails. When considering engineering measures, it is best to identify the problem first and then use accepted engineering practices to develop an appropriate solution. Traffic engineering analysis reveals that unnecessary control measures tend to lessen the respect for those controls that are needed. Effective traffic control can best be obtained through the uniform application of realistic policies, practices and guidelines developed through properly conducted engineering studies. A decision to use a specific device at a particular location should be made on the basis of an engineering and/or traffic study with the input of the Portsmouth City Traffic Engineer, school staff and affected stakeholders.

Of equal importance is the maintenance and monitoring of traffic control devices. Devices should be properly maintained to ensure legibility, visibility and functionality. If a device is found to be ineffective or improperly functioning, the entity that maintains the device should be immediately notified. Finally, devices used on a part-time basis, such as warning flashers, should be in operation only during the time periods when they are required—in this case, for instance, when children are present –otherwise they risk being ignored by motorists who believe they are improperly functioning.

In the sections below, one can find the complete tool kit of potential engineering strategies planned for the immediate school zone, for areas along the school route, at street crossings and for use to slow traffic. Many of the strategies, such as on-street warning signs, are most effective if used during school commute hours. Although some engineering solutions are higher-cost infrastructure improvements, many engineering tools can be implemented without large expenditures, such as posting signs, modifying signal timings or striping crosswalks or bike lanes. The engineering strategies listed below may also be utilized at the Portsmouth High School, depending on local conditions.

A speed radar sign is an effective way to encourage motorists to comply with posted speed limits.

Signage and School Zone Improvements

School zone signage and pavement markings are one of the most cost-effective infrastrucutre treatments to "traffic calm" the area and alert drivers to the presence of school children. A comprehensive survey of the school zone signage in the vicinity of the school should be conducted as part of the initial steps of the action plan. For reference, Part 7 of the 2009 MUTCD should be consulted for sign types and location standards as well as pavement markings near schools.

School Zone Designation

School zones can be designated on all roadways contiguous to a school serving kindergarten through 12th grade. A speed limit assembly shall be used to indicate the speed limit where a reduced speed zone for a school area has been established (in accordance with law based upon an engineering study) or where a speed limit is specified for such areas by statute. The speed limit assembly shall be placed at, or as near as is practical to, the point where the reduced speed zone begins. In order for a school speed limit to be established, the school zone must meet the established criteria and the jurisdiction responsible for the highway can provide written documentation of their support for a school speeed limit. By New Hampshire state law, the numerical value of a school-zone speed limit can be up to 10 mph below the posted speed limit. School speed limits shall not be set below 15 mph and the maximum length of a school speed zone shall not be greater than 1,320 feet (0.25 mile) on a highway passing a school building, entrance or exit of a school abutting the highway. With school zones signed and delineated, focused traffic enforcement can occur to target speeding and other moving violations.

This image shows a MUTCD approved school speed limit sign.

School Area Signage

The Manual on Uniform Traffic Control Devices (MUTCD) provides guidance on the use of school area signs and markings. (This is the manual used by the State of New Hampshire for standard signage design, pavement markings and traffic control devices.) The key signs include the School Advance Warning Assembly, the School Crosswalk Warning Assembly and the School Speed Limit Assembly. One way of increasing the visibility of school area signage is through the use of Fluourescent Yellow-Green (FYG) signs. The MUTCD has adopted the yellow-green as the standard for all new school zone signs and any existing standard yellow signs should be upgraded as part of the Action Plan.

FYG School advance warning sign from the MUTCD, figure S1-1.

Pavement Markings

Pavement markings have important functions in school area traffic control. In some cases, they are used to supplement the regulations or warnings provided by devices such as traffic signs or signals. In other instances, they are used alone and produce results that cannot be obtained by the use of any other device. They can serve as an effective means of conveying certain regulations, guidance and warnings that could not otherwise be made clearly understandable. Pavement markings have limitations: they may not be clearly visible when wet or covered in snow and they may not be durable when subjected to heavy traffic. The "SLOW SCHOOL XING" marking, used in advance

of uncontrolled crosswalks, is an important school-specific pavement marking. The MUTCD also provides guidance on the use of stop lines, yield lines, curb markings and other symbol markings.

Sidewalks and Paths

The sidewalk infrastructure around most areas of Portsmouth is well developed and largely complete. While there are areas where the sidewalk needs minor repairs (including providing ADA-compliant curb ramps), few gaps exist in the network other than the neighborhoods in the Dondero School District, where sidewalks are lacking. The streetscapes near the school could also be enhanced with additional street trees, which provide both shade and a traffic-calming effect.

Crossings

School crosswalks denote the preferred location for children to cross the street. Crosswalks should be marked at all intersections on established routes to schools where substantial conflict between motorists, bicyclists and pedestrian movements exist and at uncontrolled designated school crossings where students are encouraged to cross between intersections. Crosswalks should also be marked where students would not otherwise recognize the proper place to cross. The "SLOW: SCHOOL XING" marking can be used in advance of uncontrolled school crosswalks.

Various striping patterns can be used, although the standard crosswalk consists of two parallel lines, called the "transverse" pattern. High visibility markings should be considered for all high-volume crossings near schools and where conditions demonstrate a need for increased visibility marking (e.g., a mid-block location). Recommendations include wide "piano key" or "continental" crossing patterns for the best visibility and for ease of maintenance. The first priority should be the crossings directly in front of or adjacent to the school where high daily pedestrian traffic occurs.

Raised Crosswalks

Raised crossings increase the visibility of pedestrians and serve as a traffic calming device. The crossing is essentially a speed table with the height kept at sidewalk level and striped with crosswalk markings. Advanced signage and chevrons striped onto the hump itself are necessary to warn motorists of the presence of the raised crosswalk.

Raised crosswalks, like this one near the Keene State College campus, effectively slow traffic near schools and facilitate safe pedestrian crossing.

Advance Stop and Yield Lines

Stop lines consist of solid white lines extending across approach lanes to indicate the point at which the stop is intended or required to be made, in compliance with a STOP sign or traffic signal. The MUTCD requires stop lines be placed a minimum of four feet in advance of the crosswalk line at controlled intersections. At uncontrolled crosswalk locations, "yield" lines may be used instead of stop lines. The yield lines consist of a row of solid white isosceles triangles pointing toward approaching vehicle, and are often referred to as "shark's teeth."

Bump outs

Bump outs (sometimes called curb extensions or bulb outs) have many benefits for pedestrians. They shorten the street crossing distance, provide additional space at corners, allow pedestrians to see and be seen before entering the crosswalk and simplify the placement of elements like curb ramps. Bump outs may be used at any corner or mid-block location where a parking lane can absorb the extension of the curb. They are often effective at locations with crossing distances wider than 36 feet, locations adjacent to high-intensity pick-up/drop-off activity, or at locations with sight distance or visibility issues. Bump outs have the potential to conflict with bicycle travel if not designed properly, however, and should never extend into a bike lane. Generally, they should extend to within one foot of the edge of the parking lane. Bump outs must be designed to accommodate drainage or trash accumulation, and this can prove costly if utility and drainage relocation is needed. While one of their main advantages is reducing vehicle turning speeds, bump outs can impact snow removal and the turning ability of trucks and other large vehicles.

Bump outs help to slow traffic and reduce the crossing distance for pedestrians

Lighting

Safe sidewalks serve as a primary component of good pedestrian environments; well-lit environments convey a feeling of comfort and safety, particularly at night. Lighting should be scaled for pedestrians, located in the furnishings and/or frontage zones of the sidewalk and provided at roadway crossings to increase pedestrian visibility.

Crossing Guards

Adult crossing guards help create gaps in traffic at uncontrolled intersections and "platoon" children across the street at controlled intersections. The presence of a crossing guard in the roadway serves as an easily recognized indication to drivers that pedestrians are about to use the crosswalk and that all traffic must stop. When all traffic has stopped, the adult guard can allow the children to cross. The MUTCD provides guidance in Section 7E to ensure proper training of crossing guards.

The proposed bike-related improvements will encourage more children to bike to school in the future.

Bicycle Facilities

At each of Portsmouth's five schools, this Action Plan recommends a handful of improvements adjacent to, or along, streets leading to most of the schools. In aggregate within the downtown area, these recommendations form the foundation of a city-wide bicycle network that provides connections to Portsmouth's schools, parks, job centers and the downtown core. A map of the city-wide, bike-related recommendations is shown at the end of this section.

Bicycle Lanes

Striped bike lanes along Middle Street will encourage bicycling to Portsmouth Middle School and into downtown.

Bicycle lanes are striped lanes that designate a space on the road for bicycle travel. They are typically warranted where average daily trips (ADT) exceeds 2,000 trips and the 85th percentile speeds are 25 mph or more. If ADT or vehicular speed is less, bicycle boulevard treatment should be considered (see below). Bike lane width must be carefully considered due to the prevailing context of adjacent traffic and the presence of on-street parking. Typically five-foot bike lanes work well when set between a standard 11-foot-wide travel lane and an eight-foot wide curb-side parking lane. In constrained situations, bike lanes may be 4.5-feet wide next to on-street parking or even four feet when striped immediately adjacent to a curb. On streets with heavy truck traffic or traffic speeds that exceed 35 mph, a six-foot bike lane is preferable to provide an additional buffer for cyclists. In numerous instances, streets with well-designed and maintained bike lanes have encouraged new riders and studies have shown that bike lanes reduce sidewalk cycling, wrong-way riding and encroachment of the double yellow line by passing motorists. Six-foot bike lanes are recommended along Middle Street (Route 1) to encourage cycling to the Middle School, St. Patrick and downtown Portsmouth.

Bicycle Boulevards

Bicycle Boulevards include traffic-calming elements that slow and divert traffic to promote safe cycling.

Bicycle Boulevards create an attractive, convenient and comfortable cycling environment that welcomes cyclists of all ages and skill levels. They are low-volume and low-speed streets that have been optimized for bicycle travel through traffic calming and traffic reduction, signage and pavement markings, and intersection crossing treatments. These treatments allow through movements for cyclists while discouraging similar through trips by non-local motorized traffic. Motor-vehicle access to properties along the route is always maintained. In conjunction with Portland State University, Alta has developed the *Bicycle Boulevard Planning and Design Guidebook*. It can be found at http://www.ibpi.usp.pdx.edu/guidebook.php.

Recommended locations for Bike Boulevard treatment include Lincoln Avenue between Middle (Route1) and Junkins, with a westward extension along Aldrich Road between Islington and Middle, and Elwyn Avenue between Rockland and South Street.

Shared Lane Markings

Shared lane markings or "sharrows" are street stencils that provide some level of bike accommodation along streets not wide enough to provide a striped bike lane. Sharrows are placed in the center or on the right-hand side of travel lanes that are between 11-15-feet wide. Combined with "Share the Road" signs, the stencils are intended to remind motorists to expect cyclists on a particular street and to give cyclists a modest sense of entitlement to the travel lane and to not feel relegated to the gutter or on the sidewalk. These markings, however, are inappropriate along streets signed for speeds higher than 30 mph.

Shared lane markings provide an improvement for cyclists on streets not wide enough for striped bike lanes.

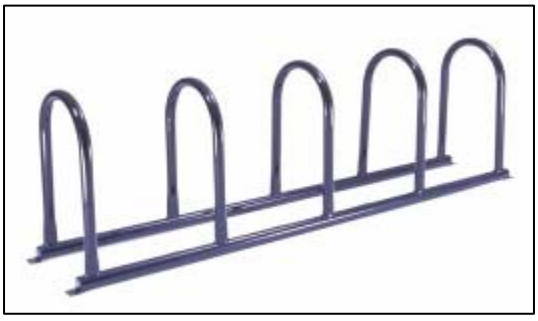
Bicycle Parking

Providing secure and convenient bicycle parking helps encourage more children, faculty, staff and visitors to bicycle to school. Attributes of good bike parking include:

- Protection from vandalism/theft
- Protection from damage to the bicycle
- Protection from weather
- Convenient to destination

Plentiful and well-placed bike racks will help to draw more bicycling students.

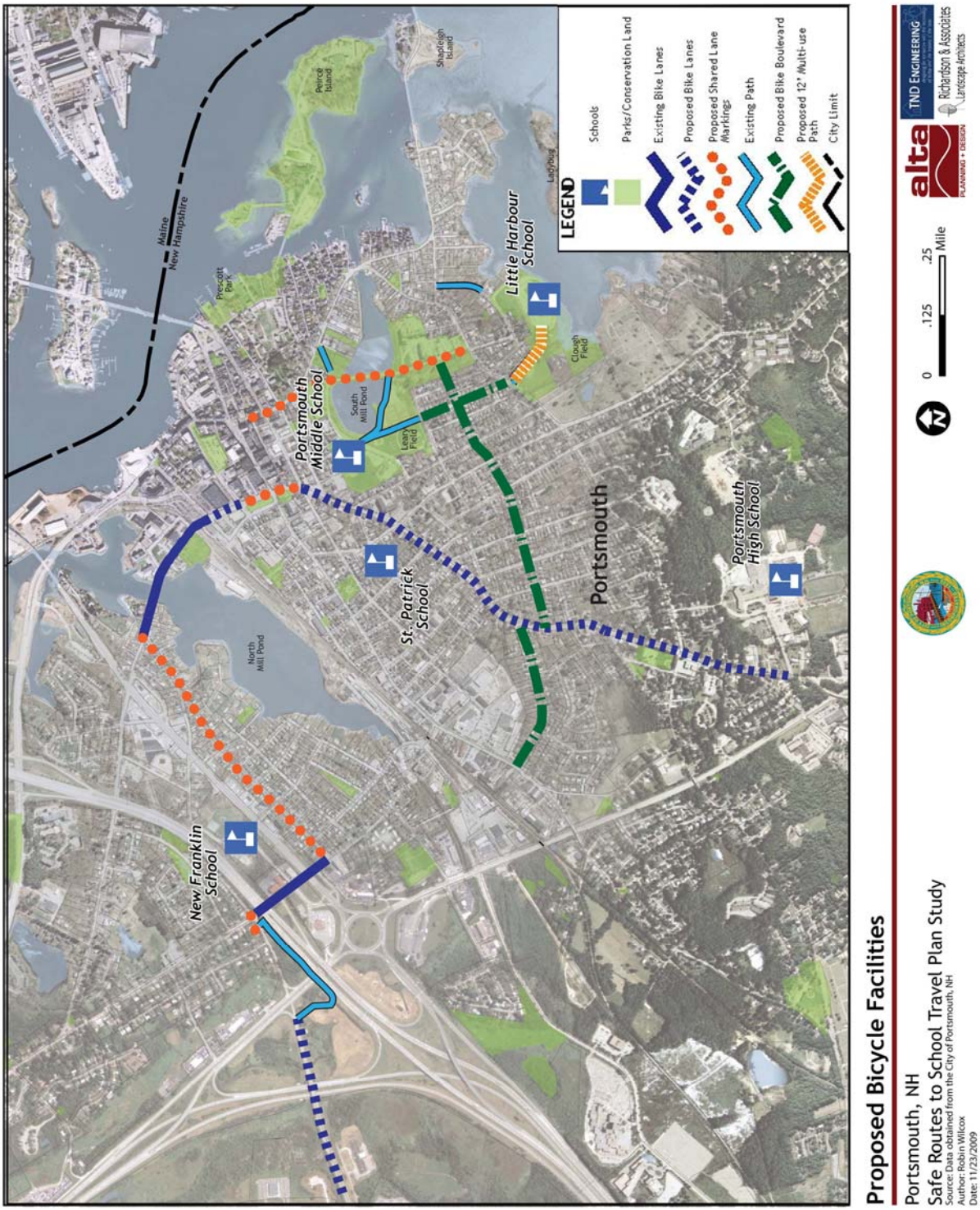
A sufficient amount of parking must be made available so that bicycles are not crowded. Secure parking in either a fenced-in or high visibility location could be provided. If possible, a covered shelter should be provided to protect the bicycles during inclement weather. The preferred bike rack design should keep the bike upright by supporting the frame, allow the bike to be locked by the frame and allow one or both wheels to be secured.



Above is an example of a preferred bike rack design that supports a bicycle in an upright position without placing additional strain on the wheels. At right is a bike-parking kiosk that can be easily installed to protect bicycles from inclement weather.

Bicycle Network

In aggregate, the combination of the numerous types of bicycle facilities illustrated above form the foundation of a bike network for Portsmouth. The map below illustrates the relationship between existing facilities and those proposed in section 2.2 School-Specific Engineering Recommendations on the following page.



2.2 School-Specific Engineering Recommendations

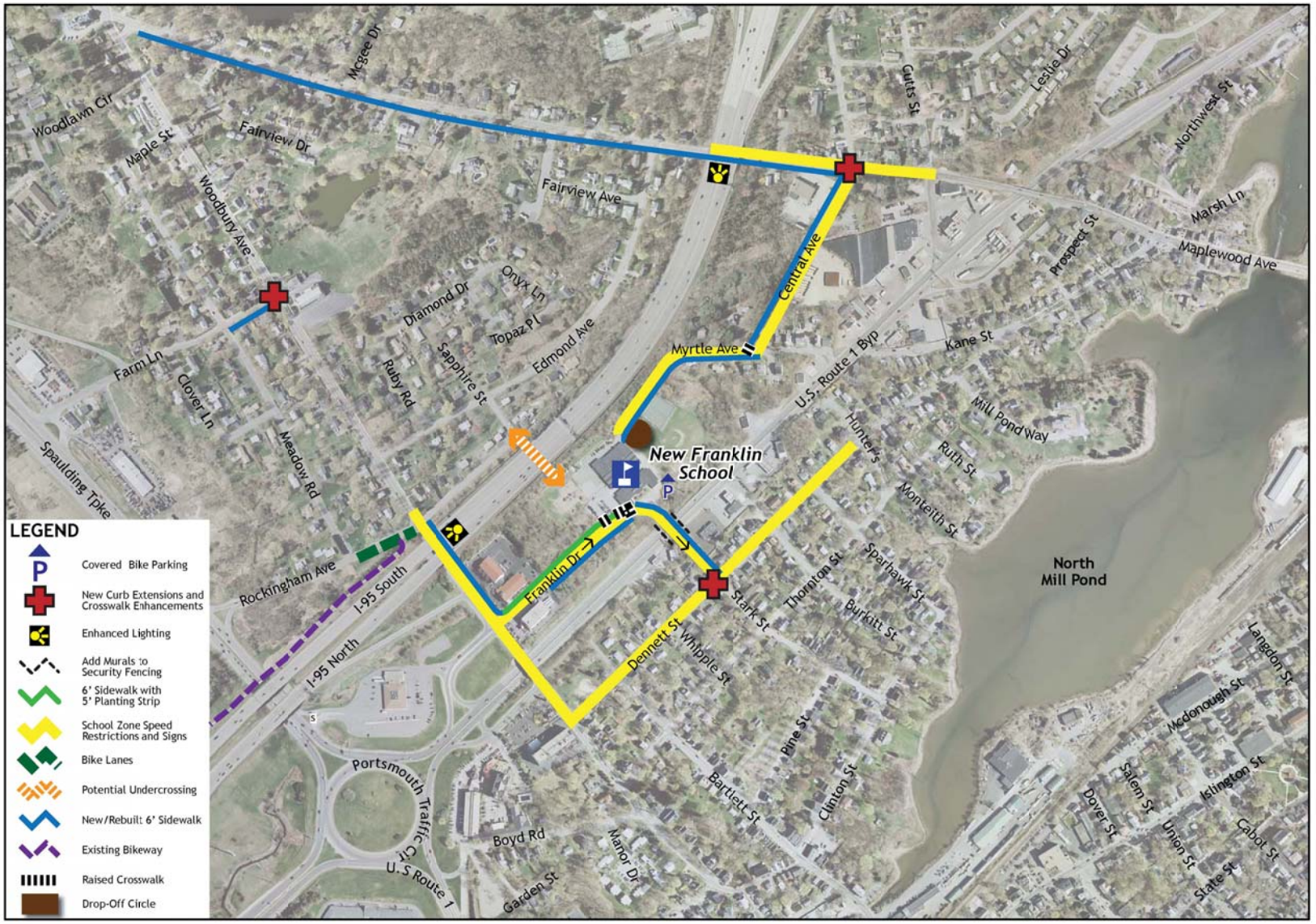
New Franklin Elementary School

The New Franklin Elementary School sits in a location that limits the number of students who can comfortably walk or bike to school. It is bordered on three sides by Interstate 95, the Route 1 Bypass and Woodbury Avenue, a busy collector road with on/off ramp connections to the Portsmouth Traffic Circle. Accessing the school from the north requires crossing under I-95 along either Woodbury or Maplewood Avenues, which are both busy collector roads with limited sidewalk connections. Only Woodbury includes a short stretch with bike lanes. From the south, children and parents are able to access the school in some relative comfort, but the missing or crumbling sidewalks along the Stark Street overpass make the walk less than ideal. Two-way traffic along Franklin Drive and confusing vehicle circulation within the parking lot to the west of the school offer additional challenges to safe and convenient walking and biking to school.

Currently, buses are able to drop students off at the curb very close to the entry of the school

Walking west from the school towards Woodbury requires crossing a large swath of asphalt

Engineering recommendations for New Franklin Elementary School include a host of measures that will make walking and bicycling more comfortable and safe. Overall, the improvements are shown in the diagram on the following page and on subsequent pages, which present the recommendations in a greater level of detail, including an approximate cost estimate.



New Franklin School Traffic and Streetscape Improvement Plan

Portsmouth, NH
Safe Routes to School Travel Plan Study
Source: Data obtained from the City of Portsmouth, NH
Author: Robin Wilcox
Date: 11/23/2009

0 300 600 Feet

alta PLANNING + DESIGN
TND Engineering
Richardson & Associates Landscape Architects

Each recommended project for the New Franklin School is shown in the tables below. These recommendations represent a balanced approach which covers both physical improvements and operational measures. To assist in the implementation of these initiatives, additional information is provided on each item including the public agencies and other groups that should be involved and an approximate cost range for the project. Generally, costs for each project are categorized as:

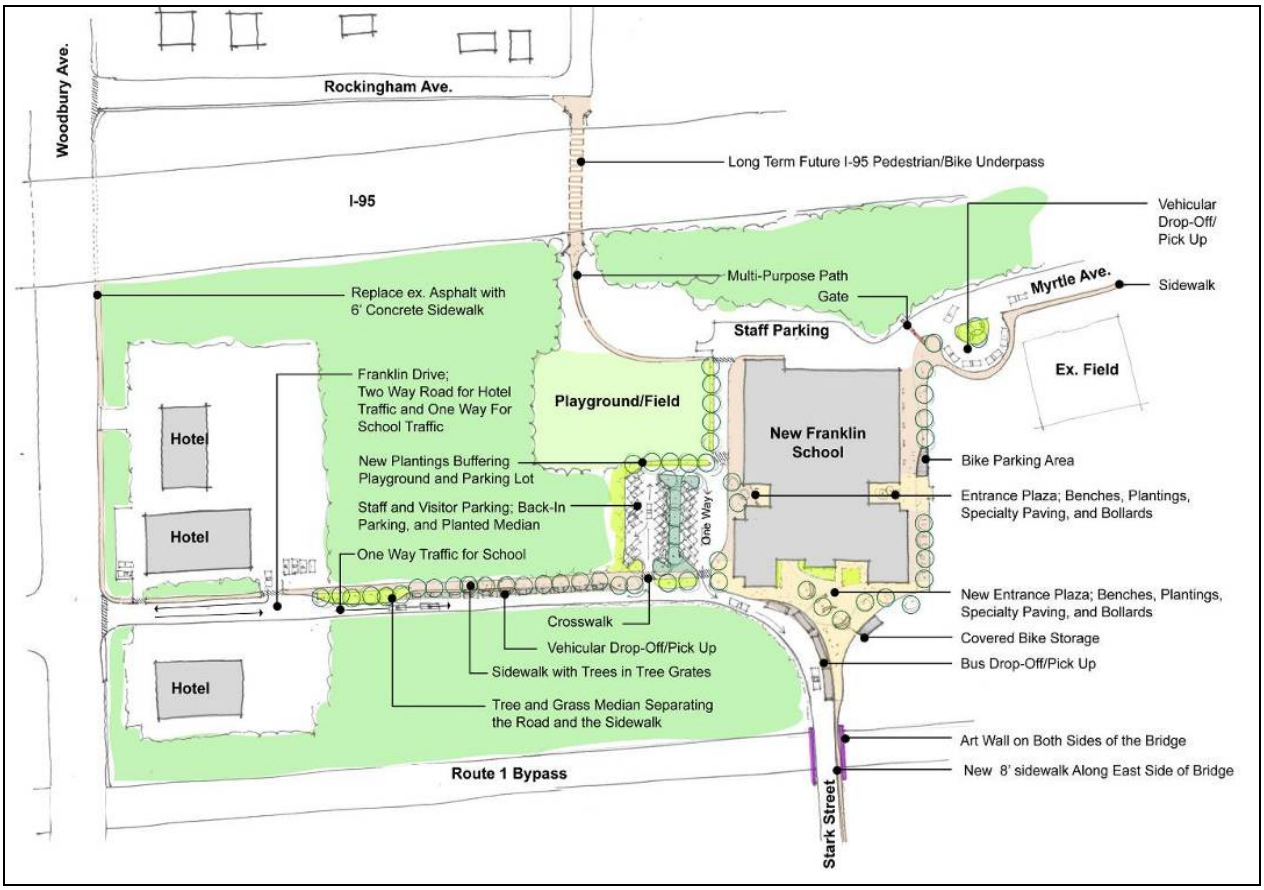
$	= Minimal to $2,000	Low funding required with short time frame
$$	= $2,000 to $20,000	Moderate amounts of funding required
$$$	= >$20,000	High amounts of funding with longer time frame required

Engineering Recommendation NFS-1	*School zone street designations and reduced speed limit signs along Woodbury, Dennett, Franklin, Central and Maplewood Avenue*
Cost	$$
Lead Organizations	School Administration and Portsmouth DPW
Description	Collector streets leading to the New Franklin school or those that currently carry, or are expected to carry, parents and students on foot or on bike should have reduced speed limits and/or flashing "School Zone" signs. Consistent with NHDOT policy, prevailing speed limits should be reduced by 10 mph during weekday school hours within the designated School Zone. Where resources are available, sign-mounted flashing yellow beacons or instant-feedback "Your speed is __" electronic signs should be employed at strategic locations.

Engineering Recommendation NFS-2	*Improved intersections with curb bump outs and enhanced crosswalks*
Cost	$$ per bump out ($$$ if an existing storm drain requires relocation)
Lead Organization	Portsmouth DPW
Description	At key locations where children currently cross, or are likely to cross, busy streets, intersection safety improvements should be implemented. Where curb-side parking is allowed or where travel lanes are wide or contain shoulders, bump-outs will make pedestrians wishing to cross the street more visible to motorists and reduce the crossing distance. These should be combined with enhanced crosswalks that are highly visible and long lasting such as thermoplastic piano key-style striping or unit pavers. Key locations for these improvements include Woodbury Avenue at Farm Lane, Dennett Street at Stark Street and Maplewood Avenue at Central Avenue.

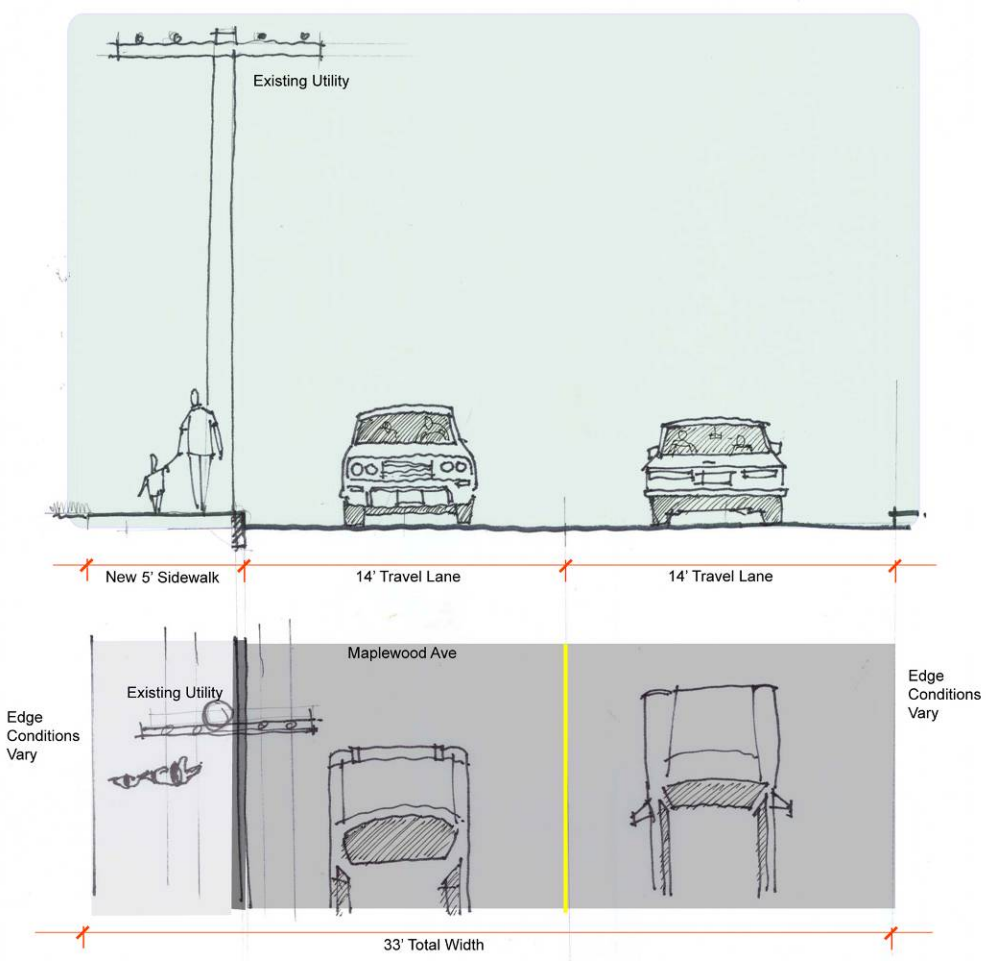
Engineering Recommendation NFS-3	*Bike lanes along Rockingham Avenue to provide connectivity from the Pease Tradeport/I-95 multi-use path to Woodbury Avenue*
Cost	$
Lead Organization	Portsmouth DPW
Description	Striped bike lanes along Rockingham will provide bicycle connectivity from the east end of the multi-use path to the existing bike lanes along Woodbury Avenue.

Engineering Recommendation NFS-4	*One-way, east-bound traffic flow along Franklin Drive; one-way, south-bound traffic flow along the Stark Street bridge over the Route1 Bypass*
Cost	$$
Lead Organizations	School Administration, SRTS Committee and Portsmouth DPW
Description	Creating a one-way traffic flow along Franklin Drive and the Stark Street bridge over the Route 1 Bypass will simplify vehicle movement and make for a more efficient drop-off and pick-up time at the school. A single traffic lane will provide space within the ROW for new sidewalks and a legal standing zone along the curb to drop off and pick up students (see Detailed Campus Plan on following page). This change needs to be carefully coordinated with the School Administration to ensure bus operations are not compromised.



Detailed Campus Plan highlighting one-way traffic along a revised Franklin Drive

Engineering Recommendation NFS-5	*New or reconstructed five-to-six foot sidewalks along Rockingham, Woodbury , Franklin, Myrtle, Central and Maplewood Avenue*
Cost	$$$ per street location
Lead Organizations	School Administration, Safe Routes to School Committee and Portsmouth DPW
Description	These sidewalks will provide needed connectivity to the New Franklin School for parents and students on foot. These streets currently lack sidewalks, include them on the far side of the road (Maplewood, see detail image below), or contain sidewalks that are either too narrow, poorly maintained or both (Woodbury and Franklin Drive). In most locations, five-foot sidewalks are sufficient, but along Woodbury and Franklin Drive, six-foot sidewalks would be preferable. Along Franklin, street trees should be planted in grates where student drop-off will be permitted or within tree lawns where curb-side access is unnecessary.



Maplewood Avenue cross-section featuring new five-foot sidewalk along south side

Engineering Recommendation NFS-6	*Raised crosswalks along Franklin Drive and at the Central-Myrtle Avenue intersection*
Cost	$$ per raised crosswalk
Lead Organization	Portsmouth DPW
Description	Raised crosswalks are recommended on Franklin Drive where the north sidewalk intersects twice with the parking lot. These will slow traffic entering the parking lot and prioritize those walking to the school. The raised crosswalks also increase connectivity for those in wheelchairs by allowing them to stay at sidewalk grade and not ramp down twice at each point where the sidewalk meets the parking lot (see image on following page). A similar configuration is recommended where the proposed sidewalk along Central Avenue meets Myrtle Avenue and crosses to the opposite side, connecting to the northeast corner of the school

Before/After photo-simulation of Franklin Drive highlighting the raised crosswalks adjacent to the school parking lot

Engineering Recommendation NFS-7	*Reconstructed 8-10 foot sidewalk on the east side of the Stark Street bridge over the Route 1 Bypass road*
Cost	$$$
Lead Organizations	Portsmouth DPW and NHDOT
Description	The Stark Street bridge is the primary route for many students walking or biking from the neighborhoods immediately to the south of the school. As such, the connection should be continuous and comfortable. Because the west sidewalk does not lead directly to the school, the sidewalk on the east side should be widened to accommodate both walkers and cyclists. The new sidewalk should direct students to a small entry plaza to the school instead of an underutilized drop off circle that currently exists today (see Detail Campus Plan on page 24).

Today, the Stark Street bridge has narrow sidewalks that are not contiguous with the Dennett Street intersection and are in poor condition.

Engineering Recommendation NFS-8	*Security fence murals along the Stark Street bridge over the Route 1 Bypass*
Cost	$-$$
Lead Organizations	School Administration and Portsmouth DPW
Description	The security fences on each side of the Stark Street bridge are ripe opportunities for a community-based mural project. Colorful murals — potentially developed in conjunction with New Franklin School students and staff — will make the walk over the bridge a more interesting experience than looking out at the passing traffic along the Route 1 Bypass below. Flanked by colorful murals, walkers may also feel more sheltered and safe as they cross the busy highway.

Engineering Recommendation NFS-9	*Enhanced lighting below the I-95 overpass that sits above Woodbury and Maplewood Avenues*
Cost	$$
Lead Organizations	Portsmouth DPW and NHDOT
Description	Currently, lighting that sits below the pair of I-95 overpasses near the school are oriented to motorists. Additional lighting at the scale of a pedestrian along the east sidewalk of Woodbury Avenue and the south sidewalk of Maplewood Avenue will create a more comfortable and safe walking environment and help tie together the neighborhoods on either side of I-95.

Engineering Recommendation NFS-10	*Vehicle drop-off circle at the west end of Myrtle Avenue*
Cost	$$$
Lead Organizations	Portsmouth DPW and Portsmouth Parks and Recreation Department
Description	A new vehicle drop-off circle should be instituted at the west end of Myrtle Avenue, just short of the existing fence that prohibits through-traffic behind the school. The drop-off circle will allow parents who live to the north and east of the school to avoid using Franklin Drive to drop off or pick up their children. Reducing congestion on the future one-way loop along Franklin Drive and the Stark Street will create a more pedestrian and bike friendly environment for those accessing the school from the adjacent neighborhoods. The additional traffic along Central and Myrtle will be mitigated by new sidewalks and a raised crosswalk. The radius of the circle should be minimized to avoid significant impacts to the green space and play fields adjacent to the school along Myrtle Avenue.

Engineering Recommendation NFS-11	*Additional bike racks and sheltered bike parking*
Cost	$$
Lead Organization	Portsmouth DPW
Description	Additional bike racks should be located where students are likely to arrive at school and space is available without disrupting the flow of students, parents and staff on foot. Likely locations include the north-east corner of the school (for those cycling via Myrtle Avenue) and in front of the school building's south side (for those cycling over the Stark Street bridge or via Franklin Drive). The latter area should include a shelter to protect bikes from inclement weather and become a visual promotional sign for biking to school.

Engineering Recommendation NFS-12	*Pedestrian underpass below I-95 at Sapphire Street*
Cost	$$$+
Lead Organizations	Portsmouth DPW and NHDOT
Description	Despite improvements described above, walking and biking to the New Franklin School will remain relatively low for those who live on the other side of Interstate 95. Especially for those living east of Woodbury Avenue, using the existing street network to walk to school requires out-of-direction travel along busy streets with narrow or nonexistent sidewalks. A well-designed and well-lit crossing below I-95 for walkers and cyclists, connecting directly to the school will likely tap into the latent demand to access the school without a motor vehicle. Though an expensive proposition, the underpass will help to break down the barrier that the elevated highway creates in this part of Portsmouth.

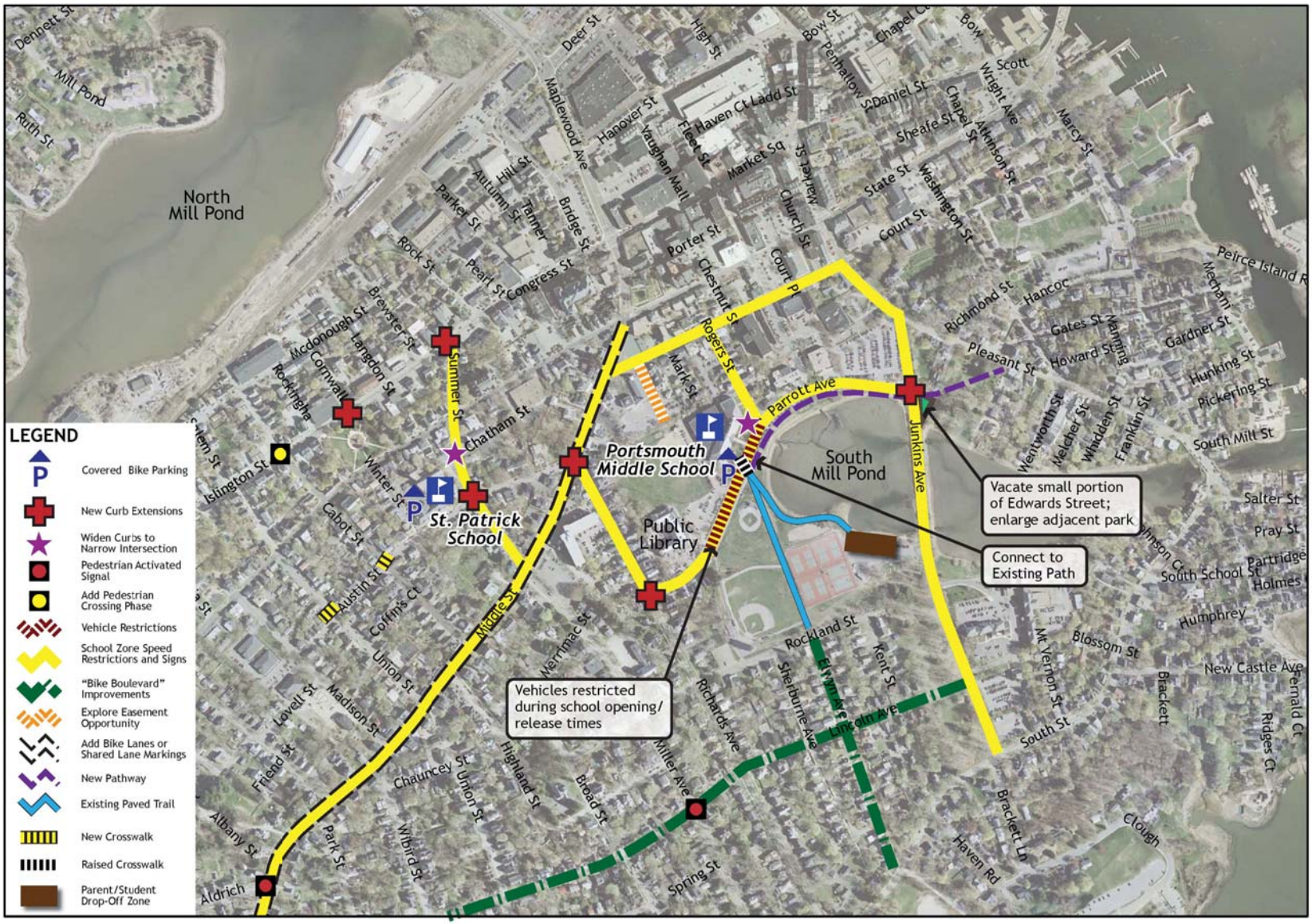
Portsmouth Middle School

The Portsmouth Middle School is located immediately adjacent to downtown and is well served by an interconnected network of streets with sidewalks on one or both sides. The glaring exception is Parrott Avenue which lacks sidewalks from Rogers Street to Junkins. A well-worn path adjacent to South Mill Pond indicates a significant demand for a sidewalk. Adjacent to the school, the Portsmouth Public Library and a collection of ballfields, tennis courts and a playground serve as major destinations for not only Middle School students, but the entire community. As such, walking and biking improvements to the Middle School possess more far-reaching implications than just safe routes to school.

Tree-lined streets with comfortable sidewalks define most of the neighborhoods that surround Portsmouth Middle School.

Because Portsmouth Middle School is located in the center of the City, tremendous opportunity exists to significantly increase the already high number of children walking and biking to school. According to the 2007 Safe Routes to School survey data, 30% of students live less than a mile from school (a 20-minute walk) and 45% live less than two miles from school (a 10-15-minute bike ride). With the appropriate changes to the infrastructure (along with programs developed for the other four Es), an increase in walking and biking is very likely at the Middle School. Key components to this include reducing traffic speeds on Miller Avenue (Route 1) and improving crossing opportunities. Another important element invovles rationalizing the somewhat chaotic mix of cars, buses and students on foot and bike that results in front of the school when the day begins and at dismissal time. Strategies to improve this scenario — such as moving student drop-off and pick-up to an off-site location — have been looked at in detail.

Engineering recommendations for the Portsmouth Middle School include a host of measures that will make walking and bicycling more comfortable and safe. Overall, the improvements are shown in the diagram on the following page, and subsequent pages present the recommendations in a greater level of detail, including an approximate cost estimate.



St. Patrick School / Portsmouth Middle School Traffic and Streetscape Improvement Plan

Portsmouth, NH
Safe Routes to School Travel Plan Study
Source: Data obtained from the City of Portsmouth, NH
Author: Robin Wilcox
Date: 11/23/2009

0 300 600 Feet

alta PLANNING + DESIGN
TND Engineering
Richardson & Associates Landscape Architects

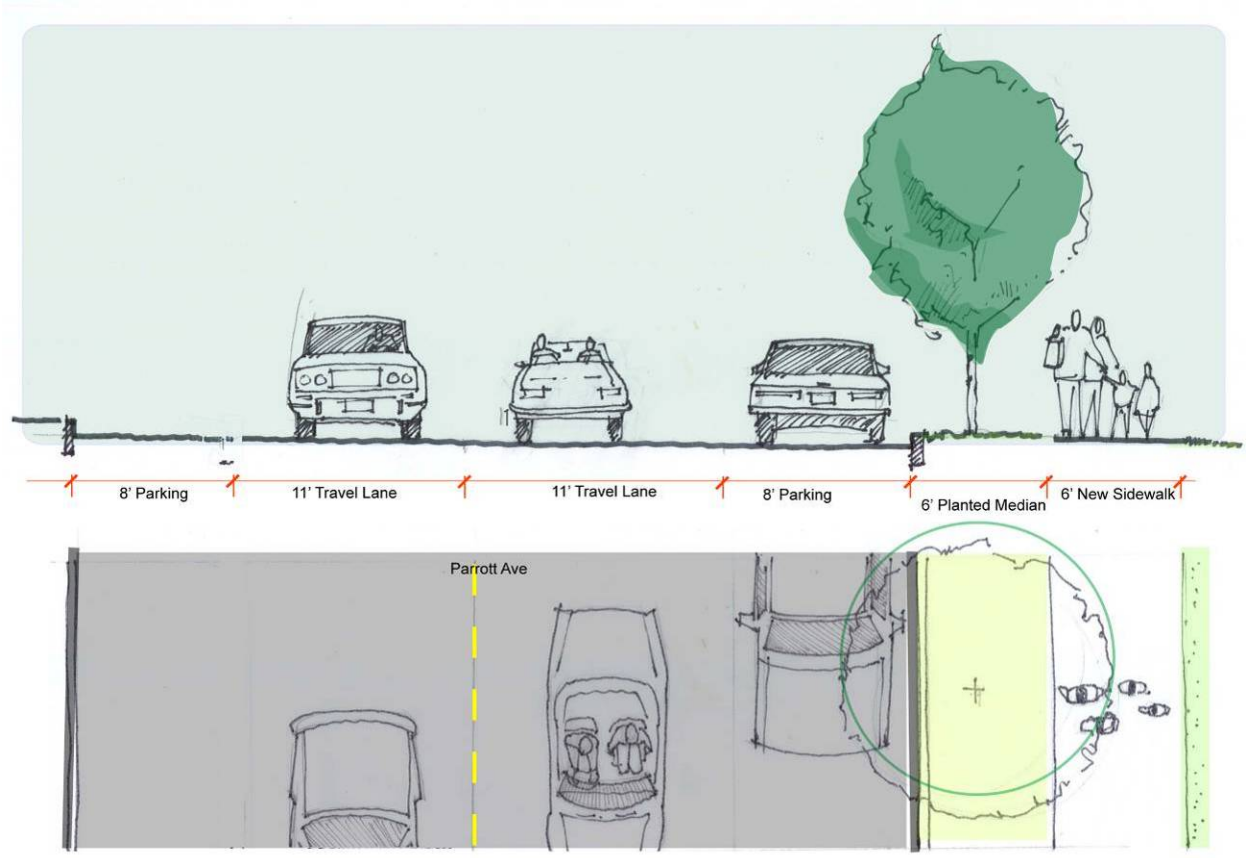
Each recommended project for the Middle School is shown in the tables below. These recommendations represent a balanced approach which covers both physical improvements as well as operational measures. To assist in the implementation of these initiatives, additional information is provided on each item including the public agencies and other groups that should be involved and an approximate cost range for the project. Generally, costs for each project are categorized as:

$	= Minimal to $2,000	Low funding required with short time frame
$$	= $2,000 to $20,000	Moderate amounts of funding required
$$$	= >$20,000	High amounts of funding with longer time frame required

Engineering Recommendation PMS-1	*School zone street designations and reduced speed limit signs along Middle, Court, Rogers, Junkins, Parrott and Richards Avenue*
Cost	$$
Lead Organizations	School Administration and Portsmouth DPW
Description	Collector streets leading to the Middle School or those that currently carry, or are expected to carry, parents and students on foot or on bike should have either reduced speed limits and/or flashing "School Zone" signs. Consistent with NHDOT policy, prevailing speed limits should be reduced by 10 mph during weekday school hours within the designated School Zone. Where resources are available, sign-mounted flashing yellow beacons or instant-feedback "Your speed is __" electronic signs should be employed at strategic locations.

Engineering Recommendation PMS-2	*Improved intersections with curb bump outs and enhanced crosswalks*
Cost	$$ per bump out ($$$ if an existing storm drain requires relocation)
Lead Organization	Portsmouth DPW
Description	At key locations where children currently cross, or are likely to cross, busy streets, intersection safety improvements should be implemented. Where curb-side parking is allowed or where travel lanes are wide or contain shoulders, bump-outs will make pedestrians wishing to cross the street more visible to motorists and reduce the crossing distance. These should be combined with enhanced crosswalks that are highly visible and long lasting such as thermoplastic striping or unit pavers. Key locations for these improvements include the intersection of Junkins and Parrott, Richards and Parrott and Middle/Richards/Austin.  **Bump outs and tighter curb radii at Parrott/Junkins will reduce the current pedestrian crossing distance substantially**

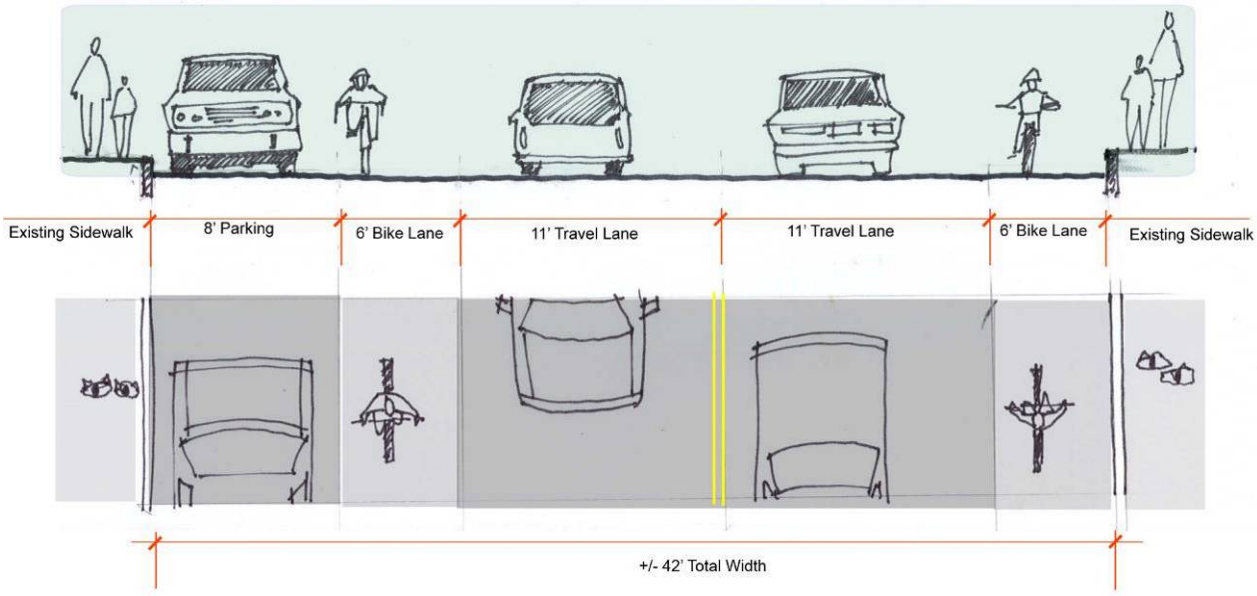
Engineering Recommendation PMS-3	*Sidewalk/path along the south side of Parrott Avenue between Junkins and the existing paths through the play fields across from the Middle School*
Cost	$$-$$$
Lead Organization	Portsmouth DPW
Description	A new sidewalk along Parrott Avenue between Junkins Avenue and the west end of South Mill Pond, or a path along the north edge of the Pond will provide a pedestrian connection from the Middle School to the Junkins/Parrott intersection and the neighborhoods to the east. Neither option will affect the adjacent roadway except at the Junkins intersection, per the bump outs described in PMS-2. As the photo above shows, the worn path in this location today is testament to the demand for such a facility.  **Today's condition along Parrott Avenue**



Recommended Parrot Avenue cross-section illustrating the new sidewalk along the south side of the street

Engineering Recommendation PMS-4	*Morning arrival and afternoon dismissal period traffic restrictions on Parrott Avenue between Rogers Street and the Public Library parking lot*
Cost	$
Lead Organizations	School Administration, Middle School staff, Portsmouth DPW and Portsmouth Police Department
Description	Morning drop-off and afternoon dismissal create busy periods in front of the Middle School. Motor vehicle passage should be prohibited from Rogers Street to Public Library parking lot entrance from 7-7:45 am and from 1:45-2:30 PM every school day. This prohibition will need to be facilitated using orange traffic cones and signage by Middle School staff in conjunction with the Portsmouth Police Department.

Engineering Recommendation PMS-5	*Bike lanes along Middle Street (Route 1) from State Street to Portsmouth High School entrance at Andrew Jarvis Drive*
Cost	$$
Lead Organization	Portsmouth DPW
Description	Middle Street connects many of Portsmouth's close-in, older neighborhoods to downtown and the middle school. Providing dedicated bike lanes along this route will encourage middle school students to ride to school and will encourage people throughout the community to use bicycles more frequently as their chosen mode of transportation. Planning the bike lanes from downtown to the high school will additionally provide opportunities for high school students to ride to and from school as well. The Middle Street bike lanes could become the primary spine of a future network of bike routes throughout the city (see Bike Network Diagram on page 19). The curb-to-curb dimension of Middle Street varies, but is approximately 42 feet in many locations. To accommodate bike lanes, the Action Plan recommends that on-street parking be allowed on only one side of the street. South of State Street, commercial land uses are infrequent and the demand for parking drops considerably. The extension of the bike facility into downtown and further north will need to be accommodated using shared lane markings and signage.



Recommended Middle Street (Route 1) cross-section illustrating the proposed bike lanes

Engineering Recommendation PMS-6	*Pedestrian-actuated traffic signal at the intersection of Aldrich Street and Middle Street (Route 1)*
Cost	$$$
Lead Organizations	Portsmouth DPW and NHDOT
Description	Currently no signal-controlled crosswalks exist along Middle Street from Miller Avenue to South Street, a substantial distance in an urban environment where many people walk. Aldrich Street is the approximate mid-point between these two signals and should have a pedestrian-actuated traffic signal to facilitate crossing Route 1 in this area. This will benefit students walking or biking to the middle school from the neighborhood between Middle and Islington streets.

Engineering Recommendation PMS-7	*Bicycle Boulevard treatment along Lincoln and Elwyn Avenues, including pedestrian-actuated device at the intersection of Lincoln and Miller avenues*
Cost	$$$
Lead Organizations	Portsmouth DPW with significant public outreach required
Description	Lincoln Avenue provides an ideal opportunity for east-west bike travel between Middle Street (Route 1) and Junkins Avenue. In its current condition, the street provides a reasonably comfortable environment for bicyclists but could be improved with Bike Boulevard treatment including: • Traffic calming elements such as speed tables, bump outs and other diverters • Pedestrian/bicyclist actuated device at Miller Avenue (further analysis based on MUTCD and NHDOT guidelines will be necessary). • A single block-long stretch of one-way traffic only to discourage through traffic on Lincoln Avenue. • Street signs and road stencils that promote lane sharing and warn of the presence of cyclists. While the Bike Boulevard will extend from Middle to Junkins, a shorter Bike Boulevard along perpendicular Elwyn Avenue will provide the direct connection to both the Middle School and the Little Harbour School.

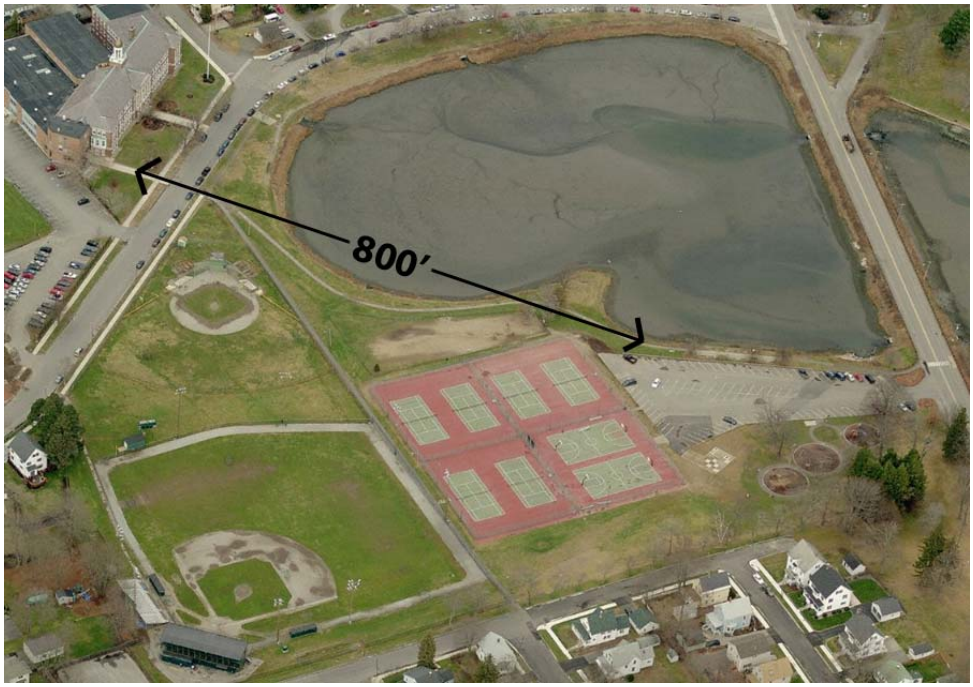
Engineering Recommendation PMS-8	*Sheltered bike parking*
Cost	$$
Lead Organizations	School Administration and Portsmouth DPW
Description	Additional bike racks should be located near the main entrance of the Middle School without disrupting the flow of students, parents and staff. At least 50% of the racks should include a shelter to protect bikes from inclement weather and become a promotional sign for biking to school.

Engineering Recommendation PMS-9	*Potential easement through Middle Street Baptist Church property to provide a convenient walking and biking route to Middle Street*
Cost	$-$$
Lead Organizations	School Administration, Portsmouth DPW and Church administration
Description	The Middle School sits on a large block that requires significant out-of-direction travel for walkers trying to reach Middle Street. The natural desire line is currently not possible due to fenced private property that fronts Richards, Middle and Court streets. The Action Plan recommends that the City negotiate with the Middle Street Baptist Church to explore the possibility of establishing an easement through church property for students walking or biking to Middle Street. The connection could be through a gate that is unlocked by Middle School staff during school hours only to prevent trespassing at night and on non-school days.

The removal of a short portion of Edward Street combined with intersection improvements at Junkins/Parrott and a new sidewalk along Parrott Avenue will dramatically improve community access to the Middle School and Public Library.

Engineering Recommendation PMS-10	*Vacate small portion of Edward Street from Junkins to Parrott Avenue and expand adjacent park space*
Cost	$$$
Lead Organizations	Portsmouth DPW and Portsmouth Parks and Recreation Department
Description	In conjunction with curb bump outs and other intersection improvements at the Junkins/Parrott intersection (see PMS-2), the short stretch of Edward Street between Junkins and Parrott should be vacated and the land amalgamated into the adjacent park space. This change will require north-bound Edward Street traffic to use the Junkins/Parrott intersection rather than veering off of Junkins at a high speed. In addition to closing off this section of street, a new sidewalk and reconstructed pathway through the park will improve connectivity to the Middle School and Public Library from the Pleasant Street and Prescott Park area neighborhood to the east.

Engineering Recommendation PMS-11	*Move parent pick-up and drop-off area to existing parking lot near South Mill Pond, adjacent to tennis courts*
Cost	$
Lead Organizations	Portsmouth DPW and Portsmouth Parks and Recreation Department
Description	During morning drop-off and afternoon dismissal, the convergence of students via private automobile, bike, on foot or by school bus can be chaotic. In the afternoon especially, parents frequently will park or stand illegally while waiting for their child to leave the school at 2:00 pm. In order to take these additional vehicles out of the mix, a dedicated student pick-up and drop-off area is recommended for the existing parking lot on the opposite end of South Mill Pond, adjacent to the tennis courts. An appropriate number of parking spaces should be signed for "10 minute parking only" before 8 am and between 1:45-2:30 PM. Additionally, new lighting should be considered along the path between the parking lot and the school for the winter months when the sun is just coming over the horizon during the morning drop-off period. This change will create the additional benefit of providing a five-ten minute daily walk for students. Exceptions to this proposal should be made for handicapped students or those with special needs.



The new drop-off/pick-up zone for parents and students in private automobiles is recommended for City-owned parking lot less than a ¼ mile from the middle school
(aerial photo from www.bing.com/maps)

Engineering Recommendation PMS-12	*Raised crosswalk across Parrott Avenue*
Cost	$$
Lead Organization	Portsmouth DPW
Description	The two paths that cut through the ball fields and park space across from the Middle School lead directly to one of the school's main entrances. Converting the existing crosswalk on Parrott Avenue to a raised crosswalk at the school's entrance location will slow traffic and further facilitate walking and biking along these paths. The raised crosswalk will also discourage buses from parking on or too close to the crosswalk, blocking students during morning bell and dismissal times.

Engineering Recommendation PMS-13	*Reduced curb radius in the northeast corner of the Rogers Street and Parrot Avenue intersection*
Cost	$$
Lead Organization	Portsmouth DPW
Description	The extremely large turning radius at the northeast corner of Rogers and Parrott enables speeding and creates a far longer crossing distance for students using the crosswalk located at the intersection. The turning radius should instead be 15-25 feet, depending on site conditions. This will slow traffic making this turn and reduce the street-crossing distance for those walking to the Middle School.

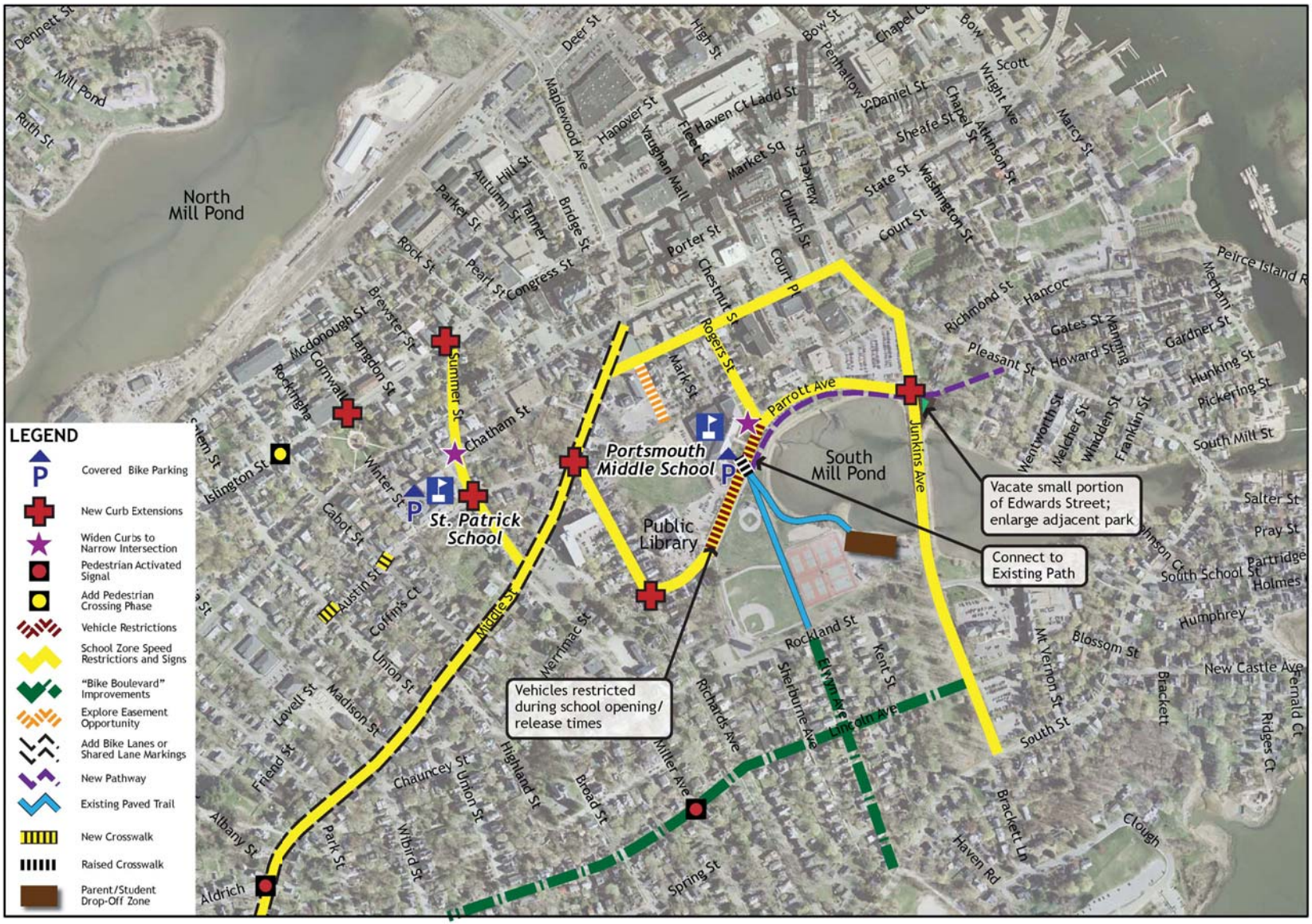
St. Patrick School

The St. Patrick School is the only private school eligible for review in this study. It sits on a small block in an urban environment of small blocks and relatively narrow streets. Though the neighborhoods surrounding the school are densely populated and generally pedestrian friendly, very few children walk or bike to the school. The primary reason for this is because the student body comes from all over the city and from a number of surrounding communities, far beyond walking or biking distance. (The school has developed a highly efficient system of drop-off and pick-up to accommodate the number of students who are traveling by private vehicles.) Despite this, a number of measures could be taken to improve the environment for those who currently walk or bicycle to school and to encourage others who dwell in the surrounding neighborhoods to come by foot or bike. Meetings with parents and school officials confirmed that students who live as far as South Street are being walked to school with their parents, but many others who live this far or even closer do not feel comfortable walking or biking to school because of traffic concerns.

Many motorists approach the Summer/Austin intersection (background) at a high rate of speed.

Student pick-up period at the St. Patrick School is run extremely efficiently, using Winter and Chatham streets for queuing.

Engineering recommendations to both Middle and Islington streets are the focus of the Action Plan's recommendations for St. Patrick School. In addition, calming traffic along Summer Street, especially near the Austin Street intersection, will go a long way to making walking or biking a more attractive option. Overall, the improvements are shown in the diagram on the following page, and subsequent pages present the recommendations in a greater level of detail, including an approximate cost estimate.



St. Patrick School / Portsmouth Middle School Traffic and Streetscape Improvement Plan

Portsmouth, NH
Safe Routes to School Travel Plan Study
Source: Data obtained from the City of Portsmouth, NH
Author: Robin Wilcox
Date: 11/23/2009

0 300 600 Feet

alta PLANNING + DESIGN
TND Engineering
Richardson & Associates Landscape Architects

Each recommended project for the St. Patrick School is shown in the tables below. These recommendations represent a balanced approach which covers both physical improvements as well as operational measures. To assist in the implementation of these initiatives, additional information is provided on each item including the public agencies and other groups that should be involved and an approximate cost range for the project. Generally, costs for each project are categorized as:

$	= Minimal to $2,000	Low funding required with short time frame
$$	= $2,000 to $20,000	Moderate amounts of funding required
$$$	= >$20,000	High amounts of funding with longer time frame required

Engineering Recommendation SPS-1	*School Zone street designations and reduced speed limit signs along Middle Street (Route 1) and Summer Street*
Cost	$$
Lead Organizations	School Administration, Portsmouth DPW and NHDOT
Description	Collector streets adjacent to St. Patrick School or those that currently carry, or are expected to carry, parents and students on foot or on bike should have reduced speed limits and/or flashing "School Zone" signs. Consistent with NHDOT policy, prevailing speed limits should be reduced by 10 mph during weekday school hours within the designated school zone. Where resources are available, sign-mounted flashing yellow beacons or instant-feedback "Your speed is __" electronic signs should be employed at strategic locations along both Middle and Summer Street.

Engineering Recommendation SPS-2	*Improved intersections with curb bump outs and enhanced crosswalks*
Cost	$$ per intersection ($$$ if an existing storm drain requires relocation)
Lead Organization	Portsmouth DPW
Description	At key locations where children currently cross, or are likely to cross, busy streets, intersection safety improvements should be implemented. Where curb-side parking is allowed or where travel lanes are wide or contain shoulders, bump-outs will make pedestrians wishing to cross the street more visible to motorists and reduce the crossing distance. These should be combined with enhanced crosswalks that are highly visible and long lasting, such as thermoplastic zebra striping or unit pavers. Key locations for these improvements include Middle Street at Austin (see illustration on following page), Summer Street at Austin and Islington Street at Cornwall and Summer Street.

Bump outs at the corner of Middle and Austin streets will enhance walking connections to the St. Patrick School (and Portsmouth Middle School).

Engineering Recommendation SPS-3	*Striped crosswalks along Austin Street at Cabot and Union*
Cost	$
Lead Organization	Portsmouth DPW
Description	Some parents and students walking to St. Patrick School prefer to use Austin Street for the end of the journey rather than parallel Middle or State streets. To accommodate this use, long-lasting and highly visible crosswalk should be striped at the intersections of Austin-Cabot and Austin-Union streets.

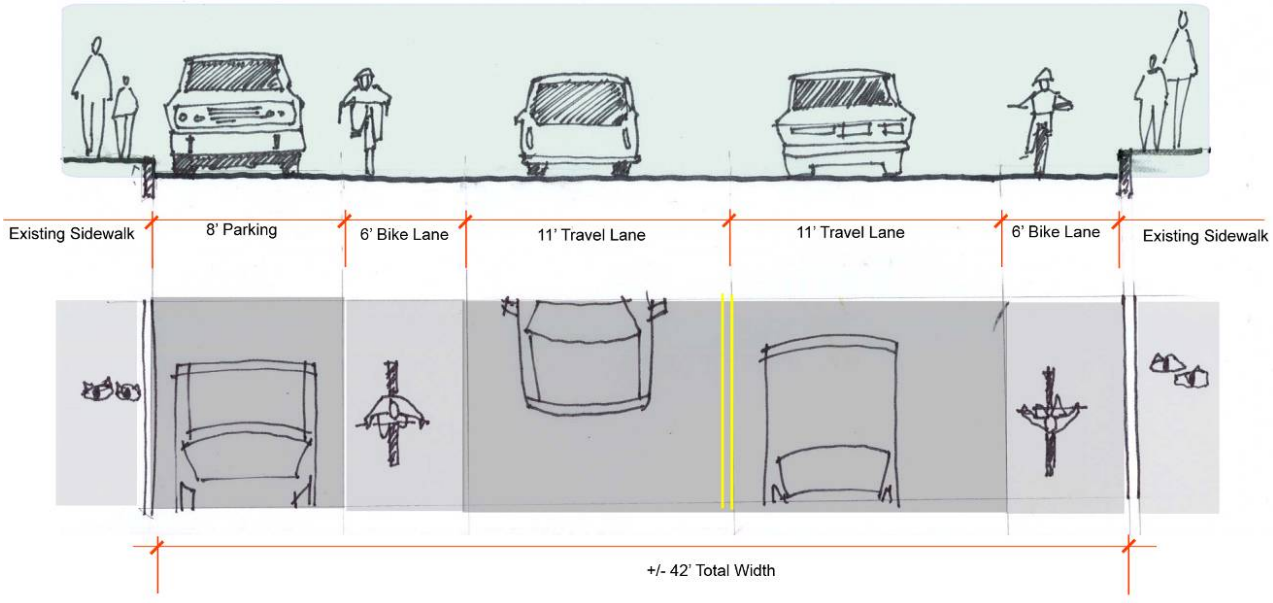
Engineering Recommendation SPS-4	*Exclusive pedestrian crossing phase of the existing light at the corner of Islington and Cabot Streets*
Cost	$
Lead Organization	Portsmouth DPW
Description	An exclusive pedestrian-only phase at the existing traffic signal at the corner of Islington and Cabot streets will promote a more comfortable environment for pedestrians and bicyclists wishing to cross Islington to reach the St. Patrick School or other destinations in the area.

Engineering Recommendation SPS-5	*Sheltered bike parking*
Cost	$$
Lead Organizations	School Administration and Portsmouth DPW
Description	Additional bike racks should be located near the main entrance of the St. Patrick School without disrupting the flow of students, parents and staff on foot. At least 50% of the racks should include a shelter to protect bikes from inclement weather and become a visual promotional sign for biking to school.

Engineering Recommendation SPS-6	*Reconfiguration of Summer Street curbs between Chatham and Austin Streets*
Cost	$$-$$$ (depending on design details and landscaping)
Lead Organizations	Portsmouth DPW and Immaculate Conception Church management
Description	The curb line along Summer Street between Chatham and Austin promotes speeding by creating an extremely wide swath of asphalt in front of the Immaculate Conception Church. The curb on the west side of this block should follow the flow of Summer Street rather than stay parallel with the property line adjacent to it. The City should work with the local Diocese to develop a landscaping plan within this part of the public ROW that complements the church's architecture, preserves parking and accommodates the flow of parishioners leaving from the front of the church.

This expanse of asphalt could instead be a small plaza.

Engineering Recommendation SPS-7	*Bike lanes along Middle Street (Route 1) from State Street to Portsmouth High School entrance at Andrew Jarvis Drive*
Cost	$$
Lead Organization	Portsmouth DPW
Description	Middle Street is the primary route that connects many of Portsmouth's close-in, older neighborhoods to downtown and to the St. Patrick School. providing dedicated bike lanes along this route will encourage middle school students to ride to school and will encourage people throughout the community to use bicycles more frequently as their chosen mode of transportation. Planning the bike lanes from downtown to the High School will additionally provide opportunities for high school students to ride to and from school. The Middle Street bike lanes could become the primary spine of a future network of bike routes throughout the city (see Bike Network Diagram on page 19). The curb-to-curb dimension of Middle Street varies but is approximately 42 feet in many locations. To accommodate bike lanes, the Action Plan recommends that on-street parking be allowed on only one side of the street. South of State Street, commercial land uses are infrequent and the demand for parking drops considerably. The extension of the bike facility into downtown and further north will need to be accommodated using shared-lane markings and signage.



Recommended Middle Street (Route 1) cross-section illustrating the proposed bike lanes

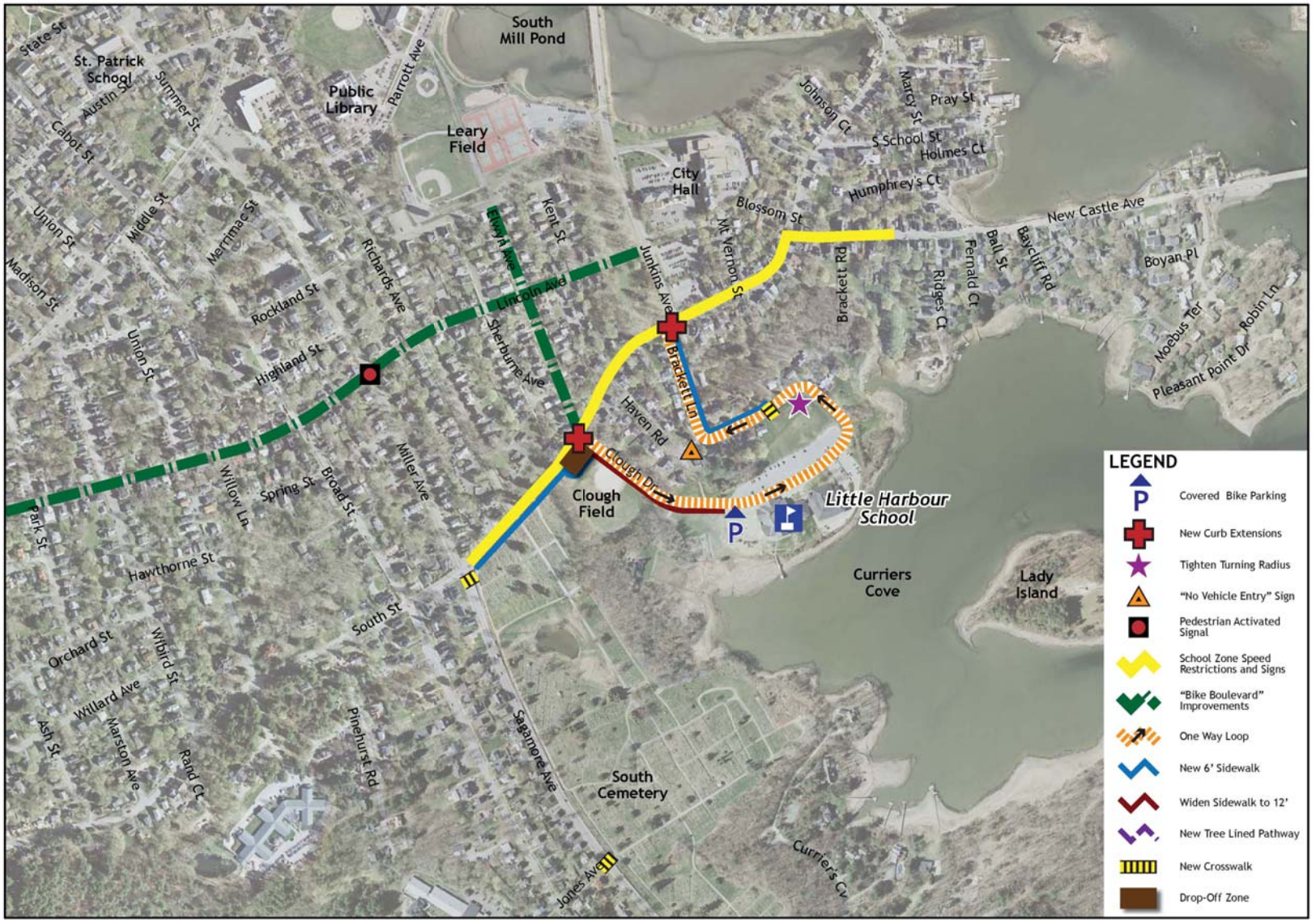
Little Harbour Elementary School

At dismissal time on nice weather days, Clough Drive carries a large number of motor vehicles as well as children walking and riding bikes and scooters.

As the public elementary school situated closest to downtown with dense, walkable neighborhoods surrounding it, the Little Harbour Elementary School currently attracts the greatest number of walkers and bicyclists on a daily basis. The design of Clough Drive and other entry points to the school do not reflect this, however, and changes are recommended for Clough and a number of other streets near the school. Changes include a permanent one-way loop through the school campus and the creation of an optional parent drop-off and pick-up zone along South Street; helping to limit the number of private automobiles approaching the school using Clough Drive. Additionally, streetscape improvements on Lincoln and Elwyn avenues will make the adjacent neighborhood more bike friendly and encourage more students to bike to school.

The sidewalk extension from Haven Road provides additional connectivity to the school from the neighborhood to the north and west.

Engineering recommendations for the Little Harbour Elementary School include a host of measures that will make walking and bicycling more comfortable and safe. Overall, the improvements are shown in the diagram on the following page, and subsequent pages present the recommendations in a greater level of detail, including an approximate cost estimate.



Little Harbour School Traffic and Streetscape Improvement Plan

Portsmouth, NH
Safe Routes to School Travel Plan Study
Source: Data obtained from the City of Portsmouth, NH
Author: Robin Wilcox
Date: 101/26/2009

0 300 600 Feet

alta PLANNING + DESIGN
TND Engineering
Richardson & Associates Landscape Architects

Each recommended project for the Little Harbour School is shown in the tables below. These recommendations represent a balanced approach which covers both physical improvements and operational measures. To assist in the implementation of these initiatives, additional information is provided on each item, including the public agencies and other groups that should be involved and an approximate cost range for the project. Generally, costs for each project are categorized as:

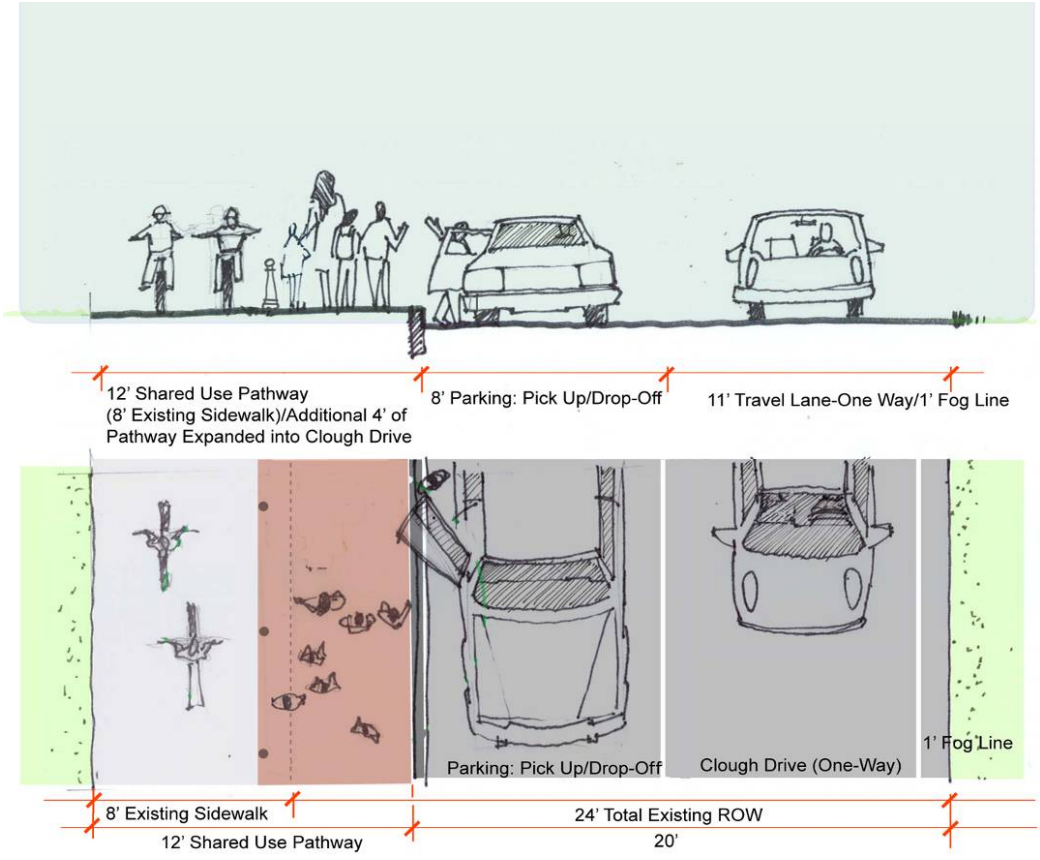
$	= Minimal to $2,000	Low funding required with short time frame
$$	= $2,000 to $20,000	Moderate amounts of funding required
$$$	= >$20,000	High amounts of funding with longer time frame required

Engineering Recommendation LHS-1	*School zone street designations and reduced speed limit signs along South Street and New Castle Avenue*
Cost	$$
Lead Organizations	School Administration and Portsmouth DPW
Description	Collector streets that currently carry, or are expected to carry, parents and students on foot or on bike heading to the Little Harbour School should have reduced speed limits and/or flashing "School Zone" signs. Consistent with NHDOT policy, prevailing speed limits should be reduced by 10 mph during weekday school hours within the designated School Zone. Where resources are available, sign-mounted flashing yellow beacons or instant-feedback "Your speed is __" electronic signs should be employed at strategic locations.

Engineering Recommendation LHS-2	*Improved intersections with curb bump outs and enhanced crosswalks*
Cost	$$ per intersection ($$$ if an existing storm drain requires relocation and/or geometry of intersection requires change)
Lead Organization	Portsmouth DPW
Description	At key locations where children currently cross, or are likely to cross, busy streets, intersection safety improvements should be implemented. Where curb-side parking is allowed or where travel lanes are wide or contain shoulders, bump-outs will make pedestrians wishing to cross the street more visible to motorists and reduce the crossing distance. These should be combined with highly-visible and long-lasting crosswalks, such as thermoplastic piano key-style striping or unit pavers. Key locations for these improvements include South Street at Clough Drive, South Street at Junkins and where a proposed path intersects with Brackett Road.

Engineering Recommendation LHS-3	*Permanent one-way vehicle circulation along Clough Drive, Brackett Road and Brackett Lane*
Cost	$
Lead Organizations	School Administration and Portsmouth DPW
Description	Currently, vehicle circulation is restricted to one-way along Clough Drive during the morning drop-off period. The Action Plan recommends that this restriction be made permanent, as a way to decongest the area in front of the school and make a more predictable traffic pattern during the opening bell and dismissal periods. One-way traffic along Clough Drive will facilitate a wider sidewalk to accommodate the large number of children who currently come to school on foot or by bike. To mitigate the traffic impact on quiet streets like Haven Road, the short stretch of Brackett Road between Haven and Brackett Lane should be made one-way east-bound and a "No Entry" sign should be posted.

Engineering Recommendation LHS-4	*Twelve-foot sidewalk/multi-use path connection along Clough Drive from South Street to the school*
Cost	$$$
Lead Organization	Portsmouth DPW
Description	With Clough Drive set permanently as a one-way, east-bound street, the existing eight-foot sidewalk should be widened to 12 feet and differentiated for bicycle and walking uses. The wider sidewalk/multi-use path will leave a narrower Clough Drive section, but wide enough to accommodate one lane of traffic and a permanent drop-off/pick up and parking lane along the curb (see illustrations on following page).



One-way traffic on Clough Drive will accommodate a wider sidewalk, creating space for the large number of Little Harbour School walkers and bicyclists

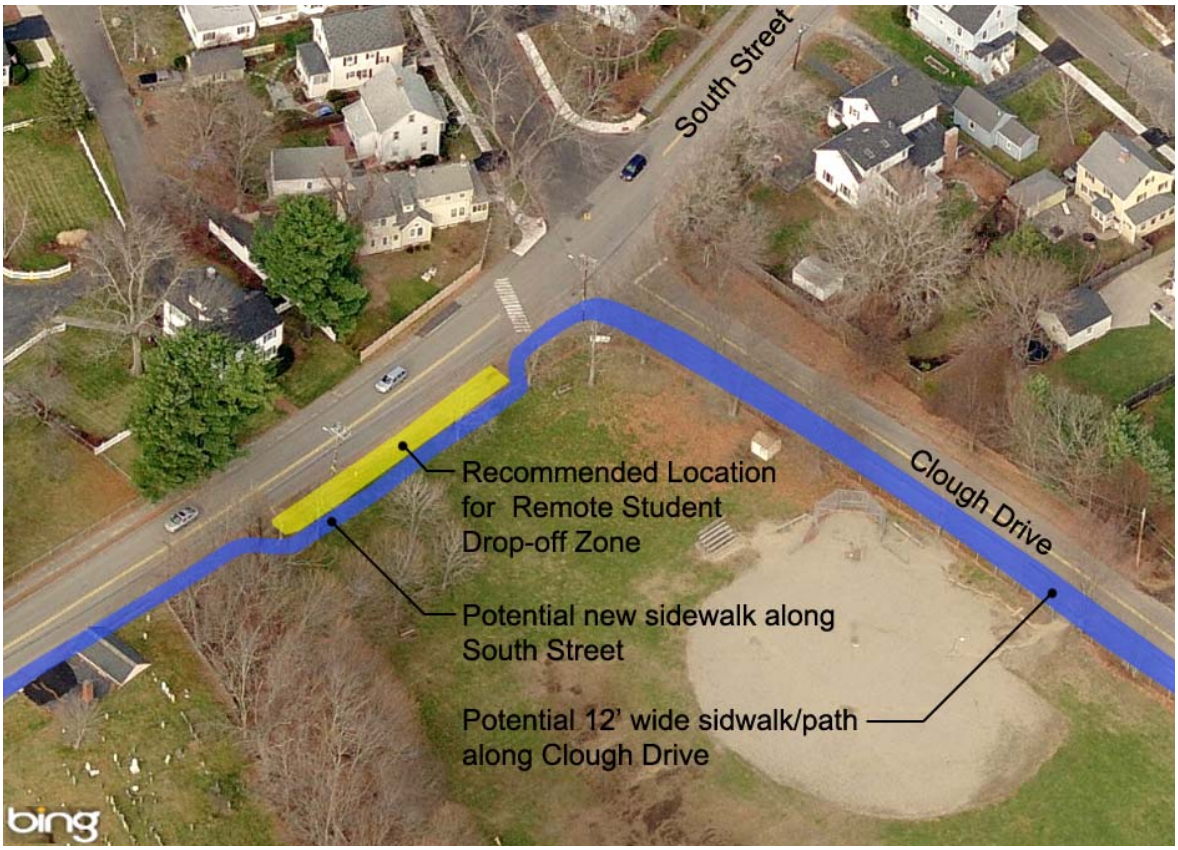
Engineering Recommendation LHS-5	*Bicycle Boulevard treatment along Lincoln and Elwyn avenues, including pedestrian-actuated device at the intersection of Lincoln and Miller Avenues*
Cost	$$$
Lead Organization	Portsmouth DPW with significant public outreach required
Description	Lincoln Avenue provides an ideal opportunity for east-west bike travel between Middle Street (Route 1) and Junkins Avenue. In its current condition, the street provides a reasonably comfortable environment for bicyclists but could be improved with Bike Boulevard treatment including: • Traffic calming elements such as speed tables, bump outs and other diverters. • Pedestrian/bicyclist actuated device at Miller Avenue (further analysis based on MUTCD and NHDOT guidelines will be necessary). • One block-long stretches of one-way traffic only to discourage through traffic on Lincoln Avenue. • Street signs and road stencils that promote lane sharing and warn of the presence of cyclists.  **With a new signal at Miller, Lincoln Avenue will become more bike-friendly** While the Bike Boulevard will extend from Middle to Junkins, a shorter Bike Boulevard along perpendicular Elwyn Avenue will provide the direct connection to both the Portsmouth Middle School and the Little Harbour School.

Engineering Recommendation LHS-6	*Sheltered bike parking*
Cost	$$
Lead Organizations	School Administration and Portsmouth DPW
Description	Additional bike racks should be located at two locations near the Little Harbour School without disrupting the flow of students, parents and staff on foot. At least 50% of the racks should include a shelter to protect bikes from inclement weather and become a visual promotional sign for biking to school. A bike parking kiosk is recommended at the location most convenient for cyclists arriving at school via the widened sidewalk/path along Clough Drive.

Engineering Recommendation LHS-7	*Sidewalks along South Street, Brackett Lane and Brackett Road*
Cost	$$$
Lead Organization	Portsmouth DPW
Description	South Street and Brackett Road and Lane carry nearly all of the children walking to the Little Harbour School and the numbers are likely to increase. New sidewalks along the Brackett Lane and Road will provide needed improvements on streets that have no sidewalks. With the enhancements to Clough Drive, a stronger argument can be made for a sidewalk adjacent to the cemetery between Clough and the traffic signal at Sagamore Avenue.

Engineering Recommendation LHS-8	*Striped crosswalks along Sagamore Avenue at South Street and Jones Avenue*
Cost	$
Lead Organization	Portsmouth DPW
Description	A dedicated pedestrian crossing phase at the Sagamore/South light provides the opportunity to stripe the "missing" crosswalk on the south leg of the intersection. Additionally, a new crosswalk on Sagamore at Jones Avenue accommodates connections to the South Cemetery.

Engineering Recommendation LHS-9	*Reduced curb radius in the southwest corner of the Clough Drive and Brackett Road intersection*
Cost	$-$$
Lead Organization	Portsmouth DPW
Description	The configuration of the southwest corner of the Clough Drive and Brackett Road intersection promotes speeding around the corner. With traffic restricted to one-way, this corner should be reconstructed with a far smaller turning radius to encourage a full stop at this intersection.



Aerial view of the recommended remote drop-off zone and the proposed sidewalk/path configuration at the intersection of South Street and Clough Drive *(aerial photo from www.bing.com/maps)*

Engineering Recommendation LHS-10	*Remote parent/student drop-off zone along South Street at Clough Drive*
Cost	$$-$$$
Lead Organizations	School Administration, Portsmouth DPW and Portsmouth Parks and Recreation
Description	A remote drop-off/pick-up zone along South Street at Clough Drive will help to decongest Clough Drive and provide an opportunity for some children to have some physical activity before and after school. The plan for this vehicle area will need to be carefully designed with regards to the intersection improvements recommended at South and Clough and the potential sidewalks along the south side of South Street.

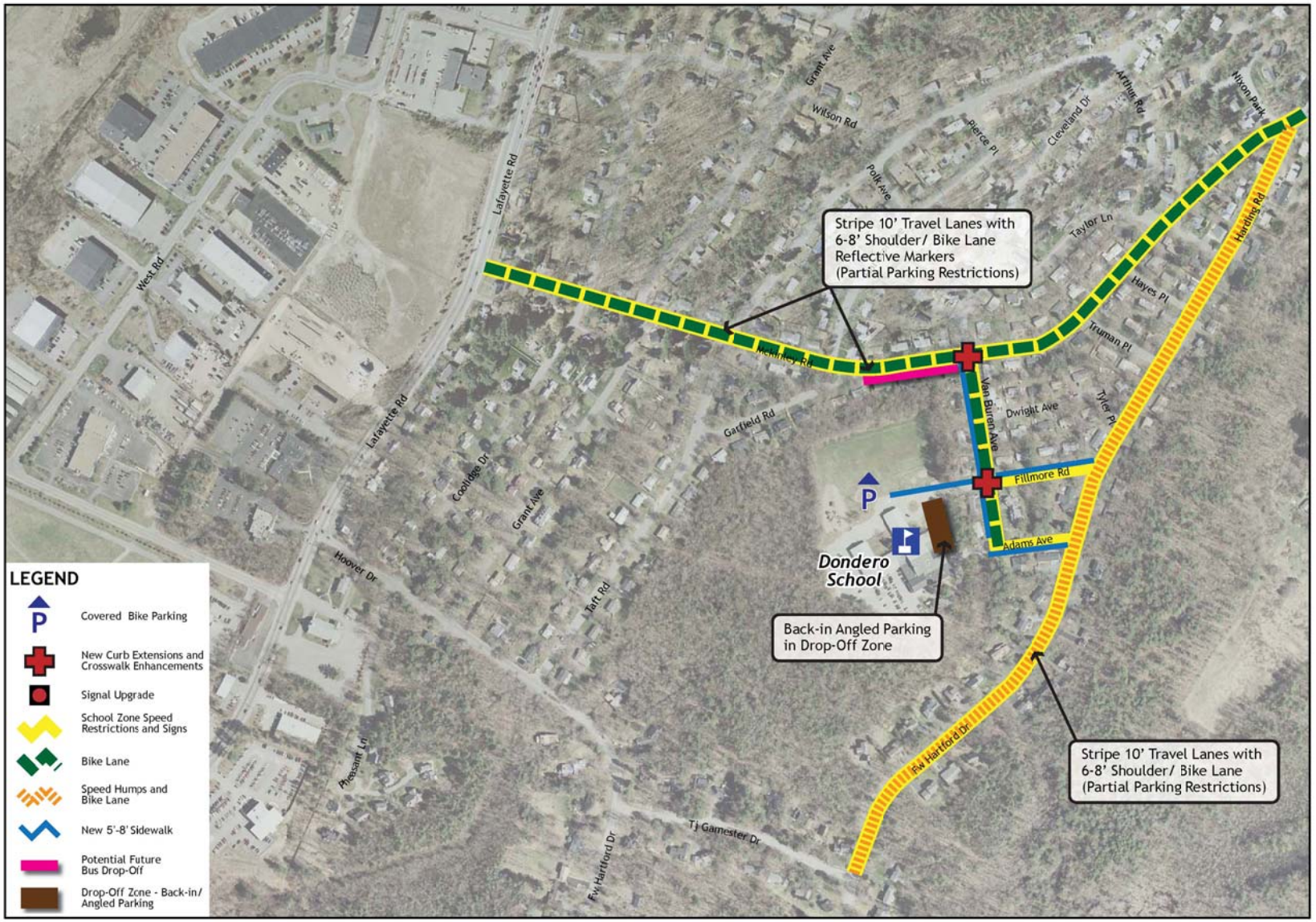
Dondero Elementary School

The Dondero Elementary School sits in the most suburban context of all the schools in this Action Plan. Surrounding the school on all sides is a 1970s-era subdivision that was built at a density much lower than most parts of Portsmouth and without sidewalks. While this is typically not condusive to walking, great potential exists for a significant percentage of students who live in the area east of Lafayette Road (Route 1) and south of Elwyn Road to walk and bike to school with proper infrastructure improvements. While the funds to build sidewalks on anything more than a small handful of streets may be difficult to find, locating the sidewalks strategically along with inexpensive bike improvements will give more parents in the immediate area confidence to encourage their children to walk or bike to school.

Engineering recommendations for the Donero Elementary School include a host of measures that will make walking and bicycling more comfortable and safe. Overall, the improvements are shown in the diagram on the following page, and subsequent pages present the recommendations in a greater level of detail, including an approximate cost estimate.

Aerial view of the Dondero School shows the surrounding suburban context *(aerial photo from www.bing.com/maps).*

The primary walking route to the Dondero School features a 250-foot long sidewalk as the only place where one is not required to walk within the roadway.



Dondero School Traffic and Streetscape Improvement Plan

Portsmouth, NH
Safe Routes to School Travel Plan Study
Source: Data obtained from the City of Portsmouth, NH
Author: Robin Wilcox
Date: 10/26/2009

0 300 600 Feet

alta PLANNING + DESIGN
TND Engineering
Richardson & Associates Landscape Architects

Each recommended project for the Dondero School is shown in the tables below. These recommendations represent a balanced approach which covers both physical improvements as well as operational measures. To assist in the implementation of these initiatives, additional information is provided on each item including the public agencies and other groups that should be involved and an approximate cost range for the project. Generally, costs for each project are categorized as:

$	= Minimal to $2,000	Low funding required with short time frame
$$	= $2,000 to $20,000	Moderate amounts of funding required
$$$	= >$20,000	High amounts of funding with longer time frame required

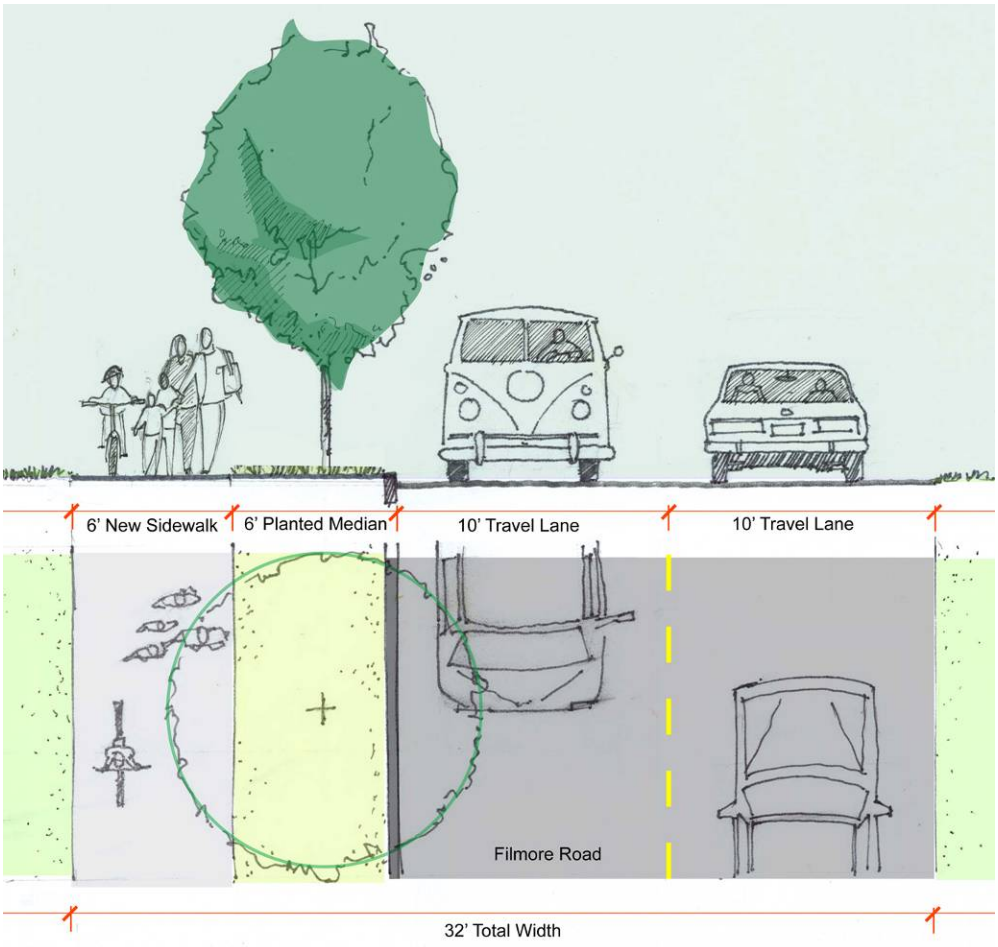
Engineering Recommendation DS-1	*School zone street designations and reduced speed limit signs along McKinley, FW Hartford, Harding, Fillmore, Adams and Van Buren Avenue*
Cost	$$
Lead Organizations	School Administration and Portsmouth DPW
Description	Streets leading to the Dondero Elementary School or those that currently carry, or are expected to carry, parents and students on foot or on bike should have reduced speed limits and/or flashing "School Zone" signs.. Consistent with NHDOT policy, prevailing speed limits should be reduced by 10 mph during weekday school hours within the designated School Zone. Where resources are available, sign-mounted flashing yellow beacons or instant-feedback "Your speed is __" electronic signs should be employed at strategic locations.

Engineering Recommendation DS-2	*Improved intersections with curb bump outs and enhanced crosswalks*
Cost	$$ per intersection ($$$ if an existing storm drain requires relocation)
Lead Organization	Portsmouth DPW
Description	At key locations where children currently cross, or are likely to cross, busy streets, intersection safety improvements should be implemented. Where curb-side parking is allowed or where travel lanes are wide or contain shoulders, bump-outs will make pedestrians wishing to cross the street more visible to motorists and reduce the crossing distance. These should be combined with highly visible and long lasting crosswalks, such as thermoplastic zebra striping or unit pavers. Key locations for these improvements include Van Buren Avenue at McKinley and Van Buren at Fillmore Road.

Engineering Recommendation DS-3	*Eight-foot sidewalk along the Dondero School entry drive (Fillmore Road) from Van Buren Avenue to the School*
Cost	$$
Lead Organizations	School Administration and Portsmouth DPW
Description	The existing five-foot sidewalk along the entry drive to the Dondero School is not sufficient to carry the expected increase in walking and bicycling to the school and should be widened to eight feet or more. To increase the comfort level for those using the sidewalk, bollards should be placed adjacent to the curb. To improve the connection to the new sidewalk, a raised crosswalk should be built across Van Buren at the adjacent intersection.

Fillmore Road and Van Buren Avenue Intersection improvements could include a raised crosswalk, new sidewalks and a wider sidewalk (foreground) leading to the school.

Engineering Recommendation DS-4	*Sidewalks along Fillmore Road, Adams Avenue and Van Buren Avenue*
Cost	$$$
Lead Organization	Portsmouth DPW
Description	While sidewalks are absent from the adjacent neighborhood, a need to build them exists on the blocks that immediately surround the school. New sidewalks along Fillmore, Adams and Van Buren should be five or six feet wide and include an adjacent planting strip where feasible. On-street parking should be restricted during the early morning hours and at dismissal time to accommodate students and parents riding bicycles to school.



Fillmore Road cross-section illustrates a new sidewalk and planting strip set adjacent to a 20-foot roadway for two-way travel.

Engineering Recommendation DS-5	*Sheltered bike parking*
Cost	$$
Lead Organizations	School Administration and Portsmouth DPW
Description	Additional bike racks should be located at the end of Fillmore Road sidewalk near the Dondero School's main drop-off circle without disrupting the flow of students, parents and staff on foot. At least 50% of the racks should include a shelter to protect bikes from inclement weather and become a visual promotional sign for biking to school.

Engineering Recommendation DS-6	*Back-in angled parking in front of the school*
Cost	$
Lead Organization	School Administration
Description	Before the start of school and at dismissal time, the small parking lot in front of the school can be a busy and congested place. Back-in parking will provide a safer alternative to the current parking configuration, allowing drivers to see children crossing the parking lot as they pull out of their parking space. This change could also mitigate the need for staff to direct cars in and out of the stalls as they arrive for pick up or drop off.

Engineering Recommendation DS-7	*Narrow travel lanes and bike lanes along McKinley Road and Van Buren Avenue*
Cost	$$
Lead Organization	Portsmouth DPW
Description	Both McKinley and Van Buren are the key streets that lead to the Dondero School. They are equally important for cyclists as they are for walkers. Travel lanes should be narrowed to ten feet and the remaining shoulder area should be dedicated for bicycle travel during early morning hours as bicyclists travel to school and at dismissal time as they leave. As such, on-street parking will need to be restricted at these hours. Flush reflectors mounted into the road along the shoulder stripe would add an additional level of separation between cyclists and motorists.

Engineering Recommendation DS-8	*Narrow travel lanes, speed humps and bike lanes along FW Hartford Drive and Harding Road*
Cost	$$-$$$
Lead Organization	Portsmouth DPW
Description	Based on comments from the community meeting at the Dondero School, there is significant concern about speeding along both FW Hartford Drive and Harding Road, both important connections to the Dondero School from different parts of the neighborhood. This Action Plan recommends the consideration of traffic calming along FW Hartford and Harding using speed tables or speed cushions in conjunction with ten-foot-wide travel lanes and shoulder areas dedicated for bicycle travel during early morning hours and at dismissal time. As such, on-street parking may need to be restricted at these hours. Flush reflectors mounted into the road along the shoulder stripe would add an additional level of separation between cyclists and motorists.

Compendium of Recommended Engineering Projects

School	Number	Recommendation
New Franklin	NFS-1	*School zone street designations and reduced speed limit signs along Woodbury, Dennett, Franklin, Central and Maplewood Avenue*
New Franklin	NFS-2	*Improved intersections with curb bump outs and enhanced crosswalks*
New Franklin	NFS-3	*Bike lanes along Rockingham Avenue to provide connectivity from the Pease Tradeport/I-95 multi-use path to Woodbury Avenue*
New Franklin	NFS-4	*One-way, east-bound traffic flow along Franklin Drive; one-way, south-bound traffic flow along the Stark Street bridge over the Route1 Bypass*
New Franklin	NFS-5	*New or reconstructed five-to-six foot sidewalks along Rockingham, Woodbury , Franklin, Myrtle, Central and Maplewood Avenue*
New Franklin	NFS-6	*Raised crosswalks along Franklin Drive and at the Central-Myrtle Avenue intersection*
New Franklin	NFS-7	*Reconstructed 8-10 foot sidewalk on the east side of the Stark Street bridge over the Route 1 Bypass road*
New Franklin	NFS-8	*Security fence murals along the Stark Street bridge over the Route 1 Bypass*
New Franklin	NFS-9	*Enhanced lighting below the I-95 overpass that sits above Woodbury and Maplewood Avenues*
New Franklin	NFS-10	*Vehicle drop-off circle at the west end of Myrtle Avenue*
New Franklin	NFS-11	*Additional bike racks and sheltered bike parking*
New Franklin	NFS-12	*Pedestrian underpass below I-95 at Sapphire Street*
Portsmouth Middle	PMS-1	*School zone street designations and reduced speed limit signs along Middle, Court, Rogers, Junkins, Parrott and Richards Avenue*
Portsmouth Middle	PMS-2	*Improved intersections with curb bump outs and enhanced crosswalks*
Portsmouth Middle	PMS-3	*Sidewalk/path along the south side of Parrott Avenue between Junkins and the existing paths through the play fields across from the Middle School*
Portsmouth Middle	PMS-4	*Morning arrival and afternoon dismissal period traffic restrictions on Parrott Avenue between Rogers Street and the Public Library parking lot*
Portsmouth Middle	PMS-5	*Bike lanes along Middle Street (Route 1) from State Street to Portsmouth High School entrance at Andrew Jarvis Drive*
Portsmouth Middle	PMS-6	*Pedestrian-actuated traffic signal at the intersection of Aldrich Street and Middle Street (Route 1)*
Portsmouth Middle	PMS-7	*Bicycle Boulevard treatment along Lincoln and Elwyn Avenues, including pedestrian-actuated device at the intersection of Lincoln and Miller avenues*
Portsmouth Middle	PMS-8	*Sheltered bike parking*
Portsmouth Middle	PMS-9	*Potential easement through Middle Street Baptist Church property to provide a convenient walking and biking route to Middle Street*
Portsmouth Middle	PMS-10	*Vacate small portion of Edward Street from Junkins to Parrott Avenue and expand adjacent park space*

Portsmouth Middle	PMS-11	*Move parent pick-up and drop-off area to existing parking lot near South Mill Pond, adjacent to tennis courts*
Portsmouth Middle	PMS-12	*Raised crosswalk across Parrott Avenue*
Portsmouth Middle	PMS-13	*Reduced curb radius in the northeast corner of the Rogers Street and Parrot Avenue intersection*
St Patrick	SPS-1	*School Zone street designations and reduced speed limit signs along Middle Street (Route 1) and Summer Street*
St Patrick	SPS-2	*Improved intersections with curb bump outs and enhanced crosswalks*
St Patrick	SPS-3	*Striped crosswalks along Austin Street at Cabot and Union*
St Patrick	SPS-4	*Exclusive pedestrian crossing phase of the existing light at the corner of Islington and Cabot Streets*
St Patrick	SPS-5	*Sheltered bike parking*
St Patrick	SPS-6	*Reconfiguration of Summer Street curbs between Chatham and Austin Streets*
St Patrick	SPS-7	*Bike lanes along Middle Street (Route 1) from State Street to Portsmouth High School entrance at Andrew Jarvis Drive*
Little Harbour	LHS-1	*School zone street designations and reduced speed limit signs along South Street and New Castle Avenue*
Little Harbour	LHS-2	*Improved intersections with curb bump outs and enhanced crosswalks*
Little Harbour	LHS-3	*Permanent one-way vehicle circulation along Clough Drive, Brackett Road and Brackett Lane*
Little Harbour	LHS-4	*Twelve-foot sidewalk/multi-use path connection along Clough Drive from South Street to the school*
Little Harbour	LHS-5	*Bicycle Boulevard treatment along Lincoln and Elwyn avenues, including pedestrian-actuated device at the intersection of Lincoln and Miller Avenues*
Little Harbour	LHS-6	*Sheltered bike parking*
Little Harbour	LHS-7	*Sidewalks along South Street, Brackett Lane and Brackett Road*
Little Harbour	LHS-8	*Striped crosswalks along Sagamore Avenue at South Street and Jones Avenue*
Little Harbour	LHS-9	*Reduced curb radius in the southwest corner of the Clough Drive and Brackett Road intersection*
Little Harbour	LHS-10	*Remote parent/student drop-off zone along South Street at Clough Drive*
Dondero	DS-1	*School zone street designations and reduced speed limit signs along McKinley, FW Hartford, Harding, Fillmore, Adams and Van Buren Avenue*
Dondero	DS-2	*Improved intersections with curb bump outs and enhanced crosswalks*
Dondero	DS-3	*Eight-foot sidewalk along the Dondero School entry drive (Fillmore Road) from Van Buren Avenue to the School*
Dondero	DS-4	*Sidewalks along Fillmore Road, Adams Avenue and Van Buren Avenue*
Dondero	DS-5	*Sheltered bike parking*
Dondero	DS-6	*Back-in angled parking in front of the school*
Dondero	DS-7	*Narrow travel lanes and bike lanes along McKinley Road and Van Buren Avenue*
Dondero	DS-8	*Narrow travel lanes, speed humps and bike lanes along FW Hartford Drive and Harding Road*

2.3 Education and Encouragement

Education and Encouragement recommendations are operational measures that the schools can consider to enhance the effectiveness of the physical improvements recommended in sections 2.1 and 2.2. These tools focus on teaching traffic, pedestrian and bicycle safety to parents and students, increasing public awareness of Safe Routes to School (SRTS) goals and benefits, and promoting changes in behavior to increase walking and bicycling. Education efforts can begin in kindergarten with safe walking basics, such as where to cross the street and looking "left, right, then left again". The instruction can come from many sources such as teachers, parent volunteers, police & fire personnel and traffic safety advocates. Other educational lessons can be brought in to health, science, physical education and other class-lesson plans. Resources for these programs are available from The National Safe Kids Campaign: www.safekids.org/members/unitedStates.html.

Encouragement activities include a variety of special events and contests, outreach campaigns, presentations to school and community groups, and surveys of current practices and attitudes related to the school commute. A major objective of educational and encouragement tools is to increase the understanding by parents, school personnel, students, and the community of the health and safety concerns that can be addressed by successful SRTS programs.

The SRTS Committee should continue its good work by being a key part of this Action Plan, Walk to School Day and other education and encouragement programs. All can be utilized to increase the percentage of children walking and biking to school. The following section of the Action Plan offers a number of programs and resources which can help to attain this goal.

Walk Mount Washington Challenge

Each child that walks the length of the Mt. Washington auto road (15.2 miles) would receive a small prize and a bumper sticker that says "My child walked Mt. Washington on his/her way to school." Any child that walks the distance twice during the course of the year could be entered into a drawing to win a larger prize, such as a bicycle. The city should work with local bike shops or relevant businesses to support this program.

Walk and Bike Across the State

A "Walk and Bike Across the State" program is another option that allows the students to track the miles they walk on a map of New Hampshire. This program can help students become aware that they can travel great distances on foot or bike. Each new destination can be reached by the class to find out more about other parts of the state. At the end of a designated time, the class that traveled the farthest gets a special reward.

Walk and Bicycle to School Day

This annual international event occurs typically on the first Wednesday of October. The event's web site — www.walktoschool.org — provides resources and ideas on how to implement a successful Walk and Bike to School Day. Additional walk and bike to school days can be held yearly, monthly, or even weekly, depending on the level of support and participation from children, parents, and

school and local officials. Some schools organize more frequent days – such as weekly Walking/Wheeling Wednesdays or Walk and Roll Fridays – to give children an opportunity to enjoy the event on a regular basis. Parents and other volunteers accompany the children, and often there are designated staging areas along the route to school where different groups can gather and walk or bike together. The events should be promoted through press releases, articles in school newsletters, and posters and flyers for children to take home.

Children and parents gather for Portsmouth's Walk to School day in 2008 (from www.seacoastonline.com, October 9, 2008)

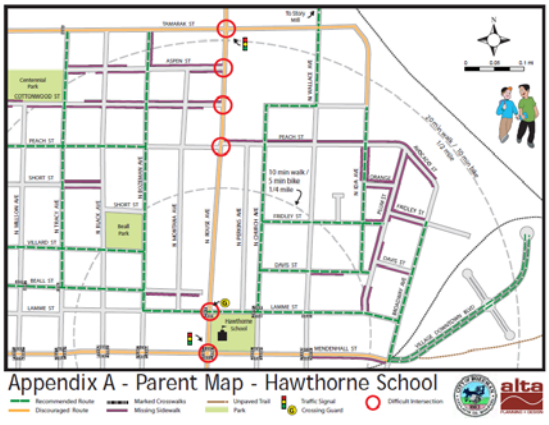
Walking School Bus

The Walking School Bus is another encouragement program to sustain long-term initiatives that will make walking to school safe. A walking school bus is a group of children walking to school accompanied by one or more adults. Members of the SRTS Committee should be recruited to host a training event and mobilize the resources to start such a program. Additional information on the Walking School Bus is available from:

- RideWise TMA: www.ridewise.org/walksafely.shtml
- Pedestrian Bicycle Information Center/Partnership for a Walkable America: www.walkingschoolbus.org
- Active and Safe Routes to School – California: www.saferoutestoschool.ca
- Go for Green – California: www.goforgreen.ca

Suggested Route to School Maps

Suggested Route to School maps are one of the most cost-effective and tangible means available for encouraging school children to walk or bike to school. The purpose of the maps is to provide school officials, parents, and students with a tool to help plan the best walking and bicycling routes to and from school.



Route to School map example from Bozeman, MT

Bicycle Rodeos

A bicycle rodeo provides children with a basic understanding of the rules of the road, educates those children and their parents about elementary bike safety, gives trained personnel a chance to look over the equipment the kids are riding, and involves parents, teachers, and/or local civic organizations in a worthwhile activity. A bicycle rodeo involves "stations" that teach skills, such as:

- Looking over a shoulder without weaving
- Fast braking without skidding
- Dealing with traffic at intersections

Bike Rodeos teach children how to safely negotiate with traffic

Golden Sneaker Award

Modeled after a program initiated in Marin County, California, each participating class can track the distance the students have traveled and plot it on a map. A 'Golden Sneaker Award' can be given to the student or classroom that accumulates the most miles or most trips to school each month.

For more information, see www.saferoutestoschools.org/events.html.

The classroom that logs the most miles or trips each month wins the coveted Golden Sneaker

2.4 Enforcement Recommendations

Enforcement recommendations are operational measures that can be implemented by the local law enforcement community. These recommendations support both the physical and programmatic recommendations included in the prior sections and play a key role in creating a safe walking and bicycling experience in the school zone. Since these programs will be carried out by the Portsmouth Police Department (PPD), it would be helpful to have a member of the PPD on the Safe Routes to School Committee.

The first step in developing an enforcement program is to identify unsafe behavior near the schools. Some common unsafe behaviors are identified in the following table - Common Unsafe Road User Behaviors. Once these have been identified, an appropriate approach to deterring those behaviors can be created. Deterrents may include education on the unsafe behavior, developing a community-based enforcement program, increasing police presence or installing warning signage and striping.

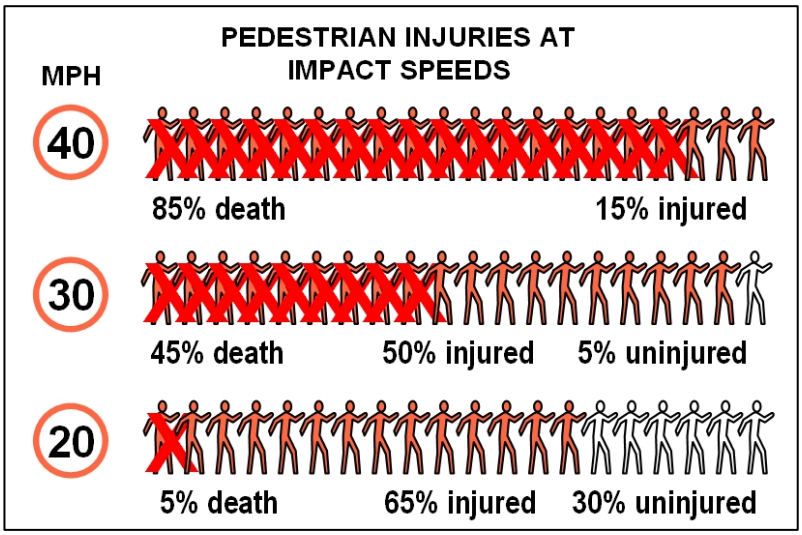
Common Unsafe Road User Behaviors

Road User	Behavior
Drivers	Speeding
	Failing to yield to students walking or biking, especially students in crosswalks
	Running red lights or stop signs
	Passing stopped school buses
	Parking or stopping in crosswalks
	Stopping in a bus zone (drop-off and pick-up)
	Dropping off or picking up students in the street rather than adjacent to the curb
	Drivers letting students walk between parked cars
	Violating school drop-off and pick-up procedures
Pedestrians	Not following directions of the crossing guard or signals
	Not looking left, right then left before crossing the street
	Crossing the street at an undesirable location
	Darting out between parked motor vehicles
	Wearing dark clothes when there is poor lighting
Bicyclists	Riding into traffic without looking left, right then left again
	Riding against traffic rather than with the traffic flow
	Turning left without looking and signaling
	Not obeying traffic signs or signals
	Riding out from a driveway or between parked vehicles
	Not wearing a bike helmet
	Not being visible at night when riding in the road

Source: Safe Routes to School Guide, National Highway Traffic Safety Administration, www.saferoutesinfo.org/ Accessed December 28, 2007

Speeding is one of the most dangerous driver behaviors. Though a motorist may not think driving over the speed limit is dangerous, even a 10 mph difference in speed can be the difference between a fatal and non-fatal crash for a pedestrian. The effect of speed on pedestrian injury severity and fatalities is especially pronounced for children and the elderly. At 20 mph a pedestrian has a 5% chance of dying if hit by a motor vehicle. At 30 mph the chance increases to 45%.

Often, the people who drive to school the most — the parents and the teachers — are responsible for speeding and other unsafe driver behavior. For this reason, education and enforcement programs that target teachers and parents can be effective. Neighborhood speed-watch programs can also be effective. An example program used in other cities in the US involves community members borrowing a radar device to record the license plate numbers of speeding vehicles. With these programs, though no official citations are issued, the law enforcement agency sends letters to registered owners of vehicles observed speeding, warning them to slow down.



Speeding is not the only dangerous motorist behavior that must be enforced. Targeted enforcement programs can also encourage motorists to yield to pedestrians at crosswalks, and help reduce illegal parking on streets or unsafe school parking lot behavior. The Safe Routes to School Committee should work to develop enforcement measures that are feasible for particular problem locations and recommendations for enforcement at a broader community level.

Finally, enforcement efforts should not only be aimed at motorists, but should also ensure that walking and bicycling children obey traffic laws. Students may not realize that behaviors such as jaywalking, bicycling against traffic, or running stop signs puts them at higher risk for a vehicle collision. As part of their regular enforcement, the Portsmouth Police Department should ensure that children walking or bicycling to school are obeying traffic laws, and use enforcement as an opportunity to educate them on proper traffic behavior.

More information is available from the following websites:

- School Zone Safety: www.activelivingresources.org/safe_school_zones.html
- Pedestrian Sting Operations: www.walkinginfo.org/ee/sting.htm
- Speed Trailers: www.nhtsa.dot.gov/people/injury/research/pub/HS809012.html
- "Keep Kids Alive – Drive 25" Campaign: www.keepkidsalivedrive25.org

2.5 Evaluation Recommendations

Evaluation of the Safe Routes to School projects and programs is important to understand their effectiveness, identify improvements that are needed, and ensure that the program can continue in the long-term. The evaluation process should include before and after studies (usually required by grant programs). It may be appropriate to regularly collect information at the beginning and end of the school year. Evaluation can measure shift in transportation mode choice, attitudes toward biking and walking, recognition of the program, grant money received and infrastructure projects constructed. One of the most effective ways to measure changes in mode choice is to perform bicycle and pedestrian counts at strategic intersections. Guidelines for such as count can be found at the National Bicycle and Pedestrian Documentation Project (see Appendix for a standard screenline count form template, also available at www.bikepeddocumentation.org).

In addition to evaluating the effectiveness of the Safe Routes to School program, the City of Portsmouth and the SRTS Committee should evaluate how the program is being run and should take steps to ensure the continuation of the program. Steps to ensure continuation may include identifying new "champions", publicizing successes to increase community support and encouraging school and city policy changes to help make walking and biking to school safer and easier throughout the community.

2.6 The Four E's Next Steps

This section of the Portsmouth Safe Routes to School Action Plan outlines a selection of next steps in the form of recommended programs and projects for the four, non-Engineering E's: Education, Encouragement, Enforcement and Evaluation. To assist in the implementation of these initiatives, additional information is provided on each item, including the groups that should be involved and an approximate cost range for the project. Costs for each next step are categorized as follows:

$	= Minimal to $1000	Volunteer effort and low funding required
$$	= $1000 to $10,000	Moderate amounts of funding required
$$$	= > $10,000	High amounts of funding required

Four E's Recommendation # 1	Identification of SRTS Facilitator & Initiation of Basic Bicycling and Walking Safety Education
Cost	$
Lead Organizations	School Administration and SRTS Committee
Description	Each school should identify a staff member or volunteer (possibly an interested parent) to initiate an expanded Safe Routes to School Program for each school. A recommended first step would be to provide a presentation on SRTS education for students, with specific attention on safe walking and bicycling skills. Ideally, this introductory session should include a representative from the Portsmouth Police Department as well.

Four E's Recommendation # 2	Formation of Safe Routes to School sub-committee for each school
Cost	$
Lead Organizations	School Administration and SRTS Committee
Description	The facilitator should reach out to interested persons to begin the formation of a SRTS sub-committee for each school. The sub-committee should include parents, teachers, school administration, students and the local community. it should review any existing wellness policies and identify areas within the policy that would be supported by a SRTS program. The sub-committee should coordinate its efforts with the existing Traffic Safety Board and the city-wide SRTS Committee.

Four E's Recommendation # 3	International Walk and Bike to School Day event
Cost	$-$$
Lead Organizations	School Administration, SRTS Committee and individual sub-committees
Description	International Walk to School Day is held annually in October. This event can serve as a kick-off event to generate awareness and enthusiasm for a Safe Routes to School program. Events may include a special Walking School Bus lead by local politicians or school administrators, school assembly, and contest. Schools may find additional information and register for the event at www.walktoschool.org. Events such as these tend to attract increased attention and excitement that can be tapped to attract volunteers to maintain efforts year-round.

Four E's Recommendation #4	Enforcement activities around every school
Cost	$-$$
Lead Organizations	School Administration, SRTS Committee and Portsmouth Police Department
Description	An improvement in driver behavior is typically shown if a police vehicle is present nearby. The schools should reach out to Portsmouth Police Department and seek their assistance in increasing police presence during the school commute period. The schools should also ensure that its adult crossing guards are properly trained and located at the ideal places to help ensure a safer crossing for children and their guardians. (additional information on best practices can be found at: http://www.saferoutesinfo.org/guide/crossing_guard/index.cfm)

Four E's Recommendation # 5	Ongoing Safe Routes to School Encouragement
Cost	$
Lead Organizations	School Administration and SRTS Committee
Description	The school should continue to encourage safe bicycling and walking, implementing contests such as the Mount Washington Challenge and weekly biking and walking days. The Taskforce should include Safe Routes to School information in the school or city newsletter. Possible features include: • Explanation of the Safe Routes to School Program and goals of the program • Facts about walking, biking, physical activity, traffic safety, etc. • Upcoming Safe Routes to School events • Announcement of contest winners

III. Appendix

Resources & References:

- Active Living Resource Center: www.activelivingresources.org
- American Automobile Association, "Adult School Crossing Guards": www.aaafoundation.org/products/index.cfm?button=item-detail&ID=404&storeid=1
- CDC, Kids Walk to School (community presentation): www.cdc.gov/nccdphp/dnpa/kidswalk/index.htm
- "Civilian Guards for School Crossings." Center for Public Safety of Northwestern University, 405 Church Street, Evanston, IL 60204.
- FHWA's Office of Safety – SRTS: http://safety.fhwa.dot.gov/saferoutes
- Marin County (CA) Safe Routes to School: www.saferoutestoschool.org
- Manual of Uniform Traffic Control Devices: www.mutcd.fhwa.dot.gov/pdfs/2009/pdf-index.htm
- National Bicycle and Pedestrian Documentation Project: www.bikepeddocumentation.org
- National Center for Bicycling & Walking: www.bikewalk.org/safe_routes_to_school/SRTS_introduction.htm
- NHTSA Safe Routes to School Tool Kit: www.nhtsa.dot.gov/people/injury/pedbimot/bike/Safe-Routes-2002/toc.html
- Pedestrian & Bicycle Information Center: www.saferoutesinfo.org
- Safe Routes to School National Partnership: www.saferoutespartnership.org
- Safe Routes to School, New Hampshire DOT Planning & Community Assistance: www.nh.gov/dot/org/projectdevelopment/planning/srts/index.htm

NATIONAL BICYCLE AND PEDESTRIAN DOCUMENTATION (NBPD) PROJECT STANDARD SCREENLINE COUNT FORM

Name: _____ Location: _____

Date: _____ Start Time: _____ End Time: _____

Weather: _____

Please fill in your name, count location, date, time period, and weather conditions (fair, rainy, very cold). Count all bicyclists and pedestrians crossing your screen line under the appropriate categories.

- Count for two hours in 15 minute increments.
- Count bicyclists who ride on the sidewalk.
- Count the number of people on the bicycle, not the number of bicycles.
- Pedestrians include people in wheelchairs or others using assistive devices, children in strollers, etc.
- People using skateboards or rollerblades should be included in the "Other" category.

	Bicycles		**Pedestrians**		**Others**
	Female	**Male**	**Female**	**Male**	
00-:15					
15-:30					
30-:45					
45-1:00					
1:00-1:15					
1:15-1:30					
1:30-1:45					
1:45-2:00					
Total					