

# Stratham Safe Routes to School Action Plan



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## **Acronyms**

AADT	Average Annual Daily Traffic
AASHTO	American Association of State Highway Transportation Officers
ADA	Americans with Disabilities Act
BWANH	Bike-Walk Alliance of New Hampshire
CIP	Capital improvement Program
CMS	Cooperative Middle School
FHWA	Federal Highway Administration
GIS	Geographic Information Systems
HAWK	High-intensity Activated Crosswalk Beacon
MUTCD	Manual of Uniform Traffic Control Devices
NHDOT	New Hampshire Department of Transportation
PCAC	Stratham Pedestrian Cyclist Advisory Committee
PTO	Parent Teacher Organization
RPC	Rockingham Planning Commission
RRFP	Rectangular Rapid Flashing Beacon
RSA	NH Revised Statutes Annotated (state laws)
RTP	Recreational Trails Program
SABR	Seacoast Area Bicycle Riders
SAU	School Administrative Unit
SMS	Stratham Memorial School
SWOC	Strengths, Weaknesses, Opportunities & Challenges analysis
TAP	Transportation Alternatives Program
TEC	The Engineering Corp

This plan has been prepared by the Rockingham Planning Commission and the Stratham Safe Routes to School Committee in cooperation with the U.S. Department of Transportation – Federal Highway Administration and the New Hampshire Department of Transportation. The contents of the report reflect the views of the authors who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Federal Highway Administration or the New Hampshire Department of Transportation. This report does not constitute a standard, specification, or regulation.

# I. Stratham Safe Routes to School Overview

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## 1.1 INTRODUCTION

Fifty years ago, the sight of children walking or biking to school was common. In 1969 about 48 percent of children 5 to 14 years old walked or rode a bicycle to school regularly (USDOT). Over the past several decades this number has dropped dramatically, with only about 13% of children age 5 to 14 walking or bicycling to school in 2011. (National Center for SRTS)

This change hasn't happened overnight, and it has multiple causes. Traffic volumes and speeds have increased in most communities. New schools have been built on the outskirts of communities, further from residential neighborhoods. Roads may have been widened or new roads built to move traffic quickly and efficiently, but with limited consideration of safety for people walking or bicycling. Some parents see these changes and decide it is safest to drive their children to school, adding more traffic to the roadway.

This change has broad implications, ranging from increased school zone traffic congestion and auto emissions, to reduced child health outcomes as less physical activity contributes to increased rates of childhood obesity, anxiety and depression. This increases the risk for long term health problems such as heart disease and diabetes. It also means a generation of children coming of age accustomed to being driven for all trips, making future efforts to encourage active transportation more difficult.

The purpose of Stratham's Safe Routes to School (SRTS) program is to enable and encourage kids, including those with disabilities, to walk and bicycle to school and to make walking and bicycling to school safer and more appealing. The SRTS program is also designed to facilitate the planning, development and implementation of projects that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of schools.

The Safe Routes to School approach encourages students to bike or walk to school through activities and incentives that remind kids how much fun biking and walking can be. The program also addresses the safety concerns of parents by supporting enforcement of traffic laws, identifying needs for road safety improvements, and educating the public about safe biking, walking and driving practices. This integrated approach is summarized as "the 5Es" – Education, Encouragement, Enforcement, Engineering, and Evaluation. These categories provide the framework for the recommendations of the plan.

This *Safe Routes to School Action Plan* for Stratham Memorial School (SMS) and the Cooperative Middle School (CMS) is funded through a planning grant from NH Department of Transportation. It summarizes the work to date of Stratham's Pedestrian/Cyclist Advisory Committee (PCAC) and Safe Routes to School Committee to develop the Town's SRTS program. It analyzes data on current levels of riding and walking, and parent concerns about allowing their children to ride and walk. It assesses the safety of routes currently used by students to access the two schools. It offers a series of recommendations for engineering and non-infrastructure strategies to encourage more Stratham kids in grades K-8 to walk or bike to school and better ensure that they can do so safely. It concludes with a series of recommendations for implementing these strategies and sustaining the Safe Routes to School effort.

## 1.2 THE SAFE ROUTES TO SCHOOL MODEL AND THE “5 Es”

The national Safe Routes to School initiative got its start in 2000 when the National Highway Traffic Safety Administration (NHTSA) funded pilot programs in Marin County, CA, and Brookline, MA, with a goal of developing a national model for encouraging active transportation to school. The initiative in Marin County involved nine pilot schools in four locations. Each of the schools developed plans for improving safety through sidewalk improvements and other engineering solutions. Each school also held periodic Bike/Walk to School Days and participated in a Frequent Rider Miles contest that rewarded kids who came to school walking, cycling, by carpool or by bus. By the end of the year-long pilot program the schools saw a 57% increase in the number of kids walking and biking to school, and a 29% decrease in the number of children arriving by car (other than in a carpool).

One of the key findings of the Marin and Brookline pilot programs is that getting more kids to ride and walk to school involves more than simply building more sidewalks and bike paths - though this is important. The pilot programs developed the integrated approach known as the “5Es”. These are summarized below.

1. Education – The education component of SRTS includes initiatives targeting students, such as bike safety rodeos, in class presentations on pedestrian and bicycle safety, and information on exercise and health. It also includes initiatives targeting the rest of the community, such as yard signs, public service announcements (PSAs) or on-street warning signage.
2. Encouragement – The encouragement component of SRTS involves anything that makes biking and walking to school fun and appealing. Things Rye has done to date include logo contests and walk/bike to school days. Other schools have developed contests or awards to see who can walk or bike most frequently or the most miles.
3. Enforcement – Ensuring enforcement of traffic laws, especially in schools zones and on routes used by children to get to school, is critical to ensuring child safety and parent peace of mind. Examples of enforcement measures include speed monitoring and enforcement, police presence at school arrival and let-out times, and use of crossing guards.
4. Engineering – Engineering improvements can include building and ensuring proper maintenance of sidewalks and bicycle routes, striping crosswalks, installing traffic calming devices, and improving safety signage in school zones.
5. Evaluation – The final key to the success of SRTS programs is an effective evaluation component. Central to all SRTS programs are surveys of classrooms and parents to track the numbers and percentages of kids riding and walking to school, develop a clearer understanding of parents’ concerns about their children’s safety and why they are or aren’t allowed to ride or walk to school, and identify new ideas for improving the program.

The success of the Marin and Brookline pilot programs lead to funding for a national Safe Routes to School initiative being included in the 2005 federal transportation bill known as SAFETEA-LU (the Safe, Accountable, Flexible, Efficient Transportation Equity Act – Legacy for Users). The Federal Safe Routes to School Program was folded into the Transportation Alternatives Program (TAP) in 2012, and school zone

safety improvements continue to be one of the most common types of TAP projects funded in New Hampshire and nationally.

In New Hampshire 62 communities have developed Safe Routes to School while nationally more than 11,370 (youth.gov) schools have developed SRTS programs. The Safe Routes to School program has proven nationally to be an effective model. Between 2001-2010 pedestrian injury rates in New York during school travel hours in school zones with SRTS programs dropped 33 percent while the pedestrian injury rate in school zones without SRTS interventions remained unchanged. (DiMaggio 2013). Nationally schools participating in SRTS programs saw an increase in the percentage of students walking to school from 7 percent to 15 percent.

### **1.3 DEVELOPMENT OF STRATHAM'S SRTS EFFORT**

Stratham's Safe Routes to School initiative has developed out of the Stratham Pedestrian and Cyclist Advisory Committee (PCAC). The PCAC was established in 2017 to assist in developing a new version of the town's master plan and updating the town's planning regulations by working with town officers and committees with the goal of improving the safety of pedestrians and cyclists as well as connecting existing trails and public lands in Stratham. The PCAC has established a series of core principles to guide their work. These include:

- Walking and cycling are inexpensive and universal activities for the preservation of health for people of all ages, including children and seniors, and should be easily accessible to the entire community.
- Everyone has a right to walk, run and cycle safely in his/her own neighborhood and town.
- Cycling and walking are the most environmentally sustainable forms of transportation, and include commuting to work and school.
- As a form of transportation, cycling and walking requires infrastructure which should be addressed in town planning and regulations.
- Walkers and cyclists are experts of their own streets and neighborhoods and must be included in Stratham's planning process.

The PCAC has worked to promote a range of education and encouragement activities such as annual activities for bike to school day in May and a weekly Walking Wednesdays event during the spring and fall where SMS students meet at Stratham Hill Park and walk a mile to school as a group along park trails.

In late 2017 members of the PCAC approached Rockingham Planning Commission for assistance in applying for Safe Routes to School grant funding from the New Hampshire Department of Transportation. The Town of Stratham applied for and received funding for this SRTS Travel Plan, as well as an SRTS Start-Up/Non-Infrastructure funding which can be used to implement a number of the education, encouragement, enforcement and evaluation strategies outlined on the following pages.

## 1.4 PLAN STRUCTURE & PROCESS

The broad purpose of this Safe Routes to School Action Plan is to set for a vision for how Stratham will develop its Safe Routes to School program to achieve the following program goals:

- Encourage students in grades K-8 to walk and bicycle to school
- Ensure that students are able to walk and bicycle to school safely
- Encourage students to participate in healthy physical activity – whether in getting to school or in other aspects of their lives
- Encourage Stratham families to consider alternatives to driving for a range of short trips, in order to reduce traffic congestion and improve air quality.

The development of a Travel Plan will also be an aid to the Town in pursuing Federal funding for pedestrian and bicycle infrastructure project through the Transportation Alternatives Program. This grant program, managed by the New Hampshire Department of Transportation (NHDOT), is the primary source of Federal funding for local sidewalk, trail and bicycle route projects. Priority has historically been given to projects that improve safe access to K-12 schools. More information on TAP and other funding sources can be found in Section 3.2 – Opportunities.

The study area for this Travel Plan includes a two mile radius around each school and is shown in Map 1. The two schools are about 3.8 miles apart, so two-mile zones overlap slightly.

### Information Sources

The Travel Plan development process has been overseen by the Stratham Safe Routes to School Committee, made up of staff from the two schools, multiple Town departments (Planning, Public Works, Police, Parks & Recreation), parents of school age children and other community members. Figure 1 shows a roster of Safe Routes to School Committee members on the following page.

The Travel Plan draws on a broad range of data sources and community input. These include:

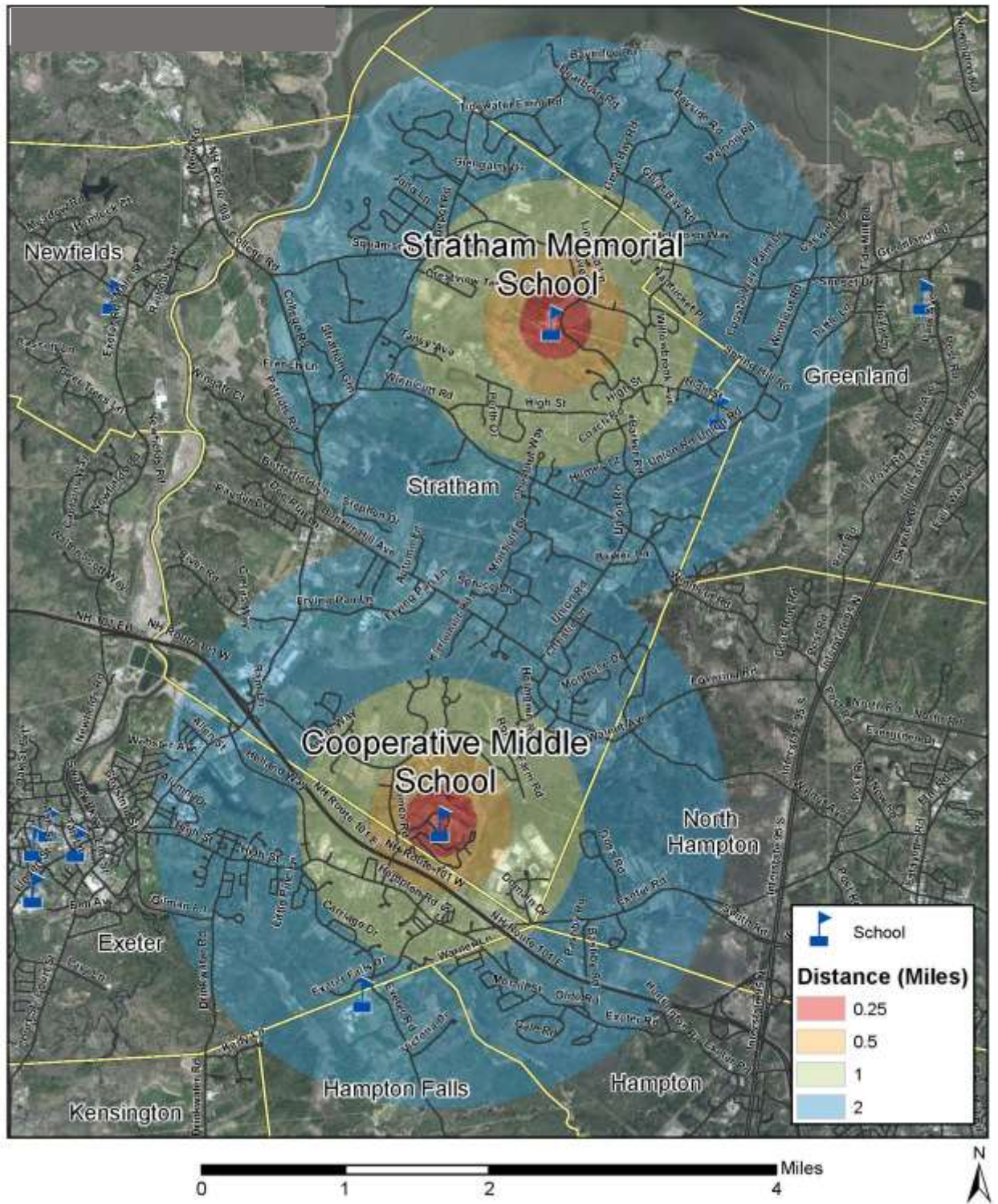
- A survey of parents of SMS and CMS students administered in April 2018
- School zone traffic and speed studies conducted in April 2018
- An initial parent forum held in early June 2018
- Tabling at three “Pizza in the Park” events Stratham Hill Park during July 2019
- Interviews with administrators and other staff at SMS and CMS in August 2018
- Site walks at SMS and CMS to observe AM arrival and PM departure in September 2018
- A second parent forum held in February 2019
- The diverse expertise brought by members of the SRTS Committee identified above.

Findings from the classroom and parent surveys are introduced in Section 5 – Public Input and Other Data, and summarized in Section 6 – Key Issues, Challenges and Opportunities.



Map 1: Travel Plan Study Area

School Zone Study Area



**Figure 1: Stratham Safe Routes to School Committee**

<b>Name</b>	<b>Affiliation</b>
Bettina Kersten	SRTS Committee & PCAC Co-Chair, SMS Parent
Melissa Gahr	SRTS Committee & PCAC Co-Chair, CMS parent
Tavis Austin	Town Planner, Town of Stratham
Colin Laverty	Public Works Director, Town of Stratham
Seth Hickey	Parks & Recreation Director, Town of Stratham, PCAC
John Scippa	Chief, Stratham Police Department
Katelyn Belanger	Assistant Principal, Stratham Memorial School (SMS)
Tiffany Locke	SMS PE Teacher
Pamela Hollasch	PCAC, SMS Parent
Jennifer Antonakakis	SMS parent, PCAC
Sue Garneau	CMS Teacher
Stephanie Frigon	CMS Experiential Education Director
Lindsay Pope	CMS Teacher
Hayley Hitchmoth	SMS Parent
Andrea Benson	SMS PTO President, PCAC, CMS Parent

## II. Existing Conditions

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The SRTS Committee and the consultant team drew on a range of input sources to develop the findings and recommendations for this Travel Plan as described in the introduction, including a survey of parents of SMS and CMS students, interviews with administrators and other staff at the two schools, input from parent forums and tabling at community events, site visits to the two schools, and traffic data collected by the Stratham Police Department and Rockingham Planning Commission. Findings are summarized in the following pages.

### 2.1 COMMUNITY PROFILE

Stratham is a growing New Hampshire Seacoast town bordered to the north by Great Bay, and by adjacent communities of Newfields, Exeter, North Hampton and Greenland. The town was settled in 1631 and incorporated in 1716, and its history as a rural agricultural community is carried through in its transportation infrastructure even as agricultural land has been subdivided into residential developments over the last forty years. The 2010 Census population count for the town was 7,255, while the Census Bureau's most recent 2016 population estimate is 7,403.

Land Use in the community can be largely described as a mix of rural residential and suburban subdivision development amid working agricultural land and conservation land. The town is bisected by two major highways: Route 108 running north-south which joins at the Stratham traffic circle with Route 33 running northeast-southwest toward Portsmouth. Much of Route 108 is lined with highway oriented commercial development, which increases in density as it heads south toward the interchange with Route 101 at the Exeter Town Line. Route 33 between Stratham Circle and Portsmouth has limited commercial development east of the town center, though carries high traffic volume at high speeds. The other significant pocket of commercial development in town is Stratham Industrial located off Route 111 in the southeast corner of the town and is accessed from Exeter. The industrial park is home to three of the town's top five employers.

The Stratham Master Plan was last updated comprehensively in 1998. The Plan's transportation chapter notes that up to that point the Town had not encouraged construction of sidewalks in new residential development due to the lack of sufficient population density to warrant the construction and maintenance expense. The Master Plan does however call for the Town in the future to add sidewalks in three locations, including the roads close to Stratham Memorial School, on Guinea Road serving the Cooperative Middle School, and in the shopping district along Portsmouth Avenue. Stratham's subdivision regulations stipulate that the Planning Board may require installation of concrete sidewalks of a minimum width of six (6) feet along subdivision roads, though this is not commonly done. There are few sidewalks in the community today. These include short stretches along Route 108/Portsmouth Avenue from the Exeter town line north to the entrances to Shaws Supermarket and the Staples Plaza; in the town center district along Route 33, and on the grounds of the two schools.

In 2008 the Town developed a Master Plan for its Gateway Commercial District along NH Route 108 which called for major redevelopment of the current commercial strip into a mixed use commercial/residential district with sidewalks and walking paths, well-marked crosswalks, and a range of streetscape

enhancements. As of the writing of this SRTS Action Plan in early 2019 the Town is engaged in a full update to the Master Plan. Data collected to date for the Master Plan points to increased community interest in bicycle and pedestrian accommodation.

Stratham has two public schools within its town boundaries. Students in grades Pre-K through five attend Stratham Memorial School, grades six through eight attend the Cooperative Middle School (CMS), and grades nine through twelve attend Exeter High School. The town is a member of School Administrative Unit 16 (SAU16), a regional school district including Stratham, Exeter, East Kingston, Kensington, Newfields, and Brentwood. Both CMS and Exeter High School are regional schools serving all six communities.

## 2.2 STRATHAM MEMORIAL SCHOOL

Stratham Memorial School is located at 39 Gifford Farm Road, a relatively low traffic volume town road amid residential development and conservation land. To the west the school backs onto the Stratham Town Forest, that in turn abuts Stratham Hill Park and an extensive trail system that is widely used by residents as well as visitors from outside. The Park's trail system provides a traffic separated access route to SMS from some neighborhoods.



*Stratham Memorial School*

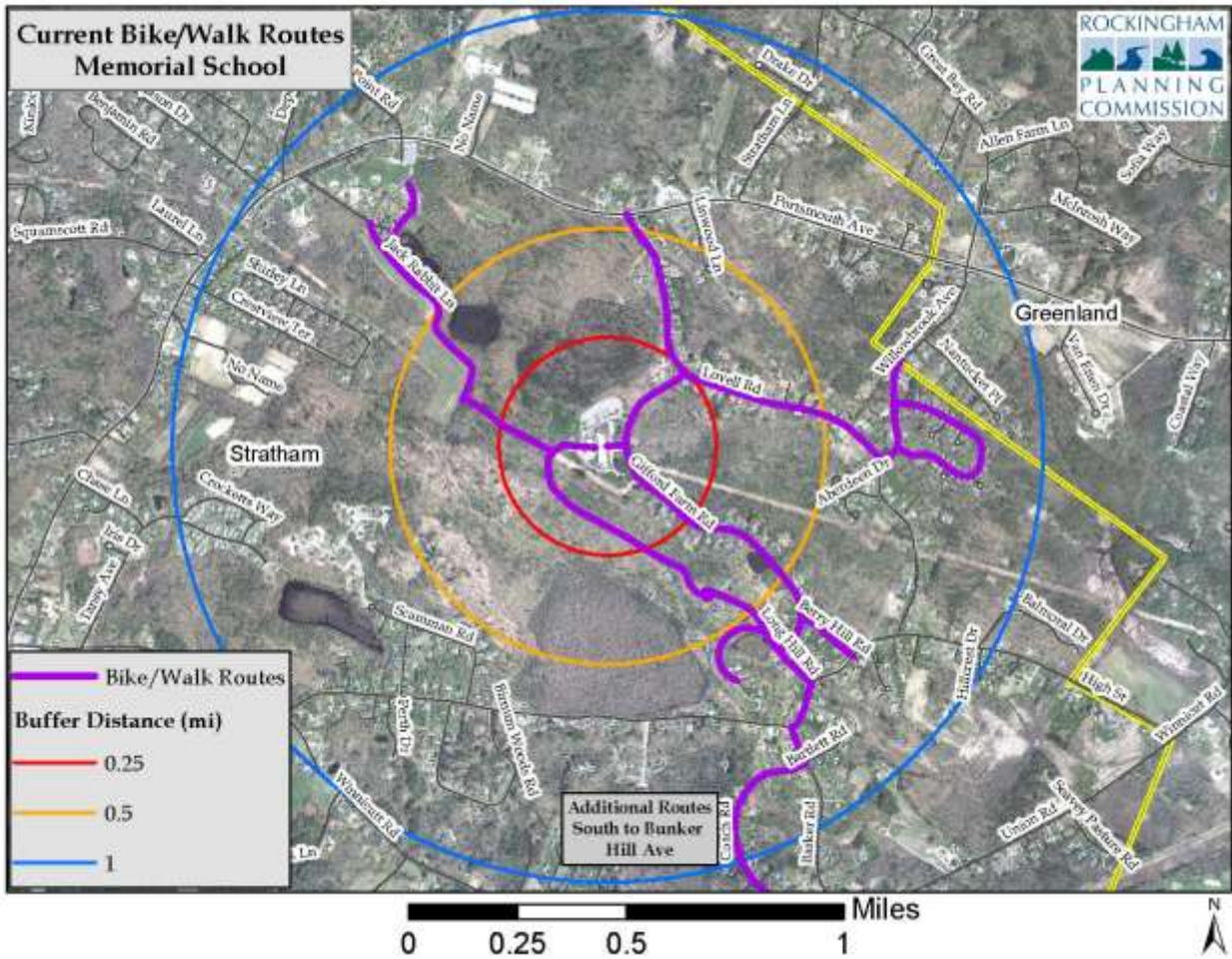
For the 2018-2019 school year there are 555 students enrolled at Stratham Memorial School in grades Pre-K through five. Approximately 89% of students ride the bus on a regular basis, while 9% arrive in family vehicles and 2% walk to school.

Map 3 shows SMS student home locations relative to school. For the 2018-2019 school year 20 students live within a half mile, 123 live within a mile and 335 within two miles. Several neighborhoods are in easy walking distance of the school by road (Easton Hill/Long Hill, Berry Hill, Alderwood), and Gifford Farm Road and Lovell Road are themselves residential roads. Other neighborhoods within a half mile of the school as the crow flies but not by road have the potential for connection via trails through Stratham Hill Park (Crestview Terrace, Scamman Road).

Map 2 shows known walking and bicycling routes used by students and their families to get from home to SMS. None of the roads used have sidewalks, and most have limited shoulder width. In most cases students who currently walk or bicycle to school are accompanied by parents.

Stratham Memorial School has already implemented several effective Education and Encouragement strategies used in SRTS efforts around the country. The school holds a popular annual Bike to School Day in May, invites presenters from the Bike/Walk Alliance of New Hampshire (BWANH) to give in-class presentations on pedestrian and safety, organizes an annual Wellness Walk in the spring.

**Map 2: Stratham Memorial School Known Walking/Bicycling Routes**



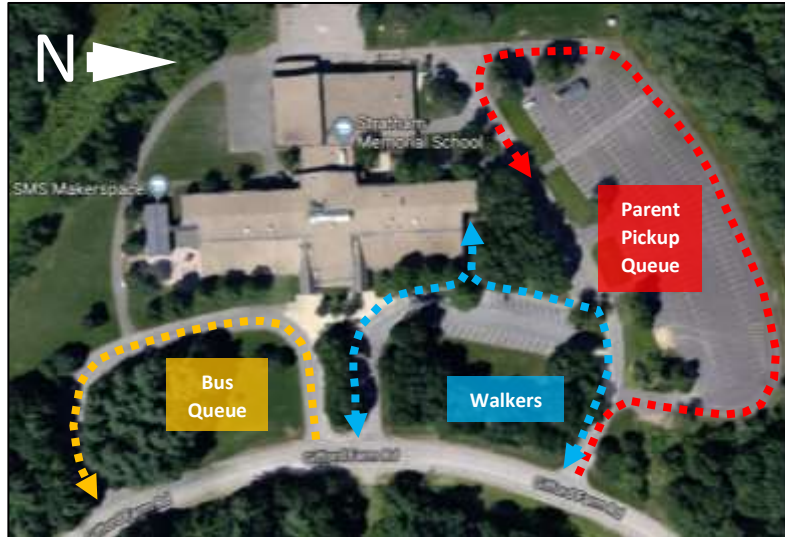
**School Zone Site Visits**

**SMS School Zone Site Walk Observations**

The project team visited Stratham Memorial School on Friday September 14<sup>th</sup>, 2018 and observed afternoon school dismissal. Comments below are summarized from full TEC field observation notes included in Appendix E, and are keyed to the school zone aerial photo.

- A good network of sidewalks exists on the school grounds, though not on connecting roads.
- A crosswalk is present directly in front of the school with a crosswalk marking sign facing each direction and single continuous LED flashing beacon. A police cruiser was stationed at the crosswalk during release.
- Crosswalks are painted in some but not all crossing areas over school driveways, and would benefit from a higher visibility paint pattern and more durable material.
- Crosswalks do not appear to provide compliant wheelchair ramps (too steep, no tactile surface, or missing ramp).

- Parents start to line up very early to pick up students and queue up along the outside of the parking area. Thirty-four cars lined up, and generally kept to the traffic pattern. Many cars were idling. A no idling sign is posted at the front of the line though not spaced out through the area where cars typically line up.
- Students boarding buses exit the front doors of the school and staff group them by bus. Buses arrived, filled and departed in an orderly fashion.



- Walkers were released from the north side of the building and most departed using the sidewalks and crosswalk directly in front of the school. Some headed north on Gifford Farm Road walked along the edge of the driveway to the parking lot where there is no sidewalk to make the most direct line.
- There are no shoulder lines on Gifford Farm Road. The road is excessively wide near the school driveways
- High visibility yellow school zone and 20 mph speed limit signs and flashers present to the north and south on Gifford Farm Road. Older yellow school zone and 20mph speed limit signs are present on Lovell Road approaching Gifford Farm Road from the both north and south.
- The intersection of Gifford Farm Road and Lovell Road is a three way stop, though lacks advance stop control signage. Lovell Road is quite wide near this intersection, which encourages high speeds even with the stop controls.

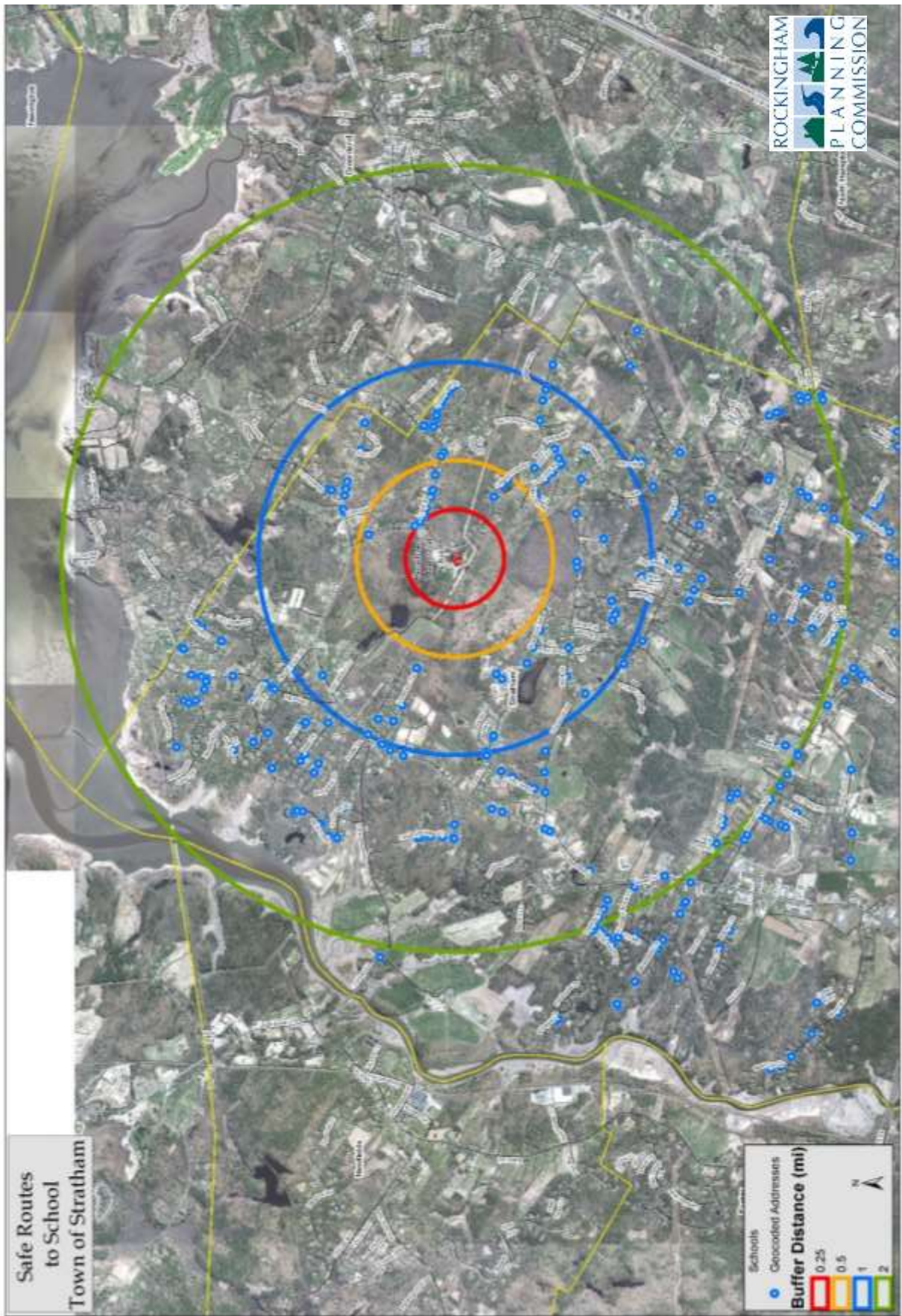
## 2.3 COOPERATIVE MIDDLE SCHOOL

The Cooperative Middle School is located at 100 Academic Way, an access road to the school complex off of Guinea Road. For the 2018-2019 school year there are 840 students from Stratham enrolled at the Cooperative Middle School, out of a total student population of 1265 from the six towns in SAU 16. The school is located near the town line with Exeter, and Exeter Farms, the nearest residential neighborhood, is across the town line.

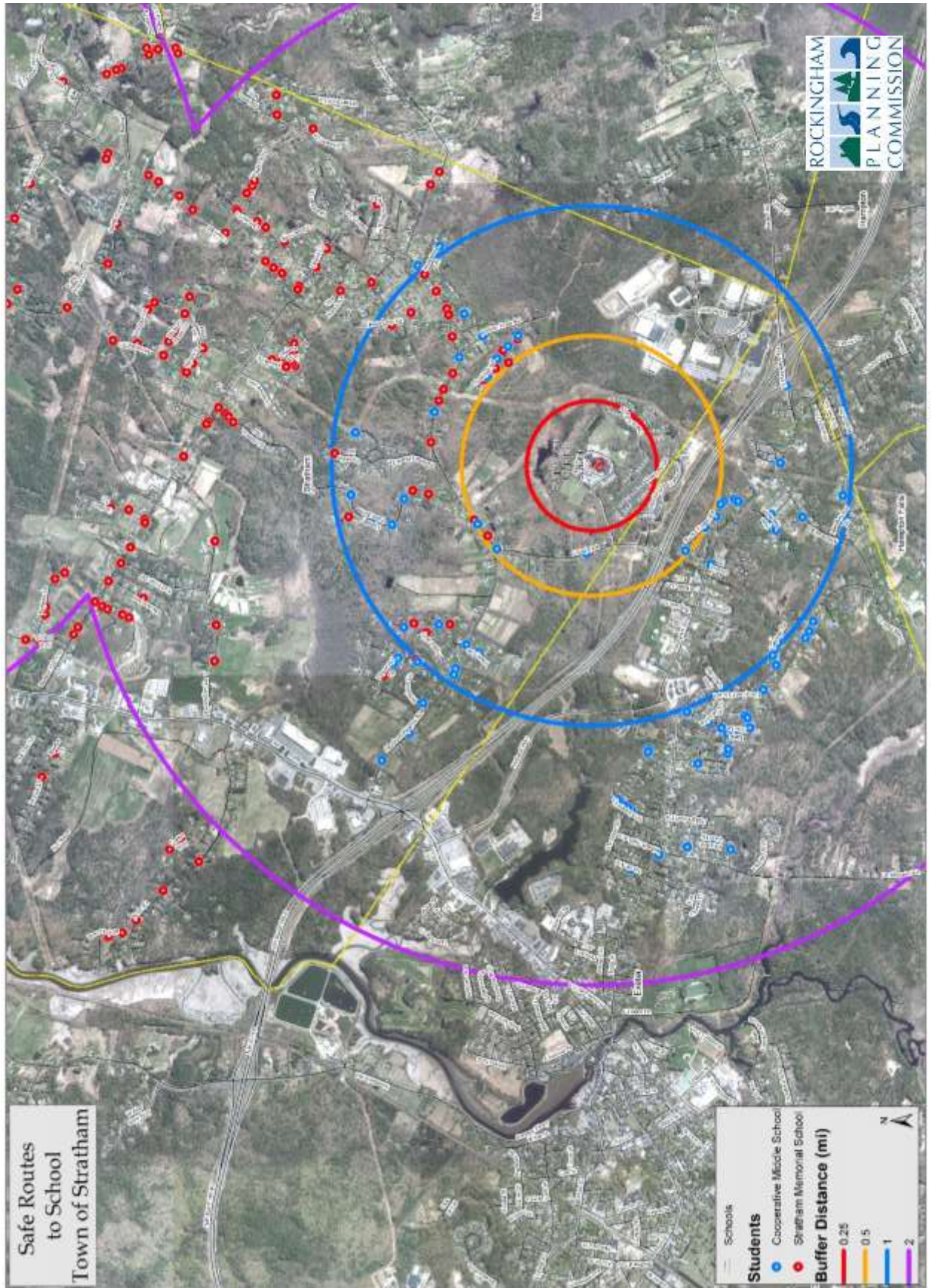


***Cooperative Middle School***

Map 3 – Stratham Memorial School Student Home Locations



Map 4 – Cooperative Middle School Student Home Locations





Few students walk or bicycle to school currently. Approximately 79% of students arrive at school via bus on a regular basis, 20% are driven by parents or in a carpool, and <1% walk or bike. There is a widely held belief that walking or bicycle to school is not allowed, or at least not encouraged. While there is no formal policy against walking or bicycling, none of the surrounding roadways are currently well suited for these modes. Guinea Road, Stratham Heights Road and Hampton Road/Route 27 lack sidewalks and feature limited shoulder width and relatively fast traffic.

CMS hosts a popular annual Bike to School Day event in May managed by teachers and parent volunteers with assistance from the police department. CMS also has a bicycling instructional unit as part of its alternative physical education program.

Map 4 shows CMS student home locations relative to school. No students live within a quarter mile of school and only two students live within a half mile. Fifty-six students live within one mile and 175 students within two miles. These numbers along with comparable numbers for SMS are summarized in Figure 3 below for the 2018-2019 school year.

**Figure 3 – Enrolled Students and Distances from School**

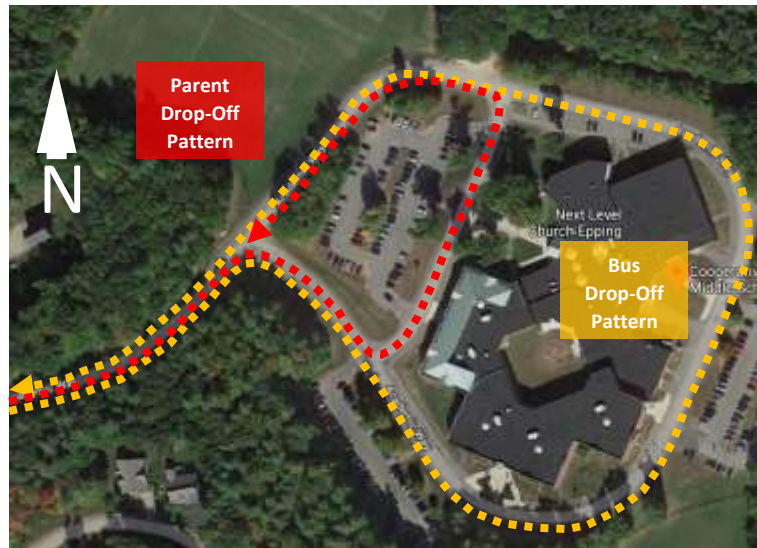
Distance from Home to School	Enrolled SMS Students	% of SMS Enrollment	Enrolled CMS Students	% of CMS Enrollment
Within 1/2 mile	20	4%	2	0.2%
Within 1 mile	123	22%	56	4%
Within 2 miles	335	60%	175	14%
Total Enrollment	555		1265	

CMS School Zone Site Walk Observations

The project team including SRTS Committee members and staff from RPC and TEC Engineers visited the Cooperative Middle School on Monday September 10<sup>th</sup>, 2018 and observed morning student arrival. Comments below are summarized from full TEC field observation notes included in Appendix E, and are keyed to the school zone aerial photo.

- Sidewalks exist immediately in front of the school and connect parking lots to the school.
- Parents drop-off students along the sidewalk in front of the school and continue out following the traffic pattern. Buses drop students behind the school.
- Long queues of cars are present for about 15 minutes during peak drop-off period, extending well back toward Guinea Road on Academic Way. While a very high volume of vehicles flows through for drop-off, the process seems to run smoothly.
- Some parents were observed using the bus/faculty lane to skip the line.
- No students were observed arriving at school by bicycle or on foot. No bike racks are present.
- Several locations lack ADA accessible wheelchair ramps. A crosswalk is missing at the southerly entrance to the parking lot in front of school.

- No idling signs along the school driveway are faded or set back.
- Entrance lanes along driveway after Academic Way are wide and could be narrowed to limit speed.
- Travel lanes along Academic Way are excessively wide and could be narrowed, making room for bike lanes, a landscaped median or sidewalks. Excessive width promotes excessive speed.
- A side path along Academic Way separated from the roadway by a grass strip would avoid the cost of drainage infrastructure that comes with curbed sidewalk. If designed to adequate width as a multi-use path this would accommodate people walking and riding bicycles.
- The intersection of Guinea Road and Academic Way is very wide, encouraging excessively speed.
- Guinea Road has no sidewalks and narrow shoulders. The bridge at the bottom of the hill may be a pinch point for widening shoulders or adding a sidewalk. The Guinea Road bridge over Route 101 is 36 feet curb to curb, so offers adequate width for a protected walkway. Adding elevated curbed sidewalk is likely not possible due to weight, though a separation could be achieved with bollards.
- School zone signs and flashers are present in both directions along Guinea Road
- Guinea Road is signed at 25 mph in the school zone. Speed count data by Stratham PD showed significantly higher average speeds



**Figure 4: Cooperative Middle School Traffic Pattern**

## 2.4 PARENT TAKE-HOME SURVEY

Stratham Memorial School and the Cooperative Middle School each fielded a survey of parent attitudes toward walking and bicycling to school in April and May 2018. Both schools used the standard format developed by the National Center for Safe Routes to School. The SMS survey was sent to the families of all 555 enrolled students in grades Pre-K through Five. The CMS survey was sent to families of students living in Stratham and Exeter, making up 840 of the school’s 1265 enrollees. Students in Stratham and Exeter were the focus as these communities are the only ones in School Administrative Unit 16 (SAU16) with residential areas in close enough proximity for walking and bicycling to school to be practical. A total of 63 responses were received from SMS and 136 responses from CMS, representing response rates of 11.3 percent and 16.2 percent respectively. Parent responses are summarized on the following pages. These data provide a baseline from which to measure change in future years as SRTS measures are implemented by the schools and the Town.

Travel Distance from Home to School

**Figure 5: Distance from Home to School**

<b>Distance from Home to School</b>	<b>SMS Respondents</b>	<b>CMS Respondents</b>
Less than 1/4 mile	0 (0%)	3 (2%)
1/4 mile up to 1/2 mile	10 (16%)	4 (3%)
1/2 mile up to 1 mile	6 (10%)	13 (10%)
1 mile up to 2 miles	12 (19%)	34 (25%)
More than 2 miles	34 (54%)	74 (54%)
No Response	1 (2%)	8 (6%)
<b>Total Survey Responses</b>	<b>63</b>	<b>136</b>

Figure 5 shows the distance from home to school for SMS and CMS students. These distances generally reflect the distribution of all students as shown in Maps 1 and 2 on pages 4 and 5. Approximately 45 percent of respondents for SMS live within two miles of school, as did approximately 40 percent of Stratham and Exeter respondents from the Cooperative Middle School.

Mode of Travel to/from School

Figure 6 shows parent responses to the question “On most days how does your child arrive at school and leave for home after school?” The numbers identify the school bus as the most common mode of travel to and from school, followed by driving in a family vehicle. No parents at either school indicated that their students rode their bicycles to school on a regular basis, though parents of seven SMS students (11 percent) and four CMS students (3 percent) reported that their kids walked on a regular basis.

**Figure 6: Mode of Travel to and from School**

	<b>Walk</b>	<b>Bike</b>	<b>School Bus</b>	<b>Family Vehicle</b>	<b>Carpool</b>	<b>Sample</b>
<b>Stratham Memorial School</b>						
AM Arrival	10%	0%	76%	15%	0%	62
PM Departure	11%	0%	68%	21%	0.0%	62
<b>Cooperative Middle School</b>						
AM Arrival	2%	0%	79%	18%	2%	129
PM Departure	3%	0%	92%	5%	0%	131

The relatively high number of respondents reporting children are driven to school in a family vehicle is consistent with the significant traffic backups at dropoff and release times reported as a challenge by multiple parents and the SWOC (Strengths, Weaknesses, Opportunities, Challenges) conducted by the SRTS Committee.

Student Interest in Walking/Biking to School

**Figure 7: Students Asking for Permission to Walk/Bike to/from School**

<b>Distance from Home to School</b>	<b>% of SMS Sample</b>	<b>% of CMS Sample</b>
Within 1/2 mile	80%	100%
1/2 mile up to 1 mile	100%	46%
1 mile up to 2 miles	50%	52%
More than 2 miles	42%	18%
<b>Total for All Distances</b>	<b>56%</b>	<b>33%</b>

Figure 7 shows parent responses to the question “Has your child asked for permission to walk or bike to/from school in the past year?” Results are shown for both the elementary school (SMS) and middle school (CMS) samples and are divided out by distance from home to school. Overall, 56 percent of parents of SMS students had received requests from their children to walk or bike to school, as had 33 percent of parents of CMS students from Stratham and Exeter. For students living within a two-mile radius of school these numbers increased to 71 percent of SMS students requesting to walk or bike to school, and 56 percent of CMS students.

Perception of Appropriate Age for Walking/Biking to School Unaccompanied

Figure 8 shows responses from SMS and CMS parents regarding the grade level at which they would allow their child to walk or bike to school unaccompanied.

**Figure 8’’: Grade Parents Would Allow Children to Ride/Walk Unaccompanied**

	<b>1st</b>	<b>2nd</b>	<b>3rd</b>	<b>4th</b>	<b>5th</b>	<b>6th</b>	<b>7th</b>	<b>8th</b>	<b>9<sup>th</sup>+</b>	<b>Never</b>	<b>Unk/NA</b>
<b>CMS Parents</b>	2%	0%	4%	13%	15%	22%	10%	1%	6%	18%	7%
Cumulative %	2%	2%	6%	19%	35%	<b>57%</b>	<b>67%</b>	68%	74%	93%	100%
<b>SMS Parents</b>	0%	2%	6%	11%	14%	11%	11%	2%	10%	30%	3%
Cumulative %	0%	2%	8%	19%	33%	44%	<b>56%</b>	57%	67%	97%	100%

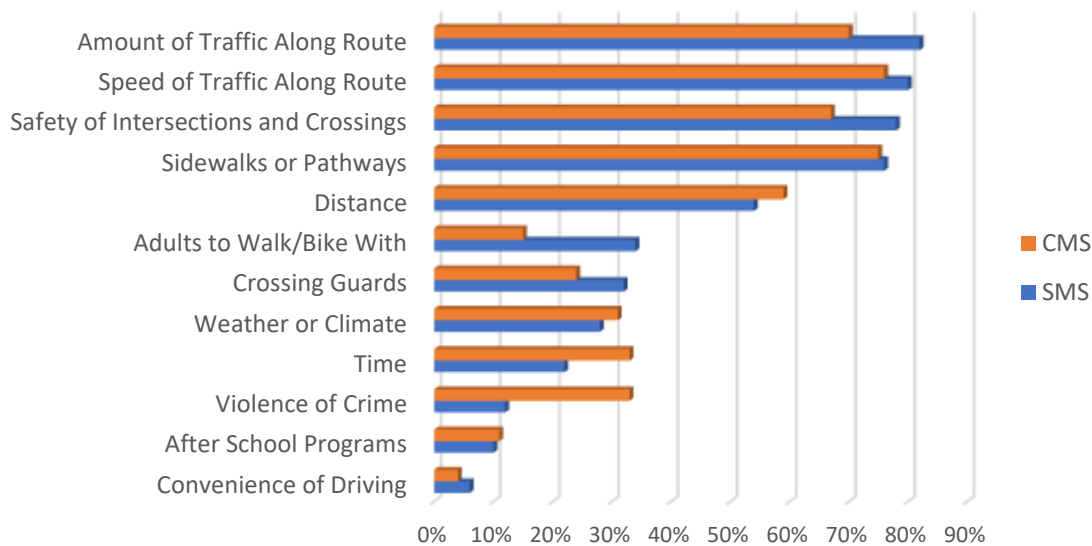
Looking at the cumulative percentage of parents indicating comfort with their children riding or walking unaccompanied, a majority of parents at SMS indicated that by seventh grade they would be comfortable with their children walking or riding unaccompanied. A majority of CMS parent respondents felt that by sixth grade they would be comfortable with their children walking or riding to school unaccompanied. Approximately a third of respondents at both schools expressed similar comfort at the 5<sup>th</sup> grade level. Interestingly close to a third of parents at SMS indicated that they would not be comfortable with their children walking or biking unaccompanied at any grade in elementary or middle school, while 18 percent of CMS parents gave this response. This points to the need for parental or other volunteer accompaniment as part of efforts to get more elementary school students walking and biking.

Issues Affecting Parent Decisions Regarding Walking & Biking to School

Figure 9 shows responses to the question “What issues affect your decision to allow your child to walk or bike to school?” from parents who currently do not allow their kids to walk or bicycle to school.

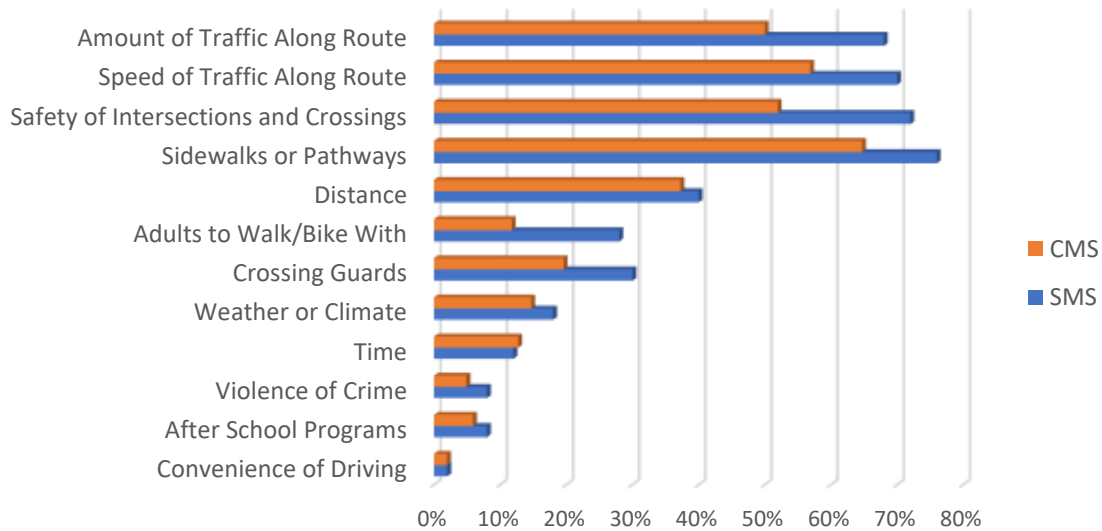
The most common concerns cited by parents included the amount of traffic along the route to school (82 percent of SMS respondents and 70 percent for CMS), the speed of traffic along the route to school (80 percent of SMS responses and 76 percent for CMS), the lack of sidewalks or pathways (76 percent of SMS responses and 75 percent for CMS), and the lack of safety at intersections and crossings (78 percent for SMS and 67 percent for CMS). The one other factor cited by a majority of parents at either school was distance from home to school, noted by 54 percent of SMS respondents and 59 percent of CMS respondents.

**Figure 9: Issues Affecting Parent Decisions to Allow Kids to Walk or Ride**



Parents were also asked whether actions to address these concerns would change their decision to allow their children to walk or ride to school. These responses are shown in Table 8. Actions identified by parents as most likely to change their decision included expanding sidewalks/bikeways (76 percent of SMS parents and 65 percent for CMS), improving safety at intersections and crossings (72 percent of SMS parents and 52 percent for CMS), addressing traffic speeds on routes traveled by children between home and school (70 percent of SMS parents and 57 percent for CMS), reducing traffic volumes (68 percent for SMS and 50% for CMS), and expanded use of crossing guards (30 percent for SMS and 20% for CMS).

**Figure 10: System Changes that would Impact Decision to Allow Walking/Riding**



Parent Perception of Walking/Biking as Fun, Healthy, and Supported by School

Figure 11 shows parent perceptions of how fun walking or biking to school is for their child. Among elementary school parents, 78 percent thought walking/biking was *fun* or *very fun* for their child. These numbers were slightly higher than for parents of middle school students, where 65 percent thought walking/biking was *fun* or *very fun*.

**Figure 11: Perception of Walking/Biking as Fun for Children**

	Very Fun	Fun	Neutral	Boring	Very Boring
Stratham Memorial School	37%	41%	22%	0%	0%
Cooperative Middle School	30%	35%	30%	2%	2%

Figure 12 shows parent perceptions of the healthfulness of walking or biking to school. Fully 98 percent of elementary school parents thought walking/biking was *healthy* or *very healthy* for their child; while 92 percent of middle school parents thought similarly.

**Figure 12: Perception of Walking/Biking as Healthy for Children**

	Very Healthy	Healthy	Neutral	Unhealthy	Very Unhealthy
Stratham Memorial School	82%	16%	2%	0%	0%
Cooperative Middle School	76%	16%	8%	1%	0%

Finally, Figure 13 shows parent perception of the extent to which their child’s school supports walking and bicycling to school. Thirteen percent of elementary school parents felt that Stratham Memorial School either *encouraged* or *strongly encouraged* walking and bicycling to school. A large majority (76 percent) saw the elementary school as neutral on the issue. In contrast the Cooperative Middle School is broadly seen as discouraging bicycling and walking, with 54 percent of middle school parents responding that CMS either *discouraged* or *strongly discouraged* walking and bicycling. Only four percent of parents thought CMS *encouraged* or *strongly encouraged* walking and bicycling. This is consistent with prior policy at CMS prohibiting walking and bicycling, though that policy has since changed.

**Figure 13: Perception of Walking/Biking as Supported by School**

	<b>Strongly Encourage</b>	<b>Encourage</b>	<b>Neutral</b>	<b>Discourage</b>	<b>Strongly Discourage</b>
Stratham Memorial School	2%	11%	76%	8%	3%
Cooperative Middle School	2%	2%	43%	16%	38%

# III. Key Issues, Challenges & Opportunities

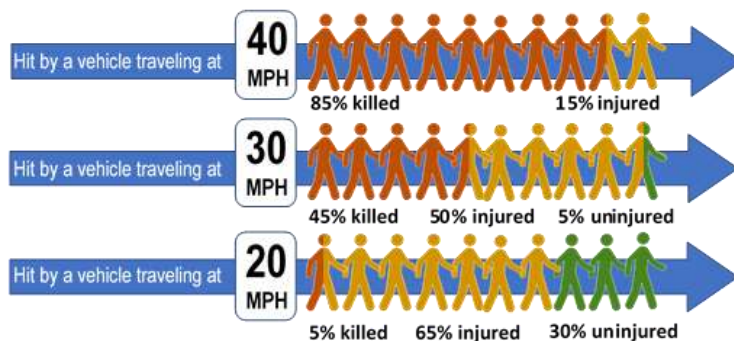
## 3.1 KEY ISSUES & CHALLENGES

Based on survey responses, school interviews, community feedback and input from the SRTS Committee and other stakeholders, a number of key issues emerge that shape parents perceptions of the safety of allowing their children to walk or ride to school. These include:

- Traffic speed, volume, and distracted drivers – Traffic speed and volume were the concerns most frequently cited by parents as impacting their decision to allow or not allow their children to walk or bike to school, identified by 79% of SMS survey respondents and 75% of CMS respondents. Coupled with the narrow shoulder concern above, 63% of parents indicated concern regarding high traffic volumes on roads in the school zone, and 65% indicated concern regarding excessive speed. A speed study conducted by Stratham Police Department found that 95% of vehicles on Guinea Road exceeded the speed limit, and 43 percent exceeded the limit by more than 10 mph. Similarly for Lovell Road north of Gifford Farm Road, 74% of traffic exceeded the speed limit while 18% exceeded the limit by more than 10 mph.

The difference between 25mph and 35mph seems quite small when behind the wheel of a car, but it has major implications if a car hits a pedestrian. According to the National Highway Traffic Safety Administration (NHTSA) a pedestrian hit by a car traveling 2 mph has a 5% chance of being killed, at 65% change of injury and a 30 percent change of emerging uninjured. At 30 mph there is a 45% chance of being killed, a 50% chance of injury and a 5% chance of avoiding injury. At 40 mph the chance of being killed jumps to 85% with a 15% chance of just being injured. Many police

departments use an enforcement tolerance of 10mph over the speed limit, meaning motorists are only ticketed if caught exceeding the speed limit by more than 10mph. With better understanding of the consequences of these speed differences in a school zone where young pedestrians are likely to be present, a growing number of communities with Safe Routes to School programs have adopted a zero tolerance policy for speeding in or near school zones. Stratham should consider narrowing its enforcement tolerance on roads within the two mile walking/bicycling commute shed for CMS and SMS, or on specific targeted roads. This could be a reduction to a 5 mph overage or even a zero tolerance policy.



**Figure 14: Relationship Between Auto Speed and severity of Pedestrian Injury (NHTSA)**

Driver distraction is a significant factor in automobile crashes, contributing to an estimated 25% of crashes nationally. Crashes attributable to driver distraction have gone up nationally as more distractions are present in automobiles – whether hand-held devices or integrated car



entertainment systems. New Hampshire banned the use of hand-held devices such as smart phones in 2015 (RSA 265:79-c), though simple observation of passing automobiles shows that use of such devices while driving remains common. Even if drivers switch to hands-free devices, these are four times more distracting than talking to a passenger (Strayer 2006).

- Narrow roads and lack of shoulders or sidewalks – Lack of sidewalks and pathways was another top concern registered by respondents to the parent survey. Seventy four percent of CMS parents and 76 percent of SMS parents indicated this as a reason they do not let their kids walk or bike to school. Correspondingly 76% percent of SMS parent respondents indicated that if sidewalks or pathways were improved it could impact their decision on allowing walking or riding to school. Sixty four percent of CMS respondents felt similarly. Once off the immediate school grounds there are no sidewalks in the school zones for either SMS or CMS. The primary roads connecting the schools to adjacent residential areas – Gifford Farm Road and Lovell Road at SMS and Guinea Road for CMS – lack shoulders wide enough to be designated as walking or bicycling routes.
- Low density development pattern – Stratham’s pattern of residential development featuring small pocket neighborhoods, often cul-de-sacs, amid larger parcels of open land poses a challenge for creating a network of pedestrian and bicycle routes.
- Intersection safety – Seventy eight percent of SMS parents and 67% of CMS parents identified intersection safety as a concern that led them to not allow their child to ride or walk to school. Several intersections specifically identified through the parent survey, school site walk and SWOT analysis conducted with the SRTS Committee. These included the intersections of Gifford Farm/Lovell Road, Lovell Road and Willowbrook, and getting across Route 33 for students from neighborhoods north of that state highway.
- Uncertainty among parents regarding school support for walking and bicycling – Survey responses indicated a sense that Stratham Memorial School policies were largely neutral on the subject of walking and biking to school (76 percent), while 13 percent of respondents thought the school either Encouraged or Strongly Encouraged walking and biking. The perception of CMS parents was quite different with 54 percent perceiving that CMS Discouraged or Strongly Discouraged walking or biking to school. While there is not school policy at CMS prohibiting walking or bicycling, there is an understandable concern on the part of CMS administration about explicitly encouraging walking and biking until key infrastructure safety improvements can be made on Academic Way, Guinea Road and/or off-road connector paths. Consistent messaging to parents will be important.

## 3.2 OPPORTUNITIES

Balancing the issues and challenges identified above, the parent surveys, school interviews and community outreach at Stratham Hill Park found much interest and receptiveness to the SRTS concept. Opportunities for the SRTS Committee, the Town and SAU16 to pursue include the following:

- Stratham’s trail network – Stratham has an excellent trail network at Stratham Hill park and on adjacent town forest and private conservation land. This trail system already provides a link to SMS from the Long Hill Road, Scamman Road, Crestview Terrace and Tansy Avenue/Crocketts Way neighborhoods and Stratham Hill Park itself. The Walking Wednesdays weekly group walk to school at SMS uses these trails. A safe crossing over Route 33 could open up access from Jason Drive, Sandy

Point Road and Depot Road neighborhoods north of Route 33, enabling them to cross the highway and use the trail system to reach SMS. Off road trails may also be a solution for access to CMS. SRTS Committee members have begun meeting with owners of land across which paths could create safe traffic-separated connections between CMS and residential areas off Stratham Heights Road.

A key question with municipal trails is who will be responsible for maintenance. In many communities this is handled by municipal public works or parks and recreation departments. Elsewhere local or regional volunteer groups organize to share the burden of trail maintenance. In Windham New Hampshire the town's four-mile rail trail is largely maintained with about 250 volunteer hours per year, minimizing the expense to the town. Similarly the non-profit Coastal Trails Coalition organizes volunteers to handle much of the maintenance of the regional trail system that connects Newbury, Newburyport, Amesbury and Salisbury Massachusetts.

- Stratham kids' interest in walking or biking to school – While school data show only about 2% of students at SMS and fewer than 1% at CMS currently walk or bike to school, 39% of students in families surveyed indicated a desire to do so. Thirty-three percent of Junior High students had requested permission from their parents to bike or walk, as had 56% of elementary school students. These percentages were higher for students within a one-mile radius of school, where 75% of families surveyed indicated their kids had requested to walk or bike to school. The analysis of student locations relative to school found 123 SMS students living within one mile of school, and 56 CMS students living within one mile of school. The participation of over half of SMS students in annual Bike to School Day activities in May underscores this desire.
- Stratham parents' willingness to reassess allowing their kids to bike or walk – While high percentages of parents indicated concerns that have led them to not allow their children to walk or bike to school, most also indicated that improvements in these areas would lead them to reassess their positions. In addition, 98% of SMS parents and 92% of CMS parents responding to the survey saw walking and biking to school as *healthy* or *very healthy*. Seventy eight percent of SMS parents and 65 percent of CMS parents surveyed saw walking and biking as *fun* or *very fun*.
- Sources of funding – One of the most common sources of funding for bicycle and pedestrian facilities is the federal Transportation Alternatives Program (TAP). TAP provides 80% federal funding to communities for bicycle and pedestrian improvement projects. These funds are highly competitive and are selected biennially in New Hampshire. Typically \$5.0-\$5.5 million are allocated statewide in each biennial funding round. Among the program priorities is improving safety in school zones where towns or school districts have established SRTS programs and completed SRTS Action Plans. The minimum project size for a TAP grant is \$400,000 federal share) and the maximum size is \$1,000,000. There is a significant administrative component to these grants, which make them impractical for smaller projects. Stratham has a successful history of managing TAP grants.

A source of local revenue for transportation projects, enabled under RSA 261:153, is the "Local Option" supplemental vehicle registration fee. State law allows municipalities to charge a supplemental registration fee of up to \$5.00 per vehicle annually to generate funding for local transportation needs, whether sidewalks, public transportation, intersection improvements, or basic road maintenance. The fee provides a modest but consistent revenue stream aside from the property tax, which has been used by several communities around the state to generate the local matching share for projects funded through TAP, or to fund projects directly.

Given Stratham’s excellent trail system and the numerous opportunities to connect neighborhoods to schools with trails, another funding opportunity is the federal Recreational Trails Program (RTP). The RTP is managed through the NH Trails Bureau and distributes approximately \$900,000 annually. About a third of this is set aside for non-motorized trails. Recreational Trails Program grants have the added benefit of allowing volunteer labor, donated materials and machinery or other in-kind services to meet the required 20 percent matching commitment.

- Volunteer resources – The Walking Wednesdays school commute walking group launched in 2018 and chaperoned by parent volunteers points to the level of volunteer effort that can be mobilized in Stratham for the right cause. Parent participation will be important in implementing many of the non-infrastructure strategies described in the next chapter, and potentially some of the infrastructure strategies. Volunteers may also be part of a local trail maintenance strategy.

## IV. Implementation Strategies

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### 4.1 PORTFOLIO OF ROAD SAFETY DESIGN STRATEGIES

The pedestrian and bicycle facility types described on the following pages are drawn from standard design guidance from the American Association of State Highway and Transportation Officials’ (AASHTO) *Guide to the Development of Bicycle Facilities* and the *Guide for the Planning, Design and Operation of Pedestrian Facilities*. *Signage and pavement markings are in most cases drawn from the Manual of Uniform Traffic Control Devices for Streets and Highways (MUTCD). The MUTCD defines the standards used by State DOTs and local public works departments around the country to install and maintain traffic control devices on public streets, highways and bikeways. Each of the design strategies described has potential application in Stratham as described in the recommendations section.*

#### ***Signage & Pavement Markings***

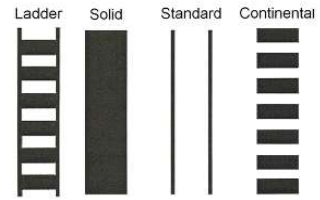
School Zone Speed Limit Signage – School speed limit signs alert drivers that they are entering a school zone and they need to slow down given the likelihood of children walking along or crossing the road. School speed limits vary by state law and typically range from 15mph to 25mph. Both CMS and SMS have flashing school speed limit signs on streets approaching the schools.



Speed Feedback Signage – Speed feedback signs show the posted speed limit but also feature a radar unit which displays the speed of oncoming vehicles to alert drivers to their actual speed and the posted speed limit. These work best if they flash or provide a SLOW DOWN message if drivers exceed a preset speed threshold. An example of such signs can be found on High Street/Route 27 in Exeter. Most speed feedback signs can also record traffic and speed counts and can be a useful tool in tracking success of speed reduction efforts through a combination of road redesign, signage and enforcement.



**High Visibility Crosswalks** – How a crosswalk is painted makes a big difference in how visible it is to oncoming vehicles. Crosswalks can be marked with paint or a longer lasting thermoplastic or epoxy material embedded with reflective glass beads. While the latter material is more expensive initially it needs less maintenance and provides better value over time. Essentially the wider the painted area of the crosswalk the greater the visibility to approaching drivers. There are multiple marking schemes provided for in the MUTCD, including the *ladder*, *solid*, *standard* and *continental*. The *ladder* and *continental* design are recommended by the Federal Highway Administration because research indicates they are most visible to approaching drivers. *Solid* crosswalks are high visibility but more costly from a labor, materials and maintenance standpoint. The *standard* design with just two transverse lanes has limited visibility to oncoming vehicles. It is important that crosswalks be repainted regularly to ensure visibility.



**Crosswalk Signage** – The MUTCD designates special signs for school zone crosswalks, distinct from general crosswalk signs. These are placed immediately at the crosswalk location facing in each direction and feature the of fluorescent yellow-green house shaped MUTCD S1-1 sign with a down arrow (W16-7P). These often feature pedestrian-activated flashing beacons as described on the following page. In-Street crosswalk signs (MUTCD R1-6) are additional marking option. These are placed on the center of the road on the crosswalk. They feature a heavy rubber base with flexible post. Stratham’s SRTS non-infrastructure grant provides for purchase of several of these portable signs.



**Advance Crosswalk Signs** – The MUTCD designates that advance warning signs be used in advance of school crossings. These alert drivers of an upcoming crosswalk so they will be prepared to stop if needed. These must be installed on both approaches at least 150 feet in advance and not more than 700 feet in advance. These use the same house shaped MUTCD S1-1 sign with a rectangular “Ahead” (W16-9P) sign.



**Advance Stop Signs** – As with advance crosswalk signs, advance stop signs (MUTCD W#-1) alert drivers to an upcoming stop controlled intersection such as the three way intersection of Lovell Road with Gifford Farm Road.



**School Route Marking Stencils** – While not described in the MUTCD, some SRTS programs have developed pavement stencil designs to mark common walking routes to school. These serve as wayfinding as well as a reminder to drivers that they are approaching a school zone and children are likely to be walking in the area. (Photo credit Baltimore Sun)



**Rectangular Rapid Flashing Beacons (RRFBs)** – RRFBs are a standard MUTCD W11-2 pedestrian warning sign and arrow in high visibility yellow green, coupled with a pedestrian-activated LED beacon employing a rapid stutter flash pattern similar to that used on emergency vehicles. They are installed on both the right and left side of the roadway facing in each direction. Research by FHWA has found that RRFBs significantly improve the rate of drivers yielding to pedestrians in marked crosswalks. (photo credit FHWA)



Pedestrian Hybrid (HAWK) Beacons – These are a special type of hybrid beacon used to warn and control traffic at an un-signalized location to assist pedestrians in crossing a street or highway at a marked crosswalk. HAWK beacons are used at locations where warrants are not met for a full traffic signal with pedestrian phase, but pedestrians need to be able to cross and traffic speed, volume and roadway width are too great for a Rectangular Rapid Flashing Beacon described above. Such a beacon is likely appropriate to facilitate pedestrian crossing of Route 33 at the entrance to Stratham Hill Park. (photo credit FHWA)



State Law: 3 Feet Minimum to Pass Bicycles – This sign has been approved by the State of New Hampshire to inform road users of the requirements of New Hampshire RSA 265:143a (New Hampshire’s 3-foot safe passing distance law). It is not currently listed in the MUTCD but is consistent with MUTCD standards for sign design. Installation of this sign shall be prioritized for routes on the New Hampshire Bicycle Route System map.



Bikes May Use Full Lane (R4-11) This sign is for use where no bicycle lanes or usable shoulders are present and where travel lanes are too narrow for bicyclists and motor vehicles to operate side by side, per the requirements of New Hampshire RSA 265:143a (New Hampshire’s 3-foot safe passing distance law). This sign is becoming popular as a replacement for “Share the Road” signs. Recent research has found those have limited impact on driver behavior, and are not as effective as the “Bikes May Use Full Lane” sign in conveying that people on bicycles have a legal right to be on the road, including occupying the travel lane where their safety warrants it. This may be used in tandem with shared use lane markings (“sharrows”).



### ***Sidewalks & Paths***

Curbed sidewalks – Curbed sidewalks are standard safety accommodation for people walking in suburban school zones. The vertical separation from the road level provided by an elevated curb offers protection against cars veering into the pedestrian way. Curbing in New Hampshire is typically granite for durability, while the sidewalk itself may be either concrete or asphalt. The recommended minimum width for sidewalk is five feet, which allows two people to pass comfortably or walk side by side. Sidewalks are typically wider in school zones where there is a likelihood of larger numbers of people walking together. Sidewalks should ideally be continuous on both sides of a roadway to minimize the need for crossing the street, and should be fully accessible to all pedestrians, including people in wheelchairs.



Set Back Sidewalks – Another sidewalk design omits curbs and sets the walkway back from the shoulder, typically with a grass or landscaped strip in between. The planted strip serves as a visual and functional barrier between traffic and pedestrians. An advantage of this design is that with no curb to channel stormwater these set back sidewalks may be constructed without need for storm drains which may be needed for long stretches of curbed sidewalk. The expense of granite curbing can also be avoided. With the added width of the grass strip this design does require greater right of way width.



Widened Shoulders- On rural roads where right of way is not adequate for set back sidewalks, and the appearance and/or expense of curbed sidewalks is not acceptable to the community, a second best alternative can be widened shoulders that can support both bicycling and walking. Shoulders should always be widened on both sides of the roadway so people walking or bicycling may do so in the proper direction. This means riding with traffic but walking against traffic.



Walking paths – Walking paths outside of the road right of way can be an excellent solution for creating connectivity in communities with low density development. Such paths can cut through park land or connect the bulb ends of cul de sacs, allowing safe routes completely separated from traffic. Given Stratham’s already extensive trail system at Stratham Hill Park and elsewhere, walking paths have terrific potential for connecting neighborhoods to both SMS and CMS. Surface can be natural earth or stone dust. Recommended minimum width for a walking path is five feet. For a multi-use path intended to support two-way bicycling and walking the recommended minimum is eight feet.



Universal Design – A key goal of the Americans with Disabilities Act (ADA) and universal design is to provide a walking environment that is equally safe and comfortable for pedestrians of all ages and abilities. In particular this includes wheelchair users and individuals with sight impairments. Sidewalks need to incorporate curb ramps with a slope of no more than 1:12 (1:16 or 1:20 preferred) and meeting other design requirements of the ADA. Curb ramps should also be fitted with truncated dome warning strips as a tactile cue for individuals with vision impairment that they are stepping off the sidewalk onto a roadway. (photo credit Peter Lagerwey, National Safe Routes to School Partnership)



Crossing Guards – Crossing guards, whether paid or volunteer, can be an important part of improving safety for kids crossing busy streets. These adults take responsibility for stopping traffic to let walkers cross during school arrival and departure periods. Stratham has received pilot funding to establish a volunteer crossing guard program as part of its SRTS Non-Infrastructure grant. Primex provides training for such programs



### ***Bicycle Accommodation***

Bicycle Lanes – The National standard for design of bicycle facilities is the American Association of State Highway and Transportation Officials’ (AASHTO) *Guide to the Development of Bicycle Facilities*. The AASHTO guide recommends a minimum four-foot shoulder on both sides of the roadway for designation as a shoulder bicycle route, or a minimum of five-foot shoulders when next to a curb or guardrail.



Sharrows – Shared lane marking arrows, or “sharrows” are road markings used to indicate a travel lane where inadequate space exists to the right of traffic for people on bicycles to ride. The sharrow puts motorists on notice to expect bicyclists in the lane. Sharrows are not appropriate for roads with speeds over 30mph, and should not be considered a substitute for bike lanes unless there is inadequate space for a designated bike lane.



Traffic Calming – This refers to a range of strategies designed to slow automobile speeds and thereby make it safer for people walking, riding bicycles or driving automobiles. On suburban or rural roads such as most in Stratham an effective traffic calming strategy is visually narrowing the road by striping narrower travel lanes. Per the Institute of Traffic Engineers (ITE), depending on volume of truck traffic, roads with speeds below 35 mph are usually suitable for ten (10) foot travel lanes. Removable speed bumps may be suitable for school driveways. These can be unbolted to avoid damage by snowplows during winter months. In more urban environments with sidewalks, traffic calming can be achieved with bulb-outs or chicanes, where curbing is used to physically narrow the roadway, particularly at crossing points. This has the double benefit of shortening the crossing distance for pedestrians at crosswalks. Removeable planter boxes and bollards can be used to achieve the same effect at lower cost. Tightening the turning radius of a corner is an effective strategy to slow the speed at which drivers take that corner, and is applicable in urban, suburban or rural settings. (photo credit FHWA)



Bicycle Parking – It is important to have a secure place to park bicycles at school as part of encouraging students and staff to commute by bicycle. The ribbon style racks installed in front of SMS are one good design. Another sound design is the Inverted U rack which provides two points of support for a bicycle reducing the likelihood of tipping over. Racks should be placed prominently near the front entrance of school. A covered bicycle parking area is preferred.



## 4.2 INFRASTRUCTURE PROJECT RECOMMENDATIONS

Recommended infrastructure improvement projects for the Stratham Memorial School and Cooperative Middle School Zone and connecting neighborhoods are summarized in the matrix on the following pages, keyed to Map 5 for SMS and Map 6 for CMS. Rough estimates of cost for each project are summarized in the table based on the categories below. The timeline category identified projects that are low cost and easily implemented as Short Term (1-2 years), while project that are more costly or complicated are identified as Mid-Term (3-5 years) or Long Term (5+ years).

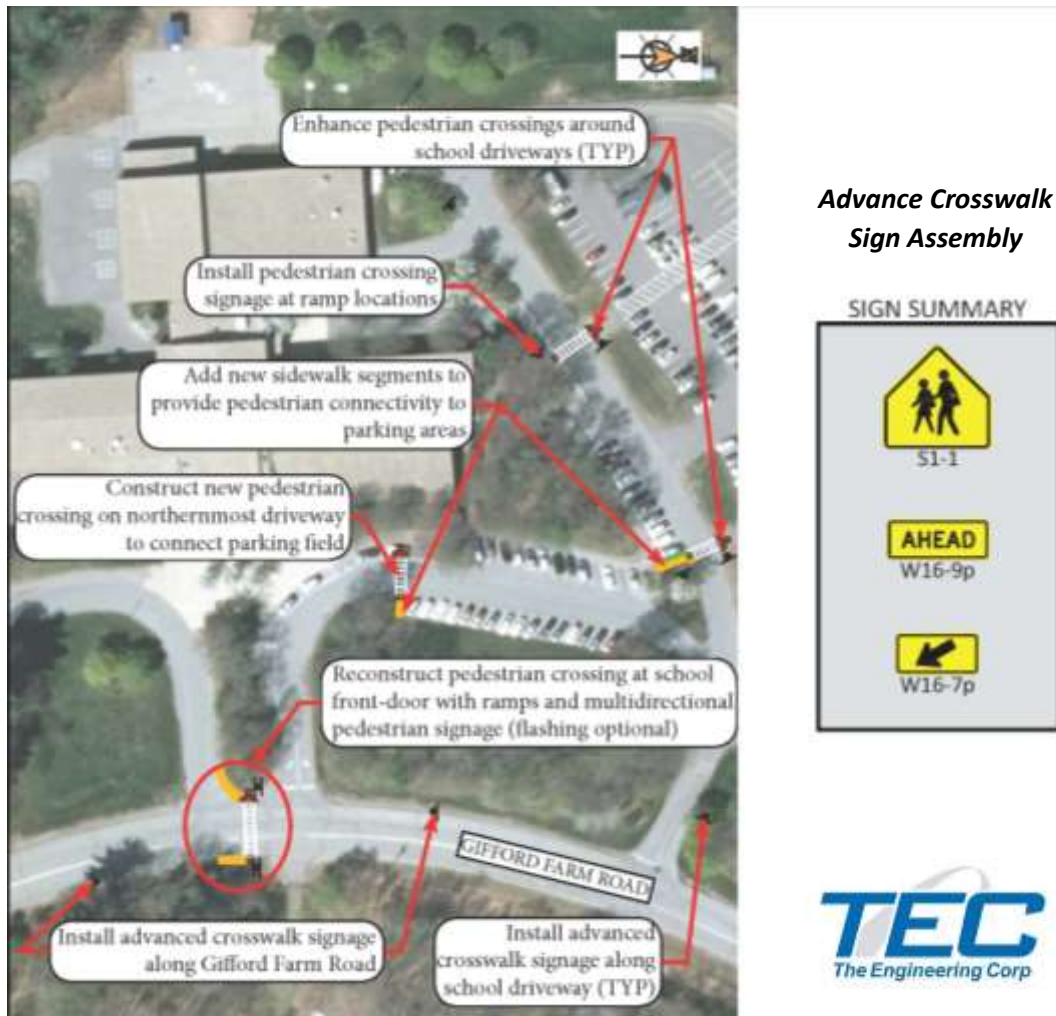
Cost Key:        \$        = \$0 to \$10,000                    \$\$\$        = \$50,000 to \$100,000  
                       \$\$        = \$10,000 to \$50,000                \$\$\$\$       = Over \$100,000

More complete first order cost estimates for key prioritized projects were prepared by the TEC consultant team and are included as Appendix A. The project prioritization process used by the SRTS Committee to select projects for conceptual design is explained in Appendix A.

## Stratham Memorial School Infrastructure Recommendations

SMS-1	CAP COST	O&M COST	TIMELINE
School Front-Door Crossing Upgrades	\$\$	\$ / YR	Short-Term
<p><b>Challenge:</b> There is currently only one existing formalized pedestrian crossing along Gifford Farm Road between the school driveways. This existing location does not provide ADA-compliant ramps, pedestrian receiving areas, or appropriate signage.</p> <p><b>Opportunity:</b> Reconstruct the crossing across Gifford Farm Road between the school driveways to provide ADA compliance; including new accessible ramps, tactile warning devices, a new receiving ramp and sidewalk area, and enhanced crossing signage. Enhanced crossing signage should include both signage at the crosswalk location and in advance of the crossing.</p>			

Figure 15: SMS School Property and Front Door Pedestrian Accommodation Recommendations





Map 5: Infrastructure Improvement Recommendations for SMS School Zone



**Stratham Memorial School**

Safe Routes to School Improvements  
Stratham, New Hampshire

**TEC**  
The Engineering Corp

246 Danforth Road  
Andover, MA 01810  
978.756.2152


387 Ocean Boulevard  
East 575, 502 New 100  
Hampton, NH 03842  
603.441.8114

111 Main Street, 2nd Floor  
Manchester, NH 03102  
603.864.1240

Scale: 1" = 40'  
November 15, 2018

- Shared Use Path/Trail
- Pedestrian Improvement
- Bridge Improvement
- Roadway Improvement
- Multi-Modal Improvement
- Ⓜ Project Description

SMS-2	CAP COST	O&M COST	TIMELINE
<b>Enhanced School Crossing Locations</b>	<b>\$\$</b>	<b>\$ / YR</b>	<b>Short-Term</b>
<p><b>Challenge:</b> Along the school driveways and parking areas, several crossing locations are defined; however, do not provide full ADA accessibility in terms of ramps, tactile warning devices, pedestrian signage, and/or ability to meet an opposing ramp. Two (2) crosswalks are currently striped around the northerly side of the school building and no crosswalks provide direct connection to angled parking along the northern school driveway.</p>			
<p><b>Opportunity:</b> Reconstruct each crossing to provide ADA compliance, including corrected ramp transition slopes, level landings, tactile warning devices, and enhanced crossing signage. For the two crossings of the parking drive aisle north of the school that lack receiving ramps, construct ramps and short sidewalk sections where currently no defined area for the crossing refuge is provided. Install associated pedestrian crossing signage to current design standards, as needed. A new crossing should also be provided to access the angled parking along the northern school driveway.</p>			

SMS-3	CAP COST	O&M COST	TIMELINE
<b>No Idling Signage</b>	<b>\$</b>	<b>\$ / YR</b>	<b>Short-Term</b>
<p><b>Challenge:</b> Although some 'No Idling' signage is present along the school property, the limited signage does not command full respect.</p>			
<p><b>Opportunity:</b> Install additional 'No Idling' signage along the edge of the parking lot where parents typically queue for student pick-up. Strategically locate additional signage along the two front-door driveways to the school.</p>			
			

SMS-4	CAP COST	O&M COST	TIMELINE
<b>Pavement Marking Enhancements</b>	<b>\$\$</b>	<b>\$ / YR</b>	<b>Short-Term</b>
<p><b>Challenge:</b> Pavement markings that delineate parent and faculty movements along the school driveways, drive aisles, parking areas are faded, and no associated signage is present.</p>			
<p><b>Opportunity:</b> Reapply pavement markings with longer-term materials (such as thermoplastic) to better delineate movements along the school driveways. Supplement parking markings with lane configuration signage.</p>			

SMS-5	CAP COST	O&M COST	TIMELINE
<b>Enhanced Gifford Farm Road School Crossing</b>	<b>\$\$\$\$</b>	<b>\$ / YR</b>	<b>Mid-Term</b>
<p><b>Challenge:</b> There is currently only one existing formalized pedestrian crossing along Gifford Farm Road between the school driveways. Walking students have been observed to use other locations to cross or exit the school where no amenities are provided.</p>			

SMS-5 Continued	CAP COST	O&M COST	TIMELINE
<p><b>Opportunity:</b> Traditionally, the easterly side of Gifford Farm Road is utilized as the walkable surface, although no sidewalk is provided. There should be consideration to the installation of more enhanced crossing opportunities along Gifford Farm Road, which may include new crosswalks and ramps with associated Rectangular Rapid Flashing Beacons (RRFB). RRFBs provide a visual cue for a pedestrian crossing as the LEDs flash only when a push button is pressed.</p> <p>A series of flashers at multiple crossing locations along the school frontage would provide opportunity for concurrent traffic calming. Any new crossing location at the school frontage to move students to the “walkable surface” should include reciprocal ramps and sidewalk sections to formally receive pedestrians. Additional sidewalk improvements are listed under a separate item.</p> <p>As part of this improvement, the school should consider the construction of additional crosswalks, ramps, and flashers at the northerly and southerly ends of the school driveway loops. Thereby having three marked crossings at the school. The additional crossing would promote slower speeds and more effective compliance to the crossing locations.</p> <p>SUPPLEMENT – Should the Town consider additional crossings at the school frontage; additional consideration should be given to forming the three crossings as raised crosswalks / speed humps.</p>			

SMS-6	CAP COST	O&M COST	TIMELINE
<b>Gifford Farm Road Open Pavement Area</b>	<b>\$ to \$\$\$</b>	<b>\$ / YR</b>	<b>Short to Mid-Term</b>
<p><b>Challenge:</b> Between the ends of the Stratham Memorial School northerly driveway, the pavement width along Gifford Farm Road expands excessively. This area may be used for bus queueing; however is rarely utilized in this fashion outside of school arrival and dismissal periods. The open area of pavement encourages higher travel speeds along the school’s frontage.</p>			
<p><b>Opportunity:</b></p> <p>6A - Alter the open asphalt area along Gifford Farm Road to include a raised apron (brick, ribbed concrete, etc.) to better define the area along the widened pavement that still allows for bus queues if needed. (\$\$\$)</p> <p>6B - At a minimum, consider applying an area of gore pavement markings to visually separate the travel way and the excessive pavement. (\$)</p>			

SMS-7	CAP COST	O&M COST	TIMELINE
<b>Gifford Farm Road Pedestrian Accommodations</b>	<b>\$\$ to \$\$\$\$</b>	<b>\$\$ / YR</b>	<b>Short to Long-Term</b>
<p><b>Challenge:</b> There are currently no formal pedestrian accommodations along Gifford Farm Road. Additional gravel is provided along the roadway edge to supplement pedestrian travel along the roadway.</p>			
<p><b>Opportunity:</b> Provide new pedestrian accommodations along Gifford Farm Road. This can be achieved in multiple ways:</p> <p>7A - Enhance the existing “side path” or “goat path” along the easterly edge of Gifford Farm Road; including widening the level area of gravel. (\$\$)</p>			

SMS-7 Continued	CAP COST	O&M COST	TIMELINE
<p>7B - Utilized the excessive roadway width along Gifford Farm Road to provide a defined pedestrian (potentially shared with bicycles) path along the asphalt. This alternative would require installation of physical separation between vehicles and pedestrians. (\$\$\$)</p> <p>7C - Construct a standard sidewalk along Gifford Farm Road with vertical separation between vehicles and pedestrians. This alternative will require enhancements to continue the current stormwater drainage scheme. (\$\$\$\$)</p> <p>7 SUPPLEMENT – Consider installation of new roadway lightings on utility poles along Gifford Farm Road in addition to pedestrian enhancements to promote pedestrian travel to/from school during winter months where arrival and/or dismissal times may occur during periods of increased darkness.</p>			

SMS-8	CAP COST	O&M COST	TIMELINE
<b>Formalize Traffic Signage Along Gifford Farm Road</b>	\$	\$ / YR	Short-Term
<p><b>Challenge:</b> Traffic signage related to speed, pedestrian crossings, and school zones are provided along the Gifford Farm Road corridor approaching SMS. This signage is not consistent in terms of height or positioning. In addition, the flashing LEDs within the signage is constantly turned on, which loses effectiveness to alert drivers of potential obstructions.</p> <p><b>Opportunity:</b> Reinstall signage along the corridor to heights compliant to design standards. Provide advanced warning signage as necessary for pedestrian crossings and consider modifying the current flashing pattern of the signage to allow for activation only as needed to improve vehicle compliance. Relocate signage along the corridor at consistent locations. For instance, the school crossing sign and school zone speed sign on Gifford Farm Road northbound are located 2,400-feet and 1,500-feet south of the school driveway respectively, reducing credibility and compliance. This approach signage should be relocated within 300-feet of the school driveway or the associated crossing opportunity.</p>			

SMS-9	CAP COST	O&M COST	TIMELINE
<b>Advanced intersection Signage at Lovell Road</b>	\$	\$ / YR	Short-Term
<p><b>Challenge:</b> There is currently no advance stop-control signage along Lovell Road or Gifford Farm Road approaching their intersection. In addition, the school crossing signs at the intersection are not compliant.</p> <p><b>Opportunity:</b></p> <p>9A – Install advance stop-control warning signage along both Lovell Road approaches and the Gifford Farm Road approach to the intersection.</p> <p>9B – Remove the non-compliant school crossing signs across Lovell Road at the intersection with Gifford Farm Road. These signs are not warranted at a stop-controlled approach.</p>			

SMS-10	CAP COST	O&M COST	TIMELINE
<b>Lovell Road at Gifford Farm Road Formalized Crossing</b>	\$\$	\$ / YR	Mid-Term
<p><b>Challenge:</b> There is currently a formalized pedestrian crossing across Lovell Road at Gifford Farm Road. This existing location does not provide ramps, pedestrian receiving areas.</p>			

SMS-10 Continued	CAP COST	O&M COST	TIMELINE
<b><u>Opportunity:</u></b> Reconstruct the crossing across Lovell Road at Gifford Farm Road to provide ADA compliance; including new accessible ramps, tactile warning devices, and a new receiving ramp and sidewalk area along both sides of the crossing.			

SMS-11	CAP COST	O&M COST	TIMELINE
<b>Lovell Road at Willowbrook Avenue Pedestrian Path</b>	<b>\$\$</b>	<b>\$ / YR</b>	<b>Short-Term</b>
<b><u>Challenge:</u></b> The intersection of Lovell Road at Willowbrook Avenue is challenging for pedestrians and bicycles to maneuver due to the narrow roadway cross-section, the grading along the roadway edge, and the horizontal curvature of Willowbrook Avenue approaching the intersection.			
<b><u>Opportunity:</u></b> Consider the establishment of an off-road pathway behind the adjacent pond (along private property) to “cut the corner” of the intersection. Establishment of this path would require easements or other acquisitions of land as the potential path location would be located along private property.			

SMS-12	CAP COST	O&M COST	TIMELINE
<b>Lovell Road at Willowbrook Avenue Signage</b>	<b>\$</b>	<b>\$ / YR</b>	<b>Short-Term</b>
<b><u>Challenge:</u></b> There is no horizontal curvature warning signage on Willowbrook Avenue approaching Lovell Road.			
<b><u>Opportunity:</u></b> Install appropriate warning signage in advance of the intersection to help notify drivers of the upcoming intersection.			

SMS-13	CAP COST	O&M COST	TIMELINE
<b>Crestview Terrace Trail Path</b>	<b>\$\$\$\$</b>	<b>\$ / YR</b>	<b>Short-Term</b>
<b><u>Challenge:</u></b> There is a lack of defined walking opportunities for students who currently reside south of the Stratham Memorial School along Portsmouth Avenue and points west.			
<b><u>Opportunity:</u></b> Investigate opportunities to establish formal walking trails / paths with appropriate wayfinding signage, from the SMS property to Portsmouth Avenue to the west, via a connection with Crestview Terrace. The defined path will be in conjunction with the power line access roadway adjacent to the school grounds. Existing recreational? trails are in place within this area and therefore school-related? trails would need to be redefined to create a straighter path of travel.			

SMS-14	CAP COST	O&M COST	TIMELINE
<b>Scamman Road Trail Path</b>	<b>\$\$\$\$</b>	<b>\$ / YR</b>	<b>Short-Term</b>
<b><u>Challenge:</u></b> There is a lack of defined walking opportunities for students who currently reside west of the Stratham Memorial School along High Street and points south.			
<b><u>Opportunity:</u></b> Investigate opportunities to establish formal walking trails / paths with appropriate wayfinding signage, from the SMS property to High Street to the south, via a connection with Scamman Road. Existing recreational? trails are in place within this area and therefore school-related? trails would need to be redefined to create a straighter path of travel.			


SMS-15	CAP COST	O&M COST	TIMELINE
<b>Route 33 HAWK Signal</b>	\$\$\$\$	\$\$\$ / YR	<b>Long-Term</b>
<p><b>Challenge:</b> Pedestrian crossing opportunities to go from north to south across NH Route 33 are non-existent north of SMS. This is not only a challenge for SMS students, but other pedestrians that may be accessing other amenities in the area. The higher speed and extensive cross-section of the arterial approaches for NH Route 33 make crossing maneuvers dangerous for all pedestrians.</p>			
<p><b>Opportunity:</b> Consider installation of an enhanced pedestrian crossing, such as a High-Intensity Activated Crosswalk (HAWK) traffic signal, at Sandy Point Way. A HAWK signal, now becoming more prevalent across New England, stays dark unless needed for a pedestrian crossing and activated by a traditional push button. Once activated, the signal turns on and utilizes only yellow and red indications. The enhanced pedestrian accommodations will not only assist SMS students, but patrons to Stratham Hill Park and the nearby trail system. The nearest HAWK was recently constructed in Epping, NH.</p>			



SMS-16	CAP COST	O&M COST	TIMELINE
<b>Gifford Farm Road Cross-Section</b>	\$\$	\$ / YR	<b>Mid-Term</b>
<p><b>Challenge:</b> Gifford Farm Road between Lovell Road and Long Hill Road currently consists of a ranging cross-sectional width that provides opportunities to enhance multi-modal accommodations. Currently, no formal multi-modal accommodations exist along this segment of Gifford Farm Road.</p>			
<p><b>Opportunity:</b> Provide new multi-modal accommodations along Gifford Farm Road; which may include:</p> <ul style="list-style-type: none"> <li>16A - Consider restriping Gifford Farm Road to provide formal bicycle accommodations in the form of shared-use lane markings (sharrows) and associated signage. (\$\$)</li> <li>16B - For a segment of Gifford Farm Road just south of SMS to Lovell Road, the roadway may provide enough width for formal bicycle lanes / shoulders. (\$\$)</li> </ul> <p>See Improvement #7 for pedestrian related accommodation improvements.</p>			

SMS-17	CAP COST	O&M COST	TIMELINE
<b>Lovell Road Multi-modal Accommodations</b>	\$ to \$\$\$\$	\$\$ / YR	<b>Short to Long-Term</b>
<p><b>Challenge:</b> There are currently no formalized pedestrian or bicycle accommodations along Lovell Road.</p>			
<p><b>Opportunity:</b> Provide new multi-modal accommodations along Lovell Road; which may include:</p> <ul style="list-style-type: none"> <li>17A - Consider restriping Lovell Road to provide formal bicycle accommodations in the form of shared-use lane markings (sharrows) and associated signage. (\$\$)</li> <li>17B - Enhance the existing "side path" or "goat path" along Lovell Road; including widening the level area of gravel. (\$\$)</li> </ul>			

SMS-17 Continued	CAP COST	O&M COST	TIMELINE
<p>17C - Construct a traditional sidewalk along Lovell Road between Gifford Farm Road and Willowbrook Avenue with vertical separation between vehicles and pedestrians. This alternative will require enhancements to continue the current stormwater drainage accommodations and potential relocation of other utilities, such as utility poles. (\$\$\$)</p> <p>17 SUPPLEMENT – Consider installation of new roadway lightings along utility poles along Lovell Road in addition to pedestrian enhancements to promote pedestrian travel to/from school during winter months where arrival and dismissal times, and after-school times, may occur during periods of increased darkness.</p>			

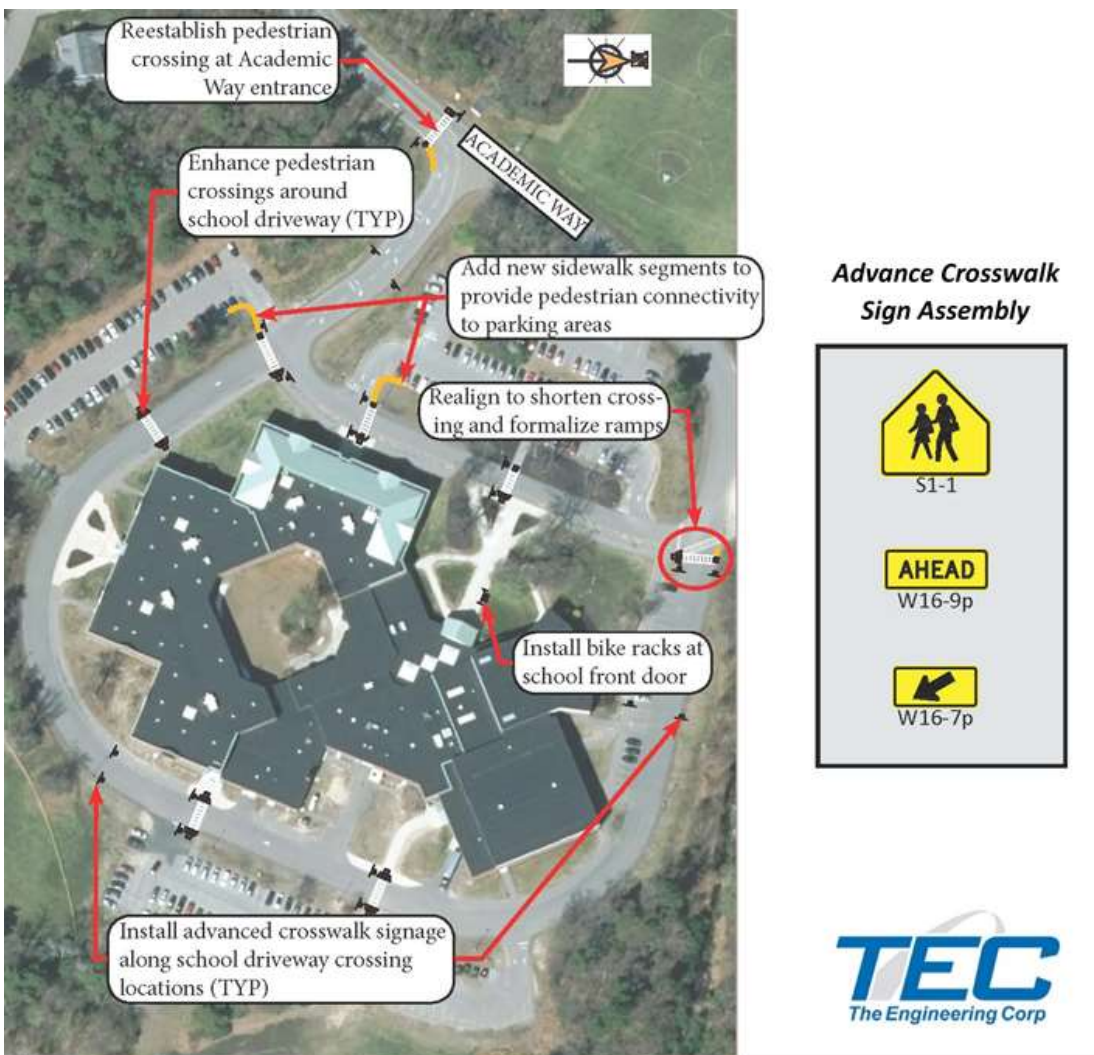
SMS-18	CAP COST	O&M COST	TIMELINE
<b>Strategic Dynamic Speed Radar Signage</b>	<b>\$\$</b>	<b>\$ / YR</b>	<b>Short-Term</b>
<p><b>Challenge:</b> Speeds are notably high on roadways near the school; including Lovell Road.</p>			
<p><b>Opportunity:</b> Consider the installation of dynamic speed radar signage on the assemblies to reinforce the speed regulation and lower vehicular speeds on roadways near the school.</p>			

SMS-19	CAP COST	O&M COST	TIMELINE
<b>Willowbrook Multi-modal Accommodations</b>	<b>\$ to \$\$\$\$</b>	<b>\$ to \$\$ / YR</b>	<b>Short to Long-Term</b>
<p><b>Challenge:</b> There are currently no formalized pedestrian or bicycle accommodations along Willowbrook Avenue</p>			
<p><b>Opportunity:</b> Implement safety measures and new multi-modal accommodations along Willowbrook Avenue; which may include:</p> <p>17A – Trim vegetation back from edge road to improve sight lines and allow space for pedestrians to walk within the right of way but off the pavement. (\$)</p> <p>17B - Restripe Willowbrook Ave to provide some improvement to bicycle accommodation with shared-use lane markings (sharrows) and associated signage. (\$\$)</p> <p>17C - Construct a traditional sidewalk along Willowbrook Ave between High Street and Lovell Road with vertical separation between vehicles and pedestrians. This alternative will require enhancements to address stormwater drainage and potential relocation of other utilities, such as utility poles. (\$\$\$\$)</p> <p>17D – Construct off road path connecting Willowbrook Ave and Jacqueline Way to SMS following the power line corridor or conservation land just to the south of the utility corridor (\$\$).</p>			

## Cooperative Middle School Infrastructure Recommendations

CMS-1	CAP COST	O&M COST	TIMELINE
School Front-Door Crossing Upgrades	\$\$	\$ / YR	Short-Term
<p><b>Challenge:</b> There is currently only one existing formalized pedestrian crossing along the Cooperative Middle School frontage driveway. This existing location does not provide full ADA accessibility in terms of ramp grade, tactile warning devices, or level landings. In addition, while a crossing is provided adjacent to the main doorway from the faculty parking area, no crossing is provided at the southernmost doorway from the faculty parking area.</p>			
<p><b>Opportunity:</b> Reconstruct the crossing adjacent to the main doorway to provide ADA compliance; including corrected ramp transition slopes, level landings, tactile warning devices, and enhanced crossing signage. Similar amenities should be constructed for a new crossing at the southernmost doorway from the faculty parking area.</p>			

Figure 16: CMS School Property and Front Door Bicycle & Pedestrian Accommodation Recommendations





Map 6: Infrastructure Improvement Recommendations for CMS School Zone



Cooperative Middle School

Safe Routes to School Improvements  
Stratham, New Hampshire



146 The Concord Road  
Andover, MA 01810  
978.759.2152

100 Green Roadway  
Box 100, 100 Elm Street  
Hampton, NH 03843  
603.883.8234

211 Main Street, 2nd Floor  
Hampton, NH 03843  
603.883.8234

Scale: 1" = 30'  
November 15, 2018

- - - Shared Use Path/Trail
- Pedestrian Improvement
- Bridge Improvement
- Roadway Improvement
- Multi-Modal Improvement
- Ⓜ Project Description

CMS-2	CAP COST	O&M COST	TIMELINE
Bicycle Racks	\$	\$ / YR	Short-Term
<b>Challenge:</b> There are currently no bicycle racks available on the Cooperative Middle School grounds.			
<b>Opportunity:</b> New bicycle racks on the school property should be evaluated; including placement along the school frontage. The bicycle racks should be on a hard surface and within 50-feet of a school entry doorway. Weather protection can be provided to encourage bicycling in rainy weather.			

CMS-3	CAP COST	O&M COST	TIMELINE
Enhanced School Crossing Locations	\$\$	\$ / YR	Short-Term
<b>Challenge:</b> Along Academic Way, circling the school building, several crossing locations are defined. However, they do not provide full ADA accessibility in terms of ramps, tactile warning devices, short-crossing distances, pedestrian signage, and/or ability to meet an opposing ramps. Five (5) crosswalks are currently striped around the Cooperative Middle School building.			
<b>Opportunity:</b> Reconstruct each crossing to provide ADA compliance, including corrected ramp transition slopes, level landings, tactile warning devices, and enhanced crossing signage. For the three (3) crossing across Academic Way that do not have receiving ramps, construct ramps and short sidewalk sections where currently no defined area for the crossing refuge is provided today. For the diagonal ramp on the northerly end of the one-way driveway segment, the crosswalk can be realigned to create a perpendicular crossing to shorten the distance. In addition, add appropriate signage to newly constructed accessible ramps. Where needed, raise the height of existing crossing signage to current MUTCD standards.			

CMS-4	CAP COST	O&M COST	TIMELINE
Academic Way Open Pavement Area	\$\$\$	\$ / YR	Mid-Term
<b>Challenge:</b> Academic Way splits into a one-way circumferential roadway at the school frontage. The apex point of the roadway split consists of a large area of open asphalt that is currently striped with a series of gore (angled) pavement markings. This open area encourages higher speeds on the turning movements entering the main school grounds.			
<b>Opportunity:</b> Alter the open asphalt area along Academic Way to include a potential raised apron (brick, ribbed concrete, etc.) to better define the “NO GO” area at the apex to calm traffic around the driveway curve; but still allow for emergency vehicle and/or bus U-turn movements.			

CMS-5	CAP COST	O&M COST	TIMELINE
Academic Way Pedestrian Accommodations	\$\$ to \$\$\$\$	\$\$ / YR	Short to Long-Term
<b>Challenge:</b> There are currently no formalized pedestrian accommodations along Academic Way. Additional gravel is provided along the roadway edge to supplement pedestrian travel along the roadway, outside of the asphalt surface.			

CMS-5 Continued	CAP COST	O&M COST	TIMELINE
<p><b>Opportunity:</b> Provide new pedestrian accommodation on Academic Way. This can be done through:</p> <p>5A - Enhance the existing “side path” or “goat path” along the northerly edge of Academic Way; including widening the level area of gravel. (\$\$)</p> <p>5B - Utilize the excessive roadway width along Academic Way to provide a defined pedestrian (potentially shared with bicycles) path along the asphalt. This alternative would require installation of physical separation between vehicles and pedestrians. (\$\$\$)</p> <p>5C - Construct a standard sidewalk along Academic Way with vertical separation between vehicles and pedestrians. This alternative will require enhancements to continue the current stormwater drainage accommodations. (\$\$\$\$)</p>			

CMS-6	CAP COST	O&M COST	TIMELINE
<b>Academic Way Cross-Section</b>	<b>\$ to \$\$\$</b>	<b>\$ / YR</b>	<b>Short to Mid-Term</b>
<p><b>Challenge:</b> Academic Way currently consists of a wide cross-section, providing approximately 13-feet or more per travel lane. This wide cross-section of asphalt encourages higher travel speeds along the straight roadway.</p>			
<p><b>Opportunity:</b> Reduce the cross-sectional width of Academic Way. This can be done in multiple ways:</p> <p>6A - Utilizing pavement markings, expand the shoulders and narrow the travel lanes along Academic Way. (\$)</p> <p>6B - Eradicate asphalt pavement along the roadway edges to physically narrow the width of open pavement. (\$\$\$)</p> <p>6C – Install multiple locations of ‘removable’ speed bumps along Academic Way to reduce travel speeds along the driveway. These features are bolt-down and can be removed in the winter months for plowing operations. (\$\$)</p>			

CMS-7	CAP COST	O&M COST	TIMELINE
<b>School Zone Flashers</b>	<b>\$\$ to \$\$\$</b>	<b>\$ / YR</b>	<b>Short-Term</b>
<p><b>Challenge:</b> There are currently school zone flashing assemblies provided along Guinea Road approaching the intersection with Academic Way. The assemblies currently include one flashing amber light and are partially blocked by vegetation along the roadway edge.</p>			
<p><b>Opportunity:</b></p> <p>7A - Reinstall new school zone flashing assemblies, positioned in highly visible locations within 300-feet of Academic Way. The flashing assemblies should include at a minimum retro-reflective speed signage, multiple amber indications, and enhanced signage legends to include time of day limits. The day clock should be consistently monitored by the appropriate towns, as one flasher is located in Exeter.</p> <p>7B - Consider the installation of dynamic speed radar signage on the assemblies to reinforce the speed regulation and lower vehicular speeds approaching Academic Way.</p>			



CMS-8	CAP COST	O&M COST	TIMELINE
<b>Guinea Road Bridge Area Cross-Section</b>	<b>\$\$ to \$\$\$\$</b>	<b>\$\$ / YR</b>	<b>Short to Long-Term</b>
<p><b>Challenge:</b> Guinea Road between Academic Way and Route 27 (Exeter) currently consists of a ranging cross-sectional width that provides opportunities to enhance multi-modal accommodations. Currently, no formal multi-modal accommodations exist along this segment of Guinea Road.</p>			
<p><b>Opportunity:</b> Provide new multi-modal accommodations along Guinea Road; which may include:</p> <p>8A - Consider restriping Guinea Road, including the area along the Guinea Road Bridge over Route 101, to provide formal bicycle accommodations in the form of shared-use lane markings (sharrows) and associated signage. (\$\$)</p> <p>8B - For a segment of Guinea Road between Academic Way and Exeter Farms Road, the roadway may provide enough width for formal bicycle lanes / shoulders. (\$\$)</p> <p>8C - If roadway width is available along Guinea Road between Academic Way and Exeter Farms Road to provide a defined pedestrian (potentially shared with bicycles) path along the asphalt. This alternative may require installation of physical separation between vehicles and pedestrians. (\$\$\$)</p> <p>8D - Construct a traditional sidewalk along Guinea Road between Academic Way and Route 27 with vertical separation between vehicles and pedestrians. This alternative will require enhancements to continue the current stormwater drainage accommodations. (\$\$\$\$)</p>			

CMS-9	CAP COST	O&M COST	TIMELINE
<b>Guinea Road Multi-Modal Accommodations</b>	<b>\$\$ to \$\$\$\$</b>	<b>\$\$\$ / YR</b>	<b>Short to Long-Term</b>
<p><b>Challenge:</b> Guinea Road between Academic Way and Stratham Heights Road currently consists of a ranging cross-sectional width that provides potential opportunities to enhance multi-modal accommodations. Currently, no formal multi-modal accommodations exist along this segment of Guinea Road.</p>			
<p><b>Opportunity:</b> Provide new multi-modal accommodations along Guinea Road; which may include:</p> <p>9A - Consider restriping Guinea Road to provide formal bicycle accommodations in the form of shared-use lane markings (sharrows) and associated signage. (\$\$)</p> <p>9B - If roadway width is available along Guinea Road between Academic Way and Stratham Heights Road to provide a defined pedestrian (potentially shared with bicycles) path along the asphalt. This alternative may require installation of physical separation between vehicles and pedestrians. (\$\$\$)</p> <p>9C - Construct a traditional sidewalk along Guinea Road between Academic Way and Stratham Heights Road with vertical separation between vehicles and pedestrians. This alternative will require enhancements to continue the current stormwater drainage accommodations and potential relocation of other utilities, such as utility poles. (\$\$\$\$)</p> <p>9 SUPPLEMENT – Consider installation of new roadway lightings along utility poles along Guinea Road in addition to pedestrian enhancements to promote pedestrian travel to/from school during winter months where arrival and dismissal times, and after-school times, may occur during periods of increased darkness.</p>			

CMS-10	CAP COST	O&M COST	TIMELINE
Stratham Heights Road Trail Path	\$\$\$\$	\$ / YR	Short-Term
<b>Challenge:</b> There is a lack of defined walking opportunities for students who currently reside west of the Cooperative Middle School along Stratham Heights Road and points west.			
<b>Opportunity:</b> Investigate opportunities to establish formal walking trails / paths, with appropriate wayfinding signage, from the CMS property to Stratham Heights Road to the north. The defined path will be in conjunction with the power line access roadway adjacent to the school grounds.			

CMS-11	CAP COST	O&M COST	TIMELINE
Elton Avenue & Apple Way Trail Path	\$\$\$\$	\$ / YR	Short-Term
<b>Challenge:</b> There is a lack of defined walking opportunities for students who currently reside north of the Cooperative Middle School along Stratham Heights Road and points north.			
<b>Opportunity:</b> Investigate opportunities to establish formal walking trails / paths, with appropriate wayfinding signage, from the CMS property to Stratham Heights Road to the west, via connections with Elton Avenue and Apple Way. The defined path will be adjacent to the Route 101 corridor starting near the terminus of Academic Way. Upon construction, short sidewalk segments, accessible ramps, and pedestrian crossing signage should be constructed at the end of Academic Way to formalize the crossing over Guinea Road.			

CMS-12	CAP COST	O&M COST	TIMELINE
Increased Speed Enforcement	N/A	\$\$ / YR	Ongoing
<b>Challenge:</b> Speeds approaching Academic Way along Guinea Road appear to be in excess of regulated speeds based on multiple field observations.			
<b>Opportunity:</b> Provide increased speed enforcement in coordination with the Exeter and Stratham Police Departments. Enforcement periods could be defined around school arrival and dismissal.			

## 4.2 NON-INFRASTRUCTURE RECOMMENDATIONS

The following matrix of non-infrastructure strategies implementing Stratham’s Safe Routes to School program is intended to increase safety for students on their journey to and from school, and where appropriate, encourage more students to walk and bike. Rough estimates of cost for each project are summarized in the table based on the categories below. The timeline category identified projects that are low cost and easily implemented as Short Term (1-2 years), while project that are more costly or complicated are identified as Mid-Term (3-5 years) or Long Term (5+ years).

**Cost Legend:**

Low = Minimal up to \$1000	Volunteer effort with limited cash funding required
Medium = \$1,000-\$10,000	Moderate funding required
High = >\$10,000	Higher level of funding required

ENCOURAGEMENT					
#	Strategy	Partners	Timeframe	Cost	Notes
ENC1	National Bike to School Day – Continue existing activities at SMS and CMS for National Bike to School Day, typically the 2 <sup>nd</sup> Wednesday in May.	School Faculty, PTO, PCAC, Stratham PD	Current & Ongoing	Low	Funds in current NHDOT grant
ENC2	International Walk to School Day – Continue activities at SMS and begin at CMS for International Walk to School Day, typically the first Wednesday in October.	School Faculty, PTO, PCAC, Stratham PD	Current & Ongoing	Low	Funds in current NHDOT grant
ENC3	Bike/Walk Interschool Challenge - Consider challenging other SAU16 elementary schools or other area middle schools to have the most students per capita biking or walking to school for a day or a week. Oyster River, Rye, Seabrook and Portsmouth middle schools have participated in such challenges.	School Faculty, PTO, PCAC, Stratham PD	Short Term	Low	commuteSMART-Seacoast and Seacoast Area Bicycle Riders (SABR) have organized such challenges for Seacoast Bike Month
ENC4	Walking Wednesdays – Continue weekly event piloted in spring 2018 with students gathering in Stratham Hill Park to walk together to SMS.	School Faculty, PTO, PCAC, Stratham PD, Stratham Parks & Recreation	Current & Ongoing	Low	
ENC5	Walking School Bus/Group Commutes – Develop regular walking/bicycling groups from individual neighborhoods. At K-5 level walk/bike with parent escort(s). At CMS level groups can be student led.	SRTS Committee	Short Term	Low	The Walking Wednesdays initiative is one example of this. Encourage neighborhoods to form others.

<b>ENCOURAGEMENT - Continued</b>					
<b>#</b>	<b>Strategy</b>	<b>Partners</b>	<b>Timeframe</b>	<b>Cost</b>	<b>Notes</b>
ENC6	Walk Across New Hampshire – Individual students or class groups can track miles walked during the school year. Those completing 70 miles (the E-W width of NH) receive an award. Class groups target 190 mile length of the state N-S. Track individual miles through the year.	SRTS Committee, Walk NH, School Faculty	Short Term	Low	Program developed by Walk New Hampshire
ENC7	Golden Sneaker Award – Create a pair of rotating golden sneaker trophies awarded to the individual and class with the most walking miles each month.	SRTS Committee, School Faculty	Short Term	Low	Modeled after program initiated in Marin County, California
ENC8	Art Projects – Incorporate a bicycle safe community message into student art projects for younger grades. Use as a design contest for annual Bike to School Day events.	SMS Faculty, SRTS Committee	Short Term	Low	
ENC9	Other(s) as identified by SRTS Committee	SRTS Committee	Various		

<b>EDUCATION</b>					
<b>#</b>	<b>Strategy</b>	<b>Partners</b>	<b>Timeframe</b>	<b>Cost</b>	<b>Notes</b>
EDU1	SMS In-Class Instruction - Continue bicycle and pedestrian safety education presentations by BWANH at SMS	SMS and CMS Faculty, PTO, PCAC	Current & Ongoing	Low	
EDU2	CMS In-Class Instruction - Continue bicycling instruction as part of the Alternative PE class at CMS	CMS Faculty, BWANH	Current & Ongoing	Low	
EDU3	Bike Rodeos - Continue bicycle rodeos/safety skills workshops offered by Stratham Parks & Recreation	Stratham Parks & Recreation, Stratham PD	Current & Ongoing	Low-Medium	

EDUCATION - Continued					
#	Strategy	Partners	Timeframe	Cost	Notes
EDU4	Public Outreach Yard Sign Campaign – Print and distribute a large run of <i>Watch Out for Each Other</i> yard signs. Publicity strategy tested and found effective in Seattle.	PCAC, SRTS Committee	Short Term	Low-Medium	Funds in current NHDOT grant. Designs borrowed with permission from City of Seattle’s Vision Zero program.
EDU5	Safety Campaign – Design local Share the Road/Watch Out for Each Other campaign targeting all residents with materials to be disseminated via town website, town hall, library, schools, and traffic stops. Integrate distracted driving message.	PCAC, SRTS Committee, Stratham PD	Short Term	Medium	Pilot funds in current NHDOT grant. Draw on Vision Zero campaigns in multiple US communities.
EDU6	Suggested Route to School Maps – Such a map could be produced in the near term for SMS – especially using SHP trails. A map for CMS should follow further improvements.	SRTS Committee, Stratham Parks & Recreation, Stratham PD	Short and Medium	Low-Medium	Show most direct routes through SHP trail system. Ideally support wayfinding with trail signage
EDU7	Drivers Education – Ensure NH traffic laws related to bicycling are thoroughly covered in area drivers education programs.	Area Drivers Ed Instructors, SRTS Committee, Stratham PD	Short and Medium	Low-Medium	This is part of state curriculum
EDU8	Advanced road riding skills course for older riders. The Bike/Walk Alliance of NH has developed a				
EDU9	Other(s) as identified by SRTS Committee	SRTS Committee	Various		



ENFORCEMENT					
#	Strategy	Partners	Timeframe	Cost	Notes
ENF1	Install dynamic speed radar signage on school zone speed limit assemblies on Gifford Farm Road and Guinea Road approaching the two schools from either direction (4 units total).	Stratham Police Department, SRTS Committee	Medium Term	High	Similar to that installed by Exeter on High Street/NH27
ENF2	Volunteer Crossing Guard Program – Develop volunteer crossing guard program based on Primex training.	Stratham Police Department, PCAC, SRTS Committee, Volunteers	Short Term	Medium -High	Pilot funds in current NHDOT grant
ENF3	Targeted Speed Enforcement – Based on spring 2018 speed studies target Guinea and Lovell Roads. Consider reducing enforcement tolerance to 5mph or a zero tolerance policy for speeding in school zones, and/or doubled fines in school zones as implemented in other states.	Stratham Police Department, SRTS Committee	Short Term	Medium	Pilot funds in current NHDOT grant
ENF4	Yield to Pedestrians in Crosswalk Signs – Purchase and deploy flexible base, portable.	Stratham Police Department, SRTS Committee	Short Term	Medium	Funds in current NHDOT grant
ENF5	Encourage Helmet Use – Establish pool of bike helmets that Stratham PD can distribute to kids riding without a helmet.	Stratham Police Department, SRTS Committee	Short Term	Low	Pilot funds in current NHDOT grant
ENF6	Enforce prohibition on hand held device use while driving (RSA 265:79c) and NH’s 3-Foot Passing Distance law (RSA 265:143a). Integrate hands-free message with safety campaign.	Stratham Police Department, SRTS Committee	Short Term	Medium	
ENF7	Other(s) as identified by SRTS Committee	SRTS Committee	Various		

<b>EVALUATION</b>					
<b>#</b>	<b>Strategy</b>	<b>Partners</b>	<b>Timeframe</b>	<b>Cost</b>	<b>Notes</b>
EVL1	Student In-Class Tallies – Each year in September and May conduct a tally for each classroom of how each student arrived and plans to depart school over a 2-3 day period. Track changes in commute mode over time.	School Administration, School Faculty, SRTS Committee, National Center for SRTS	Short Term	Low	The National Center for SRTS provides forms, data collection guidelines, and online tracking.
EVL2	Parent Surveys – An initial parent survey was conducted in April 2018. Repeat every other year to track results from program implementation.	School Administration, School Faculty, SRTS Committee, National Center for SRTS	Short Term	Low	The National Center for SRTS provides online survey tool and trend data analysis.
EVL3	School Zone Speed Studies – Baseline speed studies were conducted for four school zone roads (Guinea, Gifford Farm, Lovell, High) in spring 2018. Repeat every 1-2 years to track trends, and before and after significant infrastructure improvements.	Stratham PD, SRTS Committee,	Current and ongoing	Low-Medium	Stratham PD has access to a data logging speed trailer to conduct these studies.
EVL4	Public Opinion Survey – Consider conducting a baseline town-wide survey of public opinion and understanding regarding traffic safety. Repeat after implementing community safety campaign.	SRTS Committee, Stratham PD	Short Term	Low	This can be conducted using free online surveying tools.
EVL5	Maintain Stratham SRTS Committee – Implementation of this Travel Plan will rely on an active Committee.	SRTS Committee including all current stakeholder groups	Current and ongoing	Low	
EVL6	Develop annual report on implementation of Action Plan recommendations to Town and SAU to keep program in public eye.	SRTS Committee, PCAC, Town Departments, SMS, CMS	Current and ongoing	Low	
EVL7	Others as identified by SRTS Committee	SRTS Committee	Various		

## V. Next Steps

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The strategies identified in this Plan can combine to create a system of policies, programs and physical improvements that will increase walking and bicycling among students at SMS and CMS and help ensure that they can do so safely. Through the work of the Stratham Pedestrian/Cyclist Advisory Committee, school staff, the Stratham Parks and Recreation Department and other partners some of the strategies identified here are already in place, and good momentum has been developed to assist in implementing others. This final section of the SRTS Action Plan identifies several key next steps to build on the work already done and continue to grow Stratham's Safe Routes to School initiative.

### **Plan Adoption by Town**

Once the plan is accepted by SRTS Committee, key next steps will be to present it to the Stratham Planning Board for their endorsement, and then to the Stratham Select Board. Adoption of the Action Plan by the Select Board will be important for all future implementation efforts, from endorsement of future warrant articles for infrastructure improvements to potential traffic enforcement initiatives to public awareness campaigns on road safety.

### **Incorporation into Master Plan & Capital Improvement Program**

The timing of the SRTS planning effort dovetails well with the town's concurrent work to update the Stratham Master Plan. Clear inclusion of Safe Routes to School program recommendations in the Master Plan is an important statement that the Town is committed to supporting active transportation, and a key step toward getting more costly infrastructure projects listed in the town's Capital Improvement Program. This will help down the road in seeking federal Transportation Alternatives Program (TAP) or other grant funding for infrastructure improvements and securing developer support for road safety improvements within and adjacent to new subdivisions other development projects.

### **Incorporation into School District Planning**

Funding for safety improvements on the grounds at either Stratham Memorial School or the Cooperative Middle School will need to be approved by SAU 16. The elementary school serves only Stratham students, so infrastructure improvements at SMS will in effect be funded by the Town via the SAU. Infrastructure improvements at the Middle School will also serve many Exeter students if not the other towns in the district. The SRTS Committee and Stratham town staff will need to work with counterparts in Exeter to build regional support for improvements at CMS. The major Renewal project approved for CMS provides a natural opportunity to incorporate new pedestrian and bicycle safety features and to ensure compliance with the ADA.

### **Maintain and Expand SRTS Committee**

It will be important to maintain the Safe Routes to School Committee as an active body working to implement the strategies described here. Over the long term the SRTS Committee could be a stand-alone entity or function as a sub-committee of the PCAC. Continued active participation by town department staff (Planning, Parks & Recreation, Public Works and Police) will help ensure a collaborative approach to implementation. Representatives from Exeter should be added, looking toward eventual

implementation of infrastructure improvements at CMS that will serve the Exeter Farms neighborhood and potentially other Exeter students.

### **Optimize Use of SRTS Non-Infrastructure Grant**

The Town has already secured pilot funding for several of the non-infrastructure strategies identified here. In 2018 the Town also applied for and received \$19,995 in SRTS Non-Infrastructure funding from NHDOT. This grant includes funding for supplemental speed enforcement, a volunteer crossing guard program, continuation of the bike safety skills workshops piloted by the Parks & Recreation and Police Departments, continuation of annual Bike to School and Walk to School Day activities, crosswalk signage and a community awareness campaign to ensure drivers safely share the road with people walking and bicycling. The SRTS Committee will have an important role in directing the use of these grant funds.



**Figure 17: Sample yard sign for proposed public education/outreach program.**  
*Design modified with permission from the Seattle Vision Zero Initiative.*



