Safe Routes to School: A Multimodal Approach

Mary Munford Elementary School
and
Virginia Commonwealth University
L. Douglas Wilder School of Government and Public Affairs
Master of Urban and Regional Planning Program
Fall 2013
Safe Routes to School:
A Multimodal Approach

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Fall 2013

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Acknowledgements

I would like to dedicate this work to my wife Holly, our son Quinn, and our daughter Eliza. Thank you
for your support, sacrifices, and patience.

I would like to thank Dr. Chen, Dr. Suen, Dr. Accordino, and Principal Greg Muzik for guiding me
through this plan. Your interest and expertise were integral.

Thank you!
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Executive Summary

This document was prepared for Mary Munford Elementary School in Richmond, Virginia as a Safe Routes to School plan. It also fulfills the Studio II requirement for the Master of Urban and Regional Planning program at Virginia Commonwealth University.

Mary Munford Elementary School agreed to participate in this study and the assessment of existing conditions. The purpose of this plan is to improve the safety of the routes to school, increase the number of students walking and biking (active transportation) to school, and improve the overall quality of life for all students and families by encouraging and promoting healthy activities.

This plan identifies concerns of students and parents, recognizes existing barriers to active transportation, and establishes safer routes and practices for children traveling to and from school.

The existing conditions are assessed through visual surveys, parent surveys, a student tally, and review of Virginia Department of Transportation traffic and road inventory data.

The recommendations in this plan are categorized as both short-term improvements and long-term improvements that support the five “E”s — Education, Encouragement, Enforcement, Engineering, and Evaluation — integral components of a Safe Routes to School plan as defined by the National Center for Safe Routes to School.

Education strategies are designed to educate the students about safe walking and biking habits. This includes bicycle safety skills classes for students and vehicle safety procedures for vehicle operators (parents or caregivers). An increased awareness of the health and environmental benefits evolves from these techniques as well. A travel safety guide, “Sharing the Road in Virginia: Laws & Safety Tips for Bicyclists, Pedestrians, & Motorists,” developed by the Virginia Department of Transportation and the Department of Motor Vehicles, has been made available to each student and his or her family.

Encouragement strategies include the Walk to School Day event held on October 9, 2013 and, hopefully, walking school buses will be incorporated in the future. A walking school bus is an organized group of children that walks together to and/or from school with adult supervision. An incentive program that tracks
mileage with tokens or some type of reward may be implemented to encourage more students to get involved in active transportation.

Enforcement issues are addressed with traffic calming measures such as speed regulation signs and speed humps as well as crossing guards (City of Richmond Police and faculty) and possibly a student crossing guard patrol. A student crossing guard patrol would serve as another enforcement measure, encouraging desired traffic behaviors.

An evaluation of existing conditions and an analysis of results from the student tally and parent survey establish the numbers of students that walk and bike to and from school. The tally and survey should be conducted during the same week in subsequent years to evaluate the process and progress being made.

Finally, engineering improvements such as crosswalks, sidewalk installations, traffic signal timing, and signage will be examined to identify areas that can be improved. Recommendations for all strategies are depicted through photographic examples or digital renderings in part two.
Background

Forty years ago, half of all U.S. children walked to school. Today, according to the Centers for Disease Control, an estimated ten percent walk to school. In many communities, as much as thirty percent of morning commuter traffic is generated by parents driving their children to school. These travel habits and children’s lifestyle choices can have serious consequences. Traffic jams around our schools pollute the air, waste fuel, and create safety concerns for children.

The Safe Routes to School (SRTS) program is a national and international movement, established by the Federal Highway Administration (FHWA), which supports the planning, development, and implementation of projects and activities that have the potential to improve the safety and accessibility of pedestrian and bicycle facilities to satisfy the needs of student travelers and to enhance their understanding of safer walking and bicycling practices. Benefits of the program include promotion of more healthy and active lifestyles and reductions in traffic congestion, fuel consumption, and air pollution around schools.

The national SRTS program was established and funded under the Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users Act (SAFETEA-LU) of 2005. It required each state and the District of Columbia to establish a full-time SRTS coordinator, and directed federal funding for both infrastructure and non-infrastructure projects. Once established, the SRTS coordinator creates and implements the state program and administers the distribution of federal funds to local jurisdictions. Funding for SRTS programs may be pursued through federal programs that provide resources for pedestrian and bicycle programs. In addition, financial support may also be sought from local government operating budgets, nonprofit foundations, or via grassroots fundraising efforts.

In 2012, the SRTS program was modified in the Moving Ahead for Progress in the 21st Century Act (MAP-21) for surface transportation funding. SRTS projects are now eligible for funding through a new transportation alternatives program. The SRTS coordinator position is no longer required yet the Commonwealth of Virginia continues this practice. Although the funding method has been altered, the program’s goals remain – encouraging communities to establish safer walking and bicycling routes around schools.
In recent years, a growing number of communities in the nation have begun promoting school children walking to school with groups from health professionals, Smart Growth advocates, traffic safety specialists, local PTA, and elected officials supporting these initiatives. Some states have passed legislation instituting “Safe Routes to Schools” programs to encourage schoolchildren to walk or bike to school. The primary emphasis of these programs is to provide children with an opportunity to walk or bike to school in a safe and secure environment.

The Virginia Department of Transportation also recognizes the need to improve the safety of students who walk or bike to school. In recent years, a number of initiatives to enhance bicycle and pedestrian safety around schools have been undertaken by the Department’s Transportation and Mobility Planning Division. These efforts include facility improvements, training initiatives, technical assistance, and research.
Introduction

Mary Munford Elementary School

The Richmond Public School (RPS) district educates more than 23,000 students and is comprised of 28 elementary schools, eight middle schools, five high schools, and three specialty schools. To narrow the focus, Mary Munford Elementary, located at 211 Westmoreland Street in Richmond’s West End neighborhood, has been selected for this Safe Routes to School plan.

Built in 1951, Mary Munford Elementary School is surrounded by a myriad of relatively dense neighborhoods with sidewalks and serves 560 students from census tracts 501 through 506. More than two thirds of the students at the school live in the Mary Munford school zone with the rest attending through open enrollment. There is a waiting list each year of students who want to enroll from outside the school's service area. While neighborhood enrollment has increased, the school also continues to provide special education services. Approximately 18% of the students have individualized education programs, and Mary Munford Elementary School is one of three elementary schools in the city with a model program for autism.

This plan will not only recommend ways to address the perceptions of safety of the students, parents, and neighbors, it will recommend ways to improve the built environment surrounding the school campus as well. Improved circulation patterns that benefit the entire community will also be recommended.

Examples of existing sidewalk and signage along Westmoreland Street.
Map showing Mary Munford Elementary School Zone with City Of Richmond inset.
Both Mary Munford Elementary School and the City of Richmond will benefit from improved pedestrian and bicycle circulation patterns as a result of this plan. There are three primary goals associated with this plan: improve the safety of the routes to school, increase the number of students walking and biking (active transportation) to school, and improve the overall quality of life for all students and families by encouraging and promoting healthy activities.

In 1969, approximately half of all schoolchildren walked or bicycled to or from school and 87% of those living within 1 mile of school walked or bicycled. According to the Center for Disease Control and Prevention, fewer than 15% of children and adolescents use active modes of transportation today. The decline in walking and bicycling has had an adverse effect on traffic congestion and air quality around schools, as well as on pedestrian and bicycle safety and overall health. In addition, a growing body of evidence has shown that children who lead sedentary lifestyles are at risk for a variety of health problems such as obesity, diabetes, and cardiovascular disease. The National Safe Routes to School Program was created in 2005 to encourage walking and biking to school by making it safer and more appealing (Martin, Moeti, and Pullen-Seufert, 2008). Safety issues, along with time constraints, are a big concern for parents, who consistently cite traffic danger as a reason why their children are unable to bicycle or walk to school. This is why “walking school buses,” supervised groups of children walking to school, can be a great response to these concerns by addressing safety concerns and chaperone duties. This method eliminates the need for parents to spend the extra time to walk their children each morning and afternoon, addressing supervision and time management while encouraging active transportation modes (McDonald and Aalborg, 2009).

This Safe Routes to School (SRTS) plan addresses the issues and barriers head on in a comprehensive fashion. The issues will be identified through an assessment of existing conditions and the five “E”s — Education, Encouragement, Enforcement, Engineering, and Evaluation, and analysis of students’ attitudes toward walking and biking. Education activities can include pedestrian and bicycle safety awareness, as well as driver education. Complementary to the
education strategy, the encouragement component can promote the SRTS plan by making the concepts fun with a rewards system. Enforcement is carried out through the promotion of safe activities combined with the deterrence of unsafe actions. Engineering techniques can include sidewalks, signs, and other traffic calming measures. Getting students out of vehicles and onto their feet enriches their social relationships with friends and neighbors, allows children to learn street safety lessons, makes the school trip an adventure, and helps to develop independent mobility and confidence. The final “E”, evaluation, is an important step as this is how problems will be identified. Evaluation continues throughout the implementation process to determine whether or not the plan is having the desired effects.

Although most areas throughout the City of Richmond have an infrastructure for pedestrian safety, there is room for improvement in pedestrian connectivity and bicycling in the school zone. Sidewalks surround the campus on all sides; however, there are numerous places along Commonwealth Avenue, a preferred travel route, as well as other gaps in connectivity along Cary Street Road and other side roads. A goal of this plan is to fill in the gaps and improve connectivity within the school zone, especially within a half-mile (ten minute) walk of the campus. One of the City’s transportation goals is to improve both pedestrian and bicycle circulation patterns and Connectivity. Now is a critical moment in advance of the World Cycling Championship’s arrival in 2015. A planned bike route on Grove Avenue, along the northern periphery of Mary Munford Elementary school, is an existing strategy which will be included in this SRTS plan along with an additional bike rack (City of Richmond Master Plan, 2000, pp. 185-188). Review of the Virginia Department of Transportation’s Statewide Planning System will help identify problem areas based on average annual daily traffic volumes as well as level of service concerns for vehicular, pedestrian, and bicycle traffic.

Example of a missing sidewalk segment along Hanover Avenue.
Map showing Mary Munford Elementary School Zone with proximity buffers.
The implications of this SRTS plan can be far-reaching. SRTS programs can improve safety for children, pedestrians, and bicyclists. They provide opportunities for all people to become more physically active and to rely less on their cars. SRTS programs also benefit the environment and a community’s quality of life by reducing traffic congestion and automobile emissions (Stewart, Moudon, and Claybrooke, 2012).

This SRTS plan will present an opportunity to address the needs of Mary Munford Elementary School and the adjacent neighborhoods on a comprehensive level, encouraging families within close proximity of the school to walk or bicycle to the school and its associated park, thus limiting the demand on infrastructure by reducing the number of vehicles on area streets. This will result in improved safety for both vehicular and pedestrian users. The results from a successful SRTS plan can escalate from minor safety improvements that directly affect the students (and parents) to peripheral benefits such as the reduction of school zone congestion, as well as lower transportation costs to the school district, less over-consumption of resources, to improvements to the air quality along affected corridors.

Each community participating in a SRTS plan is unique. Goals and strategies vary depending on the challenges, barriers, and geographic and demographic characteristics associated with the school. Therefore, the activities associated with Education, Encouragement, Enforcement, Engineering, and Evaluation will also be unique to Mary Munford Elementary School based on an analysis of existing conditions, field reconnaissance visits, surveys, and stakeholder interviews and meetings.
“Safe Routes to School” is a national and international movement established by the Federal Highway Administration (FHWA) to create safe, convenient, and fun opportunities for children to bicycle and walk to and from school. The program has been designed to reverse the decline in children walking and bicycling to schools. Safe Routes to School can also play a critical role in reversing the alarming nationwide trend toward childhood obesity and inactivity.

Concerned by the long-term health and traffic consequences of this trend, in 2005, U.S. Congress approved $612 million in funding for five years of state implementation of Safe Routes to School programs in all 50 states and the District of Columbia. Congress extended the program at $183 million per year starting in FY2010 and approximately $1.1 billion was allocated by Congress for Safe Routes to School programs through 2012. With the 2012 federal transportation bill MAP-21 (Moving Ahead for Progress in the 21st Century), Safe Routes to School is still an eligible program (FHWA). Schools and communities are using this funding source to construct new bicycle lanes and sidewalks and to launch Safe Routes to School education, promotion, and enforcement plans in elementary and middle schools.

Safe Routes to School programs are built on collaborative partnerships among many stakeholders that should include educators, parents, students, elected officials, city planners, community leaders, health officials, and bicycle and pedestrian advocates.

The most successful Safe Routes to School programs incorporate the Five “E’s” — Education, Encouragement, Enforcement, Engineering, and Evaluation. The goal of Safe Routes to School is to get more children bicycling and walking to schools safely on a regular basis. This improves the built environment and increases opportunities for healthy physical activity for students, parents, and community neighbors.
This plan has benefitted from the approaches and insights of similar, precedent plans:

“City of Falls Church Safe Routes To School Plan”

The City of Falls Church SRTS plan (2011) examines four public schools and provides the City with a guide to infrastructure improvements (engineering) as well as education, enforcement, and encouragement techniques that will improve the walking and biking environment for students. This plan has been successful at addressing the needs of the entire public school population of Falls Church as it is a small city with overlapping walking zones.

This plan used extensive community involvement throughout the planning process, including public meetings, surveys, meetings with stakeholders, neighborhood walk-throughs, and an interactive web application. The school administration conducted a survey of the students to understand their various travel modes and display the data with the problem areas in a concise manner. One of the most important steps in the development of an SRTS plan is the identification of existing barriers to active transportation and prioritizing them as tasks to address. These include the following: unsafe drop-off and pick-up practices, missing or insufficient sidewalks, dangerous intersections, speeding and significant crash numbers associated with the walking zones.

The Falls Church plan establishes goals that correspond to the proposed plan. They are: improve the safety of the routes to school, increase the number of students walking and biking to school, and improve the overall quality of life for all students. The plan outlines strategies for each of the five “E”s, education, encouragement, enforcement, engineering, and evaluation, and discusses each strategy in detail. Many of the same strategies will be incorporated into the proposed SRTS plan for Mary Munford Elementary School.

“Virginia Safe Routes to School: Comprehensive School Travel Plan, Louise Archer Elementary School”

The approach of this plan is important as it begins with the school selection process, an integral component of any SRTS plan, and the identification of community stakeholders. The vision of this plan, as is the case with all SRTS plans, is to combine pedestrian and bicycle activities with healthy eating and safety awareness. The
primary focus of this precedent plan is to increase the number of sidewalks.

This plan uses a student tally system to determine travel modes used by the students, looks at school policies related to student travel modes, and examines parent perceptions of walking and biking and related safety concerns. The tally system used is a good reference for future student surveys. The plan is concerned with the lack of sidewalks but also addresses the need for bike racks and supervision at crosswalk locations. These are all components that will likely be incorporated into the proposed SRTS plan for Mary Munford Elementary School.

The recommendation phase of this plan includes both infrastructure and non-infrastructure projects as a way to achieve the goals of the five “E”s: education, encouragement, enforcement, engineering, and evaluation. This plan utilizes GIS to display the infrastructure recommendations and the proposed SRTS plan for Mary Munford Elementary School will also use GIS as a tool to display recommendations.

“Safe Routes To School, Spring 2012 Studio”

This Studio project from Rutgers University assesses the existing conditions of four schools in New Brunswick, New Jersey and develops SRTS plans for each. The plan evaluates the existing pedestrian and bicycle conditions, traffic and safety concerns, and assessment techniques as a way to develop a school travel plan for each school. This assessment is a good example of a plan that compares multiple schools with differing characteristics and issues to address.

The analysis portion of this plan demonstrates the variety of schools and the unique approaches and strategies used with each school in reference to the five “E”s: education, encouragement, enforcement, engineering, and evaluation. This plan is successful at outlining the responsible parties, the timeframe, and the relative costs associated with each of the strategies and will be a useful reference to this proposed SRTS plan for Mary Munford Elementary School.
Methodology for this plan:

This SRTS plan will provide Mary Munford Elementary School with a guide to engineering improvements along with education, encouragement, and enforcement strategies geared towards improving the walking and biking environment for the Mary Munford community. An analysis of the current conditions involved reviewing City of Richmond GIS data, observation, conducting interviews and gathering student tally sheets. The following concerns and needs are assessed as the first phase of this project.

The initial question asked involved travel mode. Tally sheets were used by teachers to record travel mode for three days in October, 2013. Also, parent surveys were sent home to parents of students and were used to ascertain how each student typically arrives to school. This tally sheet and survey followed the format approved by the National Center for Safe Routes to School to determine if individuals walk, bike, ride the school bus, ride in a family car, carpool, or something different. This provided detailed information pertaining to student travel mode. The parent survey also allowed the parents to provide their distance from the school. This will determine which students lived within a quarter-mile, half-mile, one mile, and more than one mile and establish a target audience for this plan, as well as identify specific concerns and barriers.

A student tally was conducted by the Mary Munford administration to assess the travel mode of its students. The travel mode options were walk, bike, school bus, family vehicle, carpool, transit, and other (e.g. skateboard, scooter). This tally meets the standards established by the National Center for Safe Routes to School. To maintain a level of anonymity, no specific class or grade is recorded on the tally and any forms that do not meet the necessary level of anonymity were destroyed.

A parent survey was sent home with each student for his or her parents to complete. This survey addressed the student’s transportation mode, proximity to school, travel time, and opinions and concerns about walking and biking to school. This survey meets the standards established by the National Center for Safe Routes to School. This survey was required to maintain the aforementioned level of anonymity and therefore any survey forms that were returned with names were destroyed. A response rate of 37% was achieved.
A review of existing activities associated with students walking and biking to school was conducted and issues were addressed during interviews with Mary Munford Elementary faculty, site observation visits, and visual surveys. Some questions needed answering. Were staff members or crossing guards present and what were the locations? Was there an established walking trail with signage and were there school zone signs and bike racks around the campus? Also, a review of the current infrastructure conditions, including sidewalks, crosswalks, and signage, was conducted by walking the school grounds and adjacent blocks as part of an early reconnaissance visit.

A walking zone was defined by creating buffers around the school at quarter-mile, half-mile, three-quarter-mile, and one mile intervals utilizing ArcGIS software and City of Richmond data. The initial panel meeting for this Safe Routes to School plan was a good time to establish primary and secondary routes and establish desired routes for pedestrian and bicycle traffic. Commonwealth Avenue is the preferred route and connecting streets are important secondary routes. An initial assessment of barriers to walking and biking was discussed at this first panel meeting and the barriers were categorized as a short-term improvements and long-term improvements.

The Mary Munford Elementary School campus and surrounding blocks have been walked or driven as part of a visual survey of the existing conditions. The existing conditions refer to the built environment, including pavement, sidewalk conditions, signage, and signal timings. In addition to this observational analysis, a review of aerial imagery and City of Richmond and Virginia Department of Transportation GIS data has been conducted to assess the existing conditions.

These methods, in addition to discussions with faculty members and neighbors, were used to identify concerns, issues, and barriers associated with active transportation to and from Mary Munford Elementary school.

Example of missing ADA ramp and sidewalk.
Part One
Analysis of Existing Conditions

The first section of the document provides an assessment of the current conditions surrounding Mary Munford Elementary School. The first portion of this section is comprised of a brief history of the area and a detailed description of the study area. This includes an assessment of the existing built environment, including sidewalks, crosswalks, pavement, and traffic signals.

Next, details of the area’s demographics are discussed as a means to determine the number of children in the area, realizing the target audience for this study. A student tally and a parent survey are incorporated as tools to understand the number of students who walk and bike to school. These tools also roughly identify the number of students within the one mile walking zone.

Traffic count data and crash data obtained from the Virginia Department of Transportation are discussed to identify some of the perceived barriers associated with vehicular traffic, primarily within a half-mile of the school. Barriers that exist as part of the built environment are identified, prioritized, and addressed with urban design solutions. The strategies and recommendations are developed in part two.

Example of a poorly marked crosswalk.

Part Two
Strategies and Recommendations

The second part of the document discusses in detail the five “E’s” of a Safe Routes to School plan -- education, encouragement, enforcement, engineering, and evaluation. Explanation of the benefits of each of these components will lead to a comprehensive approach to develop this Safe Routes to School plan for Mary Munford Elementary School, Richmond, Virginia.
Munford Elementary School.

Education strategies are designed to educate the students about safe walking and biking habits. This includes bicycle safety skills classes for students and safety procedures for vehicle operators (parents or caregivers). A travel safety guide, “Sharing the Road in Virginia: Laws & Safety Tips for Bicyclists, Pedestrians, & Motorists,” developed by the Virginia Department of Transportation and the Department of Motor Vehicles, has been made available to each student and his or her family.

Encouragement strategies include the Walk to School Day event held on October 9, 2013 and, hopefully, walking school buses will be incorporated in the future. An incentive program that tracks mileage with tokens or some type of reward may be implemented to encourage more students to get involved in active transportation.

Enforcement issues are addressed with crossing guards (City of Richmond Police and faculty) and possibly a student crossing guard patrol. The crossing guard and student patrol reinforce encouragement as well.

An evaluation of existing conditions and an analysis of the results from the student tally and parent survey establish the numbers of students that walk and bike to and from school and concerns associated with active transportation. The tally and survey should be conducted in subsequent years to evaluate the process and progress being made.

Finally, engineering improvements such as crosswalks, sidewalk improvements, traffic signal timing, and signage will be examined to identify areas that can be improved. Recommendations for all of these strategies are depicted throughout this plan with photographic examples or digital renderings.

Example of a raised crosswalk.
Part One

Historic Context

Mary Munford was born in Richmond on September 15, 1865, and although her family never experienced poverty, Munford became interested in social welfare issues at a young age. Educational causes captured much of Munford's attention and she helped establish and served as president of the Richmond Education Association, which became operational in 1901, and promoted public education.

Educated in both Richmond and New York, Munford regretted the fact that her mother had not allowed her to attend college, despite Munford's desire to do so. Hoping to improve women's opportunities in higher education, Munford played an integral role in helping to convince the College of William and Mary to admit women in 1918, and in 1920 she became the first woman to serve on the Richmond School Board. Having been an advocate for education opportunities for everyone, it is fitting that her name adorns an elementary school.

A master plan was developed in 1946 and it included a new elementary school in the city's west end. A rapid growth in population necessitated the new school as Westhampton, the only school in the far west end, was at capacity. Westhampton was a combination junior high and elementary school. In March 1950, a decision was made to build a new school on the old Beattie lot between Westmoreland Street, Commonwealth Avenue, Cary Street and Grove Avenue and in September of 1951 children began attending.

Overcrowding continued to be a problem in the West End schools. Mary Munford operated on a double shift and served as many as 1,500 students. In 1953, an eight-room addition was added to the twenty-room school. Mary Munford enjoyed widespread community support and families moved to the city to attend due to full day kindergarten and foreign language instruction opportunities.

When court-ordered busing began in Richmond in 1971, Mary Munford Elementary School became a K – 2 school, with students in grades 3 – 5 attending Highland Park in Richmond's Northside. As a result, large numbers left Mary Munford Elementary School, Richmond, Virginia
School and very few Richmond schools experienced the magnitude of “white flight” that Mary Munford did. In the spring of 1979, after nine years of busing, the school board decided to make Mary Munford a neighborhood K–5 school again. The school had a total enrollment of 593 with most students coming from Highland Park in Richmond’s Northside, as there was and still is a strong private school system in the area. In the early 1980’s a handful of neighborhood children began attending Mary Munford. When Governor Chuck Rob enrolled his daughter there was a brief spike in the neighborhood enrollment. This declined each year following her initial enrollment.

In the summer of 1994, Mr. Greg Muzik was appointed principal of Mary Munford. He lived in the neighborhood and enrolled both his daughters in the school. He continued the efforts of the previous principal to attract neighborhood children to the school and worked closely with parents, teachers and the PTA. School programs were enhanced, thanks to PTA leadership and Principal Muzik’s ability to recruit and retain quality teachers. Since 1994, neighborhood enrollment has grown by over 200%. Almost two thirds of the students at the school live in the Mary Munford neighborhood with the rest coming through open enrollment. In 2013, the incoming kindergarten class was comprised entirely of neighborhood children. There is a waiting list each year of students who want to enroll from outside the school’s neighborhood. Neighborhood enrollment has increased and the school continues to serve as a center for special education services. Approximately 18% of the students have individualized education programs, and Mary Munford Elementary School is one of three elementary schools in the city with a model program for autism. It is currently the most inclusive school in the district with over 90% of the special education students assigned to regular education programs with support from special education teachers and assistants.

There is extensive parent involvement and PTA activities have become an important part of the school culture. The PTA sponsors many extended-day activities, community events, educational programs, and has made significant improvement to the school facility. This support system plays a critical role, creating an environment which is conducive to a successful SRTS program.
Description of Study Area

The area served by Mary Munford Elementary School is the Near West End of the City of Richmond. The Near West End boundaries are defined as beginning at the James River and running north to Broad Street. The eastern boundary is I-195 and the western boundary is the Richmond/Henrico County line. The Near West End is largely residential and some of the city's most beautiful and mature neighborhoods are located here, including Windsor Farms and a myriad of other neighborhoods established in the early to mid-twentieth century. The Mary Munford school zone is comprised of the following City of Richmond neighborhoods:

**Colonial Place:** This neighborhood is bounded by Patterson Avenue to the north, Grove Avenue to the south, the Downtown Expressway to the east, and Shadwell Road to the west. Single-family homes account for 75% of the housing stock, with 76% of homes being owner occupied, quite a bit higher than the Richmond average of 46%. School age children live in 16% of the homes in Colonial Place.

**Country Club of Virginia:** This area is recognized as a neighborhood within the Mary Munford school zone yet there are no residences. This neighborhood is comprised solely of The Country Club of Virginia land and structures.

**Malvern Gardens:** This neighborhood is bounded by Monument Avenue to the north, Patterson Avenue to the south, the Downtown Expressway to the east, and Westmoreland Street to the west. Over 91% of the residences are single family homes, with 61% being owner occupied. Nearly 17% of the homes in the neighborhood have school age children.

**Mary Munford:** This neighborhood is bounded by Grove Avenue to the north, Cary Street Road to the south, the Downtown Expressway to the east, and Shadwell Road to the west. Nearly 70% of homes are single family, with 43% being owner occupied. Children reside in 11% of the homes in the neighborhood.
Neighborhoods served by Mary Munford Elementary School.
**Monument Avenue Park:**  This neighborhood is bounded by Broad Street to the north, Monument Avenue to the south, Westmoreland Street to the east, and Staples Mill Road to the west. Nearly 85% of the homes are single-family, with 60% being owner occupied. Children reside in nearly 17% of the homes in the neighborhood.

**Sauer’s Gardens:**  This neighborhood is bounded by Broad Street to the north, Monument Avenue to the south, the Downtown Expressway to the east, and Westmoreland Street to the west. Nearly 85% of the homes are single-family, with 61% being owner occupied. Children reside in nearly 17% of the homes in the neighborhood.

**Stonewall Court:**  This neighborhood is bounded by Patterson Avenue to the north, Cary Street Road to the south, Shadwell Road to the east, and Greenway Lane to the west. 100% of the homes are single-family, with 88% being owner occupied. Children reside in 29% of the homes in the neighborhood.

**Three Chopt:**  This neighborhood is bounded by the City of Richmond border to the north, the Country Club of Virginia to the south, Libbie Avenue to the east, and the University of Richmond to the west. Over 95% of the homes are single-family, with 81% being owner occupied. Children reside in 22% of the homes in the neighborhood.

**University of Richmond:**  This is the western most portion of the school zone and the City of Richmond. This area is entirely comprised of land and structures owned by the University.

**Westhampton:**  This neighborhood is bounded by the City of Richmond border to the north, Cary Street Road to the south, Tuckahoe Boulevard to the east, and Libbie Avenue to the west. 94% of the homes are single-family, with 80% being owner occupied. More than 38% of the homes have school age children.

**Willow Lawn:**  This neighborhood is bounded by Monument Avenue and the City of Richmond border to the north, Patterson Avenue to the south, Westmoreland Street to the east, and Dumbar Street to the west. Over 97% of the homes are single-family, with 84% being owner occupied. Children reside in almost 20% of the homes in the neighborhood.

**Wilton:**  This neighborhood is bounded by Cary Street Road to the north, the James River to the south, Lock Lane to the east, and the City of Richmond border to the west. Over 90% of the homes are single-family, with 98% being owner occupied. Children reside in 30% of the homes in the neighborhood.
**Windsor Farms:** This neighborhood is bounded by Cary Street Road to the north, the James River to the south, the Downtown Expressway to the east, and Lock Lane to the west. Over 95% of the homes are single-family, with nearly 98% being owner occupied. Children reside in almost 30% of the homes in the neighborhood.

The stability of these neighborhoods is indicative of the social capital established over the years. Approximately one third of the households in the school zone have children. These areas are comprised largely of homeowners in well-established and relatively dense neighborhoods in which the people tend to have a vested interest in the quality of their surroundings and most importantly their children's school, Mary Munford Elementary School.
Demographics

This section describes the demographics of Richmond’s Near West End neighborhood. The neighborhoods within this section of Richmond are comprised of large numbers of well-educated young adults, many of whom have elementary school-age children. More than ninety percent of the Mary Munford Elementary School zone is white, approximately five percent is black or African American, and small percentages of Asian, American Indian/Alaska Native, Native Hawaiian/Other Pacific Islander, or other represent the remainder of the population.

United States Census data can be used to map the locations of employment for individuals living in a certain area. For this study, individuals living within a half-mile of the school were assessed. The data shows that the overwhelming majority of adults work outside of the study area and this contributes to the high number of children that ride to school in a family vehicle out of convenience. The following pages examine the demographics of each census tract in greater detail.
Census Tracts Served by Mary Munford Elementary School.
Census Tract 501: This census tract has a total population of 2,577 and 10% of the population is less than ten years old. Nearly 7% of the population is less than five years old and more than half the population is comprised of children or adults capable of having school age children.

The educational attainment of people in this census tract is exceptionally high compared to the City of Richmond as a whole. Education is clearly an important part of daily activity in this area and activities associated with the school are a priority.

This is not a very diverse census tract as more than 88% of the population is classified as white compared to the City average of nearly 40%.
**Census Tract 502:** This census tract has a total population of 3,006 and 14% of the population is less than ten years old. Over 8% of the population is less than five years old and more than half the population is comprised of children or adults capable of having school age children.

The educational attainment of people in this census tract is exceptionally high compared to the City of Richmond as a whole. Education is clearly an important part of daily activity in this area and activities associated with the school are a priority.

This is not a very diverse census tract as 94% of the population is classified as white compared to the City average of nearly 40%.

**Percentage of population by race.**

- White: 94%
- Black or African American: 2%
- American Indian and Alaska Native: 1%
- Asian: 0%
- Native Hawaiian and Other Pacific Islander: 0%
- Some Other Race: 3%

**Percentage of population by age.**

- 0 to 9 years: 14%
- 10 to 19 years: 12%
- 20 to 29 years: 17%
- 30 to 39 years: 5%
- 40 to 49 years: 13%
- 50 to 59 years: 8%
- 60 to 69 years: 4%
- 70 to 79 years: 4%
- 80 years and older: 23%

**Educational attainment of population.**

- Graduate or professional degree: 12%
- Bachelor’s degree: 5%
- Associate’s degree: 1%
- Some college, no degree: 1%
- High school graduate (includes...): 1%
- 9th to 12th grade, no diploma: 1%
- Less than 9th grade: 1%
- Population 25 years and over: 1%

*Source: 2007-2011 American Community Survey*
Census Tract 503: This census tract has a total population of 1,267 and 11% of the population is less than ten years old. Nearly 6% of the population is less than five years old and more than half the population is comprised of children or adults capable of having school age children.

The educational attainment of people in this census tract is exceptionally high compared to the City of Richmond as a whole. Education is clearly an important part of daily activity in this area and activities associated with the school are a priority.

This is not a very diverse census tract as more than 94% of the population is classified as white compared to the City average of nearly 40%.
**Census Tract 504:** This census tract has a total population of 2,907 and 16% of the population is less than ten years old. Over 8% of the population is less than five years old and more than half the population is comprised of children or adults capable of having school age children.

The educational attainment of people in this census tract is exceptionally high compared to the City of Richmond as a whole. Education is clearly an important part of daily activity in this area and activities associated with the school are a priority.

This is not a very diverse census tract as more than 90% of the population is classified as white compared to the City average of nearly 40%.
Census Tract 505: This census tract has a total population of 5,439 and 6% of the population is less than ten years old. Only 3% of the population is less than five years old as the majority of the population is comprised of University of Richmond students.

The educational attainment of people in this census tract is exceptionally high compared to the City of Richmond as a whole. Education is clearly an important part of daily activity in this area and activities associated with the University are a priority.

This is not a very diverse census tract as more than 89% of the population is classified as white compared to the City average of nearly 40%.

Percentage of population by race.

- White: 89%
- Black or African American: 1%
- American Indian and Alaska Native: 4%
- Asian: 0%
- Native Hawaiian and Other Pacific Islander: 5%
- Some Other Race: 1%

Percentage of population by age.

- 0 to 9 years: 3%
- 10 to 19 years: 3%
- 20 to 29 years: 7%
- 30 to 39 years: 7%
- 40 to 49 years: 6%
- 50 to 59 years: 6%
- 60 to 69 years: 26%
- 70 to 79 years: 37%
- 80 years and older: 2%

SOURCE: 2007-2011 American Community Survey
Census Tract 506: This census tract has a total population of 2,378 and 14% of the population is less than ten years old. Nearly 5% of the population is less than five years old and more than half the population is comprised of children or adults capable of having school age children.

The educational attainment of people in this census tract is exceptionally high compared to the City of Richmond as a whole. Education is clearly an important part of daily activity in this area and activities associated with the school are a priority.

This is not a very diverse census tract as more than 97% of the population is classified as white compared to the City average of nearly 40%.
Traffic Count Analysis

The number of vehicles and the speeds at which the vehicles travel on roads influence a person’s perception of safety along a corridor. The Mary Munford Elementary School campus is defined by Commonwealth Avenue along the eastern edge, Westmoreland Street along the western edge, Grove Avenue along the northern edge, and Cary Street Road along the southern edge. Vehicular traffic speeds on each of these corridors act as a barrier to active transportation for some.

The Virginia Department of Transportation (VDOT) employs a system where traffic counts are gathered using sensors along major roads and this data is used to determine the average number of vehicles that travel along each segment of road. For the road segments on which data is collected, VDOT can establish an Annual Average Daily Traffic (AADT) value for each segment. AADT is the estimate of typical daily traffic on a road segment for all days of the week over the period of one year.

Not every road has data collected and Commonwealth Avenue, which establishes the eastern boundary of the Mary Munford campus is one of those. In addition to AADT values, other traffic and road data collected from VDOT’s Statewide Planning System (SPS) was used to evaluate the existing conditions of the road network surrounding the school, Grove Avenue, Cary Street Road, and Westmoreland Street.

Grove Avenue: The segment of Grove Avenue near the school is classified as an urban minor arterial roadway. In 2012, the AADT was 11,184 with the most recent average speed collected being slightly less than 32 miles per hour (mph). Grove Avenue has an Operating Level of Service (LOS) score of “C” on an “A-F” scale, with “A” being the most desirable score. The trend for this segment shows annual growth rate of vehicles on the road at 0.47%. This trend predicts that there will be an AADT of 12,333 with more than 1,500 vehicles an hour during peak hours in 2020.

In addition to vehicular trends, VDOT’s Statewide Planning System rates Bicycle Level of Service (BLOS) and Bicycle Compatibility Index (BCI). These indicate bicyclists’ comfort level for specific road segments. Roads with better scores are more attractive and safer for bicycling. Grove Avenue has a BLOS score of “D” on an “A-F” scale, with “A” being the most desirable score. Using the same
grading scale, the BCI score along Grove Ave. is “E.” The ratings for these two indicators are expected to be slightly worse by 2020 unless improvements are made.

Cary Street Road: The segments of Cary Street Road near the schools are classified as urban minor arterial roadways. In 2012, the AADT was roughly 15,000 with the most recent average speed collected being slightly less than 37 mph. Cary Street Road has an operating LOS score of “B.” The trend for these segments shows annual growth rate of vehicles on the road at 0.42%. This trend predicts that there will be an AADT of nearly 18,000 with more than 1,600 vehicles an hour during peak hours in 2020.

Cary Street Road has a BLOS score of “D” and the BCI score along Grove Avenue is “E.” The ratings for these two indicators are expected to be slightly worse by 2020 unless improvements are made.

Westmoreland Street: The segment of Westmoreland Street near the schools is classified as an urban collector road. In 2012, the AADT was 2,255 with the most recent average speed collected being slightly less than 24 miles per hour (mph). Westmoreland Street has an operating LOS score of “C.” The trend for this segment shows annual growth rate of vehicles on the road at 0.50%. This trend predicts that there will be an AADT of 2,345 with more than 290 vehicles an hour during peak hours in 2020.

Westmoreland Street has a BLOS score of “C” and the BCI score along Westmoreland Street is “D.” The ratings for these two indicators are expected to be slightly worse by 2020 and the BLOS will be downgraded to “D” in 2025 unless improvements are made.

Commonwealth Avenue: Traffic data and LOS information is not collected for Commonwealth Avenue yet the traffic volumes are comparable to Westmoreland Street, per visual surveys of the corridor.

Patterson Avenue: The segments of Patterson Avenue that act as a barrier to active transportation are classified as urban principal arterial roadways. In 2012, the AADT was almost 11,000 with the most recent average speed collected being 37 mph. Patterson Avenue has an operating LOS score of “B.” The trend for these segments shows annual growth rate of vehicles on the road at 0.5%. This trend predicts that there will be an AADT of more than 11,000 with more than 1,100 vehicles an hour during peak hours in 2020.

Patterson Avenue has a BLOS score of “D” and the BCI score along Patterson Avenue is “D.” The ratings for these two indicators
Volumes of traffic along nearby roads.
are expected to be slightly worse by 2020 unless improvements are made.

High volumes of traffic and speeding vehicles lead to low comfort levels for parents as the aforementioned routes tend to act as barriers to active transportation. Enforcement of traffic laws and the addition of traffic calming measures will lower vehicular traffic speeds. Engineering improvements such as sidewalks and ADA ramps will create an environment more conducive to walking and bicycling where parents are more inclined to allow their children to get out of the automobile, off the road, and on their feet and bikes.
Crash Data Analysis

Crash data analysis is a critical component of road safety and existing conditions analysis. Review of Virginia Department of Transportation (VDOT) crash data collected between 1990-2011 (most recent available) allows for each crash instance to be plotted using GIS. For this time period there were no recorded accidents along the portions of Westmoreland Street and Commonwealth Avenue that are adjacent to the campus. Along Grove Avenue and Cary Street Road there were 102 and 64 accidents, respectively, for the same years. It should be noted that not all accidents are reported to the police and entered into the record. The table below and the associated graphics shows the number of crashes and the proximity to Mary Munford Elementary School for crashes spanning the years 1990 through 2011.

Assessments of the crash locations place an emphasis on the intersections and associated crosswalks around the campus. Crashes at an intersection may be influenced by conditions on the road segment leading up to the location of the incident. Proper signage and crosswalk markings should be present and inform pedestrians and motorists of responsible practices.

Review of the Virginia Department of Transportation’s statewide crash data involving children between the ages of 5 and 15 within two miles of a school shows that there are 2,442 pedestrians aged 5 to 15 who were injured or killed between 2003 and 2012 (see tables). Despite a slight increase in the number of statewide accidents in 2012, the number of accidents involving children has been reduced to roughly half the number of accidents prior to the development of Safe Routes to School programs in 2005. This trend should continue as more schools and jurisdictions incorporate SRTS policies and encourage active transportation.

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<th>Proximity to Mary Munford</th>
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<tr>
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<td>Less than ¾ mile</td>
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<tr>
<td>Less than 1 mile</td>
<td>2161</td>
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</table>

SOURCE: Virginia Department of Transportation
Crash locations within 1-mile of Mary Munford Elementary
A closer look at crash locations in close proximity of Mary Munford Elementary
A closer look at crash locations in close proximity of Mary Munford Elementary
Safe Routes to School plans can help jurisdictions and schools protect children in areas where much of their time is spent. In 2009 alone, there were more than 23,000 children injured and 250 children killed by vehicles across the nation while walking or bicycling (NHTSA).

While there have not bee any reported accidents involving children in close proximity to Mary Munford Elementary School, there have been a number of accidents along the periphery of the campus. The trend of more vehicles on the road and more and more distracted drivers is exactly why proactive Safe Routes to School strategies need to be implemented to provide safe alternatives for children to incorporate active transportation into their daily routine.

Table 2. Gender of children involved in accidents.

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Table 3. Age of children involved in accidents.

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<td>90</td>
<td>144</td>
<td>168</td>
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</tbody>
</table>

SOURCE: Virginia Department of Transportation
Barriers to Active Transportation

There are a number of factors that can influence a parent or caretaker’s decision to let their children walk or bike to school. These variables are referred to as barriers in this plan and can include everything from traffic conditions and safety concerns to road and sidewalk conditions. This plan identifies existing barriers to active transportation and recommends strategies to address the issues.

Barriers to walking and bicycling, i.e., active transportation, have been identified using a parent survey, a site reconnaissance and visual survey, and through discussions with the Mary Munford Elementary School administration. The parents were asked to identify concerns associated with active transportation and they were given the opportunity to include comments as well on the survey (see Appendix for complete survey). With a response rate of 37%, the parents were able to identify a variety of perceived barriers to active transportation. Many of the issues addressed on the survey forms coincide with barriers identified by the author while surveying the study area in the field and in talks with the school’s administration.

The following barriers were identified through the parent survey as issues to be addressed by this Safe Routes to School plan:

- Speed of traffic along route
- Amount of traffic along route
- Lack of adults to walk or bike with
- Lack of sidewalks or pathways
- Safety of intersections and crosswalks
- Lack of crossing guards
**Speed of traffic**

Mary Munford Elementary School is situated in a dense residential neighborhood that experiences high volumes of traffic traveling at what are perceived as unsafe speeds along Grove Avenue and Cary Street Road. Both Westmoreland Street and Commonwealth Avenue experience a lot of cut-through traffic as well. Parents have suggested that crossing these roads near the school is dangerous due to speeding and this perception is a barrier to families and parent willingness to allow their children to walk or bike to and from school.

**Amount of traffic**

Parents see the large number of vehicular traffic on Westmoreland Street, Grove Avenue, Commonwealth Avenue, and Cary Street Road as a barrier to active transportation. While the volumes of traffic are predicted to increase over time, the road network and infrastructure in the vicinity of the school can be modified to reduce speeds and the constant flow of traffic.

**Lack of adults to walk or bike with**

Parents suggested that the lack of adult supervision is a barrier to allowing their children to walk or bike to school. This correlates to the amount of time parents can allocate to active transportation during the morning or afternoon commute. Not all parents have the time to commit but would be willing to let their children walk or bike with other adults supervising.

Example of a walking school bus.
Sidewalks or pathways

Parents identified missing and insufficient sidewalks along nearby streets as a barrier to active transportation and a field survey of the area has located missing sidewalk segments within a ten minute walk, approximately one half mile. Commonwealth Avenue is the recommended route for traveling to Mary Munford yet there are missing sections along this road in addition to a number of side streets. The following list describes the locations where sidewalks are missing:

- Commonwealth Avenue between Grove Avenue and Patterson Avenue
- Cary Street Road between Lock Lane and Westmoreland Street
- Cary Street Road between Commonwealth Avenue and Reveille United Methodist Church
- Woodlawn Avenue between Cary Street Road and Stuart Avenue
- Willeta Drive
- Ashlawn Drive
- Kingcrest Parkway between Willeta Drive and Woodlawn Avenue
- Hanover Avenue between Shadwell Road and Westmoreland Street
- Stuart Avenue between Shadwell Road and Westmoreland Street
- Kensington Avenue between Shadwell Road and Wisteria Avenue
- Leonard Parkway between Wisteria Avenue and Bunting Avenue
- Shadwell Road between Grove Avenue and Hanover Avenue
- Wisteria Avenue between Grove Avenue and Hanover Avenue
- Bunting Avenue between Grove Avenue and Patterson Avenue
Locations of recommended sidewalk improvements within a ten minute walk (half-mile).
**Safety of intersections and crosswalks**

The most difficult intersections for pedestrians to cross are along Grove Avenue, Cary Street Road, Patterson Avenue, and Monument Avenue. Parents also suggested crossing Westmoreland Street and Commonwealth Avenue can be dangerous and act as barriers to active transportation. Issues associated with the intersections include the short duration of the signalized crosswalk at Grove Avenue and Westmoreland Street, poor visibility along Grove Avenue and Cary Street Road, lack of sufficient ADA (Americans with Disabilities Act) approved ramps, lack of signage and lights to alert drivers, insufficient crosswalk markings on the road surface, the lack of median pedestrian refuge locations, and the volumes of traffic.
Locations of recommended crosswalk improvements attached to the campus.
Lack of crossing guards

Crossing guards assist children and their parents or caretakers to cross the street in a safe and efficient manner. Currently, there is one crossing guard at the intersection of Commonwealth Avenue and Grove Avenue during the morning and afternoon commute. The parent survey results revealed parents concerns about crossing Grove Avenue and Cary Street Road. Parents would like to see a crossing guard and well-defined crossing locations at each of the four corners of the Mary Munford Elementary School campus.

It is not necessary to place a crossing guard at each corner of the campus but the perceived danger in crossing Cary Street Road can be placated by an additional crossing guard along the southern edge of the campus. Improvements to the other crossing locations will improve pedestrian circulation patterns for the students, their parents or caretakers, and community members; however, crossing at the designated locations for the crossing guards should be encouraged.
Locations of existing crossing guard and proposed crossing guard.
Current Travel Environment

In September 2013, the Mary Munford Elementary School administration conducted a survey of its students in kindergarten through fifth grade to assess the transportation modes being utilized. The survey consisted of a student tally sheet which recorded each student’s travel mode over the course of three days, September 17 through 19 (see Appendix). The weather was ideal for parents and their children to take advantage of active transportation.

For the morning commute, there were 1,150 trips recorded over the three days. More than 14% of the student body opted to walk or bike to school (some with adult supervision). The highest rate recorded was for fourth or fifth grade at more than 17%. The tally showed that over 60% of students arrive via a family vehicle, causing congestion and barriers around the school, especially near the drop off location on Westmoreland Street.

For the afternoon commute, there were 1,107 trips recorded over the same time period. In the afternoon, slightly fewer students walk or bike (12.5%) and 56% use a family vehicle and this seems likely due to after-school activities, as there is a slight increase in school bus and carpool use. The highest rate of active transportation was again with the fourth and fifth grade at 16%. During both the morning and afternoon commutes, second and third grades had the lowest rate of active transportation.

AM Travel modes:

PM Travel modes:
Along with the student tally, a parent survey was given to each of the 560 students to take home (see Appendix). With a response rate of 37%, this survey allowed the parents to identify issues affecting their decision to allow, or not allow, their children to walk or bike. This survey also gauged a child’s interest in active transportation. For all grades, nearly 42% of students showed an interest in walking or biking, with higher rates after kindergarten. Parents were asked at what grade they would allow their children to walk or bike without an adult. Roughly half the respondents would not allow their children to walk or bike without an adult in any grade, mostly due to the distance. Of those respondents who would allow their children to walk or bike unaccompanied, the most popular response was fourth or fifth grade, giving many students at least two years to take advantage of the active transportation opportunities.

Parents were asked if, in their opinion, Mary Munford Elementary School encourages or discourages walking and biking and 60% of respondents believe the school either encourages or strongly encourages active transportation. Only 1% suggested the school discourages or strongly discourages walking and biking and that was also due to distance (outside of the school zone). Mary Munford Elementary School is doing a good job of encouraging these healthy activities, according to parents. When asked how much fun
walking or biking with a child is, nearly 73% of respondents suggested the activities as fun or very fun. Only 1% of respondents thought that walking or biking with a child was boring. These numbers are encouraging and the rates for very fun are even higher in the lower grades, suggesting a trend for even more involvement. These trends will need to be evaluated over the next few years to measure success.

Mary Munford Elementary School is ideally situated among relatively dense neighborhoods and the percentage of students walking and biking to school is greater than 14%. Slightly fewer students utilize active transportation as their travel mode home from school. According to the parent survey, active transportation is encouraged by the school. Creating an environment that offers a safe alternative to the family vehicle will decrease congestion around the school for those who need to drive and improve the health of those who can take advantage of active transportation. The parents are committed to improving the conditions and greater numbers of students will be achieved with the implementation of this plan’s recommendations.
Part Two

Strategies and recommendations have been identified for each of the five E’s—Education, Encouragement, Enforcement, Engineering, and Evaluation to address the identified barriers to walking and bicycling to and from Mary Munford Elementary school. Many of the strategies are related to one another and can overlap as well, leading to greater involvement and a healthier lifestyle. The recommendations in this plan are categorized as short-term improvements and long-term improvements and will support the five E’s, integral components of a Safe Routes to School plan as defined by the National Center for Safe Routes to School.

Education strategies are designed to teach the students about safe walking and biking habits. This includes bicycle safety skills classes for students and vehicle safety procedures for vehicle operators (parents or caregivers). An increased awareness of the health and environmental benefits evolves from these techniques as well.

Encouragement strategies include the Walk to School Day event held on October 9th, 2013 and, hopefully, walking school buses will be incorporated in the future. A walking school bus is an organized group of children that walks together to and/or from school with adult supervision. An incentive program that tracks mileage with tokens or some type of reward may be implemented to encourage more students to get involved in active transportation.

Enforcement issues are addressed with traffic calming measures such as speed regulation signs and speed humps as well as crossing guards (City of Richmond Police and faculty) and possibly a student crossing guard patrol. The crossing guard and student patrol reinforces encouragement as well.

Engineering improvements such as crosswalks, sidewalk improvements, traffic signal timing, and signage will be examined to identify areas that can be improved. Recommendations for all of these strategies are depicted through photographic examples and digital renderings.

Finally, an evaluation of the existing conditions and an analysis of the results from the student tally and parent survey establish the numbers of students that walk and bike to and from school and the progress being made.
A focus on education is always an important component for Safe Routes to School programs seeking to change cultural norms. As SRTS is multi-disciplinary in nature, there are a number of opportunities for educating students, parents, drivers, and community members. Education strategies are geared towards teaching students about safe walking and bike practices and support the Safe Routes to School plan. It is important to inform children of the variety of transportation options and teach lifelong walking and bicycling safety skills and create safety awareness.

Education strategies are complementary to encouragement strategies since the knowledge of safe practices will reinforce involvement in the encouragement strategies, and vice versa. Education strategies should include:

- Distribute education materials
- Improve pedestrian and bicycle safety skills of students
- Reinforce safe driving procedures for parents
- Create awareness of health and environmental benefits

A safety procedures and traffic regulations guide, “Sharing the Road in Virginia”, was given to each student and classroom at Mary Munford Elementary school and should be provided to incoming students as well (see Appendix). This guide, produced by the Virginia Department of Transportation, outlines best practices for traveling on streets, sidewalks, and crosswalks and will help pedestrians, bicyclists, and motorists use the existing transportation network in a safe manner. This guide, in conjunction with future materials will improve pedestrian and bicycle safety skills for children and adults and reinforce safe driving techniques for adults.

Bicycle safety skills can also be developed through a yearly education program known as a bike rodeo. Assisted by City of Richmond police, this event will discuss safety concerns as well as the rules to follow when riding a bike. There should also be an actual bike riding component to reinforce the skills learned.
Carytown Bikes assisted Mary Munford during the Walk and Bike to School Day on October 9, 2013 and hopefully this is a partnership that will continue.

There are health, environmental, and sustainable transportation benefits associated with walking and biking to school. These benefits should be included as part of health and physical education classes. Regular physical activity helps children build strong bones, muscles, and it decreases the risk of obesity. The U.S. Department of Health and Human Services suggests children get at least an hour of physical activity each day. Every time a child and/or parent opts to travel by foot or bicycle, they help to reduce the amount of air pollution in addition to improving their own health benefits.

Example of a walking school bus.

Example of bike safety and skills training

Example of a bike safety and skills class.
Encouragement

Families are busy and it is difficult to make a change in daily routines; however, many parents are willing to let their children participate in special events such as the “Walk and Bike to School Day” event held on October 9, 2013. A single day can increase the popularity and emphasize the fun of walking and biking. Encouragement can generate excitement and spark an interest in active transportation. Special events are one form of an encouragement program that provides an excuse for families to alter their routines and try something new.

Encouragement strategies are complementary to education strategies as the knowledge of safe practices will influence involvement in the encouragement strategies, and vice versa. Encouragement strategies should include:

- **Walk and Bike to school contests**
- **Walking School Buses**
- **International Walk to School Day**

Contests, which can foster individual and classroom competition, also help to get kids out of cars and onto feet and bikes. Some schools run contests such as the “Frequent Rider Miles Program” where students track how they come to school and receive points for their accumulated travel distances. Other contests such as Walk and Bike Across America encourage classrooms to track the overall number of miles the students have covered by walking and bicycling, and then to plot the distances on a map. This exercise can become a history lesson as students can travel to locations around the country, as a virtual trip.

These events and contests have been effective in inspiring students, parents, planners and school administrations to try something new. This encouragement can result in the development of ongoing programs to encourage active transportation. Other successful encouragement programs facilitate ways for parents to walk and bicycle with groups of children who live in nearby neighborhoods. Through the formation of a walking school bus, an organized group of children that walks together to and/or from school with adult supervision. This will eliminate many parental
fears of walking and bicycling by ensuring a supervised commute with the added benefit of exercise and socialization with classmates and neighbors. It will only require two or more families taking turns to get this bus moving. On their way to school, more and more students (and parents) will be encouraged to take part in the walking school bus.

Encouragement is all about changing the culture. For years, travel has revolved around the automobile and infrastructure geared towards that mode of transportation. This has lead to a decline in the number of children walking or bicycling to school. The more children that choose active transportation, the less traffic there will be and the safer it will be for walking and biking.

International Walk to School Day took place October 9, 2013 and is a yearly event supported by the National Center for Safe Routes to School. This is a global event that encourages all forms of active transportation, and decreases the number of vehicles on the road around schools.

Example of a butterfly themed bike rack.

Example of a walking school bus.
Enforcement

The primary goals of the enforcement strategy are to increase awareness of traffic laws and improve driver behavior. Partnering with City of Richmond law enforcement to ensure that traffic laws are obeyed in the vicinity of schools (including enforcement of speeds, yielding to pedestrians in crosswalks as well as proper walking and bicycling behaviors) can help decrease the perception of danger. In addition to local law enforcement presence, initiating neighborhood and school enforcement programs such as crossing guard programs and student safety patrols can help increase awareness of pedestrians, improve driver behavior, and increase the overall awareness of pedestrians and bicyclists. Enforcement strategies should include:

- **Crossing guards**

- **Create a student or parent patrol program**

  The existing policy at Mary Munford Elementary School places a lone crossing guard at the intersection of Grove Avenue and Commonwealth Avenue as Commonwealth Avenue is the preferred route for pedestrians and bicyclists. Per the parent survey, a few locations for crossing guards have been suggested:

- **Grove Avenue at Westmoreland Street**
- **Cary Street Road at Commonwealth Avenue**
- **Cary Street Road at Westmoreland Street**

  However, resources are limited and recommending a crossing guard at each of these locations seems excessive. There is reason enough to recommend a crossing guard at the intersection of Cary Street Road and Westmoreland Street. This additional crossing guard will decrease the perception of danger along this stretch of road and encourage more children and parents to participate in active transportation.
Locations of existing crossing guard and proposed crossing guard.
Engineering

Engineering strategies deal with the built environment and can range from installing road surface markings and signage to sidewalk installation and intersection redesign. During the evaluation process, survey data will indicate that there are significant concerns about the designs of streets, intersections, lack of sidewalks/crosswalks/signage or poorly timed traffic lights. Changes to the built environment through engineering improvements are a critical component of Safe Routes to School so most successful programs include a thorough community assessment of existing barriers to walking and bicycling to school.

Clearly defined pedestrian and bicycle routes, along with traffic calming measures, such as raised crosswalks and signage and alerts for drivers, will influence drivers to modify their driving behavior, creating safer and more accessible environments for walking and biking. Creating a safer environment for active transportation will encourage more families to choose walking and bicycling as a healthy alternative to the family car. The engineering strategies recommended include:

- New Sidewalks
- ADA (American Disability Act) Ramps
- Raised crosswalks
- Median pedestrian refuge
- Signage and road markings
New Sidewalks

Sidewalks form the backbone of the pedestrian transportation network and a walkable community. As mentioned earlier, there are a number of missing sidewalk segments within a half mile radius of Mary Munford Elementary School. Sidewalk connectivity is an integral component of this plan as the sidewalks are the safest location for children and parents to walk.

Sidewalk improvements include new sidewalks, sidewalk gap closure, and associated sidewalk ADA ramps. The following list and graphic shows the locations of recommended sidewalk improvements:

- Commonwealth Avenue between Grove Avenue and Patterson Avenue
- Cary Street Road between Lock Lane and Westmoreland Street
- Cary Street Road between Commonwealth Avenue and Reveille United Methodist Church
- Woodlawn Avenue between Cary Street Road and Stuart Avenue
- Willeta Drive
- Ashlawn Drive
- Kingcrest Parkway between Willeta Drive and Woodlawn Avenue
- Hanover Avenue between Shadwell Road and Westmoreland Street
- Stuart Avenue between Shadwell Road and Westmoreland Street
- Kensington Avenue between Shadwell Road and Wisteria Avenue
- Leonard Parkway between Wisteria Avenue and Bunting Avenue

Example of a parent and child walking on Commonwealth Avenue.
Locations for proposed sidewalk improvements.
ADA Ramps

Curb ramps are critical to providing access between the sidewalk and the street for people who use wheelchairs and parents with strollers or wagons. Curb ramps are most commonly found at intersections, but they may also be used at other locations such as on-street parking, loading zones, bus stops, and midblock crossings.

Curb ramps provide access for people who use wheelchairs, who would otherwise be excluded from the sidewalk because of the barrier created by the curb. This inclusive planning practice is an integral component of creating a complete network through this Safe Routes to School plan for Mary Munford Elementary School.

Example of ADA ramp improvements along Commonwealth Avenue.

Locations of proposed ADA ramp improvements along Cary Street Road.

Example of proposed ADA ramp improvements along Commonwealth Avenue.
Locations of proposed ADA ramp improvements.
Raised Crosswalks

The crosswalks along Westmoreland Street allow access to the main entrance of Mary Munford Elementary School. Per the results of the parent survey, this corridor, and Commonwealth Avenue as well, will benefit from the implementation of traffic calming devices to slow traffic and to improve the students’ ability to cross.

A raised pedestrian crossing is essentially a speed table with a flat portion wide enough to accommodate a crosswalk. These encourage pedestrians to cross in the designated areas and the pedestrians are more visible to approaching vehicles. The raised crosswalks should involve a combination of measures, including roadway color and texture, as a way to mark the entrance to the school area and to alert drivers to slow down.

Locations of proposed raised crosswalks along Commonwealth Avenue.

Locations of proposed raised crosswalks along Westmoreland Street.

Example of a raised crosswalk.
Locations of proposed crosswalk improvements connected to campus.
**Median Pedestrian Refuge**

Median pedestrian refuges are raised barriers situated in the center of the roadway that serve as a place of refuge for pedestrians who cross at an intersection. By splitting the street crossing into two stages, median refuges reduce the crossing distance and allow pedestrians and bicyclists to concentrate on one direction of traffic at a time. Crossing Grove Avenue can be difficult due to traffic and the perception of fear is exacerbated by the short duration of the pedestrian crossing signal at Westmoreland Street.

Median pedestrian refuges are recommended at the intersection of Grove Avenue and Westmoreland Street and the intersection of Grove Avenue and Commonwealth Avenue, currently the only location with a crossing guard..

Examples of median pedestrian refuges.
Locations of proposed median pedestrian refuges.
Signage and Road Markings

School zone speed limit signs with flashing lights are currently located along Cary Street Road and Grove Avenue yet moving them further away from the campus will give drivers more time to react and adjust their speed. Cary Street Road, Grove Avenue, Commonwealth Avenue, and Westmoreland Street all have signs indicating crosswalks but they should be enhanced with solar powered lights to increase visibility. These signs will alert motorists as they approach crosswalks and be activated during the morning and afternoon school commute. In addition, a no right turn on red sign on Westmoreland Street at the intersection of Grove Avenue will eliminate the constant flow of traffic turning to head east on Grove Avenue. This will make crossing at this location more feasible.

The road surface markings for each of the crosswalks attached to Mary Munford Elementary School are not sufficient and roadway markings to alert drivers of the school zone should be placed approximately two blocks away from the campus in all directions.

An illuminated crosswalk, using in roadway lights (IRWLs), is a relatively new traffic control device being used throughout the nation to alert approaching motorists to the presence of pedestrians in or about to enter the crosswalk. It consists of a series of lighting units encased in durable housings and embedded in the pavement parallel with the marked crosswalk. The lights are activated by a pedestrian, either by push-button or passive detection, and are aimed to flash toward approaching traffic. The lights serve essentially the same function as traditional overhead flashing beacons, with the major differences being the location of the lights and the pedestrian activation feature.
Locations of pavement marking and sign recommendations.
Example of existing signage and sidewalk.

Example of solar flashing school zone sign.

Example of existing signage and crosswalk.

Example of in-roadway lights installed at crosswalks.
Evaluation

Evaluation is the final “E” of the five “E”s — Education, Encouragement, Enforcement, Engineering, and Evaluation. Evaluation helps measure the impact of the Safe Routes to School efforts over time. The evaluation process began with the initial assessment of existing conditions, review of the current travel policy, and analysis of results of the student tally and parent survey. After the Safe Routes to School plan has been implemented, it is important to evaluate the strategies utilized and assess any success stories or failures. Changes to the program can be made accordingly, as some programs may prove more successful than others.

The evaluation process should occur annually and evaluation strategies include:

- **Student Tally**
- **Parent Survey**
- **Student Participation in Events**

**Student Tally**

Student Travel Tally Week is the time of year when schools count and assess the modes of travel used by students to travel to and from school. Teachers ask their students how they traveled to school in the morning and how they planned to travel home in the afternoon, recording the information on tally sheets (see Appendix). In Virginia, this typically occurs over a two or three day period during the second week in September of each year, making the results easier to compare. Review of these tallies will show an increased level of participation with regards to active transportation.

**Parent Survey**

The parent survey is a great tool to collect information about what factors affect whether parents allow their children to walk or bike to school and any safety concerns the parents may have. The parent survey helps to identify barriers to active transportation and measures the parents’ perceptions of the Safe Routes to School plan. This survey can be completed on paper as it was this year or the information can be collected online through the National Center for Safe Routes to School website.
Student Participation in Events

Special events associated with walking and biking to school can create excitement about the subject of active transportation. Events such as the International Walk to School Day, National Bike to School Day, and bike skills and safety classes can introduce these healthy concepts to students or reinforce skills in those who already participate.

Walk to School Day is a global event to get students and their parents out of the automobile and onto their feet or bike. This is a fun event that promotes healthier habits, safety, and improves the environment and sense of community. The event began in 1997 in Chicago and has continued each year, with the most recent event being held on October 9, 2013. Next year’s event will be October 9, 2014.

The Bike to School Day event evolved out of the popular Walk to School Day and occurs in the Spring. This event started in 2012 and the most recent Bike to School Day was on May 8, 2013. Mary Munford has held another Bike to School Day event in October and the next official Bike to School Day is May 7, 2014.

In the past Carytown Bikes has assisted Mary Munford Elementary School with events to teach bike skills and safety to the students. It would be great if this partnership could continue as they can provide bicycles and helmets, along with the expertise and enthusiasm.
Conclusion

This document was prepared for Mary Munford Elementary School in Richmond, Virginia as a Safe Routes to School plan. Mary Munford Elementary School agreed to participate in this study and the assessment of existing conditions. The purpose of this plan is to improve safety of the routes to school, increase the number of students walking and biking (active transportation) to school, and improve the overall quality of life for all students and families by encouraging and promoting healthy activities.

This plan has recognized students’ and parents’ concerns, identified existing barriers to active transportation, and recommended strategies to establish safer routes and practices for children to travel to and from school. The existing conditions were assessed through in-field visual surveys, a student tally, a parent survey, review of school policy, and analysis of Virginia Department of Transportation traffic and road inventory data.

The recommendations in this Safe Routes to School plan are categorized as short-term and long-term improvements and will support the five “E”s—Education, Encouragement, Enforcement, Engineering, and Evaluation—integral components of a Safe Routes to School plan as defined by the National Center for Safe Routes to School.

Short-term engineering improvements such as painting the crosswalks on the road surface, increasing the timing at the traffic light at the intersection of Westmoreland Street and Grove Avenue, installing temporary speed-humps, and installing solar-powered flashing lights on the existing school zone signs are immediate fixes and can be completed within a short time frame. These recommendations are priorities and should be implemented prior to August, 2014 in advance of the upcoming academic year. The cost of these initial improvements is approximately $32,000. The momentum established by these tactics along with the recommended education, encouragement, and enforcement strategies will pave the way for the long-term projects to be implemented.

Mary Munford Elementary School has a very active Parent Teacher Association (PTA) that has provided monetary support for previous projects and can be a valuable resource to generate funding for the short-term improvements. Support from the PTA and the school administration will allow for implementation of the short-
term non-infrastructure and engineering tactics within twelve months after this plan was finalized, or by December, 2014.

Long-term improvements such as installing the sidewalks to complete the connectivity within a half-mile of the campus (and eventually further), installing the raised crosswalks along Westmoreland Street and Commonwealth Avenue, the in-road lights to illuminate the crosswalks, and the median pedestrian refuges along Grove Avenue are costly and require planning and should be included as part of the capital improvement plan for the City of Richmond. Mary Munford Elementary School will need to apply for funding from Federal grants. The most recent legislation, MAP-21 Act, requires active transportation projects to apply for funding through a competitive process. The total cost for these engineering improvements is $1,097,640 and will likely need to involve multiple funding sources and a coordinated implementation process. These long-term tactics are considered for implementation beyond the initial year of the Safe Routes to School program and should be completed within five years after this plan was finalized, or by December, 2018.

Other recommendations such as the encouragement and enforcement strategies, educational components, and the evaluation process should be included as annual occurrences as funding and events are available. These tactics will continue the momentum started with this Safe Routes to School plan.
Resources


City of Richmond Master Plan, (2000).


Center for Disease Control
http://www.cdc.gov/

Community Commons
http://www.communitycommons.org/

Federal Highway Administration
http://www.fhwa.dot.gov/

National Center for Safe Routes to School
http://www.saferoutesinfo.org/

National Highway Traffic Safety Administration
http://www.nhtsa.gov/

OpenPlans
http://openplans.org/

Safe Routes to School National Partnership
http://www.saferoutespartnership.org/

United States Census Bureau
http://factfinder2.census.gov
Appendix

Safe Routes to School Students Arrival and Departure Tally Sheet

Date: ________________ 20__

Gender:
- Kindergarten or First
- Second or Third
- Fourth or Fifth

- Please conduct these counts on two of the following three days: Tuesday, Wednesday, or Thursday.
- Please do not conduct these counts on Mondays or Fridays.
- Before asking your students to raise their hands, please read through all possible answer choices so they will know their choices. Each student may only answer once.
- Ask your students as a group the question “How did you arrive at school today?”
- Then reveal each answer choice and ensure the number of students that raised their hands for each. Please just one character or number in each box.
- Follow the same procedure for the question “How do you plan to leave for home after school?”
- You can conduct the counts once per day but during the count please ask students both the school arrival and departure questions.
- Please conduct this count regardless of weather conditions (i.e., ask the questions on rainy days, too).
- Any survey with a blank on it will be considered invalid and not used. Thank you!

Parent Survey About Walking and Biking to School

Dear Parent or Caregiver,

Your child’s school wants to learn your thoughts about children walking and biking to school. This survey will take about 5 – 10 minutes to complete. We ask that each family complete only one survey per school your children attend. If more than one child from a school brings a survey home, please fill out the survey for the child with the next birthday from today’s date.

This survey is anonymous and you are not asked to provide any names or other identifying information. Any survey with a name will be considered invalid and not used.

Thank you for participating in this survey!

1. What is the grade of the child who brought home this survey?
2. Is this child who brought home this survey male or female? [ ] Male [ ] Female
3. How many children do you have in Kindergarten through 8th grade?
4. What is the street intersection nearest your home? ____________________________
5. How far does your child live from school?
   - Less than 1 mile
   - 1 mile up to 5 miles
   - 6 miles up to 10 miles
   - More than 10 miles
   - Don’t know
6. On most days, how does your child arrive and leave for school?

<table>
<thead>
<tr>
<th>Arrive at school</th>
<th>Leave from school</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk</td>
<td>Walk</td>
</tr>
<tr>
<td>Bike</td>
<td>Bike</td>
</tr>
<tr>
<td>School Bus</td>
<td>School Bus</td>
</tr>
<tr>
<td>Family vehicle</td>
<td>Family vehicle</td>
</tr>
<tr>
<td>(only children in your family)</td>
<td>(only children in your family)</td>
</tr>
<tr>
<td>Carpool</td>
<td>Carpool</td>
</tr>
<tr>
<td>(Children from other families)</td>
<td>(Children from other families)</td>
</tr>
<tr>
<td>Transit (city bus, subway, etc.)</td>
<td>Transit (city bus, subway, etc.)</td>
</tr>
<tr>
<td>Other (skateboard, scooter, inline skates, etc.)</td>
<td>Other (skateboard, scooter, inline skates, etc.)</td>
</tr>
</tbody>
</table>
7. How long does it normally take your child to get to/from school?

<table>
<thead>
<tr>
<th>Travel time to school</th>
<th>Travel time from school</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 5 minutes</td>
<td>Less than 5 minutes</td>
</tr>
<tr>
<td>5 – 10 minutes</td>
<td>5 – 10 minutes</td>
</tr>
<tr>
<td>11 – 20 minutes</td>
<td>11 – 20 minutes</td>
</tr>
<tr>
<td>More than 20 minutes</td>
<td>More than 20 minutes</td>
</tr>
<tr>
<td>Don't know / Not sure</td>
<td>Don't know / Not sure</td>
</tr>
</tbody>
</table>

8. Has your child asked for permission to walk or bike to/from school in the last year? Y ☐ N ☐

9. At what grade would you allow your child to walk or bike to/from school without an adult?
   [ ] Less than a grade
   [ ] One grade
   [ ] Two or more grades
   [ ] Would not feel comfortable at any grade

10. What is the highest grade or year of school you completed?
    [ ] Grades 1 through 8 (Elementary)
    [ ] Grades 9 through 11 (High school)
    [ ] College 1 to 3 years (College graduate)
    [ ] College 4 years or more (College graduate)
    [ ] Prefer not to answer

11. Would you probably let your child walk or bike to/from school if these problems were changed or improved? (Select one choice per line, mark box with X)

   - Distance: ☐ Yes ☐ No ☐ Not sure
   - Convenience of driving: ☐ Yes ☐ No ☐ Not sure
   - Time: ☐ Yes ☐ No ☐ Not sure
   - Child's before or after-school activities: ☐ Yes ☐ No ☐ Not sure
   - Speed of traffic along route: ☐ Yes ☐ No ☐ Not sure
   - Amount of traffic along route: ☐ Yes ☐ No ☐ Not sure
   -Adults to walk or bike with: ☐ Yes ☐ No ☐ Not sure
   - Sidewalks or pathways: ☐ Yes ☐ No ☐ Not sure
   - Safety of intersections and crossings: ☐ Yes ☐ No ☐ Not sure
   - Crossing guards: ☐ Yes ☐ No ☐ Not sure
   - Violence or crime: ☐ Yes ☐ No ☐ Not sure
   - Weather or climate: ☐ Yes ☐ No ☐ Not sure

12. In your opinion, how much does your child's school encourage or discourage walking and biking to/from school?
    [ ] Strongly Encourages ☐ Encourages ☐ Neither ☐ Discourages ☐ Strongly Discourages

13. How much fun is walking or biking to/from school for your child?
    [ ] Very Fun ☐ Fun ☐ Neutral ☐ Boring ☐ Very Boring

14. How healthy is walking or biking to/from school for your child?
    [ ] Very Healthy ☐ Healthy ☐ Neutral ☐ Unhealthy ☐ Very Unhealthy

15. What is the highest grade or year of school you completed?
    [ ] Grades 1 through 8 (Elementary)
    [ ] Grades 9 through 11 (High school)
    [ ] College 1 to 3 years (College graduate)
    [ ] College 4 years or more (College graduate)
    [ ] Prefer not to answer

16. Please provide any additional comments below.

   ___________________________________________________________
   ___________________________________________________________
   ___________________________________________________________
   ___________________________________________________________

Thank you for participating in this survey!
Sharing the Road in Virginia: Laws and Safety Tips for Bicyclists and Pedestrians

Sharing the Road in Virginia brings together safety procedures and traffic regulations for all users of Virginia’s roads. This practical guide for bicyclists and pedestrians as well as motorists helps everyone confidently navigate Virginia’s transportation network.

Like motorists, bicyclists and pedestrians are subject to the Code of Virginia section on motor vehicles (Title 46.2) which may be accessed online from www.Virginia.gov, the official Web site of the Commonwealth of Virginia.

Visit www.SharingtheRoadinVirginia.org to download this booklet in English and Spanish. Copies may be reproduced for distribution; contact your local office supply store, copy center, or printer for assistance.

Sharing the Road in Virginia is funded by a Transportation Enhancement grant from the Virginia Department of Transportation with additional support from the Department of Motor Vehicles and the City of Alexandria. It has been prepared by BikeWalk Virginia according to a contract issued by the Northern Virginia Regional Commission with oversight from the Technical Advisory Committee members listed below.

BikeWalk Virginia is a non-profit organization which conducts programs, supports policies, and sponsors activities that promote the benefits of biking and walking for recreation and transportation.
Sharing the Road in Virginia

No matter how they drive, bicycle or walk, Virginians should be able to safely share the Commonwealth’s transportation network to get to neighborhoods, parks, schools, stores, places of worship, and businesses.

Due to concerns about the economy, the environment, and health, bicycling and walking are increasingly viewed as sustainable, inexpensive and efficient forms of transportation for short commutes and for getting around town. In addition, by walking or riding a bicycle instead of driving a motor vehicle, the Commonwealth of Virginia’s citizens reduce traffic congestion, road wear and tear, and the need for more roads and parking.

Everyone Uses the Roads

Because everyone uses the roads, it is important to recognize that motorists, bicyclists, and pedestrians have mutual rights and responsibilities.

Some people drive because it is convenient. However, other people don’t own a car or can’t drive a vehicle so they must bike, walk, or use public transportation. Still others choose to bicycle or walk to keep the air clean and neighborhoods quiet, save fuel, and improve health.

Know the Law and Put Safety First

When all users of the transportation system know the law and respect their mutual rights and responsibilities, sharing the road is safe and predictable.

Congratulations for consulting this booklet. It is a good place to start learning the rules and the most common safety practices for all travelers sharing Virginia’s streets and roads.
Know the Law

The Code of Virginia, Title 46.2 (Motor Vehicles, Chapter 8) contains laws covering bicycle and pedestrian use of the Virginia transportation network.

“Every person riding a bicycle on a highway shall be subject to the provisions of the Code of Virginia section on motor vehicles and shall have the rights and duties applicable to the driver of a vehicle unless a provision clearly indicates otherwise.”

Code of Virginia § 46.2-800

Bicyclists should read the Virginia Driver’s Manual (www.dmv.state.va.us/webdoc/pdf/manual/manual.pdf) to become familiar with these rules.

“Pedestrians shall not use the roadways for travel, except when necessary to do so because of the absence of sidewalks which are reasonably suitable and passable. If they walk on the hard surface, or the main travelled portion of the roadway, they shall keep to the extreme left side or edge thereof, or where the shoulders of the highway are of sufficient width to permit, they may walk on either shoulder…”

Code of Virginia § 46.2-928

Know the Law!

Bicycles are vehicles when ridden on roads and streets:

- Follow rules that apply to motor vehicles
- Obey all traffic signs, signals, lights, and markings
- Ride on the right side, with traffic
- Stay as far to the right as safely possible or use the shoulder
- Ride no more than two side by side
- Ride single file when moving slower than traffic
- Obey signs that restrict riding on Interstate highways and limited access roads
- Yield to pedestrians
- Call to pedestrians when approaching from behind and to pass
- Use hand signals for turns and stops
- When turning, use motor vehicle turn lanes
- Keep one hand on the handlebars when carrying articles
- Don’t carry adults on bicycles not built for more than one
- Carry children securely in special seats or trailers
- Don’t wear earphones in both ears
- Use white headlamps visible 500 feet when bicycling between sunset and sunrise
- Use rear reflectors at night; if using roads with speed limits of 35 mph or more, use a red taillight visible 600 feet
- Be sure brakes work properly
- Obey local ordinances for riding on sidewalks, wearing a helmet, and having a bicycle license
Pedestrians have rights and responsibilities:
- Use sidewalks if available
- Use crosswalks wherever possible
- If walking on roads, walk facing traffic and travel on extreme edge
- Obey Walk/Don’t Walk control signals or countdown timers
- Use caution when crossing highway
- Make sure bicyclists and motorists can see you

Motorists respect bicyclists’ and pedestrians’ rights:
- Approach and pass bicyclists at a reasonable speed
- Allow at least two feet between you and bicyclists when passing
- Yield to pedestrians
- When turning, yield to pedestrians and bicyclists
- Permit pedestrians to cross roads safely
- Come to a full stop for a blind pedestrian with a cane or guide dog (Class 3 misdemeanor)

If involved in a crash:
- Stop to determine injury or damage
- Report name, etc., to police or others involved
- Report property damaged during a crash to police within 24 hours

Violation of traffic law is a civil penalty or traffic infraction punishable by a fine or points against your driver’s license.

Code of Virginia § 46.2

Before you hit the road

Get a bike that fits
Size: A bike that fits is important for safety, comfort, and fun. You should be able to reach the ground and handlebars easily. This makes controlling the bike less complicated.

Style: Road bikes have narrow tires, dropped handlebars, and are designed for faster riding. Mountain bikes have wide tires and are designed for off-road use. A hybrid or city bike combines features for comfort and efficiency.

Local bike shops can help you choose a bike that fits you and your bicycling needs. They will explain features and help you learn to use gears and brakes. They can also help with safety equipment.

Bike check
- Inspect your bike regularly or take it to a bike shop for inspection.
- **Air** – Are tires at recommended pressure and in good condition?
- **Brakes** – Can you reach brake levers? Are brakes powerful?
- **Chain** – Does the chain spin and change as gears are engaged?
- **Lights** – Do you have a white front light that is visible at least 500 feet and a red light that is visible at least 600 feet to the rear? More light means more visibility!
Helmet

There is no statewide helmet law, but the Code of Virginia gives a county, city, or town the authority to require anyone 14 years old or younger to wear a helmet that meets the Consumer Product Safety Commission (CPSC) standard when riding or being carried on a bicycle. Check local laws for helmet regulations. When buying a helmet, look for the CPSC label.

- Helmet should sit level and not shift easily.
- V-straps should fit beneath the ear lobes.
- Chin strap should be snug, about a finger’s width under the chin.


When the helmet hits a hard surface, replace it. Even if you don’t see a dent, the foam may be damaged and unable to absorb a shock in the future. Other recommendations for replacement can be found at http://www.helmets.org/replace.htm.

Helmets greatly reduce the risk of serious brain injury. Everyone should wear a helmet, but helmets are most important for children, who are more prone to falls.

STREETS

Rules to remember

Ride in a straight line

Bicyclists should generally ride single file. Be predictable; especially don’t weave in and out of parked cars - bicyclists may disappear from motorists’ sight and get squeezed when they need to merge back into traffic. Occupy more of the travel lane if it is narrow or if traffic is moving slowly to increase visibility. Likewise, motorists should stay in their lanes and not swerve into bike lanes.

Take the lane

If there is no shoulder or bike lane, and the travel lane is narrow, take the lane by riding closer to the center of the lane. This will prevent motorists from passing you when there isn’t room. You should also take the lane when you’re traveling at the same speed as traffic. This will keep you out of motorists’ blind spots and reduce conflicts with right-turning traffic.
Keep your distance
Bicyclists should avoid traveling too close to parked cars to avoid the risk of having a door open in front of them. The bicyclist in this photo, however, is correct. He has taken the lane and is traveling three to five feet from parked cars to stay out of their door-opening zone.

Riding side by side
Two bicyclists may ride side by side, but only if they don’t impede other traffic. If traffic doesn’t have enough room to pass, ride single file.

Walk the line
Pedestrians are not allowed to walk on roadways when sidewalks are available. If there is no sidewalk or shoulder, any pedestrian shall walk as near as practicable to an outside edge of the roadway, and if on a two-way roadway, shall walk only on the left side of the roadway and yield the right of way to all vehicles upon the roadway. It is safest to walk facing traffic.

A teachable moment
Parents: When walking, talk to children about the motorists, bicyclists, and pedestrians you observe.
Who has right of way?

**Pedestrians** have the right of way on sidewalks. Sidewalks are constructed to keep pedestrians safe.

**Bicyclists** should avoid using sidewalks. If they do use one, they should yield the right of way to pedestrians. Bicyclists should slow down when approaching a pedestrian, give an audible warning such as “approaching on your left!” and wait for the pedestrian to move over.

Bicyclists on sidewalks should also slow down to watch for cars preparing to turn across a sidewalk into a road or driveway.

**Motorists** should look for pedestrians and bicyclists and yield to them when turning across sidewalks.

Even though they have the right of way on sidewalks, pedestrians can avoid crashes by paying attention to motor vehicle and bicycle traffic!

Make eye contact to be sure to be seen when crossing roads, sidewalks, crosswalks, paths, driveways, and roads.

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**CROSSWALKS**

**Pedestrians: Scan and cross**

Pedestrians are required by law to cross at crosswalks whenever possible. Crossing at crosswalks is the safest way to cross the street. However, crashes often occur there, so be alert!

Before crossing, stop, look LEFT-RIGHT-LEFT, and over the shoulder for turning traffic.

Crossing the street mid-block is not a good idea. Especially in urban areas, motorists expect pedestrians to cross at crosswalks and pedestrians expect motorists and bicyclists to watch out for them.

Crosswalks occur wherever sidewalks meet the street and where streets intersect. The Code of Virginia defines this type of crosswalk as an “unmarked crosswalk.”

[Code of Virginia §46.2-924]
Motorists: Slow down!
Motorist speeding is a major factor in crashes with pedestrians.

Bicyclists: Stay on the road
Bicyclists should not ride in crosswalks or alternate between the sidewalk and road by hopping the curb or using driveway cuts. Be consistent and predictable.

Motorists & Bicyclists: Yield to pedestrians
Motorists and bicyclists must yield to pedestrians in crosswalks, both marked and unmarked.

Pedestrians: Don’t Disregard traffic!
“No pedestrian shall enter or cross an intersection in disregard of approaching traffic.”

What is a crosswalk?
Crosswalks may be marked or painted on the highway.

Virginia traffic Crash facts can be found on the Virginia Department of Motor Vehicles site at www.dmv.state.va.us/index.asp. Go to Highway Safety, Traffic Crash Data.

Be Aware! More than 50 percent of pedestrian-motorist crashes occur at intersections.

YOUR SIDE

Walk LEFT
When there is no sidewalk or shoulder, PEDESTRIANS may walk as near as practicable to an outside edge of the roadway. It is safest to walk facing traffic.

Ride RIGHT
MOTORISTS and BICYCLISTS use the right lane of traffic.

Take a class
• Bicycle education courses are offered by League of American Bicyclists-certified instructors.
• Health and P.E. teachers may be Bike Smart certified to teach bike skills and safety in schools.
• Many bike shops and parks and recreation departments offer bicycling courses.
How far to the right?
In most cases, bicyclists should not hug the curb or road edge since hitting the curb could cause a bicyclist to lose his or her balance and fall into traffic. Bicyclists may use the shoulders or take the lane.

Choose a lane
Bicyclists should stay in the lane marked for the direction they are traveling. Don’t ride in the turn lane if not planning to turn.

Never ride facing traffic
Riding a bike the wrong way through traffic is against the law and is a leading cause of crashes. Bicyclists may think they are safe if looking at on-coming traffic, but it is more dangerous. If hit head on, the impact would be greater than if hit from behind.

When wrong-way riding, bicyclists can’t see signs and traffic signals. Motorists are not expecting bicyclists approaching from that direction.

Bicycling with traffic
Bicycle-riding expert John Forester coined the phrase vehicular cycling in the 1970s after observing bicycling attitudes and riding styles in Europe, where bicycle-riding is far more common and motor vehicle drivers and bicyclists are more used to sharing the road. Forester said, “Cyclists fare best when they act and are treated as drivers of vehicles.” For children and new bicyclists though, this is easier said than done! Especially since interstate highways, limited access highways, and high-speed driving have been the norm, inexperienced bicyclists are often timid. Confident bicyclists integrate themselves with motor vehicle traffic. When bicyclists are in command of their vehicles and when motorists see bicyclists acting predictably, the highways are safer for everyone.

Remember, in Virginia bicycles are vehicles. Bicyclists and motor vehicle drivers share mutual rights and responsibilities as users of public roads. Ride your bicycle with confidence!
Hand signals

To signal a left turn, look behind, and then hold out the left arm. To signal a right turn, hold out the right arm or hold the left arm up, with bent elbow. Do not signal through the turn since both hands are needed on the handlebars to maintain control.

To signal a stop, hold the left arm down at an angle. If braking is necessary when using one hand, don’t squeeze the brake too hard. It may cause you to be thrown from the bike or to skid.

Traffic signals

Some traffic signals are triggered by electrically charged wires buried under the pavement. (Look for cut lines filled with tar.) When a vehicle goes over them, the metal disrupts the current, which trips the signal. Most bicycles contain enough metal to trigger the light when stopped over it.

If a light is not triggered, a bicyclist can move forward to let a car to trigger it, proceed as traffic allows, or go to the sidewalk and cross with pedestrians.

TURNS

When approaching an intersection with several lanes, a bicyclist should choose the one with the arrow pointing where he or she wants to go. Don’t use the straight through bike lane when a left turn lane is available; use the straight through lane only if going straight ahead or turning right in an intersection without a right turn lane.

Bicycles turning left

1. Make a left hand turn as a vehicle.
   - While approaching the intersection, look over your left shoulder for traffic.
   - Make eye-contact with approaching motor vehicle drivers.
   - When clear, signal a turn.
   - Move over to the left side of the lane (on a two-lane road) or into the turn lane.
   - Be positioned so cars going straight through can’t pass you on the left.
Yield to on-coming cars before turning.
• If riding in a bike lane or on a road with several lanes, look and signal at each lane change.
• Never make a left turn from the right side of the road.

2. If less comfortable in traffic, use the crosswalks.
• Dismount and cross as a pedestrian in the crosswalk.
• If there is a signal, wait for the green or WALK signal before crossing.

**Bicycles turning right**

Always scan ahead for cars that may be turning right. If a car ahead is signaling a right turn, do not pass on the right. Bicycles must stop at red lights before turning right. Do not pass stopped cars at a crosswalk or intersection; they may be preparing to turn right.

**Stay alert!**

*Use mirrors and scan, just as you would if you were driving a motor vehicle.*

*In Virginia, it’s against the law for bicyclists to wear earphones in both ears while riding.*

Bicyclists should watch ahead for vehicles planning to turn right at an intersection or driveway. Don’t get into the motorist’s blind spot or other position where visibility is limited. Passing requires special caution.

Avoid passing on the right at intersections where motor vehicles frequently make right turns.

Bicyclists should stay in front of or behind vehicles to always remain visible. Bicyclists should call out and pass pedestrians on the pedestrian’s left.

To warn bicyclists not to pass on their right, motorists turning right should use their turn signal and occupy a bike lane marked with a dashed line.

**Bicycle lanes**

Designated bike lanes separate bicyclists from other traffic. They are marked by signs as well as white lines and icons applied to the pavement.

Motorists should not drive in a bike lane. However, when turning across a bike lane, motorists should enter the lane as noted above.

Bicycle lanes are frequently unavailable and sometimes unsafe due to potholes and litter. Bicyclists and motorists must share the road, whether or not bike lanes are provided.
What to do if in a crash

First, check for injuries. If someone is injured, call 911 for help right away. If trained, administer first aid and remove the injured from harm’s way. Severely injured persons should not be moved.

Virginia law requires that bicyclists must stop when they are in an accident involving death, injury, or property damage.

If you are involved in an accident with a motor vehicle, ask for the driver’s:

• Name and address
• Vehicle registration number
• Driver’s license number
• Insurance company and policy number
• Other information usually needed by police and insurance companies

Give your name and address. Ask witnesses, including passengers, for their names and addresses.

As soon as possible, write down what you think happened. Document injuries and property damage with photographs. Save all receipts and repair estimates.

Contact your insurance company if you have coverage on your bicycle. You may want to contact an attorney. When bicycling, always carry your identification and medical insurance information, especially when traveling alone.

BE ALERT

Be visible and be aware

Even if you are obeying all traffic laws, there is a risk of being involved in a crash if another bicyclist, pedestrian, or motorist isn’t obeying the law or is not able to see a dangerous situation ahead. Ride or walk cautiously!

1. Watch others who are waiting at stop signs or in driveways, or who are in parking spaces. They may be preparing to pull out.

2. Look out for others who may not see you when they are preparing to turn.

3. Watch for oncoming traffic that may be preparing to turn left.

Always be prepared to stop suddenly or to take other evasive action.
Riding at night

Increase visibility by using lights and wearing reflective or light colored clothes.

- Every bicycle ridden between sunset and sunrise must (by law) have at least one white headlamp on the front with a light that is visible at least 500 feet.*
- At night, a bicycle must have a rear red reflector. On roads with speed limits of 35 mph or greater, one red taillight visible from 600 feet* to the rear is required. Rear lights are safer than reflectors.
- Taillights may be steady or blinking and may be attached to the bicycle or rider.
- Wear clothing made of reflective material. Yellow and lime green are somewhat visible. Red is NOT a good color for evening riding since it looks black in the fading light.

* 10-watt halogen, 1-watt LED minimum.

Commuting

- Commuting by bicycle or walking helps reduce pollution and is a great way to keep fit and increase stamina.

When bicycling:
- Always carry your identification and medical insurance information.
- Crash facts
- Most car and bike collisions occur when turning at intersections. Watch for cars turning both left and right at intersections and driveways.
- Fatal crashes peak in the evening, often with alcohol as a contributing factor. (National Highway Traffic Safety Administration).
- Especially when you are alone. Before deciding to commute by bicycle or on foot, consider how far you will be traveling, how much motor vehicle traffic will be traveling on the roads at the same time, and the terrain.
- Choose a route or streets that have less traffic or better accommodations for bicyclists - such as bike lanes, wider lanes, or shared-use paths - to make the ride or walk more pleasant. Carry a map or plan an alternate route in case you need to make a detour.
**Tips for commuting by bicycle**

- Dress safely - wear a helmet, wear bright colored clothing, and secure loose pants legs.
- Wear comfortable clothing and shoes that are intended for bicycling. They will make the ride more enjoyable and efficient.
- Ride defensively - anticipate the actions of other road users and watch for road hazards.
- Pass with care - turning vehicles may not see you.
- Maximize visibility at twilight and night - wear reflective clothing and apply reflective tape to your bicycle.
- Walk your bicycle when you get into traffic situations beyond your cycling abilities. Walk to the right of your bike for safety.
- Use caution around buses and large trucks. Watch for buses pulling to and from curbs and passengers getting on and off. Stay out of blind spots and give large vehicles plenty of room to maneuver.
- Park your bicycle so you do not block sidewalks, handicap and building accesses, or emergency drives.

Lock your bicycle - secure both wheels and the frame to a stationary object using a sturdy lock.

**Shared Use Paths** are provided for recreation. Bicycle commuters and fast-moving road bicyclists are not required to use these paths. If they do, use care when passing recreational bicyclists, walkers, and other users.

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**Be careful crossing railroad tracks**

Cross railroad tracks carefully.
Watch for uneven pavement and grooves that could catch a wheel. Stay in control of your bicycle. Rise up from your saddle and bend your arms and legs so your body acts like a shock absorber.
If the tracks cross the road at a sharp angle, change course to cross them at a right angle.

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**Tips for commuting on foot**

Walking, instead of driving a motor vehicle, improves the environment and personal health, and reduces traffic congestion. Consider walking, especially when the distance is less than a mile.

Wear comfortable shoes. Use a backpack or messenger bag so that your arms can swing free, allowing you to maintain better balance and increase the length of your stride.

If just beginning, start slowly and don’t test your limits. You will want to feel energized and exhilarated, not exhausted, when you arrive at your destination.
International Walk to School Day
Walk a child to school or participate in a Walk to School Day event in October. Walking benefits the physical and emotional health of children when they get more exercise, notice their environment, and socialize with parents and other children.
www.walktoschool.org
www.vcuhealth.org/virginiasafekids

Bike and walk for long-term benefits!
The long-term benefits of bicycling and walking include:
- Lower blood pressure
- Lower cholesterol
- Strengthened heart and cardiovascular system
- Increased bone density
- Increased hormone production that counteracts the effects of aging
- Increased endorphins that decrease stress, depression, and anxiety while increasing relaxation
- Loss or maintenance of weight
- Strengthened nervous system and reflexes
- Increased flexibility
- Reduced diabetes complications

America Walks
Advocacy for local, state, and national pedestrian issues
www.americawalks.org

Bicycle Helmet Safety Institute
A clearinghouse of bicycle helmet information serving consumers, parents, teachers, the media, and more
www.bhsi.org

BikeWalk Virginia
Resources for bicyclists and pedestrians
- www.bikewalkvirginia.org/resources/bicyclists.asp
- www.bikewalkvirginia.org/resources/peds.asp

City of Alexandria Local Motion
Active transportation resource in Northern Virginia
http://alexandriavta.gov/localmotion/

Effective Cycling

Federal Highway Administration
Resident’s Guide for Creating Safe and Walkable Communities
safety.fhwa.dot.gov/ped_bike/ped/ped_walkguide
Laws and Safety Tips
Laws and tips to make bicycling and walking safe and enjoyable on Virginia's highways
www.virginia.dot.org/bikeped

League of American Bicyclists
Promotes bicycling for fun, fitness, and transportation; certifies bicycling instructors; and advocates for bicycle-friendly communities, regions, and states
www.bikeleague.org

National Highway Traffic Safety Administration
Pedestrian safety program with publications, activities, information about National Safe Routes to School program and more
http://www.nhtsa.gov/people/injury/pedbimot/ped/

Pedestrian and Bicycle Information Center
Resources to increase viability of walking and bicycling as a means of transportation and physical activity
www.pdbikeinfo.org

Safe Routes to School
Program that assists interested localities, schools, and non-profit groups in making bicycling and walking to school safer and more appealing to children
www.saferoutesva.org

Street Smart
Public safety program of the District of Columbia, Maryland, and Virginia
www.mwcog.org/streetsmart

U.S. Department of Federal Highway Administration
Pedestrian Safety Resources
http://safety.fhwa.dot.gov/ped_bike/

Virginia Bicycling Federation
Volunteer organization working to promote bicycling; change public policy and community attitudes; and improve the safety, convenience, and acceptance of bicycling throughout Virginia
www.vabike.org

Virginia Department of Health
- Injury and Violence Prevention site with pedestrian and bicycle statistics, tips, and links to resources
  www.vahealth.org/civp
- Bike Smart Basics training provides bike safety certification to health and physical education teachers in collaboration with the Virginia Department of Education
  www.vahealth.org/civp/bike/schools.asp

Virginia Department of Transportation
Bicycle and Pedestrian Program, including VDOT's Safe Routes to School Program
Virginia Department of Motor Vehicles

- Virginia Driver’s Manual

- Virginia Highway Safety

Virginia Maps

- Bicycling In Virginia
  www.virginia.dot.org/bikeped

- Birding and Wildlife Trails
  www.virginia.gov/site/features.asp?FeatureID=213

Washington Area Bicyclist Association
The Commonwealth of Virginia’s largest metropolitan area bicycling group’s Web site offers many resources
www.waba.org
Sharing the Road in Virginia:
Laws and Safety Tips for Bicyclists and Pedestrians

plus, What Motorists Need to Know

Technical Advisory Committee
Heather Funkhouser Board, Virginia Department of Health
Kimberly Burt, Virginia Department of Motor Vehicles
Rebecca Crowe, Federal Highway Administration
Jakob Helmboldt, Virginia Department of Transportation
Rod Hyner, Virginia Department of Health
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Debbie Spiliotopoulos, Northern Virginia Regional Commission
Stephanie Smith, BikeWalk Virginia
Allen Turnbull, Citizen Advocate
Jennifer Wampler, Department of Conservation and Recreation
Sarah Welsig, Virginia Department of Transportation
Vanessa Wigand, Virginia Department of Education

December 2009
## Cost Analysis

<table>
<thead>
<tr>
<th>Strategy Type</th>
<th>Strategy Detail</th>
<th>Time Frame</th>
<th>Cost</th>
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<td>Distribute educational materials</td>
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<td>Walking school buses</td>
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<td>Signage and road markings</td>
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<td>Parent survey</td>
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<td>Evaluation</td>
<td>Student participation in Events</td>
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**TOTAL**                                                                                       **$1,135,340**
Funding

Federal Safe Routes to School Program

Federal Highway Administration
- Headquarters
- Divisions

National Center for Safe Routes to School
- Federally funded clearinghouse, providing centralized resources and technical support for local and state Safe Routes to School programs.

State Departments of Transportation
- Full-time State Coordinators responsible for developing state Safe Routes to School programs and dispersing federal funds to local programs.

Local Safe Routes to School Programs

Safe Routes to School National Partnership
- Non-profit organization advocating, lobbying and providing technical assistance for safe walking and bicycling to and from schools, and in daily life.

State and Regional Network Project
- Changing state level policies, including complete streets and school siting, in 20 states and focusing on serving low-income communities and reducing crime through Safe Routes to School. In addition, affecting regional decisions in Southern California, Atlanta and the Washington, DC area.

Legend:
- ADVOCACY / POLICY CHANGE
- FUNDING
- LOCAL WISDOM
- TECHNICAL ASSISTANCE