SAFE ROUTES TO SCHOOL

Strategic Action Plan

MARION, NORTH CAROLINA













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1 INTRODUCTION



Chapter Outline:

1.0 Background 1.1 School Descriptions 1.2 Planning Process 1.3 Vision and Goals
1.4 SRTS Action Plan Framework

1.0 BACKGROUND

The City of Marion Safe Routes to School Action Plan is a planning document prepared by committed citizens, parents, school administrators, and local government officials that recognizes goals and visions for enhancing opportunities for active travel to school, and outlines ways to turn those opportunities into realities. The Action Plan is the best first step in a successful Safe Routes to School program. This Action Plan addresses five schools in total: East McDowell Junior High School, Marion Elementary, West McDowell Junior High School, Phoenix Academy, and Eastfield Elementary. The planning process served as an excellent tool for engaging schools and preparing them to make significant changes in their travel environments.

Many adults today walked or bicycled to school when they were young. But few of today's children enjoy that trip. There are a number of reasons for the decline in active travel to school, from land use policies and school consolidation, to fears about traffic safety and lack of infrastructure for non-motorized transportation. As a result, more parents are driving their children to school, morning traffic congestion is getting worse, and children are getting less exercise. Childhood obesity and diabetes rates are at all-time highs. Committed citizens in North Carolina can change this cycle, just as those in other communities across the country have done.

Safe Routes to School began as a safety initiative in Odense, Denmark about 30 years ago. The community was experiencing a high rate of crashes, including fatalities, involving children on their way to and from school. To resolve the problem, the town brought together a diverse group of citizens, transportation professionals, and local government representatives who developed and implemented a variety of infrastructure improvements and educational and awareness programs. They achieved dramatic results, with 29 percent fewer crashes involving students and a 58 percent reduction in the overall number of crashes involving pedestrians and cyclists. Because of the community's educational program highlighting the benefits of bicycle helmets, their use increased significantly and injuries declined[1].

Clearly, Safe Routes to School helps not only school children, but also the community as a whole. Other European cities took note and began their own programs, followed in short order by cities in New Zealand, Australia, and Canada, then the United States in the 1990s. The Bronx is credited with the United States' first Safe Routes to School program[1]. Successful federal pilot programs in California and Florida have demonstrated how educational and encouragement programs can help get more children safely walking and bicycling to school, and have paved the way for a national Safe Routes to School program.

The primary goals of the Safe Routes to School Program are to:

1) Enable and encourage children, including those with disabilities, to walk and bicycle to school;

2) Make bicycling and walking to school a safer and more appealing transportation option, thereby encouraging a healthy and active lifestyle from an early age and;

3) Facilitate the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of schools[2].

The Federal Safe Routes to School Program[2]

The Federal Safe Routes to School Program was established in the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). It is a federally-funded reimbursement program providing communities with the opportunity to improve conditions for bicycling and walking to school. Section 1404 of SAFETEA-LU mandates that the North Carolina Department of Transportation (NCDOT) administer this program within the state, providing financial assistance to state, local, and regional agencies, and non-profit organizations that demonstrate an ability to meet the requirements of the program. The program provides funds for infrastructure improvements and non-infrastructure educational and encouragement activities for schools serving grades K-8. Infrastructure improvements must occur within a two-mile radius of the school[2]. This distance is considered reasonable for a child to bicycle to and from school each day.

The NC Safe Routes to School Program

The North Carolina Department of Transportation's Division of Bicycle and Pedestrian Transportation has a long history of promoting active travel to and around schools. The Division continues to work with numerous communities across the state to develop pedestrian and bicycle plans, which is often the first step in improving non-motorized transportation infrastructure within a municipality. The Division provides a number of other services, including safety education, bicycle use training, crossing guard training, and helmet promotions throughout the state, as well as design support to other NCDOT units.

The NCDOT first identified safe travel to school as a safety priority in 2000. In 2005, it established the North Carolina Safe Routes to School (SRTS) Program to coordinate with the federal program. It works with schools, local governments and agencies, advocacy and non-profit organizations, and public health professionals at a grassroots level to identify improvements that can help make bicycling and walking to and from school a safe and healthy transportation alternative.

While infrastructure improvement is a key recommendation, education and encouragement programs are also critical to change a community's habit of driving children to school. Parents are persuaded by the actions of others. If other children in their neighborhood are walking or bicycling, they are more likely to let their children do so as well.

> "Motor vehicle crashes are the leading cause of death for children from 2 to 14 years old." (Source: National Highway Traffic Safety Administration[3])

Why Safe Routes to School Matters

Nationally, fewer than 15 percent of children walk or bicycle to school. Nearly half of all school-aged children are driven to school[4] by their parents. This contrasts sharply with the statistical picture of 40 years ago. In 1969, 42 percent of all school-aged children walked or bicycled[5] to school. In fact, almost 90 percent of kids living within one mile of their school walked or bicycled. Now, less than half of school children living within a mile of school walk or bicycle. This decline in active travel coincides with a three-fold rise in childhood obesity and an alarming increase in adult onset diabetes - among children. A 2008 analysis by the U.S. Centers for Disease Control and Prevention shows that the South has the worst record of any U.S. region in active travel to school, with only 36 percent of children living within a mile of school walking or bicycling at least one day each week[6]. Only about half of North Carolina's school children are getting the recommended amount of physical activity, at least one hour most days, preferably everyday[7].

In addition to health concerns, the increase in the number of children being driven to school by their parents directly affects traffic congestion. Studies by the National Highway Traffic Safety Administration (NHTSA) show that school–related traffic accounts for 20 to 25% of all morning peak hour traffic[5]. By reducing the number of parents driving children to school, we can relieve morning peak hour delays and congestion. Reducing congestion around a school will improve the air quality. Although pollutants from

congestion do not cause asthma, it can be a factor in triggering attacks. A study performed in Atlanta, Georgia during the 1996 Summer Olympics showed a direct link between asthma and air quality. During the 17 days of the games, the City increased public transportation and limited the use of private vehicles in the downtown area, reducing morning traffic by 23% and peak ozone amounts by 28%. During this same time, there was a 42% decrease in asthma related hospitalizations, emergency room visits, and urgent care visits when compared to the 4 weeks before and after the Summer Games[8]. Asthma accounts for over 14 million missed school days each year (approximately 4 days per year per student with asthma)[9]. Therefore, improving the air quality around schools can improve student attendance rates.

Overall, there are several significant benefits to providing exercise for children: weight control, healthy bones, and fighting disease. Additionally, children who exercise regularly tend to sleep better at night and feel more rested for school. Starting good habits at an early age benefit a lifetime.

Research has shown that the most successful way to increase bicycling and walking is through a comprehensive approach that includes the "5 E's": education, encouragement, engineering, enforcement, and evaluation. Local SRTS programs can address these topics by following a comprehensive strategy that focuses on infrastructure improvements where the physical environment is not conducive to walking or bicycling, and promoting non-infrastructure programs, including education, encouragement and enforcement strategies.

1.1 SCHOOL DESCRIPTIONS

East McDowell Junior High School serves grades 7-9 and is located east of the Marion downtown core. It adjoins residential neighborhoods. It serves 633 children of which a substantial amount of children walk to school. Some numbers in the table below are estimates.

East McDowell Junior High School

Table 1.1 East McDowell Junior High School Enrollment Data and School Characteristics

Grades Serviced	7-9
Total Enrollment (2009)	633
Number of Students Living Within 2 Miles	220
Percent of Students Living Within 2 Miles	35%
Number of Buses	10
Number of Students Riding Buses	200 (32%)
Number of Students Walking	200 (32%)
Number of Students Bicycling	Unknown (likely just a few)
Number of Students Driven to School	233 (37%)
Special Needs Population	Unknown
Land Uses Surrounding School	Residential
"No transport" or "walk" zones	No
Crossing Guards	Yes, officer in front of school on State St.
Policies that Restrict Walking or Bicycling	No
Existing Safety Patrol Program	No
Pedestrian Safety Taught to Students	No
Bicycle Safety Taught to Students	No

Data provided by School Principal and School District.

Marion Elementary serves preK-6 grades and is located in a residential neighborhood, just north of the Downtown core. It serves 409 children of which only a few children walk and bicycle to school.

Table 1.2 Marion Elementary Enrollment Data and School Characteristics	
Grades Serviced	preK-6
Total Enrollment (2009)	409
Number of Students Living Within 2 Miles	Unknown
Percent of Students Living Within 2 Miles	Unknown
Number of Buses	2, double-loaded
Number of Students Riding Buses	150 (37%)
Number of Students Walking	10 (2%)
Number of Students Bicycling	2 (0.4%)
Number of Students Driven to School	247 (60%)
Special Needs Population	35
Land Uses Surrounding School	Residential
"No transport" or "walk" zones	No
Crossing Guards	No
Policies that Restrict Walking or Bicycling	No
Existing Safety Patrol Program	Yes
Pedestrian Safety Taught to Students	No
Bicycle Safety Taught to Students	No

Data provided by School Principal and School District.

West McDowell Junior High School serves grades 7-9 and is located on the northwest side of Marion. It is not immediately surrounded by any significant density of residential areas. It is nearby commercial areas on US 70. It serves 770 children of which none walk or bicycle to school.

Table 1.3 West McDowell Junior High School Enrollment Data and School Characteristics	
Grades Serviced	7-9
Total Enrollment (2009)	770
Number of Students Living Within 2 Miles	Less than 50
Percent of Students Living Within 2 Miles	Less than 6.5%
Number of Buses	20
Number of Students Riding Buses	385 (50%)
Number of Students Walking	0 (0%)
Number of Students Bicycling	0 (0%)
Number of Students Driven to School	385 (50%)
Special Needs Population	50
Land Uses Surrounding School	Commercial; forest
"No transport" or "walk" zones	Yes
Crossing Guards	Yes, one for walking 9th graders to high school for driver's education
Policies that Restrict Walking or Bicycling	No
Existing Safety Patrol Program	Unknown
Pedestrian Safety Taught to Students	No
Bicycle Safety Taught to Students	No

Data provided by School Principal and School District.

Phoenix Academy serves grades K-12 and is located on the west side of Marion. It is surrounded mostly by rural, low-density residential. It serves 140 children of which only a few walk to school.

Table 1.4 Phoenix Academy Enrollment Data and School Characteristics	
Grades Serviced	K-12
Total Enrollment (2009)	140
Number of Students Living Within 2 Miles	Unknown
Percent of Students Living Within 2 Miles	Unknown
Number of Buses	1
Number of Students Riding Buses	30 (21%)
Number of Students Walking	5-7 (5%)
Number of Students Bicycling	0 (0%)
Number of Students Driven to School	103 (74%)
Special Needs Population	45
Land Uses Surrounding School	Rural residential
"No transport" or "walk" zones	No
Crossing Guards	No
Policies that Restrict Walking or Bicycling	No
Existing Safety Patrol Program	No
Pedestrian Safety Taught to Students	No
Bicycle Safety Taught to Students	Yes

Data provided by School Principal and School District.

Eastfield Elementary serves grades K-6 and is located east of the Marion Downtown core. It adjoins residential neighborhoods. It serves 340 children of which only a few walk or bicycle to school.

Table 1.5 Eastfield Elementary Enrollment Data and School Characteristics	
Grades Serviced	K – 6
Total Enrollment (2009)	340
Number of Students Living Within 2 Miles	Unknown
Percent of Students Living Within 2 Miles	Unknown
Number of Buses	2, double loads
Number of Students Riding Buses	75 (22%)
Number of Students Walking	12 (3.5%)
Number of Students Bicycling	3 (varies) (0.1%)
Number of Students Driven to School	250 (74%)
Special Needs Population	Unknown
Land Uses Surrounding School	Residential
"No transport" or "walk" zones	No
Crossing Guards	No
Policies that Restrict Walking or Bicycling	No
Existing Safety Patrol Program	No
Pedestrian Safety Taught to Students	No
Bicycle Safety Taught to Students	No

Data provided by School Principal and School District.

1.2 PLANNING PROCESS

This planning process began with a 'kick-off' meeting in February 2010, which included a visioning and goals exercise and map working session with the project staff, SRTS Advisory Committee, and consultants. This meeting was followed by comprehensive fieldwork and a public workshop that sought input from residents, including parents, teachers, principals, children, and City staff. This input and analysis led to the development of a draft plan that consisted of an analysis of existing conditions, and recommendations in the areas of engineering, education, encouragement, enforcement, and evaluation. The plan communicates the current conditions for walking and bicycling around the five schools, recommends improvements, and outlines strategies to carry out those recommendations. The SRTS Advisory Committee, City staff, and NCDOT met with the Consultants for a draft plan review in which comments were provided.

The final plan is an action-oriented document that will guide the City of Marion and the five schools in making it safer to walk and bicycle to school and to encourage more children and families to walk and bicycle to school.

1.3 VISION AND GOALS

The following five-year vision and goal statements were developed out of the City's original SRTS planning grant application, previous SRTS workshops, and from SRTS Advisory Committee members and the general public during the planning process. These statements guided the development of this Plan:

• Create safer walking and bicycling environments where walking and riding are the "norm" rather than the exception.

• Develop a comprehensive bicycle and pedestrian system for the entire City of Marion.

• Identify priority implementation of infrastructure and non-infrastructure improvements.

• Build more sidewalks, curbs, trails, and safer crossings of roadways for pedestrians.

• Consider traffic calming as short-term solutions where right-of-way and topography create a constraint to sidewalk construction.

• Provide greater connectivity between neighborhoods and schools.

• Educate parents and children about safety and proper rules of the road for pedestrians.

• Increase parental involvement in such programs as walking school buses.

• Increase physical activity for children.

• Seek funding for engineering improvements and for programs such as helmet giveaways for lower-income populations.

• Provide McDowell County School System with the tools, programs, and activities needed to assure parents, students, and the community that walking and bicycling to school is a safe and healthy transportation alternative.

• Reduce mileage that school buses travel and stops buses make in order to save money and pollute less.

• Provide consistent, ancillary pedestrian safety measures such as clear signage, lighting, safe bus waiting sites, animal control, and bicycle racks.

• Designate appropriate safe routes of travel to school.

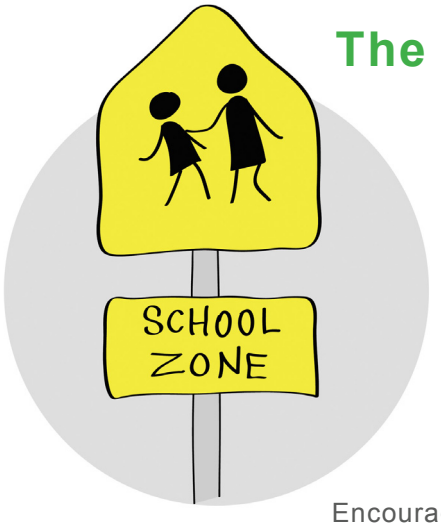
• Enforce traffic laws and slow down traffic.

• Implement parent/advocacy group or PTO subcommittee to champion and continue the efforts of this plan after adopted (Don't let this effort and program fall aside after the Plan has been developed).

1.4 SRTS ACTION PLAN FRAMEWORK

The Marion SRTS Action Plan was developed with a comprehensive, framework approach addressing all 5 E's of the SRTS program (engineering, education, encouragement, enforcement, and evaluation). Recommendations are developed for all 5 E's. They are talked about more in-depth on the following page.

The 5 E's of Safe Routes to School



ENGINEERING

Engineering strategies can enable more bicycling and walking and also make these activities safer. Engineering can include: improving & installing sidewalks, cross-walks, signage, traffic signals and more.

ENCOURAGEMENT

Encouragement strategies are about having fun — they can provide ways for parents and children to discover that walking and bicy-cling are do-able and a lot of fun! Special events and contests can get kids excited to be a part of SRTS!





EDUCATION

Education activities teach pedestrian, bicycle and traffic safety, as well as create awareness of the benefits and goals of SRTS. Lessons can be incorporated into classroom activities or special events to teach skills. Also, parents, teachers, drivers and neighbors can all be a potential audience for SRTS's messages.

ENFORCEMENT

Enforcement through the SRTS program should involve a network of community members working together to ensure safe walking, bicycling and driving. It helps deter unsafe behaviors of drivers, pedestrians and bicyclists.





EVALUATION

Evaluation is about identifying issues, improving activities and understanding results. It is an important component of any SRTS program because it is used to determine if the goals of the strategies are being met and to assure that successful efforts are being recognized.

Footnotes

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2 EXISTING CONDITIONS



Chapter Outline:

2.0 Introduction 2.1 City of Marion Overview 2.2 East McDowell Junior High Overview 2.3 Marion Elementary Overview 2.4 West McDowell Junior High Overview 2.5 Phoenix Academy Overview 2.6 Eastfield Elementary Overview

2.0 INTRODUCTION

Defining the existing conditions of the study area is a critical element of the SRTS Action Plan. It documents the physical conditions of the study area, participant perceptions and the social norms within the individual school that ultimately delineate the issues the Action Plan must mitigate. The existing conditions are documented through a series of data collection processes that interface both the engineering and planning aspects of the SRTS Program. By combining the identification of infrastructure barriers and deficiencies in the non-vehicular transportation system with the identification of the regulations, policies and social patterns of the school's adjacent community, a complete profile can be assembled that fully defines the unique challenges of each individual school's community as well as the goals of its Action Plan.

A comprehensive, multi-faceted approach was taken to examine existing conditions including the collection of data from parent surveys and student travel tallies, site work and field interviews, and area mapping. A thorough inventory of existing conditions is assembled to provide a baseline by which to measure the results and outcomes of the SRTS Program at the community, school and street levels. The following resources were used to develop the baseline profiles of the existing conditions at five schools: East McDowell Junior High School, Marion Elementary, West McDowell Junior High School, Phoenix Academy, and Eastfield Elementary.

Student Tallies collected within the classrooms identify student travel norms, a profile of the school's travel environment and the number of children using each mode of transportation.

Parent Surveys distributed by the schools identify parental perceptions of the walkability and/or bikeability of his/her child's route to school. These surveys were a key component in the identification of relevant influences in family transportation choices to/from the school.

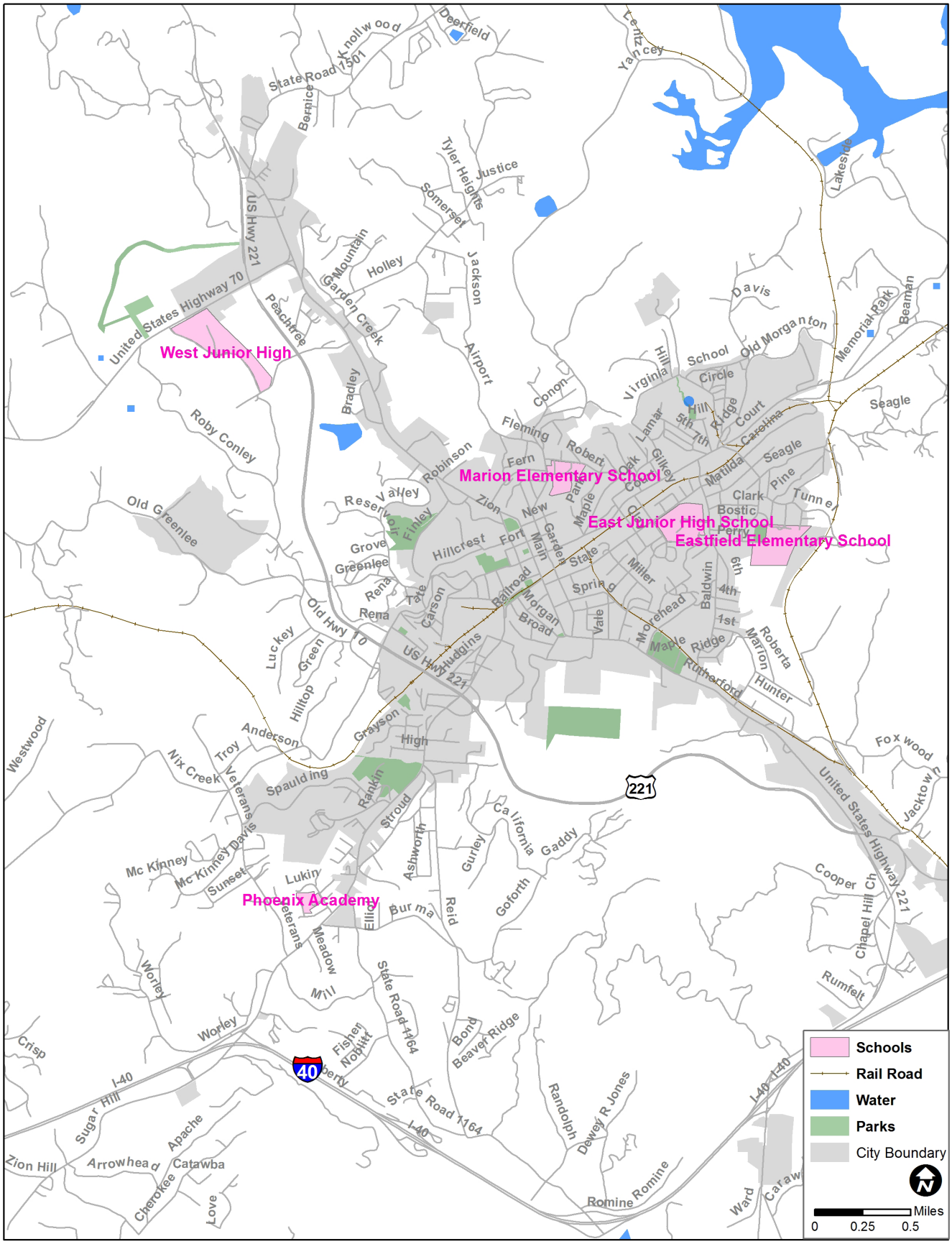
Field Assessments were used to evaluate the supporting infrastructure and user behaviors through on-site data collection and mapping of existing conditions. During their on-site assessments, the consultants logged the important features of both the physical and behavioral components of the pedestrian environment within the school zone and spoke with crossing guards, police officers, municipal planners, teachers, administrators, and agency officials.

Existing Data Sources were tapped to expose all relevant points-of-interest to the Action Plan such as roadways and intersections with pedestrian and bicycle statistics including, but not limited to, significant crash histories as well as future State and municipal capital improvement projects that may impact the school's pedestrian routing plan. Geographic Information Systems (GIS) data was critical to analyze bicycle and pedestrian facilities and gaps.

2.1 CITY OF MARION OVERVIEW

The City of Marion is a small, densely populated mountainous community. It is not bicycle-friendly but exhibits some qualities of a pedestrian-friendly community in places with a significant sidewalk system and crossing features especially around the core of downtown. Citywide pedestrian connectivity and local, school area improvements are needed to make Marion a more walkable community. Map 2.1 shows an overview of the five schools in the City.

Map 2.1 School Service Boundary Map



2.2 EAST MCDOWELL JUNIOR HIGH SCHOOL OVERVIEW

East McDowell Junior High School exhibits some walkable features but is generally lacking complete, safe pedestrian accommodations and treatments around its perimeter and on adjacent roadways. Still, dozens of students walk to and from school each day, making it the most "walked to" school in this study.

East McDowell Junior High School is flanked by State Street and Baldwin Street, two significant two-lane arterials through Marion.

East McDowell Junior High School Student Tallies

The National Center for Safe Routes to School provides a Student Arrival and Departure Tally to help measure the modes of transportation utilized by the students and how the SRTS Program will affect vehicular trip generation for the school. This tally may be taken annually and is a measure of the overall success of the program.

The following tables (Tables 2.1 and 2.2) show the results of tallies collected in Fall 2007 and Spring 2010 breaking down the non-motorized traffic by mode of transportation and by origin relative to school location.



It is commonplace to see many students walking home from school from East McDowell Junior High School (above on State Street in front of school).

Table 2.1: Travel Norms for East McDowell Junior High School (estimates from school leaders)

East McDowell Junior High School Travel Norms	
Transportation Mode	**Number of Students**
Driven by Parents	233
Transported by Bus	200
Walked	200
Bicycled	Only a few

Table 2.2: Percentage of Students Walking and Bicycling by Distance (from SRTS student tallies)

Pedestrian and Bicycle Breakout by Locality and Transportation Mode		
Distance to School	**Walk**	**Bicycle**
Less than 1/4 mile	9%	0%
Between 1/4 and 1/2 mile	3%	0%
Greater than 1 mile	4%	0%

East McDowell Junior High School Parent Surveys

The Parent Survey, provided by The National Center for Safe Routes to School, polls parents to determine the key factors affecting parents' decisions to allow or disallow children to walk or bicycle to area schools. These surveys also help identify the presence of safety-related conditions and provide basic background information for demographic correlation and analysis. Both the Parent Survey and Student Tally forms should be conducted at least annually to track changes and determine the success of the SRTS program.

The following information in Tables 2.3 and 2.4 was compiled from East McDowell Junior High School Parent Surveys in Fall 2007 and highlights the perceptions of parents who do not allow their children to walk or bike to school, and the improvements necessary to elicit their participation in the SRTS program.



A lack of facilities, including those at crossings, was one of the many parental concerns for allowing their children to walk or bicycle to school. Above is the railroad crossing at Baldwin Avenue.

Table 2.3: Top Five Concerns for Parents Under Existing Conditions

Top Five Concerns of Parents
1. Distance
2. Violence or Crime
3. Weather or Climate
4. Traffic speed along route of travel
5. Traffic volume along route

For complete results, see Appendix A.

Table 2.4: Top Five Improvements Specified as Prerequisite by Parents for Participation

Top Five Improvements	
1. Distance	27.1%
2 Weather or Climate	20.0%
3. Sidewalks or pathways added/improved	18.6%
4. Safety of intersections and crossings	17.1%
5. Traffic speed along route of travel reduced	17.1%

For complete results, see Appendix A.

East McDowell Junior High School Field Assessment And Maps

Fieldwork conducted in the winter and spring included a thorough on-site assessment of existing infrastructure within the school zone and an evaluation of both traffic and behavioral patterns exhibited by roadway users during drop-off and pick-up. The field assessment broadly analyzes school traffic patterns, characteristics of the transportation network users, and the existing infrastructure strengths and weaknesses within the school zone. The following pages highlight the data collected pertaining to the strengths and weaknesses of the existing pedestrian environment for East McDowell Junior High School. A photographic inventory, infrastructure survey and site mapping are included.

Existing pedestrian infrastructure and school zones (campus area) are shown on Map 2.2, and the school within the neighborhood context and school zones are shown in Map 2.3, at the end of this chapter.

Behavioral Components of Vehicular and Pedestrian Traffic Patterns

The majority of students bicycling or walking to school do so without parental supervision. A couple hundred pedestrians and one bicyclist come to and leave the front of the school each day (State Street main entrance). Significant numbers of students were seen walking both ways on State Street and across State Street. There are no official crossing guards in the area but a police officer directs traffic and stops traffic for pedestrians before and after school on State Street. Additional information describing the travel norms for East McDowell Junior High School is listed below:

• Motorist's behavior was observed as "fair," adhering to pedestrian courtesies as appropriate on campus and as "fair" along State Street. The officer directing traffic on State Street was forced to yell at high speed traffic.

• Student pedestrian and bicyclist behavior was generally safe around the school. Students made use of the existing sidewalks on the south side of State Street. Most students crossed State Street at the McDowell/State Street intersection crosswalk or with officer assistance at the crossing in front of the school. However, some were seen crossing State Street inappropriately at locations other than crosswalks.

• Automobile traffic was generally slow and respectful of pedestrians and designated traffic patterns with the exception of some speeding thru-traffic.

• Motorists drop their children off and pick them up at the Baldwin Avenue rear entrance. A number of automobiles park along State Street in both directions to pick up some the students.

• Crime was not a significant issue of concern based on field analysis but was perceived as an issue by parents (See Table 2.3). The officer directing traffic noted that there is some drug use within the vicinity of the school. He also noted the location of a men's shelter (for men with crime/societal problems) located on State Street, just east of the school. This caused some potential safety concern and certain perceived safety concern.





Above: Students waiting at McDowell/State stoplight for pedestrian signal. Students generally used the pedestrian crossing treatments and devices properly. Below, students wait until the officer directs them (at pedestrian crossing on State Street).

Existing Infrastructure - Strengths

There are pedestrian facilities in and around East McDowell Junior High School, providing a great starting point for further improvements. The following observations were noted as existing system strengths.

• There are a number of sidewalks suitable for pedestrian traffic within the East McDowell School vicinity (not all ADA compliant).

• Some nearby intersections/crossings are equipped with pedestrian treatments ranging from marked crosswalks to countdown pedestrian signal heads.

• The Peavine Rail-Trail is approximately 1/3 mile southwest of the school and is currently being used and is maintained as a foot trail. The City plans to pave the trail providing a tremendous connection through the City and close to the school.



The location of the future Rail-Trail at the Baldwin Avenue crossing. The City plans to pave this off-road facility from Baldwin Avenue to State Street.

Existing Infrastructure - Deficiencies

Despite the strengths of the existing system, there are several issues related to infrastructure that warrant improvement, create safety hazards and prevent children from walking and cycling to school. Key weaknesses, barriers, and obstacles were noted as follows:

• There are significant gaps in sidewalk connectivity along routes joining target neighborhoods to the school's campus. Table 2.5 summarizes key locations where insufficient walkways or system breaks in sidewalk continuity create barriers to pedestrians.

• There are multiple roadways that pose safety barriers for school-age bicyclists and pedestrians. Traffic is significant and right-of-way limited for walking along the primary roadway system within the school zone most notably upon Baldwin Avenue, State Street, and Court Street.

• Pedestrian crossings were either lacking or needed improvement in all cases. Crosswalks were lacking or were not highly visible in most cases. Curb ramps were also missing at some locations.

• There were no bicycle racks on campus. One bicyclists resorts to locking his/her bicycle to a fence surrounding campus.



There are no bicycle racks on campus. A student has locked their bicycle to a fence, which is inconvenient to the school entrance.

• The number of driveways and their wide crossing distance was a common issue, especially along State Street, just east of campus and along Court Street. A driveway access management improvement is needed.



Pedestrians are left without a defined and safe space along State Street, just east of campus. The driveway excess creates a dangerous situation for pedestrians.

• The roadways within the school area that did not feature sidewalk exhibit numerous constraints for sidewalk construction due to topography, drainage, and right-of-way issues.

Key Crossing Issues

Baldwin Avenue/State Street
• Skewed Intersection.
• Common crossing point.
• Sidewalks lacking.
• Crosswalks lacking.
• Wide turning radius for cars turning right off Baldwin Avenue on to State.



Baldwin Avenue and State Street are stop controlled and lack pedestrian treatments. The wide turning radii shown above is hazardous because motorists do not slow as much around the curve and a pedestrian has a longer crossing distance.

Baldwin Avenue/6th Street
• Crosswalks lacking.
• Wide crossing distance for pedestrians along Baldwin Avenue, crossing 6th Street.

Baldwin Avenue/Court Street
• Sidewalks, crosswalks, and pedestrian signalization lacking.
• Popular crossing point for pedestrians with convenience store and residential neighborhoods on north side of Court Street.



While Baldwin Avenue features sidewalk here, the Baldwin/6th Street crossing is hazardous for pedestrians. There is no defined crosswalk space and the crossing distance is long.

Baldwin Avenue/Railroad
• Sidewalks lacking.
• No formal, pedestrian crossing provided across at-grade railroad crossing.

State Street/Clay Street
• State Street sidewalk changes side of road at Clay Street.
• No marked crosswalks or curb ramps present.

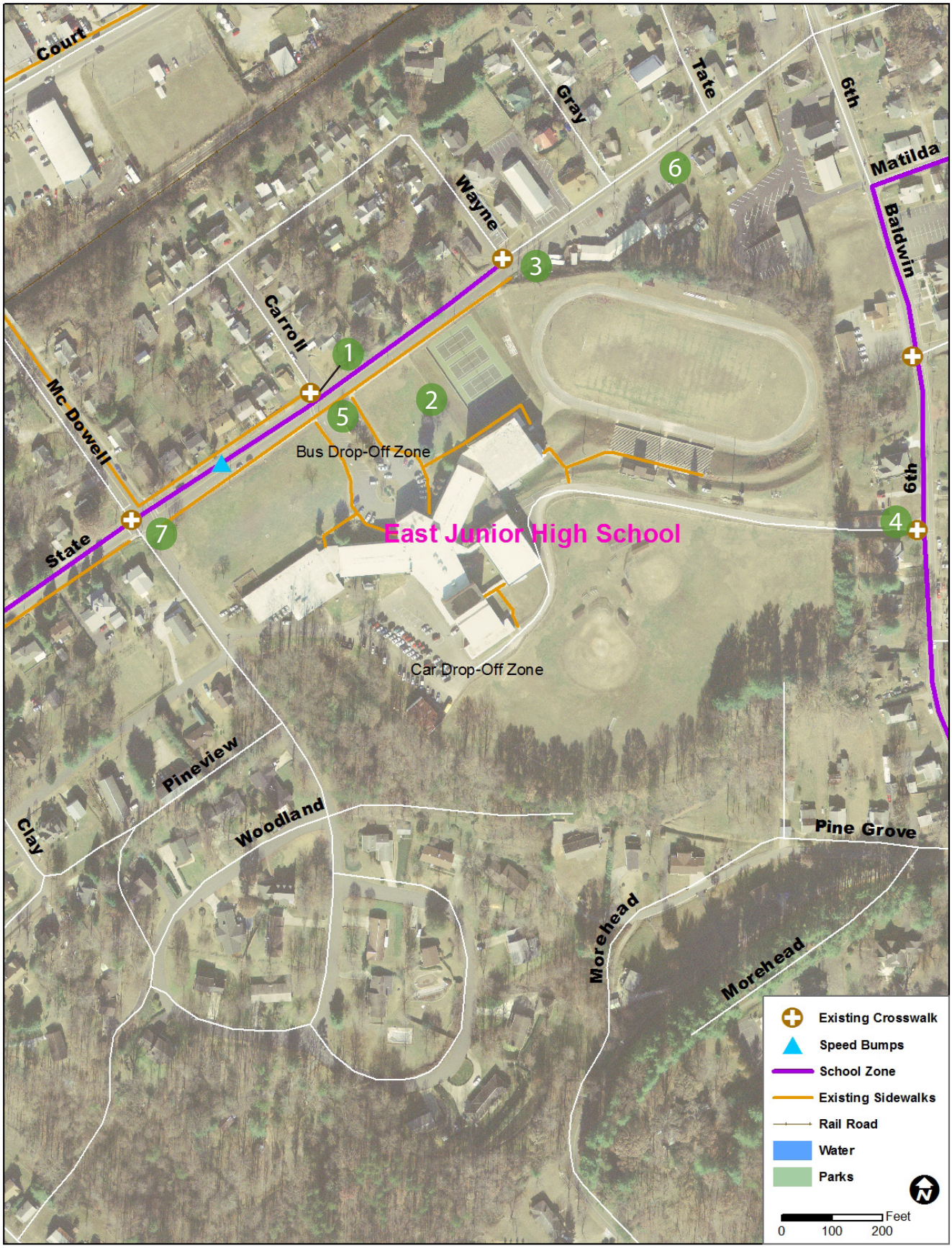
State Street/McDowell Street
• Good pedestrian crossing treatments with countdown signals and curb ramps.
• Marked crosswalks are existing, but are low-visibility and in fair condition.

Court Street/7th, Branch, and Church Street
• Three roadways enter Court Street at nearly the same location.
• Sidewalks and crosswalks lacking. Existing sidewalk is found on the north side of Court Street from Baldwin Avenue to Branch Street.

Table 2.5: Insufficient Walkways

Key Sidewalk Gaps		
Roadway	**Orientation**	**Gap Description**
Baldwin Avenue	East side	From just south of Perry St. to Court Street
State Street	South side	From Ann Street to Baldwin Avenue
Baldwin Avenue	East side	From Hunt Street halfway to 6th Street

Map 2.2 East McDowell Campus Map





The officer assists a student in crossing State Street from East Junior High School.



A bicycle is parked and locked to fencing around campus. Currently, there are no bicycle racks.



Sidewalk ends on State Street, heading east from campus.



Car pickup and drop-off entrance from Baldwin Avenue to East Junior High School. There is no separated space for pedestrians.



Faded, low-visibility marked crosswalk across the State Street entrance and exit of the school.

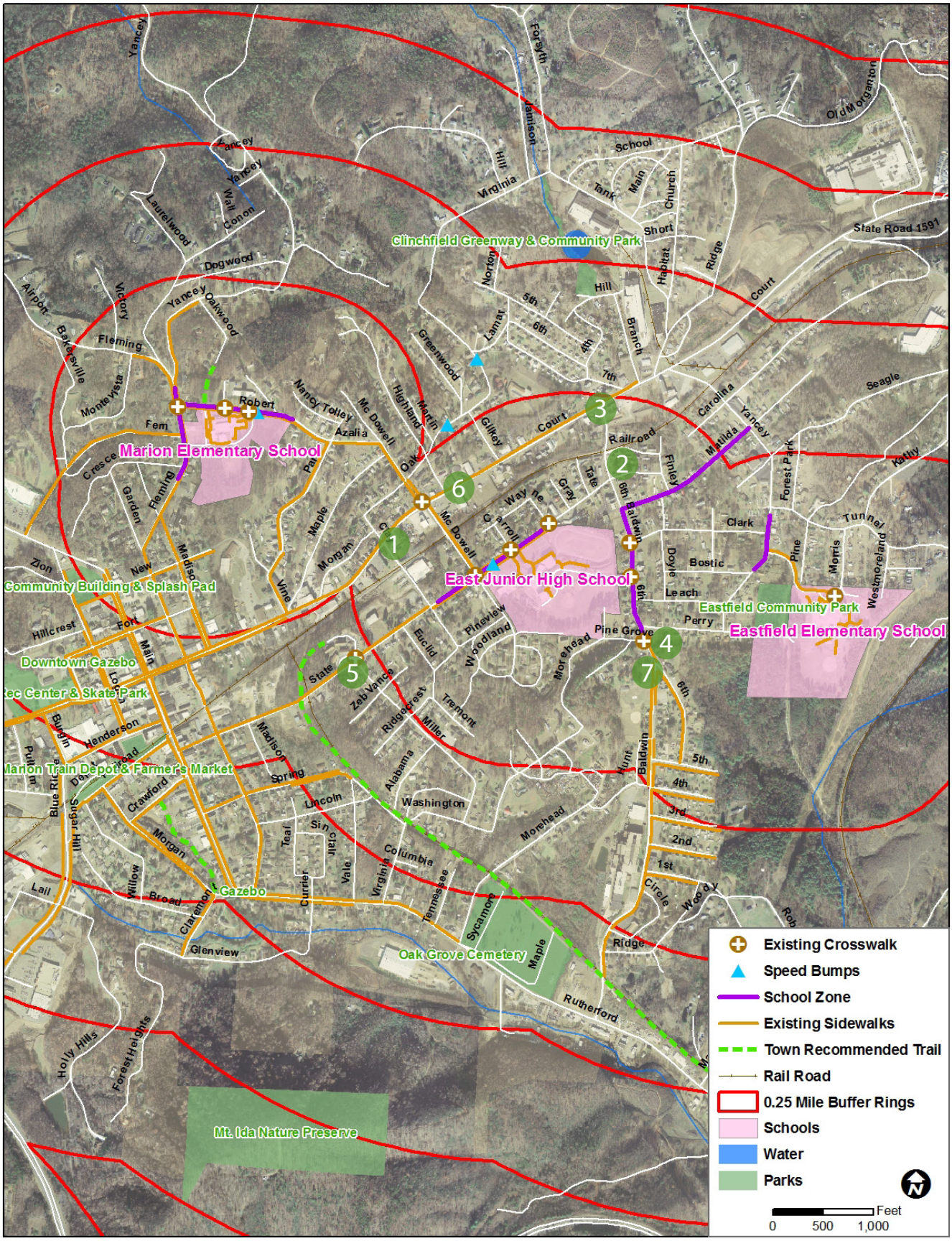


Excess driveways, lack of sidewalks, and a mens recovery shelter along State Street make walking less appealing for students.



The intersection of State Street and McDowell Avenue features countdown signals, marked crosswalks, and curb ramps.

Map 2.3 East McDowell Junior High School Vicinity Map





Existing sidewalk switches from the south side to the north side along State Street at the Clay Street intersection. There are no marked crosswalks or curb cuts designating this crossing.



Driveway excess along east side of Baldwin Avenue, near Railroad Street.



Baldwin Avenue and Court Street features no pedestrian accommodations. Sidewalks and crossing facilities are lacking for students who commonly walk to convenient stores and across Court Street.



Gap in existing sidewalk along east side of Baldwin Avenue, near Pine Grove crossing.



Low-visibility crosswalk is barely visible crossing State Street at Miller Street.

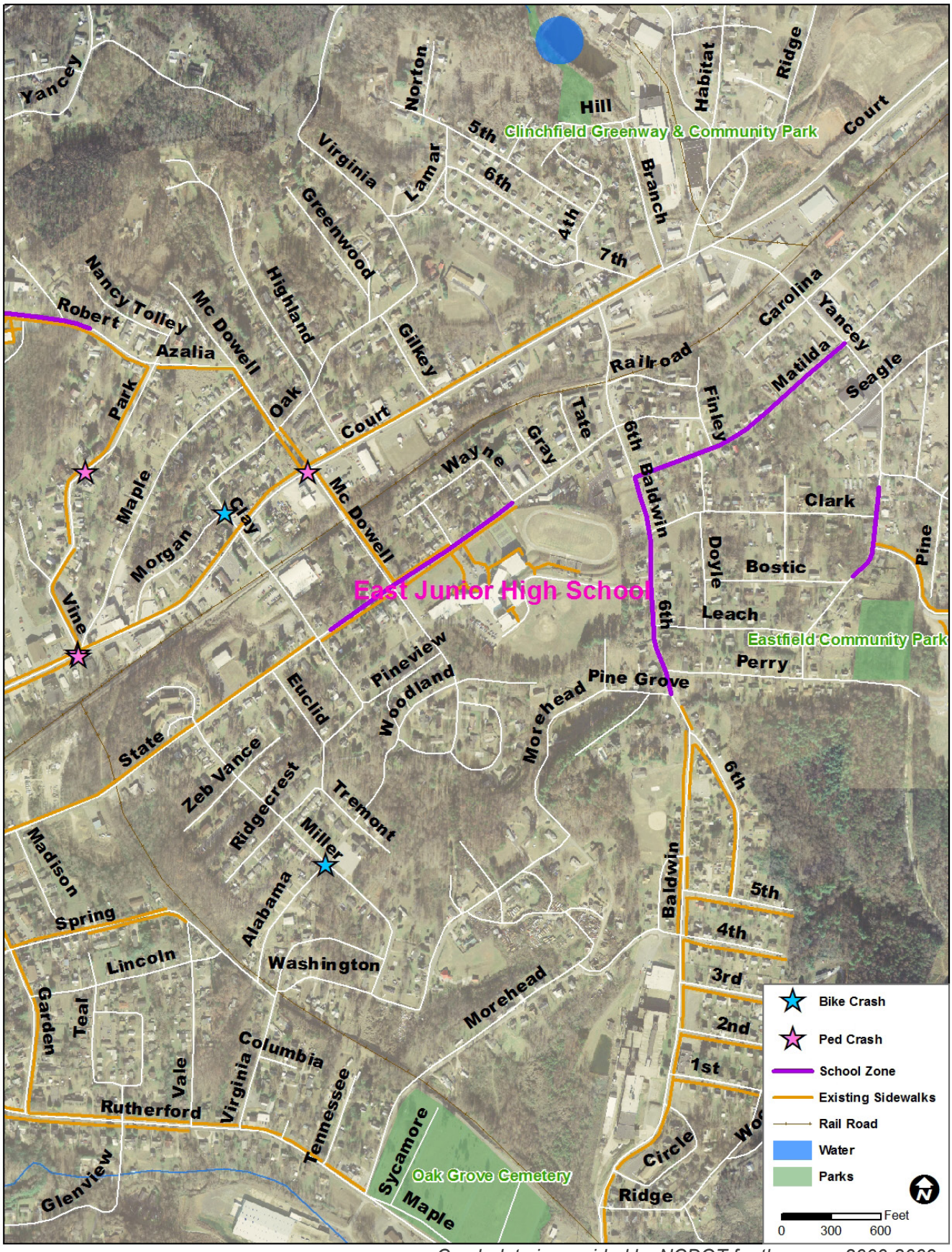


Court Street lacks pedestrian accommodations on the south side and has significant driveway access management issues. However, there is opportunity for bicycle and pedestrian improvements with a 3 lane, 40' wide roadway cross section.



Wide crossing distance for pedestrians at Baldwin Avenue and 6th Street.

Map 2.4 East McDowell Bicycle/Pedestrian Crash Map



Crash data is provided by NCDOT for the years 2000-2009.

2.3 MARION ELEMENTARY OVERVIEW

Marion Elementary is nestled inside a neighborhood with mostly slow residential roads and sidewalks surrounding it, making it quite walkable today. Yet, there are still significant opportunities for improvement to make it safer for walking and bicycling.

Marion Elementary is flanked by Fleming Avenue and Robert Street. Fleming Avenue sees more significant traffic as a collector road with less and slower traffic on the narrower Robert Street.

Marion Elementary Student Tallies

The National Center for Safe Routes to School provides a Student Arrival and Departure Tally to help measure the modes of transportation utilized by the students and how the SRTS Program will affect vehicular trip generation for the school. This tally may be taken annually and is a measure of the overall success of the program.

The following tables (Tables 2.6 and 2.7) show the results of tallies collected in Fall 2007 and Spring 2010 breaking down the non-motorized traffic by mode of transportation and by origin relative to school location.



Existing mid-block crosswalk over Robert Street to access Marion Elementary.

Table 2.6: Travel Norms for Marion Elementary (estimates from school leaders)

Marion Elementary Travel Norms	
Transportation Mode	**Number of Students**
Driven by Parents	247
Transported by Bus	150
Walked	10
Bicycled	2

Table 2.7: Percentage of Students Walking and Bicycling by Distance (from SRTS parent surveys)

Pedestrian and Bicycle Breakout by Locality and Transportation Mode		
Distance to School	**Walk**	**Bicycle**
Less than 1/4 mile	2.6%	0%
Between 1/4 and 1/2 mile	2.6%	0%
Greater than 1 mile	0.9%	0%

Marion Elementary Parent Surveys

The Parent Survey, provided by The National Center for Safe Routes to School, polls parents to determine the key factors affecting parents' decisions to allow or disallow children to walk or bicycle to area schools. These surveys also help identify the presence of safety-related conditions and provide basic background information for demographic correlation and analysis. Both the Parent Survey and Student Tally forms should be conducted at least annually to track changes and determine the success of the SRTS program.

The following information in Tables 2.8 and 2.9 was compiled from Marion Elementary Parent Surveys in Fall 2007 and highlights parent perceptions of their children's existing non-motorized routes to school and the improvements necessary to elicit their participation in the SRTS program.



Roadway crossings and traffic were high among parents' concerns for allowing their children to walk or bicycle to school. Above is a blind curve along Fleming Avenue at Crescent Drive. Existing sidewalk is found in this area, on the east side of Fleming.

Table 2.8: Top Five Concerns for Parents Under Existing Conditions

Top Five Concerns of Parents
1. Traffic volume along route
2. Distance
3. Safety of intersections and crossings
4. Traffic speed along route to school
5. Weather or climate

For complete results, see Appendix A.

Table 2.9: Top Five Improvements Specified as Prerequisite by Parents for Participation

Top Five Improvements	
1. Safety at intersections and crossings improved	22.8%
2 Sidewalks or pathways added/improved	18.8%
3. Traffic speed along route to school reduced	17.8%
4. Traffic volume along route reduced	16.8%
5. Distance to walk/bicycle reduced	15.8%

For complete results, see Appendix A.

Marion Elementary Field Assessment And Maps

Fieldwork included a thorough on-site assessment of existing infrastructure within the school zone, and an evaluation of both traffic and behavioral patterns exhibited by roadway users during drop-off and pick-up. The field assessment broadly analyzes school traffic patterns, characteristics of the transportation network users, and the existing infrastructure strengths and weaknesses within the school zone.

The following pages highlight the data collected pertaining to the strengths and weaknesses of the existing pedestrian environment for Marion Elementary. A photographic inventory, infrastructure survey and site mapping are included.

Maps showing pedestrian infrastructure and school zones (Map 2.5) at Marion Elementary, and the school within the neighborhood context (Map 2.6) are found at the end of this chapter.

Behavioral Components of Vehicular and Pedestrian Traffic Patterns

Currently, there are very few students walking or bicycling to school. The majority of students bicycling or walking to school do so with parental supervision. There are no crossing guards in the area. Additional information describing the travel norms for Marion Elementary is listed below:

• Motorist's behavior was observed as "good," adhering to pedestrian courtesies as appropriate on campus and along Robert Street and as "fair" along Fleming Avenue. Traffic speeds on Fleming Avenue exceed the speed limit at times and volumes can be relatively high.

• Only a few students and parents were observed walking to school at the time of this study. These people parked at the church parking lot across Robert Street and safely crossed Robert Street at the crosswalk.

• Automobile traffic was generally slow and respectful of pedestrians and designated traffic patterns with the exception of some higher speed traffic on Fleming Avenue.

• Motorists drop their children off and pick them up at the Fleming Avenue rear entrance. Automobile stacking does occur at times backing up along Fleming Avenue. For this reason, an additional right-hand turn queue lane is being added to Fleming, south of the entrance.

• Crime was not a significant issue of concern based on field analysis and public input.

Existing Infrastructure - Strengths

There are pedestrian facilities and traffic calming facilities in and around Marion Elementary, providing a great starting point for further improvements. The following observations were noted as existing system strengths.

• There are a number of sidewalks suitable for pedestrian traffic within the Marion Elementary School zone. This includes sidewalks along the east side of Fleming Avenue and the south side of Robert Street.



Above: The McDowell Avenue/Court Street intersection features a number of pedestrian accommodations including countdown signals. Still, pooling water is an issue. Below: A parent and child crossing Robert Street from the school to the church.



• On-campus sidewalks are adequate.

• There are two mid-block crossings crossing Robert Street that are simple, low-visibility (two solid stripes) crosswalks.

• There is one speed hump along Robert Street, just east of the front of the school. This serves to slow traffic through this corridor.

Existing Infrastructure - Deficiencies

Despite the strengths of the existing system, there are several issues related to infrastructure that warrant improvement, create safety hazards, and prevent children from walking and cycling to school. Key weaknesses, barriers, and obstacles were annotated as follows:

• While there is sidewalk on adjacent roadways, there are a few gaps in overall sidewalk connectivity to other neighborhoods. Table 2.10 summarizes key locations where insufficient walkways or system breaks in sidewalk continuity create barriers to pedestrians.

• Low-visibility, marked crosswalks at Robert Street are located near on-street parking areas without curb bulb-outs. Curb ramps are also lacking at the crosswalk directly across from the church.

• The existing marked crosswalk across Fleming Avenue, at Robert Street, is low-visibility and faded.

• There are no bicycle racks on campus.



The marked crosswalk at Fleming and Robert is low-visibility and faded. Because of the proximity to the school and the traffic on Fleming, enhancements are needed to this crossing facility.



While signage and marked crosswalks are present on Robert Street, the crosswalks are not visible enough for motorists.



Fleming Street, south of Marion Elementary, is quite wide (36' in places). Despite a speed limit of 25 mph, cars travel faster through this section. No traffic calming exists, despite adequate roadway widths in this area.

Key Crossing Issues

Fleming Avenue/Robert Street
• T-intersection with low-visibility, faded crosswalk.
• No bulb-outs present.

McDowell Street/Oak Street
• Existing low-visibility crosswalk, crossing McDowell on south side.
• Yield to Pedestrian signage is only installed on northbound McDowell.
• Marked crosswalks and curb ramps lacking elsewhere.

Fleming Avenue/Crescent Drive
• T-intersection with expressed concern of pedestrian crossing safety issues at this intersection.
• Currently no crosswalk facility.
• Blind curve (looking north on Fleming from Crescent).

Robert Street Mid-blocks Crossings
• Low-visibility crosswalks present.
• No curb bulb-outs, high-visibility marked crosswalks, or raised crosswalks exist.

Fleming Avenue/Fern Avenue
• Disconnect in sidewalks along Fleming Avenue.
• No marked crosswalks or curb ramps exist.

McDowell Avenue/Court Street
• Crosswalks in all directions are low-visibility..

Robert Street/Park Avenue
• Crosswalk and curb ramps crossing Park Avenue do not exist.
• Stop bar is located too close to intersection and will conflict with future crosswalk.



Fern Street and Fleming Avenue intersection, directly across from elementary school. Sidewalk is found on the north side of Fern and the west side of Fleming Avenue. Currently, no crosswalk treatment is present.

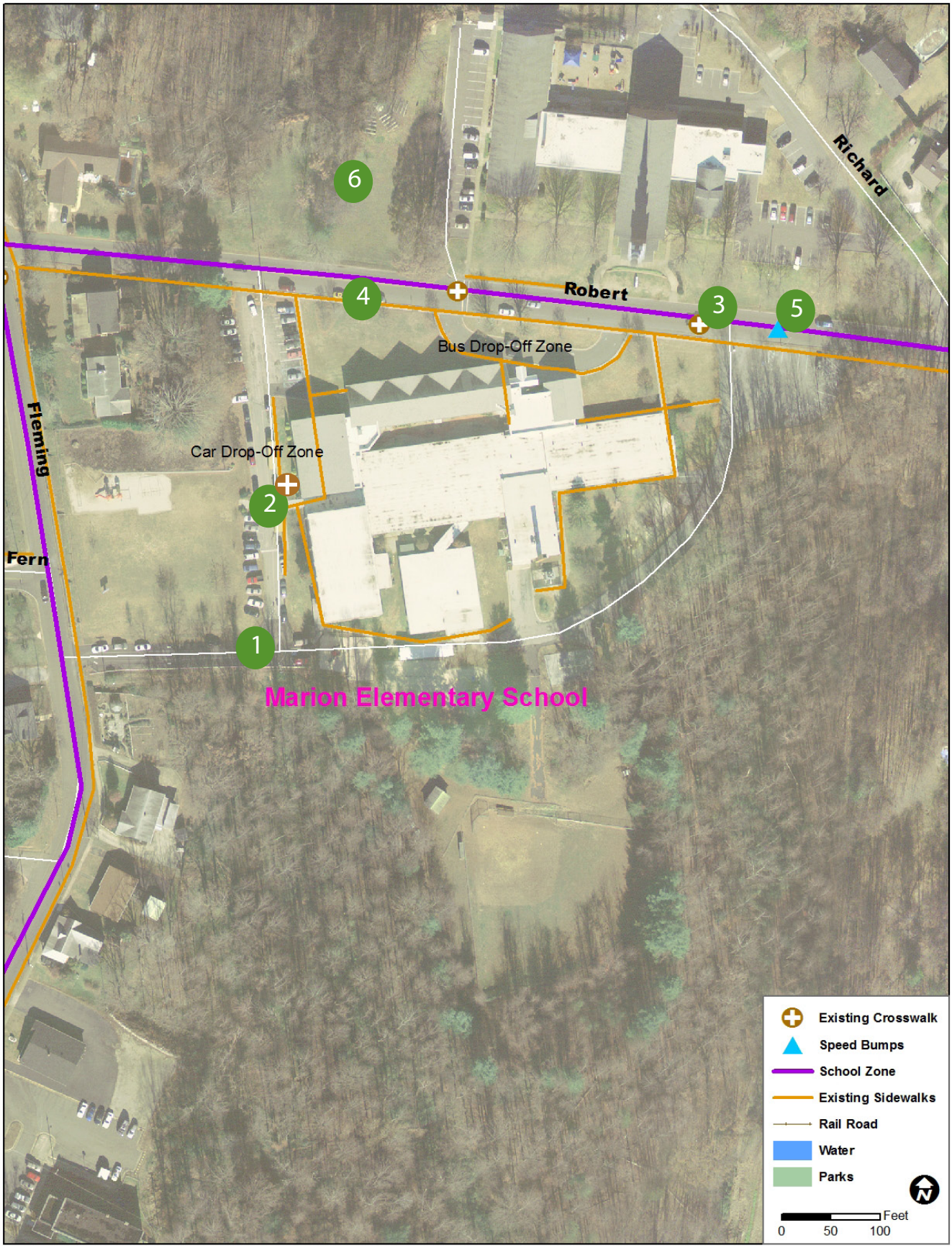


Fleming Avenue and Robert Street (west side of intersection). Sidewalk ends along west side of Fleming with low-visibility crosswalk across Fleming Avenue.

Table 2.10: Insufficient Walkways

Key Sidewalk Gaps		
Roadway	**Orientation**	**Gap Description**
Oak Street	Either side	From McDowell to Gilkey
Robert Street	North side	From Fleming to Richard (portion is existing)

Map 2.5 Marion Elementary Campus Map





Car pickup and dropoff entrance at Fleming Avenue.



Marked crosswalk wiith curb ramp at Fleming Avenue entrance to elementary school.



Pedestrians crossing at easternmost Robert Street crosswalk from church.



School zone sign and sidewalk along Robert Street.

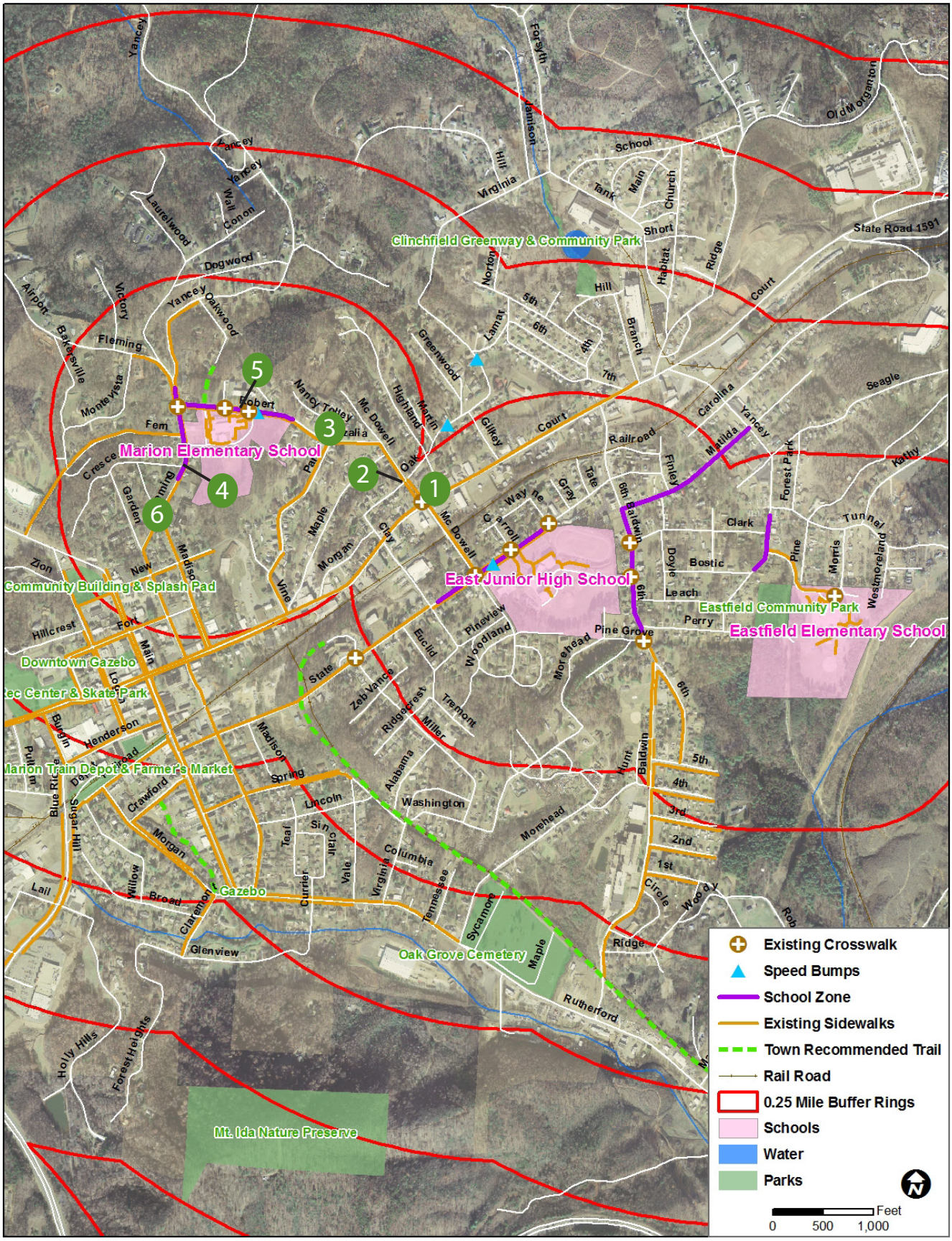


Speed hump along Robert Street.



Footprints in the snow indicating some pedestrian travel from neighborhoods in close proximity to the church up to Robert Street and Marion Elementary.

Map 2.6 Marion Elementary School Vicinity Map





McDowell Avenue and Court Street intersection features a number of pedestrian treatments including marked crosswalks, countdown signals, and curb ramps.



McDowell Avenue and Oak Street intersection with some pedestrian treatments including a marked crosswalk on the south side of the intersection, truncated domes, and a "Yield to Peds" sign. Crosswalks are lacking across Oak Street however.



Robert Street and Park Avenue intersection. Sidewalk continues along west side of Robert but marked crosswalks and curb ramps are lacking crossing Park Avenue.



Sharp turn in Fleming Avenue at Crescent Drive intersection, just south of the school.

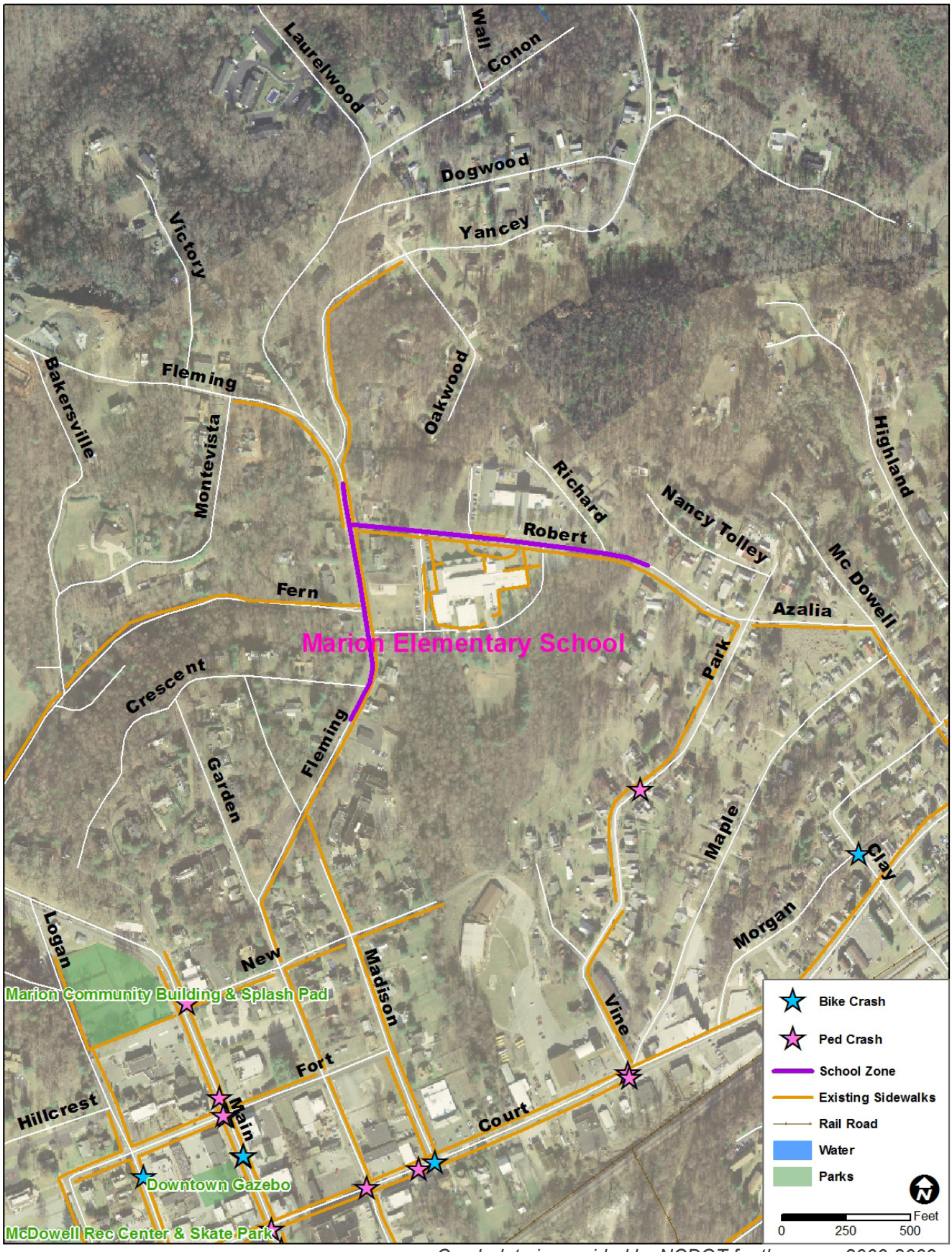


Sidewalk gap on the north side of Robert Street, across from school and in front of church.



Fleming Avenue, south of the school, is quite wide (36' here) offering opportunity for traffic calming improvements.

Map 2.7 Marion Elementary Bicycle/Pedestrian Crash Map



Crash data is provided by NCDOT for the years 2000-2009.

2.4 WEST MCDOWELL JUNIOR HIGH SCHOOL OVERVIEW

West McDowell Junior High School is located well to the north and west of Downtown Marion, on the border of the Pisgah National Forest. Currently, due to its isolation and lack of pedestrian facilities, it is not a walkable or bikeable school. Still, there are improvements that can be made to improve safety around the school.

West McDowell Junior High School is flanked by West McDowell High School Road and US 70. US 70 is a very busy 5-lane highway with commercial growth nearby. West McDowell High School Road is a two-lane, hilly roadway that sees significant traffic when school starts and ends for the day.

West McDowell Junior High School Student Tallies

The National Center for Safe Routes to School provides a Student Arrival and Departure Tally to help measure the modes of transportation utilized by the students and how the SRTS Program will affect vehicular trip generation for the school. This tally may be taken annually and is a measure of the overall success of the program.

The following tables (Tables 2.11 and 2.12) show the results of tallies collected in Fall 2007 and Spring 2010 breaking down the non-motorized traffic by mode of transportation and by origin relative to school location.



West McDowell Junior High School sits high above US 70 on a steep hillside.

Table 2.11: Travel Norms for West McDowell Junior High School (estimates from school leaders)

West McDowell Junior High School Travel Norms	
Transportation Mode	**Number of Students**
Driven by Parents	385
Transported by Bus	385
Walked	0
Bicycled	0

Table 2.12: Percentage of Students Walking and Bicycling by Distance (estimate of Consultant)

Pedestrian and Bicycle Breakout by Locality and Transportation Mode		
Distance to School	**Walk**	**Bicycle**
Less than 1/4 mile	0%	0%
Between 1/4 and 1/2 mile	0%	0%
Greater than 1 mile	0%	0%

West McDowell Junior High School Parent Surveys

The Parent Survey, provided by The National Center for Safe Routes to School, polls parents to determine the key factors affecting parents' decisions to allow or disallow children to walk or bicycle to area schools. These surveys also help identify the presence of safety-related conditions and provide basic background information for demographic correlation and analysis. Both the Parent Survey and Student Tally forms should be conducted at least annually to track changes and determine the success of the SRTS program. The parent surveys were NOT conducted for West McDowell Junior High School during this process. It should be completed in the future. Tables 2.13 and 2.14 are completed below as estimated by the consultant's fieldwork.



McDowell High School Road and Business US 70 intersection.

Table 2.13: Top Three Concerns Under Existing Conditions

Top Three Concerns of Parents
1. Distance
2. Traffic speeds and volumes
3. Safety of intersections and crossings

Table 2.14: Top Three Improvements Specified as Prerequisite by Parents for Participation

Top Three Improvements
1. Distance
2 Sidewalks and pathways
3. Safer intersection crossings

West McDowell Junior High School Field Assessment and Maps

Fieldwork included a thorough on-site assessment of existing infrastructure within the school zone, and an evaluation of both traffic and behavioral patterns exhibited by roadway users during drop-off and pick-up. The field assessment broadly analyzes school traffic patterns, characteristics of the transportation network users, and the existing infrastructure strengths and weaknesses within the school zone.

The following pages highlight the data collected pertaining to the strengths and weaknesses of the existing pedestrian environment for West McDowell Junior High School. A photographic inventory, infrastructure survey and site mapping are included.

Maps showing pedestrian infrastructure and school zones (Map 2.8) at West McDowell Junior High School, and the school within the neighborhood context (Map 2.9) are found at the end of this chapter.

Behavioral Components of Vehicular and Pedestrian Traffic Patterns

Currently, there are few, if any students walking or bicycling to school. The majority of students who do walk cross US 70 after school to visit fast food restaurants and other stores without parental supervision. There are no crossing guards in the area. Additional information describing the travel norms for West McDowell Junior High School is listed below:

• Motorist's behavior was observed as "fair," adhering to pedestrian courtesies as appropriate on campus and along West McDowell High School Road. However, traffic speeds on US 70 often exceed the speed limit at times and volumes can be relatively high.

• Motorists drop their children off and pick them up at the W. McDowell Junior High School main entrance. Automobile stacking does occur at times backing up along McDowell High School Road.

• Crime was not a significant issue of concern based on field analysis, public input, and the relative isolation of the school.

Existing Infrastructure - Strengths

There are no pedestrian facilities on roadways adjacent to the school property. Covered sidewalks are present leading up to the school from the parking lot and dropoff zones and also around the edges of the school. However, the Catawba River Greenway is a community asset across US 70.

Existing Infrastructure - Deficiencies

There are significant issues related to infrastructure that warrant improvement, create safety hazards, and prevent children from walking and cycling to school. Key weaknesses, barriers, and obstacles were annotated as follows:

• There are no sidewalks or crosswalks along McDowell High School Road or US 70.
• There is no safe access (sidewalk) or pedestrian crossing to the River Greenway which is across US 70 from the school.
• There are no bicycle racks on campus.
There is no pedestrian connection across US 221 on McDowell High School Road.

Key Crossing Issues

The following roadways/crossing locations do not have sidewalk or any pedestrian crossing features:

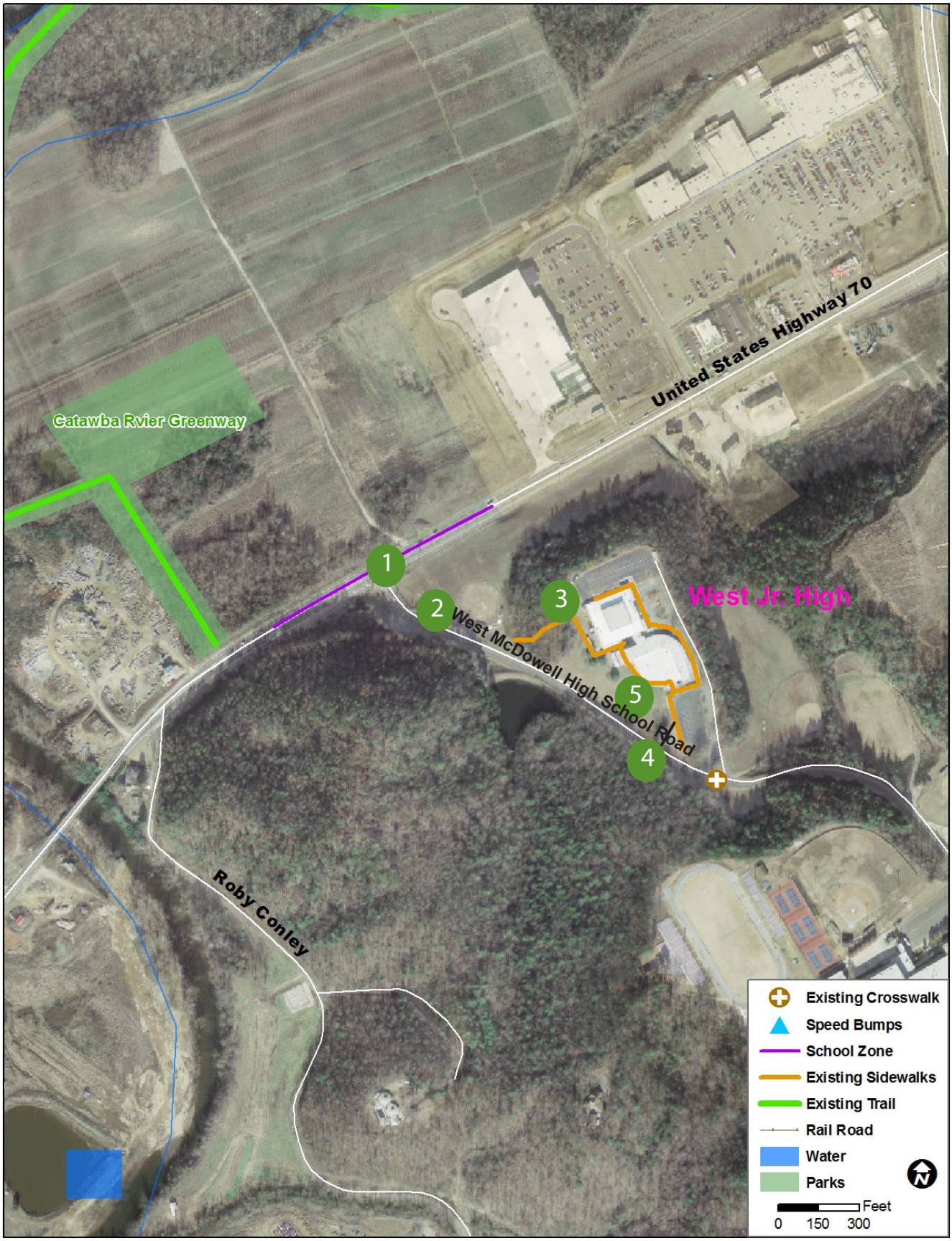
• *US 70/McDowell High School Road*
• *US 70/US 221*
• *US 70/Lowe's*

• All roadways/crossings lack any sidewalk or pedestrian crossing feature.

Table 2.15: Insufficient Walkways

Key Sidewalk Gaps		
Roadway	**Orientation**	**Gap Description**
US 70	Both sides	McDowell High School Road to Business 70
McDowell High School Road	Both sides	No sidewalk entire roadway

Map 2.8 West McDowell Junior High Campus Map





The intersection of West McDowell High School Road and US 70 has no pedestrian features (sidewalks or crosswalks). Improvements are needed to connect to Catawba River Greenway (to the west) and commercial areas to the east.



West McDowell High School Road, facing north from US 70 towards the campuses. Currently, there is no sidewalk present.



Steep stairwell from West McDowell Junior High School down to playing fields.

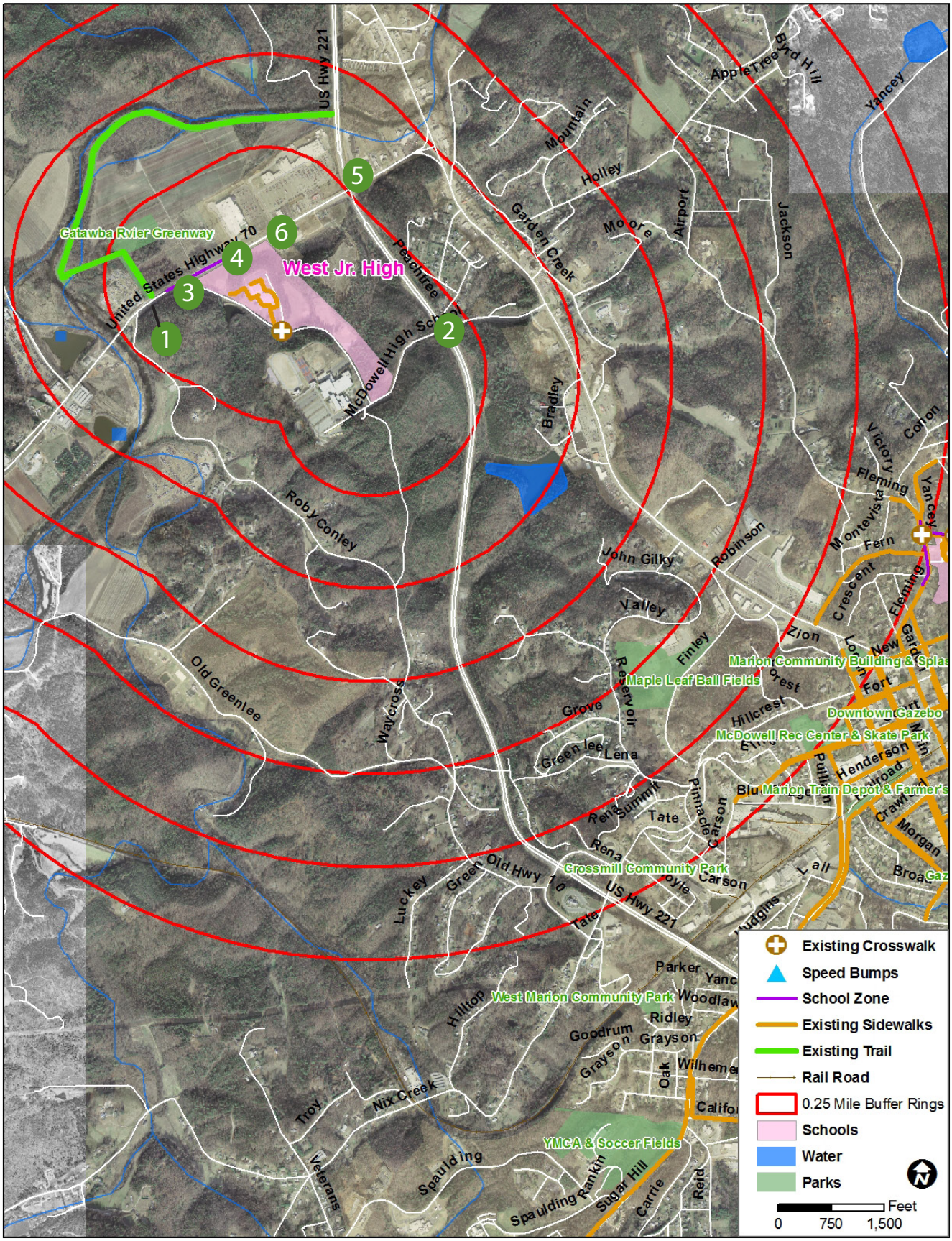


Covered walkway at the dropoff and pickup zone in front of West McDowell Junior High School.



On-campus sidewalks are covered around a long part of the school building's edge.

Map 2.9 West McDowell Junior High School Vicinity Map





The first phase of the Catawba River Greenway project starts at the intersection with US 70, in close proximity to West Junior High School.



There is a lack of pedestrian accommodation and shoulder on the W. McDowell High School bridge crossing of US 221.



5-lane cross section of US 70, looking east along US 70 near the school entrance. Currently, there are no pedestrian features along this corridor.



US 70, east of school entrance features adequate, flat space for a future sidewalk.

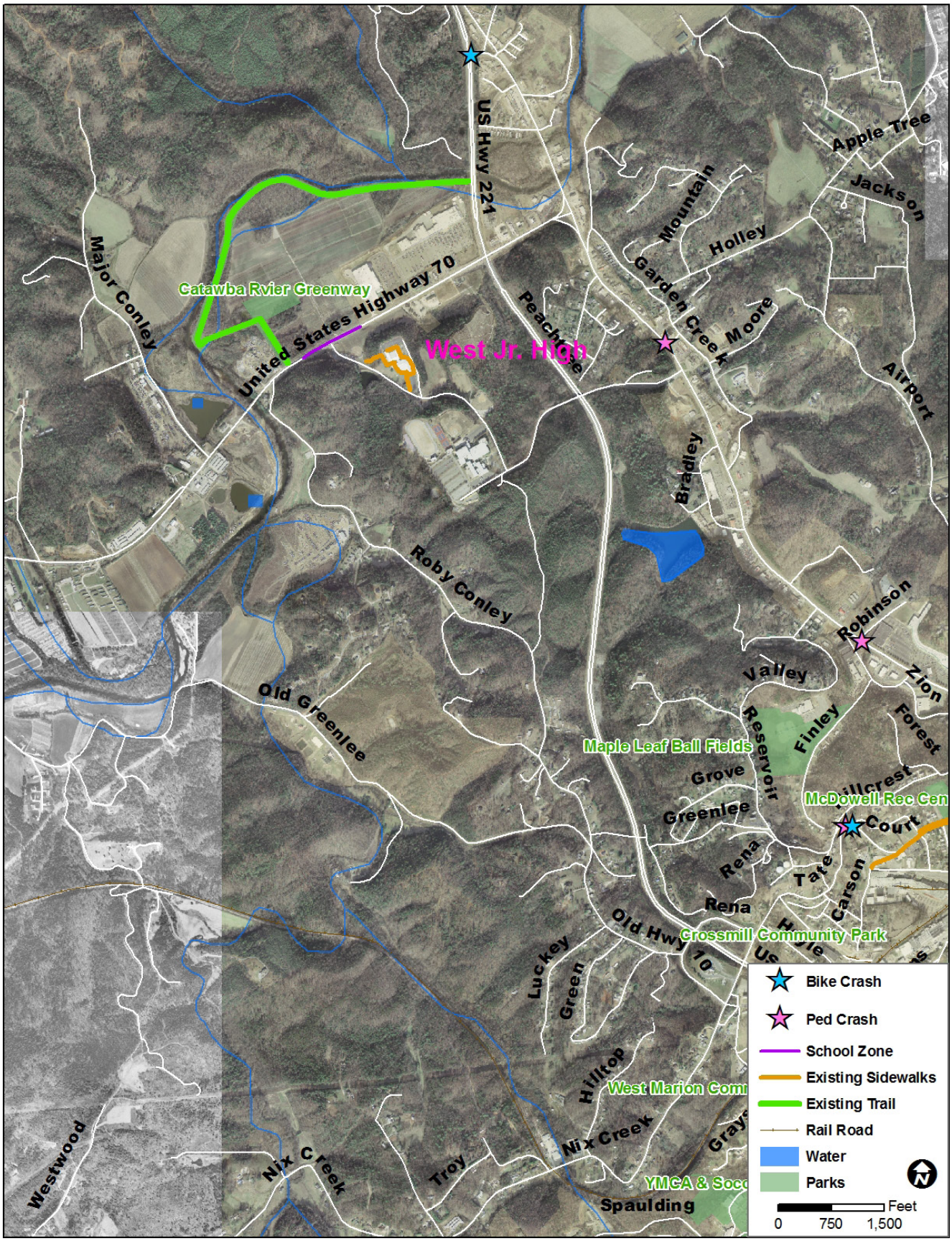


Footprints in the snow evident of pedestrian traffic at US 70 and US 221. Shopping and fast food restaurants are destinations not only of W. Junior High students but also the general public.



Sidewalks and crosswalks are lacking all along the US 70 commercial corridor (here at the Lowe's intersection).

Map 2.10 W. McDowell Junior High Bicycle/Pedestrian Crash Map



Crash data is provided by NCDOT for the years 2000-2009.

2.5 PHOENIX ACADEMY OVERVIEW

Phoenix Academy is a small school with a total enrollment of only 140 students, only five to seven of which walk to school. It is located on Lukin Street at the crest of a hill, just past Overlook Drive. Lukin Street is a mostly residential, low volume traffic road which lacks a sidewalk. The school is about two miles southwest of downtown Marion, approximately the same distance from downtown as West McDowell Junior High School. Sugarhill Road, which intersects Lukin, is the only thoroughfare to access the school and is a busy five-lane roadway. According to NCDOT, the 2008 average traffic volume on Sugarhill Road was approximately 12,000 vehicles per day.

Phoenix Academy is an alternative education center, with many of its students coming from areas all around the county. This makes walking and bicycling to school hard for many, but still a possibility for some.

Phoenix Academy Student Tallies

The National Center for Safe Routes to School provides a Student Arrival and Departure Tally to help measure the modes of transportation utilized by the students and how the SRTS Program will affect vehicular trip generation for the school. This tally may be taken annually and is a measure of the overall success of the program. This was NOT completed for Phoenix Academy during this study. It should be completed in the future. However, travel norms can still be analyzed with information provided by school leaders (Table 2.16).



Phoenix Academy entrance sign.

Table 2.16: Travel Norms for Phoenix Academy (estimates from school leaders)

Phoenix Academy Travel Norms	
Transportation Mode	**Number of Students**
Driven by Parents	103
Transported by Bus	30
Walked	5-7
Bicycled	0

Phoenix Academy Parent Surveys

The Parent Survey, provided by The National Center for Safe Routes to School, polls parents to determine the key factors affecting parents' decisions to allow or disallow children to walk or bicycle to area schools. These surveys also help identify the presence of safety-related conditions and provide basic background information for demographic correlation and analysis. Both the Parent Survey and Student Tally forms should be conducted at least annually to track changes and determine the success of the SRTS program. Again, the parent surveys were NOT conducted during this process. It should be completed in the future. Tables 2.17 and 2.18 are completed below as estimated by the consultant's fieldwork.



The entrance to the school property shows and nearby roads lack pedestrian accommodations.

Table 2.17: Top Three Concerns Under Existing Conditions

Top Three Concerns of Parents
1. Distance
2. Traffic speeds and volumes
3. Safety of intersections and crossings

Table 2.18: Top Three Improvements Specified as Prerequisite by Parents for Participation

Top Three Improvements
1. Distance
2 Sidewalks and pathways
3. Safer intersection crossings

Phoenix Academy Field Assessment and Maps

Fieldwork included a thorough on-site assessment of existing infrastructure within the school zone, and an evaluation of both traffic and behavioral patterns exhibited by roadway users during drop-off and pick-up. The field assessment broadly analyzes school traffic patterns, characteristics of the transportation network users, and the existing infrastructure strengths and weaknesses within the school zone.

The following pages highlight the data collected pertaining to the strengths and weaknesses of the existing pedestrian environment for Phoenix Academy. A photographic inventory, infrastructure survey, and site mapping are included.

Maps showing pedestrian infrastructure and school zones (Map 2.11) at Phoenix Academy, and the school within the neighborhood context (Map 2.12) are found at the end of this chapter.

Behavioral Components of Vehicular and Pedestrian Traffic Patterns

When school is dismissed there is a single bus and about thirty riders that leave at 2:45 pm. Car riders are then picked up behind the back of the building, and the small number of pedestrians are let out with a teacher between the cars and bus dismissals.

Existing Infrastructure - Strengths

There is a length of sidewalk that runs down the west side of Sugarhill Road from past Highway 221 to the north to about 725 feet north of Lukin Street. An addition of a few more blocks of sidewalk would create a pedestrian friendly route all the way to the local YMCA and local businesses for the children of Phoenix Academy.

Existing Infrastructure - Deficiencies

There are significant issues related to infrastructure that warrant improvement, create safety hazards, and prevent children from walking and cycling to school. Key weaknesses, barriers, and obstacles were annotated as follows:

• There have been many accidents involving pedestrian on Sugarhill Road caused by people running across at non-designated crossings. Due to these issues, additional pedestrian treatments such as a marked crosswalk and flashing lights have been added at the crossings with Wilhemenia Street and California Avenue due to pedestrian related incidents.

• There is a shopping center approved for development in the northeast quadrant of Interstate 40 and Sugarhill Road. Currently, no sidewalks or marked roadway crossings are planned as a part of this development project. This project is less than a mile from Lukin Street and will have the potential to attract students after school once it is complete.

• The closest intersection that has pedestrian treatments to cross Sugarhill Road is located at Grace Corpening Drive (at the YMCA entrance), which is just under a mile from the Phoenix Academy.

• Many of the neighborhood roads to the west of Phoenix Academy, such as Veterans Drive and its offshoots, are windy, mountainous roads with no shoulders and steep embankments that would make walking or bicycling to school from this area a dangerous option.

• There is no sidewalk on Lukin Street to the school.
• There is no sidewalk on the school campus.

Key Crossing Issues

Sugarhill Road/Wilhemenia Street
• No traffic signal present.
• Existing marked crosswalk is low-visibility.

Sugarhill Road/Grace Corpening/Stroud Street
• Sidewalks and curb ramps not present at all corners.
• Existing marked crosswalks are low-visibility and faded.

Table 2.19: Insufficient Walkways

Key Sidewalk Gaps		
Roadway	**Orientation**	**Gap Description**
Lukin Street	One side	From Sugarhill Road to Phoenix Academy.
Sugar Hill Rd.	One Side	Sidewalk ends north of Lukin Street

Map 2.11 Phoenix Academy Campus Map





The entrance to Phoenix Academy is not pedestrian-friendly and is mostly parking lot and pavement.



Sugar Hill Road, near entrance to Phoenix Academy.

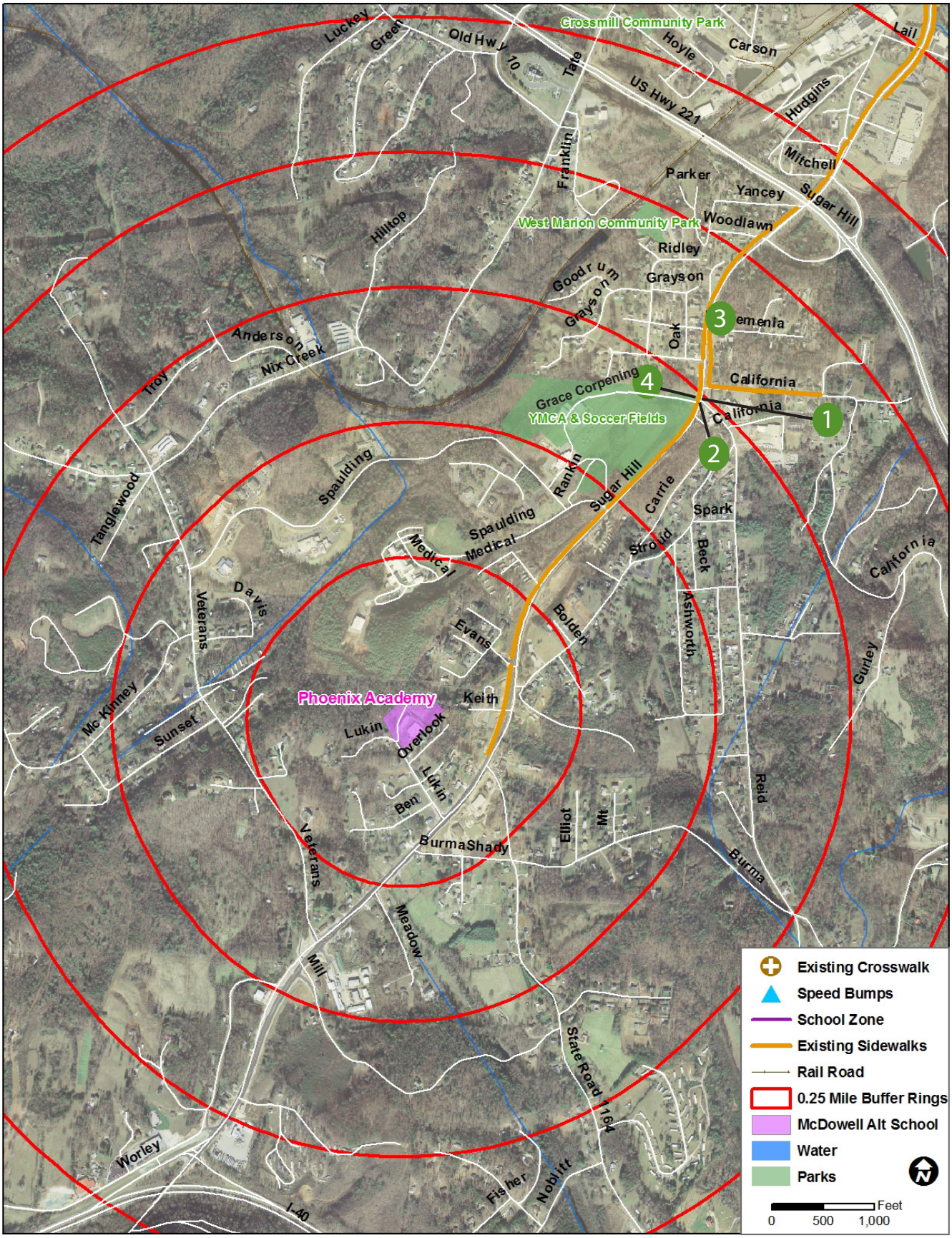


The intersection of Lukin Street and Sugar Hill Road. There is no sidewalk currently along either road, in this area, but there is adequate space to provide a sidewalk along Sugar Hill Road.



Lukin Street at the Ben Street intersection.

Map 2.12 Phoenix Academy Vicinity Map





Sugar Hill Road sees heavy pedestrian use due to nearby residential areas, convenience store, and the YMCA. Above is a worn foot path at Sugar Hill Road and Stroud Street.



The intersection of Sugar Hill Road and Stroud Street from the southeast corner. Sidewalk and curb ramps are lacking and needed on the east side of Sugar Hill Road.



A push-button, flashing light activated crossing of Sugar Hill Road at Wilhemenia. This intersection is only controlled by a stop sign. The crosswalk is fading and should be high-visibility for a crossing of this magnitude.



The west side of the Sugar Hill Road/Stroud Street intersection. Curb ramps, median refuge, and high-visibility marked crosswalk crossing Sugar Hill Road would make this high pedestrian use area safer.

Map 2.13 Phoenix Academy Bicycle/Pedestrian Crash Map



Crash data is provided by NCDOT for the years 2000-2009.

2.6 EASTFIELD ELEMENTARY OVERVIEW

Eastfield Elementary is situated inside a neighborhood with narrow two lane residential roads of which some are calm but others pose serious threats to pedestrians and bicyclists. The school is close to the Downtown and East McDowell Junior High School. There are no sidewalks except one leading to the school on Eastfield School Road. There is currently a public park under construction on Perry Street, just west of the school. Thus, there are significant opportunities for improvement to make it safer for walking and bicycling.

Eastfield Elementary is flanked by Yancey Street, Tunnel Road, and Perry Street. Yancey Street sees more significant traffic as a collector road with less traffic on the narrower, curvy Tunnel Road. Perry Street connects with Yancey Street at an undesirable angle which requires free flow traffic to make a 90 degree turn to stay on what is designated as the through movement.



Main entrance to Eastfield Elementary.



Bicycle rack in front of Eastfield Elementary.

Eastfield Elementary Student Taliies

The National Center for Safe Routes to School provides a Student Arrival and Departure Tally to help measure the modes of transportation utilized by the students and how the SRTS Program will affect vehicular trip generation for the school. This tally may be taken annually and is a measure of the overall success of the program.

The following tables (Tables 2.20 and 2.21) show the results of tallies collected in Fall 2007 breaking down the non-motorized traffic by mode of transportation and by origin relative to school location.

Table 2.20: Travel Norms for Eastfield Elementary (estimates from school leaders)

Marion Elementary Travel Norms	
Transportation Mode	**Number of Students**
Driven by Parents	175
Transported by Bus	150
Walked	12
Bicycled	3

Table 2.21: Percentage of Students Walking and Bicycling by Distance (from SRTS parent surveys)

Pedestrian and Bicycle Breakout by Locality and Transportation Mode		
Distance to School	**Walk**	**Bicycle**
Less than 1/4 mile	8%	0%
Between 1/4 and 1/2 mile	0%	0%
Greater than 1 mile	0%	0%

Eastfield Elementary Parent Surveys

The Parent Survey, provided by The National Center for Safe Routes to School, polls parents to determine the key factors affecting parents' decisions to allow or disallow children to walk or bicycle to area schools. These surveys also help identify the presence of safety-related conditions and provide basic background information for demographic correlation and analysis. Both the Parent Survey and Student Tally forms should be conducted at least annually to track changes and determine the success of the SRTS program. Only 12 parents participated for this round and this number should be increased to gather more meaningful information.

The following information in Tables 2.22 and 2.23 was compiled from Eastfield Elementary Parent Surveys in Fall 2007 and highlights parent perceptions of their children's existing non-motorized routes to school and the improvements necessary to elicit their participation in the SRTS program.



Roadway crossings and traffic were high among parents' concerns for allowing their children to walk or bicycle to school. Above is a dangerous crossing at Yancey and Bostic. There are no existing sidewalks or crosswalks inside this school zone.

Table 2.22: Top Three Concerns for Parents Under Existing Conditions

Top Five Concerns of Parents
1. Distance
2. Traffic speed along route to school
3. Weather or climate

For complete results, see Appendix A.

Table 2.23: Top Three Improvements Specified as Prerequisite by Parents for Participation

Top Five Improvements	
1. Distance	22.2%
2 Time	11.1%
3. Before/after-school activities	11.1%

For complete results, see Appendix A.

Eastfield Elementary Field Assessment And Maps

Fieldwork included a thorough on-site assessment of existing infrastructure within the school zone, and an evaluation of both traffic and behavioral patterns exhibited by roadway users during drop-off and pick-up. The field assessment broadly analyzes school traffic patterns, characteristics of the transportation network users, and the existing infrastructure strengths and weaknesses within the school zone.

The following pages highlight the data collected pertaining to the strengths and weaknesses of the existing pedestrian environment for Eastfield Elementary. A photographic inventory, infrastructure survey and site mapping are included.

Maps showing pedestrian infrastructure and school zones (Map 2.14) at Eastfield Elementary, and the school within the neighborhood context (Map 2.15) are found at the end of this chapter.

Behavioral Components of Vehicular and Pedestrian Traffic Patterns

Currently, there are very few students walking or bicycling to school. The majority of students bicycling or walking to school do so with parental or sibling supervision. There are no crossing guards in the area. Additional information describing the travel norms for Eastfield Elementary is listed below:

• Motorist's behavior was observed as "good," adhering to pedestrian courtesies as appropriate on campus. Yancey Street and Tunnel Road could be labeled as "fair" due to speeding and roadway characteristics. Traffic speeds on Yancey Street exceed the speed limit of 25mph at times and volumes can be relatively high.

• Only a few students and parents were observed walking to and from school at the time of this study. These people were either observed walking down Eastfield School Road or Morris Avenue.

• Motorists drop their children off and pick them up at the Eastfield School Road main entrance (which is one-way during school hours). Automobile stacking does occur at times backing up along Eastfield School Road but this does not hinder pedestrian safety or flow.

• Crime is issue of concern based on field analysis and public input and pedestrian facility placement will need to be thoughtfully analyzed to minimize this threat.

Existing Infrastructure - Strengths

There are few pedestrian facilities and traffic calming facilities in and around Eastfield Elementary. The following observations were noted as existing system strengths.

• There are sidewalks present in the neighborhood located south of the school, and on Eastfield School Road leading to the school from Yancey Road. However this sidewalk needs tree and brush maintenance to optimize its capacity.

• On-campus sidewalks and crosswalks are adequate.

• There is one bicycle rack located on campus and its location is adequate.



Above: A few children walking home from school on Morris Avenue, note the lack of sidewalks.
Below: A path worn by children at the rear of Eastfield Elementary School.



Existing Infrastructure - Deficiencies

Due to the lack of existing infrastructure surrounding Eastfield Elementary School, there are several issues that warrant improvement, create safety hazards, and prevent children from walking and cycling to school. Key weaknesses, barriers, and obstacles were annotated as follows:

• While there is sidewalk on Eastfield School Road leading to the school from Yancey Road, there are gaps in overall sidewalk connectivity to other neighborhoods and streets. Table 2.24 summarizes key locations where insufficient walkways or system breaks in sidewalk continuity create barriers to pedestrians including Yancey Road, Tunnel Street, Perry Street, and Morris Avenue.

• There is only one crosswalk, a skewed, long crosswalk, in the vicinity around the school and it is on campus (See Map 2.14). Curb ramps are also lacking due to the absence of sidewalk.

• The intersection of Perry Street and Yancey Road poses a serious vehicle and pedestrian safety threat. This intersection is narrow, has blind curves, hills, and only one stop sign (on Perry Street) and drivers swiftly turn on/off of Yancey Road with little attention to pedestrians. This intersection needs improvement not only for the school but also for Eastfield Neighborhood Park.



This marked crosswalk on Yancey Street is low-visibility and faded. Due to the close the proximity of the school to the automobile traffic on Yancey Street, enhancements are needed to this crossing facility.



Tunnel Street is relatively calm but is narrow and has poor sight visibility in many sections. Improvements such as sidewalks and high-visibility marked crosswalks are recommended.



Yancey Street is dangerous for pedestrians due to its lacking sidewalks and curves. Despite a speed limit of 35 mph, cars travel faster through this section. There is need for traffic calming and sidewalks near Eastfield Elementary.

Key Crossing Issues

Perry Street/Yancey Street

• T-intersection, stop controlled for westbound traffic on Perry Street, no sidewalks, and no crosswalks. exist. The free flow through movement is actually a 90 degree turn.
• No other pedestrian facilities present.
• Blind curve (looking south on Yancey towards Perry).

Morris Avenue/Tunnel Road

• T-intersection with one stop sign (on Morris Avenue), no sidewalks, and no crosswalks exist.
• No other pedestrian facilities present.

Eastfield School Road/Yancey Street

• T-intersection with one stop sign (on Eastfield School Road) and no crosswalks.
• Sidewalk on Eastfield School Road leading to the school.
• No other pedestrian facilities present.

Clark Street/Yancey Street

• T-intersection with one stop sign (on Clark Street), no sidewalks, and no crosswalks exist.
• No other pedestrian facilities present.



The intersection of Yancey Street and Perry Street is very dangerous for both motorists and pedestrians due to its configuration, lack of stop signs, and lack of sidewalk.

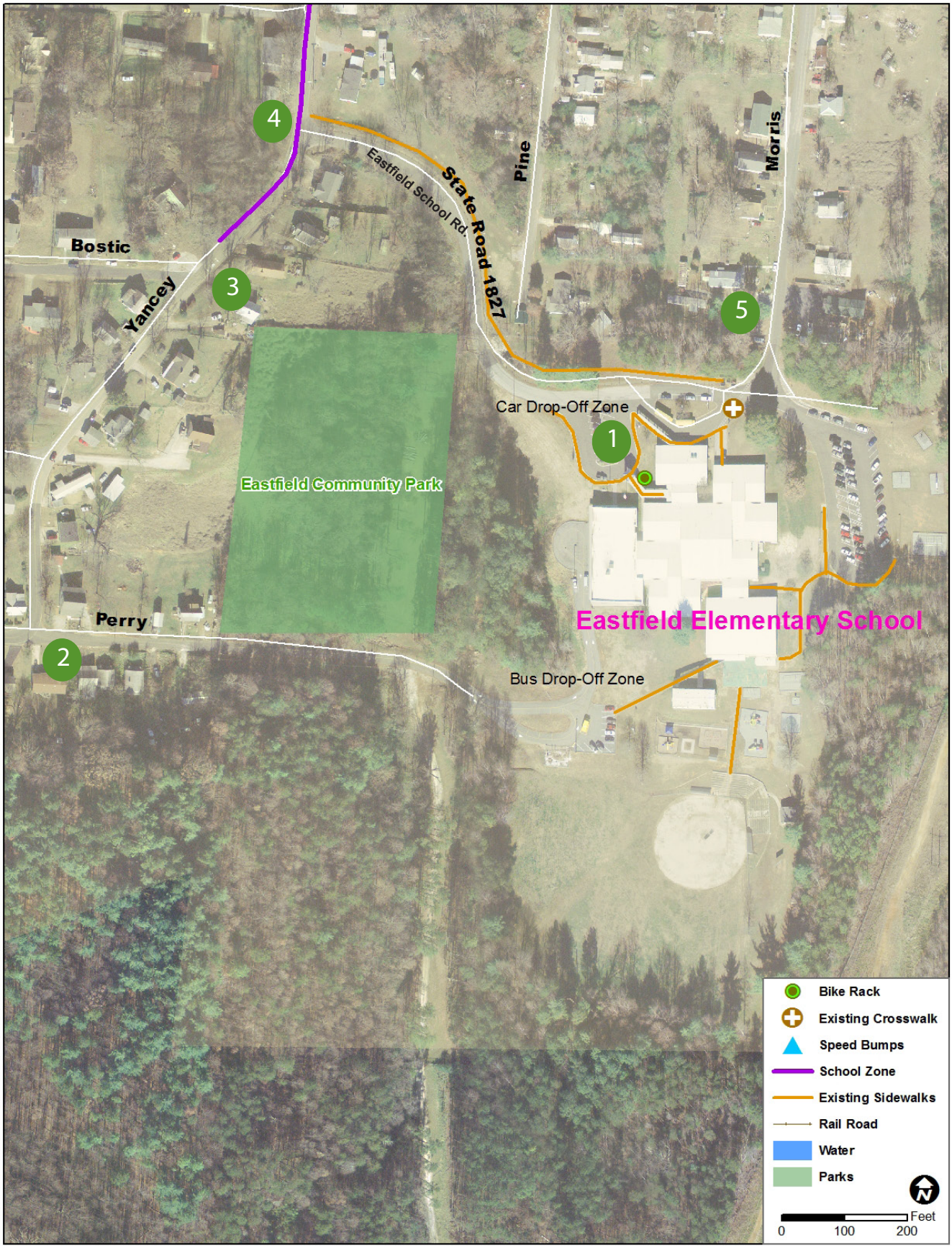


The intersection of Yancey Street and Clark Street is dangerous for pedestrians because of speeding motorists and lack of pedestrian infrastructure.

Table 2.24: Insufficient Walkways

Key Sidewalk Gaps		
Roadway	**Orientation**	**Gap Description**
Yancey Street	Either side	From Perry to Tunnel
Tunnel Road	North side	From Yancey to Westmoreland

Map 2.14 Eastfield Elementary Campus Map





Car pick-up and drop-off entrance at Eastfield Elementary.



Blind intersection at Yancey Street and Perry Street.



School zone sign at Yancey Street and Bostic Street.

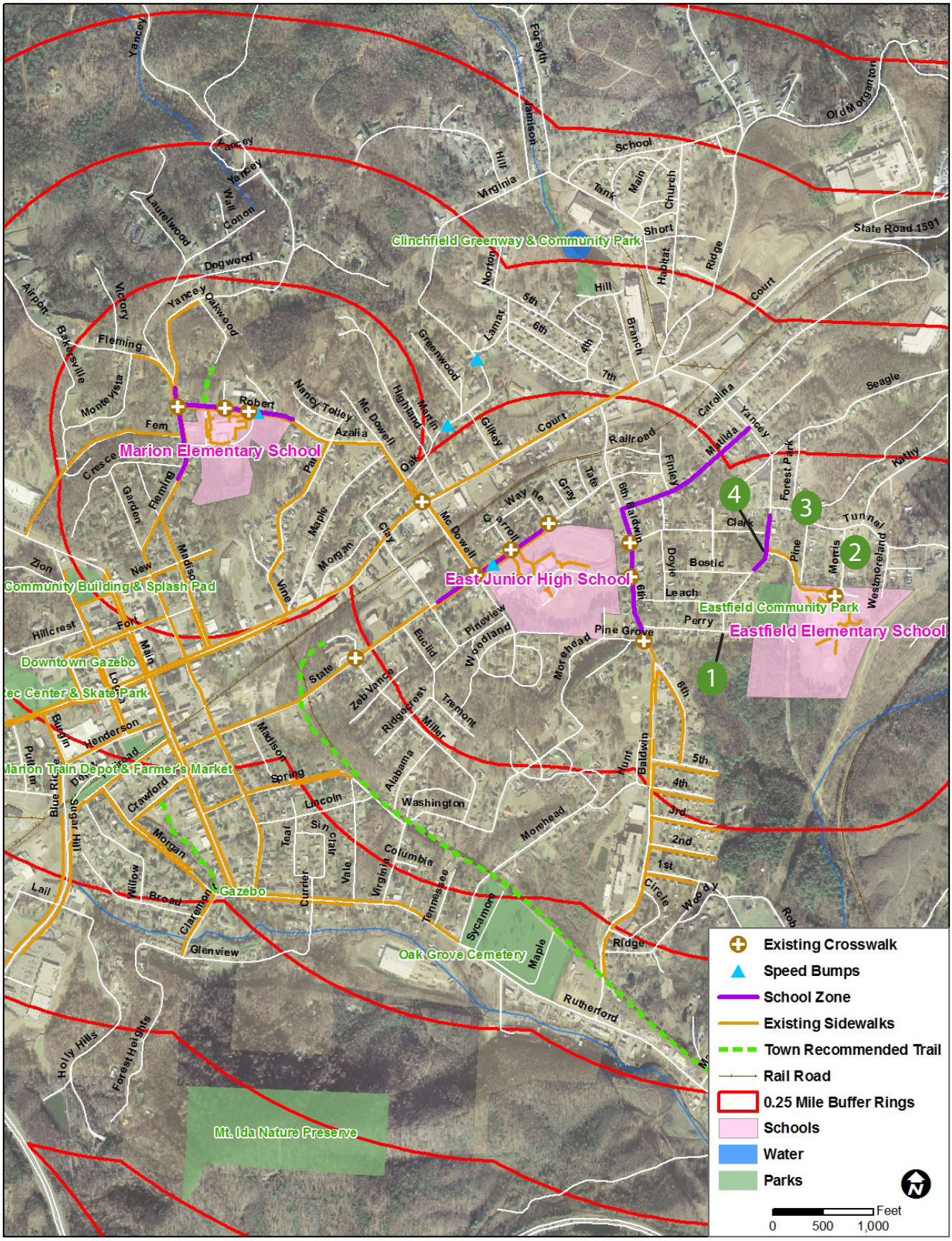


Yancey Street and Eastfield School Road (becomes one way during school hours).



View of Morris Avenue from Eastfield Elementary.

Map 2.15 Eastfield Elementary School Vicinity Map





The intersection of Yancey and Perry Streets is a blind curve.



Pedestrians walking in the distance on Morris Avenue.

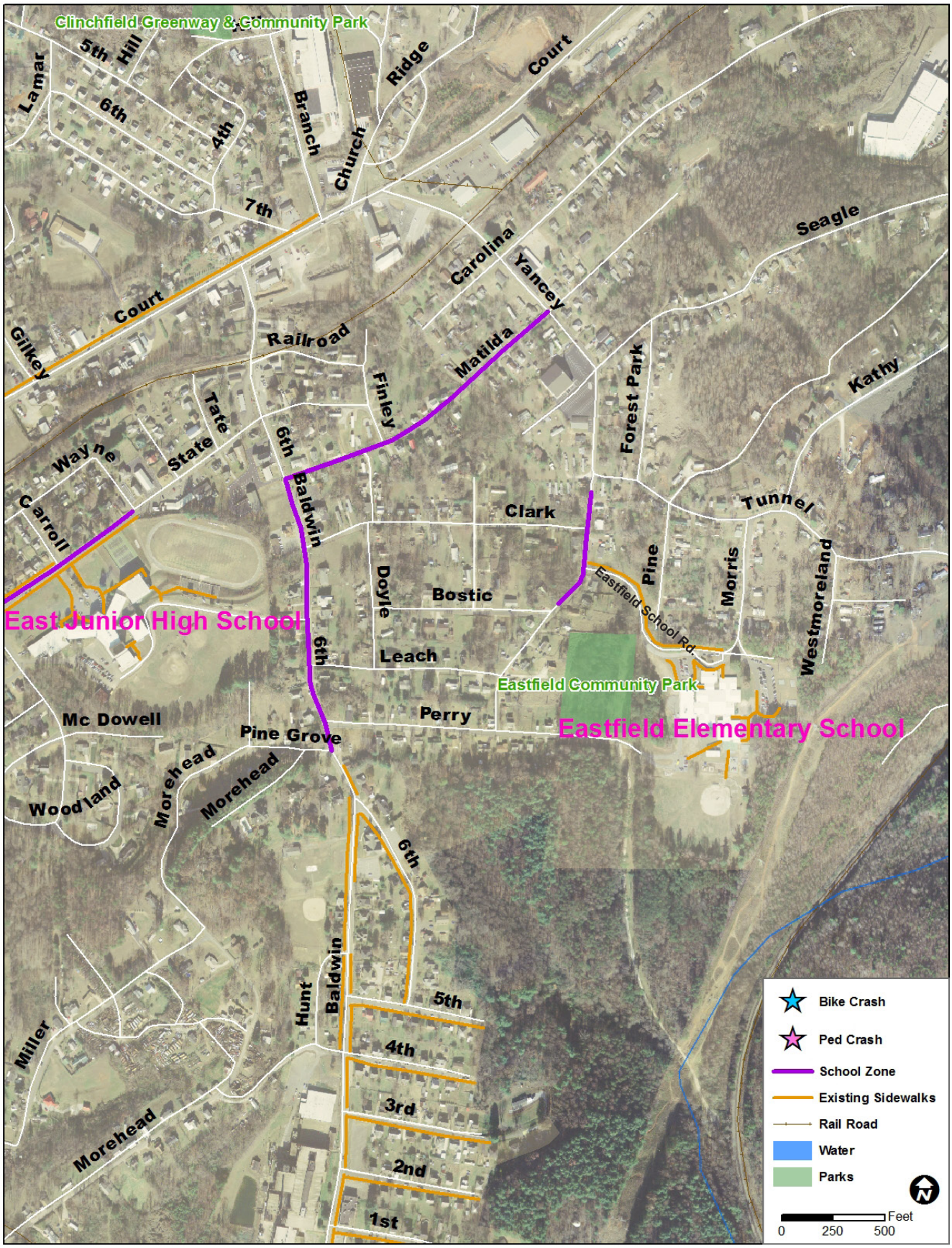


Tunnel Road, just north of campus.



The intersection of Yancey Street and Eastfield Road is a blind curve.

Map 2.16 Eastfield Elementary Bicycle/Pedestrian Crash Map



Crash data is provided by NCDOT for the years 2000-2009.

3 RECOMMENDATIONS



Chapter Outline:

3.0 Overview **3.1** Methodology **3.2** Safety Improvements **3.3** Infrastructure Facility Types **3.4** East McDowell Junior High **3.5** East McDowell Junior High Priority Projects **3.6** Marion Elementary **3.7** Marion Elementary Priority Projects **3.8** West McDowell Junior High **3.9** West McDowell Junior High Priority Projects **3.10** Phoenix Academy 3.11 Phoenix Academy Priority Projects **3.12** Eastfield Elementary **3.13** Eastfield Elementary Priority Projects

3.0 OVERVIEW

There are two main strategies for creating a safe environment where more students are walking and bicycling to school: physical improvements (engineering) and programs (education, encouragement, and enforcement activities). Engineering topics are covered in this chapter, while programming recommendations are covered in Chapter 5.

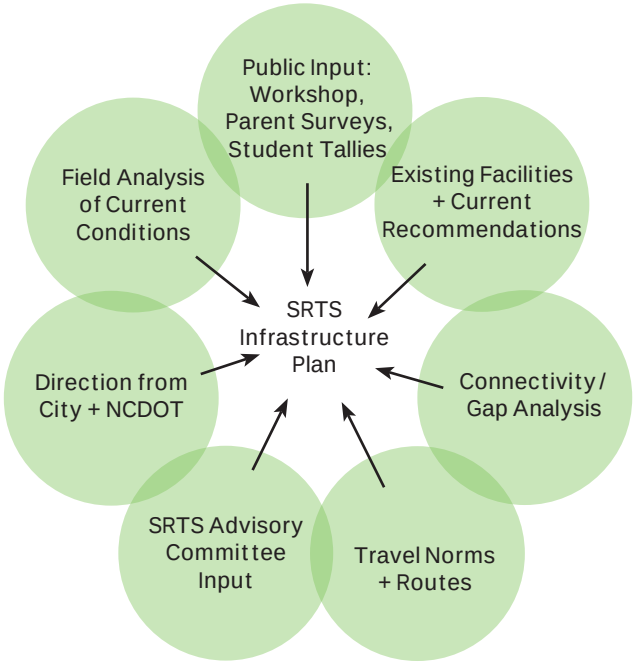
The proposed physical recommendations for East McDowell Junior High School, Marion Elementary, West McDowell Junior High School, Phoenix Academy, and Eastfield Elementary are a series of bicycle and pedestrian improvements that create a safe, connected, and comprehensive system. This chapter presents those recommendations along with key SRTS recommendations and a proposed infrastructure map of each school.

3.1 METHODOLOGY

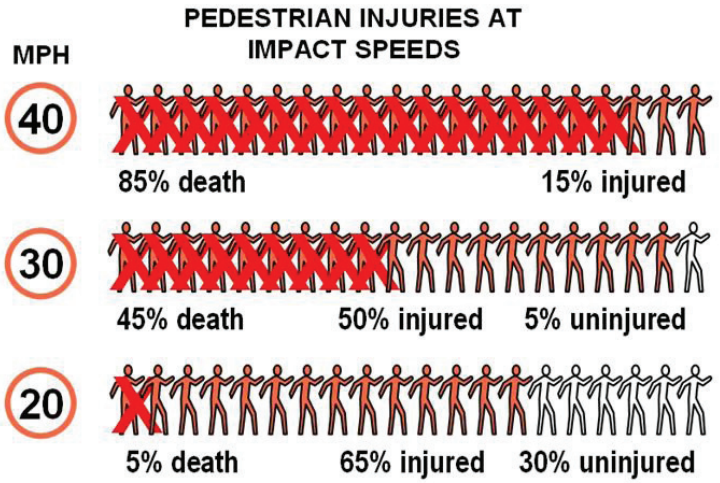
A variety of sources were consulted during the development of the infrastructure recommendations: previous plans and studies, existing conditions, the consultant's fieldwork inventory, public input, and noted patterns of travel. Fieldwork included an examination of conditions at major crossings, conditions along primary corridors, and a consideration of gap connectivity. Map discussion and analysis was conducted at SRTS Advisory Committee meetings and public meetings to pinpoint specific areas in need of infrastructure improvements.

3.2 SAFETY IMPROVEMENTS

One of the main goals of the SRTS program and this Action Plan is the provision of bicycle and pedestrian facilities. Provision of bicycle and pedestrian facilities not only makes walking and bicycling to school feasible options, but makes those options safer, as well. The infrastructure rec-



Above is a diagram of the methodology described in section 3.1 to develop the SRTS Infrastructure Plan.



From: Killing Speed and Saving Lives, U.K. Department of Transportation, London, 1987.

ommendations are geared towards areas in need - where children and parents live and where they are walking today.

It is important to consider current statistical information and national design standards when making these recommendations. Some key statistics include:

• The age group with the highest rate of pedestrian crashes are boys ages 5-9 because of darting across roadways.
• Pedestrians struck at 40 mph have 15 percent survival rate; 95 percent of those hit by a vehicle moving at 20 mph survive.

Table 3.1: Crash Reduction Factors

Countermeasure	Crash Reduction Factor
Install sidewalk	74%
Install pedestrian countdown signal heads	25%
Install pedestrian refuge islands	56%
Improve/install marked crosswalks	25%

2007 FHWA Crash Reduction Factors Study (http://safety.fhwa.dot.gov)

Some of the treatments recommended in this chapter have been proven to reduce crashes, as shown in the 2007 FHWA Crash Reduction Factors Study (http://safety.fhwa.dot.gov). Table 3.1 shows some typical countermeasures and associated crash reduction factors from that study.

Together, all proposed facilities should be developed or improved to create a safer and connected pedestrian network to and from Marion Elementary, Eastfield Elementary, East McDowell Junior High, West McDowell Junior High, and Phoenix Academy. On-road and off-road components should be integrated to provide a connected pedestrian transportation and recreation network. All pedestrian facility projects undertaken by the City of Marion should aim to meet the highest standards possible (using NCDOT, ADA and AASHTO standards) for accessibility for all users.

3.3 INFRASTRUCTURE FACILITY TYPES

There are six project types typically recommended for bicycle and/or pedestrian infrastructure:

• ***Corridor Projects*** - The recommended corridor projects are linear in nature and aim to expand upon the existing network of sidewalks, bicycle lanes, paved shoulders and trails to provide a more connected system which adequately separates pedestrians from roadway travel lanes.

• ***Crossing Improvements*** - Pedestrians have a much greater risk of being struck by a vehicle when crossing a roadway as opposed to walking on the shoulder or sidewalk beside it. Nationally, nearly 75 percent of all police-reported pedestrian crashes involve pedestrians crossing roadway travel lanes. Typical crossing improvement recommendations may include: marking intersection crossings, installing or retrofitting curb ramps, or adding signalization.

• ***Traffic Calming Measures*** - This comprehensive approach seeks to reduce traffic speeds and create a balance between cars, pedestrians, and bicyclists. Traffic calming helps pedestrians and bicyclists feel less threatened by traffic, and helps drivers be more aware of pedestrians. Many installations reduce the width of the roadway at the intersection, also reducing the pedestrian's exposure to traffic. Slowing speeds makes a big difference in safety. Traffic calming may include speed humps, median islands, curb extensions, lane width reduction, etc.

• ***On-campus Improvements*** – Once students have reached campus, they need continuous infrastructure to support the completion of their trip. This may include sidewalks, marked crosswalks, covered walkways, and bicycle parking options.

• ***Other Safety Improvements*** – Additional, site-specific issues and needs may exist such as signage, lighting, flashing beacons, crossing guards, and maintenance.

• ***Long Term Improvements*** – These projects are also critical for SRTS safety but may require a longer-term process or be dependent upon future reconstruction project

3.4 EAST MCDOWELL JUNIOR HIGH SCHOOL

The following section outlines specific recommendations for each project type for East McDowell Junior High School. Short-term or high priority projects are identified and further discussed in Section 3.5.

Table 3.2: East McDowell Junior High Corridor Improvements

Improvement Type	Description	Length
New Sidewalk	Along one side of Baldwin Avenue from 6th to Court (most likely on east side). Negotiations with homeowners and institutions and NCDOT will be necessary to acquire easement and build sidewalk. Driveway access management needed at portions and at-grade railroad pedestrian crossing improvement.	2500 LF
New Sidewalk	Along State Street (south side) from Ann Street to Baldwin Avenue. Driveway access management needed as well.	770 LF
New Sidewalk	Along south side of Court Street from Vine Street to Yancey Street. Driveway access management needed and possible utilization of wide roadway to make quality pedestrian facility.	4635 LF
New Sidewalk	Along one side of Baldwin Avenue entrance to school, potentially with bollards to separate walkway from driveway.	1100 LF
New Multi-use Path	Rail-trail project from State to east of Baldwin Avenue (Peavine Rail Trail).	6000+ LF
New Sidewalk	Along west side of McDowell Street from Court Street to State Street.	860 LF

Corridor Improvements

See Table 3.2 above for a complete list of corridor improvements. All corridor improvements should be ADA-compliant, contain curb ramps, marked crosswalks, and sidewalk buffers if possible. See Appendix D for appropriate design guidelines.

Crossing Improvements

1. School entrance and State Street (front of school)

• Make existing marked crosswalk high-visibility across State Street. Raise crosswalk as traffic calming mechanism.

• Add curb bulb-out for State Street crossing, especially on school side, extend curb bulb-out to parallel parking edge.

• Make existing marked crosswalk high-visibility across school entrance driveways.

• Extend median refuge (that separates incoming and outgoing traffic) into crosswalk. Provide curb ramps through refuge.

• Maintain crossing guard/police presence at this crossing to slow traffic and assist children.

2. Court Street and Baldwin Avenue

• Stripe high-visibility crosswalks on east side of Baldwin Avenue crossing Court Street (with advanced stop lines). Stripe additional crosswalks as sidewalks are added.

• Construct new curb ramps with marked crosswalks.

• Provide pedestrian countdown signals.

• Implement right-turn-on-red restriction when pedestrians are present for right turning traffic off Baldwin Avenue to Court Street.

3. State Street and Clay Street

• Existing sidewalk shifts from south side of State Street (from east) to north side of State (to west) without crossing facilities. Sidewalks are needed on both sides of the street and pedestrian crossing facilities are needed at intersections.

• At Clay Street, provide high-visibility marked crosswalk across State Street from existing sidewalk on east side of intersection with curb ramps.

• Provide high-visibility marked crosswalk across Clay Street on north side of intersection to connect with existing sidewalk.

• Add pedestrian crossing signage in both directions on State Street.

4. State Street and Miller Avenue

• Improve existing marked crosswalk to be high-visibility.

• Provide curb ramps.

5. Baldwin Avenue and 6th Street

• Current crossing distance across 6th Street is long, with existing sidewalk on both sides. Decrease crossing distance by retro-fitting corner radii or adding curb extensions.

• Provide high-visibility marked crosswalk.

• Due to intersection skew and long crossing, provide small median refuge as a traffic calming mechanism and a refuge for pedestrians.

• Include curb ramps at refuge and at sidewalk/crosswalk.



The crossing across 6th Street at Baldwin Avenue is currently long and dangerous.



This photo rendering shows how a median refuge and high-visibility crosswalk would make this intersection more pedestrian friendly.

6. Baldwin Avenue existing sidewalk and intersecting streets

• Provide high-visibility marked crosswalk across intersecting streets where existing sidewalk is present.

7. Baldwin Avenue and State Street

• Add high-visibility marked crosswalk.

• Add pedestrian countdown signalization in all directions.

• Add pedestrian signage.

Traffic Calming Measures

• Extend school zone along State Street to Baldwin Avenue (east) and to Miller Avenue (west).

•Extend school zone along Baldwin Avenue north to Court Street and south to 6th Street.

On-campus Improvements

• Provide bicycle racks on campus at convenient location near main entrance.

Other Improvements

• Provide driveway access management along Baldwin Avenue with new sidewalk. For example, improve rocky, uneven surface near the Thrift Store at Perry Street/Morehead Road crossing of Baldwin Avenue to smooth, connected sidewalk.

• In addition to recommended sidewalk on south side of State Street from school to Baldwin Avenue, driveway entrances along this corridor should be reduced and narrowed for safer pedestrian travel.

Long Term Improvements

Court Street

• As a major corridor, there is opportunity to make it more bicycle and pedestrian friendly. Improvements to this road would help walkability for both Marion Elementary and East Junior High School.

• Provide sidewalks along south side of Court Street.

• Driveway access management is necessary.

• With excess roadway width, provide bicycle lanes and/or widened sidewalk with buffer on south side of street.



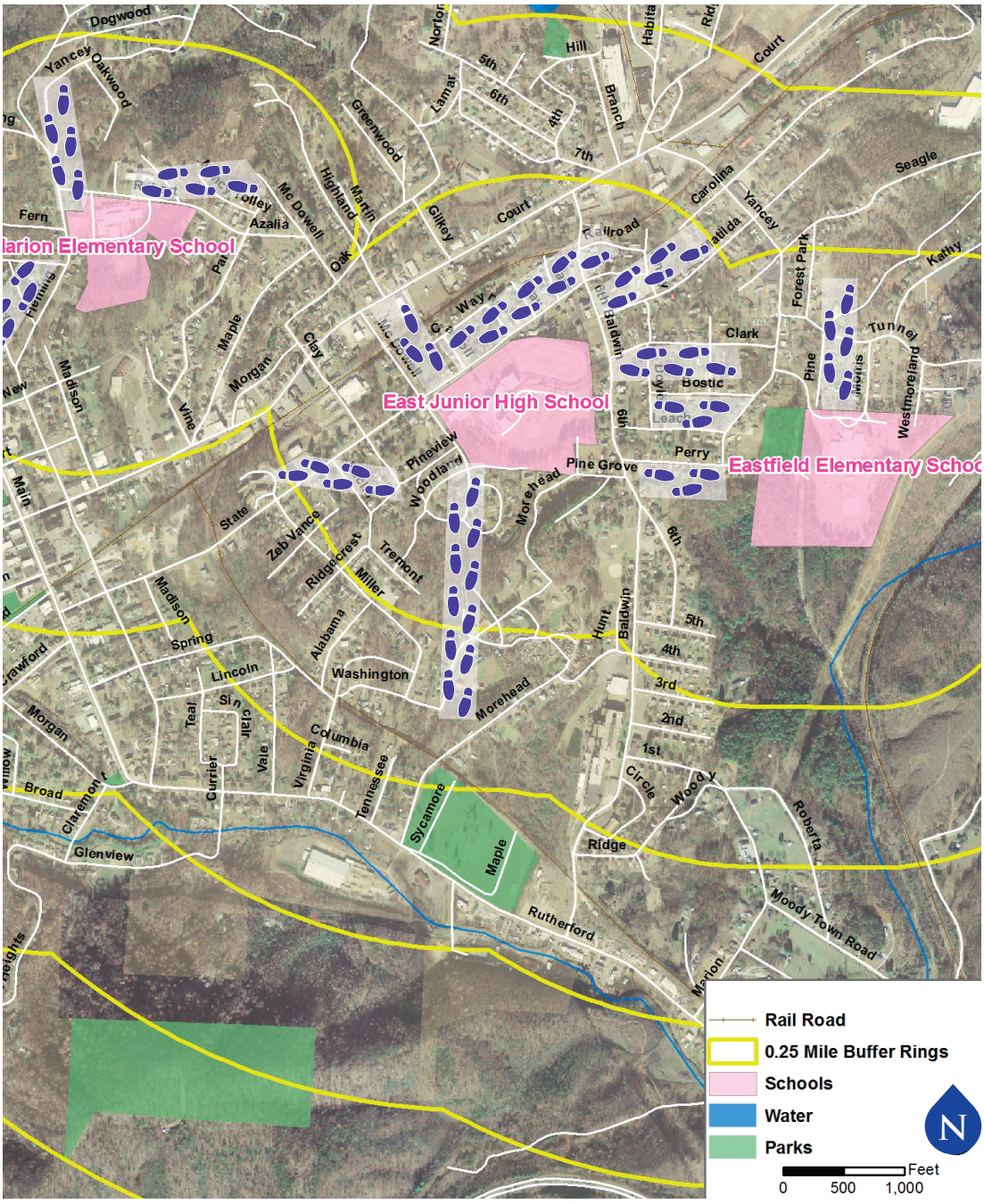
Baldwin Avenue has many safety issues, including this railroad crossing with very limited sight distance.

3.5 EAST MCDOWELL JUNIOR HIGH PRIORITY PROJECTS

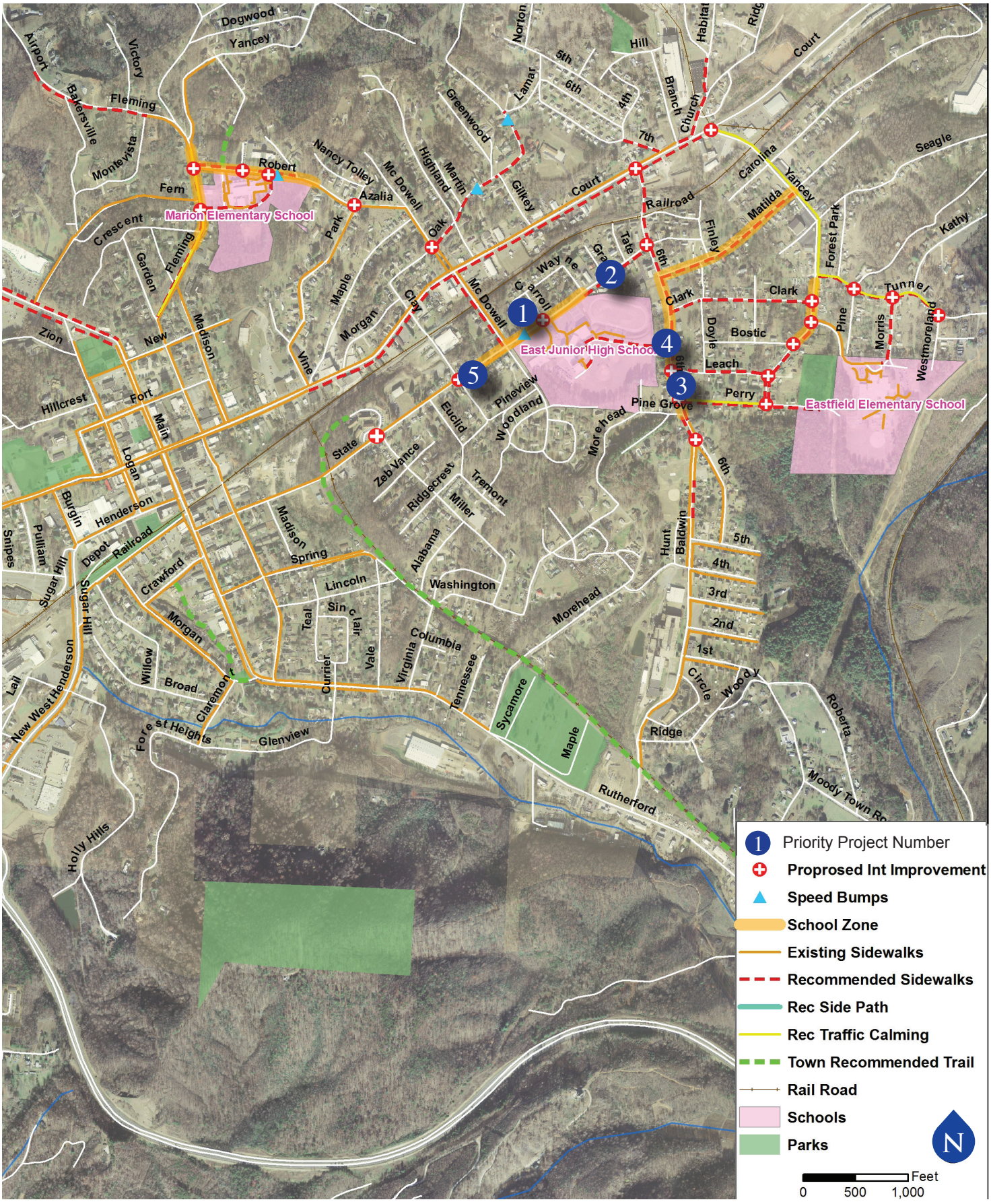
Overview

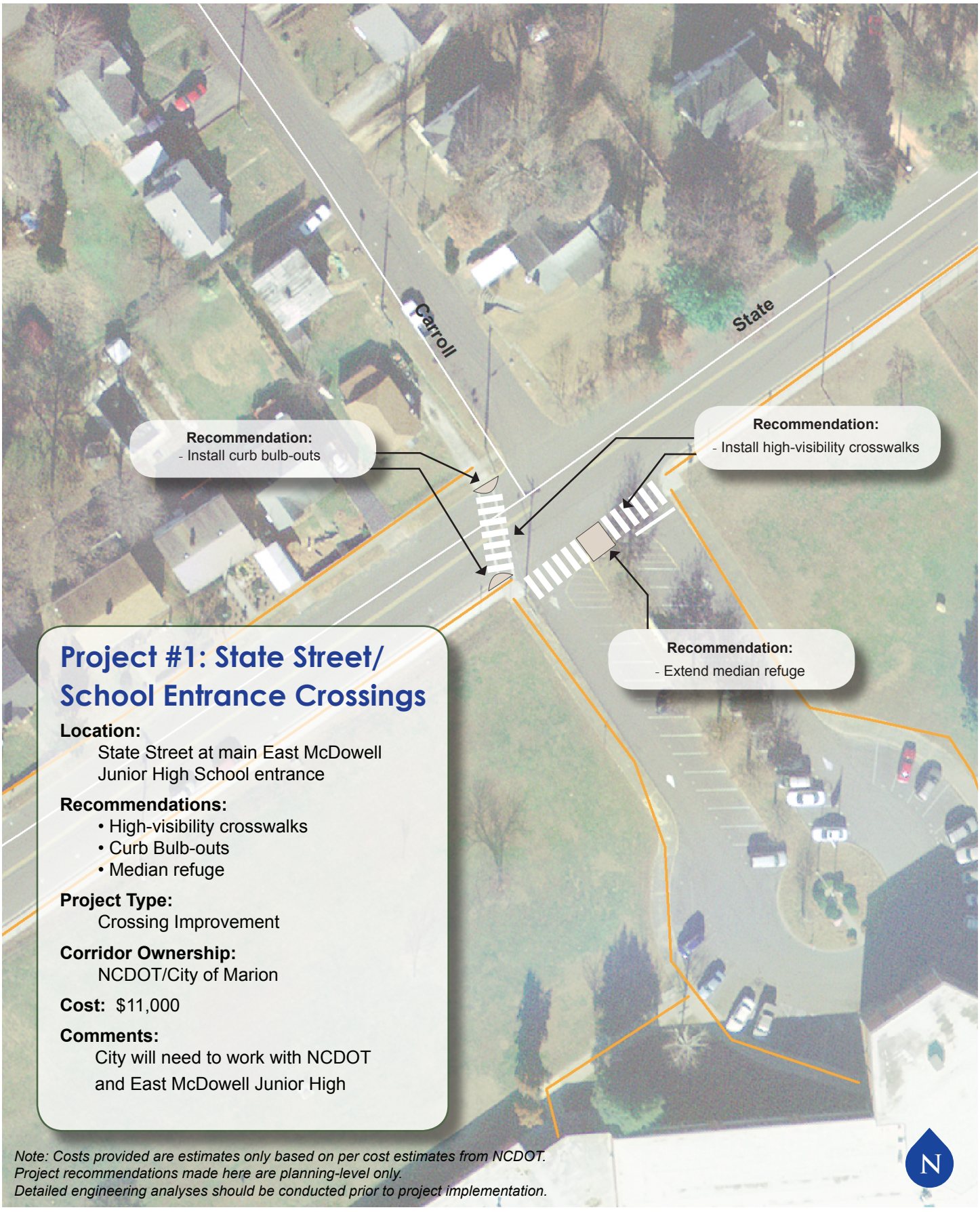
A comprehensive network of engineering improvements is recommended for the East McDowell Junior High School area. In Map 3.1 local travel routes that are already viable are illustrated with footprints. Specific network projects have been identified as integral to improving bicycle and pedestrian safety around the East McDowell Junior High School. These are the top priority projects of the comprehensive recommended network seen in Map 3.2. The project number on the map identifies the location of each priority project. The following pages provide detailed map recommendations, photos, and cost estimates. Note: Because of the proximity of the three schools, improvements at one school will impact walkability at other schools as well.

Map 3.1: East McDowell Junior High School Travel Map



Map 3.2 East McDowell Junior High School Priority Projects





Project #1: State Street/ School Entrance Crossings

Location:
State Street at main East McDowell Junior High School entrance

Recommendations:
- High-visibility crosswalks
- Curb Bulb-outs
- Median refuge

Project Type:
Crossing Improvement

Corridor Ownership:
NCDOT/City of Marion

Cost: $11,000

Comments:
City will need to work with NCDOT and East McDowell Junior High

Note: Costs provided are estimates only based on per cost estimates from NCDOT.
Project recommendations made here are planning-level only.
Detailed engineering analyses should be conducted prior to project implementation.

Project #1: State Street/School Entrance Crossings

Importance

Since State Street is adjacent to East McDowell Junior High School, crossing improvements will make a big difference in safety and walkability. A significant amount of pedestrians cross State Street with the help of a police officer and cross the school entrance and exit driveways. With on-street parking present and a fair amount of traffic (especially during school arrival and departure hours), these enhancements will make pedestrian facilities more visible.

Recommended Solutions

State Street Crossing

- The current marked crosswalk is low-visibility and should be made high-visibility (continental style).
- The high-visibility marked crosswalk would be ideal as a raised crosswalk to help calm traffic more.
- With on-street parking present, provide curb bulb-out on both sides of the street in order to make pedestrians more visible to motorists and vice versa. Bulb-outs would not conflict with turning movements in and out of the school.
- Maintain crossing guard/police presence to account for traffic and heavy number of pedestrians.

School Entrance Crossing

- The current marked crosswalk is low-visibility (faded paint) and should be made high-visibility (continental style).
- Median refuge should be extended slightly so that marked crosswalk runs through it.
- Provide curb ramps through the refuge island.



The current entrance to East McDowell Junior High School lacks adequate crossing facilities.



This photo rendering shows what this intersection would like with the recommended changes.

Project #2: State Street Corridor Improvements

Location:
South side of State Street from existing sidewalk (across from Wayne) to Baldwin Avenue

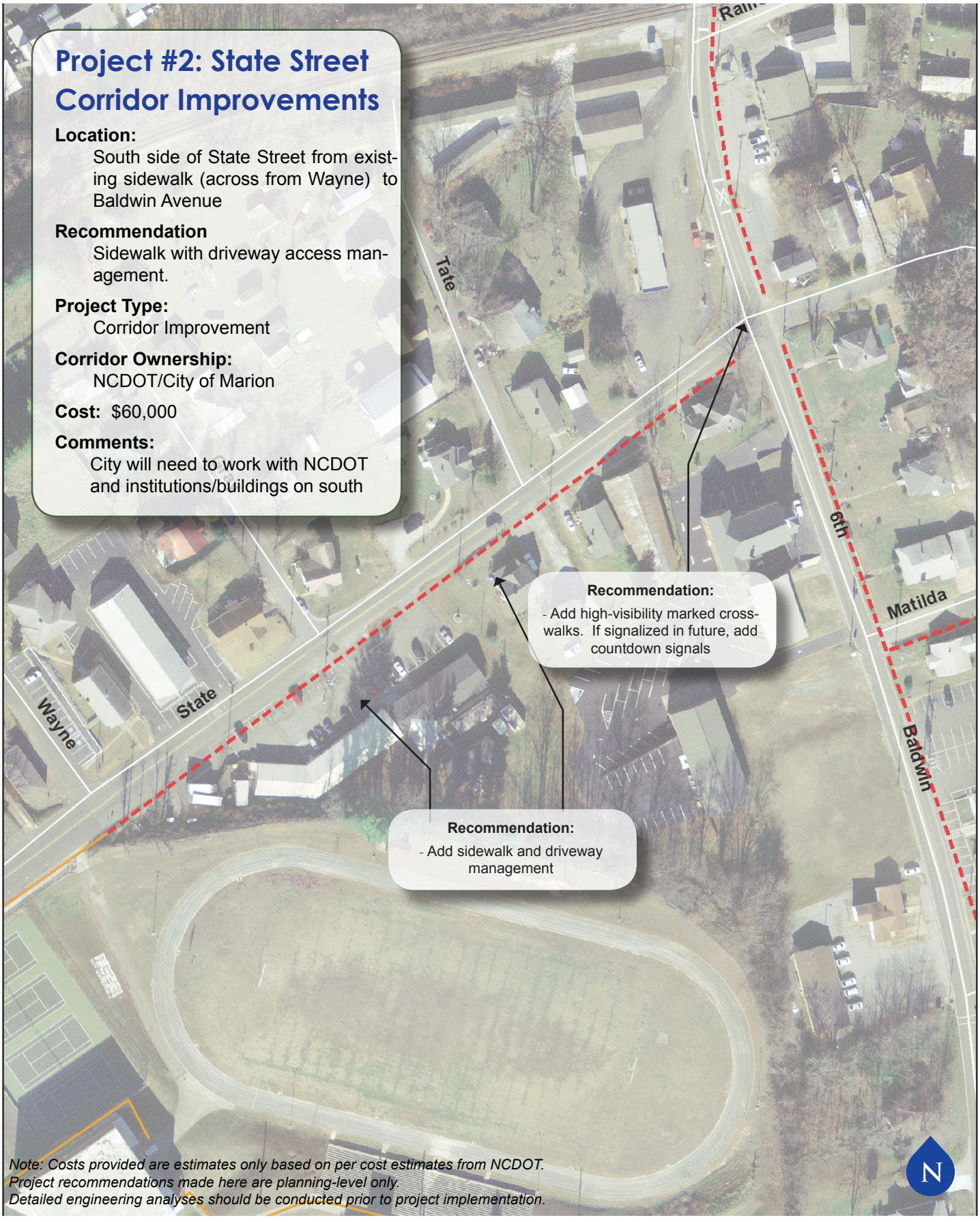
Recommendation
Sidewalk with driveway access management.

Project Type:
Corridor Improvement

Corridor Ownership:
NCDOT/City of Marion

Cost: $60,000

Comments:
City will need to work with NCDOT and institutions/buildings on south



Note: Costs provided are estimates only based on per cost estimates from NCDOT.
Project recommendations made here are planning-level only.
Detailed engineering analyses should be conducted prior to project implementation.

Project #2: State Street Corridor Improvements

Importance

Existing sidewalk stops just east of East McDowell Junior High School on State Street. From there, pedestrians are forced to walk through a wide, open driveway/parking lot almost to Baldwin Avenue. A number of students live across Baldwin Avenue and need to walk in this direction. Improvements here will make pedestrian facilities stand out more and slow traffic.

Recommended Solutions

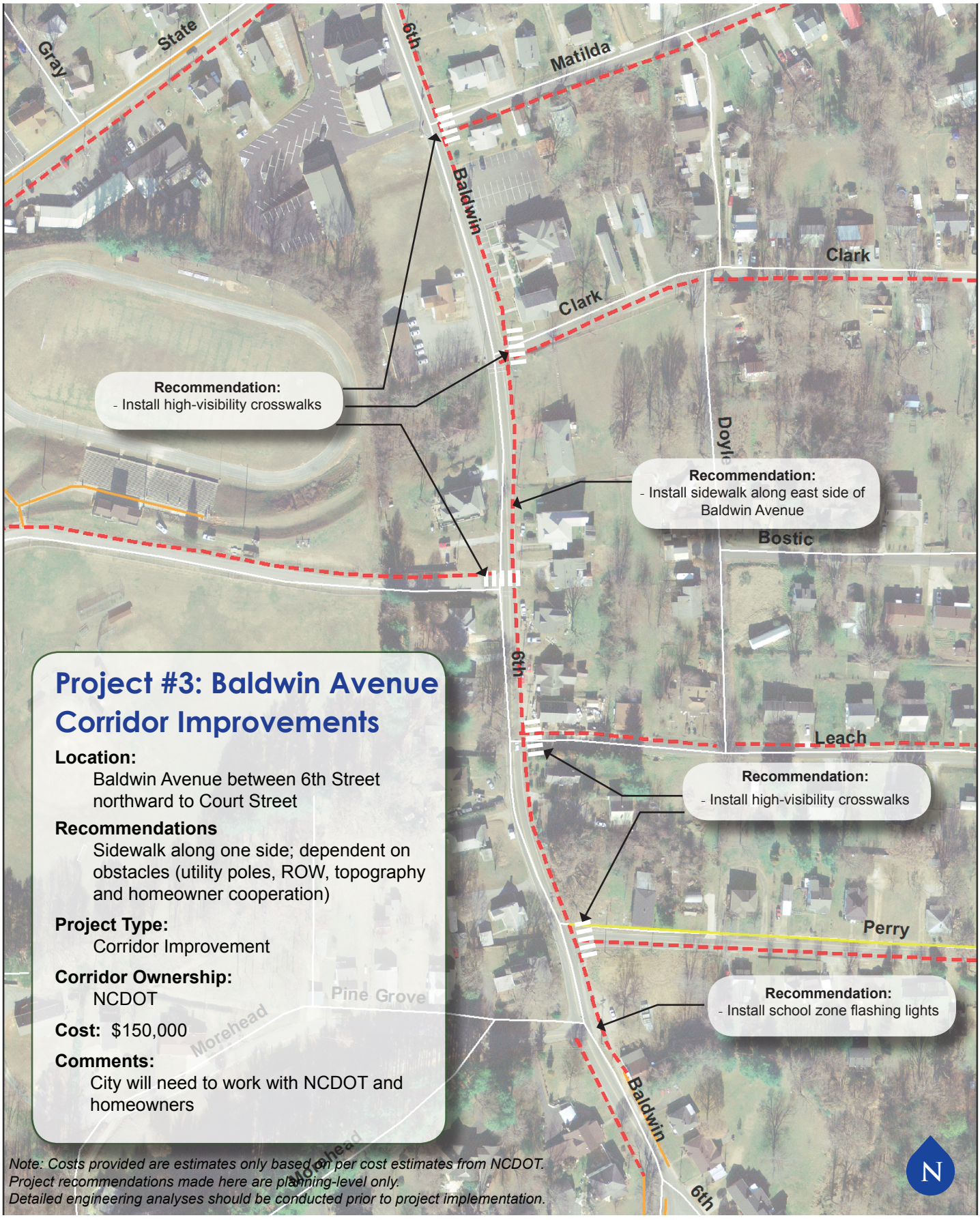
- Continue sidewalk across from Wayne Street to Baldwin Avenue.
- Reduce size and number of driveway/parking lot entrance points, creating a separated, safer space for pedestrians.
- Extend school zone eastward to Baldwin Avenue.
- Add high-visibility marked crosswalk at State and Baldwin.



State Street is adjacent to a wide driveway/ parking lot with no sidewalk available.



As shown in this photo rendering, a sidewalk, a grass-buffer and a reduction in the entrance points to the parking lot would make this a safer place to walk.



Project #3: Baldwin Avenue Corridor Improvements

Location:
Baldwin Avenue between 6th Street northward to Court Street

Recommendations
Sidewalk along one side; dependent on obstacles (utility poles, ROW, topography and homeowner cooperation)

Project Type:
Corridor Improvement

Corridor Ownership:
NCDOT

Cost: $150,000

Comments:
City will need to work with NCDOT and homeowners

Note: Costs provided are estimates only based on per cost estimates from NCDOT.
Project recommendations made here are planning-level only.
Detailed engineering analyses should be conducted prior to project implementation.

Project #3: Baldwin Avenue Corridor Improvements

Importance

As a roadway adjacent to East McDowell Junior High School, Baldwin Avenue is an important collector roadway that connects multiple neighborhoods to the school. Existing sidewalk is found from 6th Street southward on Baldwin Avenue. To make pedestrian-friendly, a sidewalk is absolutely critical along this two-lane road.

Recommended Solutions

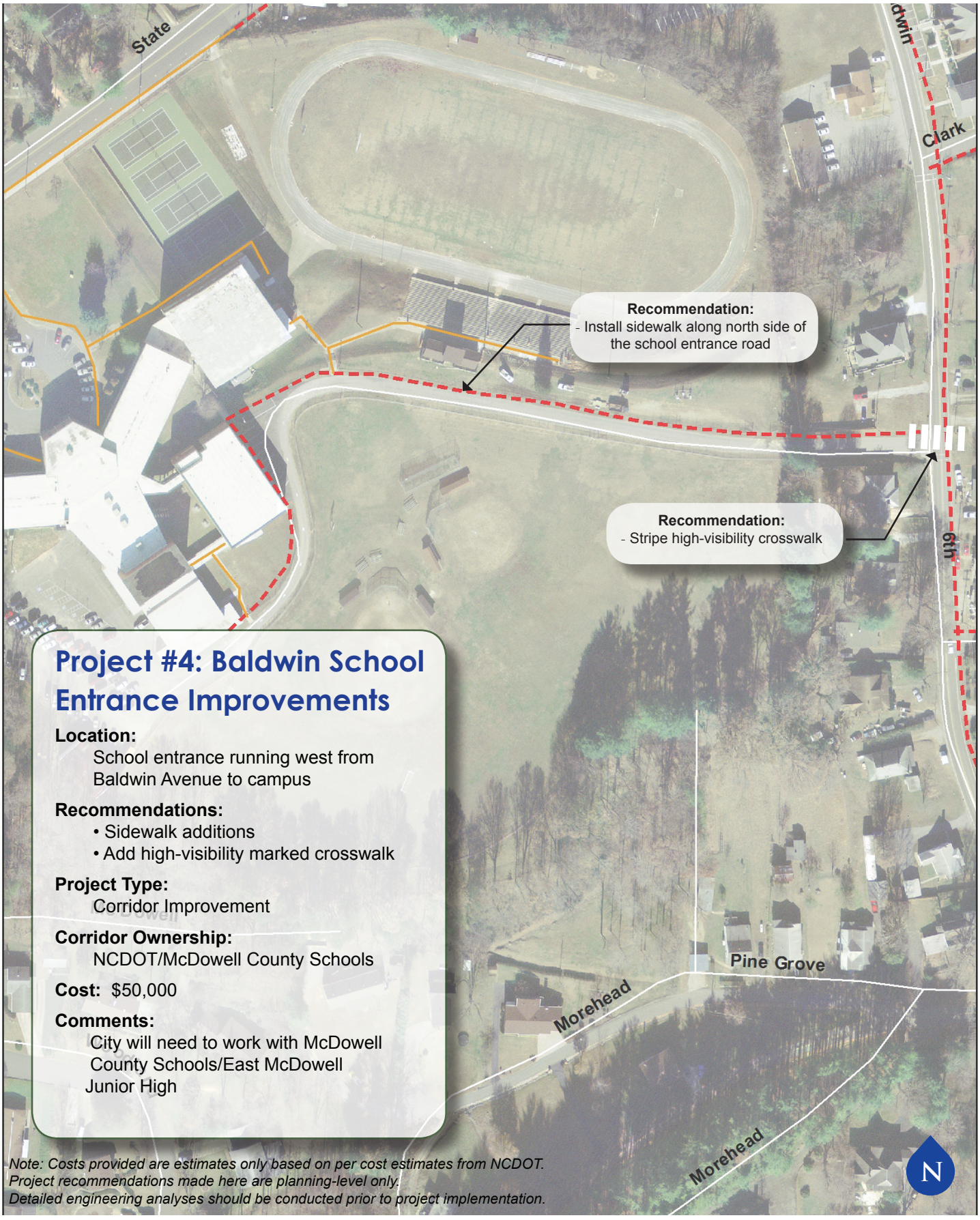
• Provide sidewalk along one side of Baldwin Avenue, possibly its east side. The sidewalk may need to shift sides based on topography/drainage, ROW, utilities, and homeowner concerns. If sidewalk does shift, highly visible marked crosswalks should be provided at each shift location.
• Driveway access management must be addressed at some locations, especially on east side of Baldwin Avenue including: near thrift store at Morehead Road/Perry Street crossing, and businesses between State Street and Court Street.
• Clearly defined and safe railroad crossing is necessary for pedestrians.
• Marked crosswalks should be provided across each intersecting street.
• Flashing lights should be added to school zone signage. Speeding should be enforced, especially during school hours. A crossing guard should be considered at the school entrance and at State Street.
• Install traffic calming treatments for Baldwin Avenue.
• Reduce speed limit and increase enforcement.



As seen in this photo, Baldwin Avenue lacks sidewalks on both sides and the crosswalks are low-visibility and faded.



School zone signage should be accompanied by flashing lights to gain the motorist's attention.



Project #4: Baldwin School Entrance Improvements

Location:
School entrance running west from Baldwin Avenue to campus

Recommendations:
- Sidewalk additions
- Add high-visibility marked crosswalk

Project Type:
Corridor Improvement

Corridor Ownership:
NCDOT/McDowell County Schools

Cost: $50,000

Comments:
City will need to work with McDowell County Schools/East McDowell Junior High

Note: Costs provided are estimates only based on per cost estimates from NCDOT. Project recommendations made here are planning-level only. Detailed engineering analyses should be conducted prior to project implementation.

Project #4: Baldwin School Entrance Improvements

Importance

With convenient access off Baldwin Avenue, this is a natural entry point to the school campus for any pedestrians coming from the south and east. There currently is no separated space for pedestrians. Enhancing this space for pedestrians will encourage more pedestrian travel to campus.

Recommended Solutions

- Add sidewalk likely on the north side of the entrance road.
- Provide curb or bollards to clearly distinguish sidewalk space from driveway.
- Provide high-visibility marked crosswalks where necessary.
- Crosswalk is currently on south side of the intersection; stripe crosswalk on the north side to align with new sidewalk to the school. Add flashing beacon lights and/or school zone flashing lights along Baldwin Avenue.
- Add crossing guard(s) at Baldwin School entrance.

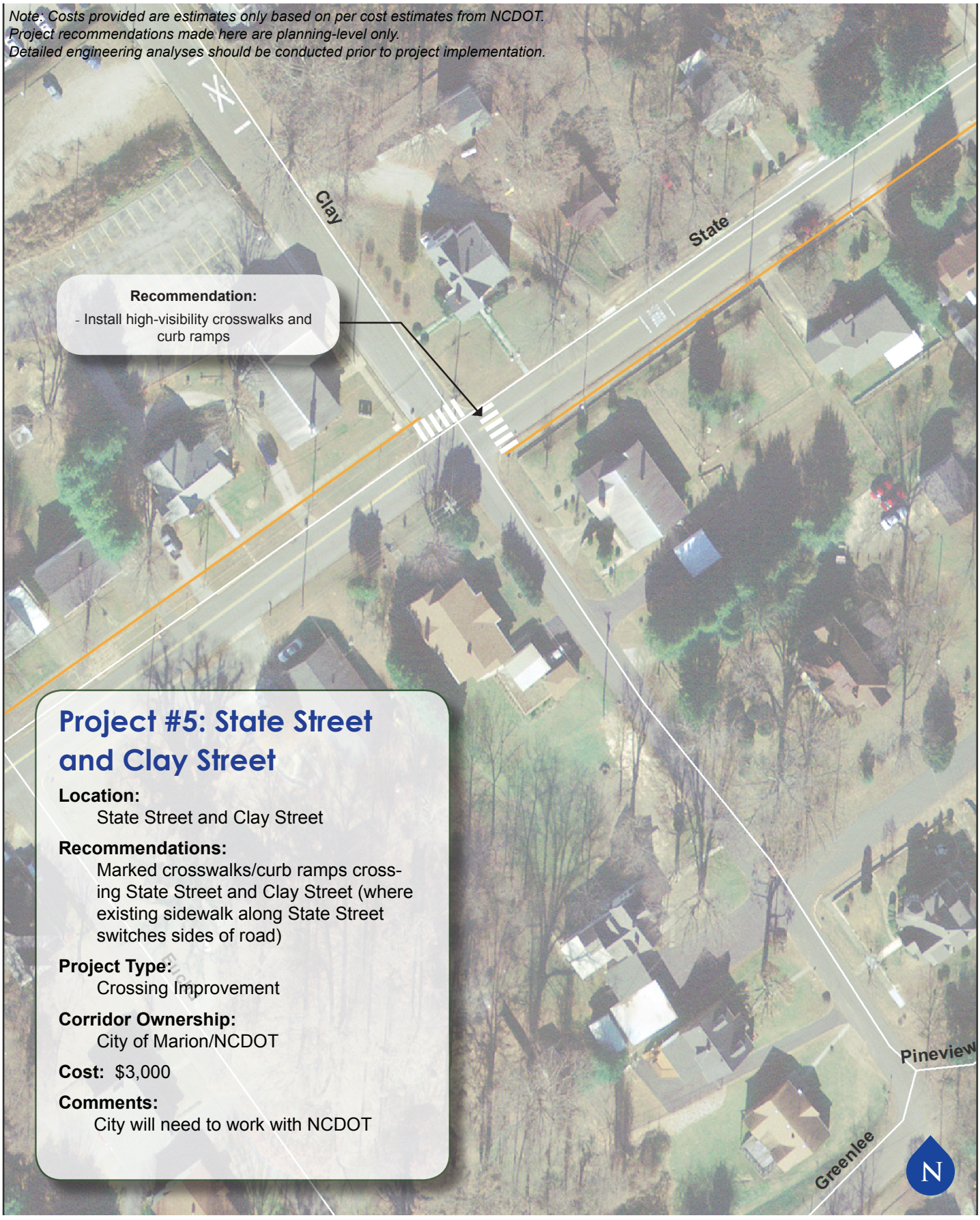


The Baldwin Avenue entrance to the school has plenty of room for a sidewalk on the north side, as seen in this photo.



The Baldwin Avenue entrance has faded, low-visibility crosswalks across Baldwin Avenue.

Note: Costs provided are estimates only based on per cost estimates from NCDOT.
Project recommendations made here are planning-level only.
Detailed engineering analyses should be conducted prior to project implementation.



Project #5: State Street and Clay Street

Location:
State Street and Clay Street

Recommendations:
Marked crosswalks/curb ramps crossing State Street and Clay Street (where existing sidewalk along State Street switches sides of road)

Project Type:
Crossing Improvement

Corridor Ownership:
City of Marion/NCDOT

Cost: $3,000

Comments:
City will need to work with NCDOT

Project #5: State Street and Clay Street

Importance

The sidewalk along State Street changes sides of the road in close proximity to the school. It is critical to provide an accommodation for pedestrians wanting to stay on the sidewalk.

Recommended Solutions

- Provide high-visibility marked crosswalk across State Street on east side of intersection.
- Provide high-visibility marked crosswalk across Clay Street on north side of intersection.
- Provide curb ramps for both marked crosswalks.
- Add pedestrian crossing signage in both directions on State Street.



The State Street and Clay Street intersection lacks pedestrian crossing facilities.



As shown in this photo rendering, high-visibility crosswalks and curb ramps enhance this intersection.

3.6 MARION ELEMENTARY

The following section outlines specific recommendations for each project type for Marion Elementary School. Short-term or high priority projects are identified and further discussed in Section 3.7.

Corridor Improvements

See Table 3.3 below for a complete list of corridor improvements.

Table 3.3: Marion Elementary Corridor Improvements

Improvement Type	Description	Length
New Sidewalk	Along Fleming Avenue school entrance to meet on-campus sidewalks and on to Robert Street.	860 LF
New Multi-use Path	Connection from Oakwood Drive cul-de-sac up hill through church property to Robert Street and Marion Elementary	470 LF
New Sidewalk	Along Oak Street from McDowell Avenue to Lamar Street (one side).	1750 LF
New Sidewalk	Along Fleming/Airport from Robert to just beyond Bakersville	2200 LF
New Sidewalk	North side of Robert from Fleming to Richard	800 LF



Fleming Street is missing sidewalks near campus.

Crossing Improvements

1. Robert Street Mid-block Crossings

- Make existing marked crosswalks high-visibility.
- Incorporate curb ramps at marked crosswalks, where they are not currently present.
- Raise crosswalk at school bus entrance.
- Provide curb bulb-outs at crosswalks (extensions to edge of current parallel parking zone).
- Provide in-roadway crossing sign at raised crosswalk.

2. Robert Street and Fleming Avenue

- Make existing marked crosswalks high-visibility (currently faded and low-visibility).
- Improve curb ramps to include truncated domes; also improve cracking pavement.
- Provide high-visibility marked crosswalk for crossing Robert Street (connecting existing sidewalk on east side of Fleming Avenue). Mark advanced stop line.
- Provide a crossing guard at this location.

3. Fern Avenue and Fleming Avenue

• Provide high-visibility marked crosswalk on north side of Fern Avenue, crossing Fleming Avenue (to match existing sidewalk on Fern Avenue).

• Provide curb ramps on both sides.

• Raise the crosswalk as a means to slow traffic.

• As sidewalk is added along west side of Fleming Avenue, provide high-visibility marked crosswalk, curb ramps, and curb extensions for crossing Fern Avenue. Stripe high-visibility crosswalks with advanced stop lines.

4. Robert Street and Park Avenue

• Stripe high-visibility crosswalks across Park Avenue to connect existing sidewalks along south side of Robert Street. Stripe advanced stop lines.

• Provide curb ramps.

5. McDowell Avenue and Oak Street

• Make existing marked crosswalk crossing McDowell Avenue on south side a high-visibility marked crosswalk.

• Add high-visibility marked crosswalk crossing Oak Street on west side, connecting existing sidewalk along McDowell Avenue. Stripe high-visibility crosswalks with advanced stop lines. Add a new high-visibility crosswalk and curb ramps.

• Add pedestrian crossing signage for traffic approaching intersection on Oak Street.

6. McDowell Avenue and Court Street

• Re-stripe existing marked crosswalk to make high-visibility.

• Driveway access management needs to be addressed on both corners (south side of intersection).

Traffic Calming Measures

• Extend school zone on Fleming Avenue to Garden Street.

• Add curb bulb-outs, especially along Robert Street where on-street parking is present.

• Provide gateway traffic calming along Fleming Avenue near N. Madison Street. Roadway width allows for a median island, mini traffic circle, and/or landscaping.

• Provide sidewalk along Fleming Avenue at least at Crescent Drive where blind curve makes pedestrian travel difficult. Because of topography, may need to be in-roadway striped bicycle/pedestrian lane with small vertical structure separating car traffic from pedestrian traffic.

• Reduce speed limit and incorporate additional pedestrian signage on Fleming Avenue from Yancey to Garden.

• On Robert Street, provide curb bulb-outs at marked crosswalks and raise one crosswalk.

On-campus Improvements

• Provide bicycle racks on campus at convenient location near main entrance.
• Construct secondary pick-up and drop-off.

Other Improvements

• Improve/maintain existing sidewalks around campus area, especially along Robert Street and Park Avenue area.

• Improve all curb ramps to follow modern guidelines with truncated domes.

Long-term Improvements

• Due to the current width of Court Street, a major corridor between Marion Elementary School and East Junior High School, there are opportunities to make it more pedestrian and bicycle friendly. Improvements to this area will benefit both schools.

• Provide sidewalks along south side of Court Street.

• Driveway access management is necessary.

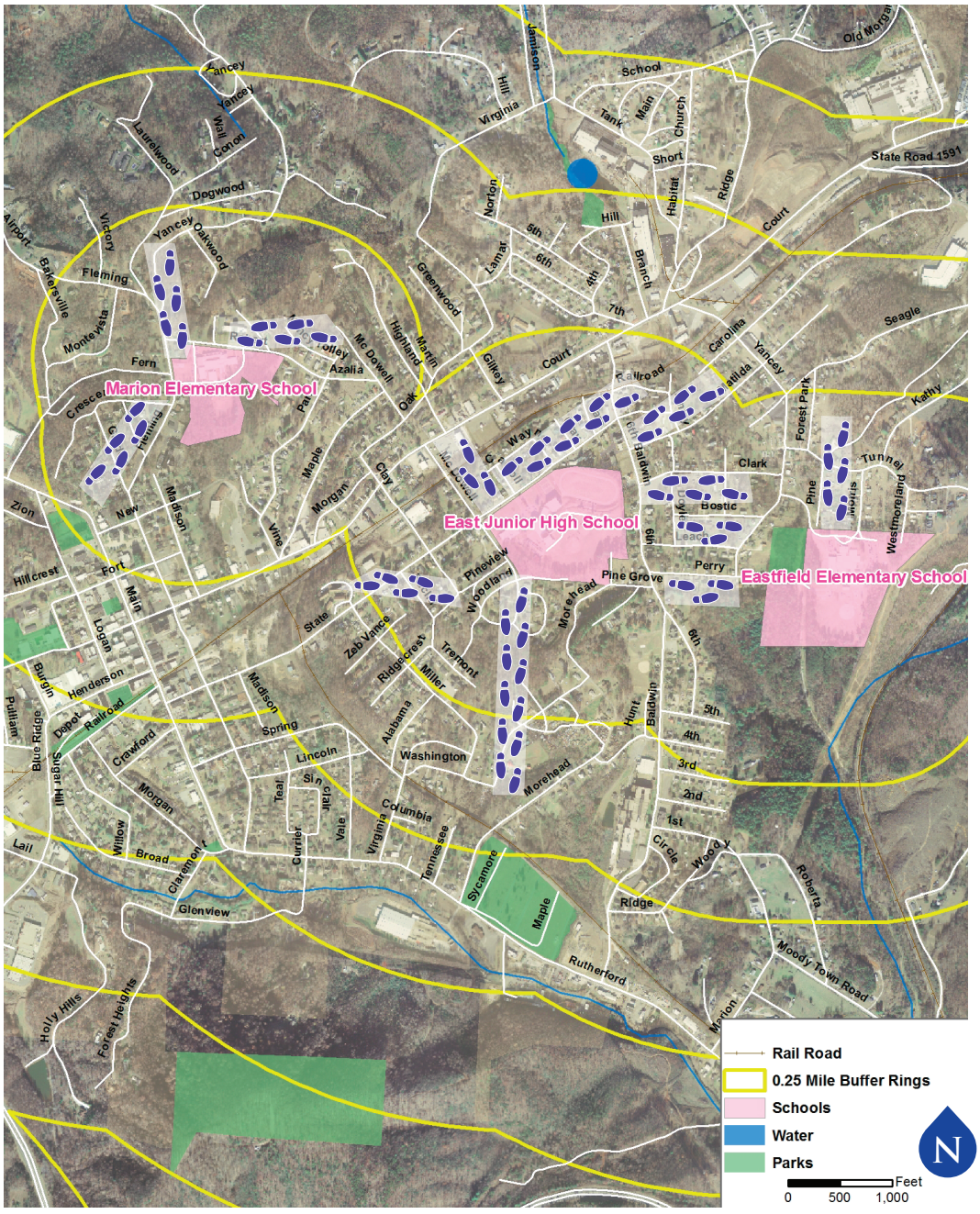
• On Court Street, options for long-term traffic calming and improvement include: adding bicycle lanes and/or widening the sidewalk with a buffer on south side of street.

3.7 MARION ELEMENTARY PRIORITY PROJECTS

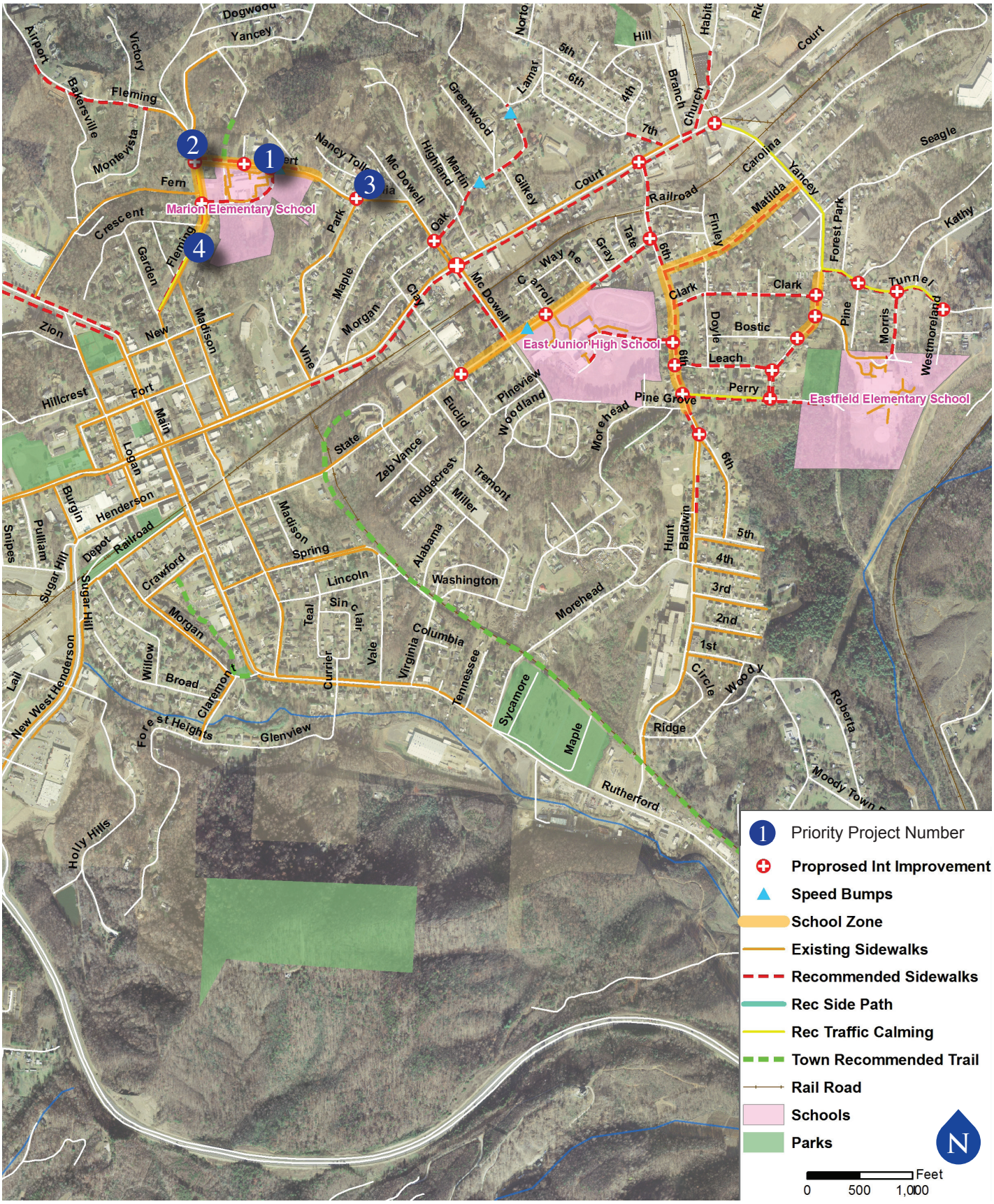
Overview

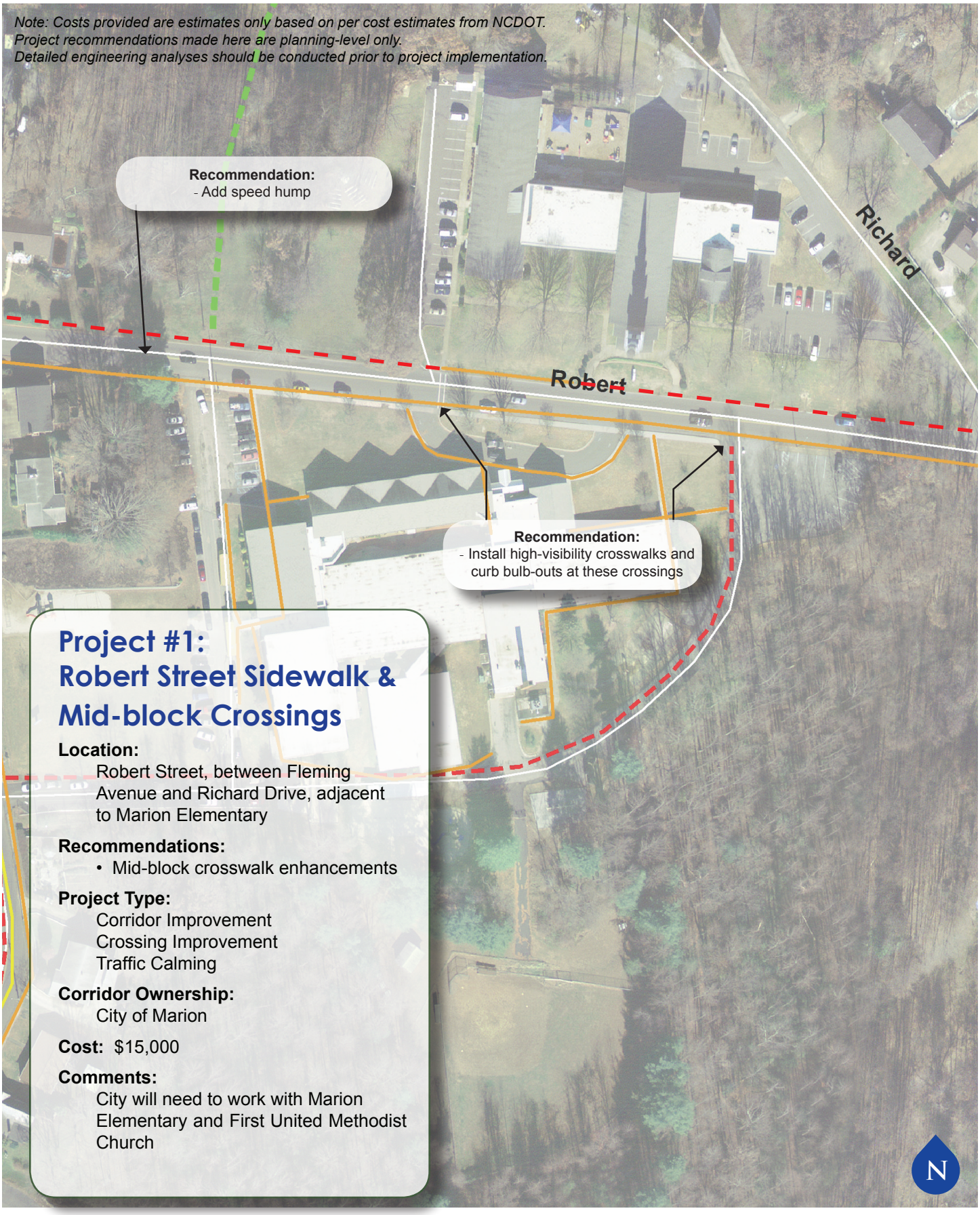
A comprehensive network of engineering improvements is recommended for the Marion Elementary School area. In Map 3.3 local travel routes that are already viable are illustrated with footprints. Specific network projects have been identified as integral to improving bicycle and pedestrian safety around the Marion Elementary School. These are the top priority projects of the comprehensive recommended network seen in Map 3.4. The project number on the map identifies the location of each priority project. The following pages provide detailed map recommendations, photos, and cost estimates.

Map 3.3: Marion Elementary Travel Map



Map 3.4: Marion Elementary Priority Projects





Project #1: Robert Street Sidewalk & Mid-block Crossings

Location:
Robert Street, between Fleming Avenue and Richard Drive, adjacent to Marion Elementary

Recommendations:
- Mid-block crosswalk enhancements

Project Type:
Corridor Improvement
Crossing Improvement
Traffic Calming

Corridor Ownership:
City of Marion

Cost: $15,000

Comments:
City will need to work with Marion Elementary and First United Methodist Church

Project #1: Robert Street Sidewalk & Mid-block Crossings

Importance

As one of the roadways adjacent to Marion Elementary, improvements will make a big difference in safety and walkability. A significant amount of pedestrians cross this roadway between the church and the school. With on-street parking present and a fair amount of traffic (especially during school arrival and departure hours), these enhancements will make pedestrian facilities more visible.

Recommended Solutions

- Add sidewalk on north side of Robert Street.
- The two current marked crosswalks are low-visibility and should be made high-visibility (continental style).
- With on-street parking present, curb bulb-outs should be provided at each crosswalk in order to make pedestrians more visible to motorists and vice versa.
- Add curb ramps where they are not currently present for marked crosswalks.
- Add in-roadway pedestrian crossing signs.
- Add additional speed hump (or construct crosswalk as raised crosswalk) on Robert Street near Fleming Av enue.



The current crosswalk across Robert Street is faded and low-visibility.



High-visibility crosswalks and curb bulb-outs decrease crossing distance and provide safer crossing environment for pedestrians.

Note: Costs provided are estimates only based on per cost estimates from NCDOT.
Project recommendations made here are planning-level only.
Detailed engineering analyses should be conducted prior to project implementation.



Project #2: Robert Street & Fleming Avenue Intersection

Location:
Robert Street and Fleming Avenue

Recommendation:
Crosswalk enhancements (high-visibility crosswalks and curb ramps)

Project Type:
Crossing Improvement

Corridor Ownership:
City of Marion

Cost: $7,000

Comments:
None

Recommendation:
- Stripe high-visibility crosswalks, and add curb ramps

Project #2: Robert Street & Fleming Avenue Intersection

Importance

Robert Street and Fleming Avenue are adjacent to the Marion Elementary School property. This intersection is a confluence of pedestrian traffic coming from the north and south. Currently, the marked crosswalk is low-visibility and faded. Traffic is significant along Fleming Avenue and there is a blind curve coming from north. Improvements here will notify motorists of pedestrian crossing facilities and slow automobile traffic.

Recommended Solutions

• Re-stripe existing low-visibility marked crosswalk crossing Fleming Avenue to high-visibility (continental style).
• A high-visibility marked crosswalk should be added crossing Robert Street to connect existing sidewalk on the east side of Fleming Avenue.
• Improve curb ramps to include truncated domes; also improve cracking pavement where roadway interfaces with the curb.
• Provide a crossing guard at this location, especially if number of pedestrians increases in the future. There is significant traffic at this intersection, especially during drop-off and pick-up hours. A crossing guard will help control traffic and guide children.

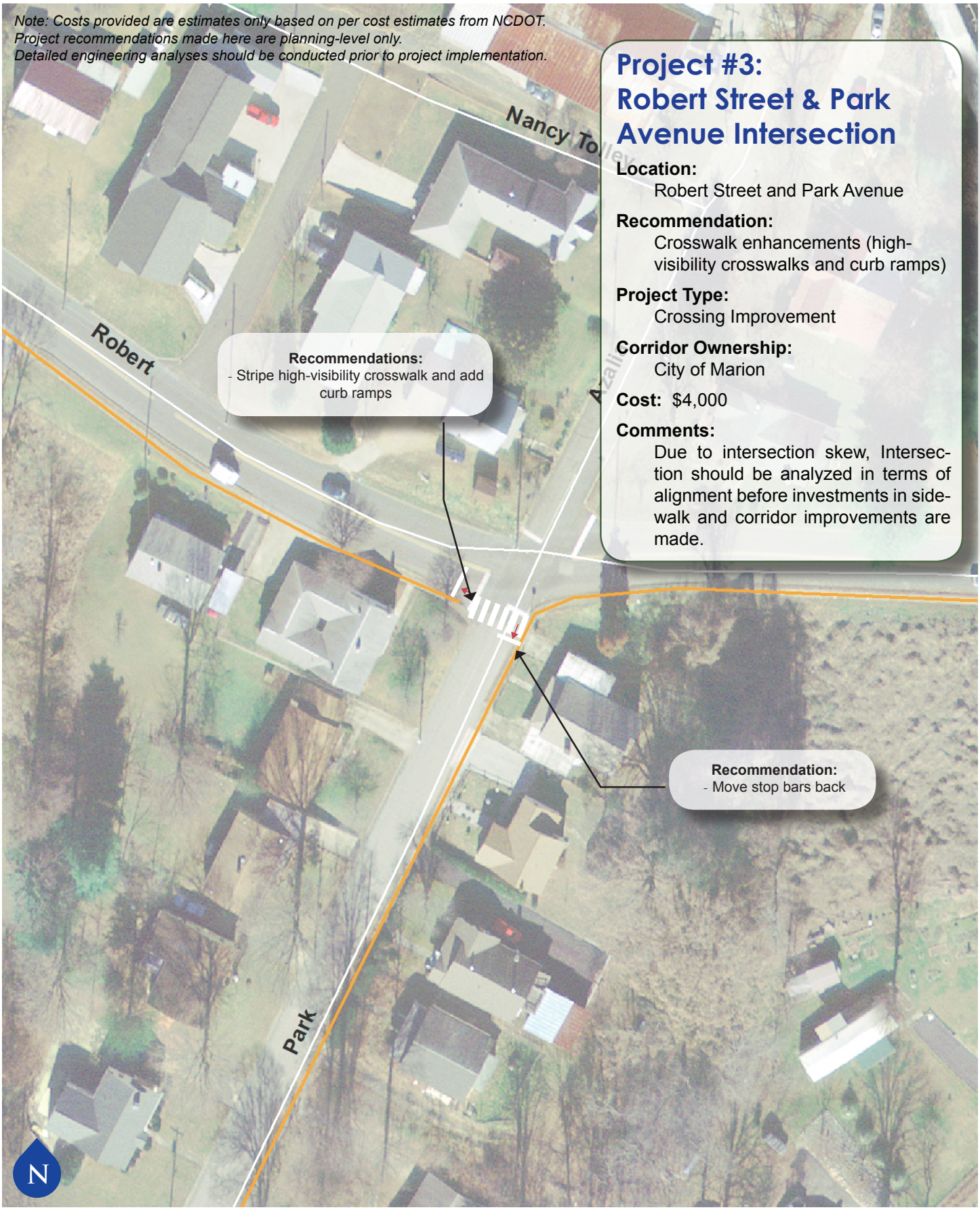


The current crosswalk across Fleming Avenue is faded and low-visibility.



Curb ramps should be improved (by law) to include truncated domes and remove pavement cracking.

Note: Costs provided are estimates only based on per cost estimates from NCDOT.
Project recommendations made here are planning-level only.
Detailed engineering analyses should be conducted prior to project implementation.



Project #3: Robert Street & Park Avenue Intersection

Location:
Robert Street and Park Avenue

Recommendation:
Crosswalk enhancements (high-visibility crosswalks and curb ramps)

Project Type:
Crossing Improvement

Corridor Ownership:
City of Marion

Cost: $4,000

Comments:
Due to intersection skew, Intersection should be analyzed in terms of alignment before investments in sidewalk and corridor improvements are made.

Recommendations:
- Stripe high-visibility crosswalk and add curb ramps

Recommendation:
- Move stop bars back

Project #3: Robert Street & Park Avenue Intersection

Importance

As an important connection to Marion Elementary, Robert Street has existing sidewalk along its south side providing the opportunity for safe walking to school. However, the four-way stop crossing of Park Avenue (which also brings potential pedestrian traffic), needs improvement. There currently is no marked crosswalk which reduces visibility and awareness for motorists entering the intersection. Improvements here notify motorists of pedestrian crossing facilities and reduce automobile speed.

Recommended Solutions

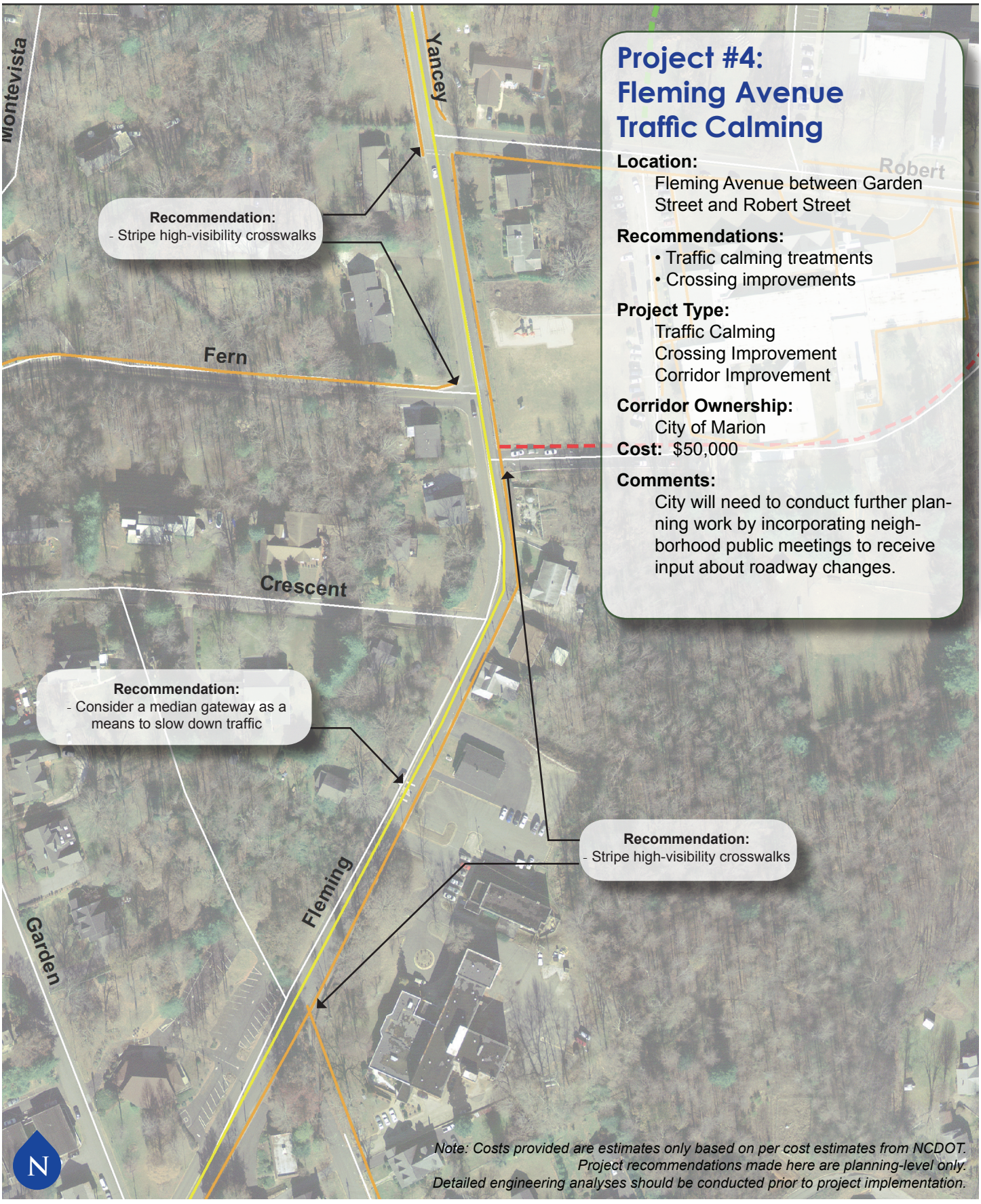
• Provide a high-visibility marked crosswalk crossing Park Avenue and connecting existing sidewalk on south side of Robert Street.
• Re-stripe and relocate crosswalk and advanced stop line. The advanced stop line for traffic coming from the south on Park Avenue should be moved behind the new marked crosswalk. Also, the advanced stop line for Robert Street traffic coming from school should be moved behind the crosswalk.
• Provide curb ramps (as required by law) where sidewalks are present.



There is currently no marked crosswalk at the intersection of Robert Street and Park Avenue.



Here is a rendering of a new high-visibility crosswalk with the stop bar aligned behind the crosswalk.



Project #4: Fleming Avenue Traffic Calming

Location:
Fleming Avenue between Garden Street and Robert Street

Recommendations:
- Traffic calming treatments
- Crossing improvements

Project Type:
Traffic Calming
Crossing Improvement
Corridor Improvement

Corridor Ownership:
City of Marion

Cost: $50,000

Comments:
City will need to conduct further planning work by incorporating neighborhood public meetings to receive input about roadway changes.

Recommendation:
- Stripe high-visibility crosswalks

Recommendation:
- Consider a median gateway as a means to slow down traffic

Recommendation:
- Stripe high-visibility crosswalks

Note: Costs provided are estimates only based on per cost estimates from NCDOT. Project recommendations made here are planning-level only. Detailed engineering analyses should be conducted prior to project implementation.

Project #4: Fleming Avenue Traffic Calming

Importance

As an important connection and adjacent collector roadway to Marion Elementary, Fleming Avenue experiences significant residential traffic. It also has two blind curves along this section. With existing sidewalk on its east side, Fleming Avenue does have pedestrian-friendly facilities. However, very wide lanes can be found between Garden Street and Crescent Street providing an opportunity for significant traffic calming and pedestrian enhancements. Improvements here will make this entire roadway and community more pedestrian friendly facility and help slow traffic.

Recommended Solutions

• Extend school zone on Fleming Avenue southward to Garden Street.
• Consider sidewalk on west side of Fleming (but due to topography and ROW issues, consider striped bicycle pedestrian lane with vertical separator from vehicular traffic such as curb or bollards.
• Where Fleming Avenue sidewalk crosses intersecting streets or major driveways, provide high-visibility marked crosswalks, curb ramps, and consider curb extensions/bulb-outs where feasible.
• Provide and/or enhance high-visibility marked crosswalks crossing Fleming Avenue at Robert Street and Fern Avenue.

• Conduct further study and hold neighborhood meetings to address traffic calming solutions. Consider utilizing excess width on Fleming.
Ideas to consider are:
• Incorporation of bicycle lanes, which will narrow the travel lanes to slow traffic and provide a buffer between the travel lanes and the sidewalk.
• Provide a median island gateway as means to slow traffic both into the residential areas northward and to downtown southward.
• Provide a median island for entire length of segment.
• Utilize portion of roadway to extend pedestrian sidewalk space on both sides, especially at blind curve near Crescent Street (paint a separated bicycle/pedestrian lane on-road).
• Reduce speed limit along entire segment.

3.8 WEST MCDOWELL JUNIOR HIGH SCHOOL

The following section outlines specific recommendations for each project type for West McDowell Junior High School. Short-term or high priority projects are identified and further discussed in Section 3.9.

Corridor Improvements

See Table 3.4 below for a complete list of corridor improvements.

Table 3.4: WestMcDowell Junior High School Corridor Improvements

Improvement Type	Description	Length
New Sidewalk	Along both sides of US 70 from McDowell High School Road to Business 70.	3780 LF
New Sidewalk	Along north side of US 70 from McDowell High School to Catawba River Greenway.	680 LF
New Sidewalk	Along one side of McDowell High School Road.	3315 LF
New Sidewalk	Along both sides of North Main Street to central Marion	11500+ LF

Crossing Improvements

1. US 70/McDowell High School Road

• Stripe new high-visibility marked crosswalks across US 70 on one side of intersection (continental style). The west side is preferable where there is no conflict with left turning traffic, and there is opportunity for median refuge island on west side to accompany the marked crosswalk.

• Add advanced stop lines with crosswalk.

• Construct new curb ramps.

• Add pedestrian countdown signals for crossing US 70.

• Provide median refuge island with US 70 crosswalk.

2. US 70/Lowe's Entrance

• Stripe high-visibility marked crosswalks across US 70 on west side of intersection.

• Provide advanced stop lines and curb ramps with marked crosswalk.

• Provide median refuge for US 70 crossing.

• Enhance intersection with other pedestrian treatments such as a median to provide a safe environment for pedestrians to cross..

Traffic Calming Measures

• Traffic calming such as speed humps along High School Road will slow school traffic, making it safer for pedestrians.

• Enhance "school zone" along US 70 to include flashing lights/signage and speed limit reduction.

On-campus Improvements

• Add bicycle rack area near main entrance of school.
• Connect campus sidewalk to recommended sidewalk on High School Road.
• Include pedestrian accommodations on the W. McDowell High School Rd. bridge over US 221.

Other Improvements

• None.

Long-term Improvements

• Provide sidewalk along both sides of US 70. Ensure driveway access management. Sidewalk should have adequate buffer between road.



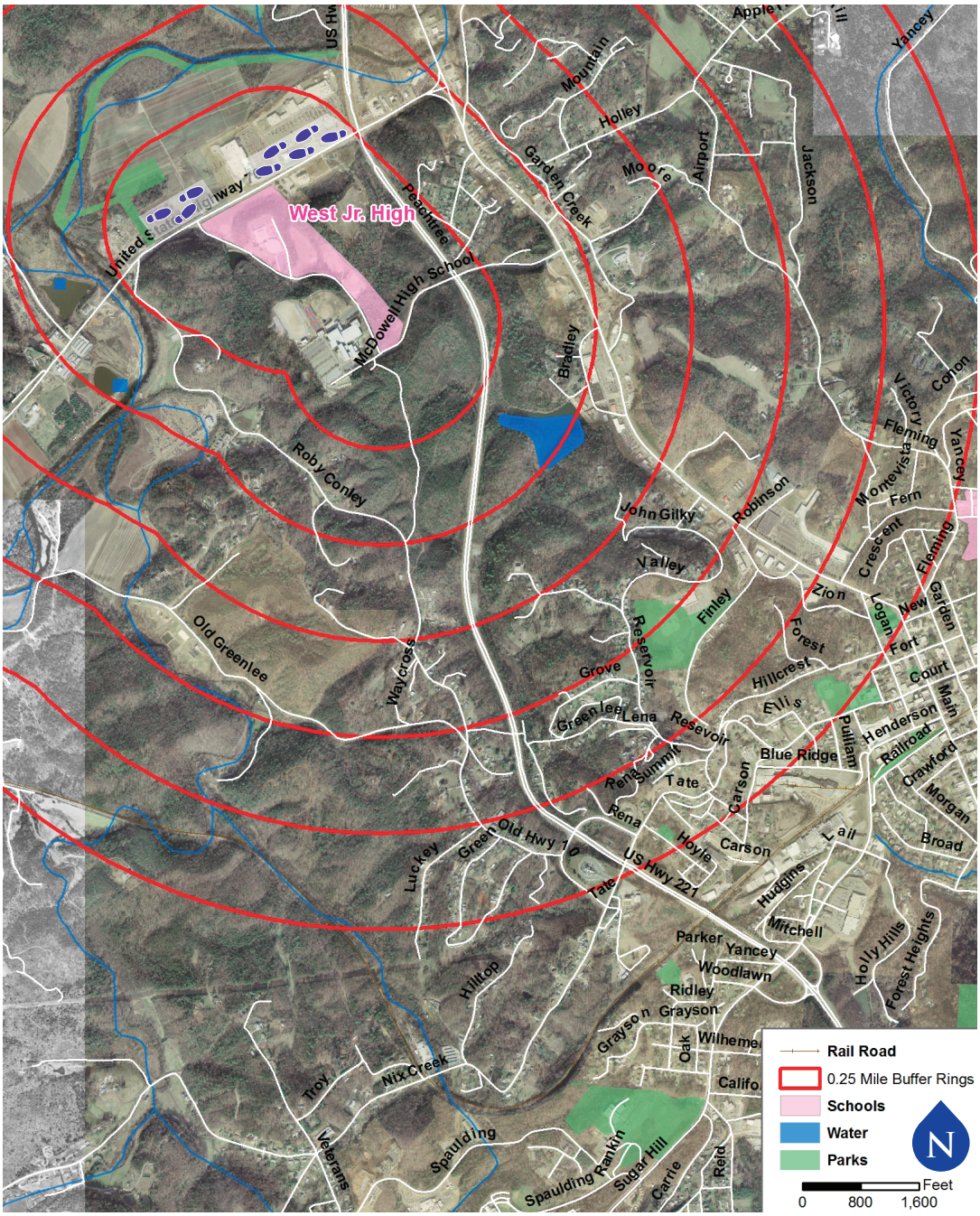
As shown above, US 70 has adequate space for sidewalk installation.

3.9 WEST MCDOWELL JUNIOR HIGH SCHOOL PRIORITY PROJECTS

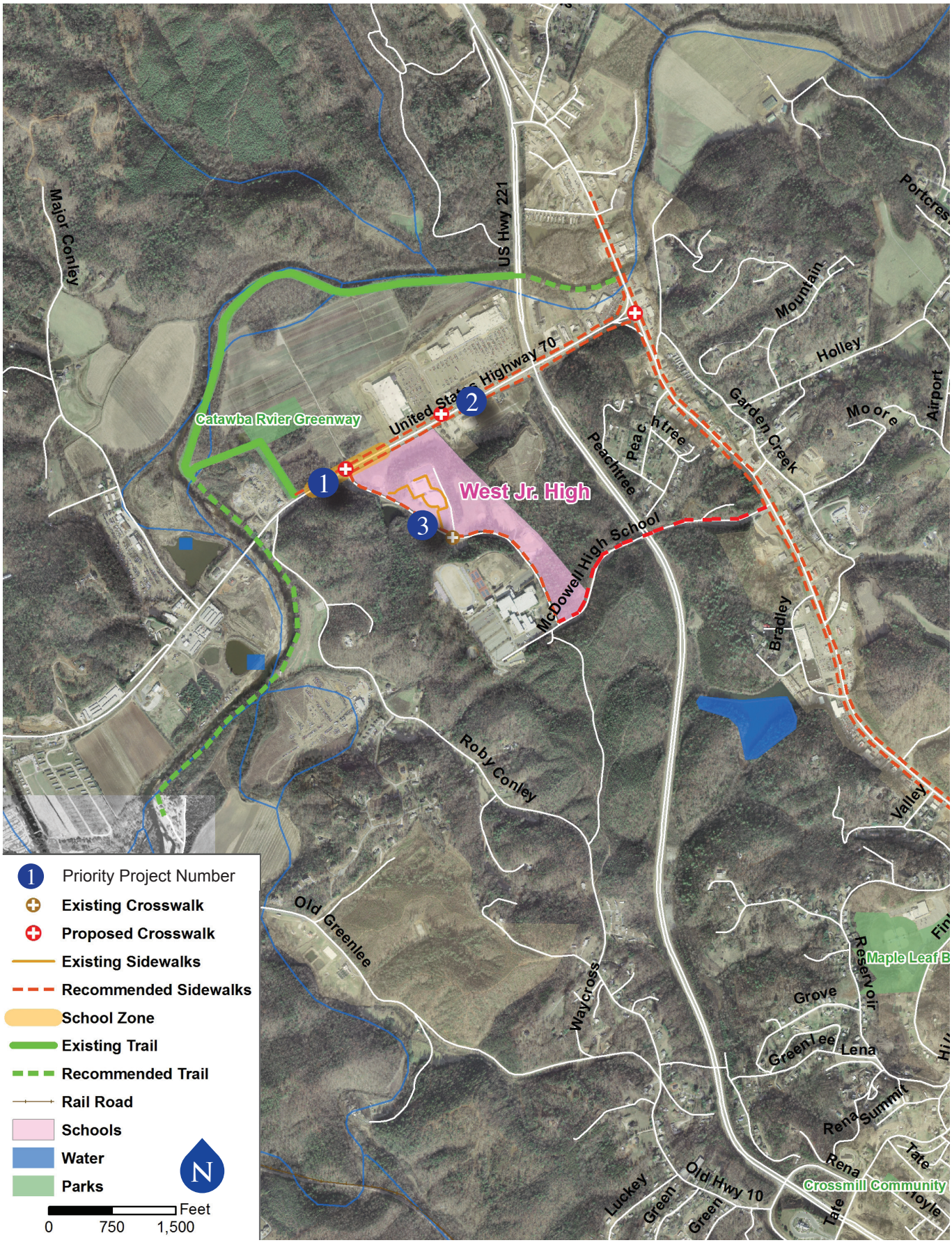
Overview

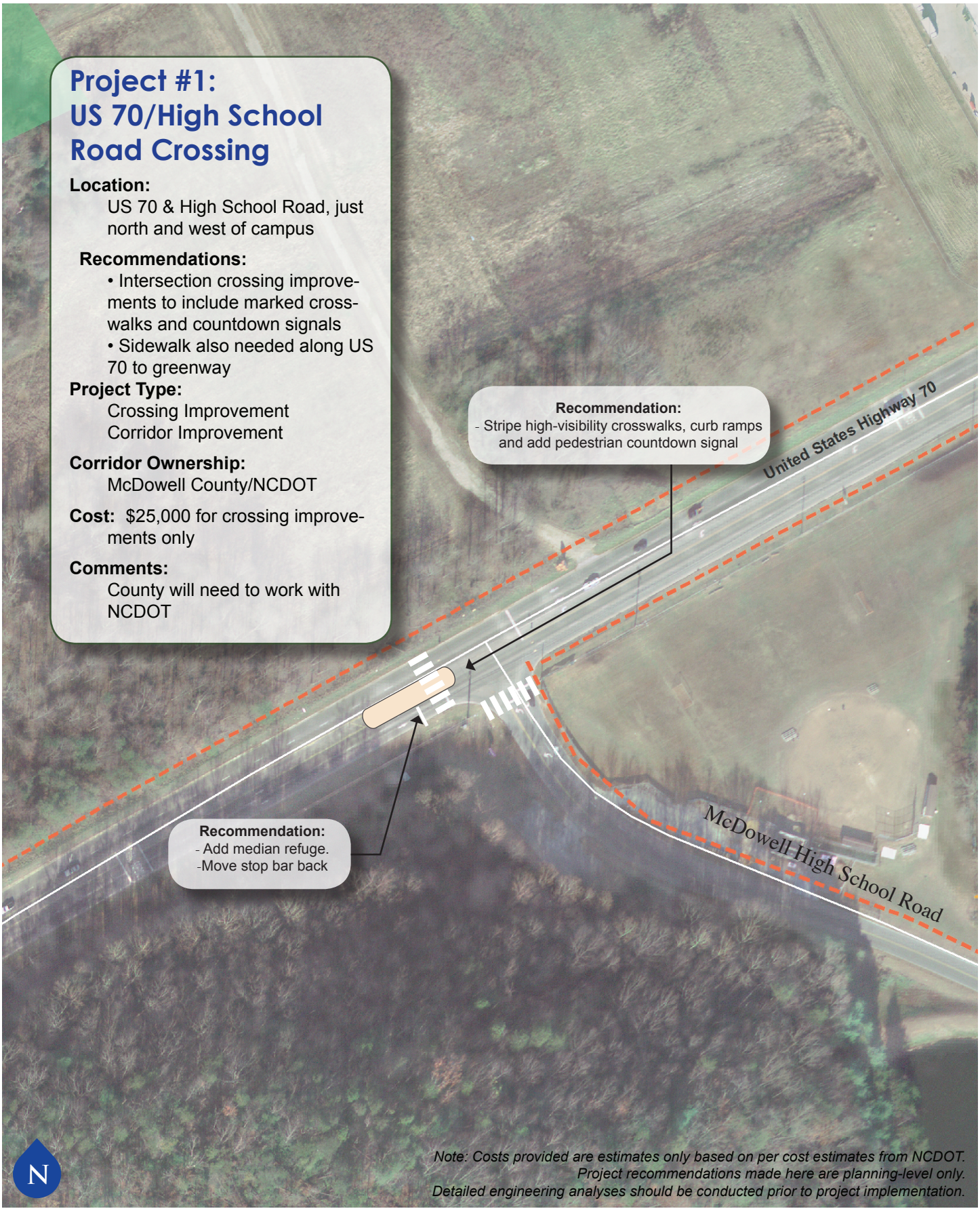
A comprehensive network of engineering improvements is recommended for the West McDowell Junior High School area. In Map 3.5 local travel routes that are regularly used are illustrated with footprints. Specific network projects have been identified as integral to improving bicycle and pedestrian safety around the West McDowell Junior High School. These are the top priority projects of the comprehensive recommended network seen in Map 3.6. The project number on the map identifies the location of each priority project. The following pages provide detailed map recommendations, photos, and cost estimates.

Map 3.5: West McDowell Junior High School Travel Map



Map 3.6: West McDowell Junior High School Priority Projects





Project #1: US 70/High School Road Crossing

Location:
US 70 & High School Road, just north and west of campus

Recommendations:
- Intersection crossing improvements to include marked crosswalks and countdown signals
- Sidewalk also needed along US 70 to greenway

Project Type:
Crossing Improvement
Corridor Improvement

Corridor Ownership:
McDowell County/NCDOT

Cost: $25,000 for crossing improvements only

Comments:
County will need to work with NCDOT

Recommendation:
- Stripe high-visibility crosswalks, curb ramps and add pedestrian countdown signal

Recommendation:
- Add median refuge.
-Move stop bar back

Note: Costs provided are estimates only based on per cost estimates from NCDOT. Project recommendations made here are planning-level only. Detailed engineering analyses should be conducted prior to project implementation.

Project #1: US 70/High School Road Crossing

Importance

The US 70/High School Road intersection serves as the main entry point to the middle school and high school. Many students walk from the Junior High School toward the commercial destinations that are east on US 70. Also, the new Catawba River Greenway is just west of this intersection and is an important destination. Students are anticipated to use this greenway for classes and educational activities during the school year.

Recommended Solutions

• Provide sidewalk with grass buffer on north side of US 70 from High School Road west to Catawba River Greenway.

US 70/McDowell High School Road Crossing

• Stripe new high-visibility marked crosswalks across US 70 on one side of intersection (continental style). The west side is preferable so that there isn't conflict with turning traffic from that direction (also offers opportunity for median refuge island on west side to accompany the marked crosswalk).
• Add advanced stop lines with crosswalk.
• Construct new curb ramps.
• Add pedestrian countdown signals
• Provide median refuge island with crosswalk (no left turning traffic coming from west on US 70 so opportunity is there for a median refuge).





Project #2: US 70 Corridor Improvements

Location:
US 70 from High School Road eastward to US 221

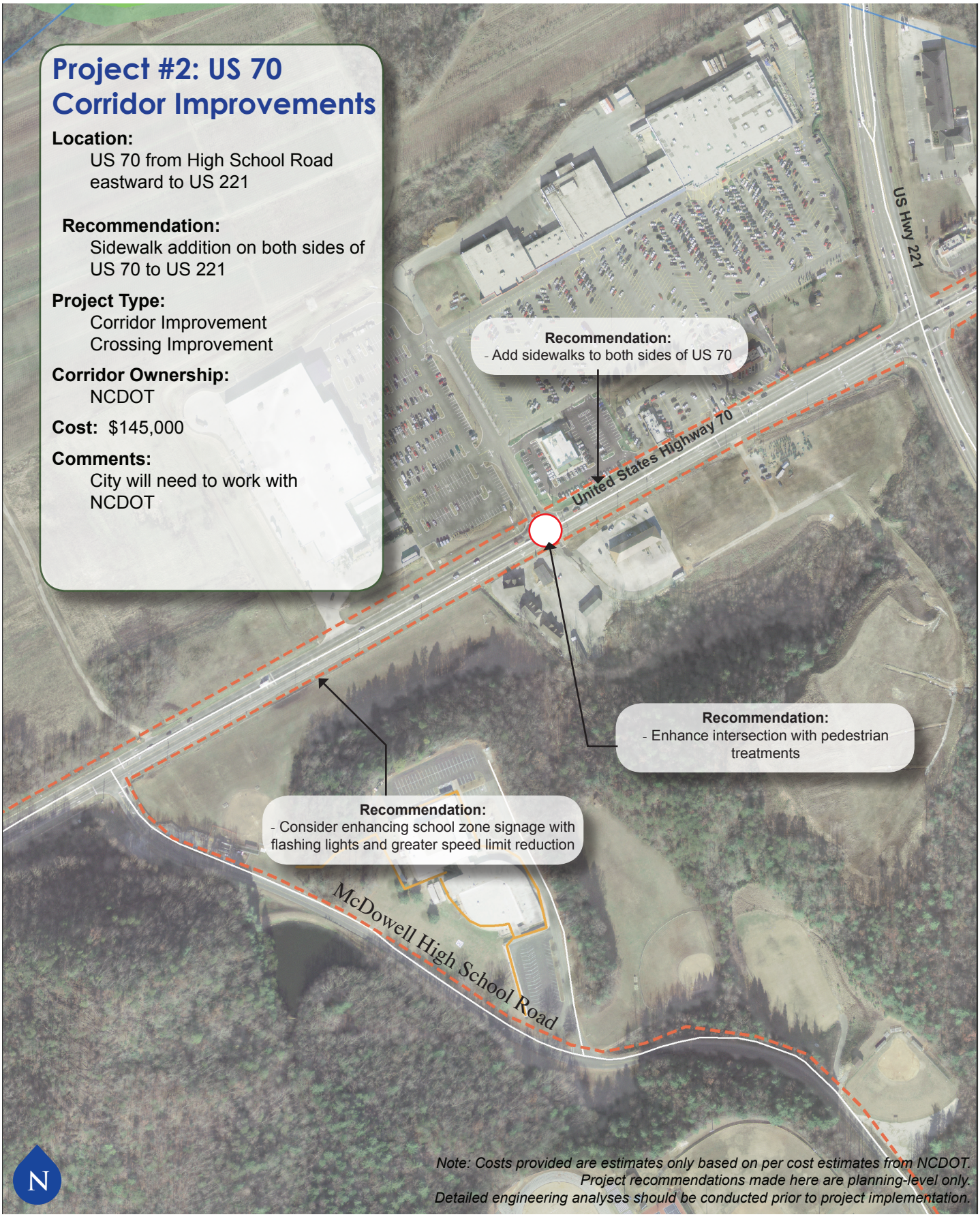
Recommendation:
Sidewalk addition on both sides of US 70 to US 221

Project Type:
Corridor Improvement
Crossing Improvement

Corridor Ownership:
NCDOT

Cost: $145,000

Comments:
City will need to work with NCDOT



Note: Costs provided are estimates only based on per cost estimates from NCDOT. Project recommendations made here are planning-level only. Detailed engineering analyses should be conducted prior to project implementation.

Project #2: US 70 Corridor Improvements

Importance

US 70 is a major arterial that connects the school to a number of commercial locations, including fast food restaurants. It also connects the school to the Catawba River Greenway.

Recommended Solutions

• Provide sidewalks with grass buffer on both sides of US 70 from High School Road to US 221.
• Once sidewalks are developed, provide adequate crossing treatments at stoplight intersections (include high-visibility marked crosswalks, countdown signals, curb ramps, and possibly median refuges).
• Enhance school zone along US 70. Currently only signage is provided. Flashing lights and greater speed limit reduction are preferred, especially when there is more pedestrian activity in the future.



Project #3:High School Road Corridor Improvements

Location:
High School Road adjacent to middle school and high school

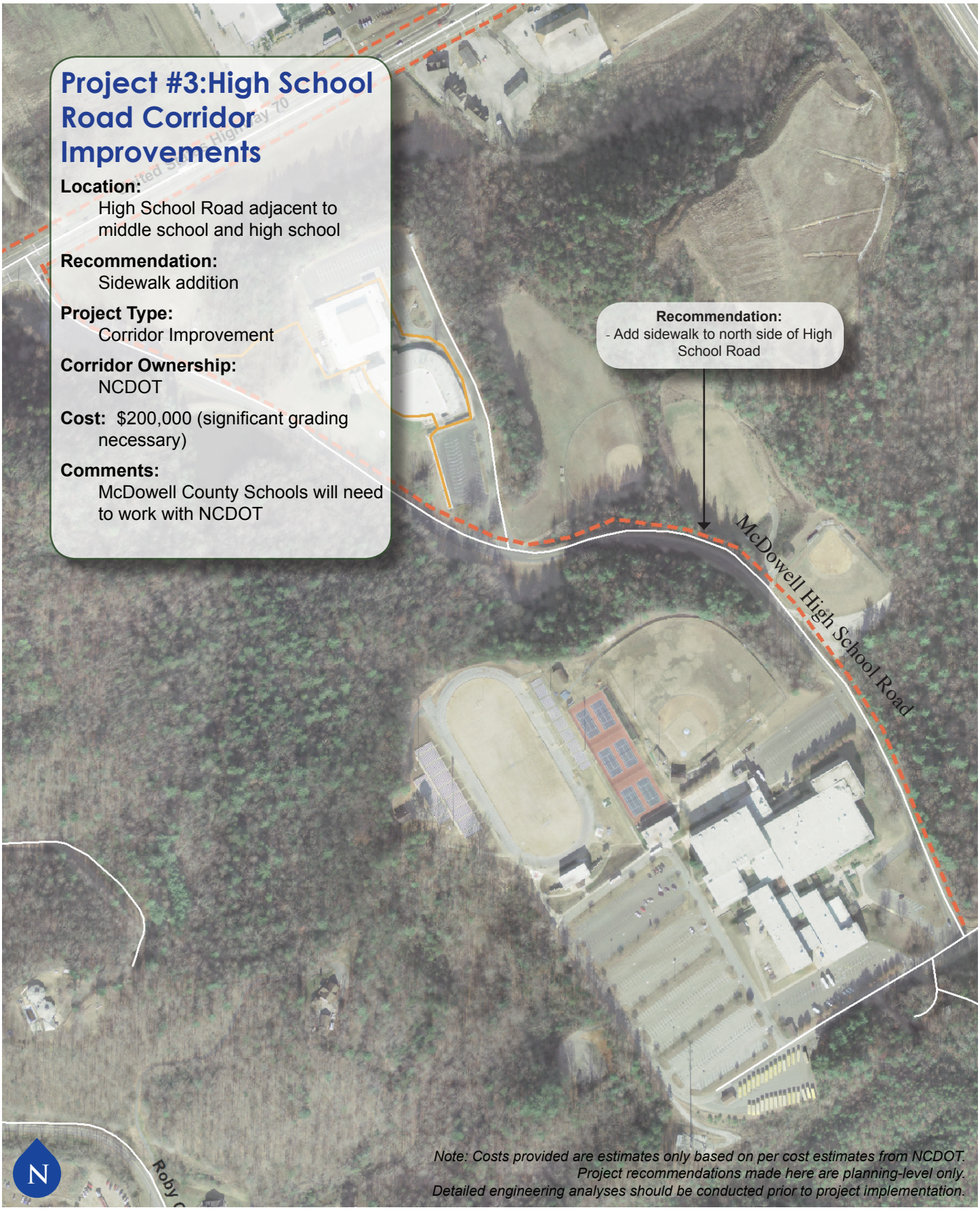
Recommendation:
Sidewalk addition

Project Type:
Corridor Improvement

Corridor Ownership:
NCDOT

Cost: $200,000 (significant grading necessary)

Comments:
McDowell County Schools will need to work with NCDOT



Note: Costs provided are estimates only based on per cost estimates from NCDOT. Project recommendations made here are planning-level only. Detailed engineering analyses should be conducted prior to project implementation.

Project #3: High School Road Corridor Improvements

Importance

This is the only road that runs directly to the Junior High School and the High School. Improving connectivity between the two schools is essential, to allow children to safely walk between both schools.

Recommended Solutions

• Provide sidewalk on one side of High School Road from US 70 to high school.
• There are significant topographic/ROW constraints for the development of sidewalk. This is likely to be an expensive proposition along some segments. However, this is important for improving pedestrian safety.
• If sidewalk cannot be developed or must be developed later, traffic calming such as speed humps or striping to narrow the travel lanes should be considered in the interim to make walking safer between the two schools and down to US 70.



3.10 PHOENIX ACADEMY

The following section outlines specific recommendations for each project type for Phoenix Academy. Short-term or high priority projects are identified and further discussed in Section 3.11.

Corridor Improvements

See Table 3.5 below for a complete list of corridor improvements.

Table 3.5: Phoenix Academy School Corridor Improvements

Improvement Type	Description	Length
New Sidewalk	Add sidewalk from where it currently terminates on the west side of Sugar Hill Road to Lukin Street.	725 LF
New Sidewalk	Add sidewalk along one side of Lukin Street from Sugar Hill Road to the Phoenix Academy.	850 LF
New Sidewalk	Add sidewalk on west side of Sugar Hill Road from Lukin Street to the proposed commercial development near Interstate 40.	3900 LF
New Sidewalk	Add sidewalk on the east side of Sugar Hill Road from Wilhemenia Street to Reid Street.	725 LF
New Sidewalk	Add sidewalk on one side of Reid from Sugar Hill southward.	2400 LF



A current view up Lukin Street towards the school shows the lack of sidewalks.

Crossing Improvements

1. Sugar Hill Road / Super Wal-Mart Shopping Center Access

• Install a high-visibility crosswalk across Sugar Hill Road in conjunction with development.

• Install pedestrian activated countdown crossing signals in all directions.

• Install ADA compliant curb ramps.

• Add pedestrian signage.

2. Sugar Hill Road / Reid Street / Grace Corpening Drive

• Add sidewalk on Sugar Hill Road from Reid Street to Wilhemenia Street.

• Add high-visibility marked crosswalks on all crossings.

• Add pedestrian activated countdown crossing signals on Sugar Hill Road and Reid Street.

• Add pedestrian signage.

Traffic Calming Measures

• Add school zone on Sugar Hill and Lukin.

On-campus Improvements

• Provide a bicycle rack area near the front of the school. Ideally, the bicycle area should have a concrete pad and be covered.

Other Improvements

• Keep sidewalks in good condition (maintenance).

• Improve all curb ramps to meet ADA standards.

Long-term Improvements

• Provide sidewalk on both sides of Sugar Hill Road from NC 221 to Interstate 40, and provide crossing improvements at all signalized intersections.



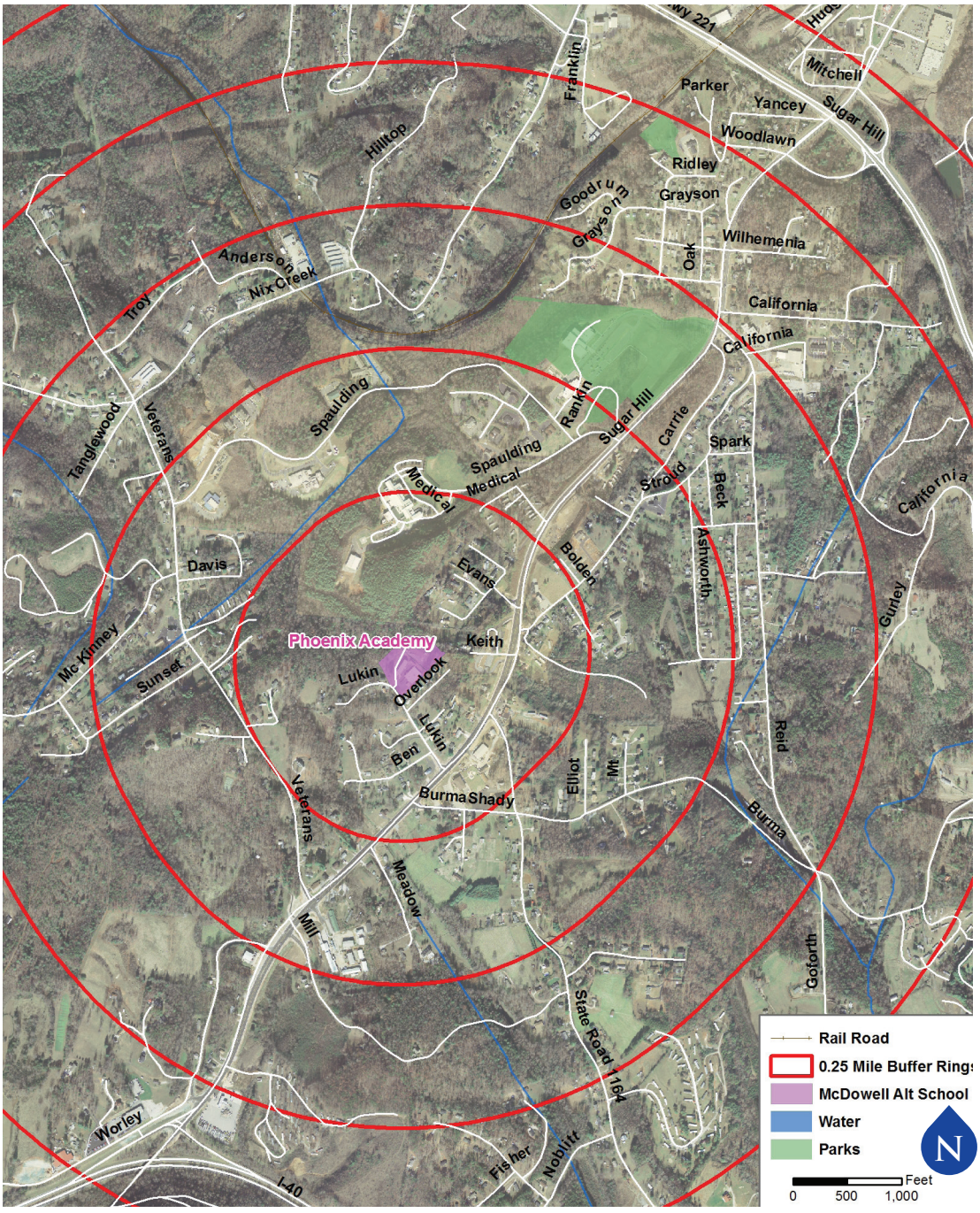
The intersection of Grace Corpening Drive and Sugar Hill Road lacks high-visibility crosswalks.

3.11 PHOENIX ACADEMY PRIORITY PROJECTS

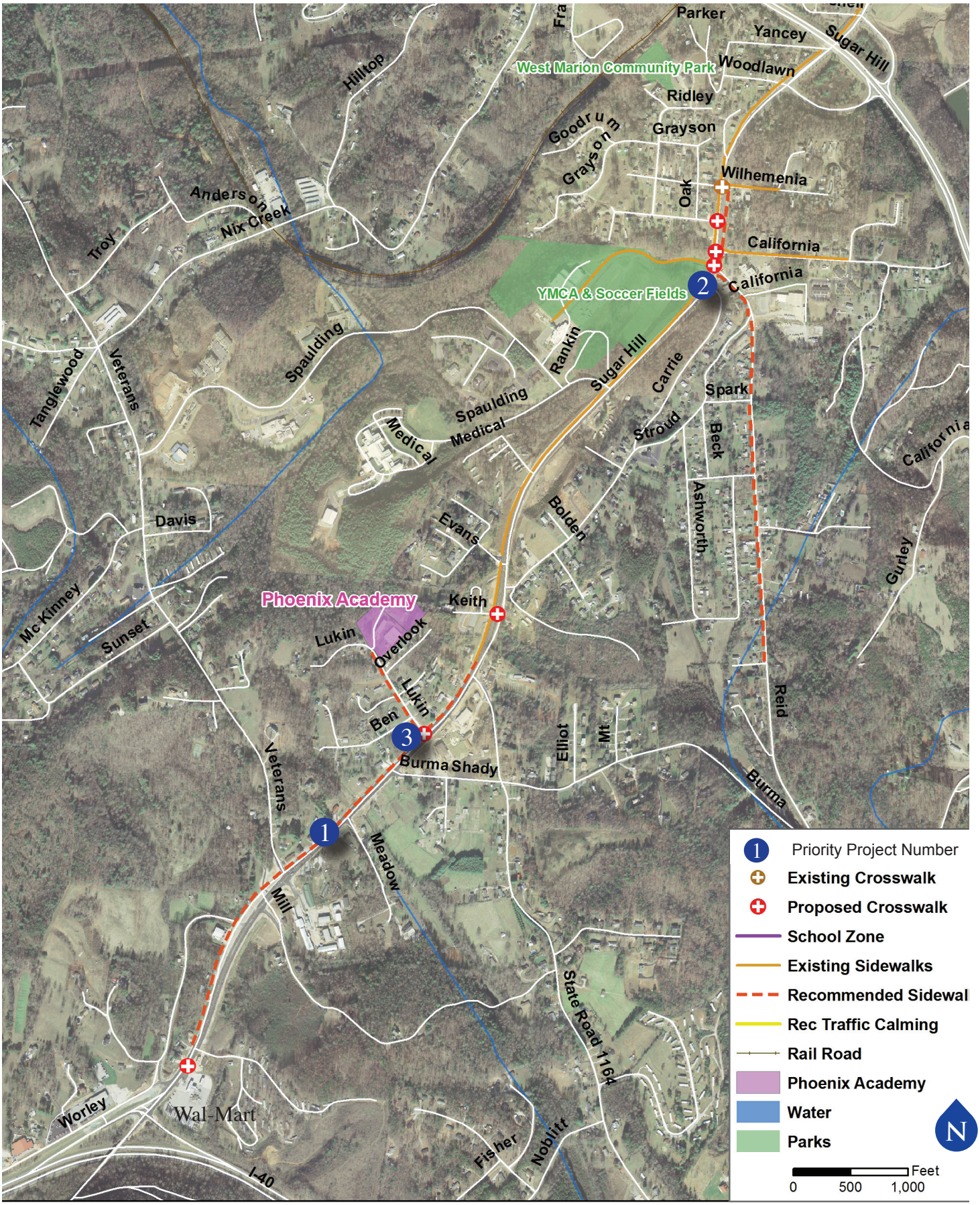
Overview

A comprehensive network of engineering improvements is recommended for the Phoenix Academy area. In the Travel Map 3.7, no travel routes are illustrated because of the lack of current safe routes to school. Specific network projects have been identified as integral to improving bicycle and pedestrian safety around the Phoenix Academy. These are the top priority projects of the comprehensive recommended network seen in Map 3.8.The project number on the map identifies the location of each priority project. The following pages provide detailed map recommendations, photos, and cost estimates.

Map 3.7: Phoenix Academy Travel Map



Map 3.8: Phoenix Academy Priority Projects





Project #1: Sugar Hill Road Sidewalk Extension

Location:
Sugar Hill Road, from the current end on the west side southward to the proposed Super Wal-Mart Shopping Center Access

Recommendation:
Extend existing sidewalk from its current terminus to the Super Wal-Mart Shopping Center Access

Project Type:
Corridor Improvement

Corridor Ownership:
NCDOT

Cost: $175,000

Comments:
If constructed in phases, the first phase should be to extend the existing sidewalk to Lukin Street, which leads to Phoenix Academy

Project #1: Sugar Hill Road Sidewalk Extension

Importance

There is a length of sidewalk that runs down the west side of Sugarhill Road from past Highway 221 to the south to about 725 feet north of Lukin Street. An addition of a few more blocks of sidewalk would create a pedestrian friendly route all the way to the local YMCA for the children of Phoenix Academy. If the sidewalk extended further south to the future Super Wal-Mart Shopping Center, a good connection would be provided to local businesses.

Recommended Solution

• Install a sidewalk on Sugar Hill Road, from the current terminus, to the proposed Super Wal-Mart Shopping Center. A pedestrian crossing treatment is needed to connect to Wal-Mart with development.
• Consider school zone addition along Sugar Hill Road.
• Add marked crosswalk and curb ramps at intersecting roads.



The sidewalk that runs down Sugar Hill Road stops short before it reaches Lukin Street and should be extended.

Project #2: Sugar Hill Road and Reid Street / Grace Corpening Drive

Location:
Sugar Hill Road and Reid Street

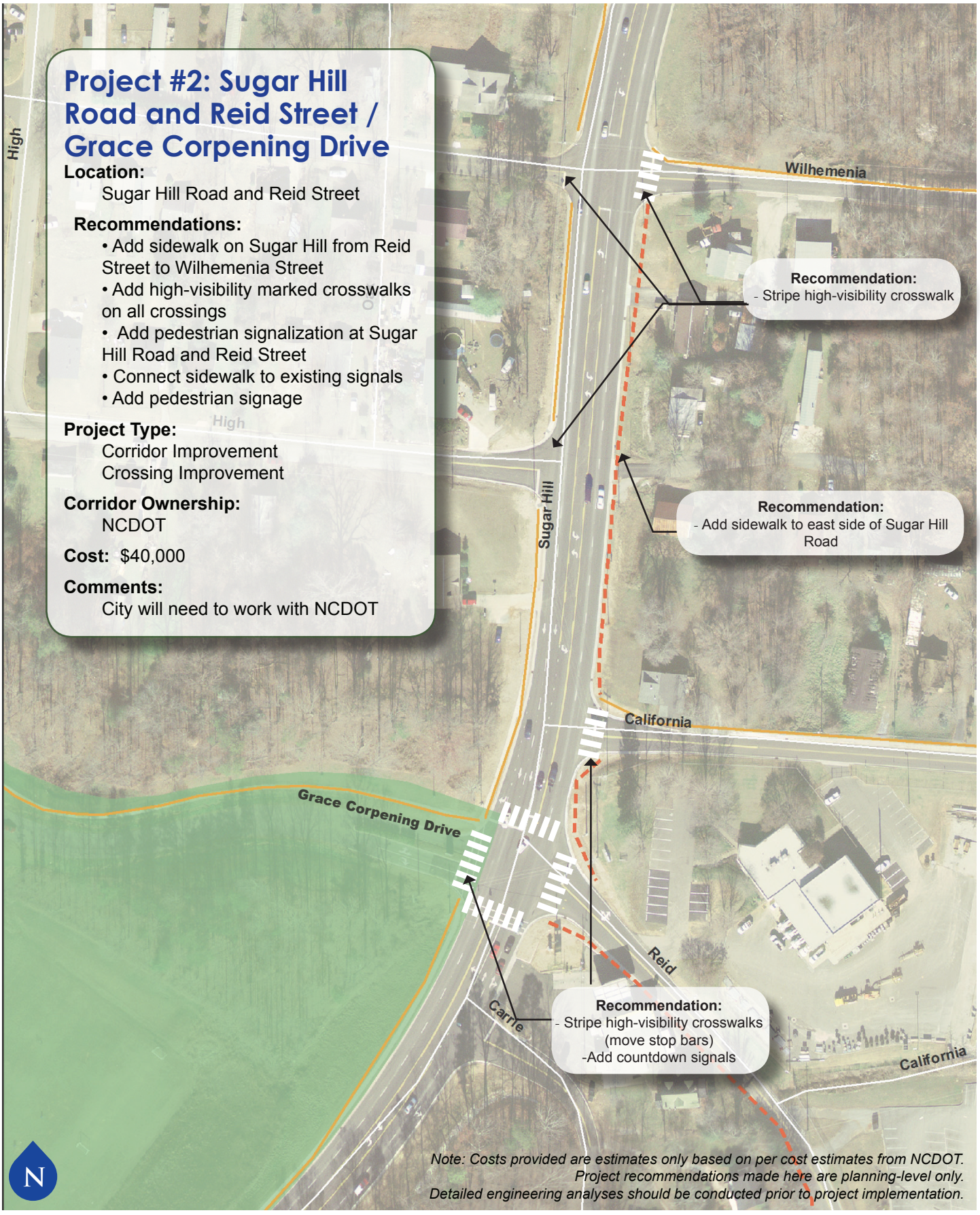
Recommendations:
- Add sidewalk on Sugar Hill from Reid Street to Wilhemenia Street
- Add high-visibility marked crosswalks on all crossings
- Add pedestrian signalization at Sugar Hill Road and Reid Street
- Connect sidewalk to existing signals
- Add pedestrian signage

Project Type:
Corridor Improvement
Crossing Improvement

Corridor Ownership:
NCDOT

Cost: $40,000

Comments:
City will need to work with NCDOT



Note: Costs provided are estimates only based on per cost estimates from NCDOT. Project recommendations made here are planning-level only. Detailed engineering analyses should be conducted prior to project implementation.

Project # 2: Sugar Hill Road and Reid Street / Grace Corpening Drive

Importance

This intersection of Sugar Hill Road and Reid Street/Grace Corpening Drive and corridors connects neighborhoods with the YMCA. Sugar Hill Road is difficult to cross due to high traffic, motorist speeds, and lacking pedestrian facilities. Therefore it is critical that this intersection and road be improved for pedestrians.

Recommended Solutions

- Add sidewalk on Sugar Hill Road from Reid Street to Wilhemenia Street.
- Add high-visibility marked crosswalks on all crossings.
- Add pedestrian signalization at Sugar Hill Road and Reid Street.
- Connect sidewalk to existing signals.
- Add pedestrian signage.
- Consider speed limit reduction on Sugar Hill Road.



Making high-visibility crosswalks on all legs of the intersection of Grace Corpening Drive and Sugar Hill Road will increase pedestrian safety.



Project #3: Lukin Street Sidewalk

Location:
Lukin Street, from Sugar Hill Road to the Phoenix Academy

Recommendations:
- Provide sidewalk on one side of Lukin Street to provide access to Phoenix Academy from Sugar Hill Road
- Improve School Zone markings on Lukin Street

Project Type:
Corridor Improvement

Corridor Ownership:
NCDOT.

Cost: $35,000

Comments:
None

Note: Costs provided are estimates only based on per cost estimates from NCDOT. Project recommendations made here are planning-level only. Detailed engineering analyses should be conducted prior to project implementation.

Project #3: Lukin Street Sidewalk

Importance

After the sidewalk is extended down Sugar Hill Road to Lukin Street, a connection up Lukin Street to Phoenix Academy would provide a safe path for the children walking to school.

Recommended Solution

- Install a sidewalk on one side of Lukin Street from Sugar Hill Road to Phoenix Academy.
- Add school zone on Lukin Street.
- Add crosswalk and curb ramps across Lukin when Sugar Hill sidewalk is constructed.



As shown above, no sidewalk is currently present along Lukin Street. Seen in this photo rendering below, a simple sidewalk along Lukin Street would make Phoenix Academy much more accessible to pedestrians.



3.12 EASTFIELD ELEMENTARY

The following section outlines specific recommendations for each project type for Eastfiled Elementary School. Short-term or high priority projects are identified and further discussed in Section 3.13.

Corridor Improvements

See Table 3.6 below for a complete list of corridor improvements.

Table 3.6: Eastfield Elementary School Corridor Improvements

Improvement Type	Description	Length
New Sidewalk	Add sidewalk along Morris Avenue from existing school sidewalk to Tunnel Road.	640 Ft
New Sidewalk	Add sidewalk along Tunnel Road from Westmoreland Street to Yancey Street.	1320 Ft
New Sidewalk	Add sidewalk along Yancey Street from Tunnel Road to Perry Street.	1340 Ft
New Sidewalk	Add sidewalk along Perry Street from 6th Street to school. This will provide a pedestrian connection to Eastfield Neighborhood Park and the school.	1500 Ft
New Sidewalk	Add sidewalk along Leach Street from 6th Street to Yancey Street.	930 Ft
New Sidewalk	Add sidewalk along Clark Street from 6th Street to Yancey Street.	1400 Ft
Traffic Calming/Signage	Add traffic calming and/or pedestrian signage along Tunnel Road from Westmorland Sreet to Yancey Street.	1500 Ft
Traffic Calming/Signage	Add traffic calming and/or pedestrian signage along Perry Street from 6th Street to Yancey Street.	830 Ft
Traffic Calming/Signage	Add traffic calming and/or pedestrian signage along Yancey Street from Court Street to the school entrance road	830 Ft

Crossing Improvements

1. Yancey Street/Perry Street

- Add high-visibility marked crosswalks.
- Add stop signs to create a 3-way stop for all directions of travel, reduce turning radii, and improve sight distance.
- Add pedestrian signage and school zone signage.
- Maintain a crossing guard at this location.

2. Yancey Street/Leach Street

- Add sidewalks on both Yancey Steet and Leach Street.
- Add high-visibility marked crosswalks across intersections where sidewalk is installed.
- Add pedestrian signage.

3. Yancey Street/Bostic Street

- Add sidewalks on both Yancey Street and Bostic Street.
- Add high-visibility marked crosswalks across intersections where sidewalk is installed.

• Provide a crossing guard to this location.

• Install pedestrian warning signs.

4. Yancey Street / Eastfield School Road

• Add sidewalks on Yancey Street.

• Add high-visibility marked crosswalks across intersections where sidewalk is installed.

• Provide a crossing guard to this location.

• Install pedestrian warning signs and school zone signage.

5. Yancey Street/Clark Street

• Add sidewalks on both Yancey Street and Clark Street.

• Add high-visibility marked crosswalks across intersections where sidewalk is installed.

• Provide a crossing guard to this location.

• Install pedestrian warning signs.

6. Pine Street/Tunnel Road

• Add sidewalks on Tunnel Road.

• Add high-visibility marked crosswalks across intersections where sidewalk is installed.

• Install pedestrian warning signs.

7. Tunnel Road/Morris Avenue

• Add sidewalks on both Tunnel Road and Morris Avenue.

• Add high-visibility marked crosswalks across intersections where sidewalk is installed.

• Provide a crossing guard to this location.

• Install pedestrian warning signs.

8. Tunnel Road/Westmoreland Street

• Add sidewalks on Tunnel Road.

• Install pedestrian warning signs.

9. Morris Avenue/Eastfield School Road

• Reduce turning radii, move dumpsters, realign crosswalk

Traffic Calming Measures

• Extend school zone on Yancey Street down to Perry Street.

• Provide traffic calming and/or pedestrian signage on Tunnel Road from Westmoreland Street to Yancey Street, Perry Street from 6th Street to Yancey Street, and on Yancey Street from Court Street to Eastfield School Road,

On-campus Improvements

• Add bicycle rack area near main entrance of school.

• Re-stripe on-campus crosswalks as they are faded and extend existing sidewalk to Morris Avenue.

Other Improvements

• Improve all curb ramps to meet ADA guidelines with level landing and truncated domes.

Long-term Improvements

Yancey Street, Perry Street, and Tunnel Road

• Significant improvements are needed that include intersection reconfiguration, sidewalk, traffic calming measures, turning radii reduction/reconfigurations, and marked crosswalks.

• Follow recommendations set forth by the Town of Marion sidewalk/greenway planning.



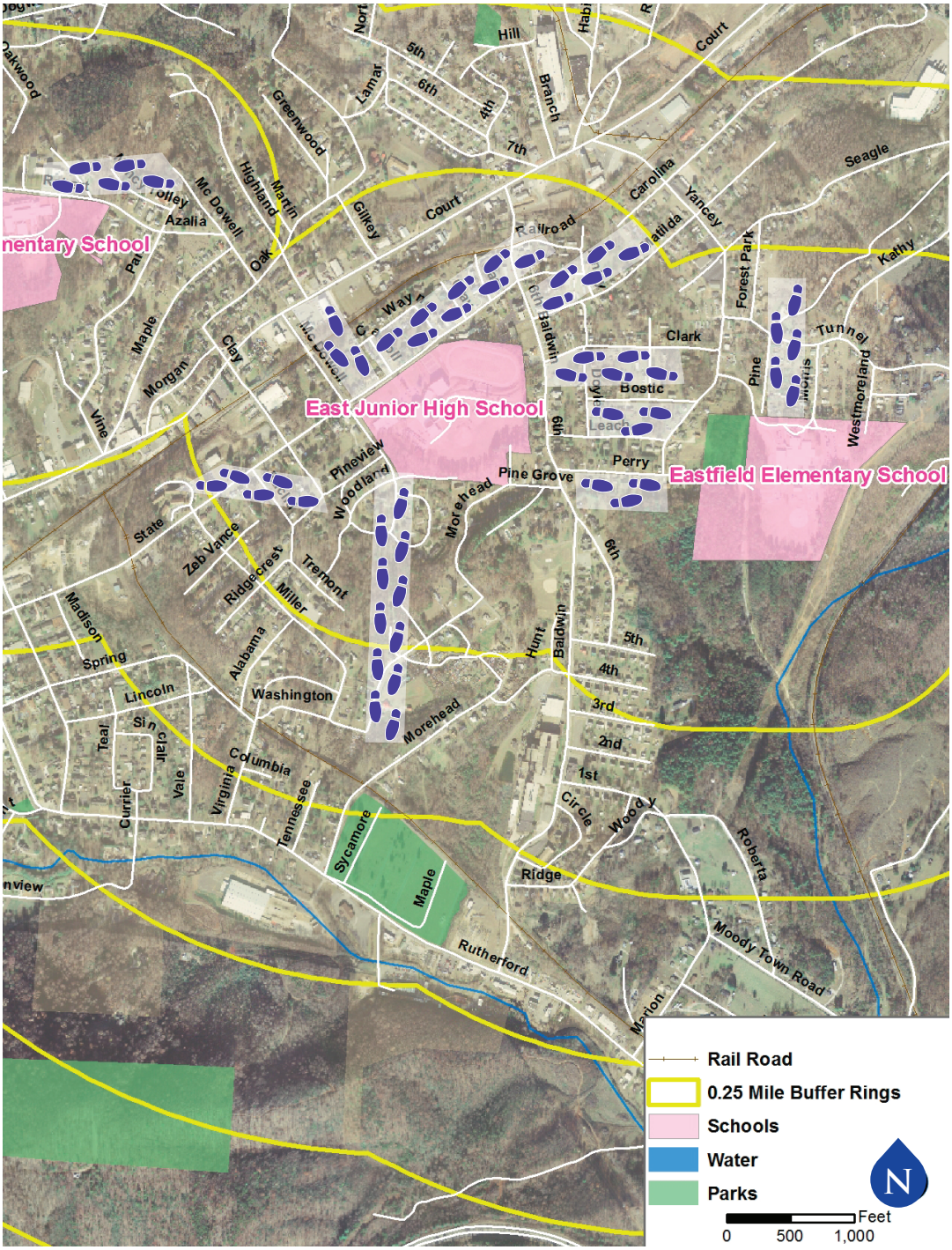
A view down Yancey Street shows that it is not a pedestrian friendly roadway and is in need of sidewalks and traffic calming solutions.

3.13 EASTFIELD ELEMENTARY PRIORITY PROJECTS

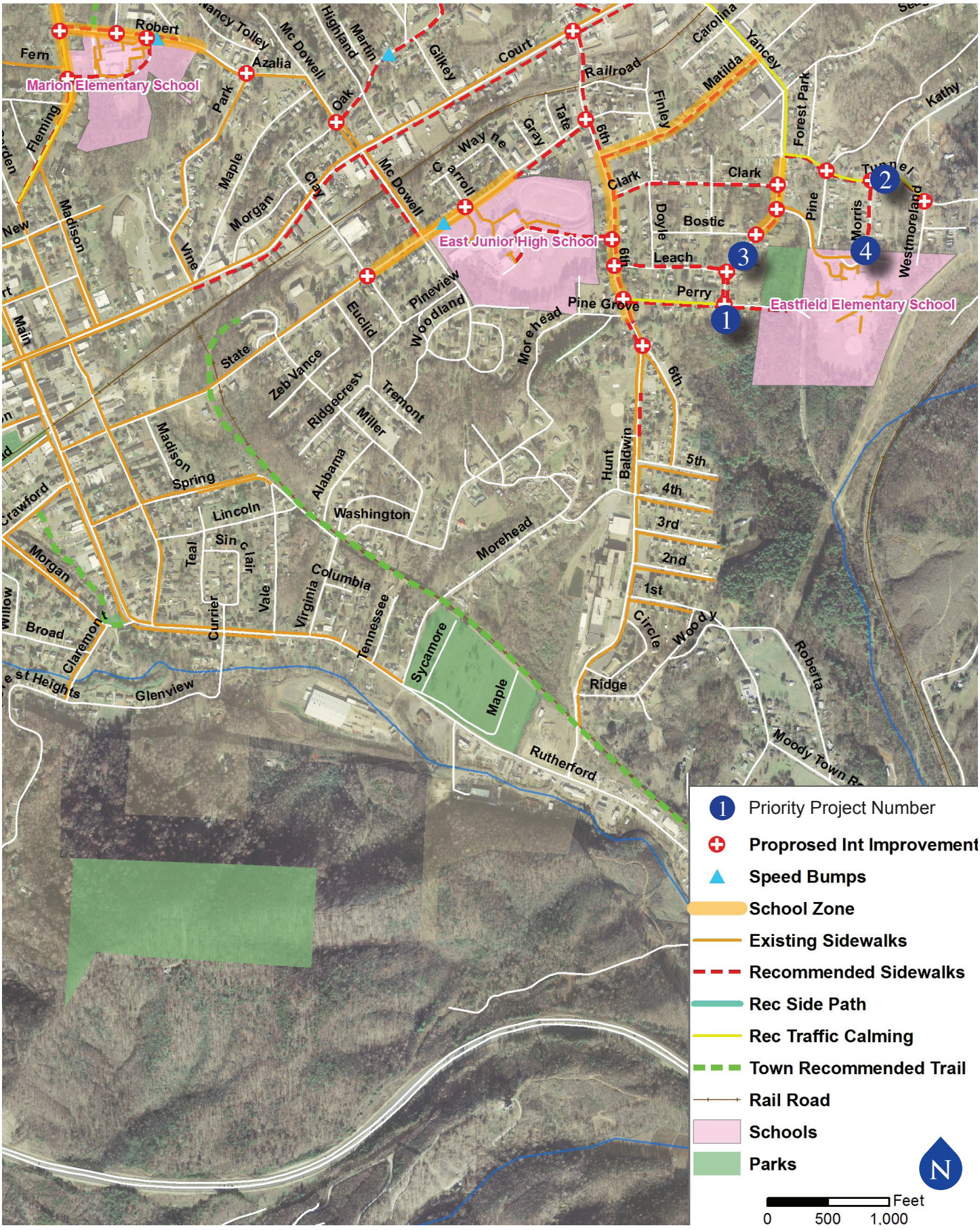
Overview

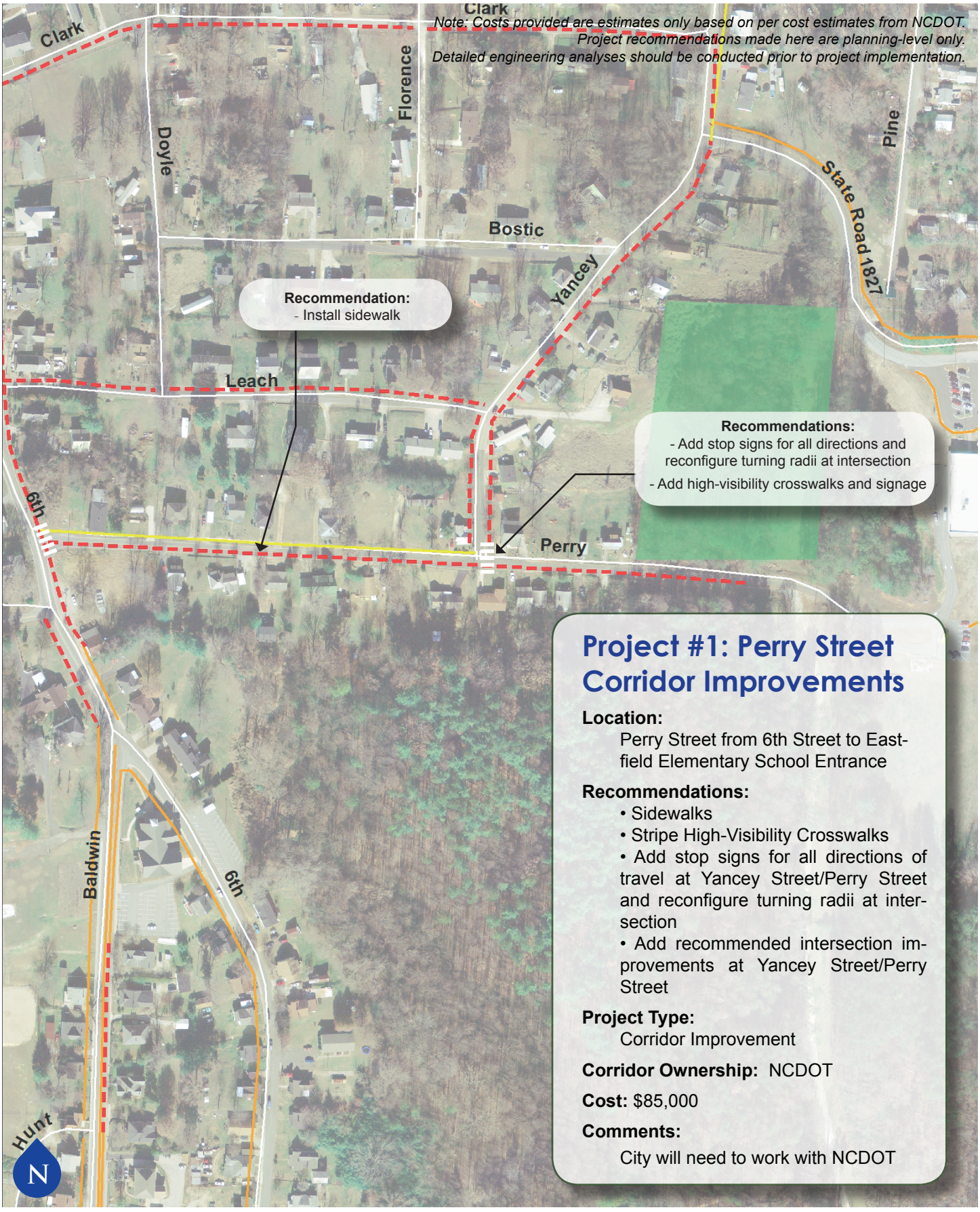
A comprehensive network of engineering improvements is recommended for the Eastfield Elementary School area. In Map 3.9 local travel routes that are already viable are illustrated with footprints. Specific network projects have been identified as integral to improving bicycle and pedestrian safety around the Eastfield Elementary School. These are the top priority projects of the comprehensive recommended network seen in Map 3.10. The project number on the map identifies the location of each priority project. The following pages provide detailed map recommendations, photos, and cost estimates.

Map 3.9: Eastfield Elementary Travel Map



Map 3.10: Eastfield Elementary Priority Projects





Project #1: Perry Street Corridor Improvements

Location:

Perry Street from 6th Street to Eastfield Elementary School Entrance

Recommendations:

- Sidewalks
- Stripe High-Visibility Crosswalks
- Add stop signs for all directions of travel at Yancey Street/Perry Street and reconfigure turning radii at intersection
- Add recommended intersection improvements at Yancey Street/Perry Street

Project Type:

Corridor Improvement

Corridor Ownership: NCDOT

Cost: $85,000

Comments:

City will need to work with NCDOT

Project #1: Perry Street Corridor Improvements

Importance

Perry Street directly connects both the newly constructed park and Eastfield Elementary School with neighborhoods to the west. It currently has no pedestrian facilities and is highly unsafe to walk on. Therefore it is critical that this road be improved for pedestrians.

Recommended Solutions

Perry Street

- Add sidewalk on Perry Street.
- Add high-visibility marked crosswalks.
- Add stop signs for all directions of travel and improve turning radii.
- Add pedestrian signage and school zone signage.
- Maintain a crossing guard at this location.



Looking west down Perry Street, there is a blind curve as Yancey Street intersects, and sight distances are even further limited by hedges alongside of the road. Turning this into a three-way stop, adding sidewalks and signage here would greatly improve this intersection.



Project #2: Tunnel Road and Morris Avenue

Location:
Tunnel Road from Yancey Street to Westmorland Street and Morris Avenue from Tunnel Road to Eastfield Elementary School

Recommendations:
- Sidewalks—All Streets
- Stripe High-Visibility Crosswalks
- Add recommended intersection improvements
- Add School Zone from Pine Street to Westmorland Street

Project Type:
Corridor Improvement
Crossing Improvement

Corridor Ownership: NCDOT

Cost: $75,000

Comments:
City will need to work with NCDOT

Project #2: Tunnel Road and Morris Avenue

Importance

Currently Tunnel Road is a major barrier to pedestrians. It separates neighborhoods to the north, from Eastfield Elementary School and is highly dangerous to cross with speeding traffic and lack of pedestrian facilities. Therefore it is critical that this road be improved for pedestrians. Additionally, providing sidewalks on Morris Avenue from the school will provide a safe location for students to walk from Eastfield Elementary up Tunnel Road.

Recommended Solutions

- Add sidewalks on Tunnel Road and Morris Avenue
- Add high-visibility marked crosswalks at Pine/Tunnel, Tunnel/Morris, and Tunnel/Westmoreland..
- Install pedestrian warning signs throughout.



A group of students walks down Morris Avenue.





The addition of a sidewalk down Tunnel Road, as seen in this photo rendering, would give children a safe place to walk to school.

Project #3: Yancey Street Corridor Improvements

Location:
Between Clark Street and Perry Street

Recommendations:
- Sidewalks
- Stripe High-Visibility Crosswalks
- Add recommended intersection improvements
- Extend school zone to Perry Street

Project Type:
Corridor Improvement

Corridor Ownership:
NCDOT

Cost: $65,000

Comments: Coming Soon



Note: Costs provided are estimates only based on per cost estimates from NCDOT. Project recommendations made here are planning-level only. Detailed engineering analyses should be conducted prior to project implementation.

Project #3: Yancey Street Corridor Improvements

Importance

Currently children and parents living in the neighborhoods to the west of Yancey Street must walk to school via Yancey Street where there are no sidewalks or pedestrian facilities. Crossing this street is highly dangerous due to sight distance problems. Improving the pedestrian facilities on Yancey Street is critical to aiding children and parents to walk to school safely.

Recommended Solutions

Yancey Street/Leach Street
- Add sidewalks on both Yancey Street and Leach Street.
- Add high-visibility marked crosswalks.
- Add pedestrian signage.

Yancey Street/Bostic Street
- Add sidewalks on both Yancey Street and Bostic Street.
- Add high-visibility marked crosswalks.
- Provide a crossing guard at this location.
- Install pedestrian warning signs.

Yancey Street/School Entrance
- Add sidewalks on Yancey Street.
- Add high-visibility marked crosswalks.
- Provide a crossing guard at this location.
- Install pedestrian warning signs and school zone signage.

Yancey Street/Clark Street
- Add sidewalks on both Yancey Street and Clark Street.
- Add high-visibility marked crosswalks.
- Provide a crossing guard at this location.
- Install pedestrian warning signs.

Consider traffic calming measures, especially if sidewalk is not constructed.





Sidewalk is also needed on Yancey Street, and as seen in this photo rendering at the intersection of Yancey Street and the school entrance, it could open up the area right around the school to pedestrians.

Project #4: Morris Avenue Corridor Improvements

Location:
Morris Avenue, between Tunnel and school

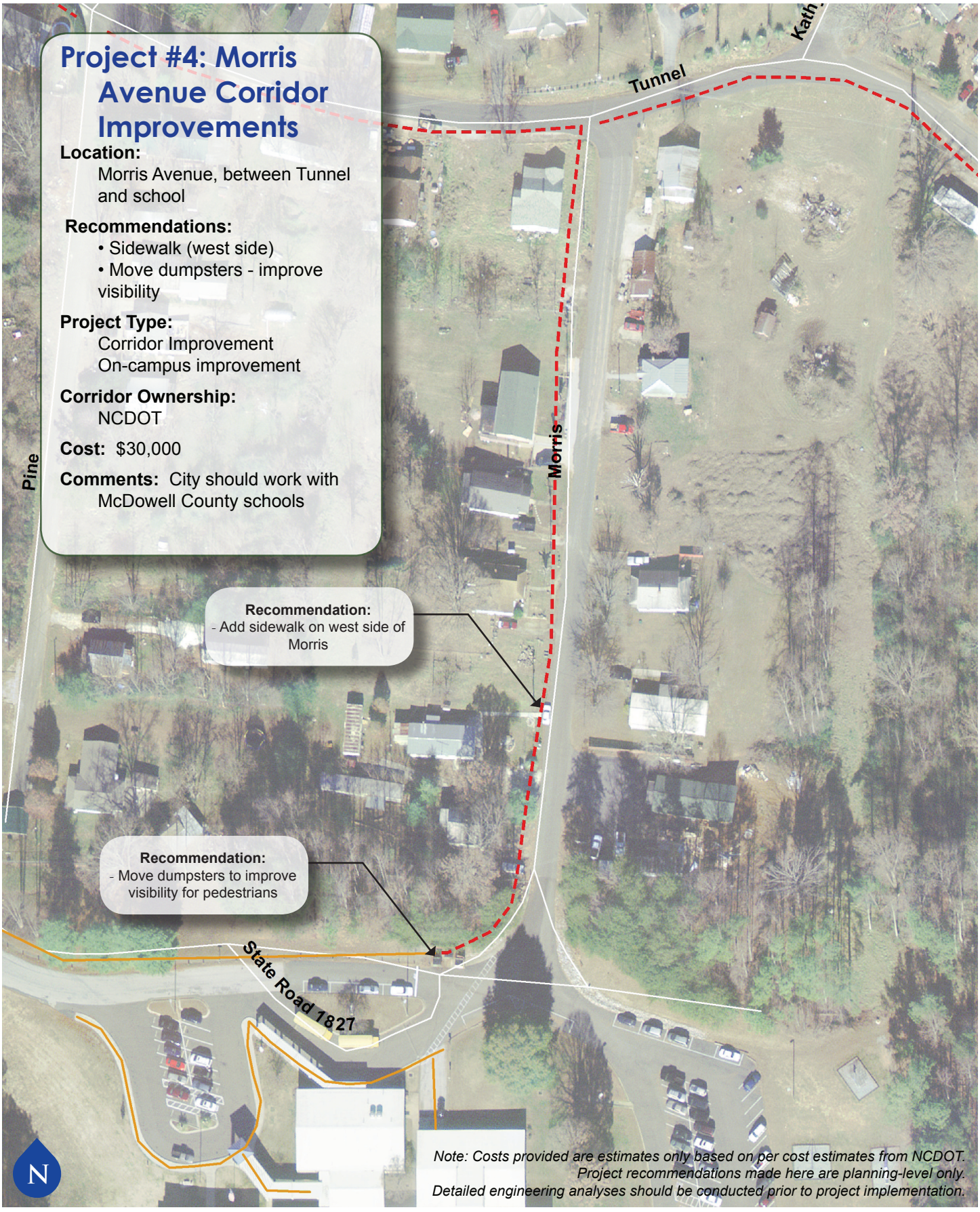
Recommendations:
- Sidewalk (west side)
- Move dumpsters - improve visibility

Project Type:
Corridor Improvement
On-campus improvement

Corridor Ownership:
NCDOT

Cost: $30,000

Comments: City should work with McDowell County schools



Note: Costs provided are estimates only based on per cost estimates from NCDOT. Project recommendations made here are planning-level only. Detailed engineering analyses should be conducted prior to project implementation.

Project #4: Morris Avenue Corridor Improvements

Importance

Morris Avenue is one the major entry ways to campus. Sidewalk would provide separated space for pedestrians. Currently, dumpsters block sight vision for motorists as pedestrians cross at the existing marked crosswalks.

Recommended Solutions

- Install sidewalk on west side of Morris Avenue.
- Relocate dumpsters, extend sidewalk, and re-orient crosswalk to improve sight lines.



Sidewalk is needed on the west side of Morris Avenue, as can be seen by the pedestrians (in the image above) along the roadway.

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4 CURRENT PLANNING EFFORTS & POLICIES AND POLICY RECOMMENDATIONS



Chapter Outline:

4.0 Introduction 4.1 City Policies/Existing Plan Review 4.2 City Policy Recommendations
4.3 School/District Policies 4.4 School/District Policy Recommendations

4.0 INTRODUCTION

While the engineering and programming recommendations described in this Plan are critical for creating safe routes to school, strong pedestrian-oriented plans, policies, and regulations are also key elements of a complete SRTS program. These plans and policies help ensure that pedestrian and bicycle-friendly facilities are implemented with new development. Also, school system policies such as busing, school siting, and wellness policies are essential for making it safer and for encouraging more walking and bicycling to school.

This chapter contains existing plan and policy reviews with recommended policy revisions and amendments. The recommended policy statements will help the community and its schools achieve its vision of becoming more walkable and bikable. Town planning staff and school leaders should become familiar with these policies and regulations to ensure the full suite of policy tools are used and enforced.

Walkability should be an item considered with all future development, growth, and school siting decisions. More people will walk when their proximity to key destinations is reasonable. For example, a mixed use development near a school will engage more walking while the development of a school at the outskirts of town will promote less walking and more driving.

This section is divided into the following components:

City Policy/Existing Plan Review

City Policy Recommendations

School/District Policies

School/District Policy Recommendations

4.1 CITY POLICIES / EXISTING PLAN REVIEW

Thoroughfare Plan for the City of Marion 2002

The Thoroughfare Plan provided by NCDOT does mention pedestrians and bicyclists in a limited capacity. It suggests that the City develop a pedestrian plan to include with this plan as well as developing recommendations for bicycle routes within the City. This SRTS Action Plan will provide a cohesive link that is better suited plan for the needs of pedestrians and bicyclists, especially those near the City's schools.

City of Marion Code of Ordinances

As shown in the excerpts below, the City of Marion's Code of Ordinances supports safe pedestrian and bicycle transportation and development. While these policies could be strengthened, such as requiring sidewalks and bicycle facilities at all new development, they provide a good foundation and support for Safe Routes to School.

Sidewalks shall be constructed on such streets the city council considers sidewalks to be necessary. Sidewalks, if constructed, shall be within the street right-of-way and installed in accordance with city specifications and standards.

All parking areas shall include facilities that ensure safe pedestrian circulation on-site and between parking areas, dedicated rights-of-way, and adjacent properties where appropriate. Bikeway facilities are recommended but optional. If a bikeway system is included it shall comply with the following requirements as part of the site design:
An internal pedestrian walkway or bikeway system shall provide a direct connection to any planned or existing public greenway system or park facility.

Parking areas with twenty (20) or more parking spaces may substitute a bicycle rack that provides space for five (5) bicycles at a ratio of one bicycle rack for each twenty (20) parking spaces. One parking space may be subtracted for each five-space bicycle rack.

Community Comments for Update of Comprehensive Plan 2009

The City of Marion's Comprehensive Plan is currently being updated. Below are a few relevant public comments received during a public brainstorming workshop:

Bicycle & Pedestrian Systems

- Connect downtown sidewalks to urban trails.
- Seek to reclaim old alleys in order to reopen such areas for public space and pedestrian accessibility.
- Expand and enhance sidewalks within Marion.
- Enhance multi-modal transportation opportunities in and around Marion through the development of a comprehensive bicycle and pedestrian trail system.
- Establish comprehensive trail system that is low impact and low maintenance that connects to other county, regional, state, and national trails.
- Sidewalk extension from Viewcrest north to the Bi-Lo Shopping Center.
- Develop a bicycle and pedestrian master plan that creates a comprehensive system of corridors promoting alternative means of travel and healthy living.
- Ensure safe street crossings with adequate crosswalks with timed crossing signs especially at unusually wider intersections in downtown and other identified locations within the City.
- Ensure all streets have sidewalks with ramps at curbs and all heavily trafficked streets have bicycle-lanes and painted crosswalks.

McDowell County Greenway Master Plan 2007

The purpose of the McDowell Trails Association is to identify and prioritize opportunities for establishing hiking, biking, and paddling trails that can lead residents and visitors to interact with the area's natural resources. The MTA also pursues funding from state, federal and other grant sources to protect these resources for utilization as parks, greenways, open spaces, historical sites and recreational facilities.

This Greenway Master Plan ties in with the walking trail goals of the communities of Marion and Old Fort. This Greenway Master Plan focuses on protecting, preserving, and restoring McDowell County's valuable resources, and addresses voluntary public acquisition of land and funding alternatives to implement the vision. A greenway trail system through McDowell County would run along the Catawba River from the Catawba Falls to Lake James.

Recommended greenways in Marion include:

Phillips/Rabb Greenway Connector -
This trail will connect West McDowell Junior High School and McDowell High School to the County River Park and the Catawba River Greenway.

The Historic Downtown Marion Connector-
This walkway will connect the McDowell House to the Historic Downtown Marion. It will be approximately 2.25 miles and will most likely be a sidewalk and bicycle lane along the highway.

Pea Vine Railroad Connector-
This greenway connects the historic downtown Marion business area with the 3.5 mile abandoned Norfolk Southern Rail roadbed. The initial portion to be developed will probably be approximately 1 mile long beginning at State Street and running southeast toward Rutherfordton. After the 1-mile point, the railway bed parallels an active rail line making further development of a greenway difficult.

Mount Ida – Pea Vine Connector-
This connector is to provide a greenway link from the Pea Vine Greenway to the top of Mount Ida. It will be approximately .68 of a mile long.

Corpening YMCA/McDowell Senior Center Connector-
This connector will join the downtown Marion business section with the Corpening YMCA and the McDowell County Senior Center. It will be approximately 1.2 miles long.

East Junior High School Connector-
This connector will join the downtown Marion business section with the East Junior High School. It will be approximately .07 miles long.

4.2 CITY POLICY RECOMMENDATIONS

•The City should adopt a complete streets policy which requires that the planning, design, construction and maintenance of roadway and transit facilities will include the needs of all transportation users – pedestrians, bicyclists, the disabled, transit users, and motorists. Complete streets improve safety by providing dedicated facilities for pedestrians and bicyclists. As such this is an important strategy for Safe Routes to School, as children are our most vulnerable roadway users, and roads leading to schools are regularly built and reconstructed.

• Develop stronger bicycle policies and ordinances to foster development of facilities within the City. Policies such as bicycle parking, bicycle lane development with roadway construction/repair, and bicycle helmet laws should be added.

• Sidewalk requirements for new development should be added to all pertinent ordinances. Sidewalk/trail connectivity within developments and parking areas should be stressed as highly important for transportation purposes.

• The City should be open to obtaining easements when necessary to retrofit sidewalk.

• A pedestrian countdown signal and crosswalk policy should be written to require these important pedestrian facilities at all major roadway intersections.

• The City should consider utilizing a portion of the revenue from traffic fines for SRTS. When drivers speed and commit other moving violations, especially in areas where there are vulnerable populations such as school zones, they endanger children. Therefore, it is rational that the fine revenue generated should be used for programs that increase safety. Safe Routes to School programs calm traffic and reduce the number of vehicles driven by parents in school zones and other places where children may be walking or bicycling to school. Utilizing fine-based revenues creates a permanent and appropriate way to supplement SRTS programs within the City or County.

4.3 SCHOOL/DISTRICT POLICIES

McDowell County School District Policies:

McDowell County School District does support walking and bicycling to school. The busing policy provides transportation for students who live 1 mile or further from school, encouraging children to walk to school, if conditions are safe for children to walk to school. However, this policy is not enforced and busing occurs within 1 mile of the schools. Additionally, several policies such as the school wellness and school siting policies need to be strengthened in order to support the goals of SRTS better. The wellness policy should mention how walking and bicycling to school should be encouraged, when safely appropriate, because of the physical exercise these modes of transportation offer. The school siting policy needs to better account for existing pedestrian and bicycle facilities as well as the construction of new facilities if the school is located away from existing facilities.

4.4 SCHOOL/DISTRICT POLICY RECOMMENDATIONS:

• The school district should consider revising the wellness policy to include language about SRTS and how walking and bicycling to school aids in children obtaining their needed daily physical exercise. It should include elements of the SRTS program such as educational and encouragement programs and events to increase the amount of children walking and bicycling as well as improving route safety and accessibility.

• The school siting and school facilities policies should be revised to provide more opportunity for schools to be located in City and near residential areas free of barriers for pedestrians and bicyclists. The school district should also consider establishing low minimum acreage requirements for new school facilities. These requirements are often too large for what is ideally needed for each school and the “one size fits all” guidelines often eliminate potential school property within City limits. The policy should also include language on encouraging the re-use and adaptation of existing schools rather than the construction of new schools.

• The school district should maintain the busing policy providing transportation for students who live 1 mile or further from school. This policy aids in encouraging children to walk and bicycle to school.

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5 PROGRAM RECOMMENDATIONS



Chapter Outline:

5.0 Introduction 5.1 Education 5.2 Encouragement 5.3 Enforcement

5.0 INTRODUCTION

The SRTS Program is an opportunity to address the needs of the community on a comprehensive level. Encouraging families within close proximity of the schools to walk or bicycle reduces the demand on our infrastructure by directly reducing the number of motor vehicles on the roadway. This results in improved safety for both vehicular and pedestrian users alike. The results from a successful SRTS Program quickly domino from health and safety improvements that directly affect our students to more indirect benefits, such as the reductions to school zone congestion, the consumption of fuel, and transportation costs to the school district, as well as marked improvements in the air quality along strategic corridors.

Each community committed to the SRTS movement is unique. In fact, visions and goals may vary greatly between communities depending on the individual challenges, barriers, and demographics of the school district. Therefore, the activities associated with Education, Encouragement and Enforcement may also vary greatly. It should also be noted that some strategies for each of these three E's may address all three E's together.



The following sections outline the basic strategies of these programming elements. A comprehensive listing of topics and action steps for education, encouragement, and enforcement programs is provided along with a list of specific programs that can be implemented to have the greatest impact. Note, education, encouragement, enforcement, engineering and evaluation are all interdependent tools that are often most effective when presented in combination.

It is recommended that all the priority programs identified below be incorporated early on when initiatiing a SRTS Program. Education and Encouragement activities are relatively low cost and can easily be part of the kick-off of the program. Several other programs are identified that offer a variety of techniques to encourage the parents and children to walk and ride their bicycles to school. Many of these are also low cost, giving schools a wide variety of activities to utilize in and sustain their SRTS Program.

Involving Students with Special Needs

Improved infrastructure such as sidewalk connectivity and pedestrian treatments at crossings benefit the welfare of the entire community as well as those participating in the SRTS Program. However, there are select sectors of the school populace that can feel disconnected from the program due to limitations beyond their control. Two such groups include those students living too far to walk or bicycle to school and students with disabilities. It is important to design SRTS Programs, events and activities that include everyone.

Living Outside the Walk Zone

With encouragement strategies in place, much excitement can be generated within the student body about participating in the SRTS Program. There are

events, activities and rewards that are highly visible to the entire community. However, what if you are a child that lives outside of the walk zone? The SRTS Program is for everyone! Each of the activities can be modified to accommodate children from neighborhoods outside the walk zone. For instance, Park and Walk or Bus and Walk programs allow for parents and / or school buses to drop off students at a designated location (maybe a park, church, or community center) that is within walking distance to the school. Adult chaperones then assemble walking school buses from that location to the school. Other participation opportunities may be built in by allowing special time and access to the school or athletic fields before, during, or after school, so that children who cannot walk to school can still accrue miles, minutes, or steps by walking laps around designated locations on campus. There are many classroom activities and curriculum enhancements that can be modified in the same manner.

Link of interest:
•http://www.saferoutesinfo.org/guide/encouragement/index.cfm

Involving Children with Disabilities
Federal legislation identifies the inclusion of children with disabilities as a necessary component of the SRTS Program. Disabilities are defined under many different classifications and by varying degrees, but the common factor between them all is that the benefits of physical exertion and social interaction as well as the promotion of physical independence are crucial in developing these children's well being. Many resources for ideas on how to include this very special and important sector of the student body in physical activities for the SRTS Program can be found at the National Center of Physical Activity and Disabilities. Listed below are a few examples.

a) Parental Roles in Facilitating and Supporting an Active Lifestyle for a Child with a Disability.
b) Maintaining or Improving Fitness in Childhood Disorders.
c) The Rationale and Benefits of Sport Participation for Youth of All Abilities.
d) Program Considerations for Integrating Children with Disabilities into Community Sports and Recreation Programs.
e) Cycling (includes equipment).
f) Exercise Guidelines for People with Disabilities.

The National Center for Safe Routes to School has created a list of strategies for involving disabled students:

1. *Involve special education professionals and parents of children with disabilities on the SRTS team*. Achieving the benefits of SRTS for children with disabilities begins with awareness of their needs and how the school system is structured to address them. The people in the best position to know these things are special education professionals and the parents of children with disabilities. Invite them to participate as members of the school's SRTS team. Without this perspective, SRTS organizers may miss important opportunities to benefit children with disabilities.

2. *Consult special education professionals and parents of children with disabilities when planning SRTS education activities during the school day.* Communicate with special education professionals to ensure that inclusive SRTS activities are scheduled to maximize participation by special needs students. This involves knowledge of both class schedules and times when the special needs professionals are available to assist. For example, if a pedestrian/bicycle safety education class is held during physical education, additional staff or volunteers may be needed to ensure students with disabilities are able to fully participate.

3. *Seek input and involvement when planning SRTS encouragement events*. Safe Routes to School activities, such as Walk to School Day and Walking and Wheeling Wednesdays, can also benefit from the input of those who know children with disabilities best. Parents and special education professionals can work with SRTS organizers to determine appropriate strategies to include their children, as well as provide a source of volunteers to assist with the event.

4. *Involve children with disabilities in walking and bicycling audits.* Safe Routes to School programs can

help to make schools more accessible for children with disabilities by identifying physical barriers along the route to school, such as missing curb ramps, steep driveways, sidewalk gaps and pedestrian signals that are not accessible. Students with physical disabilities, and their parents, know these barriers all too well. They should be invited to participate in walking and bicycling audits and other "field activities" throughout the SRTS process.

5. *Ensure that the Principal understands that including students with disabilities is a priority.* Principals have a unique authority in every school. If you are having trouble reaching out to special education resources, they can often help bridge relationships with the right people, including special education teachers and parents.

6. Ensure SRTS messages and images are inclusive. One common mistake that SRTS programs make is using photographs and images that do not include students with disabilities, therefore implying that the program is not intended for them. Images chosen to represent the program should always include a balance of students of all ages, genders, ethnicities and abilities.

7. *Establish special programs when necessary.* In most cases, children with disabilities can be included alongside their peers. All that is required is proper consultation with parents and special educators, a little creativity, and perhaps a change of approach. However, SRTS organizers should recognize that there are circumstances under which this arrangement, on its own, does not achieve optimal results for a student with disabilities. In these cases, it is best to work with a special education professional to develop a custom-tailored program.

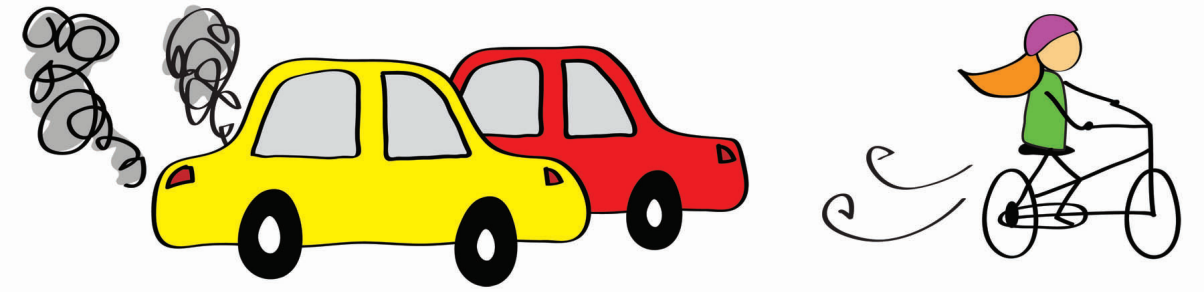
Links of interest:
• http://www.ncpad.org/fun/fact_sheet.php?sheet=96&view=all
• http://www.saferoutesinfo.org/search/?searchbox=children+with+disabilities
• http://www.saferoutespartnership.org/local/4317/4359
• http://katana.hsrc.unc.edu/cms/downloads/Involving_students_with_disabilities.pdf

5.1 EDUCATION

The Education Program activities target the entire school community including residents living within the school zone, roadway users, student body, parents and even the school staff. Activities focus on teaching pedestrian and bicycle safety, health and wellness benefits and the positive environmental impacts of walking and bicycling.

Suggested Topics:

1) For Children: Bicycle and pedestrian safety is always the principal focus of SRTS educational strategies and events. For young pedestrians, education is a valuable tool in encouraging safe practices and habits even though they may be traveling under parental supervision. However, education involves more than just safety procedures for pedestrians at crossings and the use of clear hand signals for cyclists. It includes teaching children about their personal safety as well -- why they need to exercise; wear their helmets; use a buddy system; know where "safe places" are along the route; and use only designated, well-traveled routes. Just as importantly, children need to understand their choices do matter, and



Teaching kids about the environmental benefits of riding a bike or walking to school is a great way to get them excited about the SRTS Program.

that environmental responsibility is assigned to all ages. Helping children assimilate good habits into their routines is a simple strategy, but its benefits are perhaps the most important improvement goal within the SRTS Program -- improving our children's safety and well-being. The primary topics pertinent to children are listed below and can be easily incorporated into events, activities and/or contests.

a) Pedestrian and bicycle safety skills
b) Personal safety
c) Health and environmental benefits

Links of interest:
• http://www.saferoutesinfo.org/guide/education/children.cfm

• http://www.saferoutesinfo.org/guide/education/strategies_for_educating_children.cfm

2) For Parents: Parents play multiple roles in the SRTS Program and their advocacy is pivotal in promoting student participation. Parents lead by example: initiating efforts to participate in the SRTS Program, exhibiting compliance with drop off and pick up procedures, imparting instructional guidance, and driving responsibly through the school zones. It is important for parents to know proper pedestrian and bicycle safety skills so that they can model and reinforce the proper behavior with their children, even when not walking or bicycling to school. The following topics represent key information to be conveyed to parents to encourage their participation in the SRTS Program.



Bike Rodeos are a fun way to teach kids about important bicycle safety skills.

a) Drop off and Pick up policies and traffic patterns
b) Review of pedestrian and bicycle facilities within the school district
c) Teaching age-appropriate safety procedures

Link of interest:
• http://www.saferoutesinfo.org/guide/education/key_messages_for_parents.cfm

3) For Drivers near the School: There is universal concern among school and community stakeholders about the speed of traffic and driver compliance with State traffic laws within the school zones. Statistics support their concerns as the severity of pedestrian injuries is directly related to the travel speed of the vehicle. Therefore, it is imperative that driver education stress the importance of these topics.

a) Awareness and driver expectation for pedestrian traffic within the school zones and designated program routes
b) Compliance with speed limits, yielding to pedestrians, and awareness of school zone speed limits
c) Compliance with coming to a complete stop at stop signs
d) Compliance with stop bars and remaining clear of the crosswalk

Link of interest:
http://www.saferoutesinfo.org/guide/education/key_messages_for_drivers_near_the_school.cfm

4) For Neighbors: The residents and businesses within the school zones benefit from the SRTS Program through the addition of walkable and bikable facilities, improvements in safety features, and the reduction in area congestion. Likewise, the schools' neighbors also influence the effectiveness of these improvements based on their level of participation in the program. Designated routes through neighborhoods that have the community's support provide a safer and more positive experience for the children. Certain businesses along a route may even identify themselves as "safe places" for children to go if they need assistance. The information listed below

includes the issues residents and businesses within SRTS communities should address.
a) Keeping sidewalks clear of obstructions, including snow
b) Pruning plants that impede visibility at intersections and street crossings
c) Being responsible with pets and keep them appropriately leashed or restrained along the designated routes.
d) Being prepared to share the road with young pedestrians and bicyclists.

Link of interest:
• http://www.saferoutesinfo.org/guide/education/key_messages_for_neighbors.cfm

Priority Education Programs

1. Integrate bicycle/pedestrian education into the school day. This can come in the form of making it part of the curriculum, part of Physical Education class, or even one-day events/assemblies. It should be a priority of the schools to teach safety and educate children. Include hands-on skills training such as simulated street crossings and bicycle handling drills. The following is a list of how bicycle/pedestrian education can be incorporated into several different classes:

Art, Computer Class - Create posters promoting Walk to School Day, safety messages, contests and reward recipients.

Geography - Design survey and maps of walking routes to school or use on line Walk Across America games and activities.

Health - Use pedometers to measure steps, or simply measure walking time accumulated by students; study health benefits of physical activity. Other issues such as air pollution and air quality could be taught. Children could figure out the amount of greenhouse gases that are not produced each time students walk or bicycle to school. Additionally, the impact of exercise and healthy lifestyle as it relates to obesity, diabetes, asthma and other diseases could be addressed in the classroom.

Priority Education Programs

1. Integrate bicycle/pedestrian education into the school day.

2. Start a comprehensive motorist/pedestrian/bicyclist safety campaign.

Mathematics - Keep logs of walking time or steps; calculate speeds and distances, individual and group averages, trends and statistical analyses.

Physics - Study the biomechanics of walking. For example: Do stride lengths vary with height, weight, age, leg length? How does walking speed depend on your step speed and stride length?

Biology - Look for specific plant or animal species, or inventory indigenous species along walking routes or catalogue seasonal changes in the flora and fauna.

English - Write press releases and public service announcements to promote Walk to School Day. Write essays or keep a diary about your experiences walking.

History - Study historical locations in your community by walking to them.

Social Sciences - Photograph important things about your community observed while walking to school. Is there anything you'd like to change? What can you do about it?

2. Start a comprehensive motorist/pedestrian/bicyclist safety campaign. This would be an early implementation effort after adoption of this plan to continue momentum of this program. A significant campaign should be conducted annually. This should include the following efforts:

• Create flyers and brochures with safety information and tips (crossing at marked crosswalks, using sidewalks, obeying traffic signals, stopping for pedestrians, being attentive around schools, etc.).

• Create posters and billboards with simple, powerful graphics and language about the importance of safety.
• Develop handouts and materials passed out to schoolchildren to deliver to their parents.

• Involve the local television and newspaper media.

• Utilize additional law enforcement staff and techniques during the campaign.

• Hold walking and bicycling events during this campaign.

• Involve elected officials through organized events and speeches.

Other Suggested Strategies:

• Utilize the League of American Bicyclists Kids Bicycle Education and the NCDOT Basics of Bicycling curricula to fit a bicycle safety program into the Physical Education schedule.

• Conduct bicycle rodeos locally with cooperation from local government and/or businesses.

• Include hands-on skill training.

• Hold one-time instruction assemblies about walking/bicycling to school.

• Educate parents during PTA/PTO meetings and open houses by sending home materials through the schoolchildren.

• Develop media stories, brochures, emails, and websites to distribute key messages and safety education materials.

• Develop a driver safety campaign.

• Hold neighborhood group meetings or attend existing neighborhood group meetings to introduce SRTS.

• Provide environmental educational signage along trails leading to school or on school property.

• Participate in the Walk and Bicycle Across America Program. This program is a web-based, interactive game that promotes exercise and participation in the SRTS Program and integrates these components with more traditional educational lessons. Classes participating in the game receive a map identifying historical or otherwise significant sites with links to educational web pages. This is a wonderful compliment to geography, math, social studies, and other subject area lessons as each destination on the map is designed to broaden the student's knowledge of the United States while teaching skills in mapping, computer science, and more. The cumulative miles clocked by the students in the class walking and bicycling to school are summed and used as available miles to travel the map and progress the children along to interesting places, fun exercises and plenty of learning experiences.

Links of interest:
• www.saferoutesinfo.org/guide/education/
• www.saferoutestoschools.org/lessonplans.shtml
• www.saferoutestoschools.org/pdfs/CurriculumGuide0910.pdf
• www.saferoutestoschools.org/lessonplans.shtml
• www.saferoutestoschools.org/Forms/WalkBicycleGuide2006.pdf

5.2 ENCOURAGEMENT

Encouragement activities present the best opportunities to generate excitement and build momentum for a community's SRTS Program. The strategies focus on fun ways to create interest in walking and bicycling to school, bring families and community stakeholders together, and inspire a sense of pride in self, school, and community for all participants. As mentioned previously, all encouragement activities should incorporate both children who live outside the walking and bicycling zone and children with disabilities.

Suggested Topics:

1) Target Audience: It is important to tailor activities to address the concerns outlined in the Action Plan for each individual school. The success of promotional events depends on how well the encouragement experience matches the interest of the group participating. For example, the children's ages are key components in the selection of the activities, as well as the presentation of the educational information. Additional considerations in planning the activities are listed below:

a) Include interests for community stakeholders, parents and children.
b) Plan for participation by individuals with disabilities.
c) Plan for participation by individuals outside walk-zone parameters.
d) Combine multiple elements (5 E's) in each activity.
e) Plan efforts that fit the personality of the community.

Links of interest:
• http://www.saferoutesinfo.org/guide/encouragement/index.cfm

2) Create Partnerships: Public and private service providers prove to be helpful partners in the planning and implementation of both activities and project goals. Often these groups have educational materials or reward incentives to contribute to the activities. Make sure you canvas your local agencies for support as well as participation. Note, common agencies identifiable in most communities are listed below:

a) Organizations that support public health.
b) City/Town Planning Department for joint promotion.
c) Local law enforcement.
d) City officials and/or celebrities.
e) Local businesses especially those near designated routes and/or with similar priorities -- bicycle repair shops, retail sportswear and equipment stores, etc.

Links of interest:
• http://www.saferoutesinfo.org/guide/encouragement/index.cfm
• http://ctb.ku.edu/en/LearnMore.htm
(Community Toolkit)

3) Promoting Events: Creating excitement around the SRTS Program, maintaining its momentum, and sustaining the community's participation can be a challenging endeavor and one that primarily hinges on successful promotion initiatives. Each year the SRTS Program should be reintroduced for new families joining the school's community as well as for veteran participants. Maintaining the visibility of the program's activities, participants, and rewards not only contributes to the vitality of the program, but it also influences the community's adoption of new cultural attitudes about transportation and environmental responsibility. The following list provides suggestions for consideration.

a) Use media to spread word and generate excitement.
b) Utilize City officials and celebrities as advocates and spokespersons.
c) Create a website with SRTS information and maps of routes to school.
d) Be visible in the community with presence in local businesses and event locations prior to festivities.
e) Engage sponsors.

Links of interest:
• http://www.saferoutesinfo.org/guide/encouragement/index.cfm
• http://ctb.ku.edu/en/LearnMore.htm
• http://www.nhtsa.gov/people/injury/pedbimot/bicycle/Safe-Routes-2002/toc.html

Priority Encouragement Programs

1. Immediately begin a walking school bus program at Marion Elementary School, Eastfield Elementary School, and East McDowell Junior High School. As improvements are implemented, a walking school bus program can be implemented at West Junior Elementary School. The walking school bus was the most articulated request and interest of the public and SRTS Advisory Committee during this planning process. A walking school bus is a group of children

Priority Encouragement Programs

1. Begin a walking school bus program at Marion Elementary School, Eastfield Elementary School, and East McDowell Junior High School.

2. Begin mileage clubs/contests.

walking to school with one or more adults. This community should build on the momentum of this planning process and reach out to parents and students to make this a reality. The walking school bus could begin as a once-a-month or once-a-week activity and, as it gains more interest, becomes a regular occurrence. A walking school bus serves a number of purposes:

• Makes walking to school safer and more fun.

• Increases number of children walking to school.

• Eases parents' concerns and fears of their children walking to school unsupervised.

• Provides a means of reinforcing safe walking/bicycling behaviors by practicing techniques learned.

• Creates an opportunity for more socialization and community-building.

• Saves gas and eases traffic congestion.

2. Begin mileage clubs/contests. Mileage clubs and/or contests encourage children to begin or increase their amount of walking or bicycling to school. Typically, children track their mileage, and may win a prize. These clubs or contests are a good way to establish individual or team goals and can be structured for friendly competition or self motivation. They also allow a way to recognize accomplishments which keeps children interested in participating and makes the program fun. More information on mileage clubs and contests is included in the Activities and Contests sections below.

Other Suggested Strategies:

• Participate in International Walk to School Day which is held annually in the month of October. The participating schools can celebrate with organized activities and an organized parent / student walk to school. Some communities plan participation events for a day, some for a week and some for the entire month. There are readily available guidelines for planning, promoting and implementing Walk to School Day events.

• Establish a regular Walk and Bicycle to School Day. Much like the International Walk to School Day, city or school administration officials select a special day, or number of periodic days during the school year, to encourage parents and students to use non-motorized transportation on designated day(s). Rewards, competitions and incentives are used to combine education, healthy life choices and entertaining activities that help bond the community together and champion a common cause.

• Involve schoolchildren in "Adopt-a-Trail" program. Schools could participate by adopting a nearby trail and performing basic maintenance like trail clean-up.

• Promote Park and Walk strategies where families drive to meet and walk the remaining distance to school. This could be a parking lot within walking distance.

• Hold special events, activities, and contests that relate to SRTS throughout the year. The following sections provide several examples that can be considered.

Special Events:

Special events can create a lot of excitement in the community. The following are some ideas for events that can stand alone or incorporate into other planned programs.

• Bicycle Swap: Bicycle swaps are exciting events that can be used as fund raising opportunities. Individuals bring gently used bicycles to the swap. For a small admission fee, they are allowed to display and/

or barter for fantastic deals on a "new" set of wheels. In some states, these events draw hundreds of bicycles and are very organized complete with websites and media coverage.

• Walk to School Parade: One way to involve the entire community is a Walk to School Parade. Elected officials, SRTS stakeholders and sponsors all meet at a central location along a designated route and walk to school together. If neighborhoods are spread out, several specific routes can be utilized and team spirit tapped for friendly competition. Flags or incentives along the route could make the hike seem short and exhilarating. Competition between the teams can even be rewarded through sponsors willing to donate prizes or discounts within their establishment for the victors. A Walk to School Parade is a great way to increase involvement in walking to school.

Bicycle Rodeos: Bicycle rodeos are bicycle skills events that provide an opportunity for bicyclists to practice and develop safe skills. Goals are to learn, practice, and demonstrate their bicycle handling skills in a fun, noncompetitive atmosphere. Bicycle rodeos can be large or small and require volunteers or a group of instructors. Local service organizations, PTA/PTOs, bicycle shop owners, cycling clubs, and law enforcement could provide assistance. A bicycle rodeo is related to Priority Recommendation #1 in Section 5.1 except that the recommendation in 5.1 is more intense, is built into school classtime, and utilizes a series of lessons. A bicycle rodeo is used more as an "introductory", fun, one-day event that is better suited for community events or field days.

Activities:

Activities can be a fun way to get parents and children involved in SRTS Programs. They are typically very low cost, but provide a lot of motivation and excitement. The following is a list of potential activities that can be incorporated into a SRTS Program:

• Bicycle Trains: Bicycle trains may be more convenient than walking school buses for students and parents located more than one to two miles from the school or more attractive to older students. However, its operation resembles the Walking School Bus in terms of group pick ups and drop offs under adult supervision.

• Mileage Clubs: Logging miles, minutes and even steps with pedometers can give children a sense of accomplishment and earn prizes for achieving established goals. Mileage clubs can also be joined by children who live outside the walk zone as well. Some SRTS Programs have offered opportunities to Walk-at-Recess giving tokens, charms and rewards for miles reached.

• Walk N' Roll Punch Cards: This activity is used as an incentive to encourage students to walk or ride to school by tracking the number of days they participate through the number of punches they receive on their card. When the card's punch spaces are completely filled, the child earns a reward.

• School-based Welcome: The School-based Welcome is designed to greet walkers arriving at school with refreshments, rewards, and incentives. This is an excellent encouragement activity that can be used independently or in combination with other events and SRTS elements. The Welcome station may be manned with special guests from time to time to keep children excited about reaching their final destination. Some examples of innovative ideas used in existing SRTS Programs include Welcome stations that include a tour of a fire truck or ambulance, a visit from school mascots, or local celebrities.

Contests:

A little friendly competition can cause a lot of excitement! Contests can be incorporated into several of the programs previously mentioned. The prizes do not have to be expensive...special recognition, a party for a class, a scooter or bicycle donated by an area business... these are all ideas of incentives for children. You can incorporate beads or bracelets that the children earn... small things can easily motivate children. The following are just a few examples of contests that can be held as a part of your SRTS Program.

• Golden Sneaker Award: One example of a very inexpensive prize is the "Golden Sneaker Award". For this award, homeroom classes tally the number of children each week that use an alternative mode of transportation. Points are accumulated based on the total number of commutes per mode per class. The class with the highest participation for the month wins the coveted Golden Sneaker Trophy. The trophy is a sneaker that is spray painted gold and mounted on a base. The winning class gets to keep the trophy for the following month. This also allows students who cannot walk or bicycle to school an opportunity to participate as well with the group.

• Program Logo/Art Contest: Many Encouragement activities are simple and require nothing more than a child's imagination and a few basic art supplies. One creative way to make the SRTS Program visible at your school is to hold Logo, Sign, or Banner contests for the School's SRTS Program or event days. This is also an activity that works well in combination with other Encouragement and Education activities such as International Walk to School Day. Students can create signs and banners used to promote the walk, display throughout the school and/or carry during the event.

• Walkability and Bikeability Checklists: By enlisting the children and parents in the maintenance and sustainability of the SRTS Program, they take on the ownership and responsibility for its success.



Checklists for neighborhood walkablity and bikeability are available through the National Safe Routes to School website listed below. These lists can be used to engage children and parents in the assessment of their neighborhood and school districts. Prizes can be awarded to children or parents who participate in completing the checklists. Small prizes could be given to everyone who participates or you could have participants enter their name in a drawing for a nicer prize.

Contests are a great way to build excitement about your SRTS Program. They don't have to be expensive, just fun!

Resources

a) Encouragement
http://www.saferoutesinfo.org/guide/encouragement/
b) Event Ideas:
http://www.walktoschool.org/eventideas/index.cfm
c) Official website of International Walk to School
http://www.iwalktoschool.org/resources.htm
d) Planning Walk to School Events:
http://www.walktoschool.org/eventideas/plan_event
e) Bicycle Swap Advertised by the Bicycle Coalition of Maine:
http://www.bicyclemaine.org/
f) Frequently Asked Questions about organizing and registering an event on line:
http://www.walktoschool.org/faq/index.cfm
g) Combining Safety, Fun and the Walk to School:
http://www.saferoutesinfo.org/guide/walking_school_bus/index.cfm
h) Log Miles Walked:
http://www.walktoschool.org/eventideas/log-miles
i) Walk and Roll Punch Card:
http://www.saferoutesinfo.org/program-tools/walk-n-roll-punch-card
j) Golden Sneaker Award:
http://www.tam.ca.gov/Modules/ShowDocument.aspx?documentid=494
k) Walkability Checklist
http://drusilla.hsrc.unc.edu/cms/downloads/walkability_checklist.pdf

5.3 ENFORCEMENT

Enforcement becomes necessary when unsafe behaviors are identified and/or persist within the school zone after the education and encouragement features of the plan have been implemented. These behaviors can likely be attributed to frustrated commuters struggling to navigate school related congestion during peak hours, on-site drivers engaged in drop off and pick up, and/or the failure of pedestrians and bicyclers to follow safety rules. The primary focus of the SRTS Program is the safety and well being of our children. Enforcement strategies ranging from school posted warnings to involvement with law enforcement agencies are often necessary to insure these goals are met.

Suggested Topics:

1. For Drivers: The integration of vehicular traffic, pedestrians, and bicyclists on shared roadway facilities fosters the most critical safety concerns both on the school campus and along designated routes. The most common safety violations for drivers are included in the list below.

a) Speeding.
b) Not yielding to pedestrians at a marked or unmarked crosswalk.
c) Stopping or unloading students in a bus zone.
d) Parking illegally.
e) Dropping students off in the street instead of designated areas.
f) Allowing students to walk between parked vehicles and buses.
g) Driving while distracted (by cell phones, radios, eating, etc...).
h) Violating school drop off and pick up procedures.

2. For Pedestrians: Enforcement strategies do not just apply to drivers of motor vehicles. It is also imperative that pedestrians follow the safety rules when sharing roadway facilities with vehicular traffic, and this is especially true for children whose behaviors are less predictable. The most common safety violations of pedestrians are:

a) Disregarding directions of the Crossing Guard.
b) Failing to follow safety rules like looking both ways before crossing.
c) Not walking facing traffic.
d) Crossing at unsafe or unpredictable locations.
e) Playing near vehicular travel ways - darting.

Link of interest:
• http://www.walkinginfo.org/enforcement/programs-behaviors.cfm

3. For Bicyclists: In North Carolina, bicycles are legally defined as vehicles. Therefore, traffic violations and penalties defined under State laws and municipal ordinances for vehicular traffic also include bicycles. Municipal ordinances govern rules concerning riding on the sidewalk. Other common traffic and safety violations of bicyclists include, but are not limited to, the following:

a) Failing to follow safety and procedures.
b) Riding against traffic.
c) Disobeying signs and traffic signals.
d) Failing to wear bicycle helmets.
e) Failing to yield to pedestrians.
f) Riding where vehicles have sight obstruction.



Links of interest:
• http://www.saferoutesinfo.org/guide/enforcement/identifying_unsafe_behaviors.cfm
• http://www.ncdot.gov/bikeped/lawspolicies/
• http://www.ncdot.gov/bicycleped/about/training/school_crossing_guard/

Priority Enforcement Programs

1. Begin a crossing guard program at both Marion Elementary and Eastfield Elementary Schools. The existing crossing guard program at East McDowell Junior High School could be expanded to have an additional guard at the entrance on Baldwin Drive. As improvements are implemented, a crossing guard program should be started at West McDowell Junior High School. Crossing guards should be located at key roadway crossings (as identified in Chapter 3) where children already cross or are most likely to cross or at crossing locations where it may be difficult for children to find gaps in traffic safely. Once a crossing guard is in place, school policy should be that children only cross the road where the crossing guard is located. Crossing guards provide a number of benefits:

• Create visibility and expectation to motorists that pedestrians will be crossing.

• Instill comfort and confidence in parents to allow their children to walk or bicycle to school.

• Foster a sense of community through the utilization of local crossing guards.

• Serve as role models for children

All crossing guards, whether paid or volunteer, should be trained. The NCDOT Division of Bicycle and Pedestrian Transportation funded a study on pedestrian issues, including school zone safety, and decided to establish a consistent training program for law enforcement officers responsible for school crossing guards. According to the office of the North Carolina Attorney General, school crossing guards may be considered traffic control officers when proper training is provided as specified in GS20-114.1.

Links of interest:
• http://www.saferoutesinfo.org/guide/crossing_guard/index.cfm
• http://www.ncdot.gov/bicycleped/about/training/school_crossing_guard/

Priority Enforcement Programs

1. Begin a crossing guard program at both Marion Elementary School and Eastfield Elementary School.

2. Involve local law enforcement officers and techniques.

2. Involve local law enforcement officers to enforce the law in school zones. Local law enforcement officers should ticket motorists for unlawful behavior such as speeding, passing a stopped school bus, and stopping in a marked crosswalk. Progressive ticketing or higher speeding fines in school zones should be considered. Speed trailers, active speed monitors, and complaint hotlines should also be used in areas where speeding is an issue. Local law enforcement officers can also educate parents and children regarding traffic laws/rules for pedestrians and bicyclists and the proper/safe crossing of roadways.

Links of interest:
• http://www.ncdot.gov/bicycleped/lawspolicies/laws/

• http://www.saferoutesinfo.org/guide/enforcement/role_of_the_enforcement_officer.cfm

• http://www.saferoutesinfo.org/guide/enforcement/law_enforcement_methods.cfm

Other Suggested Strategies:

• Address traffic speeding issues by talking to neighbors and school leaders to determine if they agree there is a problem. Ask the police department to monitor speeds, let the community know that speeding is unacceptable, and consider street redesign to calm traffic. Also provide radar/speed trailers periodically.

• Ensure that all children bicycling are wearing properly fitted bicycle helmets.

• Utilize a network of community members (not just law enforcement) such as students, parents, crossing guards, school personnel, and neighborhood programs to enforce rules for safe walking, bicycling, and driving.

• Provide a complaint hotline for the community to voice concerns and safety issues they see.

• Begin student safety patrols for enforcement of drop off and pick up procedures. AAA has a School Safety Patrol Program that provides an operations manual and other valuable information. Participating in the School Safety Patrol Program provides positive benefitMatts for the students, the schools, and the community.

Link of interest:
• http://www.saferoutesinfo.org/guide/enforcement
• http://www.aaacarolinas.com/Automotive/Safety/school_safety_patrol.htm



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6 PROGRAM SUSTAINABILITY



Chapter Outline:

6.0 Introduction 6.1 Evaluation 6.2 Program Maintenance and Sustainability
6.3 Funding 6.4 Student Engagement

6.0 INTRODUCTION

This Action Plan provides the necessary guidance, tools, and steps for implementing a Safe Routes to School Program. By combining the action plan with the SRTS Program resources, both the school and the community benefit through increased awareness for healthful living and environmental stewardship. Likewise, the action plan and the SRTS platform provide avenues for capital improvements within the school's community by facilitating agency funding. However, actually implementing the plan and sustaining the program are really the critical components in accomplishing the community's goals. Once the Action Plan has been approved and adopted by the Town and school board, the task of implementing and sustaining the program begins.

Each school year brings new opportunities to revitalize the SRTS program as a visible and important part of campus life. Sustaining the SRTS program is a comprehensive phase of the community's plan as it revisits some of the preliminary steps including Engineering, Encouragement, Education and Enforcement. This phase of the SRTS Program also requires the introduction of Evaluation and stakeholder investment strategies to fund its implementation and infrastructure improvements. At the beginning of each school year, the school and community should:

1) Evaluate action items from the plan for effectiveness.
2) Monitor improvement strategies.
3) Challenge and engage staff and students in promotional activities.
4) Explore/review funding resources.

6.1 EVALUATION

Evaluation is an important component of any SRTS program. It is used to determine if the aims of the strategies are being met and to assure resources are directed toward efforts that show the greatest likelihood of success. Also, evaluation can identify needed adjustments to the program while it is underway. There are four general benefits to evaluation (taken from http://www.saferoutesinfo.org/guide/evaluation/):

1) Making sure that the underlying problem is identified so that proper strategies to address the problem are picked. Sometimes a SRTS program begins without a good understanding of the underlying issues resulting in a less successful program.

2) Setting reasonable expectations about what the program can do. By knowing the starting point, SRTS programs can set specific and reasonable objectives.

3) Identifying changes that will improve the program. Part of evaluation is monitoring what happens throughout the life of a project so that mid-course corrections can be made, if needed, to improve chances of success.

Components of a SRTS Annual Evaluation Plan

- Collect Parent Surveys and Student Tally Sheets
- Perform Walkability Audits
- Monitor Program Progress
- Make Changes Where Needed

4) Determining if the program is having the desired results. This is a primary purpose of any evaluation and can be used to inform funding sources, the media, and the public to help build support for SRTS.

Evaluation occurs throughout the lifespan of the SRTS program within each school's community before, during, and after the implementation of the strategies and priority recommendations outlined in this plan. This plan marks the baseline profiles of behaviors, attitudes, and deficiencies based on the existing conditions laid out in Chapter 2. During the implementation of the program, data will be used to track progress and identify ongoing challenges that may require revitalizing the Action Plan. After the program is established, additional evaluation methods and monitoring can be used, like involving the student body in the process, documenting behavior patterns, and identifying indicators for future decisions.

For the purpose of sustaining the SRTS Program, evaluation after program implementation involves the annual distribution of the travel tally and parent survey information, data entry with the National Center for Safe Routes to School, and assessment of any engineering improvements made through the Action Plan. Engaging students in the re-assessment can also serve as Education and Encouragement activities. Students can even provide valuable assistance in the collection of data using tools such as walkability checklists or contests to find new improvements.

Summary of Evaluation Recommendations:

Prepare a SRTS Evaluation Plan that will identify annual tasks. Components of this plan should minimally include:

• Conduct Annual Parent Surveys and Student Tallies to send to the National Center for Safe Routes to School for processing.

• Conduct Annual Walkability Audits.

• Review surveys and audits to analyze information and adjust strategies and priorities for the following years.

• Follow the step-by-step procedure on a detailed evaluation process developed by the National Center for Safe Routes to School. Visit the National Center's online guide to standard evaluation, including the six step methodology:
http://www.saferoutesinfo.org/guide/evaluation/evaluation_in_six_steps.cfm

Step one and step two of this six step process are addressed as part of this action plan.

6.2 PROGRAM MAINTENANCE AND SUSTAINABILITY

A good strategy is critical to implement the SRTS Action Plan and to have a successful SRTS program. The planning process brought together stakeholders, partners, school representatives, and citizens to determine SRTS needs and priorities. A good strategy is necessary to continue those efforts and implement the Action Plan. To sustain SRTS success, consider the following list of strategies:

Sustainability/Program Maintenance Strategies:

• Form a permanent, active SRTS Committee in the community and/or school potentially made up of members of this Action Plan Advisory Committee and other interested parties. This group should meet monthly or quarterly to discuss pertinent issues, set goals, evaluate progress, assist with programming, and implement recommendations of this Plan.



An active SRTS comittee is an important part of helping the program successfully reach its goals.

Sustainability Strategies

- Form a permanent, active SRTS Advisory Committee
- Partner with local businesses for support
- Create and maintain an active SRTS website with a calendar of events and other pertinent SRTS news and information
- Re-evaluate the SRTS Program on regular intervals to celebrate accomplishments and redefine priorities
- Maintain a SRTS presence at school events throughout the year
- Continue relationships between the schools, the County, and the City for Program support

• Partner with local businesses for support. Local businesses can provide key items such as prizes for encouragement programs, bicycle helmet giveaways, sponsorship for bicycle/pedestrian events, etc.

• Create an easy to access SRTS Website with a calendar of events, with at least one event scheduled every month. Provide walking maps, park and walk locations, task force meetings, and useful links. The SRTS Task Force should encourage cross-posting of SRTS events on school websites, Town websites, and social networking sites.

• Re-evaluate your SRTS Program on regular intervals (1 – 3 years) to monitor what has been done, what still needs to be done, and what new projects/priorities should be included. Consider updating the full action plan every five years based on these evaluations.

• Maintain SRTS presence as an active and critical program each school year. This can be accomplished through regular handouts, presentations, PTA/PTO meetings, booths at school registration/events, and local media. Provide success stories/statistics to schools, parents, and community utilizing local media, websites, etc.

• Continue a relationship between local school leaders, school district leaders, and local government staff. Communication between local government and schools is critical for achieving community goals, ensuring SRTS projects are considered in local transportation plans and priority projects for funding.

6.3 FUNDING

When considering possible funding sources for SRTS projects and activities, it is important to consider that it is highly unlikely that all activities (construction and education/encouragement/enforcement programs) will be accomplished from a single funding source since these projects are expected to be in the hundreds of thousands of dollars and accomplished over several years. It will be necessary to consider several sources of funding, that when combined, would support full program implementation. It will also be critical for each school and the school system to continue working closely with the Town to set priorities for SRTS projects through the local government's capital improvement program, grant efforts, and funding request lists. Refer to Appendix B for information on possible funding resources.

Federal Funding

Federal funding is typically directed through State agencies to local governments either in the form of grants or direct appropriations. Federal SRTS funding has been a major source of funds for both infrastructure and non-infrastructure projects. Other federal programs, such as the Surface Transportation and Congestion Mitigation and Air Quality Programs, provide funding for Bicycle Transportation and Pedestrian Walkways projects, and are managed through State Departments of Transportation.

Federal funding can be difficult and costly to pursue outside of the original SRTS grant. Federal-Aid highway funds are authorized by Congress and are used to support construction and improvements on routes designated as part of our National System or provide connectivity to and within National Forests, National Parks, Native American Lands, and other public lands. Bicycle Transportation and Pedestrian Walkways resources are also viable project types for funding resources. The following is a link to "A Guide to Federal-Aid Programs and Projects".

Link of Interest:
• http://www.fhwa.dot.gov/federalaid/guide/

State Funding

State Funding for bicycle and pedestrian projects in North Carolina began with the Bicycle and Bikeway Act of 1974. Under this Act, bicycle facilities were defined as a "bona fide highway purpose, subject to the same rights and responsibilities, and eligible for the same consideration as other highway purposes and functions." In short, this act enabled NCDOT to fund bicycle and pedestrian projects through the same funding resources that historically had been used for more traditional modes of transportation such as roadway, rail and transit.

Today, bicycle and pedestrian projects for new and existing facilities of significance are adopted into the State Transportation Improvement Program (STIP) through a statewide prioritization process to address the existing and emerging needs of communities across the State. As projects are adopted into the STIP, monies are allocated and set aside in the State budget to plan, design and construct the projects. This can take many years as the STIP has a 7-10 year planning period. However, NCDOT has many initiatives that are designed to help municipalities and agencies fund infrastructure improvements, especially pedestrian facilities. A list of NCDOT programs is included in Appendix B.

Local Funding

Local funding for transportation projects can be generated from multiple sources including bonds, taxes, grants or even outside agencies that are indirectly connected with public transportation such as those involved with public health and safety. Likewise, municipal and departmental operating budgets may offer support for maintenance and repair, non-infrastructure programs like law enforcement, crossing guards, safety education and walking/bicycling program promotion. One example of a local funding source is in Portland, Oregon. They raised traffic fines, and a portion of the revenue from the increased fines was dedicated to the City's SRTS Program.

Local planning departments are another resource to consider since SRTS projects provide multimodal transportation facilities, greenways and sidewalks that fit municipal investment strategies for Capital Improvement Projects. McDowell County is a part of the Isothermal Planning and Development Commission (IPDC) Rural Planning Organization, which is mandated by federal and state laws to establish Comprehensive Transportation Plans (CTP's) in cooperation with NCDOT. These plans develop and prioritize multimodal projects for inclusion into the State Transportation Improvement Program. SRTS projects fit seamlessly into the goals and visions of these organizations, making them viable projects for incorporation into pedestrian and bicycle CTP's. Note, these are long range plans, and unless a project has immediate prioritization, project deployment may take many years. However, these organizations do have funding available and should be considered in the fund raising process. Funding is a political process, and worthwhile projects require demonstrating needs with strong benefits for the community.

Link of interest: http://www.regionc.org/IPDC/web.cfm?CID=324

Private Sector

The Private Sector is another viable means of funding non-infrastructure aspects of the SRTS program. Area businesses, eager to attract clientele, may be willing to host promotional events, donate merchandise, or even volunteer during special events. It is a great way to build professional networks. Having local officials participate in the SRTS activities is a successful way to attract the support of area businesses. Since SRTS projects promote safety, health and environmental stewardship, local corporations whose mission statements coincide with these principles may support the program with cash, sponsorships, discounts, printing services and the like in exchange for the promotional opportunity. Refer to the appendix for a more detailed list of possible private sector funding sources.

Institutions and Non-Profits

There are institutions and non-profits across the country, and even locally, that willingly support educational, community, health and environmental advocates. The National Foundation Center is an excellent

data base to search for applicable funding resources as well as the National Center for Charitable Statistics. Even popular internet search engines can often find local foundations through public tax records.

Links of interest:
• http://foundationcenter.org/
• http://nccs.urban.org/

Grants

Grants are another way to help fund SRTS initiatives in your community. There are specific grants for SRTS projects which can be used for infrastructure or non-infrastructure priorities. Additionally, SRTS improvements may be eligible for any grant that would support healthy initiatives in a community.

Volunteers

Lastly, individuals make up the corner stones of the community and they are ultimately the parents and families of the children that attend the area schools. Local fundraisers serve multiple purposes with the SRTS program and have proven to be one of the best ways to raise funding, awareness and community support.

6.3.1 Recommended Sources of Funding for Infrastructure Projects

Funding specifically set aside for SRTS is going to be the best potential funding source for large infrastructure projects. These grants are offered periodically through NCDOT, and the infrastructure awards per project can be as much as $300,000 at this time. It is likely that the next call for projects will be in Fall of 2011. Contact information for this grant reimbursement program is included in Appendix B.

Several of the recommended projects could be funded through various NCDOT funds. The priority projects should be discussed with the NCDOT Division 13 Engineer and District Engineer for McDowell County to explore potential funding sources. Contact information for these NCDOT Contacts is listed at the following links:

NCDOT Division 13 Engineer:
https://apps.dot.state.nc.us/dot/directory/authenticated/UnitPage.aspx?id=652

NCDOT District Engineer for McDowell County:
https://apps.dot.state.nc.us/dot/directory/authenticated/UnitPage.aspx?id=2660

Various sources of NCDOT funds are included in Appendix B, but the ones that are most likely to be used at this time are as follows:

Division SRTS Funds: Each Division has a limited amount of funding for small SRTS projects. This funding can be used for eligible projects up to $100,000. The Division 13 Engineer is the contact person to determine if a project is eligible and the funding is available from this source.

Contingency Funds: These funds can be used on State or Town Roads and must have a political sponsor. The funds are controlled by the North Carolina House of Representative, the North Carolina Senate, and the Secretary of Transportation. There is a lot of flexibility with these funds so they could potentially be used for several of the priority projects.

Small Construction Funds: These funds are controlled by Board of Transportation members and can be used on projects up to $250,000 per fiscal year. Coordination with the NCDOT Board Member from Division 13 is required. Typical projects for this source of funding include installing pedestrian signals or flashers to alert drivers of pedestrians. The current board members are listed on the NCDOT webpage at the following link: https://apps.dot.state.nc.us/dot/directory/authenticated/UnitPage.aspx?id=30

Division Pedestrian Enhancement Funds: Each Division receives $100,000 a year for pedestrian enhancements. Since these funds will typically be shared between several counties, they are typically used for smaller projects. The Division 13 Engineer should be contacted about using these funds to improve any of the identified pedestrian crossings.

Contract Resurfacing Program: The District Engineer for McDowell County will have a listing of the roads that are planned for resurfacing in the next two years. It is recommended that coordination be maintained with the District Engineer to determine if any roads in the SRTS Action Plan are included on this list. With coordination prior to the project beginning, additional pavement markings for pedestrian crossings could be included in the project. Also, all curb ramps will be brought into ADA compliance when the road is resurfaced.

General Maintenance Funding: At this time, funding for maintenance is limited, but very small projects like striping crosswalks could potentially be funded through this source. The District Engineer is the contact person for this funding.

Locally, Powell Bill funds may be used for projects on roadways that are not maintained by NCDOT. These funds are utilized by the City of Marion.

6.3.2. Recommended Sources of Funding for Non-Infrastructure Projects

Non-Infrastructure projects tend to be significantly less expensive than infrastructure projects, so there are a lot of options for funding sources. Non-Infrastructure funds are offered periodically through NCDOT through a competitive grant process. NCDOT has awarded as much as $50,000 per project for a non-infrastructure grant. Contact information for this grant is included in Appendix B.

The National Center for Safe Routes to School periodically awards mini-grants ($1,000) for non-infrastructure projects. During the spring and fall of 2010, 25 grants were awarded for qualifying projects. These grants are advertised at the following link: http://www.saferoutesinfo.org/news_room/

There are numerous grants available for programs that will promote healthy lifestyles for children. These can all be tied into SRTS due to the fact that it encourages children to walk or ride their bicycle to and from school. The other health benefits outlined in this Action Plan will help to qualify for these grants. Several grant programs are identified in Appendix B, and new programs are anticipated. It is recommended that grant sources be checked frequently for any that might apply to education, encouragement, and enforcement activities.

Public/private partnerships are a great way to secure funding for non-infrastructure programs. Nearby universities or non-profit organizations may be interested in sponsoring programs. Also, local businesses are usually willing to get involved with school programs. Sometimes, all you have to do is ask! Local bicycle shops, nearby businesses, and businesses run by parents of children attending the school are great places to contact.

Volunteers are also a way to get non-infrastructure programs started. For instance, the walking school bus program can be started by the SRTS Committee, the PTA, or families that are in the walk zone. This project can be done for a very small cost. The big effort is in the coordination... locating interested families, scheduling routes, and providing overall program guidance. Map or advertisement printing is a minimal cost.

For further information on these funding sources, please see Appendix B.

6.4 STUDENT ENGAGEMENT

Taking into account statistics depicting our youth's obesity rates and the plummeting activity levels of our children over the last decades, the National SRTS sets out to change the lifestyles and habits of a generation. The success of this mission depends ultimately upon the success and sustainability of the program school by school across the country and our state. Engaging students to be leaders in their classroom communities is a goal that must be met. Elementary students are likely to follow their parents' lead, and "marketing" strategies geared toward parents are effective for this age group.

Additionally, efforts must be made to ensure that information is provided in all major languages spoken at a school (in most cases English and Spanish). The programs should include all students regardless of their ethnicity and socioeconomic status.

These are a few suggestions compiled by the National Center for Safe Routes to School, which can be effective for engaging middle school students:

• Provide opportunities for self-expression and self-determination. Let the students take charge of designing logos, websites and events.

• Create hands-on learning experiences that are personally relevant. For example, using tools such as the walkability checklist, ask students to identify where changes in sidewalks, crossing guard locations and walking conditions should be improved using GPS devices and digital cameras. Encourage children to voice their opinions about walkability and bikeability at public meetings or letter writing campaigns to local officials.

• Highlight the connection between SRTS and social, cultural or environmental issues that may be important to students. Organize lessons, activities and events about climate change and the health benefits of the program. Use sports celebrities to participate in promotional events as advocates for health and fitness.

• Foster positive interactions between peers and provide opportunities for peer identification and acceptance. Start an afternoon club with a mission that ties to SRTS. Perhaps a cycling club with scheduled field trips to trails and greenways. Develop a cross-age teaching program and/or mentorship program. This may be a good way to utilize high school students and get them involved in the program as well.

Student Involvement Strategies

- Establish a routine "Walk/Ride to School Day"
- Hold annual events
- Send out newletters
- Incorporate SRTS information and activities into classroom curriculum
- Have a place to communicate SRTS updates and events

Student Involvement Strategies for sustaining/growing a SRTS program:

• Establish a routine "Walk / Ride to School Day" (either weekly or monthly).

• Hold annual events: Logo contests, mileage contests, etc.

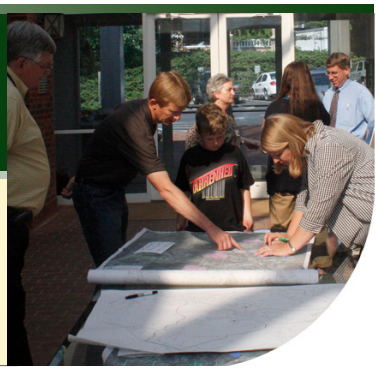
• Send out newsletters on a consistent basis (quarterly / monthly).

• Incorporate SRTS information and activities into classroom curriculum.

• Have a place to communicate SRTS updates and events (ie. a website, a blog, or a Facebook page).

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7 IMPLEMENTATION ACTION STEPS



Chapter Outline:

7.0 Overview 7.1 Implementation Action Steps Table

7.0 OVERVIEW

The successful implementation of this Action Plan will require a comprehensive approach that addresses engineering, education, encouragement, enforcement, and evaluation strategies explained in previous chapters. It will also take the dedication of local government staff, commitment of the school system and local schools, the creation of a SRTS Advisory Committee, and the continued support of local advocates and parents. This chapter serves as a simple, working implementation guide with key action steps.

The following tasks are integral to achieving the goals and visions of this Plan. Table 7.1 displays the specific items to accomplish. It is intended to serve as a guide and should be referenced often. With the exception of the first two steps (adoption of Plan), there is no particular order in which these should be addressed.

7.1 IMPLEMENTATION ACTION STEPS TABLE

Task	Lead Agency	Support	Details	Phase
Approve and Adopt this Plan (City of Marion)	City of Marion	SRTS Advisory Committee/School System	Official letter of approval expected by Fall/Winter 2012 Through adoption, the Plan becomes a legitimate planning document of the City. Adoption shows that the plan has been a successful, supported planning process.	Short Term (2012)
Approve and Adopt this Plan (School System)	McDowell County Schools	Local Schools, City of Marion	Official letter of approval expected by Fall/Winter 2012. Through adoption, the Plan becomes a legitimate planning document and shows that the School system is making SRTS a priority. Adoption shows that the plan has been a successful, supported planning process.	Short Term (2012)
Form SRTS Advisory Committee	Action Plan SRTS Advisory Committee	Local Schools, City of Marion, McDowell County Schools, NCDOT, active parents/residents	One of the most important steps in implementation is the continuation of a committee that can meet on a monthly or quarterly basis. The core group of the Action Plan's SRTS Advisory Committee may provide the starting point. This group will help maintain the momentum established during this planning process. The group will "shepherd" the plan, be knowledgeable about the Plan, advocate for its implementation, assist the City and schools in programming and grantwriting, continue to make SRTS a priority for the schools, evaluate progress, re-examine priorities, and utilize the Action Plan document. The continuity of activity in the future is essential even if members come and go from this Committee.	Short Term (2012-2013)

Task	Lead Agency	Support	Details	Phase
Complete Priority Projects	City of Marion	NCDOT	The priority cutsheets of SRTS engineering facility development includes the most important projects to improve connectivity and safety. Immediate attention to the these priority projects will have an immediate impact on walking conditions in and around the schools. First phase work that can be done at a low cost should be conducted first. All project cutsheets are found in Chapter 3.	Short-Medium Term (2013-2015)
Identify and Secure Specific Funding Sources for Project Implementation	City of Marion, SRTS Advisory Committee	McDowell County, McDowell County Schools (and local schools), PTA/PTO, Isothermal RPO, and NCDOT	Having an adopted SRTS Action Plan in place will help when seeking funding (through grants or state programs). Appendix B contains funding opportunities. The City of Marion should also remain updated with the changing funding landscape. Stimulus funding and the transportation bill reauthorization are forthcoming at the time of this study.	Short Term (2013-2014) and continuous
Develop a Long Term Funding Strategy	City of Marion, SRTS Advisory Committee	McDowell County, McDowell County Schools (and local schools), PTA/PTO, Isothermal RPO, and NCDOT	To allow continued development of the overall system, capital funds for bicycle and pedestrian facility construction should be set aside every year, even if only for a small amount (small amounts of local funding can be matched to outside funding sources). Funding for an ongoing maintenance program should also be included in the City operating budgets. Also, projects recommended in this Plan can be requested as additions to the state TIP (Transportation Improvement Program) list. Finally, federal legislation and funding should be monitored as a new transportation bill is likely in the near future.	Short Term (2013-2014) and continuous
Improve and Enforce City of Marion Policy	City of Marion Planning	SRTS Advisory Committee and NCDOT	Policy recommendations identified in Chapter 4 address local ordinances and policies. Topics such as Complete Streets and sidewalk ordinances/requirements are discussed. These policy recommendations and others should be discussed within the City of Marion and enforced to ensure that future development provides safe and adequate pedestrian infrastructure.	Short Term (2013-2014)

Task	Lead Agency	Support	Details	Phase
Improve and Enforce School District Policies and Regulations	McDowell County Schools	Local Schools, SRTS Advisory Committee, NCDOT	Policy recommendations suggested in Chapter 4 address a number of policies including busing and school siting that have a tremendous impact on the encouragement/discouragement of walking/bicycling to school. These policy recommendations should be discussed and considered by City staff, school system staff, and the SRTS Advisory Committee. In many cases, policies should not be enforced until adequate and safe sidewalk and crosswalk infrastructure is provided.	Short Term (2013-2014)
Present this Plan to other local agencies and groups.	City of Marion, SRTS Advisory Committee	McDowell County Schools (and local schools)	Presenting this plan to other local groups and agencies will help build community awareness and support for ongoing efforts. Possible groups to receive a presentation might include: the MPO/RPO, local bicycle store owners, regional transportation planners, health clubs and fitness facilities, the health department, schools and youth organizations, major employers, large neighborhood groups, etc.	Short Term (2013-2014) and continuous
Maintain contact and relationship with NCDOT Division 13	City of Marion, NCDOT	SRTS Advisory Committee, McDowell County Schools (and local schools)	Many bicycle and pedestrian engineering recommendations in this Plan are on state-owned roadways. It will be essential to stay informed about upcoming, planned NCDOT resurfacing and reconstruction projects. These are opportunities to make pedestrian enhancements around the schools. It will also be critical to keep NCDOT informed about priority projects for improvement in this Action Plan. Having an NCDOT Division representative on the SRTS Advisory Committee will be essential.	Short Term (2013-2014) and continuous
Ensure recommendations from this Plan become part of regional Comprehensive Transportation Plan (CTP) or Long Range Transportation Plan (LRTP).	City of Marion, Isothermal RPO	SRTS Advisory Committee, NCDOT	Comprehensive Transportation Plans and Long Range Transportation Plans are updated regularly. The recommendations from this Plan should be submitted for CTP update so that they are officially recognized by the region and State.	Short-Medium Term (2013-2016)

Task	Lead Agency	Support	Details	Phase
Begin priority education, encouragement, and enforcement programs.	SRTS Advisory Committee, City of Marion (Planning, Parks and Recreation, and Police), McDowell County Schools (and local schools)	Active parents and citizens	Education, encouragement, and enforcement programs are an essential component of a comprehensive approach. The top two priorities for each type of program are provided in Chapter 5. Also, the SRTS Advisory Committee may choose to focus on other programs listed in that chapter based on needs and opportunities at the time.	Short Term (2013-2014) and continuous
Apply for NCDOT Bicycle and/or Pedestrian Master Plan Grant Opportunity.	City of Marion	SRTS Advisory Committee	Consider applying for a bicycle and/or pedestrian planning grant through NCDOT. This grant would provide funding for citywide, comprehensive bicycle or pedestrian planning activities.	Short Term (2013-2014) and continuous
Develop SRTS Bicycle/Walking Map	SRTS Advisory Committee, City of Marion, McDowell County Schools (and local schools)	Local support	A hardcopy and online map would display best routes to school and information such as presence of sidewalks and crosswalks. This map should be updated as improvements are made. The map would be made available to the schools and parents.	Medium Term (2014-2017)
Provide bicycle parking on school campuses.	SRTS Advisory Committee, City of Marion, McDowell County Schools (and local schools)	Local support	Providing bicycle racks at convenient locations near school entrances will make it more feasible and convenient for children to bicycle to school. If bicycle racks are already installed or as they are being installed, ensure there are ample spaces for the amount of users. Bicycle racks are relatively inexpensive and can be funded through grant monies or private donations.	Short-Medium Term (2013-2016)
Maintain GIS bicycle and pedestrian facility database and map crash locations, especially around schools.	City of Marion	McDowell County, Isothermal RPO	Continuously update the bicycle and pedestrian facility database as new facilities come online and new crash data is published. The City of Marion should lead this effort, but should be coordinated with other regional agencies who house regional GIS data sets.	Continuous/Ongoing
Evaluate implementation of this plan and ensure program sustainability.	SRTS Advisory Committee, City of Marion, McDowell County Schools (and local schools)		Chapter 6 outlines the necessary steps to sustain the SRTS program locally and to conduct evaluations to determine progress and needs over the coming years. Ensure that the SRTS program remains a priority and that each school year, new parents and students are aware of the program.	Continuous/Ongoing

Task	Lead Agency	Support	Details	Phase
Be open to creative solutions.	City of Marion	SRTS Advisory Committee, McDowell County Schools (and local schools), NCDOT, Isothermal RPO	In many cases, the most ideal scenario (such as a complete street of bicycle lanes and sidewalks) may not be achievable because of lack of right of way, costs, lack of public support, etc. Consider alternative, creative means such as traffic calming techniques (speed humps, chicanes, bulb-outs, and speed limit reductions).	Continuous/Ongoing
Enforce improper motorist, bicyclist and pedestrian behavior around schools.	City of Marion Police Department	SRTS Advisory Committee, McDowell County Schools (and local schools)	Enforcement should be increased on motorist speed limits, use of bicycle helmets for children, and proper use of crosswalks by pedestrians through education, warnings, and if necessary, tickets.	Short Term (2013-2014) and continuous
Use Updated AASHTO Bicycle and Pedestrian Design Guides and NCDOT Complete Streets Guidelines	City of Marion	NCDOT	Adopting and implementing the Design Guidelines (Appendix D) is integral for the development of high-standard pedestrian and bicycle facilities. It will also be important to obtain new editions of the AASHTO bicycle and pedestrian guidelines when published in 2012-2015 and the NCDOT Complete Streets Guidelines 2012. Consider utilization of these new guidelines for facilities recommended in this Plan.	Short-Medium Term (2013-2017)
Update priority engineering projects every 1-2 years and work to complete all projects in the recommended network of this Action Plan.	SRTS Advisory Committee, City of Marion	McDowell County Schools (and local schools), NCDOT	In 2014, reevaluate priorities based on what has been completed thus far by creating a new agenda of priority projects. Consider including priority projects that were not completed and consider updating certain aspects of the plan's design standards, programs, and policies based on innovations and new ideas since 2012.	Medium to Long Term (2014-2020)

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A PUBLIC INPUT



Chapter Outline:

A.0 Overview A.1 Citizen and Staff-Based SRTS Advisory Committee A.2 Newsletter and Flyers A.3 Public Workshop A.4 Project Website A.5 SRTS Parent Surveys and Student Tallies

A.0 OVERVIEW

In order to gain local knowledge and input, a public outreach component was included as an integral part of planning efforts for the Marion SRTS Action Plan. Public input was gathered through several different means including the following: SRTS Advisory Committee meetings, a public input session at City Hall, project newsletters/flyers, project website, SRTS parent surveys, and SRTS student tallies. This offered the representatives, citizens, parents, and students of Marion opportunity to contribute to the Plan's development.

A.1 CITIZEN AND STAFF-BASED SRTS ADVISORY COMMITTEE

The SRTS Advisory Committee was composed of City staff, citizens, police, Isothermal Planning and Development Commission, local school staff, and health groups/health department. The group met twice during the planning process. The group established visions and goals for the Plan and identified areas in need of bicycle and pedestrian improvements. SRTS Advisory Committee members also identified key opportunities and strategies for engineering, education, encouragement, enforcement, and evaluation improvements. Committee members marked up maps and identified pedestrian problem areas and possible solutions. The goals are listed in Chapter 1 and input from the Committee is reflected throughout the recommendations of this planning document.

The SRTS Advisory Committee also provided comment on the Draft Plan. These comments led to revisions made by the Consultant in the development of the Final Plan.





In these photos, members of the SRTS Advisory Committee look at maps of the Marion area and come up with goals and visions at the Kick off meeting.

A.2 NEWSLETTERS AND FLYERS

One flyer and one newsletter were developed during this planning process. A flyer (shown below) was developed for the public input session and distributed in both digital and hardcopy form to invite Marion residents to the input session. The newsletter (shown on pages A-3-A-4) was two-sided and provided a project digest for citizens of Marion. It also listed important dates (such as the public workshop) and contact information.

Thursday, May 6th
5:00-7:00 PM
(Prior to Planning Board Meeting)

Help shape the future of your community!

PUBLIC OPEN HOUSE for Marion's SAFE ROUTES TO SCHOOL ACTION PLAN







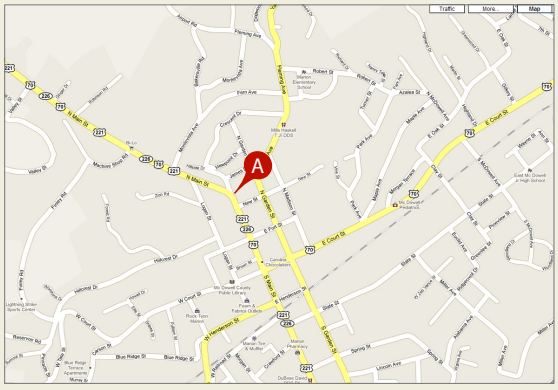






WHERE: Marion City Hall

194 North Main Street, Marion, NC



Contact Info: Ms. Heather Cotton
E-mail: hcotton@marionnc.org
Phone: (828) 652-3551

- Attend this meeting to provide input about how to make it safer for walking and biking to **Marion Elementary, Eastfield Elementary, West McDowell Junior High, East McDowell Junior High,** and **Phoenix Academy**.

- Talk with your neighbors, project consultants, and City staff about program ideas to encourage more kids to walk and bike to school!

Flyer for the public input session.

SPRING 2010

NEWSLETTER for the CITY OF MARION

SAFE ROUTES TO SCHOOL STRATEGIC ACTION PLAN

Project Contact Information:

Ms. Heather Cotton

By Mail:

City of Marion
PO Drawer 700

By Phone:

(828) 652-3551

Email:

hcotton@marionnc.org

Website:

www.greenways.com/srts_marion

PROJECT BACKGROUND

This study will identify major opportunities and constraints for walking and biking to Marion Elementary, Eastfield Elementary, West McDowell Junior High, East McDowell Junior High, and Phoenix Academy. An action plan will be developed that includes recommendations to improve bicycle and pedestrian connectivity and safety. These recommendations will include future sidewalks, crosswalks, bicycle-friendly streets, trails, and programs (education, encouragement, and enforcement).

PROJECT VISIONS AND GOALS

A project kickoff meeting was held in February 2010 with city staff, consultants, school employees, and active citizens. Key visions and goals for this project included:

- Create safer walking and biking environments.
- Develop safer crossings of roadways for pedestrians.
- Implement parent/advocacy group or PTO subcommittee to champion and continue the efforts of this plan after adopted.
- Consider traffic calming as short-term solutions where right-of-way and topography create a constraint to sidewalk construction.
- Provide greater connectivity between neighborhoods and schools.
- Educate parents and children about safety and proper rules of the road for pedestrians.
- Seek funding for engineering improvements and for programs such as helmet giveaways for lower-income populations.



Above: Walkway at Eastfield Elementary School.



Above: Images from around the country by Greenways Incorporated and from PBIC Image Library (www.pedbikeimages.org).

The Newsletter that provided a project digest for citizens.



Work Completed and Next Steps

About Safe Routes to School:
The National Center for Safe Routes to School assists communities in enabling and encouraging children to safely walk and bike to school. SRTS programs examine conditions around schools and conduct projects and activities that work to improve safety and accessibility, and reduce traffic and air pollution in the vicinity of schools. As a result, these programs help make bicycling and walking to school safer and more appealing transportation choices thus encouraging a healthy and active lifestyle from an early age.

Project Kick-off Meeting
Project consultants, City staff, and school administrators met in February to learn about the national Safe Routes to School program, discuss visions and goals for Marion, and to identify areas of safety concern within the school zones of Marion Elementary, Eastfield Elementary, West McDowell Junior High, East McDowell Junior High, and Phoenix Academy.

Existing Conditions Analysis
Project consultants completed fieldwork in February, examining conditions around the five schools. The fieldwork included a thorough on-site assessment of existing infrastructure within the school zone; and an evaluation of both traffic and behavioral patterns exhibited by roadway users during drop-off and pick-up. The field assessment broadly analyzed school traffic patterns, characteristics of the transportation network users, and the existing infrastructure strengths and weaknesses within the school zone.

Public Workshop The first workshop is **May 6, 2010** prior to the Marion Planning Board Meeting at City Hall.

Draft Plan and Final Plan During the rest of the spring, and into the summer, project consultants will generate a full draft plan that includes policy recommendations, program ideas, and an implementation strategy. The final plan is scheduled for completion in fall 2010.



How to Stay Involved

Project Consultants:

GREENE TRANSPORTATION SOLUTIONS

GREENWAYS INCORPORATED

1. Check out www.greenways.com/srts_marion for links to additional project information.

2. Stop by the Public Open House:

When: Thursday, May 6, 2010 5:00 PM - 7:00 PM
Where: City Hall; 194 North Main Street, Marion, NC

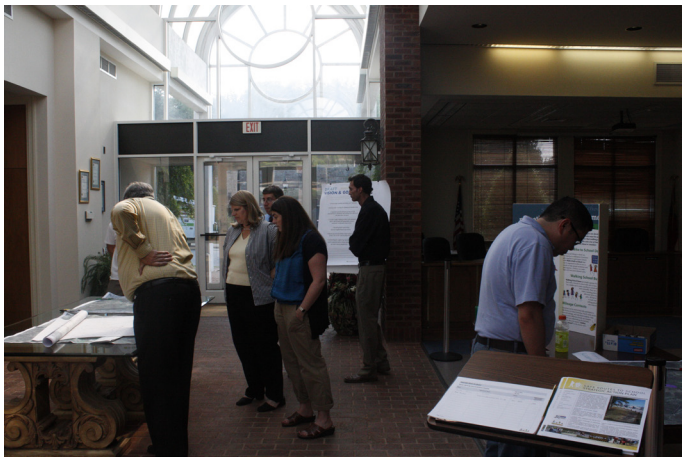
3. If you prefer to send a letter with your ideas, make a phone call, or to email, please refer to the contact information on page one.

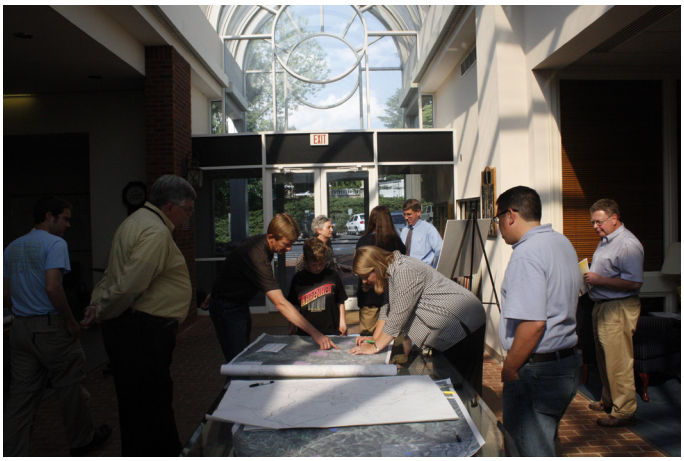
Page two of the Newsletter.

A.3 PUBLIC WORKSHOP

One public input workshop was conducted during the planning process. Consultant staff and Committee members set up public input tables at City Hall in advance of the Planning Board meeting on May 6, 2010. Approximately 20 people stopped by to learn about the SRTS plan and to provide input. The input session sought to gather preliminary input from citizens to assist in the development of draft recommendations for the plan. Public input was taken in the form of map markups, visions/goals board edits, written comments, question and answer sessions, and through discussions between citizens, consultant staff, and City staff.

In addition, an education, encouragement, and enforcement board was developed to gather further input. A hardcopy comment form, working in tandem with the board, was developed and distributed for hand written responses during each meeting. Responses from these comment forms helped inform the recommendations in Chapter 5.





Photos from the public input meeting at City Hall.

A.4 PROJECT WEBSITE

A project website was also utilized during this planning process. It provided general project background and updated materials such as meeting minutes, newsletters, and flyers. It also served as an access to the Draft Plan digital version for Committee and public review.

A.5 SRTS PARENT SURVEYS AND STUDENT TALLIES

The National Center for Safe Routes to School provides standard parent surveys and student tallies that are being used around the country. At the start of this planning process, Marion was asked to conduct these surveys at the five schools being studied. As discussed in Chapter 6, it is recommended that these surveys and tallies be conducted every year as a means to evaluate the SRTS program. The results from the surveys and tallies helped to inform the recommendations of this Plan. The following pages contain the complete results of these survey instruments.

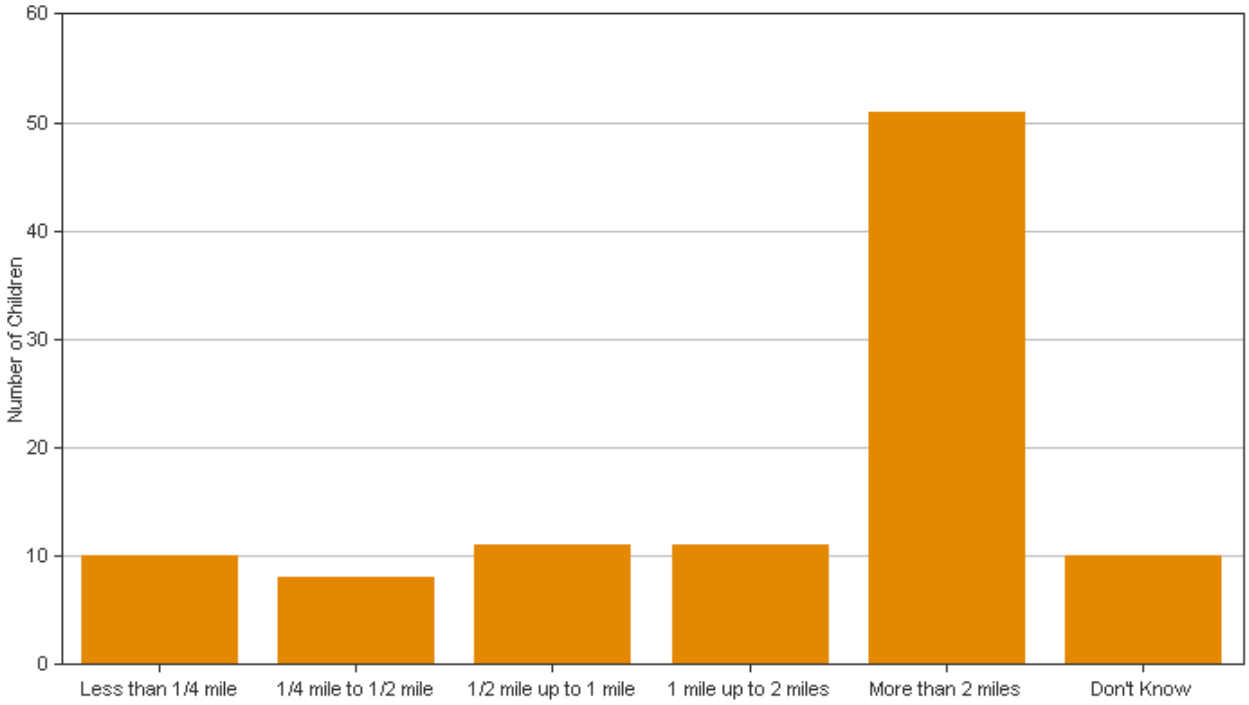
Parent Survey Summary Report:

Process Summary Information:

Program Name:	City of Marion	**Survey Data Collected:**	Fall2007
School Name:	East MDowell Jr High	**Data Collection Phase:** (pre = Before program began mid = During program; post = After program ended)	pre
Reported Enrollment:	633	**Number of Surveys Distributed:**	0
Date Report Generated:	05/13/2010	**Number of Surveys in Report:**	102

This report provides information from parents about their perceptions and attitudes on their child walking and bicycling to school. The data used in this report were collected using the Survey about Walking and Biking to School for Parents form from the National Center for Safe Routes to School.

Number of Children by Distance They Live From School:

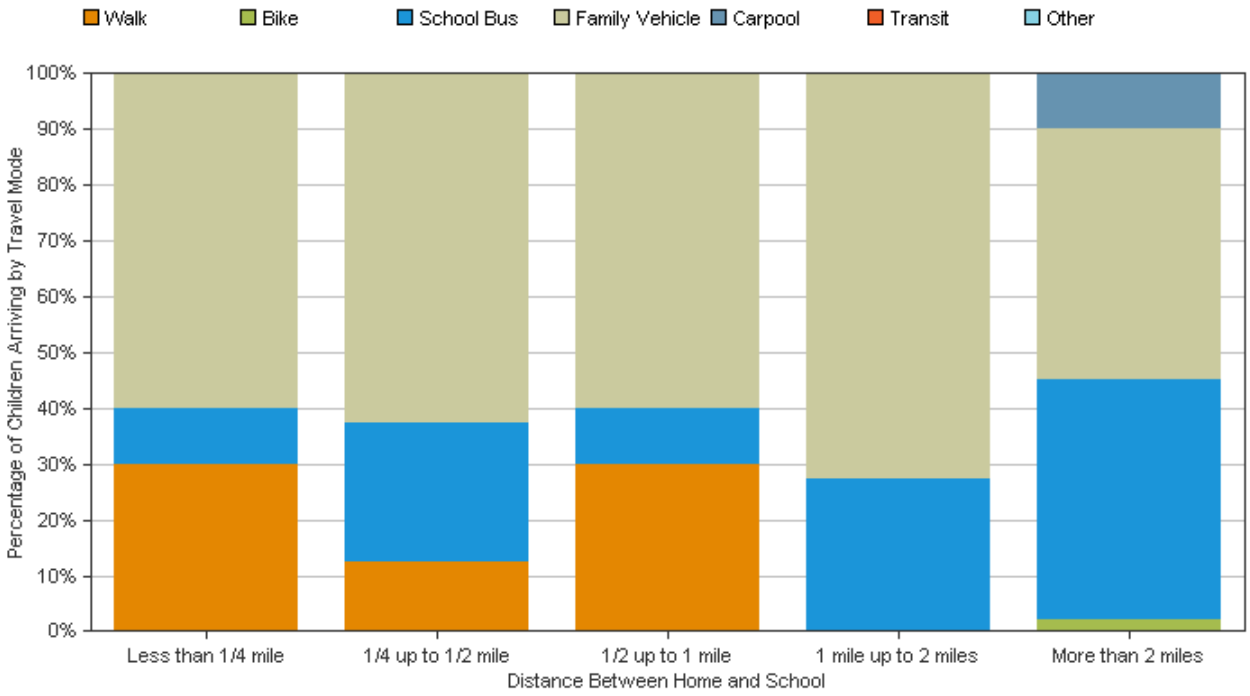


Number of Children by Distance They Live From School:

Distance from School	Number of Children
Less than 1/4 mile	10 (9.9%)
1/4 mile up to 1/2 mile	8 (7.9%)
1/2 mile up to 1 mile	11 (10.9%)
1 mile up to 2 miles	11 (10.9%)
More than 2 miles	51 (50.5%)
Don't know	10 (9.9%)
No response: 1	

(Percentages may not total 100% due to rounding.)

Percentage of Children by Travel Mode to School and Distance Between Home and School:

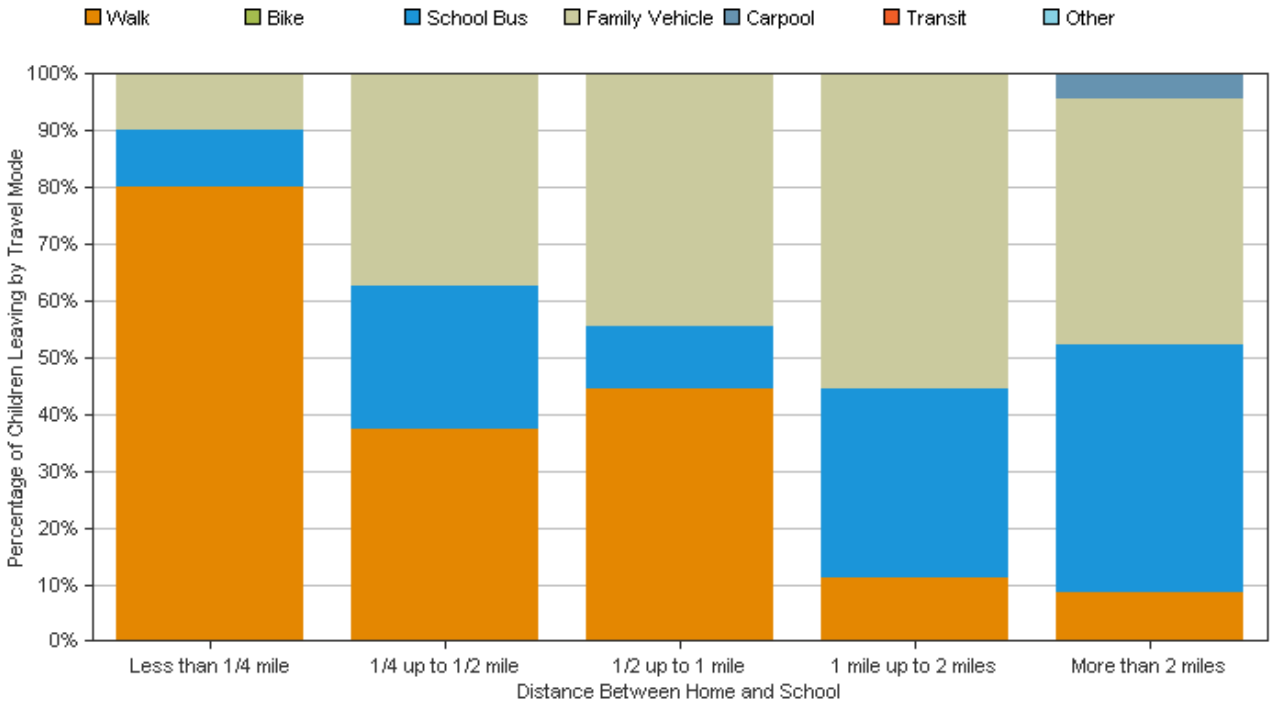


Number of Children by Travel Mode to School and Distance Between Home and School:

Mode	Less than 1/4 mile	1/4 mile up to 1/2 mile	1/2 mile up to 1 mile	1 mile up to 2 miles	More than 2 miles	Row Totals by Mode
Walk	3 (3.0%)	1 (1.0%)	3 (3.0%)	0 (0%)	0 (0%)	8 (8%)
Bike	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (1.0%)	1 (1%)
School Bus	1 (1.0%)	2 (2.0%)	1 (1.0%)	3 (3.0%)	22 (22.2%)	31 (31.2%)
Family Vehicle	6 (6.1%)	5 (5.1%)	6 (6.1%)	8 (8.1%)	23 (23.2%)	54 (54.7%)
Carpool	0 (0%)	0 (0%)	0 (0%)	0 (0%)	5 (5.1%)	5 (5.1%)
Transit	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Other	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Column Totals by Distance	10 (10.1%)	8 (8.1%)	10 (10.1%)	11 (11.1%)	51 (51.5%)	
No Response: 3						

(Percentages may not total 100% due to rounding.)

Percentage of Children by Travel Mode from School and Distance Between Home and School:



Number of Children by Travel Mode from School and Distance Between School and Home:

Mode	Less than 1/4 mile	1/4 mile up to 1/2 mile	1/2 mile up to 1 mile	1 mile up to 2 miles	More than 2 miles	Row Totals by Mode
Walk	8 (8.8%)	3 (3.3%)	4 (4.4%)	1 (1.1%)	4 (4.4%)	23 (25.3%)
Bike	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
School Bus	1 (1.1%)	2 (2.2%)	1 (1.1%)	3 (3.3%)	20 (22.0%)	29 (31.9%)
Family Vehicle	1 (1.1%)	3 (3.3%)	4 (4.4%)	5 (5.5%)	20 (22.0%)	37 (40.7%)
Carpool	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (2.2%)	2 (2.2%)
Transit	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Other	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Column Totals by Distance	10 (11%)	8 (8.8%)	9 (9.9%)	9 (9.9%)	46 (50.6%)	

No Response: 11

(Percentages may not total 100% due to rounding.)

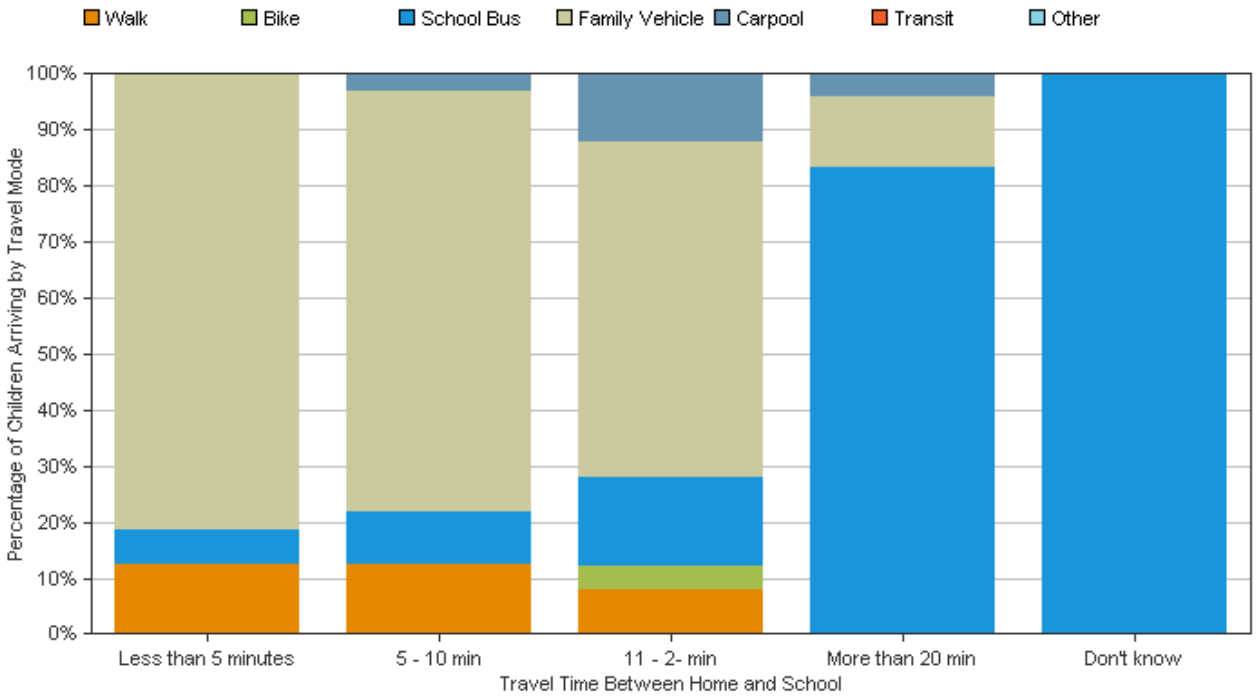
Number of Children by School Arrival Travel Mode and Travel Time to School:

Travel Mode	Less than 5 min	5 - 10 min	11 - 20 min	More than 20 min	Don't know	Row Totals by Mode
Walk	2 (2.0%)	4 (4.0%)	2 (2.0%)	0 (0%)	0 (0%)	8 (8%)
Bike	0 (0%)	0 (0%)	1 (1.0%)	0 (0%)	0 (0%)	1 (1%)
School Bus	1 (1.0%)	3 (3.0%)	4 (4.0%)	20 (20.2%)	2 (2.0%)	30 (30.2%)
Family Vehicle	13 (13.1%)	24 (24.2%)	15 (15.2%)	3 (3.0%)	0 (0%)	55 (55.5%)
Carpool	0 (0%)	1 (1.0%)	3 (3.0%)	1 (1.0%)	0 (0%)	5 (5%)
Transit	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Other	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Column Totals by Time	16 (16.1%)	32 (32.2%)	25 (25.2%)	24 (24.2%)	2 (2%)	

No Response: 3

(Percentages may not total 100% due to rounding.)

Percentage of Children by Travel Time to School and School Arrival Travel Mode:



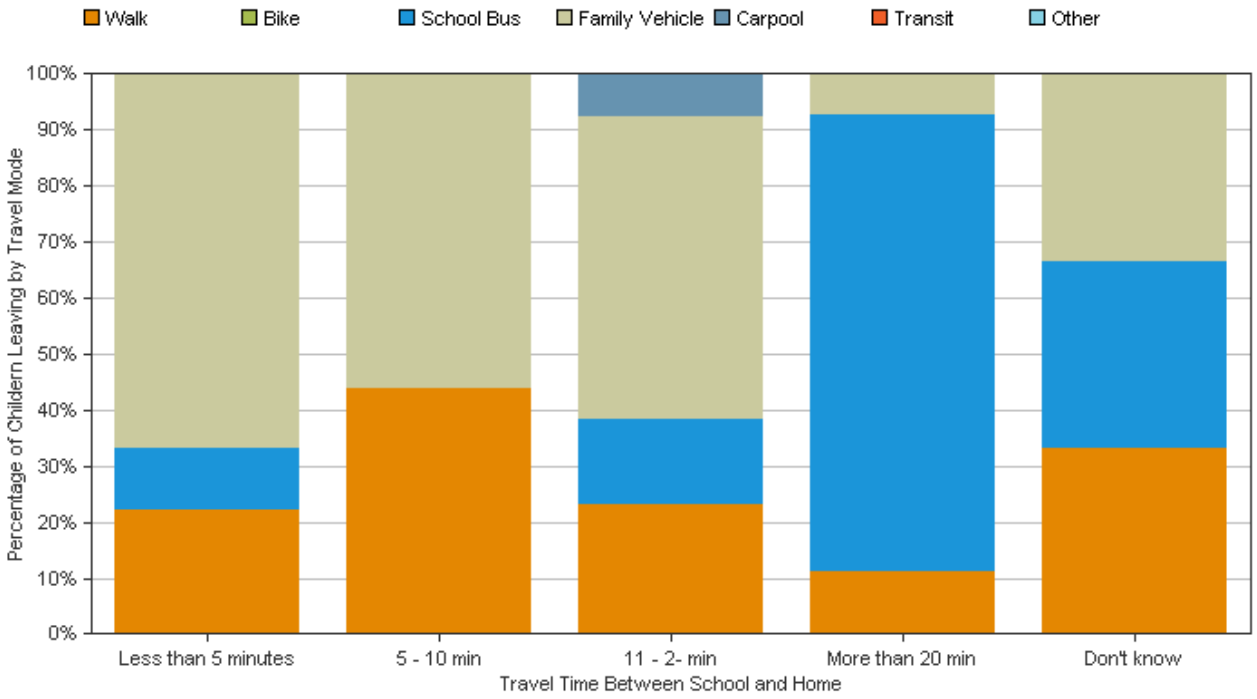
Number of Children by School Departure Mode and Travel Time from School:

Travel Mode	Less than 5 min	5 - 10 min	11 - 20 min	More than 20 min	Don't know	Row Totals by Mode
Walk	2 (2.2%)	11 (12.2%)	6 (6.7%)	3 (3.3%)	1 (1.1%)	23 (25.5%)
Bike	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
School Bus	1 (1.1%)	0 (0%)	4 (4.4%)	22 (24.4%)	1 (1.1%)	28 (31%)
Family Vehicle	6 (6.7%)	14 (15.6%)	14 (15.6%)	2 (2.2%)	1 (1.1%)	37 (41.2%)
Carpool	0 (0%)	0 (0%)	2 (2.2%)	0 (0%)	0 (0%)	2 (2.2%)
Transit	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Other	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Column Totals by Time	9 (10%)	25 (27.8%)	26 (28.9%)	27 (29.9%)	3 (3.3%)	

No Response: 12

(Percentages may not total 100% due to rounding.)

Percentage of Children by Travel Time from School and School Departure Travel Mode:



Number of Children Who Have Asked Their Parent for Permission to Walk or Bike to/from School in the Last Year Separated by Distance They Live from School:

Distance from School	Have Asked	Have Not Asked
Less than 1/4 mile	9 (9.1%)	1 (1.0%)
1/4 mile up to 1/2 mile	3 (3.0%)	5 (5.1%)
1/2 mile up to 1 mile	4 (4.0%)	7 (7.1%)
1 mile up to 2 miles	2 (2.0%)	9 (9.1%)
More than 2 miles	11 (11.1%)	40 (40.4%)
No Response: 3		

(Percentages may not total 100% due to rounding.)

Grade When Parent Would Allow Child Walk or Bike to/from School without an Adult Separated by Distance They Live from School:

Grade	Less than 1/4 mile	1/4 mile up to 1/2 mile	1/2 mile up to 1 mile	1 mile up to 2 miles	More than 2 miles
Kindergarten	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
1st Grade	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
2nd Grade	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
3rd Grade	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
4th Grade	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (1.2%)
5th Grade	1 (1.2%)	0 (0%)	0 (0%)	0 (0%)	1 (1.2%)
6th Grade	0 (0%)	1 (1.2%)	1 (1.2%)	0 (0%)	0 (0%)
7th Grade	3 (3.5%)	1 (1.2%)	4 (4.7%)	3 (3.5%)	7 (8.2%)
8th Grade	1 (1.2%)	3 (3.5%)	2 (2.4%)	1 (1.2%)	3 (3.5%)
Not at any Grade	1 (1.2%)	3 (3.5%)	3 (3.5%)	5 (5.9%)	34 (40.0%)
No Response: 17					

(Percentages may not total 100% due to rounding.)

Issues which Affect Parent's Decision to Allow or Not Allow Their Child to Walk or Bike to/from School Separated by Children who Do and Do Not Already Walk or Bike To/From School:

Issue	Child walks/bikes to school	Child does not walk/bike to school
Distance	10 (66.7%)	56 (77.8%)
Convenience of driving	4 (26.7%)	13 (18.1%)
Time	5 (33.3%)	23 (31.9%)
Before/after-school activities	2 (13.3%)	16 (22.2%)
Traffic speed along route to school	4 (26.7%)	38 (52.8%)
Traffic volume along route	3 (20.0%)	36 (50.0%)
Adults to walk/bike with	0 (0.0%)	8 (11.1%)
Sidewalks or pathways	4 (26.7%)	20 (27.8%)
Safety of intersections & crossings	3 (20.0%)	21 (29.2%)
Crossing guards	1 (6.7%)	10 (13.9%)
Violence or crime	7 (46.7%)	42 (58.3%)
Weather or climate	7 (46.7%)	42 (58.3%)
Number of Respondents Per Category	15	72
No Response: 15		

(Percentages may not total 100% due to rounding.)

For Parents Whose Children Do Not Walk or Bike to/from School, Number of Parents Responding to question: Would You Probably let Your Child Walk or Bike to/from School Issues Were Changed or Improved?

	Number of parents reporting that:		
Issue	**Change Would affect decision**	**Change Would Not affect decision**	**Not Sure if change would affect decision**
Distance	19 (27.1%)	44 (62.9%)	9 (12.9%)
Convenience of driving	9 (12.9%)	28 (40.0%)	12 (17.1%)
Time	11 (15.7%)	33 (47.1%)	11 (15.7%)
Before/after-school activities	10 (14.3%)	31 (44.3%)	10 (14.3%)
Traffic speed along route to school	12 (17.1%)	41 (58.6%)	13 (18.6%)
Traffic volume along route	7 (10.0%)	45 (64.3%)	14 (20.0%)
Adults to walk/bike with	6 (8.6%)	32 (45.7%)	13 (18.6%)
Sidewalks or pathways	13 (18.6%)	29 (41.4%)	13 (18.6%)
Safety of intersections & crossings	12 (17.1%)	29 (41.4%)	12 (17.1%)
Crossing guards	8 (11.4%)	31 (44.3%)	10 (14.3%)
Violence or crime	10 (14.3%)	39 (55.7%)	15 (21.4%)
Weather or climate	14 (20.0%)	38 (54.3%)	14 (20.0%)
Number of Respondents That Selected at Least 1 Issue: 70			
No Response: 15			

(Percentages may not total 100% due to rounding.)

Number of Parents Who Feel Their Child's School Encourages or Discourages Walking and Biking to/from School:

	Strongly Encourage	Encourage	Neutral	Discourage	Strongly Discourage
Number	7 (7.3%)	11 (11.5%)	72 (75.0%)	4 (4.2%)	2 (2.1%)
No Response: 6					

Number of Parents Reporting the Level of Fun Walking and Biking to/from School is for Their Child:

	Very Fun	Fun	Neutral	Boring	Very Boring
Number	11 (12.0%)	16 (17.4%)	45 (48.9%)	5 (5.4%)	15 (16.3%)
No Response: 10					

Number of Parents Reporting How Healthy Walking and Biking to/from School is for Their Child:

	Very Healthy	Healthy	Neutral	Unhealthy	Very Unhealthy
Number	28 (30.4%)	35 (38.0%)	26 (28.3%)	0 (0%)	3 (3.3%)
No Response: 10					

Parent Comments

This table displays the comments provided by parents as part of this Parent Survey. These comments have been entered in two ways — they may have been entered by the local program, or they may have been scanned and processed by the National Center for Safe Routes to School (NCSRTS). Comments scanned and processed by NCSRTS may have not been edited for content, spelling, and other typographical errors that may have as part of the scanning and handwriting recognition process.

Comments from: East McDowell Jr High

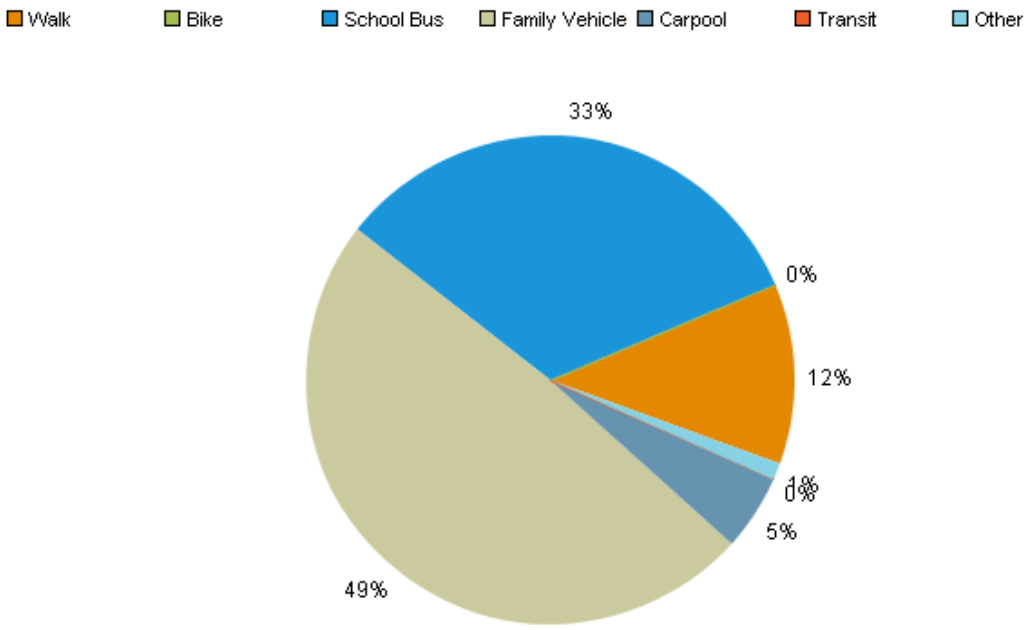
SurveyID	Comment
1612239	I WORK AT MARION ELEMENTARY AND I DO NOT THINK KIDS SHOULD WALK OR BIKE ALONE
1612242	QUESTION #11 - DURING WARM WEATHER ONLY.
1612262	CONTINOUS DRIVERS TRAINING FOR BUS DRIVERS
1612268	THIS SURVEY WAS REALLY NOT WORTH MY TIME
1612270	THIS SURVEY WASN'T WORTH MY TIME.
1612284	WE LIVE ABOUT 18 MILES FROM SCHOOL. WALKING OR BIKING IS NOT AN OPTION.
1612295	THE TRAFFIC BY THE SCHOOL IS DANGEROUS PEOPLE DON'T SEEM TO CARE THAT THE KIDS HAVE THE RIGHT OF WAY. THANK YOU
1612301	I ONLY LET MY CHILD WALK DOWN TO THE CHRISTIAN STORE AND I PICK THEM UP THERE
1612308	MY KID RIDES A BUS FOR AN HOUR AND HALF!
1612317	THE CROSSING GUARD @ THE SCHOOL DOES A GREAT JOB
1612326	ON QUESTIONS 13 & 14 - I BELIEVE MY CHILD WOULD ENJOY WALKING/BIKING AND WOULD BE VERY HEALTHY.
1612327	IF THIS IS ANOTHER WAY FOR THE SYSTEM TO CUT MONEY ON GAS I HOPE IT DOESN'T WORK. MY KID IS NOT WALKING TO SCHOOL I PAY FOR GAS FOR THE BUSES OUT OF MY CHECK EVERY WEEK (TAXES)

End of Report

Student Travel Summary

Program Name:	City of Marion	**Season Collected:**	Fall2007
School Name:	East McDowell Jr High	**Data Type *(Pre/Mid/Post)*:**	pre
		Reported School Enrollment:	633
		Number Classrooms:	0
		Number of Tallies Reported:	22

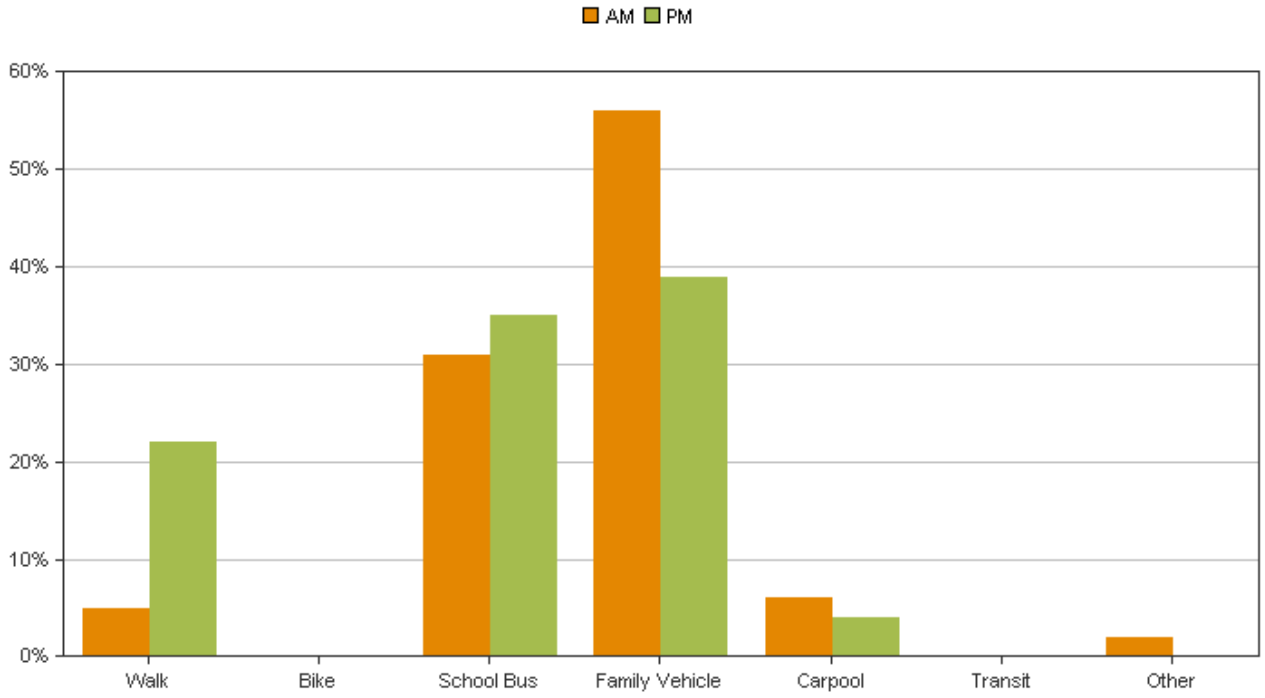
Students Traveling by Each Mode (across all reported days)



	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Average Number of Student Trips for Morning and Afternoon	29.5	0.2	78.8	117.5	12.2	0.0	3.3
Percent	12.2%	0.1%	32.6%	48.7%	5.0%	0.0%	1.4%

Average number of students per day responding to in-class tally counts: **241.5**

Morning to Afternoon Travel Mode Comparison



	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Morning	5.1%	0.1%	31.0%	55.9%	5.6%	0.0%	2.3%
Afternoon	21.7%	0.0%	34.8%	39.0%	4.3%	0.0%	0.2%

Number of students by travel mode to and from school:

	Number of Students	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Tues AM	112	3	0	37	59	7	0	6
Tues PM	60	18	0	25	17	0	0	0
Wed AM	381	23	0	116	208	27	0	7
Wed PM	295	63	0	106	111	14	0	1
Thur AM	333	16	1	103	195	12	0	6
Thur PM	268	54	0	86	115	13	0	0

Averages for classes submitting travel tallies:

	Number of Students	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Tues AM	5.1	0.1	0.0	1.7	2.7	0.3	0.0	0.3
Tues PM	2.7	0.8	0.0	1.1	0.8	0.0	0.0	0.0

Wed AM	17.3	1.0	0.0	5.3	9.5	1.2	0.0	0.3
Wed PM	13.4	2.9	0.0	4.8	5.0	0.6	0.0	0.0
Thur AM	15.1	0.7	0.0	4.7	8.9	0.5	0.0	0.3
Thur PM	12.2	2.5	0.0	3.9	5.2	0.6	0.0	0.0

Percentages of students by travel mode to and from school:

	Number of Students	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Tues AM	112	2.7%	0.0%	33.0%	52.7%	6.3%	0.0%	5.4%
Tues PM	60	30.0%	0.0%	41.7%	28.3%	0.0%	0.0%	0.0%
Wed AM	381	6.0%	0.0%	30.4%	54.6%	7.1%	0.0%	1.8%
Wed PM	295	21.4%	0.0%	35.9%	37.6%	4.7%	0.0%	0.3%
Thur AM	333	4.8%	0.3%	30.9%	58.6%	3.6%	0.0%	1.8%
Thur PM	268	20.1%	0.0%	32.1%	42.9%	4.9%	0.0%	0.0%

End of Report

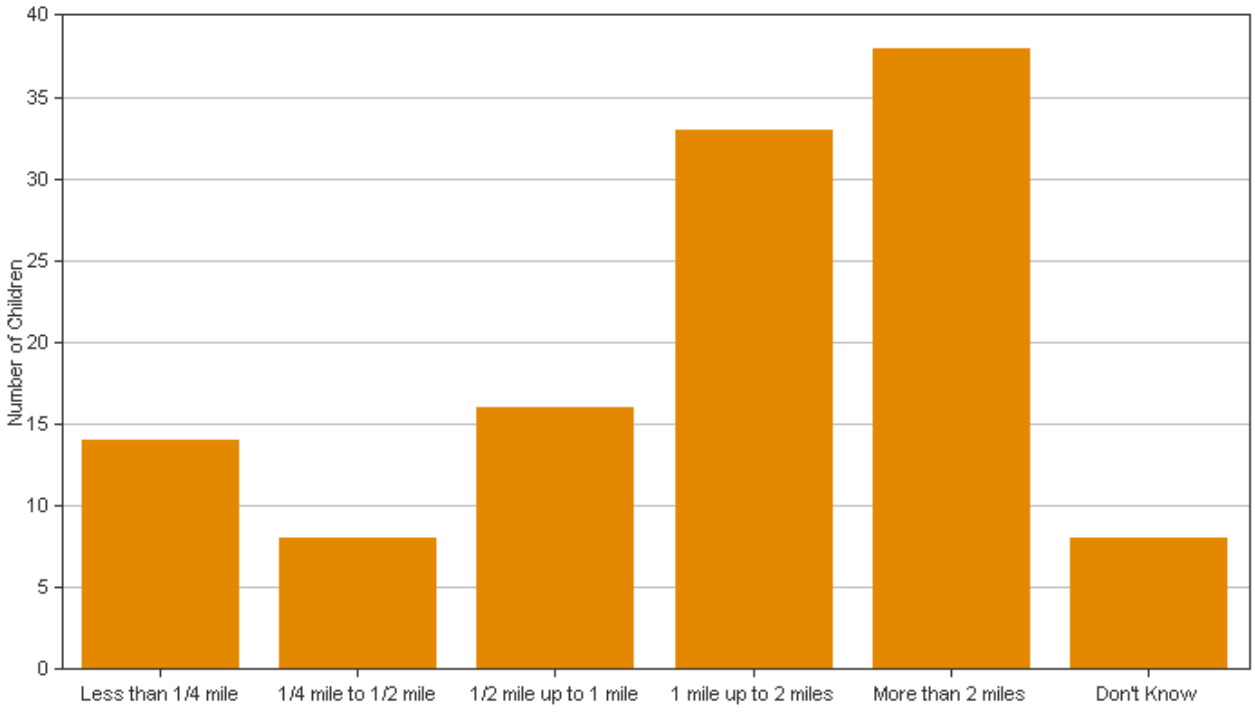
Parent Survey Summary Report:

Process Summary Information:

Program Name:	City of Marion	**Survey Data Collected:**	Fall2007
School Name:	Marion Elementary	**Data Collection Phase:** (pre = Before program began mid = During program; post = After program ended)	pre
Reported Enrollment:	409	**Number of Surveys Distributed:**	0
Date Report Generated:	05/13/2010	**Number of Surveys in Report:**	118

This report provides information from parents about their perceptions and attitudes on their child walking and bicycling to school. The data used in this report were collected using the Survey about Walking and Biking to School for Parents form from the National Center for Safe Routes to School.

Number of Children by Distance They Live From School:

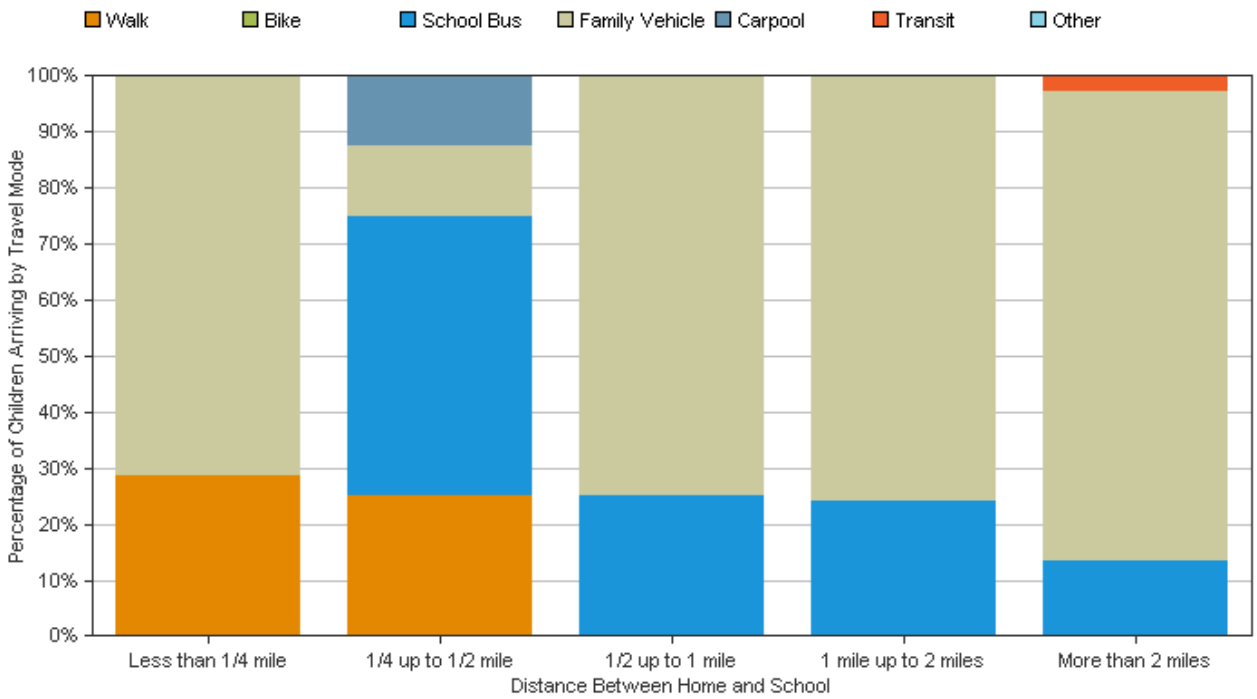


Number of Children by Distance They Live From School:

Distance from School	Number of Children
Less than 1/4 mile	14 (12.0%)
1/4 mile up to 1/2 mile	8 (6.8%)
1/2 mile up to 1 mile	16 (13.7%)
1 mile up to 2 miles	33 (28.2%)
More than 2 miles	38 (32.5%)
Don't know	8 (6.8%)
No response: 1	

(Percentages may not total 100% due to rounding.)

Percentage of Children by Travel Mode to School and Distance Between Home and School:



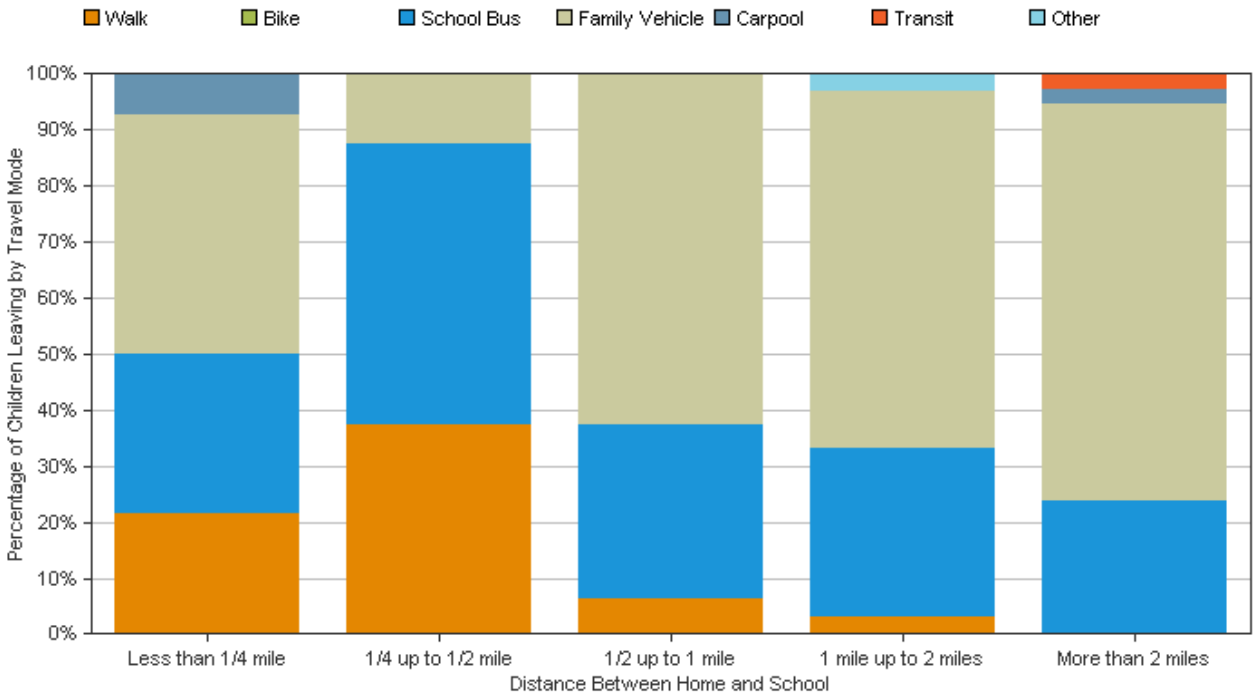
Number of Children by Travel Mode to School and Distance Between Home and School:

Mode	Less than 1/4 mile	1/4 mile up to 1/2 mile	1/2 mile up to 1 mile	1 mile up to 2 miles	More than 2 miles	Row Totals by Mode
Walk	4 (3.4%)	2 (1.7%)	0 (0%)	0 (0%)	0 (0%)	6 (5.1%)
Bike	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0.9%)
School Bus	0 (0%)	4 (3.4%)	4 (3.4%)	8 (6.9%)	5 (4.3%)	27 (23.2%)
Family Vehicle	10 (8.6%)	1 (0.9%)	12 (10.3%)	25 (21.6%)	31 (26.7%)	80 (69%)
Carpool	0 (0%)	1 (0.9%)	0 (0%)	0 (0%)	0 (0%)	1 (0.9%)
Transit	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0.9%)	1 (0.9%)
Other	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Column Totals by Distance	14 (12%)	8 (6.9%)	16 (13.7%)	33 (28.5%)	37 (31.9%)	

No Response: 2

(Percentages may not total 100% due to rounding.)

Percentage of Children by Travel Mode from School and Distance Between Home and School:



Number of Children by Travel Mode from School and Distance Between School and Home:

Mode	Less than 1/4 mile	1/4 mile up to 1/2 mile	1/2 mile up to 1 mile	1 mile up to 2 miles	More than 2 miles	Row Totals by Mode
Walk	3 (2.6%)	3 (2.6%)	1 (0.9%)	1 (0.9%)	0 (0%)	8 (7%)
Bike	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
School Bus	4 (3.4%)	4 (3.4%)	5 (4.3%)	10 (8.6%)	9 (7.8%)	38 (32.7%)
Family Vehicle	6 (5.2%)	1 (0.9%)	10 (8.6%)	21 (18.1%)	27 (23.3%)	66 (57%)
Carpool	1 (0.9%)	0 (0%)	0 (0%)	0 (0%)	1 (0.9%)	2 (1.8%)
Transit	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0.9%)	1 (0.9%)
Other	0 (0%)	0 (0%)	0 (0%)	1 (0.9%)	0 (0%)	1 (0.9%)
Column Totals by Distance	14 (12.1%)	8 (6.9%)	16 (13.8%)	33 (28.5%)	38 (32.9%)	
No Response: 2						

(Percentages may not total 100% due to rounding.)

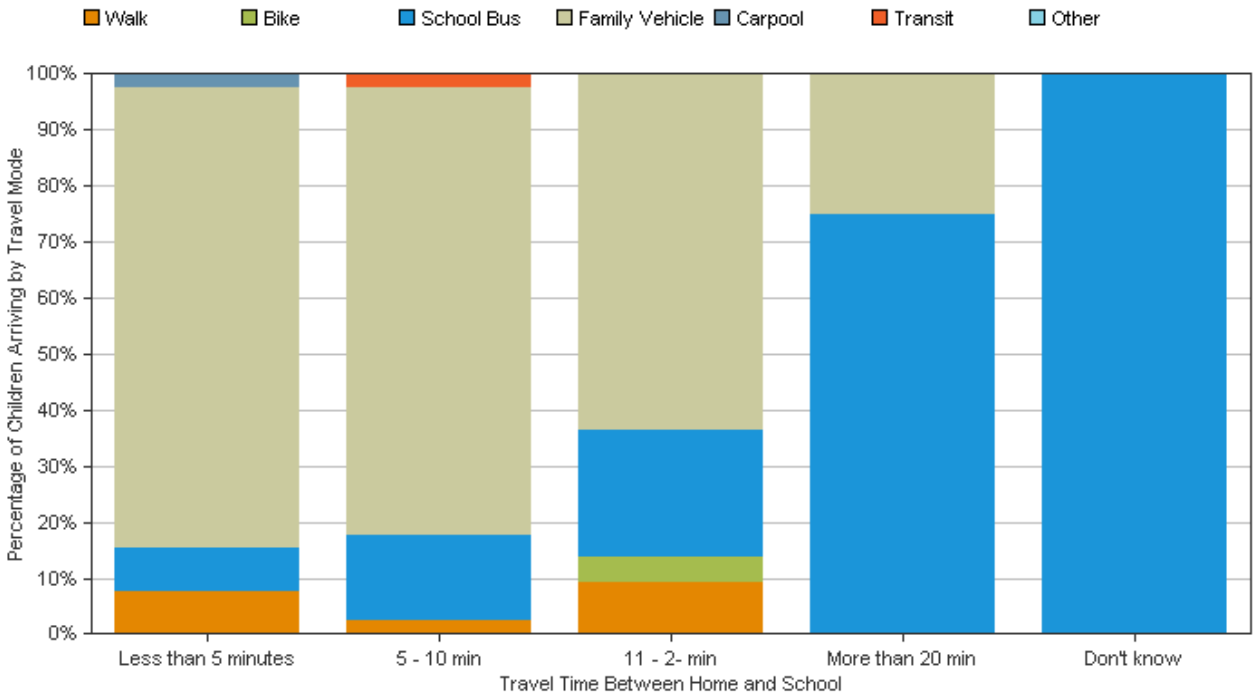
Number of Children by School Arrival Travel Mode and Travel Time to School:

Travel Mode	Less than 5 min	5 - 10 min	11 - 20 min	More than 20 min	Don't know	Row Totals by Mode
Walk	3 (2.6%)	1 (0.9%)	2 (1.7%)	0 (0%)	0 (0%)	6 (5.2%)
Bike	0 (0%)	0 (0%)	1 (0.9%)	0 (0%)	0 (0%)	1 (0.9%)
School Bus	3 (2.6%)	6 (5.2%)	5 (4.3%)	6 (5.2%)	7 (6.0%)	27 (23.3%)
Family Vehicle	32 (27.6%)	32 (27.6%)	14 (12.1%)	2 (1.7%)	0 (0%)	80 (69%)
Carpool	1 (0.9%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0.9%)
Transit	0 (0%)	1 (0.9%)	0 (0%)	0 (0%)	0 (0%)	1 (0.9%)
Other	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Column Totals by Time	39 (33.7%)	40 (34.6%)	22 (19%)	8 (6.9%)	7 (6%)	

No Response: 2

(Percentages may not total 100% due to rounding.)

Percentage of Children by Travel Time to School and School Arrival Travel Mode:

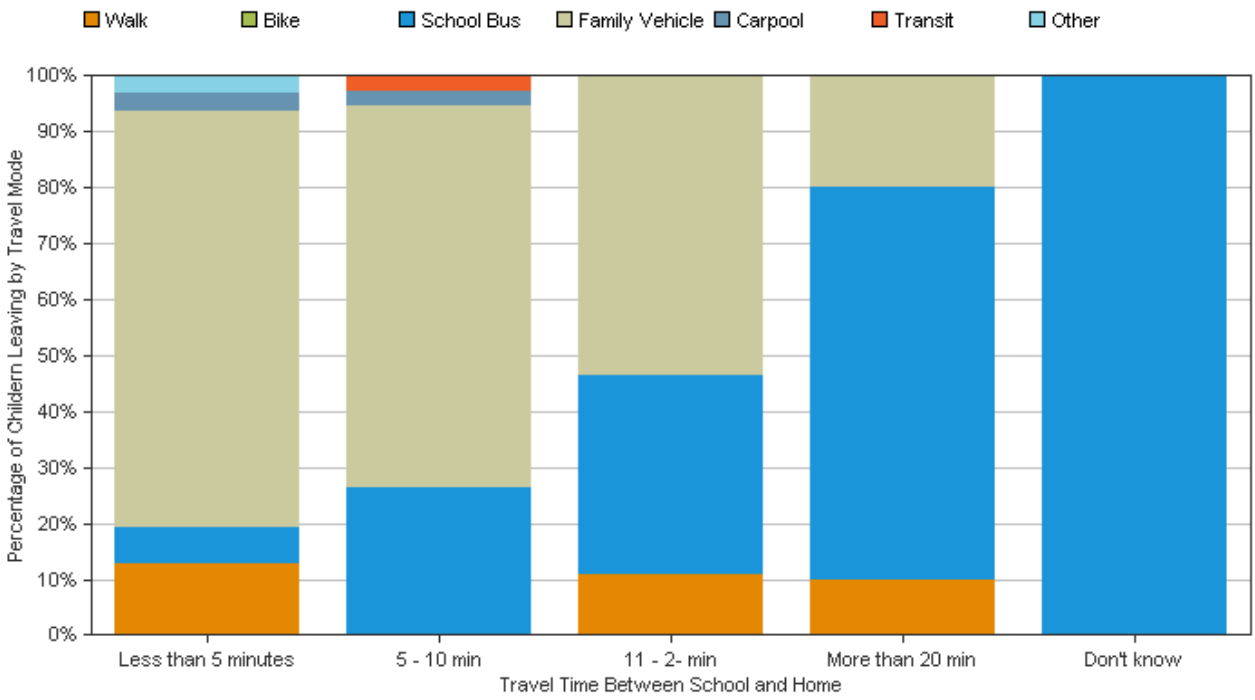


Number of Children by School Departure Mode and Travel Time from School:

Travel Mode	Less than 5 min	5 - 10 min	11 - 20 min	More than 20 min	Don't know	Row Totals by Mode
Walk	4 (3.4%)	0 (0%)	3 (2.6%)	1 (0.9%)	0 (0%)	8 (6.9%)
Bike	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
School Bus	2 (1.7%)	10 (8.6%)	10 (8.6%)	7 (6.0%)	9 (7.8%)	38 (32.7%)
Family Vehicle	23 (19.8%)	26 (22.4%)	15 (12.9%)	2 (1.7%)	0 (0%)	66 (56.8%)
Carpool	1 (0.9%)	1 (0.9%)	0 (0%)	0 (0%)	0 (0%)	2 (1.8%)
Transit	0 (0%)	1 (0.9%)	0 (0%)	0 (0%)	0 (0%)	1 (0.9%)
Other	1 (0.9%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0.9%)
Column Totals by Time	31 (26.7%)	38 (32.8%)	28 (24.1%)	10 (8.6%)	9 (7.8%)	
No Response: 2						

(Percentages may not total 100% due to rounding.)

Percentage of Children by Travel Time from School and School Departure Travel Mode:



Number of Children Who Have Asked Their Parent for Permission to Walk or Bike to/from School in the Last Year Separated by Distance They Live from School:

Distance from School	Have Asked	Have Not Asked
Less than 1/4 mile	6 (5.2%)	8 (7.0%)
1/4 mile up to 1/2 mile	6 (5.2%)	2 (1.7%)
1/2 mile up to 1 mile	6 (5.2%)	10 (8.7%)
1 mile up to 2 miles	2 (1.7%)	31 (27.0%)
More than 2 miles	3 (2.6%)	33 (28.7%)
No Response: 3		

(Percentages may not total 100% due to rounding.)

Grade When Parent Would Allow Child Walk or Bike to/from School without an Adult Separated by Distance They Live from School:

Grade	Less than 1/4 mile	1/4 mile up to 1/2 mile	1/2 mile up to 1 mile	1 mile up to 2 miles	More than 2 miles
Kindergarten	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
1st Grade	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
2nd Grade	2 (1.8%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
3rd Grade	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
4th Grade	3 (2.7%)	1 (0.9%)	2 (1.8%)	1 (0.9%)	0 (0%)
5th Grade	0 (0%)	1 (0.9%)	0 (0%)	0 (0%)	4 (3.6%)
6th Grade	2 (1.8%)	1 (0.9%)	4 (3.6%)	1 (0.9%)	1 (0.9%)
7th Grade	0 (0%)	0 (0%)	1 (0.9%)	2 (1.8%)	0 (0%)
8th Grade	0 (0%)	1 (0.9%)	3 (2.7%)	0 (0%)	1 (0.9%)
Not at any Grade	4 (3.6%)	3 (2.7%)	6 (5.5%)	28 (25.5%)	30 (27.3%)
No Response: 8					

(Percentages may not total 100% due to rounding.)

Issues which Affect Parent's Decision to Allow or Not Allow Their Child to Walk or Bike to/from School Separated by Children who Do and Do Not Already Walk or Bike To/From School:

Issue	Child walks/bikes to school	Child does not walk/bike to school
Distance	4 (57.1%)	68 (66.7%)
Convenience of driving	1 (14.3%)	20 (19.6%)
Time	3 (42.9%)	24 (23.5%)
Before/after-school activities	3 (42.9%)	16 (15.7%)
Traffic speed along route to school	3 (42.9%)	63 (61.8%)
Traffic volume along route	2 (28.6%)	71 (69.6%)
Adults to walk/bike with	5 (71.4%)	14 (13.7%)
Sidewalks or pathways	5 (71.4%)	34 (33.3%)
Safety of intersections & crossings	5 (71.4%)	59 (57.8%)
Crossing guards	1 (14.3%)	17 (16.7%)
Violence or crime	2 (28.6%)	52 (51.0%)
Weather or climate	3 (42.9%)	52 (51.0%)
Number of Respondents Per Category	7	102
No Response: 9		

(Percentages may not total 100% due to rounding.)

For Parents Whose Children Do Not Walk or Bike to/from School, Number of Parents Responding to question: Would You Probably let Your Child Walk or Bike to/from School Issues Were Changed or Improved?

	Number of parents reporting that:		
Issue	**Change Would affect decision**	**Change Would Not affect decision**	**Not Sure if change would affect decision**
Distance	16 (15.8%)	63 (62.4%)	19 (18.8%)
Convenience of driving	6 (5.9%)	44 (43.6%)	18 (17.8%)
Time	7 (6.9%)	43 (42.6%)	14 (13.9%)
Before/after-school activities	8 (7.9%)	41 (40.6%)	14 (13.9%)
Traffic speed along route to school	18 (17.8%)	52 (51.5%)	18 (17.8%)
Traffic volume along route	17 (16.8%)	56 (55.4%)	17 (16.8%)
Adults to walk/bike with	9 (8.9%)	40 (39.6%)	14 (13.9%)
Sidewalks or pathways	19 (18.8%)	44 (43.6%)	16 (15.8%)
Safety of intersections & crossings	23 (22.8%)	51 (50.5%)	17 (16.8%)
Crossing guards	15 (14.9%)	34 (33.7%)	10 (9.9%)
Violence or crime	14 (13.9%)	63 (62.4%)	23 (22.8%)
Weather or climate	14 (13.9%)	49 (48.5%)	16 (15.8%)
Number of Respondents That Selected at Least 1 Issue: 101			
No Response: 10			

(Percentages may not total 100% due to rounding.)

Number of Parents Who Feel Their Child's School Encourages or Discourages Walking and Biking to/from School:

	Strongly Encourage	Encourage	Neutral	Discourage	Strongly Discourage
Number	0 (0%)	15 (13.8%)	87 (79.8%)	5 (4.6%)	2 (1.8%)

No Response: 9

Number of Parents Reporting the Level of Fun Walking and Biking to/from School is for Their Child:

	Very Fun	Fun	Neutral	Boring	Very Boring
Number	14 (13.2%)	27 (25.5%)	54 (50.9%)	5 (4.7%)	6 (5.7%)

No Response: 12

Number of Parents Reporting How Healthy Walking and Biking to/from School is for Their Child:

	Very Healthy	Healthy	Neutral	Unhealthy	Very Unhealthy
Number	50 (45.5%)	42 (38.2%)	17 (15.5%)	0 (0%)	1 (0.9%)

No Response: 8

Parent Comments

This table displays the comments provided by parents as part of this Parent Survey. These comments have been entered in two ways — they may have been entered by the local program, or they may have been scanned and processed by the National Center for Safe Routes to School (NCSRTS). Comments scanned and processed by NCSRTS may have not been edited for content, spelling, and other typographical errors that may have as part of the scanning and handwriting recognition process.

Comments from: Marion Elementary

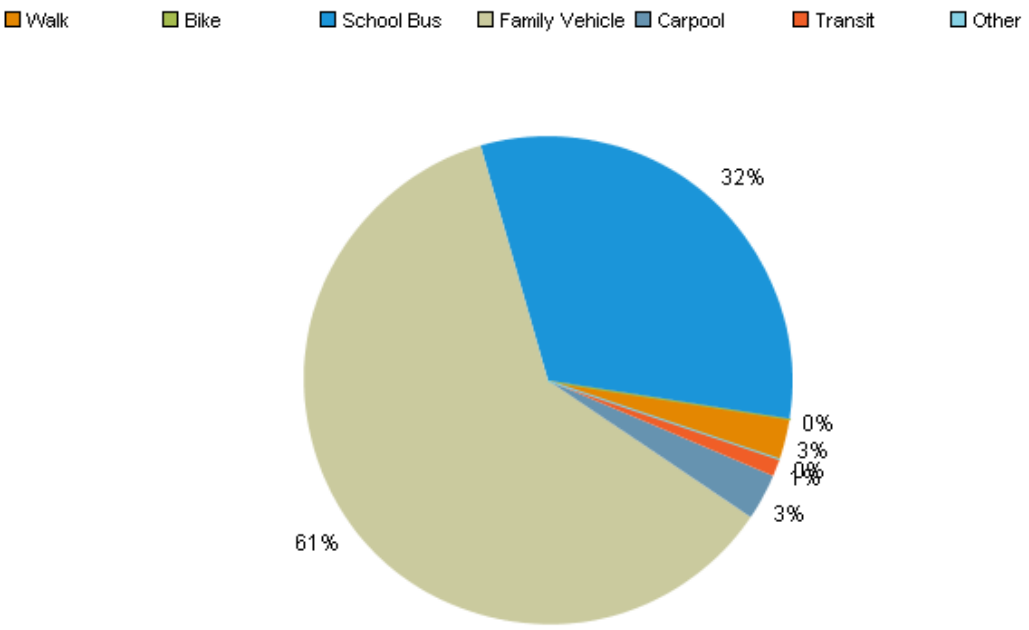
SurveyID	Comment
1612343	THERE ARENO SIDEWALKS BETWEEN MY HOUSE & OAKWOOD DRIVE. (SIDEWALK END'S AT CITY LIMIT)
1612344	I WOULD LET MY CHILDREN WALK WHEN THE TEMP IS HIGHTER
1612352	MY CHILD WILL NEVER WALK. IT'S BAD ENOUGH USING A BUS.
1612364	I HEARD THERE IS A HOME FOR JUVENILE SEX OFFENDERS CLOSE TO THE SCHOOL.
1612365	QUESTION #9 - EACH CHILD IS DIFFERENT DEPENDS ON MATURITY LEVEL & NUMBER OF CHILDREN WALKING TOGETHER.
1612367	I WISH THE SCHOOL WOULD AND SHOULD ENCOURAGE WALKING OR RIDING MORE.
1612369	NO SIDEWALK & FAST TRAFFIC!
1612376	I HAVE WALKED HOME WITH MY CHILD SEVERAL TIMES.
1612389	DISTANCE IS MY MAIN CONCERN.
1612396	WE WALK TO SCHOOL ABOUT 10% OF TIME; WEATHER & SCHEDULES ISSUES.
1612404	THERE IS A SERIOUS TRAFFIC ISSUE AND SAFETY NEEDS TO BE IMPROVED THE SYSTEM TO PICK UP CHILDREN NEEDS TO BE IMPROVED!
1612405	I WILLNOT PERMIT MY CHILD TO WALK OR BIKE TO SCHOOL
1612406	MY EDUCATION HAS NO RELEVANCE TO MY CHILD WALKING TO SCHOOL
1612413	ADULTS ARE NEEDED FOR SAFETY REASONS HOWEVER WHEN WE WALK AS A FAMILY COMMUNICATION & HEALTHY FOR OUR BODYS & WORKS OFF THAT UNUSED ENERGY THROUGHOUT THE SCHOOL DAY. QUESTION #8 - TO YOUNG TO GO WITHOUT AN ADULT YET! QUESTION #10 - SAFETY ISSUES BEYOND THE CHILDS CONTROL NEEDS AN ADULT.
1612416	I THINK THIS IDEA IS HEALTHY BUT NOT SAFE. THAT IS SAD.
1612421	SCHOOL IS TOO FAR FOR MY CHILD TO WALK - ALSO TOO DANGEROUS TO TRUST PEOPLE!
1612426	IT'S JUST NOT SAFE ANYMORE TO LET YOUR CHILD BE OUT BY THEMSELVES.
1612433	CROSSWALKS & SPEED BUMPS ON FLEMMING AVE
1612445	I FEEL THAT NOW DAYS THERE IS TO MUCH CRIME AND CARLESSNESS.
1612456	I DON'T THINK IT'S SAFE TO WALK OR BIKE TO SCHOOL NO MATTER THE CIRCUMSTANCE.

End of Report

Student Travel Summary

Program Name:	City of Marion	**Season Collected:**	Fall2007
School Name:	Marion Elementary	**Data Type *(Pre/Mid/Post)*:**	pre
		Reported School Enrollment:	409
		Number Classrooms:	0
		Number of Tallies Reported:	8

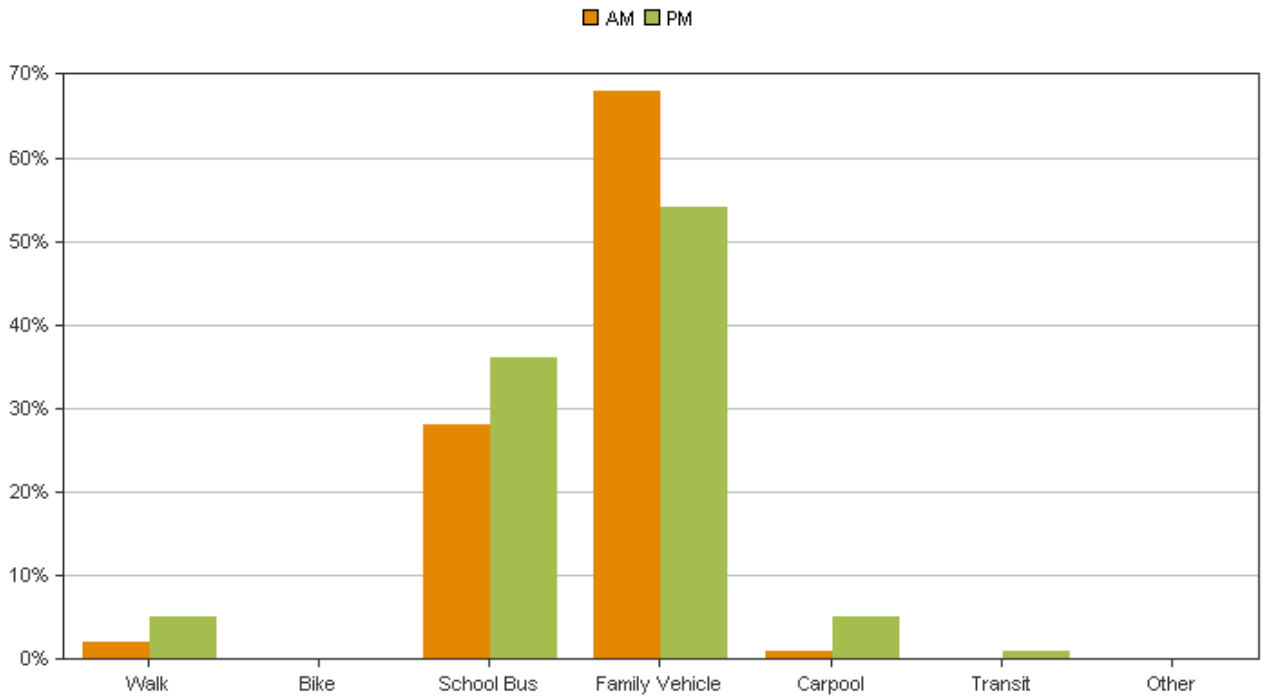
Students Traveling by Each Mode (across all reported days)



	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Average Number of Student Trips for Morning and Afternoon	4.7	0.0	45.5	85.8	4.2	1.0	0.0
Percent	3.3%	0.0%	32.2%	60.8%	3.0%	0.7%	0.0%

Average number of students per day responding to in-class tally counts: **141.2**

Morning to Afternoon Travel Mode Comparison



	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Morning	1.9%	0.0%	28.4%	68.0%	1.2%	0.5%	0.0%
Afternoon	4.7%	0.0%	36.0%	53.6%	4.7%	0.9%	0.0%

Number of students by travel mode to and from school:

	Number of Students	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Tues AM	137	2	0	36	98	0	1	0
Tues PM	138	6	0	46	78	6	2	0
Wed AM	138	3	0	40	92	3	0	0
Wed PM	139	7	0	52	73	7	0	0
Thur AM	147	3	0	44	97	2	1	0
Thur PM	148	7	0	55	77	7	2	0

Averages for classes submitting travel tallies:

	Number of Students	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Tues AM	17.1	0.3	0.0	4.5	12.3	0.0	0.1	0.0
Tues PM	17.3	0.8	0.0	5.8	9.8	0.8	0.3	0.0

Wed AM	17.3	0.4	0.0	5.0	11.5	0.4	0.0	0.0
Wed PM	17.4	0.9	0.0	6.5	9.1	0.9	0.0	0.0
Thur AM	18.4	0.4	0.0	5.5	12.1	0.3	0.1	0.0
Thur PM	18.5	0.9	0.0	6.9	9.6	0.9	0.3	0.0

Percentages of students by travel mode to and from school:

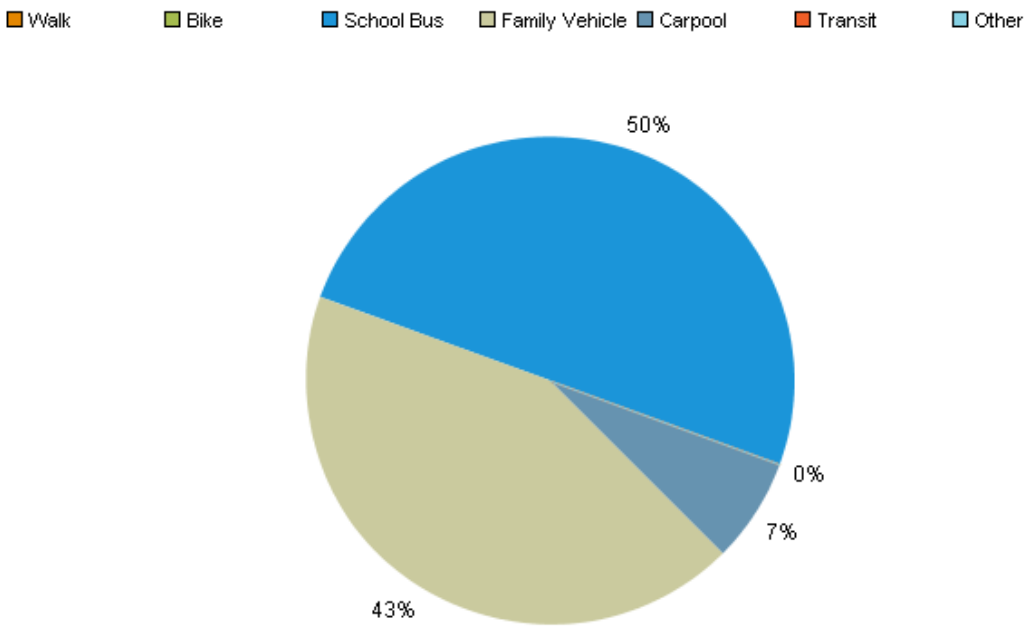
	Number of Students	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Tues AM	137	1.5%	0.0%	26.3%	71.5%	0.0%	0.7%	0.0%
Tues PM	138	4.3%	0.0%	33.3%	56.5%	4.3%	1.4%	0.0%
Wed AM	138	2.2%	0.0%	29.0%	66.7%	2.2%	0.0%	0.0%
Wed PM	139	5.0%	0.0%	37.4%	52.5%	5.0%	0.0%	0.0%
Thur AM	147	2.0%	0.0%	29.9%	66.0%	1.4%	0.7%	0.0%
Thur PM	148	4.7%	0.0%	37.2%	52.0%	4.7%	1.4%	0.0%

End of Report

Student Travel Summary

Program Name:	City of Marion	**Season Collected:**	Fall2007
School Name:	West McDowell Junior	**Data Type *(Pre/Mid/Post)*:**	pre
		Reported School Enrollment:	770
		Number Classrooms:	0
		Number of Tallies Reported:	14

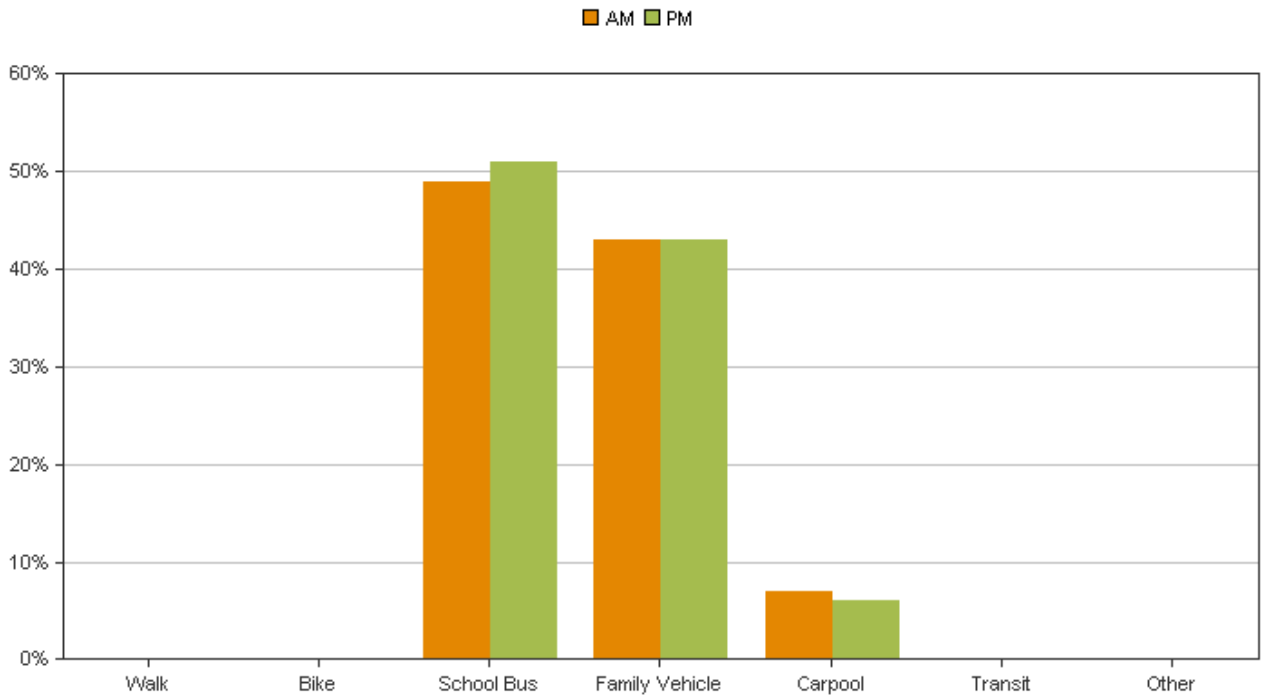
Students Traveling by Each Mode (across all reported days)



	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Average Number of Student Trips for Morning and Afternoon	0.0	0.0	144.3	125.3	20.0	0.0	0.0
Percent	0.0%	0.0%	49.8%	43.3%	6.9%	0.0%	0.0%

Average number of students per day responding to in-class tally counts: **289.5**

Morning to Afternoon Travel Mode Comparison



	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Morning	0.0%	0.0%	49.2%	43.4%	7.4%	0.0%	0.0%
Afternoon	0.0%	0.0%	50.6%	43.1%	6.4%	0.0%	0.0%

Number of students by travel mode to and from school:

	Number of Students	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Tues AM	315	0	0	153	140	22	0	0
Tues PM	271	0	0	130	125	16	0	0
Wed AM	309	0	0	154	131	24	0	0
Wed PM	263	0	0	140	105	18	0	0

Averages for classes submitting travel tallies:

	Number of Students	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Tues AM	22.5	0.0	0.0	10.9	10.0	1.6	0.0	0.0
Tues PM	19.4	0.0	0.0	9.3	8.9	1.1	0.0	0.0
Wed AM	22.1	0.0	0.0	11.0	9.4	1.7	0.0	0.0
Wed PM	18.8	0.0	0.0	10.0	7.5	1.3	0.0	0.0

Percentages of students by travel mode to and from school:

	Number of Students	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Tues AM	315	0.0%	0.0%	48.6%	44.4%	7.0%	0.0%	0.0%
Tues PM	271	0.0%	0.0%	48.0%	46.1%	5.9%	0.0%	0.0%
Wed AM	309	0.0%	0.0%	49.8%	42.4%	7.8%	0.0%	0.0%
Wed PM	263	0.0%	0.0%	53.2%	39.9%	6.8%	0.0%	0.0%

End of Report

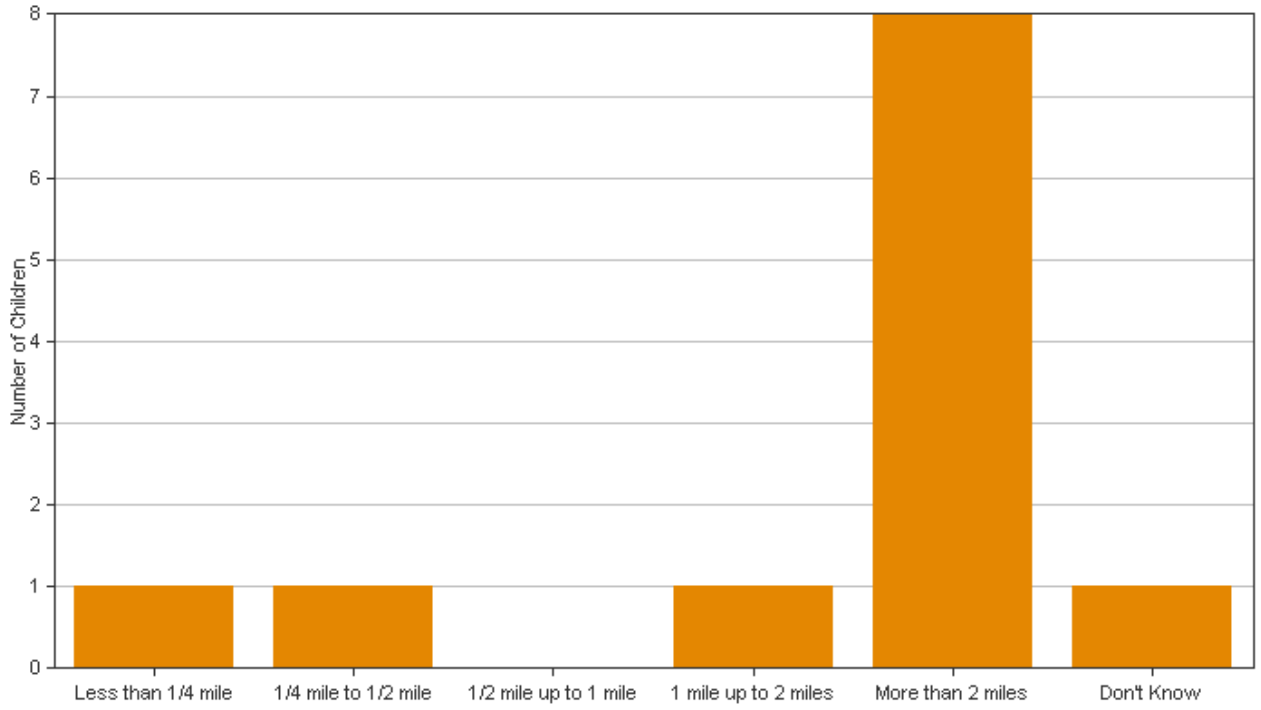
Parent Survey Summary Report:

Process Summary Information:

Program Name:	City of Marion	**Survey Data Collected:**	Fall2007
School Name:	Eastfield Elementary	**Data Collection Phase:** (pre = Before program began mid = During program; post = After program ended)	pre
Reported Enrollment:	340	**Number of Surveys Distributed:**	0
Date Report Generated:	05/13/2010	**Number of Surveys in Report:**	12

This report provides information from parents about their perceptions and attitudes on their child walking and bicycling to school. The data used in this report were collected using the Survey about Walking and Biking to School for Parents form from the National Center for Safe Routes to School.

Number of Children by Distance They Live From School:

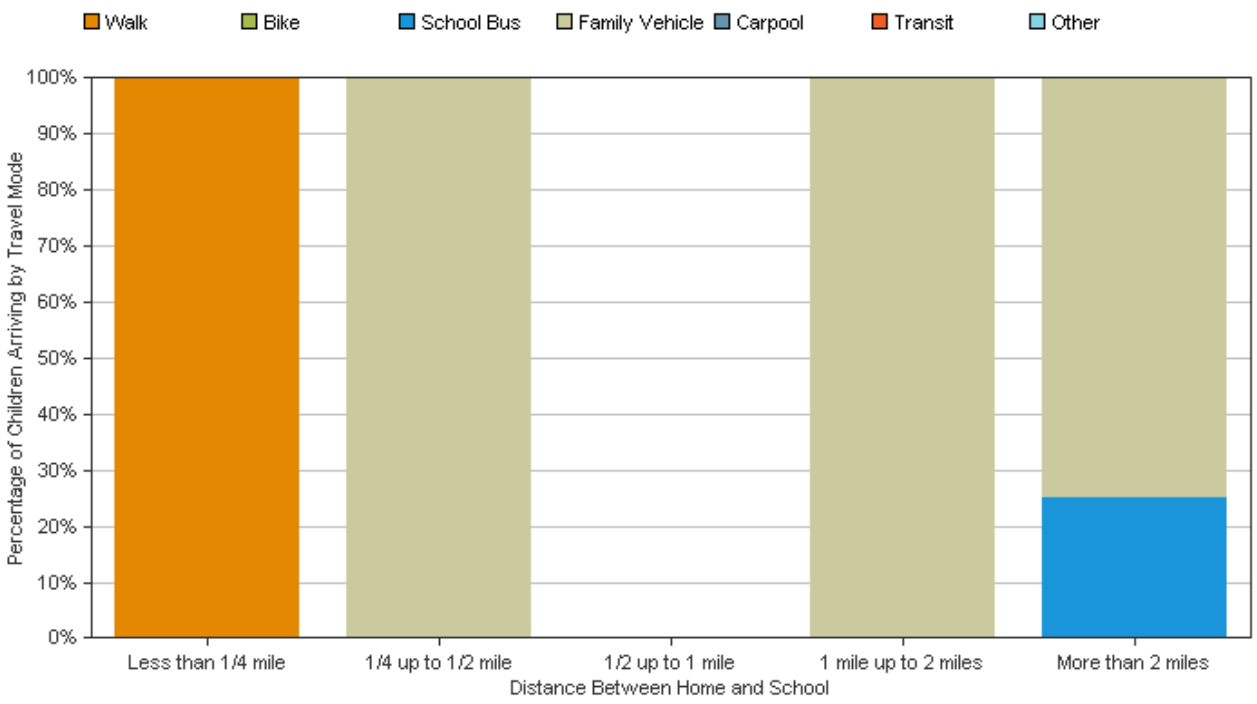


Number of Children by Distance They Live From School:

Distance from School	Number of Children
Less than 1/4 mile	1 (8.3%)
1/4 mile up to 1/2 mile	1 (8.3%)
1/2 mile up to 1 mile	0 (0%)
1 mile up to 2 miles	1 (8.3%)
More than 2 miles	8 (66.7%)
Don't know	1 (8.3%)
No response: 0	

(Percentages may not total 100% due to rounding.)

Percentage of Children by Travel Mode to School and Distance Between Home and School:



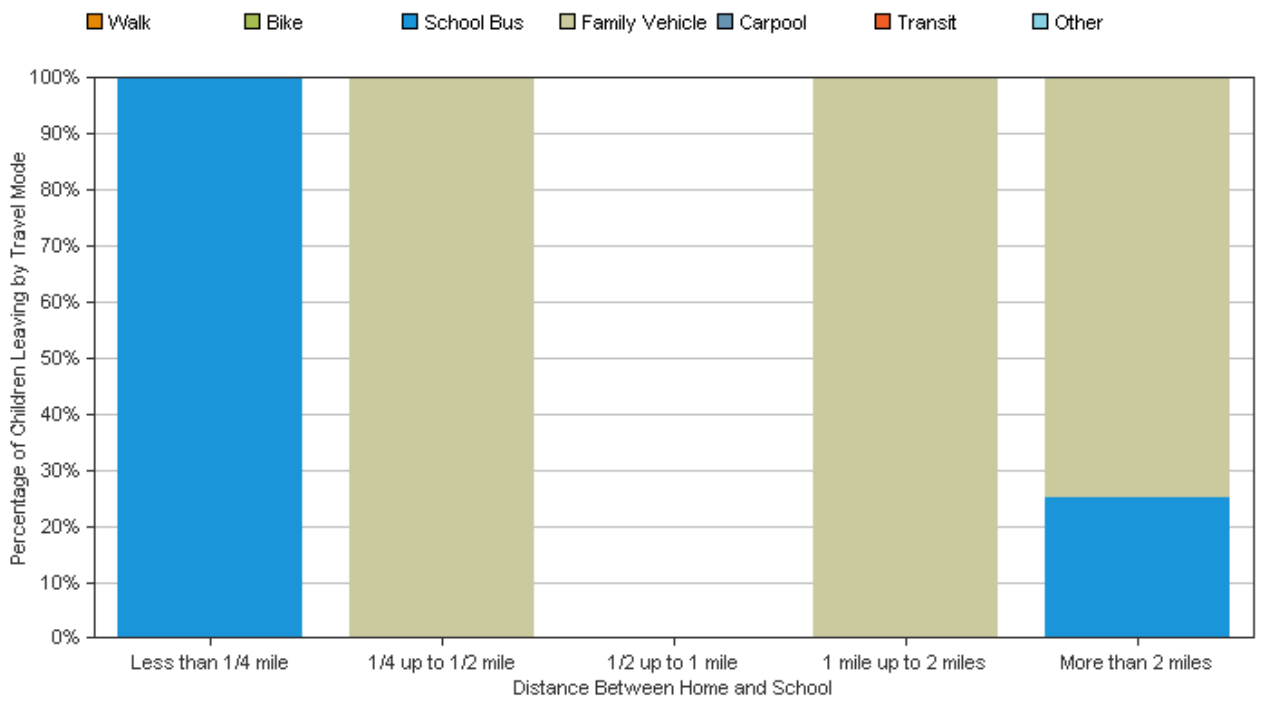
Number of Children by Travel Mode to School and Distance Between Home and School:

Mode	Less than 1/4 mile	1/4 mile up to 1/2 mile	1/2 mile up to 1 mile	1 mile up to 2 miles	More than 2 miles	Row Totals by Mode
Walk	1 (8.3%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (8.3%)
Bike	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
School Bus	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (16.7%)	2 (16.7%)
Family Vehicle	0 (0%)	1 (8.3%)	0 (0%)	1 (8.3%)	6 (50.0%)	9 (74.9%)
Carpool	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Transit	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Other	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Column Totals by Distance	1 (8.3%)	1 (8.3%)	0 (0%)	1 (8.3%)	8 (66.7%)	

No Response: 0

(Percentages may not total 100% due to rounding.)

Percentage of Children by Travel Mode from School and Distance Between Home and School:



Number of Children by Travel Mode from School and Distance Between School and Home:

Mode	Less than 1/4 mile	1/4 mile up to 1/2 mile	1/2 mile up to 1 mile	1 mile up to 2 miles	More than 2 miles	Row Totals by Mode
Walk	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Bike	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
School Bus	1 (8.3%)	0 (0%)	0 (0%)	0 (0%)	2 (16.7%)	4 (33.3%)
Family Vehicle	0 (0%)	1 (8.3%)	0 (0%)	1 (8.3%)	6 (50.0%)	8 (66.6%)
Carpool	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Transit	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Other	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Column Totals by Distance	1 (8.3%)	1 (8.3%)	0 (0%)	1 (8.3%)	8 (66.7%)	

No Response: 0

(Percentages may not total 100% due to rounding.)

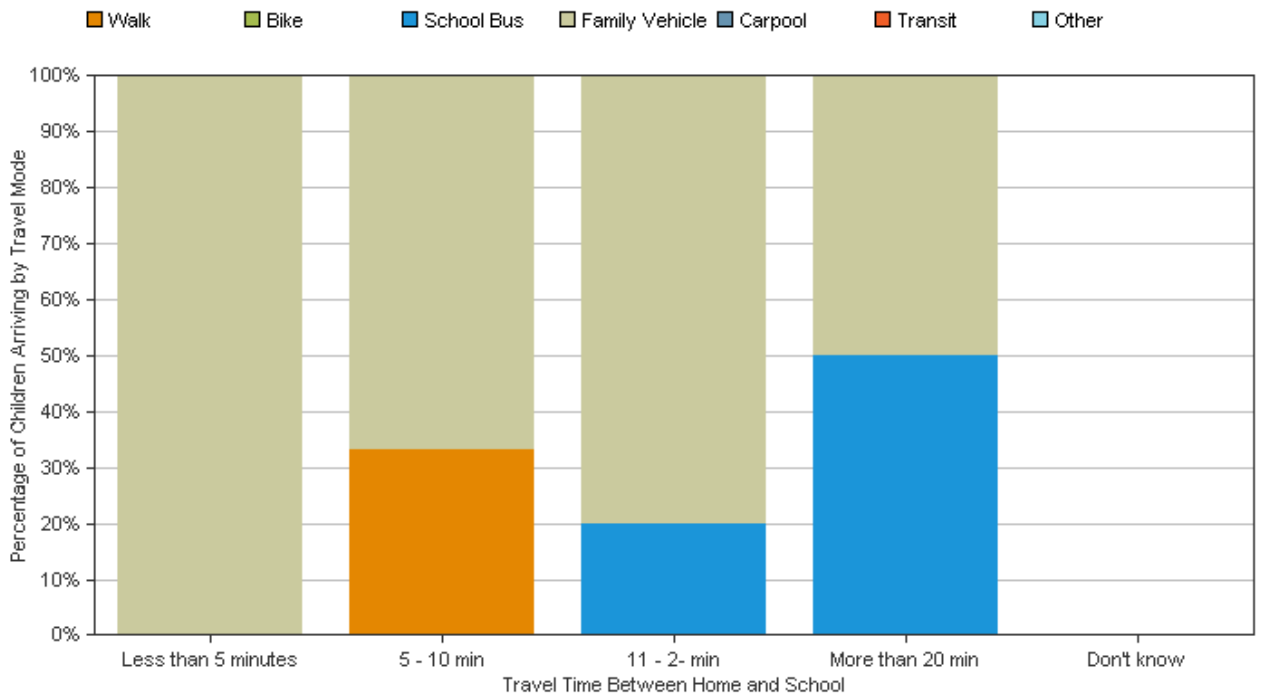
Number of Children by School Arrival Travel Mode and Travel Time to School:

Travel Mode	Less than 5 min	5 - 10 min	11 - 20 min	More than 20 min	Don't know	Row Totals by Mode
Walk	0 (0%)	1 (8.3%)	0 (0%)	0 (0%)	0 (0%)	1 (8.3%)
Bike	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
School Bus	0 (0%)	0 (0%)	1 (8.3%)	1 (8.3%)	0 (0%)	2 (16.6%)
Family Vehicle	2 (16.7%)	2 (16.7%)	4 (33.3%)	1 (8.3%)	0 (0%)	9 (75%)
Carpool	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Transit	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Other	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Column Totals by Time	2 (16.7%)	3 (25%)	5 (41.6%)	2 (16.6%)	0 (0%)	

No Response: 0

(Percentages may not total 100% due to rounding.)

Percentage of Children by Travel Time to School and School Arrival Travel Mode:



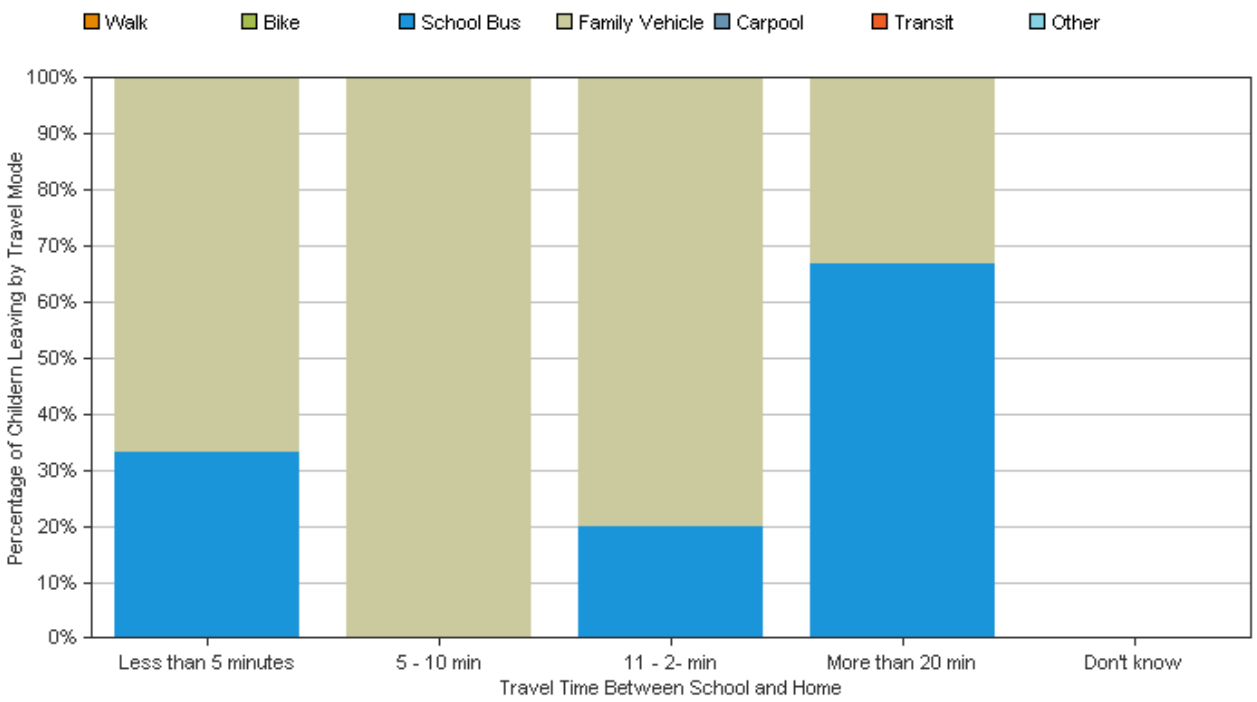
Number of Children by School Departure Mode and Travel Time from School:

Travel Mode	Less than 5 min	5 - 10 min	11 - 20 min	More than 20 min	Don't know	Row Totals by Mode
Walk	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Bike	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
School Bus	1 (8.3%)	0 (0%)	1 (8.3%)	2 (16.7%)	0 (0%)	4 (33.3%)
Family Vehicle	2 (16.7%)	1 (8.3%)	4 (33.3%)	1 (8.3%)	0 (0%)	8 (66.6%)
Carpool	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Transit	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Other	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Column Totals by Time	3 (25%)	1 (8.3%)	5 (41.6%)	3 (25%)	0 (0%)	

No Response: 0

(Percentages may not total 100% due to rounding.)

Percentage of Children by Travel Time from School and School Departure Travel Mode:



Number of Children Who Have Asked Their Parent for Permission to Walk or Bike to/from School in the Last Year Separated by Distance They Live from School:

Distance from School	Have Asked	Have Not Asked
Less than 1/4 mile	1 (8.3%)	0 (0%)
1/4 mile up to 1/2 mile	0 (0%)	1 (8.3%)
1/2 mile up to 1 mile	0 (0%)	0 (0%)
1 mile up to 2 miles	0 (0%)	1 (8.3%)
More than 2 miles	0 (0%)	8 (66.7%)
No Response: 0		

(Percentages may not total 100% due to rounding.)

Grade When Parent Would Allow Child Walk or Bike to/from School without an Adult Separated by Distance They Live from School:

Grade	Less than 1/4 mile	1/4 mile up to 1/2 mile	1/2 mile up to 1 mile	1 mile up to 2 miles	More than 2 miles
Kindergarten	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
1st Grade	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
2nd Grade	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
3rd Grade	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
4th Grade	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
5th Grade	1 (9.1%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
6th Grade	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (9.1%)
7th Grade	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (9.1%)
8th Grade	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Not at any Grade	0 (0%)	1 (9.1%)	0 (0%)	1 (9.1%)	5 (45.5%)

No Response: 1

(Percentages may not total 100% due to rounding.)

Issues which Affect Parent's Decision to Allow or Not Allow Their Child to Walk or Bike to/from School Separated by Children who Do and Do Not Already Walk or Bike To/From School:

Issue	Child walks/bikes to school	Child does not walk/bike to school
Distance	1 (100.0%)	7 (77.8%)
Convenience of driving	0 (0.0%)	1 (11.1%)
Time	0 (0.0%)	3 (33.3%)
Before/after-school activities	0 (0.0%)	0 (0.0%)
Traffic speed along route to school	1 (100.0%)	4 (44.4%)
Traffic volume along route	1 (100.0%)	2 (22.2%)
Adults to walk/bike with	0 (0.0%)	2 (22.2%)
Sidewalks or pathways	1 (100.0%)	2 (22.2%)
Safety of intersections & crossings	1 (100.0%)	2 (22.2%)
Crossing guards	0 (0.0%)	2 (22.2%)
Violence or crime	0 (0.0%)	3 (33.3%)
Weather or climate	1 (100.0%)	3 (33.3%)
Number of Respondents Per Category	1	9

No Response: 2

(Percentages may not total 100% due to rounding.)

For Parents Whose Children Do Not Walk or Bike to/from School, Number of Parents Responding to question: Would You Probably let Your Child Walk or Bike to/from School Issues Were Changed or Improved?

	Number of parents reporting that:		
Issue	**Change Would affect decision**	**Change Would Not affect decision**	**Not Sure if change would affect decision**
Distance	2 (22.2%)	6 (66.7%)	2 (22.2%)
Convenience of driving	0 (0.0%)	4 (44.4%)	2 (22.2%)
Time	1 (11.1%)	4 (44.4%)	2 (22.2%)
Before/after-school activities	1 (11.1%)	3 (33.3%)	1 (11.1%)
Traffic speed along route to school	0 (0.0%)	5 (55.6%)	1 (11.1%)
Traffic volume along route	0 (0.0%)	4 (44.4%)	1 (11.1%)
Adults to walk/bike with	0 (0.0%)	4 (44.4%)	1 (11.1%)
Sidewalks or pathways	0 (0.0%)	4 (44.4%)	1 (11.1%)
Safety of intersections & crossings	0 (0.0%)	4 (44.4%)	1 (11.1%)
Crossing guards	0 (0.0%)	4 (44.4%)	1 (11.1%)
Violence or crime	0 (0.0%)	5 (55.6%)	0 (0.0%)
Weather or climate	0 (0.0%)	5 (55.6%)	1 (11.1%)
Number of Respondents That Selected at Least 1 Issue: 9			
No Response: 2			

(Percentages may not total 100% due to rounding.)

Number of Parents Who Feel Their Child's School Encourages or Discourages Walking and Biking to/from School:

	Strongly Encourage	Encourage	Neutral	Discourage	Strongly Discourage
Number	0 (0%)	0 (0%)	11 (100.0%)	0 (0%)	0 (0%)

No Response: 1

Number of Parents Reporting the Level of Fun Walking and Biking to/from School is for Their Child:

	Very Fun	Fun	Neutral	Boring	Very Boring
Number	0 (0%)	2 (18.2%)	7 (63.6%)	0 (0%)	2 (18.2%)

No Response: 1

Number of Parents Reporting How Healthy Walking and Biking to/from School is for Their Child:

	Very Healthy	Healthy	Neutral	Unhealthy	Very Unhealthy
Number	6 (54.5%)	2 (18.2%)	3 (27.3%)	0 (0%)	0 (0%)

No Response: 1

Parent Comments

This table displays the comments provided by parents as part of this Parent Survey. These comments have been entered in two ways — they may have been entered by the local program, or they may have been scanned and processed by the National Center for Safe Routes to School (NCSRTS). Comments scanned and processed by NCSRTS may have not been edited for content, spelling, and other typographical errors that may have as part of the scanning and handwriting recognition process.

Comments from: Eastfield Elementary

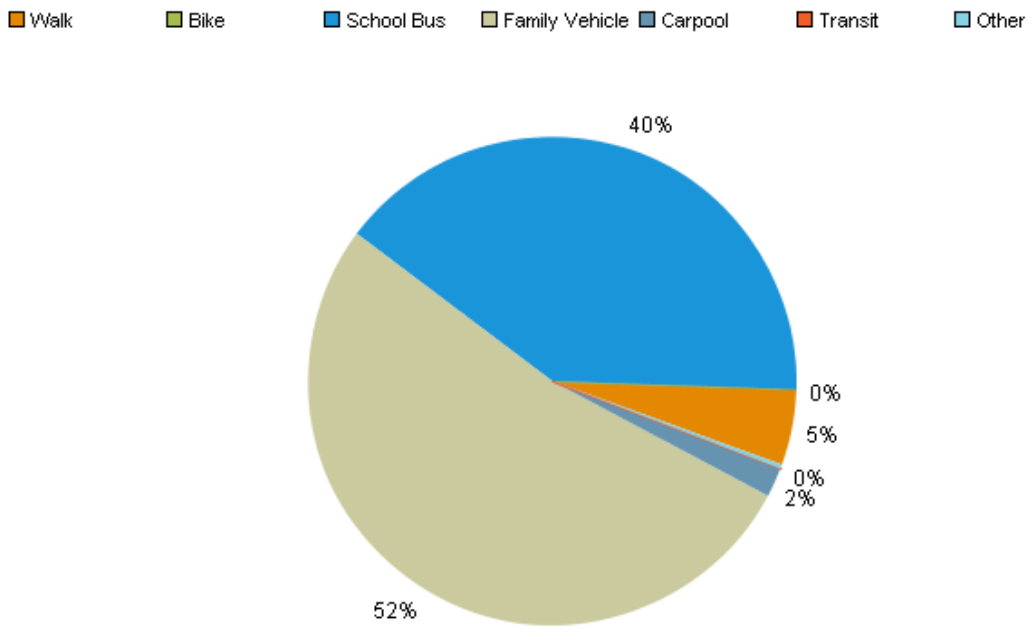
SurveyID	Comment
1612460	I THINK IT'S OK FOR KIDS TO WALK OR BIKE HOME IF THEY LIVE WITHIN 2 MILES OF SCHOOL.
1612462	I WILL NEVER LET MY CHILDREN WALK OR BIKE TO SCHOOL DANGEROUS.
1612469	QUESTION #9 - TOO FAR TO CONSIDER

End of Report

Student Travel Summary

Program Name:	City of Marion	**Season Collected:**	Fall2007
School Name:	Eastfield Elementary	**Data Type *(Pre/Mid/Post)*:**	pre
		Reported School Enrollment:	340
		Number Classrooms:	0
		Number of Tallies Reported:	17

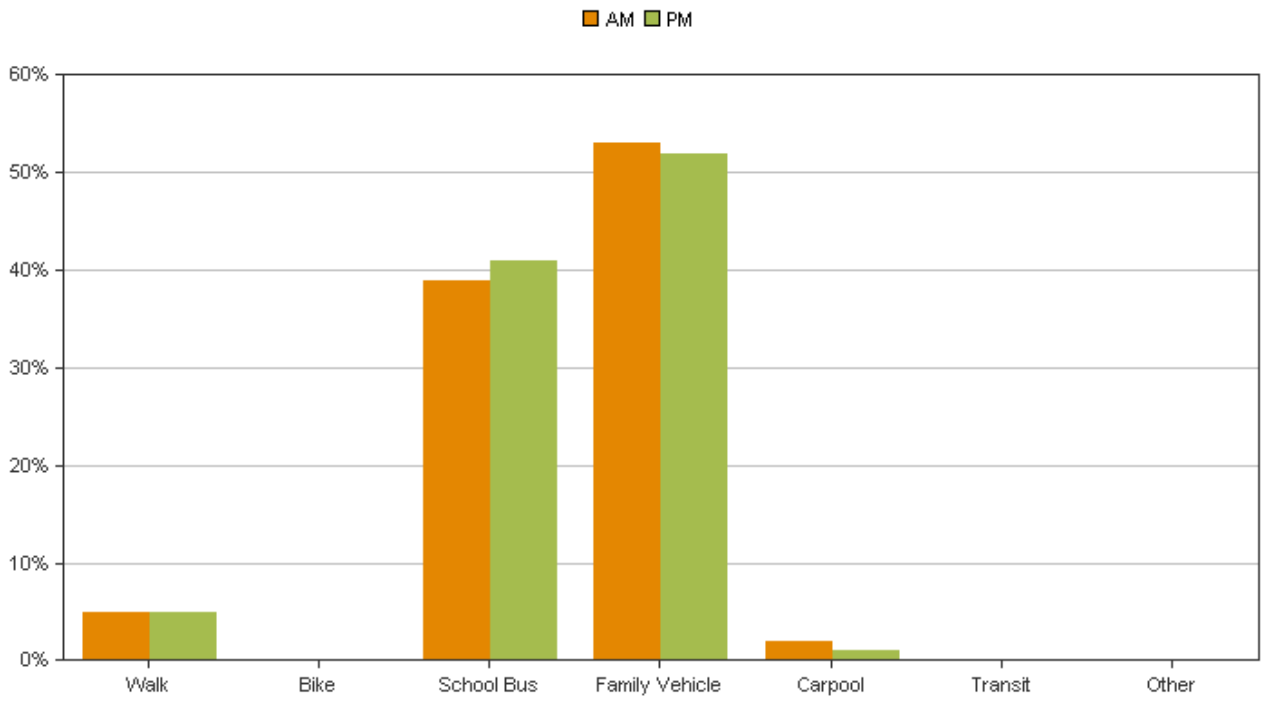
Students Traveling by Each Mode (across all reported days)



	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Average Number of Student Trips for Morning and Afternoon	12.3	0.7	98.5	128.2	4.5	0.0	0.0
Percent	5.1%	0.3%	40.3%	52.5%	1.8%	0.0%	0.0%

Average number of students per day responding to in-class tally counts: **244.2**

Morning to Afternoon Travel Mode Comparison



	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Morning	4.9%	0.3%	39.5%	53.0%	2.4%	0.0%	0.0%
Afternoon	5.2%	0.3%	41.2%	52.0%	1.2%	0.0%	0.0%

Number of students by travel mode to and from school:

	Number of Students	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Tues AM	248	12	0	101	132	3	0	0
Tues PM	233	7	0	98	127	1	0	0
Wed AM	297	14	1	114	158	10	0	0
Wed PM	296	17	1	116	156	6	0	0
Thur AM	195	10	1	77	102	5	0	0
Thur PM	196	14	1	85	94	2	0	0

Averages for classes submitting travel tallies:

	Number of Students	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Tues AM	14.6	0.7	0.0	5.9	7.8	0.2	0.0	0.0
Tues PM	13.7	0.4	0.0	5.8	7.5	0.1	0.0	0.0

Wed AM	17.5	0.8	0.1	6.7	9.3	0.6	0.0	0.0
Wed PM	17.4	1.0	0.1	6.8	9.2	0.4	0.0	0.0
Thur AM	11.5	0.6	0.1	4.5	6.0	0.3	0.0	0.0
Thur PM	11.5	0.8	0.1	5.0	5.5	0.1	0.0	0.0

Percentages of students by travel mode to and from school:

	Number of Students	Walk	Bike	School Bus	Family Vehicle	Carpool	Transit	Other
Tues AM	248	4.8%	0.0%	40.7%	53.2%	1.2%	0.0%	0.0%
Tues PM	233	3.0%	0.0%	42.1%	54.5%	0.4%	0.0%	0.0%
Wed AM	297	4.7%	0.3%	38.4%	53.2%	3.4%	0.0%	0.0%
Wed PM	296	5.7%	0.3%	39.2%	52.7%	2.0%	0.0%	0.0%
Thur AM	195	5.1%	0.5%	39.5%	52.3%	2.6%	0.0%	0.0%
Thur PM	196	7.1%	0.5%	43.4%	48.0%	1.0%	0.0%	0.0%

End of Report

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B FUNDING



Chapter Outline:

B.0 Overview B.1 Federal and State Funding B.2 Local Government B.3 Private Sector

B.0 OVERVIEW

When considering possible funding sources for SRTS engineering and program projects, it is important to consider that it is highly unlikely that all activities (construction and education/encouragement/enforcement programs) will be accomplished from a single funding source since these projects are expected to be in the hundreds of thousands of dollars and accomplished over several years. It will be necessary to consider several sources of funding, that when combined, would support full project construction. It will also be critical for the local school and school system to continue working closely with local government to establish priority for SRTS projects through the local government's capital improvement program, grant efforts, and funding request lists. This appendix outlines the most likely sources of funding for the projects at the federal, state, local government level and from the private sector.

B.1 FEDERAL AND STATE FUNDING

Changing Funding Landscape In 2012

Authorization of a new federal surface transportation bill will likely occur in the coming years. With the current administration and transportation leaders in place, it is possible that more funding will be available for multi-modal transportation and SRTS projects than ever before. Indications are that a new transportation bill may be geared at "livability" with all transportation modes considered in addition to automobile travel. However, 2012 elections may change the future of transportation funding. Because of the recent economic recession (2009-2010), stimulus funding, and the pending change in the transportation bill, it is critical for local leaders, staff, and school representatives of this Action Plan to keep up-to-date on a rapidly changing funding landscape.

In addition, a $15 billion health law prevention fund was established in 2010. Currently, there is a debate on how to spend this money over the next ten years. There is a good chance that bicycle and pedestrian improvements and SRTS programs will get a boost from this program as a means to improve exercise for youth.

With an upcoming updated surface transportation bill, the $15 billion health prevention fund, and others likely focused on livability and multi-modal approaches, monies will likely flow to communities that are addressing bicycle, pedestrian, and SRTS issues. Having this plan in place and adopted is one clear sign that this community plans to address these issues.

Federal And State Funding Process

Federal funding is typically directed through State agencies to local governments either in the form of grants or direct appropriations. The following is a list of possible Federal and State funding sources that could be used to support construction of the many pedestrian projects. Federal funding typically requires a 20% local match, however this is not always the case (for example, recent stimulus money does not require a match). Since these funding categories are difficult to forecast, it is recommended that the school system and town continue to work with the local MPO on getting SRTS bicycle and pedestrian projects listed in the TIP (Transportation Improvement Program), as discussed below.

Safe Routes To School Program (SRTS): The Safe Routes to School Program managed by NCDOT is a federally funded program that was initiated by the passing of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) in 2005, which established a national SRTS program to distribute funding and institutional support to implement SRTS programs in states and communities across the country. SRTS programs facilitate the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of schools. The Transportation Mobility and Safety Division at NCDOT is charged with disseminating SRTS funding and running the SRTS program in North Carolina

North Carolina received approximately $15 million in SRTS federal funding apportionments for fiscal years 2005 through 2009. This program is 100% federally funded; therefore, no local matching funds are required. In 2009, more than $3.6 million went to 22 municipalities and local agencies for infrastructure and non-infrastructure projects. All proposed projects must relate to walking or biking to and from schools serving any grade K-8. An example of a non-infrastructure project is an education or encouragement program to improve rates of walking and biking to school. An example of an infrastructure project is construction of sidewalks around a school. Funds are available for infrastructure or non-infrastructure projects. Infrastructure improvements under this program must be made within 2 miles of an elementary or middle school. The state requires the completion of a competitive application to apply for funding.

The SRTS program will likely take calls for projects again very soon. This should be monitored closely. Having an adopted plan in place with priority projects will provide a “leg-up” on the competition in a highly sought after funding stream.

Finally, each NCDOT Division received an allotment of funds ($430,000) for SRTS “spot” improvements. In some divisions, this money has not been spent yet. This is another source of SRTS money that should be explored by this community.

For more information on the SRTS program contact:

Transportation Mobility an Safety Division
Municipal and School Transportation Assistance (MSTA) Group
Safe Routes to School Coordinator: Ed Johnson, ASLA, RLA
(direct line: 919-662-4344)

Bicycle Transportation And Pedestrian Walkways Program: The purpose of this Federal program is to improve conditions and safety for bicycling and walking. The bicycle transportation and pedestrian walkways projects are broadly eligible for all of the major funding programs where they compete with other transportation projects for available funding at the State and Metropolitan Planning Organization (MPO) levels.

Eligible Activities Include:

- Bicycle and pedestrian plan
- Bicycle lanes on roadway
- Paved Shoulders
- Signed bike route
- Shared-use path/trail
- Single track hike/bike trail
- Spot improvement program
- Maps
- Bike racks on buses
- Bicycle parking facilities
- Trail/highway intersection
- Bicycle storage/service center
- Sidewalks, new or retrofit
- Crosswalks, new or retrofit

- Signal improvements
- Traffic calming
- Coordinator position
- Safety/education position
- Police Patrol
- Helmet Promotion
- Safety brochure/book

Congestion Mitigation and Air Quality Improvement Program (CMAQ): The purpose of the Federal CMAQ program is to fund transportation projects or programs that will contribute to attainment or maintenance of the national ambient air quality standards for ozone, carbon monoxide, and particulate matter. Therefore, funds are only available in locations that are determined to be a nonattainment area. Bicycle and pedestrian facilities and programs are eligible activities for this funding source.

Highway Safety Improvement Program (HSIP): The HSIP authorized a new core Federal-aid funding program that began in Fiscal Year 2006 to achieve a significant reduction in traffic fatalities and serious injuries on all public roads. Funds may be used for projects on any public road or publicly owned bicycle and pedestrian pathway or trail.

High Risk Rural Roads (HRRR) Program: To be eligible for these Federal funds, States must identify High Risk Rural Roads based on specific criteria. Funds may be used for projects on any public road or publicly owned bicycle and pedestrian pathway or trail. The projects must achieve a significant reduction in traffic fatalities and serious injuries.

Transportation Community and System Preservation (TCSP) Program: The purpose of this Federal program is to investigate the relationship between transportation, community, and system preservation plans and practices and identify private sector-based initiatives to improve such relationships. Bicycle and pedestrian projects are eligible for this funding.

Recreational Trails Program (RTP): The purpose of this Federal program is to develop and maintain recreations trails and trail-related facilities for both nonmotorized and motorized recreational trail uses.

NC Department Of Transportation (NCDOT)

The most likely source of funding for the SRTS projects would come from the North Carolina Department of Transportation through the federal funding program SAFETEA-LU (or new transportation bill when it is passed). Some of the sub-programs within NCDOT are listed below:

NCDOT Transportation Improvement Program (TIP): This is the traditional funding source for major transportation projects located on NCDOT roadways; however, it appears that NCDOT will be focusing on strategic highway corridors and regionally significant roadways in the future. To be identified as a potential TIP project, the project must have support from the Metropolitan Planning Organization (MPO), Division Engineer, and Board of transportation Member.

NCDOT Enhancement Funding: Federal Transportation Enhancement funding is administered and awarded by NCDOT and serves to strengthen the cultural, aesthetic, and environmental aspects of the State's intermodal transportation system. The State typically will make a Call for Projects, and each project must "benefit the traveling public and help communities increase transportation choices and access, enhance the built or natural environment and create a sense of place." This is a matching grant program that typically requires local municipalities to fund 20% of the enhancement project.

NCDOT Contingency Fund: These funds are controlled by elected or appointed officials; therefore projects must have a political sponsor. Requests are received from municipalities, counties, businesses, schools, industrial entities, and DOT staff. The President Pro-Tem of Senate, Speaker of the House and the Transportation Secretary approve projects from this fund. Typically, there is a total of $15 million in this fund. $5 million is controlled by the House, $5 million is controlled by the Senate, and $5 million is controlled by the Secretary of Transportation. Funds are administered by the NCDOT Secretary. These funds can be used on both state roads and municipal roads.

NCDOT Spot Safety Program: According to the NCDOT website, the Spot Safety Program is used to fund smaller improvement projects to address safety, potential safety, and operational issues. The program is funded with state funds and currently receives approximately $9 million per state fiscal year. The maximum allowable contribution of Spot Safety funds per project is $250,000. A Safety Oversight Committee (SOC) reviews and recommends Spot Safety projects to the Board of Transportation (BOT) for approval and funding. Criteria used by the SOC to select projects for recommendation to the BOT include, but are not limited to, the frequency of correctable crashes, severity of crashes, delay, congestion, number of signal warrants met, effect on pedestrians and schools, division and region priorities, and public interest.

NCDOT Bicycle and Pedestrian Planning Grant Initiative: This initiative is a matching grant program that encourages municipalities to develop comprehensive bicycle plans and pedestrian plans. The Division of Bicycle and Pedestrian Transportation (DBPT) and the Transportation Planning Branch (TPB) sponsor this grant. Calls for proposals open annually in the fall. For municipalities with population less than 10,000, NCDOT provides 80% of the funding and the local municipality provides 20% of the funding. The program has granted funds for over 100 communities since its inception in 2004 and a total of approximately $2.5 million.

NCDOT Bicycle and Pedestrian Projects: Funds for bicycle and pedestrian projects come from several different sources. Allocation of funds depends on the type of project/program and other criteria. Projects can include independent and incidental projects.

NCDOT Powell Bill Funds: Annually, State street-aid (Powell Bill) allocations are made to incorporated municipalities which establish their eligibility and qualify as provided by G.S. 136-41.1 through 136-41.4. Powell Bill funds shall be expended only for the purposes of maintaining, repairing, constructing, reconstructing or widening of local streets that are the responsibility of the municipalities or for planning, construction, and maintenance of bikeways or sidewalks along public streets and highways.

General Maintenance Funding: Although funding is currently very tight with NCDOT, there are some potential upgrades that could be done with general maintenance funding. For example, crosswalk markings could be updated when faded. Resurfacing monies are also available for pavement preservation on State routes.

NCDOT Small Construction Funds: Each Board of Transportation Member receives approximately $0.5 million a year to spend on transportation projects in their area. Requests are received from municipalities, counties, businesses, schools, industrial entities and DOT staff. The maximum amount per request per fiscal year is $250,000. Right of way should be provided at no cost to NCDOT. The local town government is required to provide utility relocation. Work must occur on state right of way. Eligible types of work that would benefit pedestrian and bicycle programs include widening shoulders, installing traffic flashers to alert drivers (i.e. school, truck turnout, pedestrian crossing), and installing pedestrian signals.

NCDOT Contract Resurfacing: Each year every Division is provided an allocation of funds for the preservation of the state paved road network. In accordance with current legislation, up to 15% of the funds may be used for widening existing narrow pavements, which may provide additional space for bicycle facilities or a wide-paved shoulder for pedestrian use in very rural areas.

Economic Development Funds: This fund was enacted by the General Assembly in 2005 and has been funded each year prior to Fiscal Year 2008/09; however, no funding has been approved since that time. The 2007/08 allocation was $1 million per Division. Projects funded from this source should contribute to further economic growth and development by attracting new businesses and industries or expanding existing businesses and industries that increase employment opportunity. Funds not needed for economic development projects shall be used on spot safety needs. These funds are controlled by the Board Member and the Division.

NCDOT Division Funds: Pedestrian Enhancements - Each Division typically receives $100,000 per year to be used for pedestrian enhancements. These funds are administered by the Division Engineer.

Safe Routes to School (SRTS) Enhancements – To date, each of the 14 Divisions has been allocated $430,000 for eligible projects.

NC Department Of Environment – Recreational Trails And Adopt-A-Trail Grants

The State Trails Program is a section of the N.C. Division of Parks and Recreation. The program originated in 1973 with the North Carolina Trails System Act and is dedicated to helping citizens, organizations and agencies plan, develop and manage all types of trails ranging from greenways and trails for hiking, biking and horseback riding to river trails and off-highway vehicle trails. The Recreation Trails Program awards grants up to $75,000 per project. The Adopt-A-Trail Program awards grants up to $5,000 per project.

N.C. Parks And Recreation Trust Fund (PARTF)

The Parks and Recreation Trust Fund (PARTF) provide dollar-for-dollar matching grants to local governments for parks and recreational projects to serve the general public. Counties, incorporated municipalities and public authorities, as defined by G.S. 159-7, are eligible applicants.

A local government can request a maximum of $500,000 with each application. An applicant must match the grant dollar-for-dollar, 50% of the total cost of the project, and may contribute more than 50%. The appraised value of land to be donated to the applicant can be used as part of the match. The value of in-kind services, such as volunteer work, cannot be used as part of the match. http://www.ncparks.gov/About/grants/partf_main.php

Community Development Block Grant Funds

Community Development Block Grant (CDBG) funds are available to local municipal or county governments for projects that enhance the viability of communities by providing decent housing and suitable living environments and by expanding economic opportunities, principally for persons of low- and moderate-income. State CDBG funds are provided by the U.S. Department of Housing and Urban Development (HUD) to the state of North Carolina. Some urban counties and cities in North Carolina receive CDBG funding directly from HUD. Each year, CDBG provides funding to local governments for hundreds of critically-needed community improvement projects throughout the state. These community improvement projects are administered by the Division of Community Assistance and the Commerce Finance Center under eight grant categories. Two categories might be of support to the SRTS Projects: infrastructure and community revitalization.

Department Of Energy (DOE)

The Department of Energy's Energy Efficiency and Conservation Block Grants (EECBG) grants may be used to reduce energy use and fossil fuel emissions and for improvements in energy efficiency. Section 7 of the funding announcement states that these grants provide opportunities for the development and implementation of transportation programs to conserve energy used in transportation including development of infrastructure such as bike lanes and pathways and pedestrian walkways. More information can be found at http://www.eecbg.energy.gov/

Land And Water Conservation Trust Fund

The Land and Water Conservation Fund (LWCF) has historically been a primary funding source of the US Department of the Interior for outdoor recreation development and land acquisition by local governments and state agencies. In North Carolina, the program is administered by the Department of Environment and Natural Resources.

B.2 LOCAL GOVERNMENT

Local funding sources that would support SRTS, bicycle, and pedestrian facility project construction will most likely be limited but should be explored.

Local Area Metropolitan Planning Organization (MPO)

The local MPO manages the transportation planning process required by Federal law. The MPO plans for the area's surface transportation needs, including highways, transit, bicycle, and pedestrian facilities. There are two subcommittees of the MPO: the Technical Advisory Committee and the Technical Coordinating Committee. An important part of the transportation planning process is to identify transportation needs and to explore feasible alternatives to meet those needs. Plans and programs are often conducted in partnership with the NC Department of Transportation to identify needs and projects to enhance the area's transportation infrastructure.

It is suggested that the SRTS group, school leaders, and Town staff work closely with the MPO on getting these projects listed on the Transportation Improvement Program (TIP) list since this may be the primary source of funding for the project. Typically, projects on this list require a 20% local match.

Local Government Capital Improvement Programming And Reserve Funds

Local government may have funding available to support some elements of construction or repair. It will be important to meet with local government representatives (Planner and Town Manager) to judge the availability of this funding.

Other Local Funding Options

- Bonds/Loans
- Taxes
- Impact fees
- Exactions
- Tax increment financing
- Partnerships

B.3 PRIVATE SECTOR

Many communities have solicited bicycle, pedestrian, and greenway funding assistance from private foundations and other conservation-minded benefactors. Below are several examples of private funding opportunities available. Additional local businesses and corporations should be considered as well.

Land For Tomorrow Campaign

Land for Tomorrow is a diverse partnership of businesses, conservationists, farmers, environmental groups, health professionals and community groups committed to securing support from the public and General Assembly for protecting land, water and historic places. The campaign is asking the North Carolina General Assembly to support issuance of a bond for $200 million a year for five years to preserve and protect its special land and water resources. Land for Tomorrow will enable North Carolina to reach a goal of ensuring that working farms and forests; sanctuaries for wildlife; land bordering streams, parks and greenways; land that helps strengthen communities and promotes job growth; historic downtowns and neighborhoods; and more, will be there to enhance the quality of life for generations to come. Website: http://www.landfortomorrow.org/

The Robert Wood Johnson Foundation

The Robert Wood Johnson Foundation was established as a national philanthropy in 1972, and today it is the largest U.S. foundation devoted to improving the health and health care of all Americans. Grant making is concentrated in four areas:

• To assure that all Americans have access to basic health care at a reasonable cost

• To improve care and support for people with chronic health conditions

• To promote healthy communities and lifestyles

• To reduce the personal, social and economic harm caused by substance abuse: tobacco, alcohol, and illicit drugs

For more specific information about what types of projects are funded and how to apply, visit http://www.rwjf.org/applications/.

North Carolina Community Foundation

The North Carolina Community Foundation, established in 1988, is a statewide foundation seeking gifts from individuals, corporations, and other foundations to build endowments and ensure financial security for nonprofit organizations and institutions throughout the state. Based in Raleigh, North Carolina, the foundation also manages a number of community affiliates throughout North Carolina, that make grants in the areas of human services, education, health, arts, religion, civic affairs, and the conservation and preservation of historical, cultural, and environmental resources. The foundation also manages various scholarship programs statewide. Web site: http://nccommunityfoundation.org/

Z. Smith Reynolds Foundation

This Winston-Salem-based Foundation has been assisting the environmental projects of local governments and non-profits in North Carolina for many years. They have two grant cycles per year and generally do not fund land acquisition. However, they may be able to offer support in other areas of open space and greenways development. More information is available at www.zsr.org.

Bank of America Charitable Foundation, Inc.

The Bank of America Charitable Foundation is one of the largest in the nation. The primary grants program is called Neighborhood Excellence, which seeks to identify critical issues in local communities. Another program that applies to greenways is the Community Development Programs, and specifically the Program Related Investments. This program targets low and moderate income communities and serves to encourage entrepreneurial business development. Visit the web site for more information: www.bankofamerica.com/foundation.

Duke Energy Foundation

Funded by Duke Energy shareholders, this non-profit organization makes charitable grants to selected non-profits or governmental subdivisions. Each annual grant must have:

• An internal Duke Energy business “sponsor”

• A clear business reason for making the contribution

The grant program has three focus areas: Environment and Energy Efficiency, Economic Development, and Community Vitality. Related to this project, the Foundation would support programs that support conservation, training and research around environmental and energy efficiency initiatives. Web site: http://www.duke-energy.com/community/foundation.asp.

American Greenways Eastman Kodak Awards

The Conservation Fund's American Greenways Program has teamed with the Eastman Kodak Corporation and the National Geographic Society to award small grants ($250 to $2,000) to stimulate the planning, design and development of greenways. These grants can be used for activities such as mapping, conducting ecological assessments, surveying land, holding conferences, developing brochures, producing interpretive displays, incorporating land trusts, and building trails. Grants cannot be used for academic research, institutional support, lobbying or political activities. For more information visit The Conservation Fund's website at: www.conservationfund.org.

National Trails Fund

American Hiking Society created the National Trails Fund in 1998, the only privately supported national grants program providing funding to grassroots organizations working toward establishing, protecting and maintaining foot trails in America. 73 million people enjoy foot trails annually, yet many of our favorite trails need major repairs due to a $200 million backlog of badly needed maintenance. National Trails Fund grants help give local organizations the resources they need to secure access, volunteers, tools and materials to protect America's cherished public trails. To date, American Hiking has granted more than $240,000 to 56 different trail projects across the U.S. for land acquisition, constituency building campaigns, and traditional trail work projects. Awards range from $500 to $10,000 per project.

Projects the American Hiking Society will consider include:

• Securing trail lands, including acquisition of trails and trail corridors, and the costs associated with acquiring conservation easements.

• Building and maintaining trails which will result in visible and substantial ease of access, improved hiker safety, and/or avoidance of environmental damage.

• Constituency building surrounding specific trail projects - including volunteer recruitment and support.
Web site: www.americanhiking.org/alliance/fund.html.

The Conservation Alliance

The Conservation Alliance is a non-profit organization of outdoor businesses whose collective annual membership dues support grassroots citizen-action groups and their efforts to protect wild and natural areas. One hundred percent of its member companies' dues go directly to diverse, local community groups across the nation - groups like Southern Utah Wilderness Alliance, Alliance for the Wild Rockies, The Greater Yellowstone Coalition, the South Yuba River Citizens' League, RESTORE: The North Woods and the Sinkyone Wilderness Council (a Native American-owned/operated wilderness park). For these groups, who seek to protect the last great wild lands and waterways from resource extraction and commercial development, the Alliance's grants are substantial in size (about $35,000 each), and have often made the difference between success and defeat. Since its inception in 1989, The Conservation Alliance has contributed $4,775,059 to grassroots environmental groups across the nation, and its member companies are proud of the results: To date the groups funded have saved over 34 million acres of wild lands and 14 dams have been either prevented or removed-all through grassroots community efforts.

The Conservation Alliance is a unique funding source for grassroots environmental groups. It is the only environmental grant maker whose funds come from a potent yet largely untapped constituency for protection of ecosystems - the non-motorized outdoor recreation industry and its customers. This industry has great incentive to protect the places in which people use the clothing, hiking boots, tents and backpacks it sells. The industry is also uniquely positioned to educate outdoor enthusiasts about threats to wild places, and engage them to take action. Finally, when it comes to decision-makers - especially those in the Forest Service, National Park Service, and Bureau of Land Management, this industry has clout - an important tool that small advocacy groups can wield.

The Conservation Alliance Funding Criteria: The Project should be focused primarily on direct citizen action to protect and enhance our natural resources for recreation. We're not looking for mainstream education or scientific research projects, but rather for active campaigns. All projects should be quantifiable, with specific goals, objectives and action plans and should include a measure for evaluating success. The project should have a good chance for closure or significant measurable results over a fairly short term (one to two years). Funding emphasis may not be on general operating expenses or staff payroll.

Web site: www.conservationalliance.com/index.m.
E-mail: john@conservationalliance.com.

National Fish And Wildlife Foundation (NFWF)

The National Fish and Wildlife Foundation (NFWF) is a private, nonprofit, tax-exempt organization chartered by Congress in 1984. The National Fish and Wildlife Foundation sustains, restores, and enhances the Nation's fish, wildlife, plants and habitats. Through leadership conservation investments with public and private partners, the Foundation is dedicated to achieving maximum conservation impact by developing and applying best practices and innovative methods for measurable outcomes.

The Foundation awards matching grants under its Keystone Initiatives to achieve measurable outcomes in the conservation of fish, wildlife, plants and the habitats on which they depend. Awards are made on a competitive basis to eligible grant recipients, including federal, tribal, state, and local governments, educational institutions, and non-profit conservation organizations. Project proposals are received on a year-round, revolving basis with two decision cycles per year. Grants generally range from $50,000-$300,000 and typically require a minimum 2:1 non-federal match.

Funding priorities include bird, fish, marine/coastal, and wildlife and habitat conservation. Other projects that are considered include controlling invasive species, enhancing delivery of ecosystem services in agricultural systems, minimizing the impact on wildlife of emerging energy sources, and developing future conservation leaders and professionals. Website: http://www.nfwf.org/AM/Template.cfm?Section=Grants where additional grant programs are described.

The Trust For Public Land

Land conservation is central to the mission of the Trust for Public Land (TPL). Founded in 1972, the Trust for Public Land is the only national nonprofit working exclusively to protect land for human enjoyment and well being. TPL helps conserve land for recreation and spiritual nourishment and to improve the health and quality of life of American communities. TPL's legal and real estate specialists work with landowners, government agencies, and community groups to:

• Create urban parks, gardens, greenways, and riverways

• Build livable communities by setting aside open space in the path of growth

• Conserve land for watershed protection, scenic beauty, and close-to home recreation safeguard the character of communities by preserving historic landmarks and landscapes.

The following are TPL's Conservation Services:

• Conservation Vision: TPL helps agencies and communities define conservation priorities, identify lands to be protected, and plan networks of conserved land that meet public need.

• Conservation Finance: TPL helps agencies and communities identify and raise funds for conservation from federal, state, local, and philanthropic sources.

• Conservation Transactions: TPL helps structure, negotiate, and complete land transactions that create parks, playgrounds, and protected natural areas.

• Research and Education: TPL acquires and shares knowledge of conservation issues and techniques to improve the practice of conservation and promote its public benefits.

Since 1972, TPL has worked with willing landowners, community groups, and national, state, and local agencies to complete more than 3,000 land conservation projects in 46 states, protecting more than 2 million acres. Since 1994, TPL has helped states and communities craft and pass over 330 ballot measures, generating almost $25 billion in new conservation-related funding. For more information, visit http://www.tpl.org/.

Blue Cross Blue Shield Of North Carolina Foundation (BCBS)

Blue Cross Blue Shield (BCBS) focuses on programs that use an outcome approach to improve the health and well-being of residents. The Health of Vulnerable Populations grants program focuses on improving health outcomes for at-risk populations. The Healthy Active Communities grant concentrates on increased physical activity and healthy eating habits. Eligible grant applicants must be located in North Carolina, be able to provide recent tax forms and, depending on the size of the nonprofit, provide an audit.

Blue Cross Blue Shield of NC Foundation
P.O Box 2291
Durham, NC 27702
919-765-7347
http://www.bcbsncfoundation.org/

Local Trail Sponsors

A sponsorship program for trail amenities allows smaller donations to be received from both individuals and businesses. Cash donations could be placed into a trust fund to be accessed for certain construction or acquisition projects associated with the greenways and open space system. Some recognition of the donors is appropriate and can be accomplished through the placement of a plaque, the naming of a trail segment, and/or special recognition at an opening ceremony. Types of gifts other than cash could include donations of services, equipment, labor, or reduced costs for supplies.

Volunteer Work

It is expected that many citizens will be excited about the development of SRTS improvements, including trail corridors. Individual volunteers from the community can be brought together with groups of volunteers form church groups, civic groups, scout troops and environmental groups to work on greenway development on special community workdays. Volunteers can also be used for fund-raising, maintenance, and programming needs.

C FEDERAL/STATE POLICIES



Chapter Outline:

C.0 Overview C.1 USDOT Bicycle & Pedestrian Policy C.2 2010 USDOT Policy Statement C.3 FHWA Memorandum C.4 NCDOT Complete Streets Policy C.5 NCDOT Board of Transportation Resolution C.6 NCDOT Administrative Action (Greenways) C.7 Guidelines for NCDOT (Greenways) C.8 NCDOT Pedestrian Policy Guidelines C.9 NCDOT Pedestrian Planning Resources

C.0 OVERVIEW

A number of federal and state pedestrian policies have been developed in recent years. This appendix covers a number of these policies that are intended to better integrate walking and bicycling into transportation infrastructure.

C.1 UNITED STATES DEPARTMENT OF TRANSPORTATION BICYCLE AND PEDESTRIAN POLICY (MARCH 2010)

A United States Department of Transportation (USDOT) policy statement regarding the integration of bicycling and walking into transportation infrastructure recommends that, "bicycling and walking facilities will be incorporated into all transportation projects" unless exceptional circumstances exist. The Policy Statement was drafted by the USDOT in response to Section 1202 (b) of the Transportation Equity Act for the 21st Century (TEA-21) with the input and assistance of public agencies, professional associations and advocacy groups. USDOT hopes that public agencies, professional associations, advocacy groups, and others adopt this approach as a way of committing themselves to integrating bicycling and walking into the transportation mainstream. The full statement reads as follows, with some minor adjustments for applicability in the City of Marion/McDowell County:

1. Bicycle and pedestrian ways shall be established in new construction and reconstruction projects in all urbanized areas unless one or more of three conditions are met:

- Bicyclists and pedestrians are prohibited by law from using the roadway. In this instance, a greater effort may be necessary to accommodate bicyclists and pedestrians elsewhere within the right of way or within the same transportation corridor.

- The cost of establishing bikeways or walkways would be excessively disproportionate to the need or probable use. Excessively disproportionate is defined as exceeding 20% of the cost of the larger transportation project.

- Where sparsity of population or other factors indicate an absence of need. For example, on low volume, low speed residential streets, or streets with severe topographic or natural resource constraints.

2. In rural areas, paved shoulders should be included in all new construction and reconstruction projects on roadways used by more than 1,000 vehicles per day. Paved shoulders have safety and operational advantages for all road users in addition to providing a place for bicyclists and pedestrians to operate. Rumble strips are not recommended where shoulders are used by bicyclists unless there is a minimum clear path of four feet in which a bicycle may safely operate.

3. Sidewalks, shared use paths, street crossings (including over- and undercrossings), pedestrian signals, signs, street furniture, transit stops and facilities, and all connecting pathways shall be designed, constructed, operated and maintained so that all pedestrians, including people with disabilities, can travel safely and independently.

4. The design and development of the transportation infrastructure shall improve conditions for bicycling and walking through the following additional steps:

- Planning projects for the long-term. Transportation facilities are long-term investments that remain in place for many years. The design and construction of new facilities that meet the criteria in item above should anticipate likely future demand for bicycling and walking facilities and not preclude the provision of future improvements. For example, a bridge that is likely to remain in place for 50 years, might be built with sufficient width for safe bicycle and pedestrian use in anticipation that facilities will be available at either end of the bridge even if that is not currently the case.

- Addressing the need for bicyclists and pedestrians to cross corridors as well as travel along them. Even where bicyclists and pedestrians may not commonly use a particular travel corridor that is being improved or constructed, they will likely need to be able to cross that corridor safely and conveniently. Therefore, the design of intersections and interchanges shall accommodate bicyclists and pedestrians in a manner that is safe, accessible and convenient.

- Getting exceptions approved at a senior level. Exceptions for the non-inclusion of bikeways and walkways shall be approved by a senior manager and be documented with supporting data that indicates the basis for the decision.

- Designing facilities to the best currently available standards and guidelines. The design of facilities for bicyclists and pedestrians should follow design guidelines and standards that are commonly used, such as the AASHTO Guide for the Development of Bicycle Facilities, AASHTO's A Policy on Geometric Design of Highways and Streets, and the ITE Recommended Practice "Design and Safety of Pedestrian Facilities. (Many of these guidelines are summarized in Chapter 4: Bicycle Facility Standards)

(Retrieved from http://www.fhwa.dot.gov/environment/bikeped/design.htm on 5/6/2008)

C.2 UNITED STATES DEPARTMENT OF TRANSPORTATION POLICY STATEMENT ON BICYCLE AND PEDESTRIAN ACCOMMODATION REGULATIONS AND RECOMMENDATIONS (MARCH 2010)

Purpose

The United States Department of Transportation (USDOT) is providing this Policy Statement to reflect the Department's support for the development of fully integrated active transportation networks. The establishment of well-connected walking and bicycling networks is an important component for livable communities, and their design should be a part of Federal-aid project developments. Walking and bicycling foster safer, more livable, family-friendly communities; promote physical activity and health; and reduce vehicle emissions and fuel use. Legislation and regulations exist that require inclusion of bicycle and pedestrian policies and projects into transportation plans and project development. Accordingly, transportation agencies should plan, fund, and implement improvements to their walking and bicycling networks, including linkages to transit. In addition, DOT encourages transportation agencies to go beyond the minimum requirements, and proactively provide convenient, safe, and context-sensitive facilities that foster increased use by bicyclists and pedestrians of all ages and abilities, and utilize universal design characteristics when appropriate. Transportation programs and facilities should accommodate people of all ages and abilities, including people too young to drive, people who cannot drive, and people who choose not to drive.

Policy Statement

The DOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems. Because of the numerous individual and community benefits that walking and bicycling provide — including health, safety, environmental, transportation, and quality of life — transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes.

Authority

This policy is based on various sections in the United States Code (U.S.C.) and the Code of Federal Regulations (CFR) in Title 23—Highways, Title 49—Transportation, and Title 42—The Public Health and Welfare. These sections, provided in the Appendix, describe how bicyclists and pedestrians of all abilities should be involved throughout the planning process, should not be adversely affected by other transportation projects, and should be able to track annual obligations and expenditures on nonmotorized transportation facilities.

Recommended Actions

The DOT encourages States, local governments, professional associations, community organizations, public transportation agencies, and other government agencies, to adopt similar policy statements on bicycle and pedestrian accommodation as an indication of their commitment to accommodating bicyclists and pedestrians as an integral element of the transportation system. In support of this commitment, transportation agencies and local communities should go beyond minimum design standards and requirements to create safe, attractive, sustainable, accessible, and convenient bicycling and walking networks. Such actions should include:

- Considering walking and bicycling as equals with other transportation modes: The primary goal of a transportation system is to safely and efficiently move people and goods. Walking and bicycling are efficient transportation modes for most short trips and, where convenient intermodal systems exist, these nonmotorized trips can easily be linked with transit to significantly increase trip distance. Because of the benefits they provide, transportation agencies should give the same priority to walking and bicycling as is given to other transportation modes. Walking and bicycling should not be an afterthought in roadway design.

- Ensuring that there are transportation choices for people of all ages and abilities, especially children: Pedestrian and bicycle facilities should meet accessibility requirements and provide safe, convenient, and interconnected transportation networks. For example, children should have safe and convenient options for walking or bicycling to school and parks. People who cannot or prefer not to drive should have safe and efficient transportation choices.

- Going beyond minimum design standards: Transportation agencies are encouraged, when possible, to avoid designing walking and bicycling facilities to the minimum standards. For example, shared-use paths that have been designed to minimum width requirements will need retrofits as more people use them. It is more effective to plan for increased usage than to retrofit an older facility. Planning projects for the long-term should anticipate likely future demand for bicycling and walking facilities and not preclude the provision of future improvements.

- Integrating bicycle and pedestrian accommodation on new, rehabilitated, and limited-access bridges: DOT encourages bicycle and pedestrian accommodation on bridge projects including facilities on limited-access bridges with connections to streets or paths.

- Collecting data on walking and bicycling trips: The best way to improve transportation networks for any mode is to collect and analyze trip data to optimize investments. Walking and bicycling trip data for many communities are lacking. This data gap can be overcome by establishing routine collection of nonmotorized trip information. Communities that routinely collect walking and bicycling data are able to track trends and prioritize investments to ensure the success of new facilities. These data are also valuable in linking walking and bicycling with transit.
- Setting mode share targets for walking and bicycling and tracking them over time: A byproduct of improved data collection is that communities can establish targets for increasing the percentage of trips made by walking and bicycling.
- Removing snow from sidewalks and shared-use paths: Current maintenance provisions require pedestrian facilities built with Federal funds to be maintained in the same manner as other roadway assets. State Agencies have generally established levels of service on various routes especially as related to snow and ice events.
- Improving nonmotorized facilities during maintenance projects: Many transportation agencies spend most of their transportation funding on maintenance rather than on constructing new facilities. Transportation agencies should find ways to make facility improvements for pedestrians and bicyclists during resurfacing and other maintenance projects.

Conclusion

Increased commitment to and investment in bicycle facilities and walking networks can help meet goals for cleaner, healthier air; less congested roadways; and more livable, safe, cost-efficient communities. Walking and bicycling provide low-cost mobility options that place fewer demands on local roads and highways. DOT recognizes that safe and convenient walking and bicycling facilities may look different depending on the context — appropriate facilities in a rural community may be different from a dense, urban area. However, regardless of regional, climate, and population density differences, it is important that pedestrian and bicycle facilities be integrated into transportation systems. While DOT leads the effort to provide safe and convenient accommodations for pedestrians and bicyclists, success will ultimately depend on transportation agencies across the country embracing and implementing this policy.

Ray LaHood, United States Secretary of Transportation
http://www.fhwa.dot.gov/environment/bikeped/policy_accom.htm

C.3 FHWA MEMORANDUM ON MAINSTREAMING BICYCLE AND PEDESTRIAN PROJECTS

(See pages C-5 through C-7)

U.S. Department of Transportation Federal Highway Administration

Memorandum

Subject: ACTION: Transmittal of Guidance on Bicycle and Pedestrian Provisions of the Federal-aid Program

Date: February 24, 1999

From: Kenneth R. Wykle
Federal Highway Administrator

In reply, refer to: HEPH-30

To:
Division Administrators
Federal Lands Highway Division Engineers

This memorandum transmits the Federal Highway Administration's (FHWA) Guidance on the Bicycle and Pedestrian Provisions of the Federal-aid Program and reaffirms our strong commitment to improving conditions for bicycling and walking. The nonmotorized modes are an integral part of the mission of FHWA and a critical element of the local, regional, and national transportation system. Bicycle and pedestrian projects and programs are eligible for but not guaranteed funding from almost all of the major Federal-aid funding programs. We expect every transportation agency to make accommodation for bicycling and walking a routine part of their planning, design, construction, operations and maintenance activities.

The Transportation Equity Act for the 21st Century (TEA-21) continues the call for the mainstreaming of bicycle and pedestrian projects into the planning, design, and operation of our Nation's transportation system. Under the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), Federal spending on bicycle and pedestrian improvements increased from $4 million annually to an average of $160 million annually. Nevertheless, the level of commitment to addressing the needs of bicyclists and pedestrians varies greatly from State to State.

The attached guidance explains how bicycle and pedestrian improvements can be routinely included in federally funded transportation projects and programs. I would ask each division office to pass along this guidance to the State DOT and to meet with them to discuss ways of expediting the implementation of bicycle and pedestrian projects. With the guidance as a basis for action, States can then decide the most appropriate ways of mainstreaming the inclusion of bicycle and pedestrian projects and programs.

Bicycling and walking contribute to many of the goals for our transportation system we have at FHWA and at the State and local levels. Increasing bicycling and walking offers the potential for cleaner air, healthier people, reduced congestion, more liveable communities, and more efficient use of precious road space and resources. That is why funds in programs such as Congestion Mitigation and Air Quality Improvement, Transportation Enhancements, and the National Highway System, are eligible to be used for bicycling and

walking improvements that will encourage use of the two modes.

We also have a responsibility to improve the safety of bicycling and walking as the two modes represent more than 14 percent of the 41,000 traffic fatalities the nation endures each year. Pedestrian and bicycle safety is one of FHWA's top priorities and this is reflected in our 1999 Safety Action Plan. As the attached guidance details, TEA-21 has opened up the Hazard Elimination Program to a broader array of bicycle, pedestrian, and traffic calming projects that will improve dangerous locations. The legislation also continues funding for critical safety education and enforcement activities under the leadership of the National Highway Traffic Safety Administration. If we are successful in improving the real and perceived safety of bicyclists and pedestrians, we will also increase use.

You will see from the attached guidance that the Federal-aid Program, as amended by TEA-21, offers an extraordinary range of opportunities to improve conditions for bicycling and walking. Initiatives such as the Transportation and Community and System Preservation Pilot Program and the Access to Jobs program offer exciting new avenues to explore.

Bicycling and walking ought to be accommodated, as an element of good planning, design, and operation, in all new transportation projects unless there are substantial safety or cost reasons for not doing so. Later this year (1999), FHWA will issue design guidance language on approaches to accommodating bicycling and pedestrian travel that will, with the cooperation of AASHTO, ITE, and other interested parties, spell out ways to build bicycle and pedestrian facilities into the fabric of our transportation infrastructure from the outset. We can no longer afford to treat the two modes as an afterthought or luxury.

The TEA-21 makes a great deal possible. However, in the area of bicycling and walking in particular, we must work hard to ensure good intentions and fine policies translate quickly and directly into better conditions for bicycling and walking. While FHWA has limited ability to mandate specific outcomes, I am committed to ensuring that we provide national leadership in three critical areas.

- The FHWA will encourage the development and implementation of bicycle and pedestrian plans as part of the overall transportation planning process. Every statewide and metropolitan transportation plan should address bicycling and walking as an integral part of the overall system, either through the development of a separate bicycle and pedestrian element or by incorporating bicycling and walking provisions throughout the plan. Further, I am instructing each FHWA division office to closely monitor the progress of projects from the long-range transportation plans to the STIPs and TIPs. In the coming months, FHWA will disseminate exemplary projects, programs, and plans, and we will conduct evaluations in selected States and MPOs to determine the effectiveness of the planning process.

- The FHWA will promote the availability and use of the full range of streamlining mechanisms to increase project delivery. The tools are in place for States and local government agencies to speed up the delivery of bicycle and pedestrian projects - it makes no sense to treat installation of a bicycle rack or curb cut the same way we treat a new Interstate highway project - and our division offices must take a lead in promoting and administering these procedures.

- The FHWA will help coordinate the efforts of Federal, State, metropolitan, and other relevant agencies to improve conditions for bicycling and walking. Once again, our division offices must ensure that those involved in implementing bicycle and pedestrian projects at the State and local level are given maximum opportunity to get their job done, unimpeded by regulations and red tape from the Federal level. I am asking each of our division offices to facilitate a dialogue among each State's bicycle and pedestrian coordinator, Transportation Enhancements program manager, Recreational Trails Program administrator, and their local and FHWA counterparts to identify and remove obstacles to the implementation of bicycle and pedestrian projects and programs.

In less than a decade, bicycling and walking have gone from being described by my predecessor Tom Larson as "the forgotten modes" to becoming a serious part of our national transportation system. The growing acceptance of bicycling and walking as modes to be included as part of the transportation mainstream started with passage of ISTEA in 1991 and was given a considerable boost by the Congressionally-mandated National Bicycling and Walking Study. That study, released in 1994, challenges the U.S. Department of Transportation to double the percentage of trips made by foot and bicycle while simultaneously reducing fatalities and injuries suffered by these modes by 10 percent - and we remain committed to achieving these goals.

The impetus of ISTEA and the National Bicycling and Walking Study is clearly reinforced by the bicycle and pedestrian provisions of the TEA-21. The legislation confirms the vital role bicycling and walking must play in creating a balanced, accessible, and safe transportation system for all Americans.

FHWA Guidance (1999) - Bicycle and Pedestrian Provisions of Federal Transportation Legislation

To provide Feedback, Suggestions, or Comments for this page contact Gabe Rousseau at gabe.rousseau@dot.gov.

C.4 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION COMPLETE STREETS POLICY

In 2009, NCDOT unveiled its efforts to routinely provide for all users of the roads - pedestrians, bicyclists, public transportation users, and motorists of all ages and abilities. The new document:

• Explains the scope and applicability of the policy ("all transportation facilities within a growth area of a town or city funded by or through NCDOT, and planned, designed, or constructed on state maintained facilities, must adhere to this policy");

• Asserts the Department's role as a partner to local communities in transportation projects;

• Addresses the need for context-sensitivity;

• Sets exceptions (where specific travelers are prohibited and where there is a lack of current or future need) and a clear process for granting them (approval by the Chief Deputy Secretary); and

• Establishes a stakeholders group, including transportation professionals and interest groups, tasked to create comprehensive planning and design guidelines in support of the policy.

In 2012, NCDOT released its first version of the Complete Streets Design Guidelines as a follow-up to the Complete Streets Policy. These Design Guidelines should be consulted with the design guidelines of this plan (Appendix D).

Visit www.ncdot.gov for the full policy document: http://www.ncdot.org/doh/preconstruct/highway/roadway/policymemos/Design%5CCompleteStreetsPolicy.pdf. Visit http://www.nccompletestreets.org/ for the 2012 Complete Streets Guidelines.

C.5 NCDOT BOARD OF TRANSPORTATION RESOLUTION: BICYCLING AND WALKING IN NORTH CAROLINA: A CRITICAL PART OF THE TRANSPORTATION SYSTEM

(ADOPTED BY THE BOARD OF TRANSPORTATION ON SEPTEMBER 8, 2000)

The North Carolina Board of Transportation strongly reaffirms its commitment to improving conditions for bicycling and walking, and recognizes nonmotorized modes of transportation as critical elements of the local, regional, and national transportation system.

WHEREAS, increasing bicycling and walking offers the potential for cleaner air, healthier people, reduced congestion, more liveable communities, and more efficient use of road space and resources; and

WHEREAS, crashes involving bicyclists and pedestrians represent more than 14 percent of the nation's traffic fatalities; and

WHEREAS, the Federal Highway Administration (FHWA) in its policy statement "Guidance on the Bicycle and Pedestrian Provisions of the Federal-Aid Program" urges states to include bicycle and pedestrian accommodations in its programmed highway projects; and

WHEREAS, bicycle and pedestrian projects and programs are eligible for funding from almost all of the major Federal-aid funding programs; and

WHEREAS, the Transportation Equity Act for the 21st Century (TEA-21) calls for the mainstreaming of bicycle and pedestrian projects into the planning, design and operation of our Nation's transportation system;

NOW, THEREFORE, BE IT RESOLVED, the North Carolina Board of Transportation concurs that bicycling and walking accommodations shall be a routine part of the North Carolina Department of Transportation's planning, design, construction, and operations activities and supports the Department's study and consideration of meth-

ods of improving the inclusion of these modes into the everyday operations of North Carolina's transportation system; and

BE IT FURTHER RESOLVED, North Carolina cities and towns are encouraged to make bicycling and pedestrian improvements an integral part of their transportation planning and programming.

C.6 NCDOT ADMINISTRATIVE ACTION TO INCLUDE LOCAL ADOPTED GREENWAYS PLANS IN THE NCDOT HIGHWAY PLANNING PROCESS

(ADOPTED JANUARY 1994)

In 1994 the NCDOT adopted administrative guidelines to consider greenways and greenway crossings during the highway planning process. This policy was incorporated so that critical corridors which have been adopted by localities for future greenways will not be severed by highway construction. Following are the text for the Greenway Policy and Guidelines for implementing it.

In concurrence with the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 and the Board of Transportation's Bicycle Policy of 1978 (updated in 1991) and Pedestrian Policy of 1993, the North Carolina Department of Transportation recognizes the importance of incorporating local greenways plans into its planning process for the development and improvement of highways throughout North Carolina.

NCDOT Responsibilities: The Department will incorporate locally adopted plans for greenways into the ongoing planning processes within the Statewide Planning (thoroughfare plans) and the Planning and Environmental (project plans) Branches of the Division of Highways. This incorporation of greenway plans will be consistent throughout the department. Consideration will be given to including the greenway access as a part of the highway improvement.

Where possible, within the policies of the Department, within the guidelines set forth in provisions for greenway crossings, or other greenway elements, will be made as a part of the highway project or undertaken as an allowable local expenditure.

Local Responsibilities: Localities must show the same commitment to building their adopted greenway plans as they are requesting when they ask the state to commit to providing for a certain segment of that plan. It is the responsibility of each locality to notify the Department of greenway planning activity and adopted greenway plans and to update the Department with all adopted additions and changes in existing plans.

It is also the responsibility of each locality to consider the adopted transportation plan in their greenways planning and include its adopted greenways planning activities within their local transportation planning process. Localities should place in priority their greenways construction activities and justify the transportation nature of each greenway segment. When there are several planned greenway crossings of a proposed highway improvement, the locality must provide justification of each and place the list of crossings in priority order. Where crossings are planned, transportation rights of way should be designated or acquired separately to avoid jeopardizing the future transportation improvements.

C.7 GUIDELINES FOR NCDOT TO COMPLY WITH ADMINISTRATIVE DECISION TO INCORPORATE LOCAL GREENWAYS INTO HIGHWAY PLANNING PROCESS

• Thoroughfare plans will address the existence of greenways planning activity, which has been submitted by local areas. Documentation of mutually agreed upon interface points between the thoroughfare plan and a greenway plan will be kept, and this information will become a part of project files.

• Project Planning Reports will address the existence of locally adopted greenways segment plans, which may affect the corridor being planned for a highway improvement. It is, however, the responsibility of the locality to

notify the Department of the adopted greenways plans (or changes to its previous plans) through its current local transportation plan, as well as its implementation programs.

• Where local greenways plans have not been formally adopted or certain portions of the greenways plans have not been adopted, the Department may note this greenway planning activity but is not required to incorporate this information into its planning reports.

• Where the locality has included adopted greenways plans as a part of its local transportation plan and a segment (or segments) of these greenways fall within the corridor of new highway construction or a highway improvement project, the feasibility study and/or project planning report for this highway improvement will consider the effects of the proposed highway improvement upon the greenway in the same manner as it considers other planning characteristics of the project corridor, such as archeological features or land use.

• Where the locality has justified the transportation versus the leisure use importance of a greenway segment and there is no greenway alternative of equal importance nearby, the project planning report will suggest inclusion of the greenway crossing, or appropriate greenway element, as an incidental part of the highway expenditure.

• Where the locality has not justified the transportation importance of a greenway segment, the greenway crossing, or appropriate greenway element, may be included as a part of the highway improvement plan if the local government covers the cost.

• A locality may add any appropriate/acceptable greenway crossing or greenway element at their own expense to any highway improvement project as long as it meets the design standards of the NCDOT.

• The NCDOT will consider funding for greenway crossings, and other appropriate greenway elements only if the localities guarantee the construction of and/or connection with other greenway segments. This guarantee should be in the form of inclusion in the local capital improvements program or NCDOT/municipal agreement.

• If the state pays for the construction of a greenway incidental to a highway improvement and the locality either removes the connecting greenway segments from its adopted greenways plans or decides not to construct its agreed upon greenway segment, the locality will reimburse the state for the cost of the greenway incidental feature. These details will be handled through a municipal agreement.

• Locality must accept maintenance responsibilities for state-built greenways, or portions thereof. Details will be handled through a municipal agreement.

C.8 NCDOT PEDESTRIAN POLICY GUIDELINES

(See pages C-11 through C-12)

C.9 NCDOT ONLINE PEDESTRIAN PLANNING AND DESIGN RESOURCES LIST

(See pages C-13 through C-14)

DEPARTMENT OF TRANSPORTATION
PEDESTRIAN POLICY GUIDELINES
EFFECTIVE OCTOBER 1, 2000

These guidelines provide an updated procedure for implementing the Pedestrian Policy adopted by the Board of Transportation August 1993 and the Board of Transportation Resolution September 8, 2000. The resolution reaffirms the Department's commitment to improving conditions for bicycling and walking, and recognizes non-motorized modes of transportation as critical elements of the local, regional, and national transportation system. The resolution encourages North Carolina cities and towns to make bicycling and pedestrian improvements an integral part of their transportation planning and programming.

REQUIREMENTS FOR DOT FUNDING:

REPLACEMENT OF EXISTING SIDEWALKS:

The Department will pay 100% of the cost to replace an existing sidewalk that is removed to facilitate the widening of a road.

TIP INCIDENTAL PROJECTS:

DEFINED: Incidental pedestrian projects are defined as TIP projects where pedestrian facilities are included as part of the roadway project.

REQUIREMENTS:

1. The municipality and/or county notifies the Department in writing of its desire for the Department to incorporate pedestrian facilities into project planning and design. Notification states the party's commitment to participate in the cost of the facility as well as being responsible for all maintenance and liability. Responsibilities are defined by agreement. Execution is required prior to contract let.

   The municipality is responsible for evaluating the need for the facility (ie: generators, safety, continuity, integration, existing or projected traffic) and public involvement.

2. Written notification must be received by the **Project Final Field Inspection (FFI) date**. Notification should be sent to the Deputy Highway Administrator - Preconstruction with a copy to the Project Engineer and the Agreements Section of the Program Development Branch. Requests received after the project FFI date will be incorporated into the TIP project, if feasible, and only if the requesting party commits by agreement to pay 100% of the cost of the facility.

3. The Department will review the feasibility of including the facility in our project and will try to accommodate all requests where the Department has acquired appropriate right of way on curb and gutter sections and the facility can be installed in the current project berm width. The standard project section is a 10-ft berm (3.0-meter) that accommodates a 5-ft sidewalk. In accordance with

AASHTO standards, the Department will construct 5-ft sidewalks with wheelchair ramps. Betterment cost (ie: decorative pavers) will be a Municipal responsibility.

4. If the facility is not contained within the project berm width, the Municipality is responsible for providing the right of way and/or construction easements as well as utility relocations, at no cost to the Department. This provision is applicable to all pedestrian facilities including multi-use trails and greenways.

5. A cost sharing approach is used to demonstrate the Department's and the municipality's/county's commitment to pedestrian transportation (sidewalks, multi-use trails and greenways). The matching share is a sliding scale based on population as follows:

MUNICIPAL POPULATION	DOT PARTICIPATION	LOCAL PARTICIPATION
> 100,000	50%	50%
50,000 to 100,000	60%	40%
10,000 to 50,000	70%	30%
< 10,000	80%	20%

Note: The cost of bridges will not be included in the shared cost of the pedestrian installation if the Department is funding the installation under provision 6 - pedestrian facilities on bridges.

6. For bridges on streets with curb and gutter approaches, the Department will fund and construct sidewalks on both sides of the bridge facility if the bridge is less than 200 feet in length. If the bridge is greater than 200 feet in length, the Department will fund and construct a sidewalk on one side of the bridge structure. The bridge will also be studied to determine the costs and benefits of constructing sidewalks on both sides of the structure. If in the judgement of the Department sidewalks are justified, funding will be provided for installation. The above provision is also applicable to dual bridge structures. For dual bridges greater than 200 ft in length, a sidewalk will be constructed on the outside of one bridge structure. The bridges will also be studied to determine if sidewalks on the outside of both structures are justified.

7. FUNDING CAPS are no longer applicable.

8. This policy does not commit the Department to the installation of facilities in the Department's TIP projects where the pedestrian facility causes an unpractical design modification, is not in accordance with AASHTO standards, creates an unsafe situation, or in the judgement of the Department is not practical to program.

INDEPENDENT PROJECTS

DEFINED: The DOT has a separate category of funds for all independent pedestrian facility projects in North Carolina where installation is unrelated to a TIP roadway project. An independent pedestrian facility project will be administered in accordance with Enhancement Program Guidelines.

Useful On-Line Pedestrian Planning and Design Resources

NCDOT Division of Bicycle & Pedestrian Transportation	***http://www.ncdot.org/transit/bicycle/***
Board of Transportation Resolution on Mainstreaming	*http://www.ncdot.org/transit/bicycle/laws/laws_resolution.html*
NCDOT Pedestrian Policy Guidelines	*http://www.ncdot.org/transit/bicycle/laws/ped_guide.pdf*
NCDOT Greenways - Administrative Process	*http://www.ncdot.org/transit/bicycle/laws/laws_greenway_admin.html*
Funding	*http://www.ncdot.org/transit/bicycle/funding/funding_intro.html*
Project Types	*http://www.ncdot.org/transit/bicycle/projects/project_types/bpt_intro.html*
Crash Data	*http://www.ncdot.org/transit/bicycle/safety/safety_crashdata.html*
DBPT Long Range Plan	*http://www.ncdot.org/transit/bicycle/projects/intro/projects_long_range.html*
Safe Routes to School Program	*http://www.ncdot.org/transit/bicycle/saferoutes/SafeRoutes.html*
NCDOT Division of Highways	***http://www.ncdot.org/doh/***
Alternative Delivery Unit – Publications for Download	***http://www.ncdot.org/doh/preconstruct/altern/value/manuals/***
Bridge Policy 2000	*http://www.ncdot.org/doh/preconstruct/altern/value/manuals/bpe2000.doc*
Curb Cuts & Ramps for Disabled Persons	*http://www.ncdot.org/doh/preconstruct/altern/value/manuals/handi.pdf*
Traditional Neighborhood Development Manual	*http://www.ncdot.org/doh/preconstruct/altern/value/manuals/tnd.pdf*
ADA – Detectable Warnings	*http://www.ncdot.org/doh/preconstruct/ps/std_draw/06english/08/default.html*
Highway Design Branch – Design Manual	*http://www.ncdot.org/doh/preconstruct/altern/value/manuals/designmanual.html*
Policy and Procedure Manual (See Section 28)	*http://www.ncdot.org/doh/preconstruct/altern/value/manuals/ppm/*
Policy on Street & Driveway Access	*http://www.ncdot.org/doh/preconstruct/altern/value/manuals/pos.pdf*
Traffic Engineering and Safety Systems Branch	***http://www.ncdot.org/doh/preconstruct/traffic/***
NC Supplement to the Manual on Uniform Traffic Control Devices	*http://www.ncdot.org/doh/preconstruct/traffic/MUTCD/*
Crosswalks/Mid-Block Signing and Pavement Markings	*http://www.ncdot.org/doh/preconstruct/traffic/teppl/Topics/C-36/C-36.html*

UNC Highway Safety Research Center	***http://www.hsrc.unc.edu***
Pedestrian & Bicycle Information Center	***http://www.pedbikeinfo.org/index.htm***
Walking	*http://www.walkinginfo.org/*
Engineer Pedestrian Facilities	*http://www.walkinginfo.org/engineering*
Pedestrian Safety Guide & Countermeasure Selection System (PEDSAFE)	*http://www.walkinginfo.org/pedsafe/*
Develop Plans and Policies	*http://www.walkinginfo.org/develop*
National Center for Safe Routes to School	*http://www.saferoutesinfo.org*
Federal Highway Administration Bicycle & Pedestrian Program	***http://www.fhwa.dot.gov/environment/bikeped/***
Bicycle and Pedestrian Provisions of Federal Transportation Legislation	*http://www.fhwa.dot.gov/environment/bikeped/bp-guid.htm*
Bicycle & Pedestrian Programs	*http://www.fhwa.dot.gov/environment/bikeped/overview.htm*
Program & Design Guidance	*http://www.fhwa.dot.gov/environment/bikeped/guidance.htm*
Links to Other Resources	*http://www.fhwa.dot.gov/environment/bikeped/bipedlnk.htm*
Publications	*http://www.fhwa.dot.gov/environment/bikeped/publications.htm*
Pedestrian Safety	*http://safety.fhwa.dot.gov/ped_bike/ped/index.htm*
Pedestrian & Bicycle Safety Research Page	*http://www.tfhrc.gov/safety/pedbike/index.htm*
National Highway Traffic Safety Administration – Traffic Safety: Pedestrians	***http://www.nhtsa.gov/portal/site/nhtsa/menuitem.dfedd570f698cabbbf30811060008a0c/***
National Center for Bicycling & Walking	***http://www.bikewalk.org/***

D DESIGN GUIDELINES



Chapter Outline:

D.0 Overview D.1 Sidewalks & Walkways D.2 Greenway Trails D.3 Marked Crosswalks D.4 Curb Ramps D.5 Raised or Lowered Medians D.6 Midblock Crossings D.7 Advanced Stop Bars D.8 Bulb-Outs D.9 Pedestrian Overpass/Underpass D.10 Roundabouts D.11 Traffic Signals D.12 Pedestrian Signals D.13 Landscaping D.14 Roadway Lighting Improvements D.15 Street Furniture and Walking Environment D.16Transit Stop Treatments D.17 Pedestrian Signs and Wayfinding D.18 Bridges D.19 High Intensity Activated Crosswalk (HAWK) D.20 Bicycle Facilities D.21 Traffic Calming D.21 Land Use and Pedestrian Travel

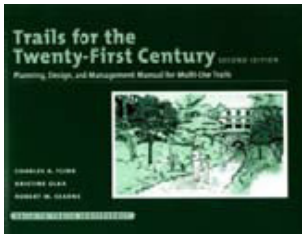
D.0 OVERVIEW

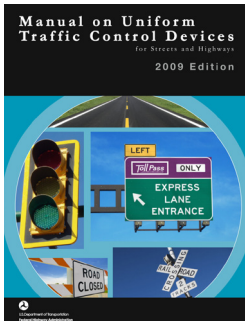
These recommended guidelines originate from and adhere to national design standards as defined by the American Association of State Highway Transportation Officials (AASHTO), the Americans with Disabilities Act (ADA), the Federal Highway Administration (FHWA) Pedestrian Facilities Users Guide, the Manual on Uniform Traffic Control Devices (MUTCD), and the NCDOT. Another major source of information in this chapter is the Pedestrian and Bicycle Information Center, found online at http://www.walkinginfo.org. Should the national standards be revised in the future and result in discrepancies with this chapter, the national standards should prevail for all design decisions. A qualified engineer or landscape architect should be consulted for the most up to date and accurate cost estimates.

The sections below serve as an inventory of pedestrian and bicycle design elements/treatments and provide guidelines for their development. These treatments and design guidelines are important because they represent minimum standards for creating a pedestrian and bicycle-friendly, safe, accessible community. The guidelines are not, however, a substitute for a more thorough evaluation by a landscape architect or engineer upon implementation of facility improvements. Some improvements may also require cooperation with the NCDOT for specific design solutions.

Pedestrian and Bicycle Information Center

AASHTO THE VOICE OF TRANSPORTATION





The Pedestrian and Bicycle Information Center, AASHTO, the MUTCD, nationally recognized trail standards, and other sources have all informed the content of this chapter.

D

D.1 SIDEWALKS AND WALKWAYS

Sidewalks and walkways are extremely important public right-of-way components often times adjacent to, but separate from automobile traffic. In many ways, they act as the seam between private residences, stores, businesses, and the street.

There are a number of options for different settings, for both downtown and more rural and/or suburban areas. From a wide promenade to, in the case of a more rural environment, a simple asphalt or crushed stone path next to a secondary road, walkway form and topography can vary greatly. In general, sidewalks are constructed of concrete although there are some successful examples where other materials such as asphalt, crushed stone, or other slip resistant material have been used. The width of the walkways should correspond to the conditions present in any given location (i.e. level of pedestrian traffic, building setbacks, or other important natural or cultural features). The Federal Highway Administration (FHWA) and the Institute of Transportation Engineers both suggest five feet as the minimum width for a sidewalk. This is considered ample room for two people to walk abreast or for two pedestrians to pass each other. Often downtown areas, near schools, transit stops, or other areas of high pedestrian activity call for much wider sidewalks.

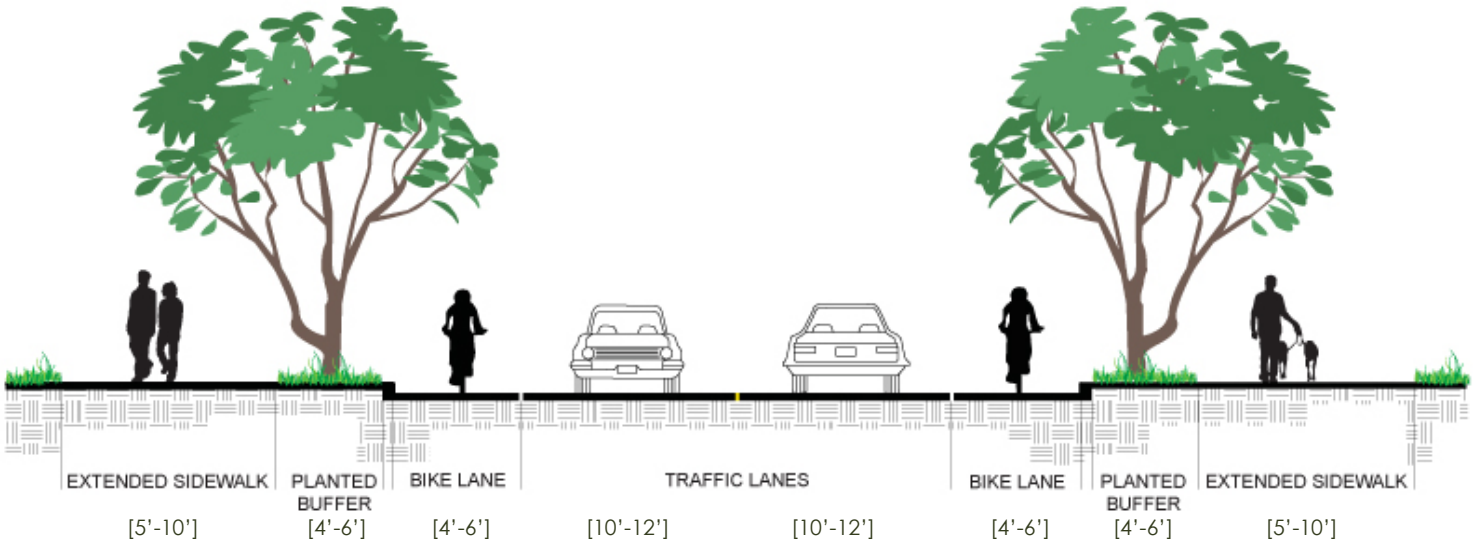


A well designed residential sidewalk will have a width of at least five feet. (Image from http://www.walkinginfo.org)



Sidewalk with a vegetated buffer zone. Notice the sense of enclosure created by the large canopy street trees. (Image from http://www.walkinginfo.org)

Below: Typical street with bicycle lanes and adjacent sidewalk.



SIDEWALKS AND WALKWAY GUIDELINES:

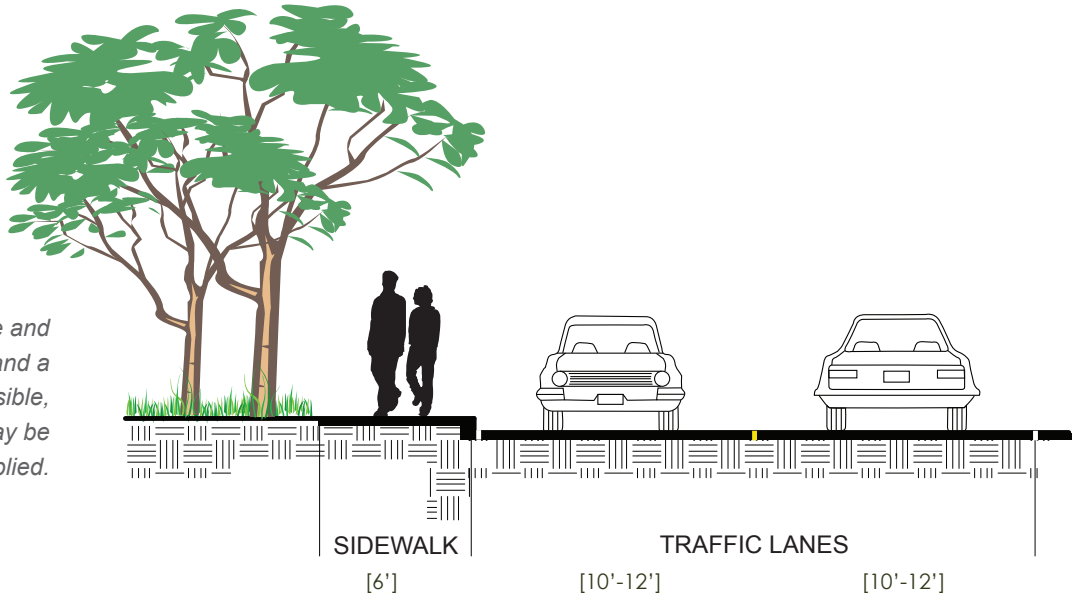
Sidewalk Guideline Sources:

American Association of State Highway and Transportation Officials. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.

Metro Regional Government. (2005). Portland, Oregon: Transportation Information Center. http://www.oregonmetro.gov

- Concrete is preferred surface, providing the longest service life and requiring the least maintenance. Permeable pavement such as porous concrete may be considered to improve water quality.
- Sidewalks should be built as flat as possible to accommodate all pedestrians; they should have a running grade of 5% or less; with a 2% maximum cross-slope.
- Concrete sidewalks should be built to minimum depth of four inches; six inches at driveways.
- Sidewalks should be a minimum of five feet wide; sidewalks serving mixed use and commercial areas shall be a minimum of 8 ft in width (12–15 feet is required in front of retail storefronts). The maximum cross-slope should be no more than 2% (1:50)*.
- Buffer zone of two to four feet in local or collector streets; five to six feet in arterial or major streets and up to eight feet in busy streets and downtown to provide space for light poles, street trees,f and other street furniture. See the Landscaping section later in this chapter for shade and buffer opportunities of trees and shrubs.
- Motor vehicle access points should be kept to minimum.
- If a sidewalk with buffer on both sides is not feasible due to topography and right-of-way constraints, then a sidewalk on one side is better than no facility. Each site should be examined in detail to determine placement options.

** If a greater slope is anticipated because of unusual topographic or existing conditions, the designer should maintain the preferred slope of 1:50 within the sidewalk area, if possible. This can be accomplished either by raising the curb so that the cross-slope of the entire sidewalk can be 1:50, or by placing the more steeply angled slope within the area between the sidewalk and the road.*



Right: Where space and topography are limiting and a planted buffer is not possible, this cross section may be applied.

D.2 GREENWAY TRAILS

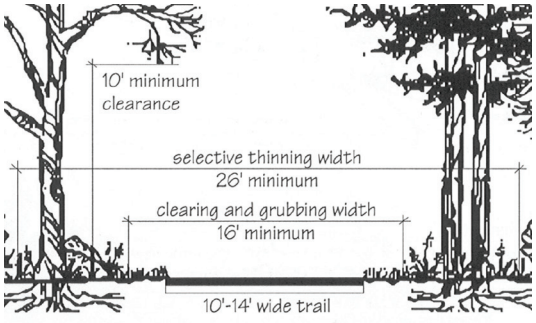
A greenway is defined as a linear corridor of land that can be either natural, such as rivers and streams, or manmade, such as abandoned railroad beds and utility corridors. Many greenways contain trails. Greenway trails can be paved or unpaved, and can be designed to accommodate a variety of trail users, including bicyclists, walkers, hikers, joggers, skaters, horseback riders, and those confined to wheelchairs. Single-tread, multi-use trails are the most common trail type in the nation. These trails vary in width and can accommodate a wide variety of users.

Note: A greenway trail located along a roadway corridor is sometimes referred to as a 'sidepath'.

TRAIL GUIDELINES:

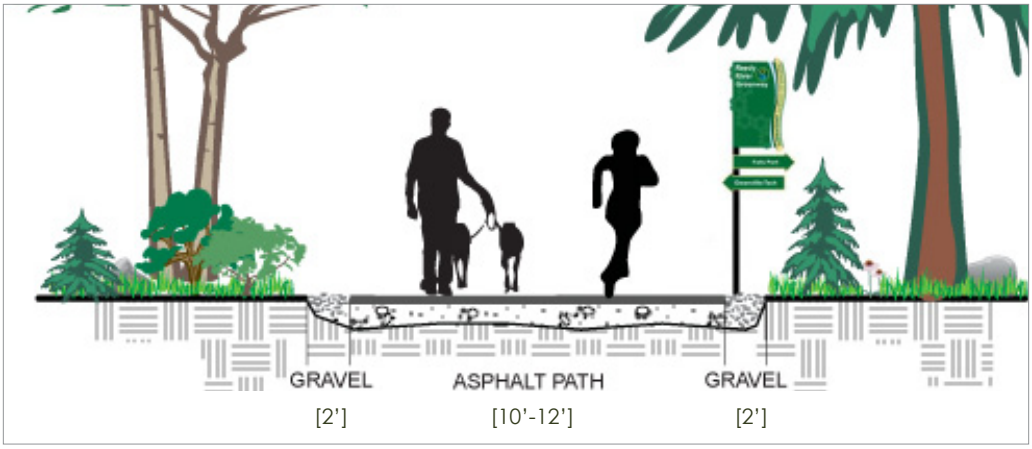
- The minimum width for two-directional trails is 10', however 12'-14' widths are preferred where heavy traffic is expected. Vertical clearance under bridges and other structures should be 8' to 10'.
- Centerline stripes should be considered for paths that generate substantial amounts of pedestrian traffic, or along curved portions of the trail, where sight-lines are limited. Radii minimums should also be considered depending on the different user groups.
- While the vegetative clearing needed for these trails varies with the width of the trail, the minimum width for clearing and grubbing a 10' wide trail is 16'. Selective thinning increases sight lines and distances and enhances the safety of the trail user. This practice includes removal of underbrush and limbs to create open pockets within a forest canopy, but does not include the removal of the forest canopy itself.
- Crossings should be a safe enough distance from neighboring intersections to not interfere (or be interfered) with traffic flow.
- A roadway with flat topography is desirable to increase motorist visibility of the path crossing.
- Motorists and trail users should be warned, such as with signage (including trail stop signs), changes in pavement texture, flashing beacons, raised crossings, striping, etc.
- A refuge is needed where crossing distance is excessive and in conditions exhibiting high volumes/speeds and where the primary user group crossing the roadway requires additional time, such as schoolchildren and the elderly.
- The crossing should occur as close to perpendicular (90 degrees) to the roadway as possible.
- If possible, it may be desirable to bring the path crossing up to a nearby signalized crossing in situations with high speeds/ADT and design and/or physical constraints.
- Signalized crossings may be necessary on trails with significant usage when intersecting with demanding roadways, but MUTCD warrants must be met for the installation of a signalized crossing.

Below: Vegetation clearing guidelines



(continued on page D-6)

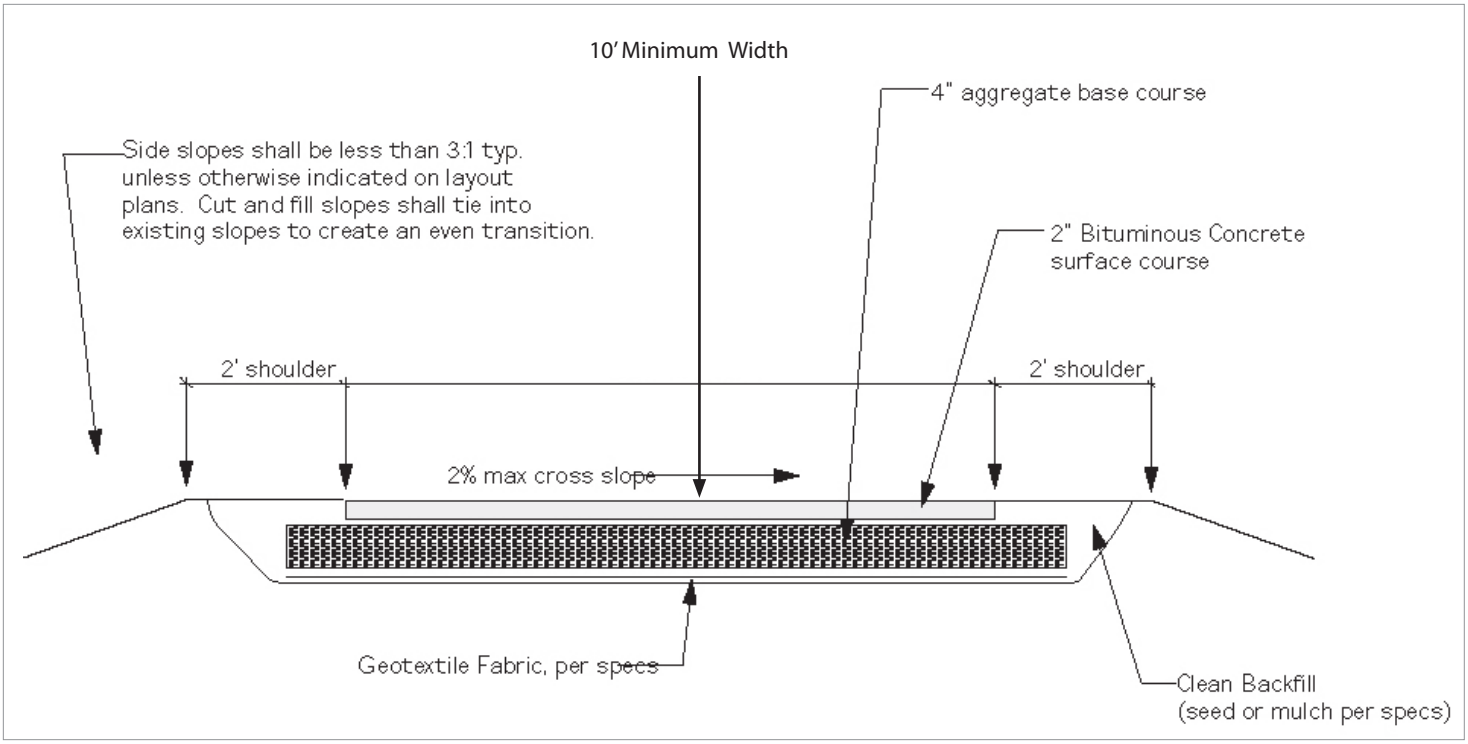
Right: Typical asphalt path section



Right: Typical natural surface trail section

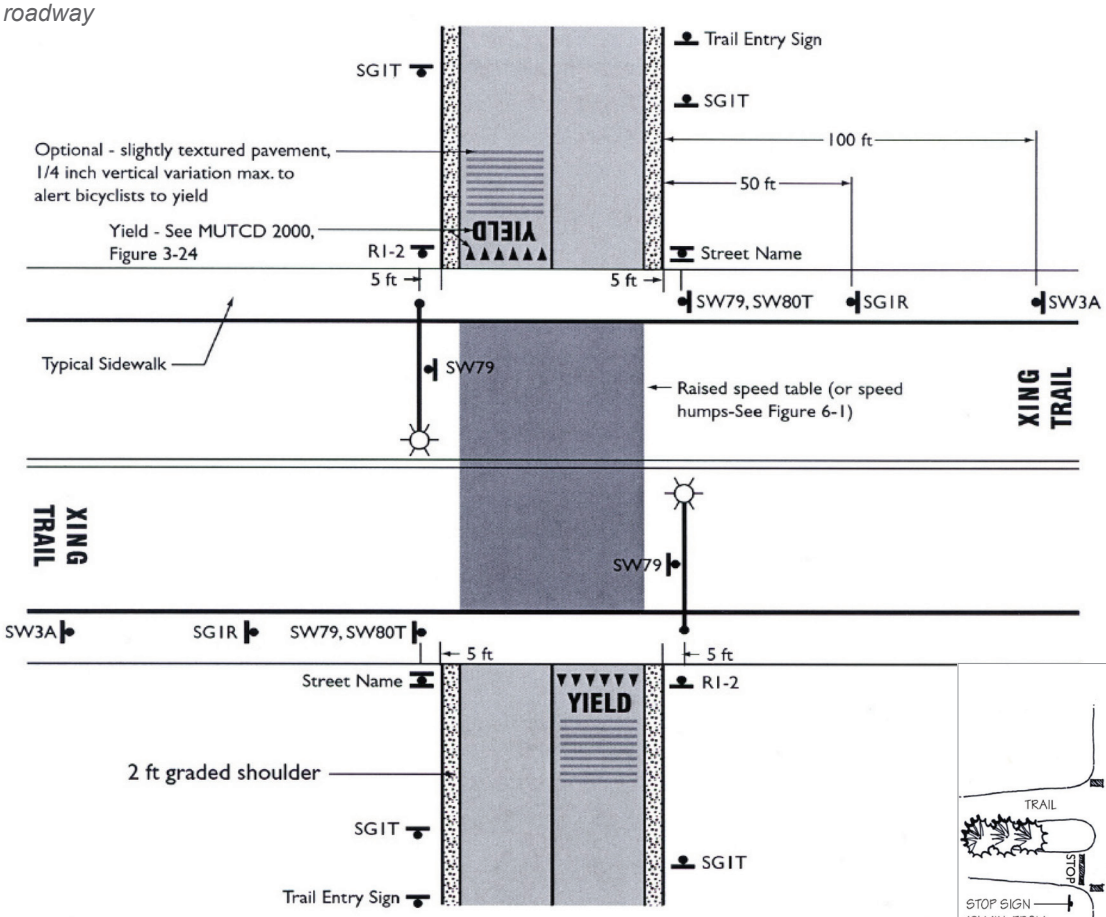


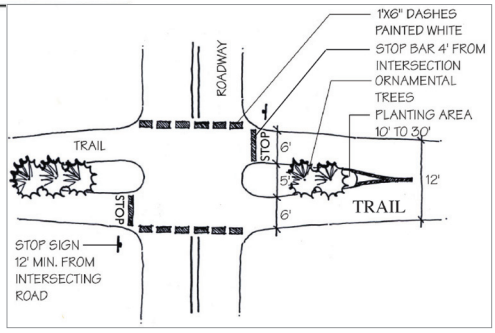
Below: Asphalt pavement construction detail



- Sidepaths should be constructed along corridors with relatively few intersections and driveways, reducing conflict points.
- Typical pavement design for a paved, off-road, multi-use trail should be based upon the specific loading and soil conditions for each project. Asphalt or concrete trails should be designed to withstand the loading requirements of occasional maintenance and emergency vehicles.
- Concrete Trail: In areas prone to frequent flooding, it is recommended that concrete be used because of its excellent durability. Concrete surfaces are capable of withstanding the most powerful environmental forces. They hold up well against the erosive action of water, root intrusion and subgrade deficiencies such as soft soils. Most often, concrete is used for intensive urban applications. Of all surface types, it is the strongest and has the lowest maintenance requirement, if it is properly installed.
- Asphalt Trail: Asphalt is a flexible pavement and can be installed on virtually any slope. One important concern for asphalt trails is the deterioration of trail edges. Installation of a geotextile fabric beneath a layer of aggregate base course (ABC) can help to maintain the edge of a trail. It is important to provide a 2' wide graded shoulder to prevent trail edges from crumbling.
- Trail and Roadway Intersections: The images below present detailed specifications for the layout of intersections between trail corridors and roadways. Signage rules for such intersections are available in the Manual on Uniform Traffic Control Devices (MUTCD).

Below: Typical greenway trail approaches to a roadway





TRAIL-ROADWAY INTERSECTIONS

• Site the crossing area at a logical and visible location; the crossing should be a safe enough distance from neighboring intersections to not interfere (or be interfered) with traffic flow; crossing at a roadway with flat topography is desirable to increase motorist visibility of the path crossing; the crossing should occur as close to perpendicular (90 degrees) to the roadway as possible.

• Warn motorists of the upcoming trail crossing and trail users of the upcoming intersections; motorists and trail users can be warned with signage (including trail stop signs), changes in pavement texture, flashing beacons, raised crossings, striping, etc.

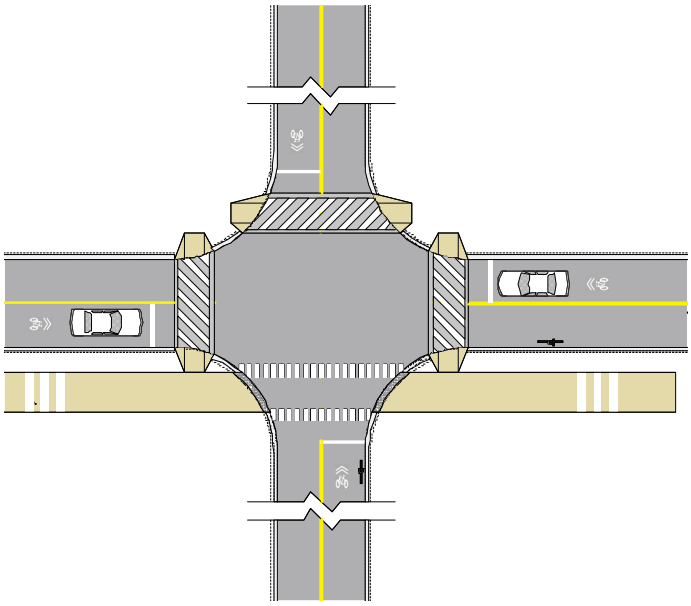
• Maintain visibility between trail users and motorists by clearing or trimming any vegetation that obstructs the view between them.

• Intersection approaches should be made at relatively flat grades so that cyclists are not riding down hill into intersections.

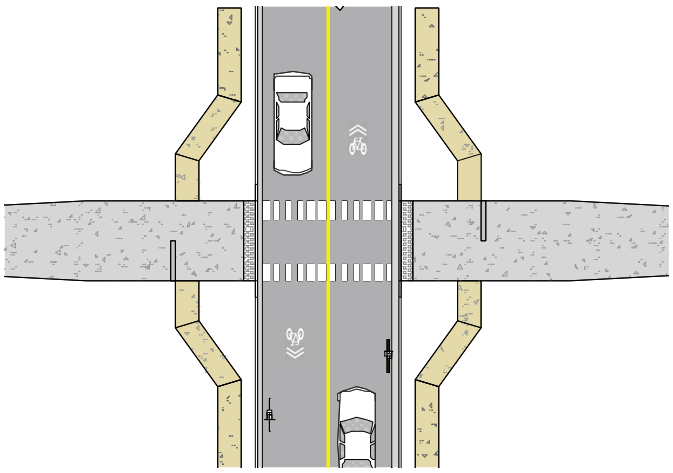
• If the intersection is more than 75 feet from curb to curb, it is preferable to provide a center median refuge area; a refuge is needed in conditions exhibiting high volumes/speeds and where the primary user group crossing the roadway requires additional time, such as schoolchildren and the elderly.

• If possible, it may be desirable to bring the path crossing up to a nearby signalized crossing in situations with high speeds/ADT and design and/or physical constraints.

• In 4-way Intersection Crossing with Shared Use Path (diagram at right) – This is also a depiction of a "sidepath" intersecting a roadway. Trail users would navigate this crossing like a common pedestrian.



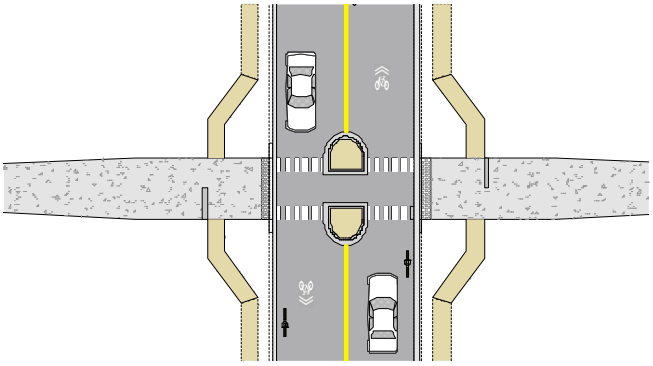
4-Way Intersection Crossing
Shared Use Path



Mid-block Intersection
Shared Use Path with Sidewalks

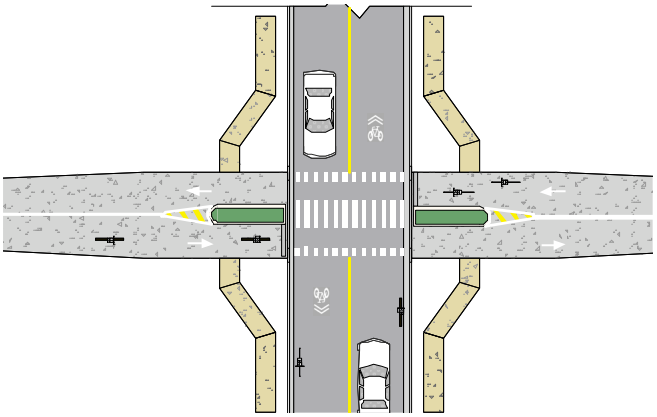
TRAIL-ROADWAY INTERSECTIONS (CONTINUED)





Median Refuge
Shared Use Path with Sidewalks





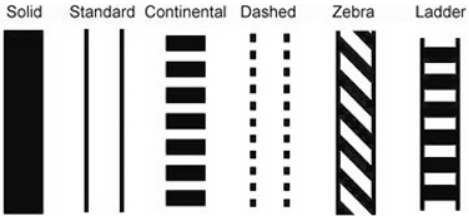
Mid-block Crossing
Shared Use Path with Sidewalks and Medians

TRAIL-ROADWAY INTERSECTIONS (SIGNALIZED)



• Signalized crossings may be necessary on trails with significant usage when intersecting with demanding roadways, but MUTCD warrants must be met for the installation of a signalized crossing. Consult the MUTCD or NCDOT Division of Bicycle and Pedestrian Transportation for signal, sign and light placement.

• FHWA issued an interim approval for the optional use of rectangular rapid flashing beacons (RRFBs, shown at left) as warning beacons supplementing pedestrian crossing or school crossing warning signs at crossings across uncontrolled approaches. An analysis by the Center for Education and Research in Safety found them to have much higher levels of effectiveness in making drivers yield at crosswalks than the standard over-head and side-mount round flashing beacons.





A variety of patterns are possible in designating a crosswalk; an example of a 'continental' design is shown above.

D.3 MARKED CROSSWALKS

A marked crosswalk designates a pedestrian right-of-way across a street. It is often installed at controlled intersections or at key locations along the street (a.k.a. mid-block crossings). Every attempt should be made to install crossings at the specific point at which pedestrians are most likely to cross: a well-designed traffic calming location is not effective if pedestrians are instead using more seemingly convenient and potentially dangerous location to cross the street. Marked pedestrian crosswalks may be used under the following conditions: 1) At locations with stop signs or traffic signals, 2) At non-signalized street crossing locations in designated school zones, and 3) At non-signalized locations where engineering judgment dictates that the use of specifically designated crosswalks are desirable.

There is a variety of form, pattern, and materials to choose from when creating a marked crosswalk. It is important however to provide crosswalks that are not slippery, are free of tripping hazards, or are otherwise difficult to maneuver by any person including those with physical mobility or vision impairments. Although attractive materials such as inlaid stone or certain types of brick may provide character and aesthetic value, the crosswalk can become slippery. Potential materials can be vetted by requesting case studies from suppliers regarding where the materials have been successfully applied. Also, as some materials degrade from use or if they are improperly installed, they may become a hazard for the mobility or vision impaired.

Crosswalk Guideline Sources:

American Association of State Highway and Transportation Officials. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.

Metro Regional Government. (2005). Portland, Oregon: Transportation Information Center. www.oregonmetro.gov

CROSSWALK GUIDELINES:

- Should not be installed in an uncontrolled environment [at intersections without traffic signals] where speeds exceed 40 mph. (AASHTO, 2004)
- Crosswalks alone may not be enough and should be used in conjunction with other measures to improve pedestrian crossing safety, particularly on roads with average daily traffic (ADT) above 10,000
- Width of marked crosswalk should be at least six feet; ideally ten feet or wider in downtown areas.
- Curb ramps and other sloped areas should be fully contained within the markings.
- Crosswalk markings should extend the full length of the crossings.
- Crosswalk markings should be white per MUTCD.
- Either the 'continental' or 'ladder' patterns are recommended for intersection improvements for aesthetic and visibility purposes. Lines should be one to two feet wide and spaced one to five feet apart.
- NCDOT typically requires pedestrian facilities (sidewalks) on both sides of a roadway when placing crosswalks.

D

D.4 CURB RAMPS

Curb ramps are critical features that provide access between the sidewalk and roadway for wheelchair users, people using walkers, crutches, or handcarts, people pushing bicycles or strollers, and pedestrians with mobility or other physical impairments. In accordance with the 1973 Federal Rehabilitation Act and to comply with the 1990 Federal ADA requirements, curb ramps must be installed at all intersections and mid-block locations where pedestrian crossings exist (Pedestrian and Bicycle Information Center: http://www.walkinginfo.org/engineering/roadway-ramps.cfm). In addition, these federal regulations require that all new constructed or altered roadways include curb ramps.

Two separate curb ramps should be provided at each intersection (see image below). With only one large curb ramp serving the entire corner, there is not safe connectivity for the pedestrian. Dangerous conditions exist when the single, large curb ramp inadvertently directs a pedestrian into the center of the intersection, or in front of an unsuspecting, turning vehicle.

CURB RAMP GUIDELINES:

- Two separate curb ramps, one for each crosswalk, should be provided at corner of an intersection.
- Curb ramp should have a slope no greater than 1:12 (8.33%). Side flares should not exceed 1:10 (10%); it is recommended that much less steep slopes be used whenever possible.

Curb Ramp Guideline Sources:

Metro Regional Government. (2005). Portland, Oregon: Transportation Information Center. http://www.oregonmetro.gov



Left: The curb ramps shown have two separate ramps at the intersection (visable across the street) (Image from http://www.walkinginfo.org).

For additional information on curb ramps see Accessible Rights-of-Way: A Design Guide, by the U.S. Access Board and the Federal Highway Administration, and Designing Sidewalks and Trails for Access, Parts I and II, by the Federal Highway Administration. Visit: www.access-board.gov for the Access board's right-of-way report.

D.5 RAISED OR LOWERED MEDIANS

Medians are barriers in the center portion of a street or roadway. When used in conjunction with mid-block or intersection crossings, they can be used as a crossing island to provide a place of refuge for pedestrians. They also provide opportunities for landscaping that in turn can help to slow traffic. A center turn lane can be converted into a raised or lowered median thus increasing motorist safety.

A continuous median can present several problems when used inappropriately. If all left-turn opportunities are removed, there runs a possibility for increased traffic speeds and unsafe U-turns at intersections. Additionally, the space occupied may be taking up room that could be used for bicycle lanes or other treatments. An alternative to the continuous median is to create a segmented median with left turn opportunities.

Raised or lowered medians are best suited for high-volume, high-speed roads, and they should provide ample cues for people with visual impairments to identify the boundary between the crossing island and the roadway.

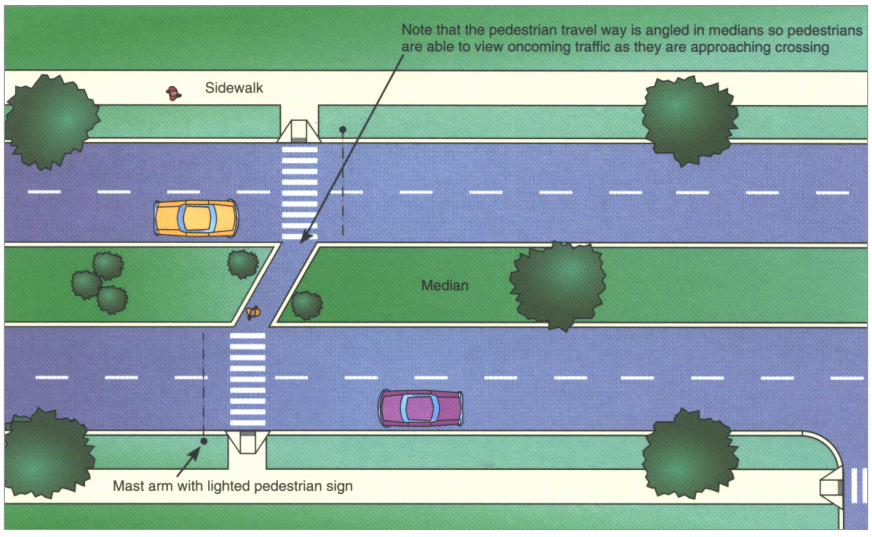
MEDIAN GUIDELINES:

- Median pedestrian refuge islands should be provided as a place of refuge for pedestrians crossing busy or wide roadways at either mid-block locations or intersections. They should be utilized on high speed and high volume roadways.
- Medians should incorporate trees and plantings to change the character of the street and reduce motor vehicle speed.
- Landscaping should not obstruct the visibility between motorists and pedestrians.
- Median crossings should provide ramps or cut-throughs for ease of accessibility for all pedestrians.
- Median crossings should be at least 6 feet wide in order to accommodate more than one pedestrian, while a width of 10 feet (where feasible) should be provided for bicycles, wheelchairs, and groups of pedestrians.
- Median crossings should possess a minimum of a 4 foot square level landing to provide a rest point for wheelchair users.
- Pedestrian push-buttons should be located in the median of all signalized mid-block crossings, where the roadway width is in excess of 60 feet.

Median Guideline Sources:

American Association of State Highway and Transportation Officials. (2004). Guide for the Planning, Design, and Operation of Pedestrian Facilities.

Metro Regional Government. (2005). Portland, Oregon: Transportation Information Center. http://www.oregonmetro.gov



Above: A median used in conjunction with mid-block crossing, serving as a refuge for pedestrians. (Image from AASHTO).

D

D.6 MID-BLOCK CROSSINGS

A Mid-Block Crosswalk is any crosswalk that is not located within an intersection. Midblock crossings are often installed in areas with heavy pedestrian traffic to provide more frequent crossing opportunities. They may also be added near major pedestrian destinations, such as schools or busy commercial areas, where people might otherwise cross at unmarked locations.

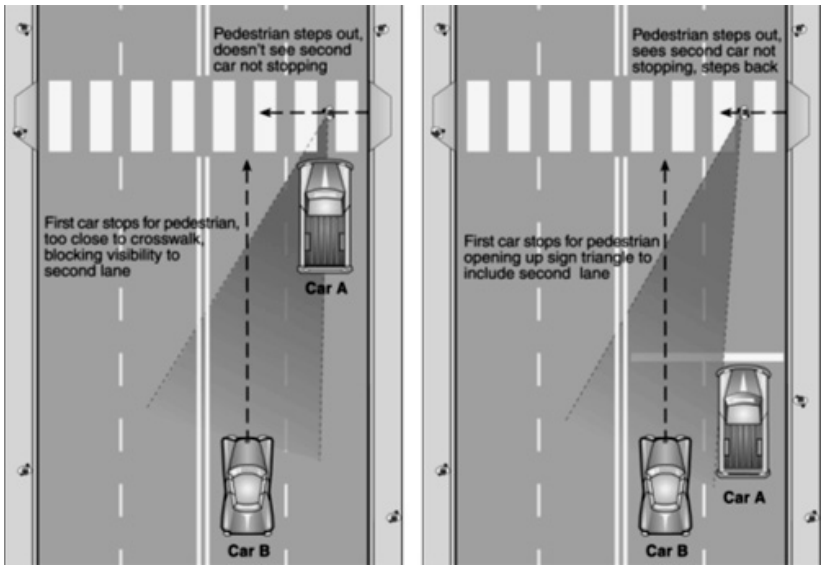
MID-BLOCK CROSSING GUIDELINES:

- Crosswalks at mid-block should not be installed within 300 ft. of another signalized crossing point.
- Utilize advance warning signs when mid-block crossings are present.
- Raised crosswalks are typically used on two-lane streets with less than 35 MPH speed limit.
- It will be the standard practice of NCDOT to install Mid-Block Crosswalks based on an engineering study. All Mid-Block Crosswalks shall be signed and marked in compliance with the Manual on Uniform Traffic Control Devices (MUTCD), the North Carolina Supplement to the MUTCD, the current NCDOT Roadway Standard Drawings, and the standards the NCDOT Policy on Mid-Block Crossings.
- The NCDOT Policy on Mid-Block Crossings can be found at www.ncdot.gov/doh/preconstruct/traffic/teppl/topics/C-36/C-36_pr.pdf

D.7 ADVANCE STOP BARS

Moving the vehicle stop bar 15–30 feet back from the pedestrian crosswalk at signalized crossings and mid-block crossings increases vehicle and pedestrian visibility. Advance stop bars are 1–2 feet wide and they extend across all approach lanes at intersections. The time and distance created allows a buffer in which the pedestrian and motorist can interpret each other's intentions. Studies have shown that this distance translates directly into increased safety for both motorist and pedestrian. One study in particular claims that by simply adding a "Stop Here for Pedestrians" sign reduced pedestrian motorist conflict by 67%. When this was used in conjunction with advance stop lines, it increased to 90% (Pedestrian and Bicycle Information Center: http://www.walkinginfo.org/engineering/crossings-enhancements.cfm).

Below: Advance stop bars enhance visibility for pedestrians (Image from www.walkinginfo.org).



D.8 BULB-OUTS

A bulb-out, or curb extension, is a place where the sidewalk extends into the parking lane of a street. Because these curb extensions physically narrow the roadway, a pedestrian's crossing distance—and consequently the time spent in the street—is reduced. They can be placed either at mid-block crossings or at intersections.

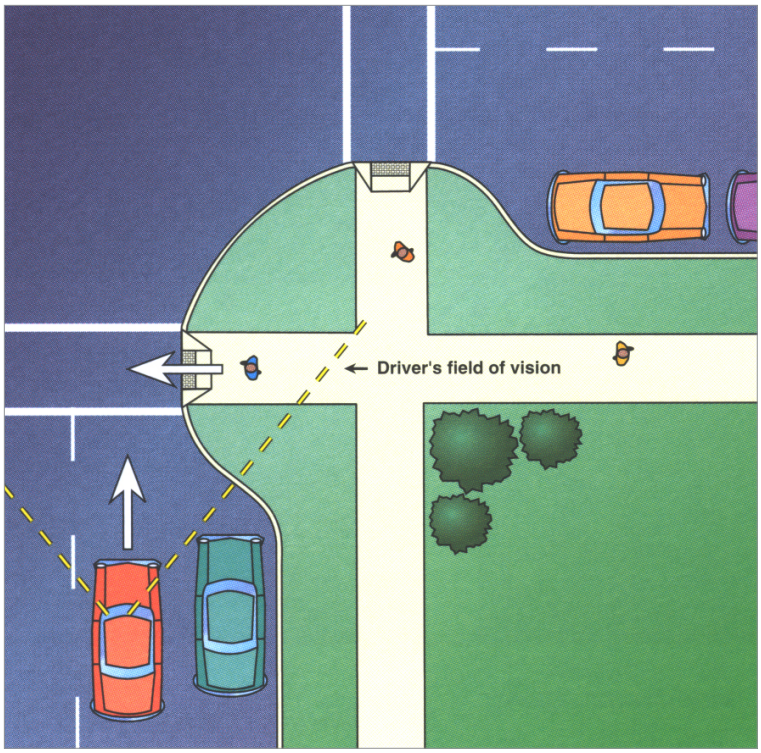
**The curb radius of a street corner affects traffic speed and crosswalk length. In general, a smaller (narrow) curb radius is better for pedestrians. A larger (wide) curb radius creates a greater crosswalk length and allows vehicles to move faster around the turn. Reducing the curb radius, especially across busy multi-lane arterials, can increase pedestrian safety by slowing vehicles and minimizing pedestrian crossing distances.*

Sightlines and pedestrian visibility are reduced when motor vehicle parking encroaches too close to corners creating a dangerous situation for pedestrians. When placed at an intersection, bulb-outs preclude vehicle parking too close to a crosswalk. Also, bulb-outs at intersections can greatly reduce turning speed, especially if curb radii are set as tight as possible (Pedestrian and Bicycle Information Center: www.walkinginfo.org/engineering/crossings-curb.cfm). Finally, bulb-outs also reduce travel speeds when used in mid-block crossings because of the reduced street width.

Bulb-outs should only be used where there is an existing on-street parking lane and should never encroach into travel lanes, bicycle lanes, or shoulders (Pedestrian and Bicycle Information Center).

BULB-OUT GUIDELINES:

- Bulb-outs should be used on crosswalks in heavy pedestrian areas where parking may limit the driver's view of the pedestrian.
- Where used, sidewalk bulb-outs should extend into the street for the width of a parking lane (a minimum five feet) in order to provide for a shorter crossing width, increased pedestrian visibility, more space for pedestrian queuing, and a place for sidewalk amenities and planting.
- Curb extensions should be used on mid-block crossing where feasible.
- Curb extensions may be inappropriate for use on corners where frequent right turns are made by trucks or buses.



Above: By reducing a pedestrian's crossing distance, less time is spent in the roadway, and pedestrian vehicle conflicts are reduced (Image from AASHTO).

D

D.9 PEDESTRIAN OVERPASS/UNDERPASS

Pedestrian overpasses and underpasses efficiently allow for pedestrian movement across busy thoroughfares. These types of facilities are problematic in many regards and should only be considered under suitable circumstances or where no other solution is possible. Perhaps the best argument for using them sparingly is that research proves pedestrians will avoid using such a facility if they perceive the ability to cross at grade as taking about the same amount of time (Pedestrian and Bicycle Information Center:http://www.walkinginfo.org/engineering/crossings-overpasses.cfm).

The other areas of contention arise with the high cost of construction. There are also ADA requirements for stairs, ramps, and elevators that in many cases once complied with result in an enormous structure that is visually disruptive and difficult to access.

Overpasses work best when existing topography allows for smooth transitions. Underpasses as well work best with favorable topography when they are open and accessible, and exhibit a sense of safety. Each should only be considered with rail lines, high volume traffic areas such as freeways, and other high volume arteries.





Example trail overpass (above) and underpass (below).

OVERPASS/UNDERPASS GUIDELINES:

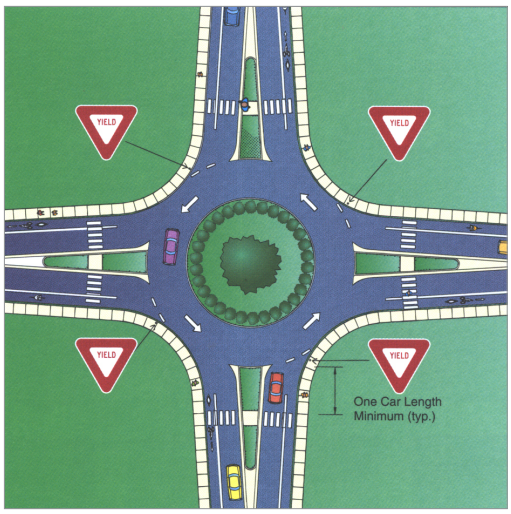
- Over and underpasses should be considered only for crossing arterials with greater than 20,000 vehicle trips per day and speeds 35 - 40 mph and over.
- Minimum widths for over and underpasses should follow the guidelines for sidewalk width.
- Underpasses should have a daytime illuminance minimum of 10- foot-candle (fc) achievable through artificial and/or natural light provided through an open gap to sky between the two sets of highway lanes, and a night time level of 4 fc.
- Consider acoustics measures within underpasses to reduce noise impacts to pedestrians and bicyclists.

D.10 ROUNDABOUTS

A roundabout is a circular intersection that maneuvers traffic around in a counterclockwise direction so that cars make a right-hand turn onto a desired street. Vehicles from approaching streets are generally not required to stop although approaching vehicles are required to yield to motorists in the roundabout. It is believed that this system eliminates certain types of crashes at traditional intersections.

Every effort must be made to prompt motorists to yield to pedestrians crossing the roundabout. A low design speed is required to improve pedestrian safety. Splitter islands and single lane approaches both lend to pedestrian safety as well as other urban design elements discussed in this chapter.

Typical roundabout (Image from AASHTO)



Problems also arise with the vision-impaired because there are not proper audible cues associated with when to cross. Studies are underway to develop and test solutions. Auditory accessible pedestrian signals placed on sidewalks and splitter islands are one solution, but again there is no research to prove their efficacy.

ROUNDABOUT GUIDELINES:

- The recommended maximum entry design speed for roundabouts ranges from 15 mph for 'mini-roundabouts' in neighborhood settings, to 20 mph for single-lane roundabouts in urban settings, to 25 mph for single-lane roundabouts in rural settings.
- Refer to roundabout diagram for typical crosswalk placement.
- Please refer to FHWA's report, Roundabouts, an Information Guide, available online through: www.fhrc.gov. The report provides information on general design principles, geometric elements, and provides detailed specifications for the various types of roundabouts.



Above: A pedestrian walks through a pedestrian refuge island, as part of a roundabout.

D.11 TRAFFIC SIGNALS

Traffic signals assign the right of way to motorists and pedestrians and produce openings in traffic flow, allowing pedestrians time to cross the street. When used in conjunction with pedestrian friendly design, proper signalization should allow for an adequate amount of time for an individual to cross the street. The suggested amount of pedestrian travel speed recommended in the Manual on Uniform Traffic Control Devices (MUTCD) is 4ft/sec; however, this does not address the walking speed of the elderly or children. Therefore, it is suggested that a lower speed of 3.5ft/sec be used whenever there are adequate numbers of elderly and children using an area.

Engineering, as well as urban design judgment, must be used when determining the location of traffic signals and the accompanying timing intervals. Although warrants for pedestrian signal timing have been produced by the MUTCD, each site must be analyzed for factors including new facility and amenity construction (i.e. a popular new park or museum) to allow for potential future pedestrian traffic volume. In addition, creating better access to existing places may in fact generate a higher pedestrian volume.

Fixed timed sequencing is often used in high traffic volume commercial or downtown areas to allow for a greater efficiency of traffic flow. In such instances, the pedestrian speed must be carefully checked to ensure safety.



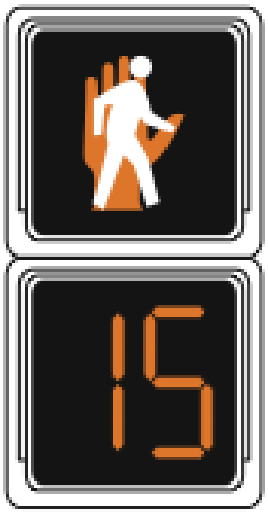
A low cost sign that restricts right-hand turns at a red light (Image from http://www.walkinginfo.org).

RIGHT TURN ON RED RESTRICTIONS

Introduced in the 1970s as a fuel saving technique, the Right Turn on Red (RTOR) law is thought to have had a detrimental effect on pedestrians. The issue is not the law itself but rather the relaxed enforcement of certain caveats within the law such as coming to a complete stop and yielding to pedestrians. Often motorists will either nudge into a crosswalk to check for oncoming traffic without looking for pedestrians or slow, but not stop, for the red-light while making the turn.

There is legitimate concern that eliminating an RTOR will only increase the number of right-turn-on-green conflicts where all of the drivers who would normally have turned on red, now are anxious to turn on green. Leading pedestrian intervals (LPI) or exclusive pedestrian intervals my help to alleviate this problem. More information on LPI's can be found in the following section. Eliminating RTOR should be considered on a case-by-case basis and only where there are high pedestrian volumes. This can be done by simple sign postings as illustrated at right.

D.12 PEDESTRIAN SIGNALS



Typical Pedestrian Signal Indicators (with countdown display).

There are a host of traffic signal features and enhancements that can greatly improve the safety and flow of pedestrian traffic. Some include countdown signals, the size of traffic signals, positioning of traffic signals, audible cues, and timing intervals which are discussed below (Pedestrian and Bicycle Information Center: http://www.walkinginfo.org/engineering/crossings-signals.cfm).

As of 2008, new federal policy requires all new pedestrian signals to be of the countdown variety. In addition, all existing signals must be updated to countdown within 10 years (updated in MUTCD). Countdown signals have proven to be an effective measure of crash reduction (25% crash reduction in 2007 FHWA study).

Countdown signals are pedestrian signals that show how many seconds the pedestrian has remaining to cross the street. The countdown can begin at the beginning of the WALK phase, perhaps flashing white or yellow, or at the beginning of the clearance, or DON'T WALK phase, flashing yellow as it counts down. Audible cues can also be used to pulse along with a countdown signal.



Audible cues can also be used to pulse along with a countdown signal.

Signals should be of adequate size, clearly visible, and, in some circumstances, accompanied by an audible pulse or other messages to make crossing safe for all pedestrians. Consideration should be paid to the noise impact on the surrounding neighborhoods when deciding to use audible signals.

The timing of these or other pedestrian signals needs to be adapted to a given situation. In general, shorter cycle lengths and longer walk intervals provide better service to pedestrians and encourage better signal compliance. For optimal pedestrian service, fixed-time signal operation usually works best. Pedestrian pushbuttons may be installed at locations where pedestrians are expected intermittently. Quick response to the pushbutton or feedback to the pedestrian (e.g.- indicator light comes on) should be programmed into the system. When used, pushbuttons should be well-signed and within reach and operable from a flat surface for pedestrians in wheelchairs and with visual disabilities. They should be conveniently placed in the area where pedestrians wait to cross. Section 4E.09 within the MUTCD provides detailed guidance for the placement of pushbuttons to ensure accessibility (Pedestrian and Bicycle Information Center: http://www.walkinginfo.org/engineering/crossings-signals.cfm).

There are three types of signal timing generally used: concurrent, exclusive, and leading pedestrian interval (LPI). The strengths and weaknesses of each will be discussed with an emphasis on when they are best employed.

When high-volume turning situations conflict with pedestrian movements, the exclusive pedestrian interval is the preferred solution. The exclusive

pedestrian intervals stop traffic in all directions. In order to keep traffic flowing regularly, there is often a greater pedestrian wait time associated with this system. Although it has been shown that pedestrian crashes have been reduced by 50% in some areas by using these intervals, the long wait times can encourage some to cross when there is a lull in traffic (Pedestrian and Bicycle Information Center: http://www.walkinginfo.org/engineering/crossings-signals.cfm).

An LPI gives pedestrians an advance walk signal before the motorists get a green light, giving the pedestrian several seconds to start in the crosswalk where there is a concurrent signal. This makes pedestrians more visible to motorists and motorists more likely to yield to them. This advance crossing phase approach has been used successfully in several places, such as New York City, for two decades and studies have demonstrated reduced conflicts for pedestrians. The advance pedestrian phase is particularly effective where there is a two-lane turning movement. There are some situations where an exclusive pedestrian phase may be preferable to an LPI, such as where there are high-volume turning movements that conflict with the pedestrians crossing.

The use of infrared or microwave pedestrian detectors has increased in many cities worldwide. These devices replace the traditional push-button system. They appear to be improving pedestrian signal compliance as well as reducing the number of pedestrian and vehicle conflicts. The best use of these devices is when they are employed to extend crossing time for slower moving pedestrians.

PEDESTRIAN SIGNAL GUIDELINES:

- Pedestrian signals should be placed in locations that are clearly visible to all pedestrians.
- Larger pedestrian signals should be utilized on wider roadways, to ensure readability.
- Pedestrian signal pushbuttons should be well-signed and visible.
- Pedestrian signal pushbuttons should clearly indicate which crossing direction they control.
- Pedestrian signal pushbuttons should be reachable from a flat surface, at a maximum height of 3.5 feet and be located on a level landing to ensure ease of operation by pedestrians in wheelchairs.
- Walk intervals should be provided during every cycle, especially in high pedestrian traffic areas.

D.13 LANDSCAPING

The introduction of vegetation in an urban environment can provide a welcomed intervention of nature into a place that is otherwise hardened from buildings, concrete, and asphalt. It can be used to provide a separation buffer between pedestrians and motorists, reduce the width of a roadway, calm traffic by creating a visual narrowing of the roadway, enhance the street environment, and help to generate a desired aesthetic.

Street trees and other plantings provide comfort, a sense of place, and a more natural and inviting setting for pedestrians. Landscaping and street furniture make people feel welcome.



Landscaping used on the Sea Street in Seattle, Washington shows how stormwater treatment can be tied to aesthetically pleasing plantings. (Image from Seattle, WA, Public Utilities: Seattle.gov)

There are also some instances where islands of vegetation are created to collect and filter stormwater from nearby streets and buildings. These islands are referred to as constructed wetlands, rain gardens, and/or bioswales. When these devices are employed, the benefits listed above are coupled with economic and ecologic benefits of treating stormwater at its source. There are many examples of this in Oregon and Washington, particularly Seattle's Green Streets Program. Using thoughtful design to treat stormwater as an amenity rather than waste to be disposed of in an environmentally harmful manner is gaining popularity nationwide.



Street trees buffer and soften often urban environments in a number of psychological, physical, and ecological ways; their shade is particularly helpful to pedestrians in North Carolina during summer months.

An issue with this or any landscaping treatment is that of ongoing maintenance. The responsibility often falls on local municipalities although there are instances where local community groups have provided funding and volunteers for maintenance. The best way to address the maintenance issue is to design using native plant material that is already adapted to the local soil and climate. Growth pattern and space for maturation, particularly with larger tree plantings, are important to avoid cracking sidewalks and other pedestrian obstructions.

D

D.14 ROADWAY LIGHTING IMPROVEMENTS

Proper lighting in terms of quality, placement, and sufficiency can greatly enhance a nighttime urban experience as well as create a safe environment for motorists and pedestrians. Two-thirds of all pedestrian fatalities occur during low-light conditions (AASHTO, 2004: Guide for the Planning, Design, and Operation of Pedestrian Facilities). Attention should be paid to crossings so that there is sufficient ambience for motorists to see pedestrians. To be most effective, lighting should be consistent, adequately spaced, and distinguished, providing adequate light.

In most cases, roadway street lighting can be designed to illuminate the sidewalk area as well. The visibility needs of both pedestrian and motorist should be considered. In commercial or downtown areas and other areas of high pedestrian volumes, the addition of lower level, pedestrian-scale lighting to streetlights with emphasis on crossings and intersections may be employed to generate a desired ambiance. A variety of lighting choices include mercury vapor, incandescent, or less expensive high-pressure sodium lighting for pedestrian level lighting. Roadway streetlights can range from 20-40 feet in height while pedestrian-scale lighting is typically 10-15 feet.



Above: An example of pedestrian-scale lighting.

It is important to note that every effort should be made to address and prevent light pollution. Also known as photo pollution, light pollution is 'excess or obtrusive light created by humans'.

GUIDELINES:

- Ensure pedestrian walkways and crossways are sufficiently lit.
- Consider adding pedestrian-level lighting in areas of higher pedestrian volumes, downtown, and at key intersections.
- Install lighting on both sides of streets in commercial districts.
- Use uniform lighting levels
- Use full cut-off light fixtures to avoid excess light pollution

D.15 STREET FURNITURE AND WALKING ENVIRONMENT

As part of a comprehensive sidewalk and walkway design, all street furniture should be placed in a manner that allows for a safe, pleasurable, and accessible walking environment. Good-quality street furniture will show that the community values its public spaces and is more cost-effective in the long run. Street furniture includes benches, trash bins, signposts, newspaper racks, water fountains, bicycle racks, restaurant seating, light posts, and other ornaments that are found within an urban street environment. Street furniture should mostly be considered in the downtown area and other important pedestrian-active areas.

In addition to keeping areas free of obstruction from furniture, a walking environment should be clean and well maintained. Attention to removing debris, trimming vegetation, allowing for proper stormwater drainage, providing proper lighting and sight angles, and repairing or replacing broken or damaged paving material can make an enormous difference in pedestrian perception of safety and aesthetics. Special attention should be paid to the needs of the visually impaired so that tripping hazards and low hanging obstructions are removed.



The street furniture shown here is placed in such a manner so as to create a safe, pleasurable, and accessible walking environment

GUIDELINES:

- Ensure proper placement of furniture; do not block pedestrian walkway or curb ramps or create sightline problems.
- Wall mounted Objects = not to protrude more than 4” from a wall between 27” and 7’ from the ground
- Single post mounted Objects = not to protrude more than 4” from each side of the post between 27” and 7’ from the ground
- Multiple Post Mounted Objects = lowest edge should be no higher than 27” and no lower than 7’
- Place street furniture at the end of on-street parking spaces rather than in middle to avoid vehicle-exiting conflict.

D.16 TRANSIT STOP TREATMENTS

Where transit opportunities are available, it is appropriate to consider some of the basic elements of a well designed, accessible, and functional transit stop.

Bus or other transit stops should be located in places that are most suitable for the passengers. For example, stops should be provided near higher density residential areas, commercial or business areas, and schools, and connected to these areas by sidewalk. Some of the most important elements to consider are the most basic: sidewalk connectivity to the stops, proper lighting, legible and adequate transit stop signage, shelter, seating, trash bins, bicycle and even car parking. Transit stops create an area of activity and may generate additional business and pedestrian traffic. Therefore, an opportunity is created to provide adequate sidewalks and other pedestrian oriented design elements. At a minimum, marked crosswalks (especially at mid-block stops), curb ramps, and proper sidewalk widths should be considered.

As with any human scale design element discussed, safety is an important factor to consider when locating bus stops. In the case of a bus stop, special attention should be paid to the number of lanes and direction of traffic when deciding to locate a stop on the near or far side of an intersection. Also special consideration must be paid to the wheelchair lifts in terms of how and where the mobility impaired will exit and enter the bus.

Local walking and bicycling maps should also be provided at bus stops, so that people are aware of the nearby destinations and how best to get there without an automobile.



This typical transit stop has all of the key features of shelter, ample seating, bicycle parking, landscaping, and trash bins (Image from http://www.walkinginfo.org).

For a step-by-step guide to help non-professionals participate in the process of developing and designing a signage system, as well as information on the range of signage types, visit the Project for Public Places website: http://www.pps.org/info/amenities_bb/signage_guide

D.17 PEDESTRIAN SIGNS AND WAYFINDING

Signage provides important safety and wayfinding information to motorist and pedestrian residents and tourists. From a safety standpoint, motorists should be given advance warning of upcoming pedestrian crossings or of traffic calming areas. Signage of any type should be used and regulated judiciously. An inordinate amount of signs creates visual clutter. Under such a condition, important safety or wayfinding information may be ignored resulting in confusion and possible pedestrian vehicle conflict. Regulations should also address the orientation, height, size, and sometimes even style of signage to comply with a desired local aesthetic.

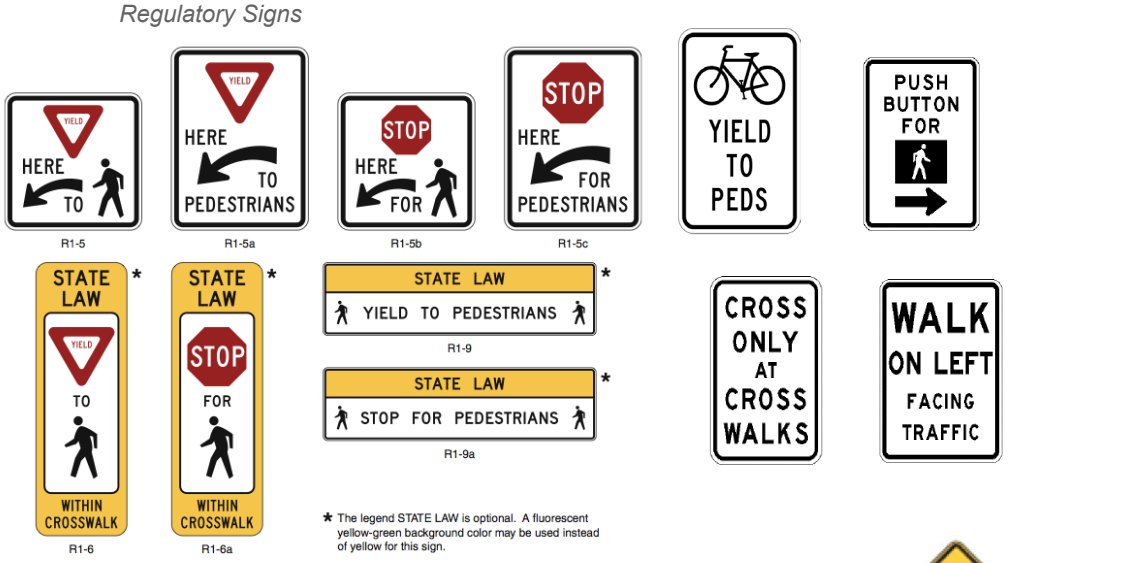
Regulatory signage is used to inform motorists or pedestrians of a legal requirement and should only be used when a legal requirement is not otherwise apparent (AASHTO, 2004: Guide for the Planning, Design, and Operation of Pedestrian Facilities).

Below: Typical traffic signs found around pedestrian friendly places.

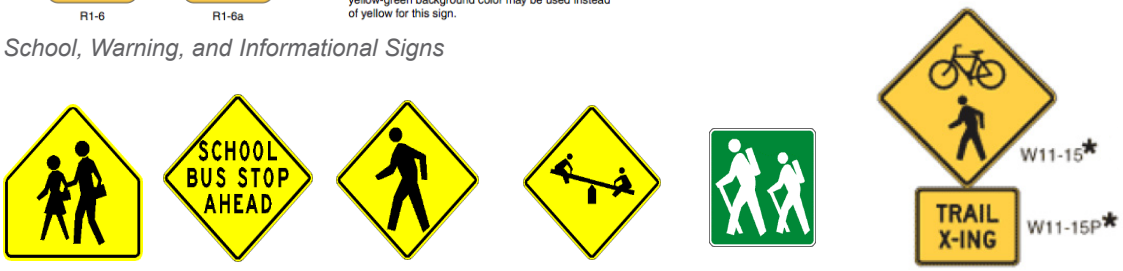
Sign	MUTCD Code	MUTCD Section	Conventional Road	
Yield here to Peds	R1-5	2B.11	450x450 (18x18)	Regulatory
Yield here to Peds	R1-5a	2B.11	450x600 (18x24)	
In-Street Ped Crossing	R1-6, R1-6a	2B.12	300x900 (12x36)	
Peds and Bicycles Prohibited	R5-10b	2B.36	750x450 (30x18)	
Peds Prohibited	R5-10c	2B.36	600x300 (24x12)	
Walk on Left Facing Traffic	R9-1	2B.43	450x600 (18x24)	
Cross only at Crosswalks	R9-2	2B.44	300x450 (12x18)	
No Ped Crossing	R9-3a	2B.44	450x450 (18x18)	
No Hitch Hiking	R9-4	2B.43	450x600 (18x24)	
No Hitch Hiking (symbol)	R9-4a	2B.43	450x450 (18x18)	
Bicycles Yield to Peds	R9-6	9B.10	300x450 (12x18)	
Ped Traffic Symbol	R10-4b	2B.45	225x300 (9x12)	
School Advance Warning	S1-1	7B.08	900x900 (36x36)	School, Warning, Informational
School Bus Stop Ahead	S3-1	7B.10	750x750 (30x30)	
Pedestrian Traffic	W11-2	2C.41	750x750 (30x30)	
Playground	W15-1	2C.42	750x750 (30x30)	
Hiking Trail	I-4	--	600x600 (24x24)	

1. Larger signs may be used when appropriate.
2. Dimensions are shown in millimeters followed by inches in parentheses and are shown as width x height.
3. First dimension in millimeters; dimensions in parentheses are in inches.
4. All information in table taken directly from MUTCD.

Regulatory Signs



School, Warning, and Informational Signs

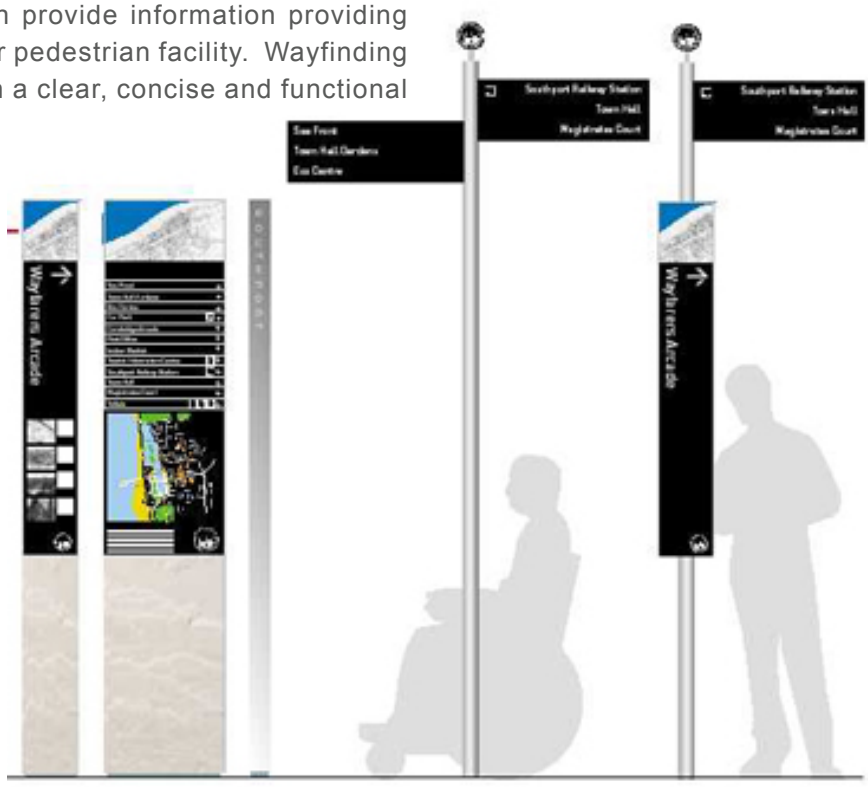


Warning signage is used to inform motorists and pedestrians of unexpected or unusual conditions. When used, they should be placed to provide adequate response times. These include school warning signs and pedestrian crossing signs3.

Informational and wayfinding signage can provide information providing guidance to a location along a trail or other pedestrian facility. Wayfinding signage should orient and communicate in a clear, concise and functional manner. It should enhance pedestrian circulation and direct visitors and residents to important destinations. In doing so, the goal is to increase the comfort of visitors and residents while helping to convey a local identity.

Maintenance of signage is as important as walkway maintenance. Clean, graffiti free, and relevant signage enhances guidance, recognition, and safety for pedestrians.

Below: Wayfinding signs promote aesthetics as well as provide important information (image from Stefton, UK: http://www.sefton.gov.uk



D.18 BRIDGES

Provisions should always be made to include a walking facility as a part of vehicular bridges, underpasses, or tunnels, especially if the facility is part of the Pedestrian Network. All new or replacement bridges, other than those for controlled access roadways, should accommodate pedestrians with wide sidewalks on both sides of the bridge. Even though bridge replacements do not occur regularly, it is important to consider these in longer-term pedestrian planning.

It is DOT bridge policy that within Urban Area boundaries (which are ambiguously defined as the “outer limits of potential urban growth”), sidewalks shall be included on new bridges with curb and gutter approach roadways with no controlled access. Sidewalks should not be included on controlled access facilities. A determination on whether to provide sidewalks on one or both sides of new bridges will be made during the planning process according to the DOT Pedestrian Policy Guidelines. When a sidewalk is justified, it should be a minimum of five to six feet wide with a minimum handrail height of 42”.

It is also DOT bridge policy that bridges within the Federal-aid urban boundaries with rural-type roadway sections (shoulder approaches) may warrant special consideration. To allow for future placement of ADA acceptable sidewalks, sufficient bridge deck width (typically 7.5’ for one side) should be considered on new bridges in order to accommodate the placement of sidewalks. The full Bridge Policy for DOT can be download as a Microsoft Word document at this address:

www.ncdot.org/doh/preconstruct/altern/value/manuals/bpe2000.doc

BRIDGE GUIDELINES:

- Sidewalks should be included on roadway bridges with no controlled access with curb and gutter approach in Urban Areas.
- Sufficient bridge deck width should be considered on new bridges with rural-type shoulder approaches for future placement of sidewalks.
- Sidewalk should be 5' to 6' wide.
- Minimum handrail height should be 42''

D.19 HIGH-INTENSITY ACTIVATED CROSSWALK (HAWK) SIGNAL



Above: HAWK signal.

The FHWA's Office of Safety Research recently completed a report on the High Intensity Activated Crosswalk (HAWK) — also known as the Pedestrian Hybrid Signal in the Manual on Uniform Traffic Control Devices (MUTCD). The HAWK is a pedestrian activated beacon located on the roadside and on mast arms over major approaches to an intersection. The HAWK signal head consists of two red lenses over a single yellow lens. It displays a red indication to drivers when activated, which creates a gap for pedestrians to use to cross a major roadway. The HAWK is not illuminated until it is activated by a pedestrian, triggering the warning flashing yellow lens on the major street. From the evaluation that considered data for 21 HAWK sites and 102 unsignalized intersections, the following changes in crashes were found after the HAWK was installed: a 29% reduction in total crashes, a 15% reduction in severe crashes, and a 69% reduction in pedestrian crashes. The HAWK is now an MUTCD approved device, so a request for experimentation is not necessary.

For more details, visit http://mutcd.fhwa.dot.gov/htm/2009/part4/part4f.htm
(Source: FHWA Office of Safety, Pedestrian Forum, Fall 2010)

D.20 BICYCLE FACILITIES

BICYCLE LANE

A bicycle lane is a portion of the roadway that has been designated by striping, signing, and pavement markings for the preferential and exclusive use of bicyclists. Bicycle lanes are always located on both sides of the road (except one way streets), and carry bicyclists in the same direction as adjacent motor vehicle traffic. The minimum width for a bicycle lane is four feet; five- and six-foot bicycle lanes are typical for collector and arterial roads (greater width is needed for bicycle lanes where traffic volume and speed are higher).

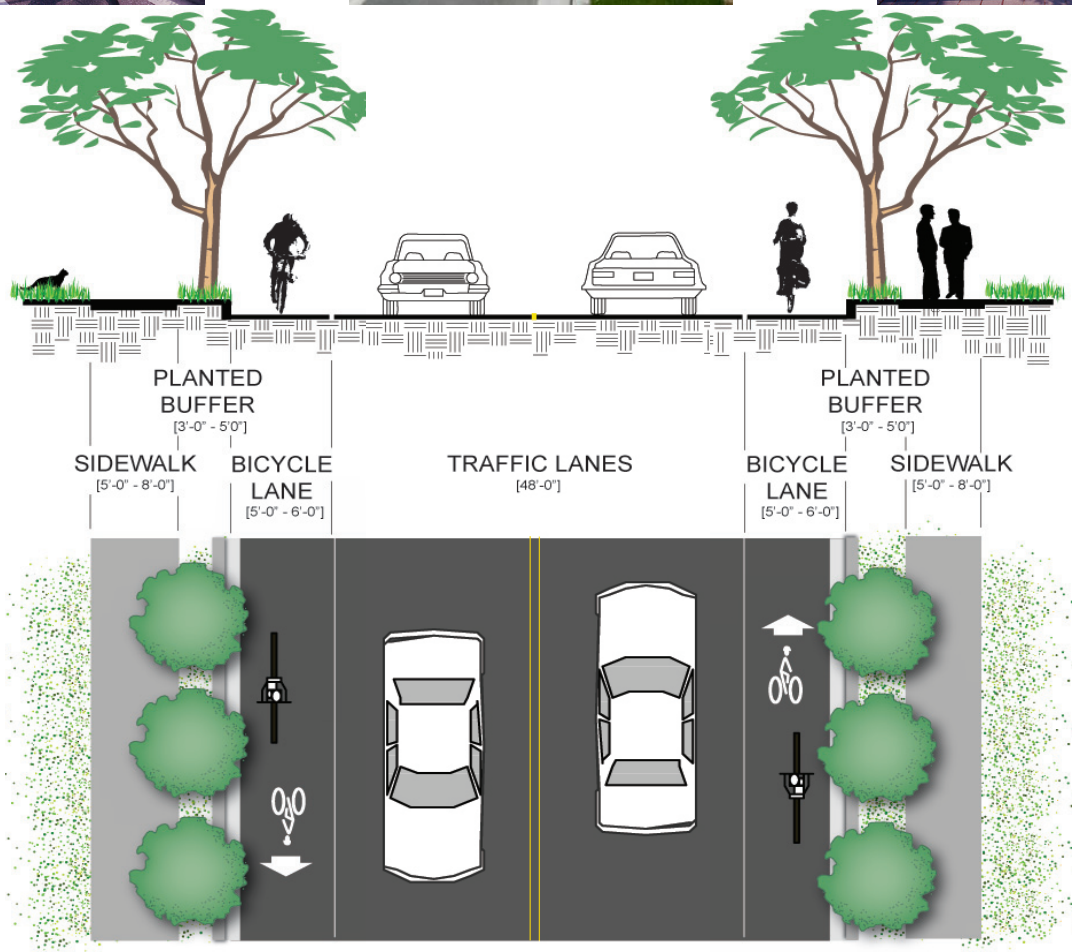
NCDOT recommends a bicycle lane width of:

- 6’ from the curb face when a gutter pan is present (or 4’ from the edge of the gutter pan)
- 4’ from the curb face when no gutter pan is present
- Should be used on roadways with 3,000 or more ADT
- Not suitable where there are a high number of commercial driveways
- Suitable for 2-lane facilities and 4-lane divided facilities





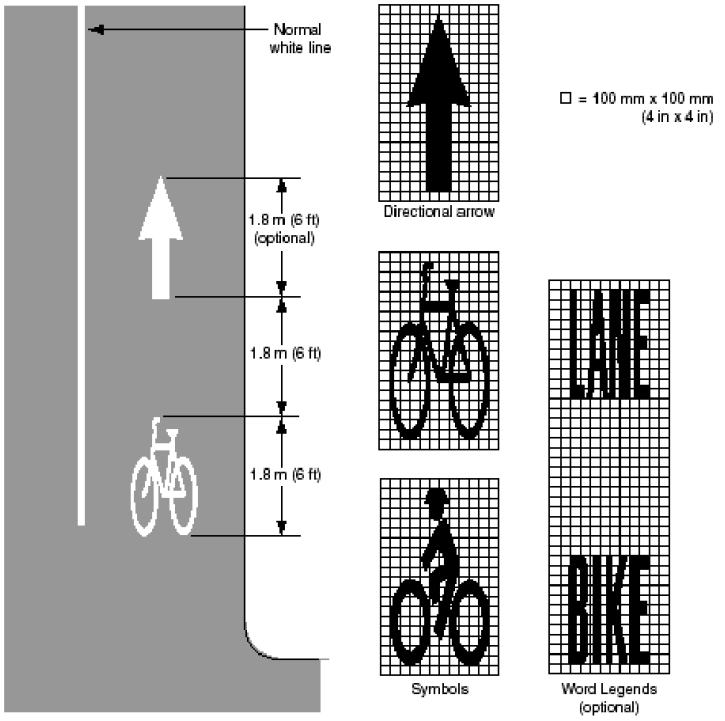




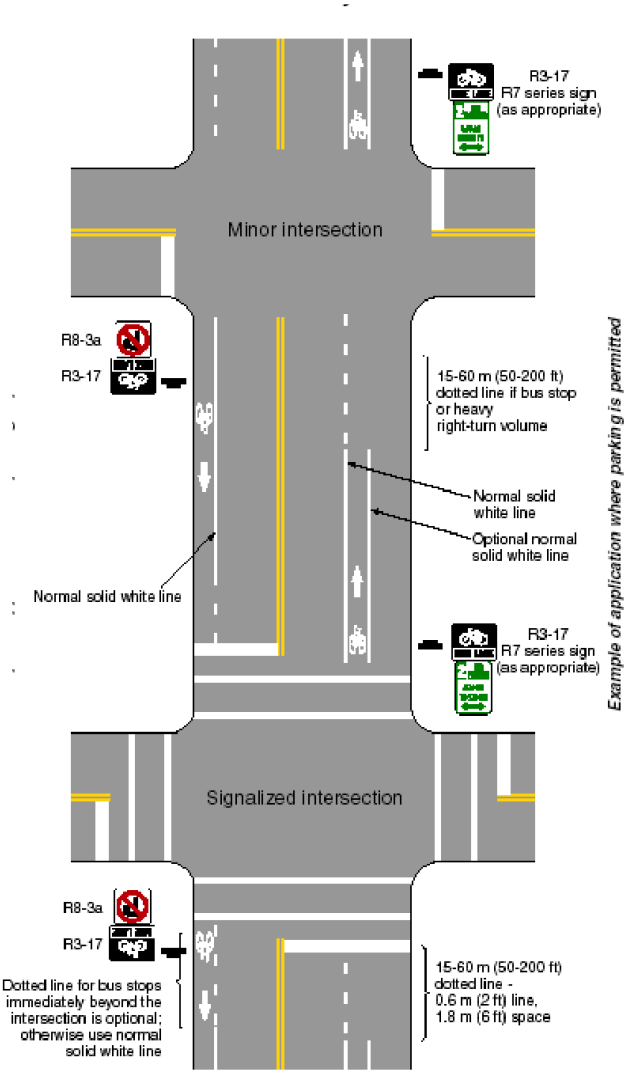
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TYPICAL PAVEMENT MARKINGS AND INTERSECTION CONFIGURATION FOR BICYCLE LANES

The Manual on Uniform Traffic Control Devices (MUTCD) provides guidance for lane delineation, intersection treatments, and general application of pavement wording and symbols for on-road bicycle facilities and off-road paths (http://mutcd.fhwa.dot.gov/pdfs/millennium/12.18.00/9.pdf).



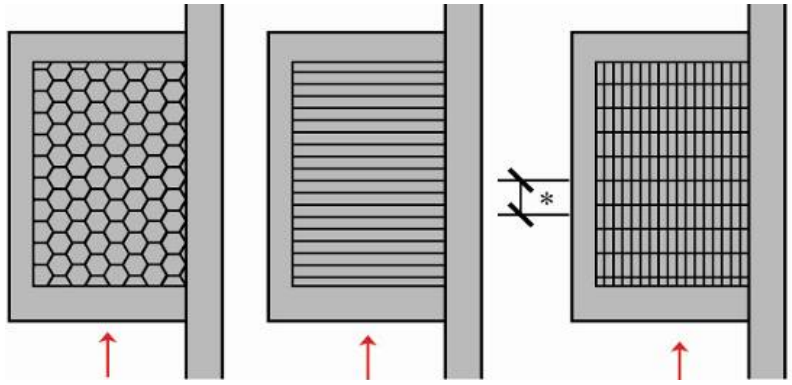
MUTCD examples of optional word and symbol pavement markings for bicycle lanes.



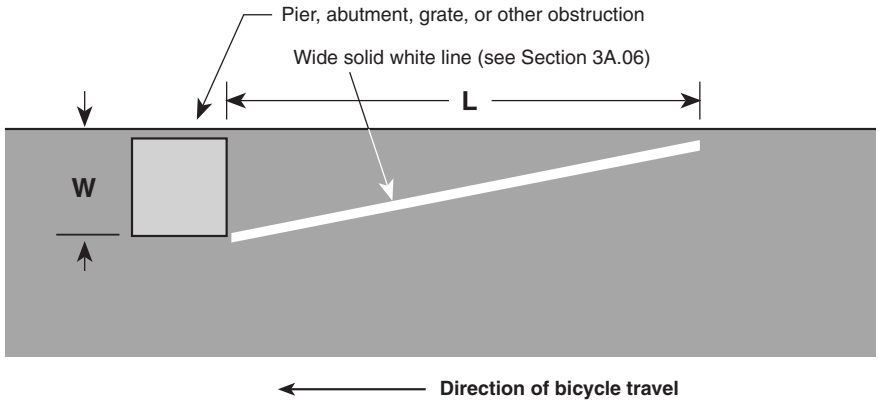
BICYCLE FRIENDLY DRAINAGE GRATES

Drainage grates usually occupy portions of roadways, such as bicycle lanes, where bicycles frequently travel. Often drainage grates are poorly maintained or are of a design that can damage a bicycle wheel or in severe circumstances, cause a bicyclist to crash. Improper drainage grates create an unfriendly obstacle a cyclist must navigate around, often forcing entrance into a motor vehicle lane in severe cases. Bicycle friendly drainage grates should be installed in all new roadway projects and problem grates should be identified and replaced.

Right: Bicycle Friendly Drainage Grate Designs



Right: MUTCD example of obstruction pavement marking; if dangerous drainage grates (or other obstructions) are not to be fixed in the short term, then this pavement marking should direct cyclists away from the obstruction.





Dangerous Drainage Grate Condition; this example is dangerous due to the grate running parallel to the roadway, creating a trap for bicycle tires.



Dangerous Drainage Grate Condition; this example is dangerous due to the surrounding paving condition (when the road was resurfaced the drainage grate remained at the same height).



Bicycle-Friendly Drainage Grate

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SHARED LANE MARKING

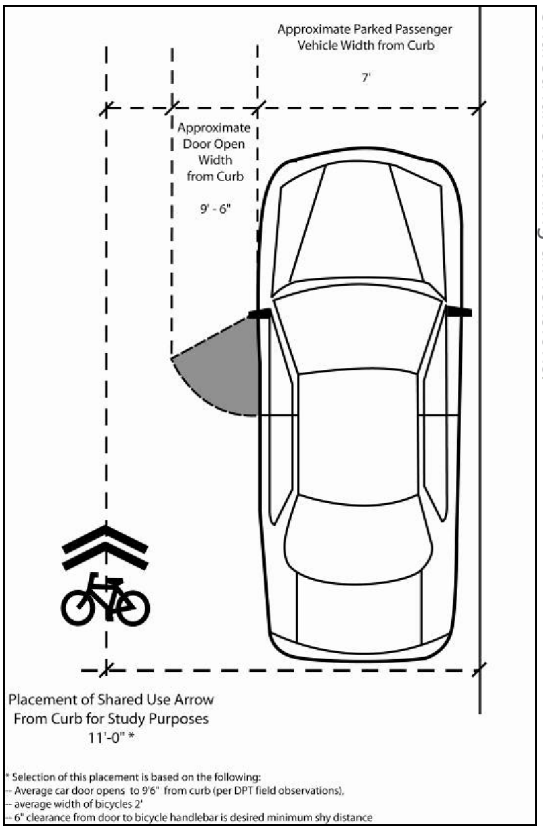
A bicycle shared lane marking (or 'sharrow') can serve a number of purposes, such as making motorists aware of bicycles potentially traveling in their lane, showing bicyclists the appropriate direction of travel, and, with proper placement, reminding bicyclists to bicycle further from parked cars to prevent "dooring" collisions. The shared lane marking stencil is used:

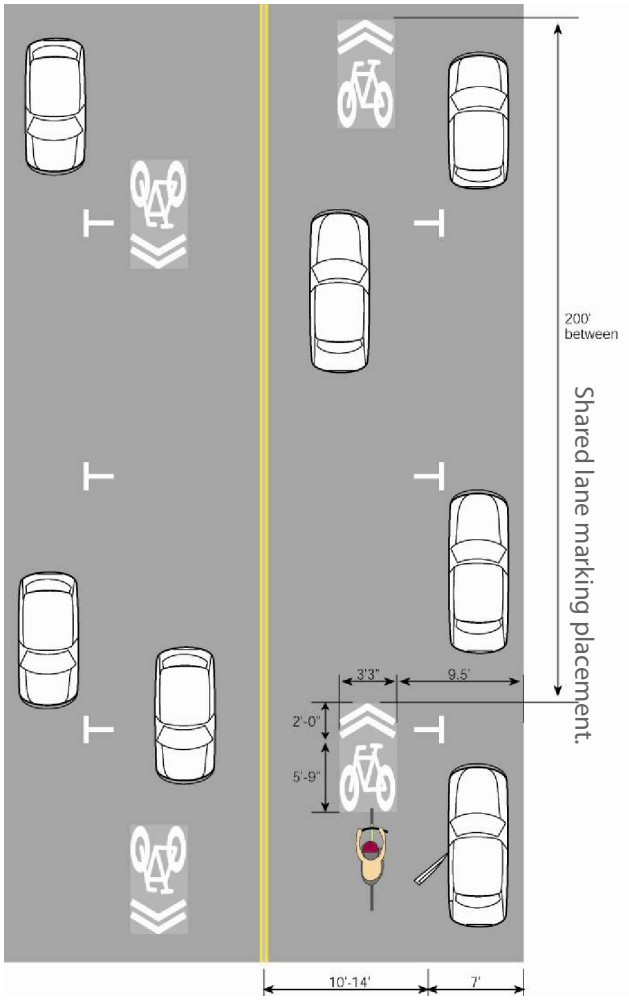
- Where lanes are too narrow for striping bicycle lanes
- Where the speed limit does not exceed 35 MPH
- With or without on-street parking

Cities such as Denver, San Francisco, Portland, and Los Angeles have effectively used this treatment for several years. As of this writing, the sharrow treatment is now included in the 2009/2010 update of the MUTCD. However, until official action is taken by the FHWA to finalize approval and adoption of shared lane markings in the next edition of the MUTCD, the use of these markings is still considered experimental. The markings are not authorized for use except under written experimental authorization by the FHWA.

Shared lane markings should also be considered for use on suburban roadway segments that connect bicycle lanes on either side, but do not have width for bicycle lanes.

It is recommended that shared lane markings be approached incrementally as a new facility treatment. Precedent studies and guidelines should be examined.









Shared lane markings installed on lanes that are too narrow for striping designated bicycle lanes.

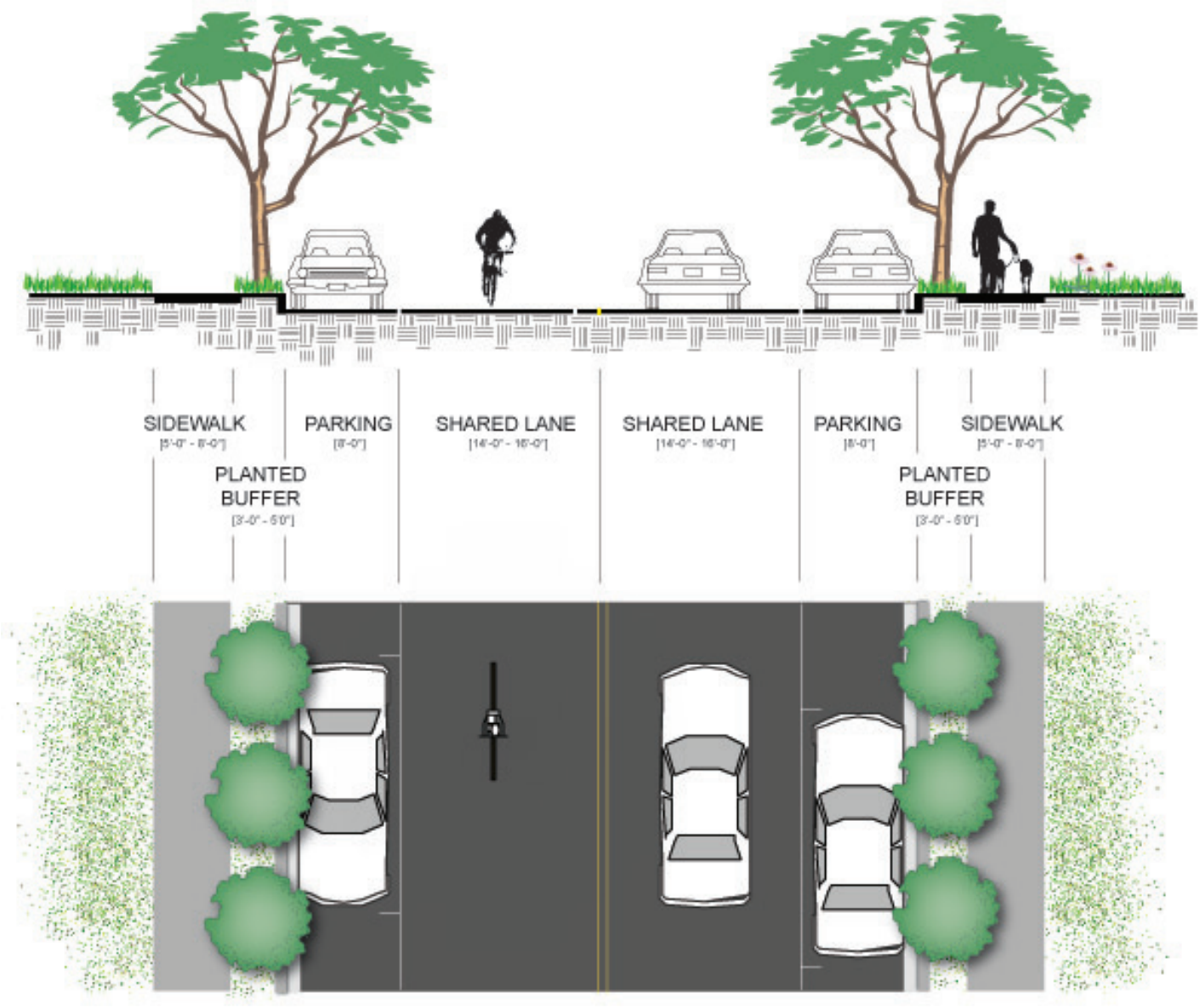
SIGNED/SHARED ROADWAY

• May either be a low volume (less than 3000 cars per day) roadway with traffic calming and signage to create a safe shared use environment, OR a higher volume roadway with wide (14') outside lanes.









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PAVED SHOULDER

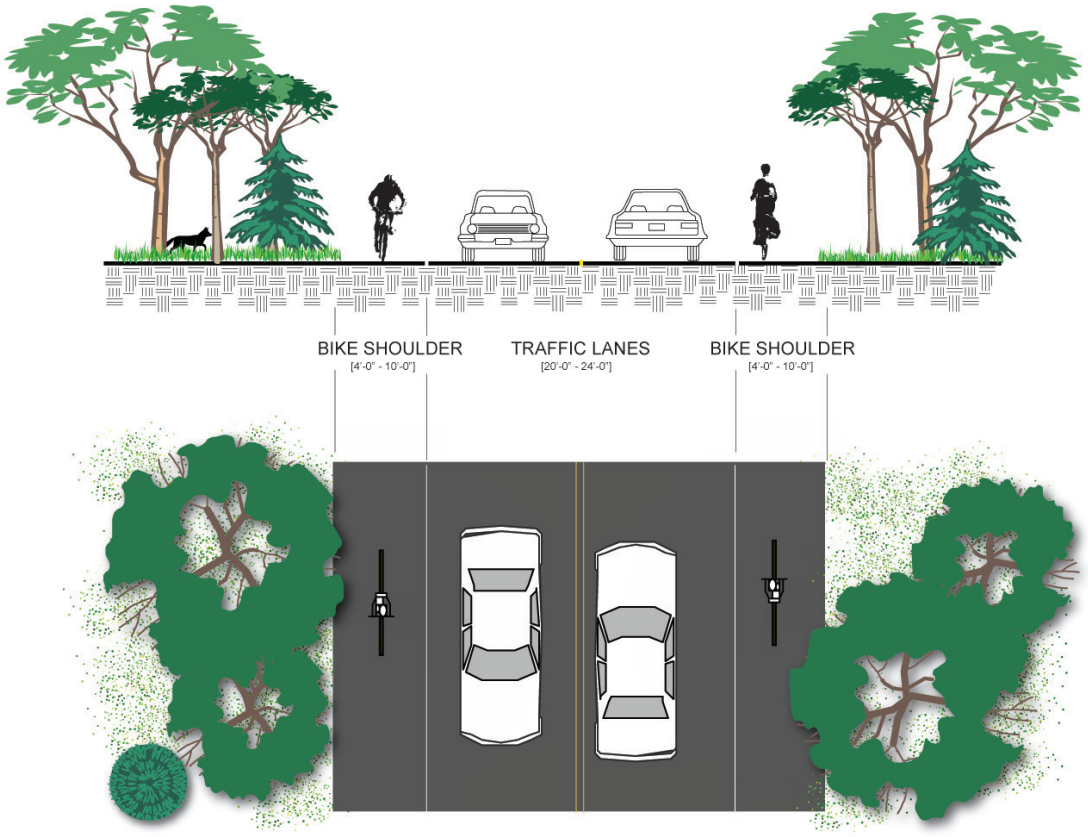
Paved shoulders are the part of a roadway which is contiguous and on the same level as the regularly traveled portion of the roadway. There is no minimum width for paved shoulders, however a width of at least four feet is preferred. Ideally, paved shoulders should be include in the construction of new roadways and/or the upgrade of existing roadways, especially where there is a need to more safely accommodate bicycles.

- Most often used in rural environments, although not confined to any particular setting
- Should be delineated by a solid white line, and provided on both sides of the road
- Should be contiguous and on the same level as the regularly traveled portion of the roadway
- 4' minimum width; however for speeds higher than 40 MPH with high ADT, a shoulder width of more than 4' is recommended.
- Rumble strips should be avoided, but if used, then a width of more than 4' is needed.
- Paved shoulders should not be so wide as to be confused with a full automobile travel lane









SIDEPATH

Multi-use paths located within the roadway corridor right-of-way, or adjacent to roads, are called 'Sidepaths'. Sidepaths are most appropriate in corridors with few driveways and intersections. Bicycle routes where side paths are recommended should also have adequate on-road bicycle facilities (such as paved shoulders or bicycle lanes), so that all types of users are accommodated.

- This type of facility works best in corridors where there are limited driveway/intersection crossings and more desirable destinations along one side of the roadway, or where no roadway space is available to provide bicycle lanes.
- A !0' minimum width is necessary on sidepaths for bicyclists to pass one another safely (12' for areas expecting high use)
- A 3-5' (preferably 6') vegetated buffer between the sidepath and the roadway should be provided where possible.
- Well-designed transitions from sidepaths to on-road facilities will direct bicyclists to the correct side of the roadway.



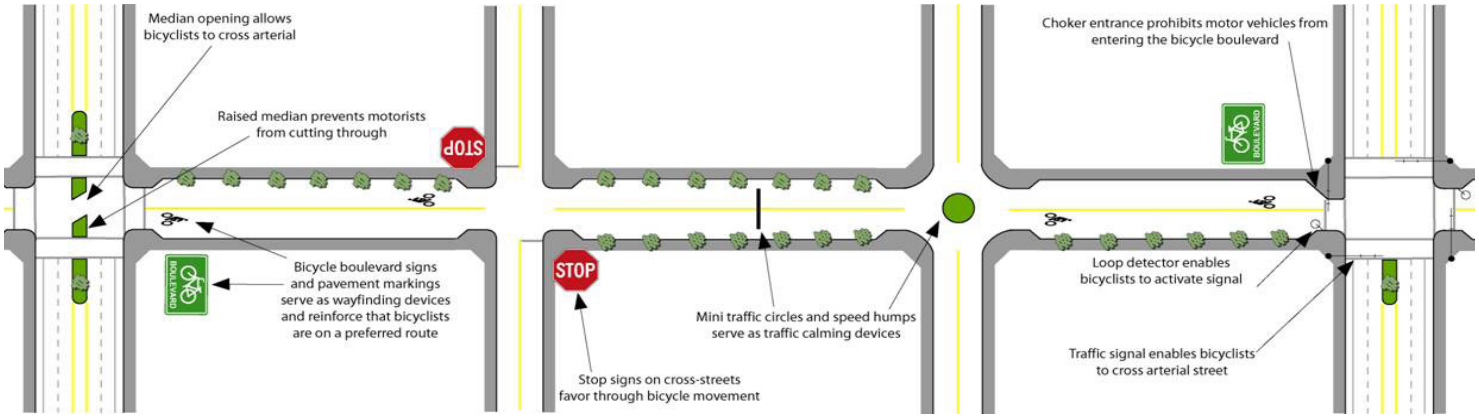


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BICYCLE BOULEVARDS

To further identify preferred routes for bicyclists, the operation of lower volume roadways may be modified to function as a through street for bicycles while maintaining local access for automobiles. Traffic calming devices reduce traffic speeds and through trips while limiting conflicts between motorists and bicyclists, as well as give priority to through bicycle movement.

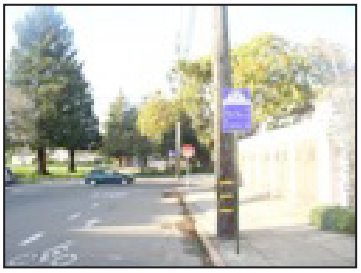
Bicycle boulevards are often located on roadways that parallel a major roadway.



A bicycle boulevard.







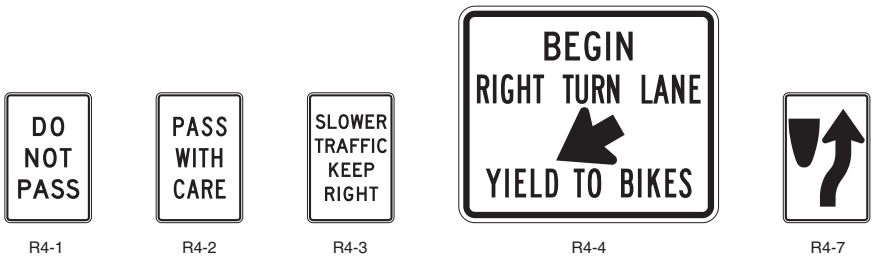
Bicycle boulevard route signs and/or pavement markings can be used to direct bicyclists.

BICYCLE REGULATORY/ WARNING SIGNS

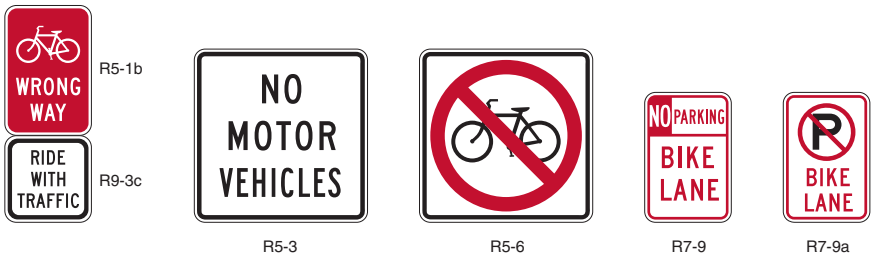
Regulatory and warning bicycle signage should conform to the Manual on Uniform Traffic Control Devices (MUTCD). The signs to the right are examples of regulatory signs for bicycle (their labels are sign reference numbers for the MUTCD).



R1-1 R1-2 R3-17 R3-17a R3-17b



R4-1 R4-2 R4-3 R4-4 R4-7



R5-1b R9-3c R5-3 R5-6 R7-9 R7-9a



SPECIAL PURPOSE SIGNAGE

The "Share the Road" sign (below), is designed to advise motorists that bicyclists are allowed to share and have the right to cycle on narrow roadways with motor vehicles. For more on the "Share the Road Initiative" go to: http://ncdot.org/transit/bicycle/safety/programs_initiatives/share.html

Innovative signage is often developed to increase bicycle awareness and improve visibility (such as 'Bicycles Allowed Use of Full Lane', bottom right).



Share the Road signs remind motorists that bicyclists have the right to ride on the roadway



The "Bicycles Allowed Use of Full Lane" sign is currently used on an experimental basis in several cities.

1. The Rack Element

Definition: **the rack element is the part of the bike rack that supports one bicycle.**



The rack element should:

- Support the bicycle upright by its frame in two places
- Prevent the wheel of the bicycle from tipping over
- Enable the frame and one or both wheels to be secured
- Support bicycles without a diamond-shaped frame with a horizontal top tube (e.g. a mixte frame)
- Allow front-in parking: a U-lock should be able to lock the front wheel and the down tube of an upright bicycle
- Allow back-in parking: a U-lock should be able to lock the rear wheel and seat tube of the bicycle

Comb, toast, school-yard, and other wheel-bending racks that provide no support for the bicycle frame are NOT recommended.

The rack element should resist being cut or detached using common hand tools, especially those that can be concealed in a backpack. Such tools include bolt cutters, pipe cutters, wrenches, and pry bars.



INVERTED "U"
One rack element supports two bikes.



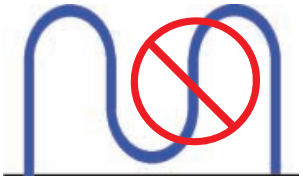
"A"
One rack element supports two bikes.



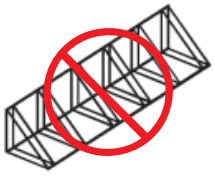
POST AND LOOP
One rack element supports two bikes.



COMB
One rack element is a vertical segment of the rack.



WAVE
One rack element is a vertical segment of the rack.
(see additional discussion on page 3)

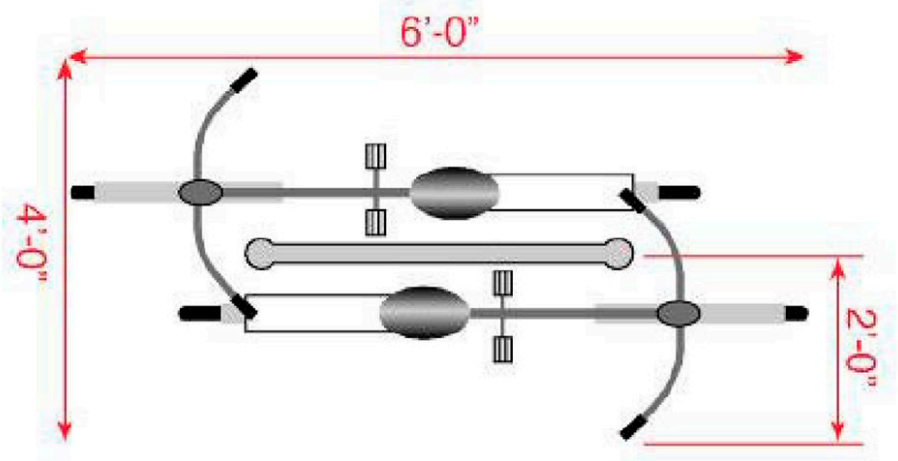


TOAST
One rack element holds one wheel of a bike.

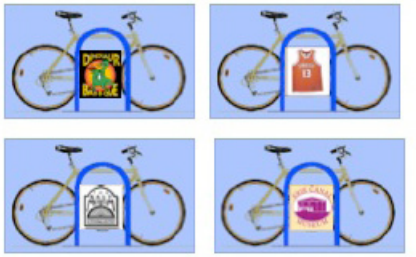


Not recommended

Recommended guidelines for bicycle parking from the Association of Pedestrian and Bicycle Professionals, 2002, www.apbp.org.



Custom Design



Bicycle racks that incorporate advertising can be sponsored by local merchants.



Provision of shelter from rain greatly increases usefulness of this bicycle parking facility during inclement weather.



A single inverted "U" rack can accommodate two bicycles.



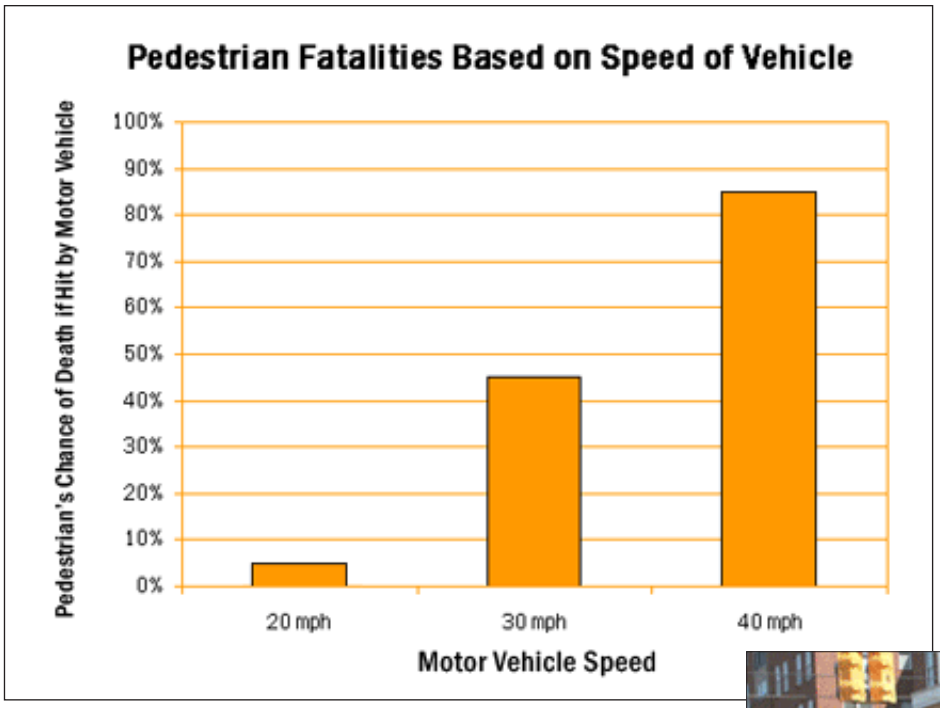
Example of a bicycle rack in Durham, NC, serving as a piece of utilitarian public art.

D.21 TRAFFIC CALMING TREATMENTS

Traffic calming is a procedure in which the arrangement of the street and its elements encourages slower traffic to ensure safe speeds. Typically, compliance with traffic control devices are optional but with the use of physical and visual cues that traffic calming introduces, drivers are forced to respond to the calming procedures.

Research on effective traffic calming in the U.S. suggests that traffic calming can effectively reduce the speed of vehicular traffic, decrease the number of automobile accidents, and contribute to noise reduction. Research also supports that the use of multiple traffic calming procedures will exponentially reduce the number of crashes.

The following pages describe typical traffic calming measures.



Above: Graph from Killing Speed and Saving Lives, U.K. Department of Transportation, London, 1987.

Right: Example of multi-modal intersection with traffic calming elements.





The curb extension makes motorist reduce speeds for turning and provides street parking.

CURB EXTENSIONS (BULB OUTS)

A curb extension (also known as a bulb out) is the additional sidewalk space allocated along the street as a traffic calming measure. By extending the curb, the street becomes more narrow to vehicular traffic thus slowing down traffic speeds. The curb extension also reduces the crossing distance for a pedestrian decreasing the time of a pedestrian in the street. The extension also improves the visibility of both motorist and pedestrians.

Curb extensions also prevent motorists from parking vehicles too close to crosswalks and curb ramps leaving the space open for pedestrian movement. Motor vehicles, parked too close to corners, present a threat to pedestrian safety, since they block sight lines, obscure visibility of pedestrians and other vehicles, and make turning particularly difficult for emergency vehicles and trucks.

Extensions to the curb are only recommended where parking exists. Curb extensions must not intervene with the adjacent drive lanes, bicycle lanes, or roadway shoulders. The turning needs of larger vehicles, such as school buses, need to be considered in curb extension design as well.



The curb extension narrows the width of the street and can be used in combination with crosswalk markings.

CHOKERS

Chokers are a design tool used to widen sidewalks or planting beds along vehicular corridors to decrease the width of the travel lane. By narrowing the street, effectively reducing the travel lanes by half of a lane width, the choker forces motorist to yield to each other and slow down. In order for this to function effectively, the width of the travel lane cannot be wide enough for two cars to pass. Sixteen feet is typically effective (and will permit emergency vehicles to pass unimpeded).

Chokers can be created by bringing both curbs in, or they can be done by more dramatically widening one side at a midblock location. They can also be used at intersections, creating a gateway effect when entering a street.



The choker produces a narrow passage for vehicular traffic.

This choker narrows the street from two lanes to one. Traffic is forced to slow down and, in some cases, wait for an approaching vehicle to pass before proceeding.



CROSSING ISLANDS (CENTER ISLANDS, PEDESTRIAN ISLANDS, MEDIAN SLOW POINTS)



Crossing islands allow pedestrians to be concerned with one direction of traffic at a time. The roadway markings in the design shown here also help make motorists aware that a pedestrian may be crossing.

Crossing islands are pedestrian refuge areas raised to curb height typically located in the center of street, intersections or midblock crossways. Center crossing islands protect pedestrians from vehicles and subsequently allow users to watch one direction of traffic at a time.

Where midblock or intersection crosswalks are installed at uncontrolled locations (i.e., where no traffic signals or stop signs exist), crossing islands should be considered as a supplement to the crosswalk. They are also appropriate at signalized crossings. If there is enough width, center crossing islands and curb extensions can be used together to create a highly improved pedestrian crossing.

Curb extensions may be built in conjunction with center crossing islands where there is street parking. Care should be taken to maintain bicycle access. Bicycle lanes must not be eliminated or squeezed in order to create the curb extensions or islands.



Crossing islands may be added to the middle of a street when the street is very wide.



Crossing island allows pedestrians to stop before completely crossing a road.

CHICANE

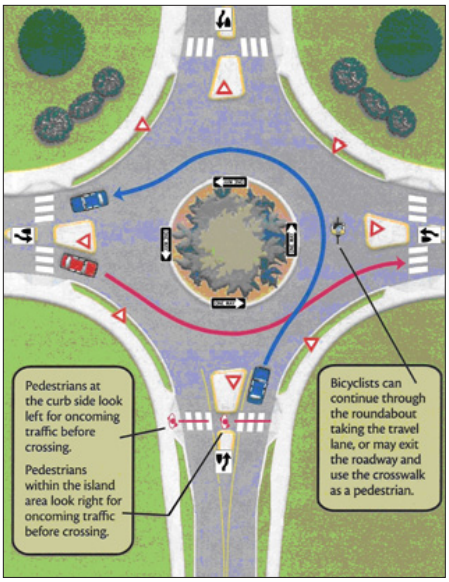
A chicane is a traffic method used to narrow and/or turn the roadway with the use of divergent paths and shifting parking lanes. When motorists are prevented from driving in a direct linear fashion, their speeds are normally reduced. Using chicanes is a successful way to force motorist to shift travel lanes and restrict direct forward movement. Shifts can be created by moving street parking from one side to the other or by building landscaped islands that gradually cause the motorist to maneuver the obstacles in order to continue progression.



A chicane on a one-lane road.



This chicane narrows the street to fewer lanes and requires traffic to move slowly.



Movement within a roundabout.



A traffic mini-circle helps reduce vehicle speeds, but still allows cars and emergency vehicles to pass through the intersection with little difficulty.

MINI CIRCLES (ROUNDABOUTS)

Mini-circles are traffic islands raised to curb height, located at the center of an intersection. The design of a mini-circle is intended to force motorists to reduce speed in order to turn in a circular motion. Drivers making left turns are directed to go on the far side of the circle prior to making the turn. Drivers going straight must go around the circle before proceeding. And drivers going right must yield to traffic that is in the mini-circle.

The center portion of the mini-circle is usually landscaped with various plant materials that allow motorists and pedestrians clear sights to all sides of the intersection. In locations where landscaping is not feasible, traffic circles can be enhanced through specific pavement materials.

Mini-circles are designed to slow traffic but because they do not have the capability of controlling right turns at the intersection, pedestrians and cyclists do encounter potential risk. In order to compensate for this risk, right curb radii should complement this treatment to discourage high speed right turn maneuvers. Large vehicles (i.e. delivery and fire trucks) can be accommodated with a roll-curb on the mini-circle.

Cyclist and pedestrian needs can also be accommodated by moving crosswalks away from the mini-circle to a mid-block crossing or next intersection.



Roundabouts (and other circular intersection types) allow for landscaping, monuments, and other aesthetic uses within the central island.



Vehicles entering the roundabout give way to vehicles in the roundabout.

SPEED HUMPS

Speed humps are 3”-4” raised mounds that extend the width of the street to deter motorists from excessive speeds. Speed humps should not be confused with the speed “bump” that is often found in mall parking lots. Generally, speed humps are 12” to 14” in height and span the width of the road. The length and height of the speed humps determine the speed at which traffic will travel over the devices. Shorter lengths and greater heights slow cars most drastically.

The traditional 12” hump has a design speed of 15 to 20 mph, a 14” hump a few miles per hour higher, and a 22” table has a design speed of 25 to 30 mph. The longer humps are much gentler for larger vehicles.

A warning sign notifies motorists before humps. Humps generally have pavement markings to enhance visibility and a taper edge near the curb to allow a gap for drainage.





Speed humps are used on streets to reduce speed, causing motorists to slow down.

D

RAISED INTERSECTION

A raised intersection is a speed table that spans the area of the entire intersection. Each side of the intersection has a ramp for the vehicle approach, which elevates the entire intersection to the level of the sidewalk. They can be built with a variety of materials, including asphalt, concrete, stamped concrete, or pavers. The crosswalks on each approach are also elevated as part of the treatment to enable pedestrians to cross the road at the same level as the sidewalk, eliminating the need for curb ramps. Use detectable warnings to mark the boundary between the sidewalk and the street.



A raised intersection slows all vehicular movements through the intersection and improves pedestrian crossings in all directions.



The raised intersection above enhances the pedestrian environment at the urban crossings.



Raised intersections, like the one above, reduce vehicle speeds at busy intersections.

RAISED PEDESTRIAN CROSSING

A raised pedestrian crossing is also a speed table, with a flat portion the width of a crosswalk, usually 10' to 15'. Raised intersections and crosswalks encourage motorists to yield to the vehicular ramp and elevated pedestrians.



A raised pedestrian crossing provides a continuous route for the pedestrian at the same level as the sidewalk. Pavement markings may be used on the slope to make the crossing visible to motorists.



The raised crosswalk helps reduce vehicle speeds and the measures tend to have a predictable speed reduction solution.

SPEED TABLE

A speed table is a broad portion of a speed hump, used as a pedestrian crossing. The speed table can either be parabolic, making it more like a speed hump, or trapezoidal, which creates the flat table like surface. Speed tables can be used in combination with curb extensions where street parking exists.



The speed table (above) causes less of a delay than humps and are typically preferred by fire departments over speed humps.



The speed table design (above) allows cars to pass without slowing as significantly as with speed humps.

D

GATEWAYS

A gateway is a physical landmark that indicates a change in environment from a higher speed major roadway to a minor road (lower speed district). Gateways can include different traffic calming techniques such as of street narrowing, medians, signing, archways, roundabouts, or other identifiable features. Gateways reveal to motorist that an area of slower speeds has been reached. This can help achieve the goal of meeting expectations and preparing motorists for a different driving environment. Gateways are only an introduction and slower speeds are not likely to be maintained unless the entire area has been redesigned or other traffic-calming features are used.



Gateways produce an expectation for motorists to drive more slowly and watch for pedestrians when entering a commercial, business, or residential district from a higher speed roadway.

Creative gateways help establish a unique image for an area.



LANDSCAPING

Landscaping along the corridor can work as a buffer to separate pedestrians from vehicles, reduce the visual width of the roadway (which encourages slower speeds), and provide an aesthetic appeal to the street. This can include a variety of trees, bushes, and/or flowerpots, which can be planted in the buffer area between the sidewalk or walkway and the street.

Choosing appropriate plants, providing adequate space for maturation, and preparing the ground can help ensure that the plants survive with minimal maintenance and don't buckle the sidewalks as they mature. The following guidelines should be considered: plants should be adapted to the local climate and fit the character of the surrounding area—they should survive without protection or intensive irrigation; and the plant's growth patterns should not obscure signs or pedestrians' and motorists' views of each other.



The landscaping enhances the street environment.



The landscaping on this street calms traffic by creating a visual narrowing of the roadway.



Landscaping with low shrubs, ground cover, and mature trees that are properly pruned can add shade, color, and visual interest to a street.

D

PAVING MATERIALS

Paving materials are important to the function and look of a street, both in the road and on the sidewalk. Paving materials can also increase crosswalk visibility and act as a physical traffic calming device when using paved brick or cobblestone. Textured crosswalks should be marked with reflective lines since these types of crosswalks are not as visible, especially at night or on rainy days.

Smooth travel surfaces are best for all pedestrians. The pedestrian path material should be firm, planar, and slip-resistant. Concrete is the preferred walking surface. A different look can be achieved by using stamped concrete or concrete pavers, which are available in a variety of colors and shapes. Colored paving can often enhance the function of portions of the roadway, such as a colored bicycle lane. This can create the perception of street narrowing, in addition to enhancing the travel facility for bicyclists.



Brick or cobblestone streets help slow traffic and create a feeling that the street is not a highway or fast-moving arterial.

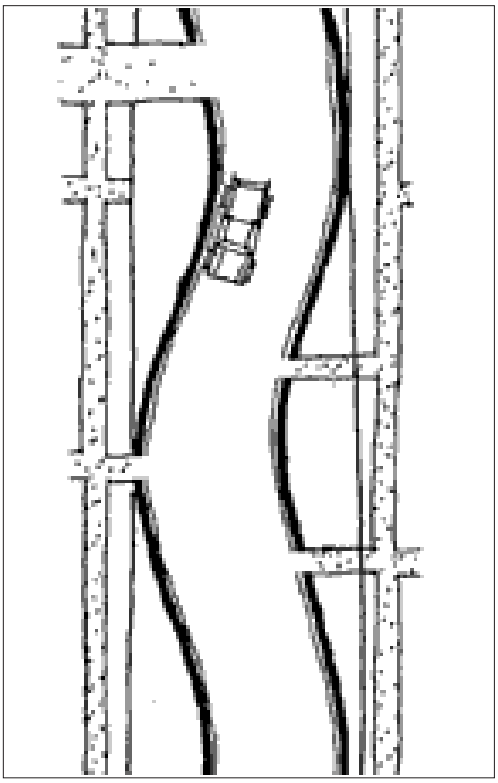


This paving creates an aesthetic enhancement to the street.

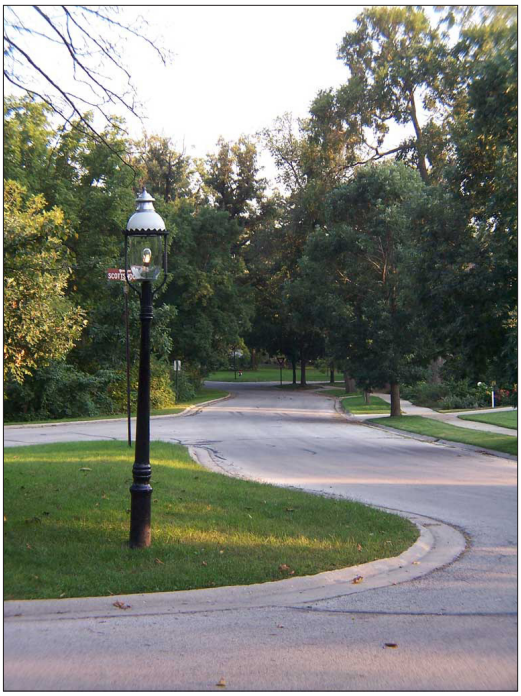
SERPENTINE DESIGN

Serpentine roadway design is when a street is aligned in a wave fashion to shift traffic left and right with the use of built-in visual enhancements. This allows movement but forces vehicles to reduce speed. The opportunities for significant landscaping can be used to create a park-like atmosphere.

Such designs are usually implemented with construction of a new neighborhood street or during reconstruction of an existing street corridor. This type of design can be more expensive than other traffic-calming options and needs to be coordinated with driveway access.



The serpentine design changes the entire look of a street to send a message to drivers that the road is not for fast driving.



The serpentine street is a curving roadway that helps slow traffic through the use of curbs and landscaping.



The opportunities for significant landscaping can be used to create a park-like atmosphere.

D

WOONERF

A woonerf ("Street for living") is a Dutch term for a common space created to be shared by pedestrians, bicyclists, and low-speed motor vehicles.

They are typically narrow streets without curbs and sidewalks. Vehicles are slowed by placing trees, planters, parking areas, and other obstacles in the street. Motorists become the intruders and must travel at very low speeds below 10 mph. This makes a street available for public use that is essentially only intended for local residents. A woonerf identification sign is placed at each street entrance.

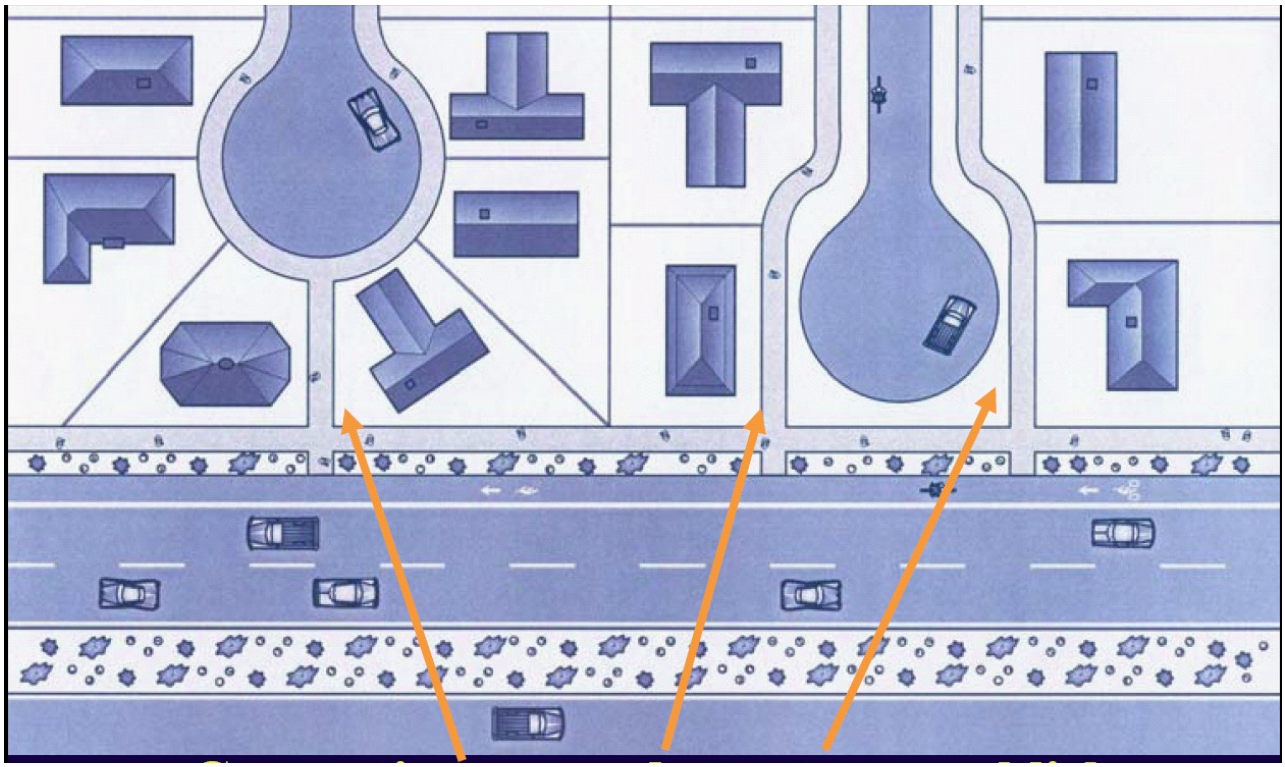
Consideration must be given to provide access by fire trucks, sanitation vehicles and other service vehicles if needed.



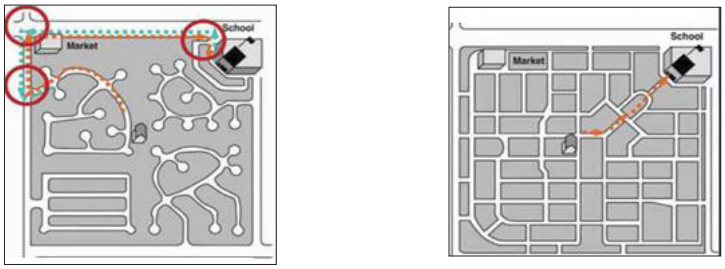
Motorists, cyclists, and pedestrians share the space on this woonerf or living street.

D.22 LAND USE AND PEDESTRIAN TRAVEL

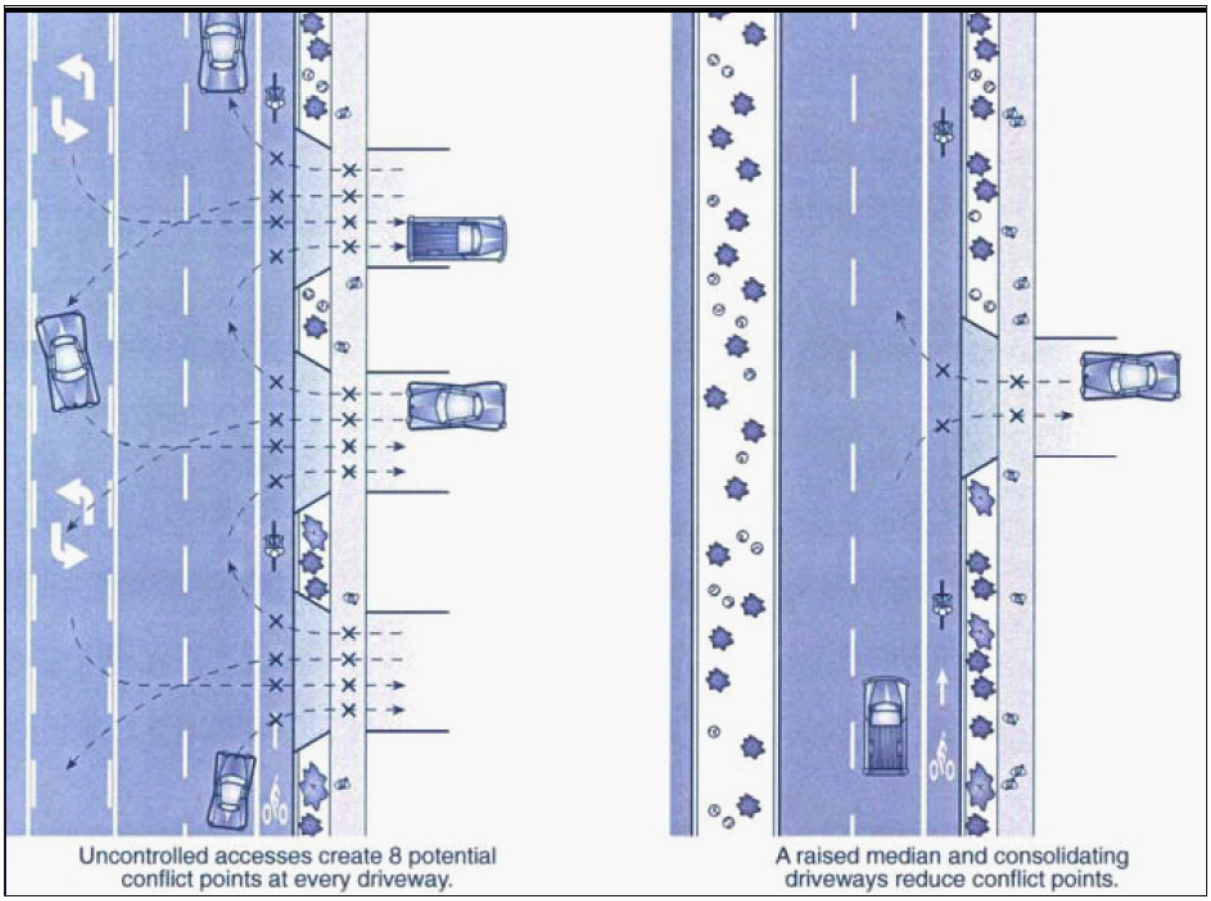
The land use and development environment plays a major role in the walkability of an area. The following are brief examples of the importance of connectivity, not only along corridors and across roadways, but also between neighborhoods and into commercial sites.



The above example shows the effectiveness of connecting a traditional cul-de-sac neighborhood to a collector or arterial road.



The above example communicates the difference between a connected street and pedestrian network (on right) versus separated cul-de-sac neighborhoods. A person living in the scenario to the left will have a longer trip to school and will likely be forced to travel by automobile. A person living in the scenario on the right could walk to school safely and easily. This scenario, used consistently, would significantly reduce traffic.



Driveway access management is a key issue throughout the United States. A high number of driveway accesses and/or wide driveway accesses create more conflict points between motorists, bicyclists, and pedestrians. Every effort should be made to retrofit and build new development with the goal of achieving the scenario to the right.



Pedestrian connectivity is critical not only between destinations but within destinations. The example shown above shows an excellent commercial area with clear pedestrian pathways of travel.