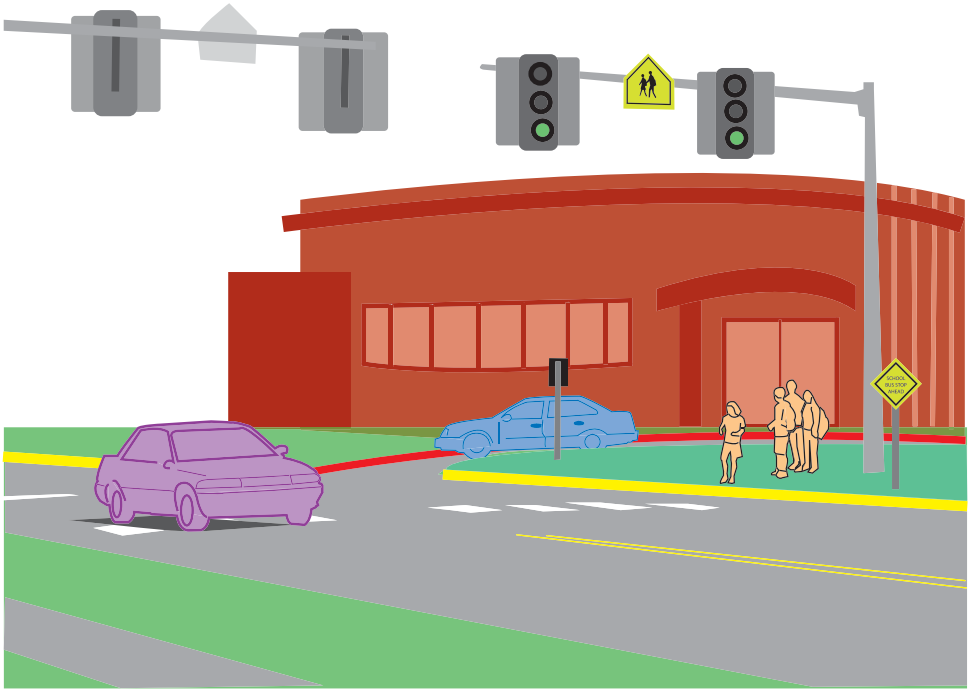
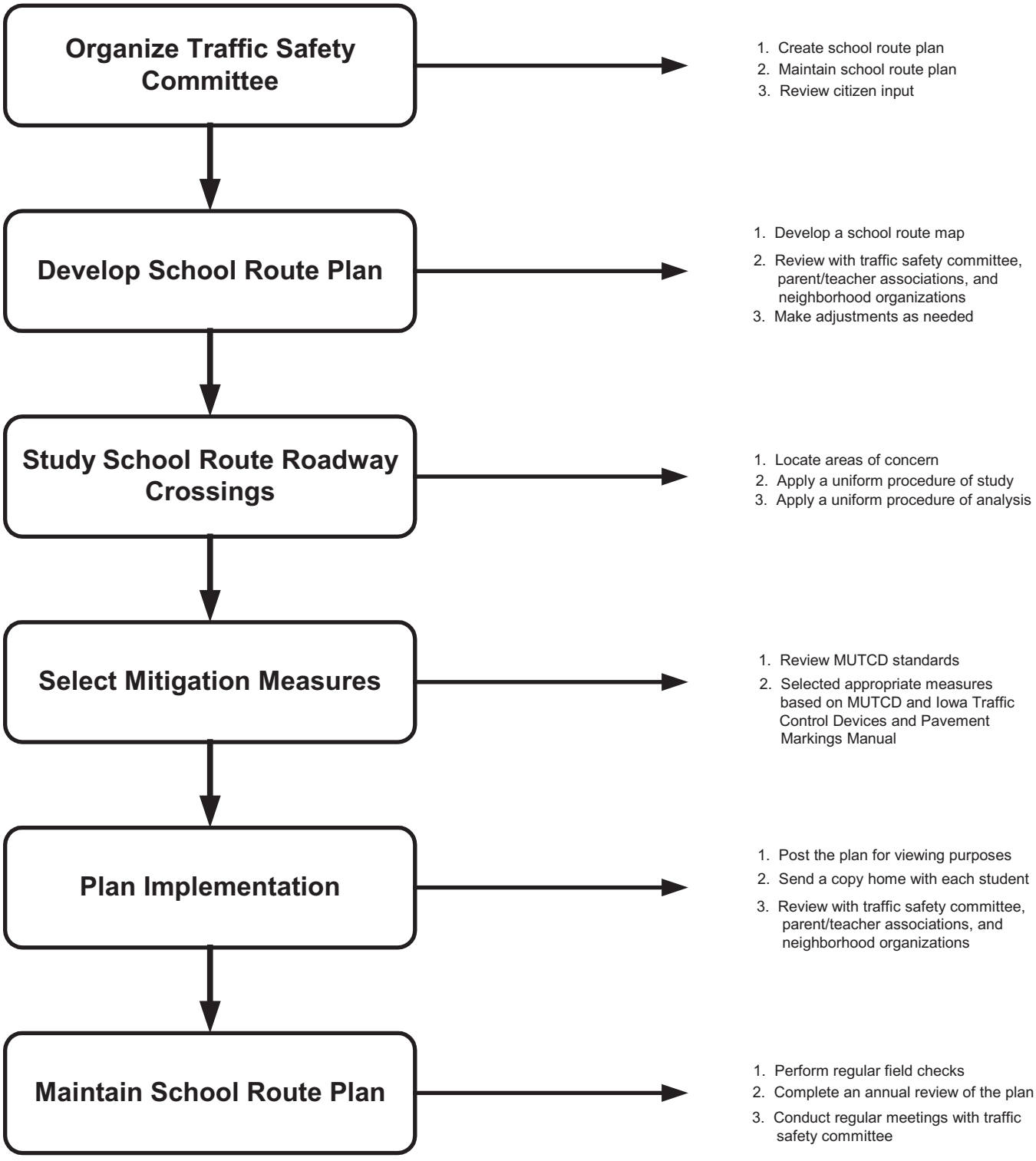
School Zone 6 Program



School Zone Program



INTRODUCTION

School zone safety is one of the most pressing, controversial, and emotional concerns that elected officials, traffic engineers, city staff, school officials, and enforcement agencies are faced with. Pedestrian and bicycle safety depends upon public understanding of accepted methods for traffic control. This understanding becomes extremely important in a school zone. School children and motorists cannot be expected to navigate safely in school zones unless they understand the need for traffic control devices and how these controls function for their mutual benefit.

The following facts may be considered in the developmental stages of a school zone program (MUTCD 2001):

- Analysis shows that at many locations school crossing controls requested by parents, teachers, and other citizens are unnecessary and costly and tend to lessen the respect for controls that are warranted.

- Pedestrian safety depends in large measure upon public understanding of accepted methods for efficient traffic control.

- Non-uniform procedures and devices cause confusion among pedestrians and vehicle operators, prompt wrong decisions, and can contribute to accidents.

- The type of school area traffic control used, either warning or regulatory, must be related to the volume and speed of traffic, roadway width, and the number of children crossing.

Note that the school zone program described here does not serve to select the device or solution for a particular situation. Instead, a procedure is outlined for logical selection of locations where school zone safety concerns exist. Engineering judgment is applied to the process of selecting a uniform approach.

RESPONSIBILITY FOR THE SAFETY OF SCHOOL PEDESTRIANS

The responsibility to provide safe walking and biking conditions and to develop self-reliance and safe habits among children is shared by parents, school authorities, government agencies, and the children themselves. Parents hold the basic responsibility of their children walking and biking to and from school. School and traffic officials work to provide the appropriate traffic control devices. Without the full cooperation of the parents, the program may not be successful. Parents are obligated to understand traffic regulations and control measures and to make sure their children also understand them (Des Moines Safety Council 1997). By their example, parents are the greatest influence in their child's development of safe and self-reliant actions.

KEY STEPS TO A SCHOOL ZONE PROGRAM

Development of a school zone program includes six key steps (ITE 1988):

1. Organize a traffic safety committee.
2. Develop a school route plan.
3. Configure the school site.
4. Consider other relevant elements.
5. Select mitigation measures (not within the scope of the handbook).
6. Distribute and maintain school route plan.

Organize a Traffic Safety Committee

The traffic safety committee is a key tool to aid in the development and maintenance of a school zone safety program. The traffic safety committee should be composed of government and school board officials who have the authority, interest, and ability to get things accomplished. A jurisdiction's traffic engineer, the chief of police, and school representatives should be official members. The manager of the local safety council, the presidents of parent-teacher associations (PTAs), and representatives of other interested organizations can also serve on the committee.

The duties of the committee are to guide and coordinate all activities connected with the school zone safety program. These activities may include the following (ITE 1988):

- Establish policies and procedures within the program.
- Develop a school route map.
- Review and approve the various phases of the school traffic safety program.
- Review and handle complaints and requests from citizens.
- Establish priorities on projects to administer.
- Promote good public relations.
- Take immediate action to correct emergency school traffic safety concerns.

Develop a School Route Plan

The school traffic safety committee should take the lead to develop a suggested school route plan for schools serving elementary and kindergarten students. Many kinds of existing information may be necessary to develop the plan. The school principal, the PTA, or any organized citizen group involved in public safety may provide information pertaining to the following items:

- student walking areas
- safety patrol and/or crossing guard locations
- locations of concern
- school hours

The school route plan should include a map that shows the following (see Figure 6.1; ITE 1988):

- the school
- nearby roadways
- existing traffic control devices
- the suggested school route for children to follow

The following criteria may be considered when developing a school route plan (ITE 1988):

- The school route plan should be designed to provide maximum protection to the children at a minimum cost to the taxpayer.

- School route plans should be designed to take advantage of existing of traffic control devices.

- School children should be thoroughly instructed by the schools and parents on the purpose and proper use of the school rout plan. Each child should be provided with a copy of the map showing the school route plan.

- Special precautions should be taken in those areas where unusual conditions exist that create problems for school children.

The following factors may be considered when determining the feasibility of requiring children to walk a longer distance to a location with existing traffic control: the availability of adequate, safe sidewalks or off roadway sidewalk areas to and from the location with existing control; the number of children using the crossing; the age levels of the children using the crossing; and the total extra walking distance (MUTCD 2001).

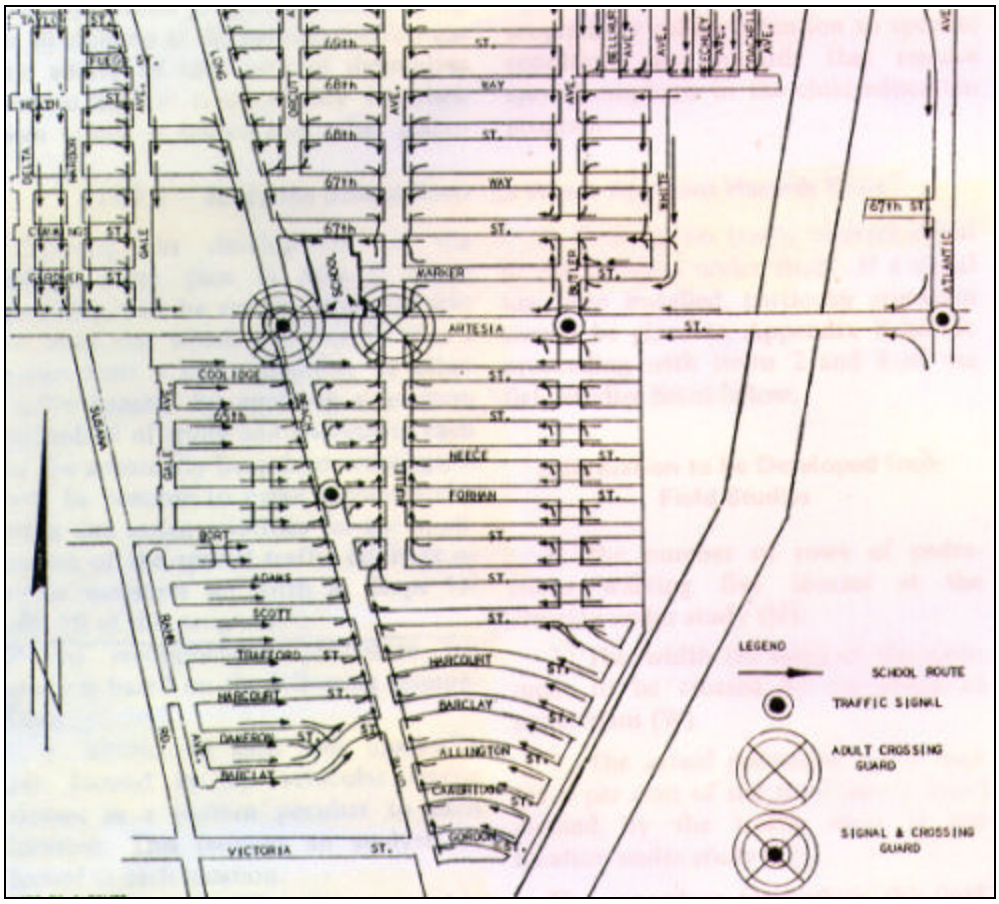


Figure 6.1. Example School Route Plan

The ideal uses and functions of the school route plan map are as follows (Bismark 1986):

- to guide children and avoid roadside and intersection hazards
- to provide for the most effective use of protective measures such as traffic control signals, stop signs, pavement markings, and sidewalks
- to minimize the number of crossings on major traffic roadways
- to maximize the use of existing sidewalks and roadways that have wide smooth shoulders
- to choose roadway crossings with adequate sight distance
- to provide a basis for engineering studies of school related traffic control devices
- to indicate priorities for sidewalk construction

Configure the School Site

Figure 6.2 is an example school site configuration. This site was reconstructed some years after the initial construction was completed. The purpose of the reconstruction was to provide a higher level of safety. The school site was designed to separate staff and visitor parking (bottom left) from the student drop off and pickup area (top left). As shown, the arterial roadway (off the school site) in front of the school is designed for student drop off and pickup. The only parking that is allowed in the access driveway on the school site is for school buses (bottom right) and handicapped individuals (top right). There is a wide sidewalk between the school building and the access driveway to allow students to move freely.

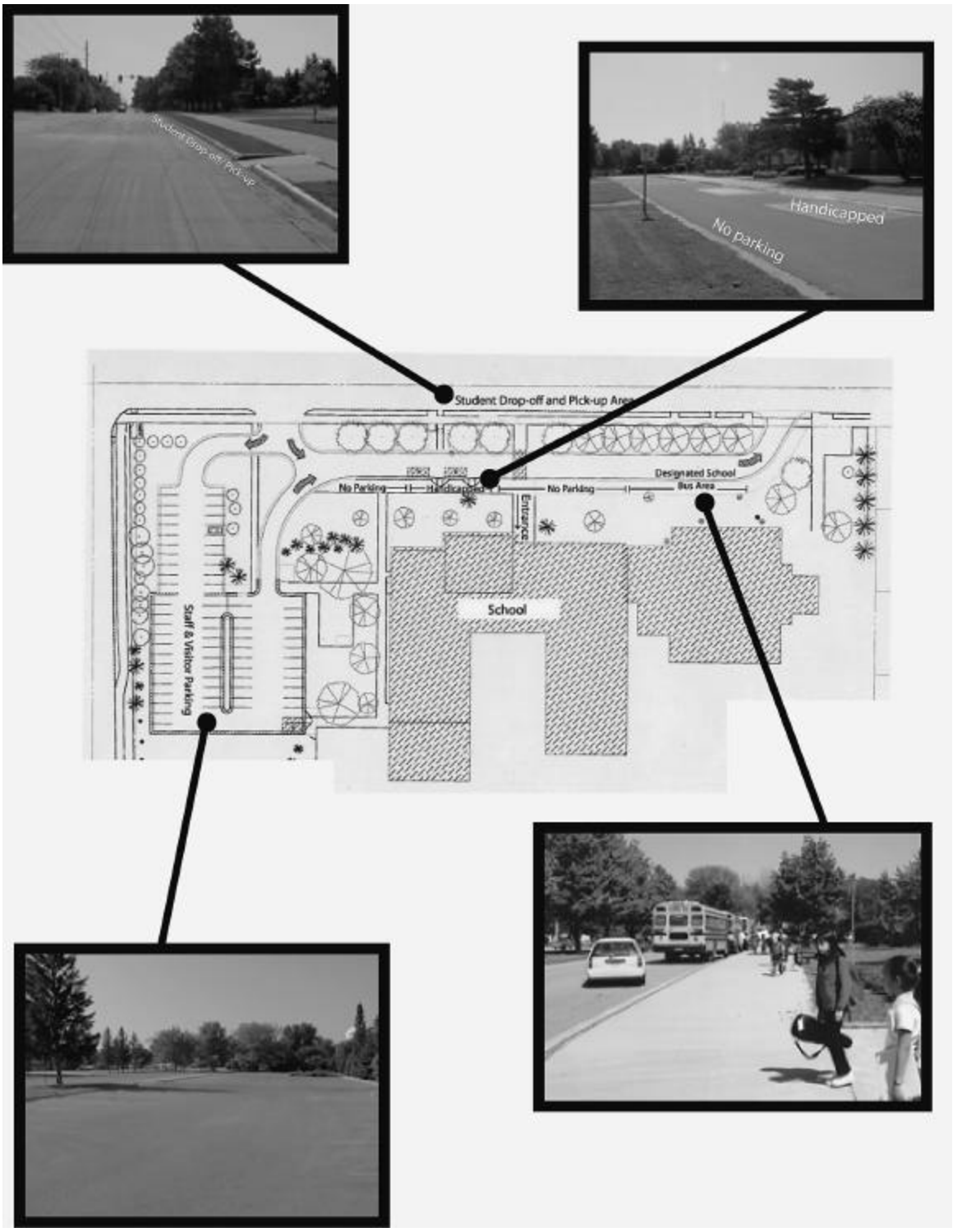


Figure 6.2. Example School Site Configuration

Consider Other Relevant Elements

A school zone safety program may also consider the following relevant elements:

- school bus operations
- school crossings where concerns have been expressed
- appropriate traffic control devices or assistance measures

School Bus Operations

The safe and efficient management of bus transportation of students is a critical element of a school zone safety program. Although school buses are not involved in a large number of traffic crashes, they are important because of their size, limited maneuvering characteristics, and the site restriction they create.

It is important to establish school bus routes that provides safe, efficient, and economical transportation of students. Bus stops should be designed to provide the safest location for stopping the bus and loading or unloading students. This includes the bus stop(s) located at/on a school site. A safe sight distance of approaching vehicles is one of the critical elements of providing a safe bus stop. Children need this critical sight distance for crossing the street safely.

The following information may be helpful in establishing school bus routing (Missouri Safety Center 1996):

- the location of students' residences
- the grade and age of students to be transported
- the type and condition of roads
- the standard of service required
- the funds available for transportation service
- the general safety of all routes in relation to hazards such as hills, intersections, railroad crossings, bridges, sharp curves, and obstructions to sight distance
- the safety of loading/unloading stops in relation to visibility of approaching vehicles
- the walking distance to the bus stop in relation to the age of the student

School Crossings Where Concerns Have Been Expressed

During the development of the school route plan, a school route may cross a major roadway. By applying a uniform procedure of study and analysis to each crossing, it is possible to make recommendations and assign priorities for the application of traffic control devices or other measures.

For information regarding the procedure for making field studies for an analysis at a location where concerns have been expressed, refer to *A Program for School Crossing Protection* (ITE 1988). The recommended procedure for study is based on the following assumptions:

- Alternating gaps and blockades are formed in the vehicular traffic stream in a pattern related to each location. This requires an analysis of the concerns at each location.

- Pedestrians will wait a reasonable time for an adequate gap in traffic before crossing a roadway.

Appropriate Traffic Control or Assistance Measures

There are several specific standard guidelines and warrants for the application of signs, markings, and signals that would ordinarily be installed on roadways near school sites. To obtain these detailed guidelines, refer to Part 7 (Traffic Controls for School Areas) of the *Manual for Uniform Traffic Control Devices* (MUTCD 2001). Some example traffic control devices and assistance measures are given here. Note: the decision to use a particular device at a particular location should be made on the basis of an engineering study.

Signs. Uniformity of the physical characteristics of signs is critical in school areas. Consequently, the removal of any nonstandard signs should carry a high priority. Signs that are associated with school areas include "School Crossing," "School Bus Stop Ahead," "School Speed Limits," "End of School Zone," and "Flashing Yellow Breakers" signs. See Figure 6.3.



Figure 6.3. School Site Signs

Markings. Markings have definite and important functions in a proper school area traffic control plan. Markings may be used to supplement the regulations and warnings provided by other devices such as traffic signs or signals. Markings can also be used on their own to produce results that cannot be obtained from any other device. See Figure 6.4.



Figure 6.4. School Site Markings

Crosswalks. Crosswalks are marked when there is a need for increased visibility and designation of the crossing area. Crosswalks are typically marked at the following locations:

- school crossings approved by the local agency, governing body, safety commission, school principal, etc.
- arterial crossing manned by adult crossing guards
- signalized intersections equipped with pedestrian signals
- crossing on recommended school route plan
- crossings at two-way and four-way stop intersections
- intersection crossings with unusual geometric design where the pedestrian or bike path is confusing and could lead to potential conflict

See Figure 6.5.



Figure 6.5. Marked Crosswalk

Traffic Signals. Standard traffic signals may be warranted at established school crossings where there is a need to create adequate gaps in vehicular traffic for pedestrian and bike crossings. The patterns of adequate vehicular gaps in the traffic stream are unique to each crossing and form the basis for determining the proper control device or technique. See Figure 6.6.



Figure 6.6. Signalized Crosswalk

Crossing Supervision. Many school crossings involve traffic situations problematic to young pedestrians despite the proper application of traditional traffic control devices. In these cases, adult crossing guards, police officers, or student patrol may supervise school crossings. See Figures 6.7 and 6.8.



Figure 6.7. Student Patrol



Figure 6.8. Adult Crossing Guard

Distribute and Maintain School Route Plan

Once the school route plan has been developed, it is distributed to users and maintained by school authorities.

School Route Plan Distribution

The school route plan should be transmitted to the agency responsible for traffic control in a given jurisdiction for final approval. Upon approval, the school should post a copy where everybody can view it. Instructions should be given on general pedestrian safety rules, and on of the use the plan. A copy of the plan should be sent home with each student so that parents can assist in identifying and explaining the correct route to school for their children.

School Route Plan Maintenance

Regular field checks by school authorities should be undertaken to make sure that students are following recommended routes to school. Lack of compliance with the plan should be investigated to determine if corrective measures or a plan revision is required.

The school route plan is reviewed annually to determine whether revisions are necessary due to changes in school district boundaries, new sidewalk construction, installation of new traffic control devices, or other factors that affect pedestrian and bike safety. Along with changes, necessary revisions should also be made on the map that displays sidewalk location, intersection traffic controls, and school-related traffic controls.

EXAMPLE SCHOOL ZONE PROGRAM STUDY

The city of Scottsville's elementary school is considering developing a school zone safety program. Concern has been expressed at PTA meetings about the overall safety of children walking or biking to and from school. Currently there is not a school route plan in place. Consequently, Scottsville Elementary School has decided to implement a school zone safety program.

Scottsville Elementary School organized the Scottsdale Elementary School Traffic Safety Committee. The goal of the committee was to develop a school route plan. Along with the development of this plan, the committee desires to handle public input positively and to promote good public relations.

The committee developed a school route map depicting the school, roadways, existing traffic control devices, and a suggested route for children to follow walking or biking to and from school. During the process of developing the school route map, the committee identified two intersections of concern, as illustrated in Figure 6.9. These were also the areas that the PTA had expressed concerned with. The committee desires to evaluate the traffic conditions at these locations.

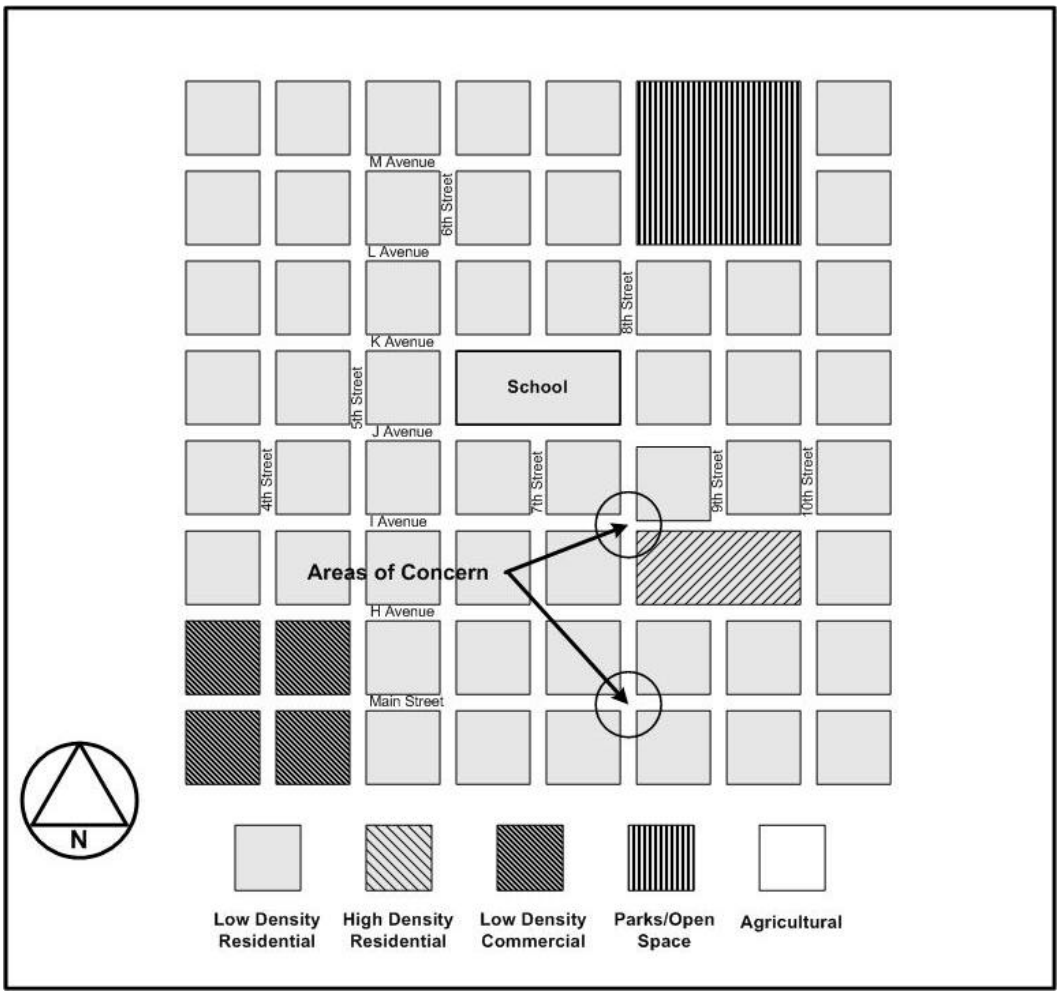


Figure 6.9. Example School Zone Map

The committee met with the local law enforcement and city traffic engineering officials to present the school route map. The main concern of the committee was the crash history and speeding in this area. The local law enforcement officials replied that the only concern they had was at the intersection of Main Street and 8th Street. There had been complaints from citizens about speeding and there was an existing crash history at that intersection.

The committee presented the school route map to the city administrator for Scottsville and requested assistance in conducting initial traffic studies.

The city conducted preliminary spot speed studies (as explained in Chapter 2 of this handbook) at both of the intersections. The city calculated the 85th percentile of speed for both intersections. The city found

that at the intersection of I Avenue and 8th Street the 85th percentile of speed was 1 mph below the posted speed limit. At the intersection of Main Street and 8th Street the 85th percentile of speed was 7 mph over the posted speed limit. A 5-mph rule of thumb is sometimes used to determine whether the 85th percentile of speed is high compared to the posted speed limit. If the 85th percentile of speed is 5 mph or more above the posted speed limit, the situation should be evaluated. In this case, the 85th percentile of speed was 7 mph above the posted speed limit, so speeding may be an issue. This intersection should be considered for further speeding evaluation. Several actions may be considered as described in Chapter 2 of this handbook.

The city also conducted preliminary 15-minute traffic volume counts at both intersections (as described in Chapter 3 of this handbook). The city conducted the volume counts and compared the results with historic traffic volume counts. The 15-minute counts were consistent with the historic traffic counts.

The city staff used a measuring wheel, a target rod, and sighting rod (as shown in Chapter 4 of this handbook) to conduct an intersection sight distance study at both intersections. The results of the study showed the sight distance at both intersections was adequate.

At this point, the city decided the school route plan could not continue without further assistance because of possible safety issues within the school route area. The city wishes to have a consulting engineering firm analyze the traffic conditions within the area included within the school route map. Information on contracting for a school zone safety program study, including a project work order using the Scottsville example, follows.

CONTRACTING FOR A SCHOOL ZONE PROGRAM STUDY

Information Gathering

Before a jurisdiction contacts an engineering consulting firm to perform a school zone study, a variety of information may need to be collected. Any information provided may aid the consulting firm in adequately completing their analysis. The following is a list of possible information that an engineering consulting firm may use:

- issue at hand
- crash history
- preliminary speed studies
- traffic volumes
- sight distances
- documentation from PTAs
- traffic control devices
- roadway classifications
- posted speed limits in and around study area
- school hours
- list of regularly scheduled events
- student demographics
- school site map
- school bus operations/schedules
- pedestrian access ways
- citizen input
- location map
- appropriate contact persons
- any other relevant information

The following project work order may assist local governments in contracting to an engineering firm. The example project work order contains information comes from the school zone example (a blank form is presented in Appendix E).

Project Work Order: School Zone Program Study

Referenced Agreement

This work order is part of an agreement between McIntyre Engineering and the city of Scottsville for municipal traffic engineering services.

Project Location Description

This work involves conducting a school zone safety study around the location of Scottsville Elementary School. A map depicting the location is attached.

Obligation of the City/County

The city shall provide the following items to the consultant: traffic volume counts, traffic volume projections, right-of-way information, truck route information, student population and address, and school hours.

Scope of Consultant Services

This work scope includes the completion of a traffic and pedestrian and bike operations study. Traffic volume counts, speed studies, sight distance measurements, and crash analysis are also included. This work involves data collection and evaluation of existing traffic control devices within the study area.

Schedule

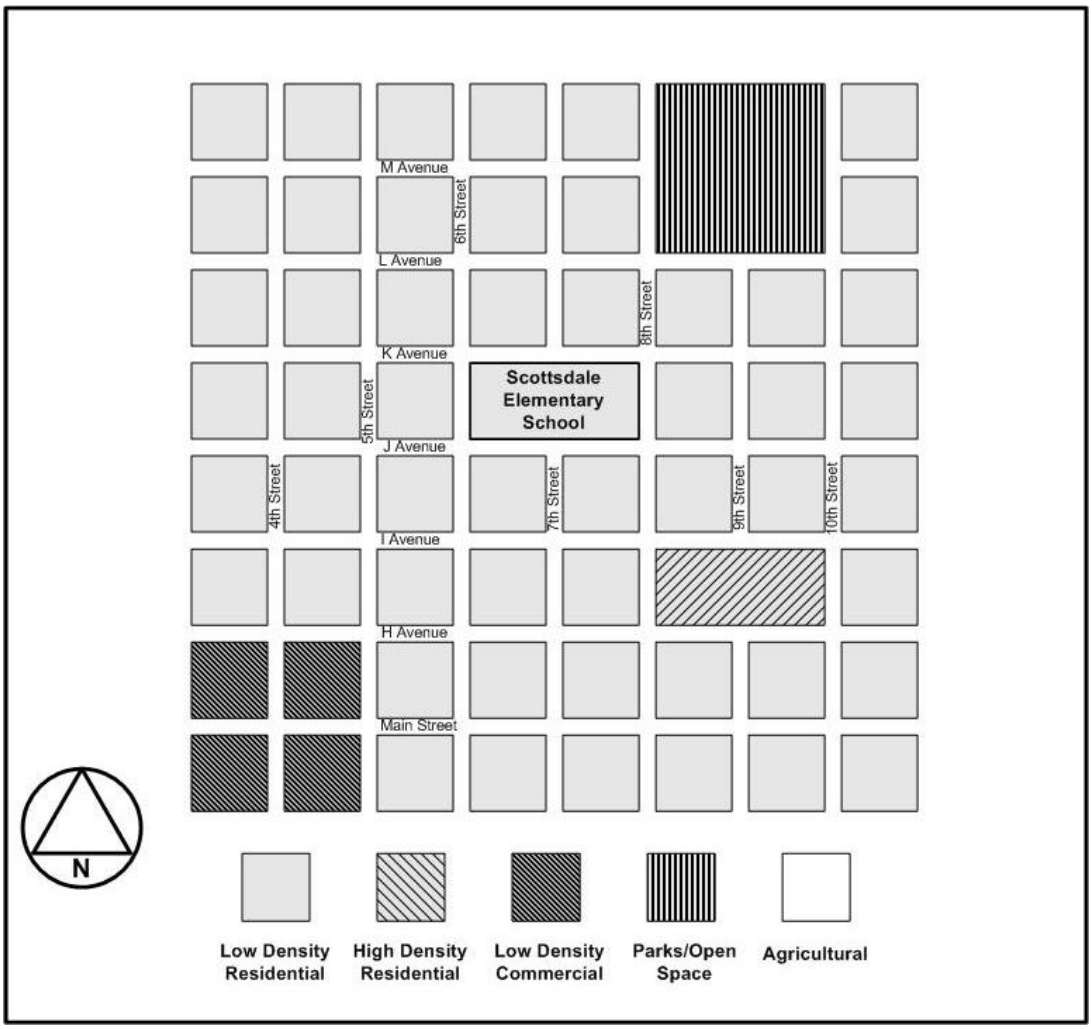
Field meeting date:	_____
Estimated date of preliminary deliverable:	_____
Estimated date of final deliverable:	_____

Compensation

Labor cost	$
Direct expenses	$
Subcontractor cost	$ _____
Overhead	$ _____
Maximum payable	$

Authorization

City of Scottsville	McIntyre Engineering
City/County	Contractor
_____	_____
City/County Administrator	Project Manager's Name/Title
_____	_____
Signature	Signature
_____	_____
Date	Date


M Avenue
6th Street
L Avenue
8th Street
K Avenue
Scottsdale Elementary School
5th Street
J Avenue
4th Street
7th Street
9th Street
10th Street
I Avenue
H Avenue
Main Street
N
Low Density Residential
High Density Residential
Low Density Commercial
Parks/Open Space
Agricultural

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