



Clark County School Zone Signing & Pavement Marking Policy



Prepared jointly with

DKS

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CHAPTER 1: INTRODUCTION

Road users have an easier time reading signs and driving prudently through school zones that are delineated in a consistent manner. The Manual on Uniform Traffic Control Devices, which sets national standards and guidelines for traffic control devices along facilities open to public travel, defines a school as, “a public or private educational institution recognized by the State education authority for one or more grades K through 12 or as otherwise defined by the State”.¹ Therefore, throughout the policy, when a school is mentioned, this is the definition being used.

This policy is intended to provide Clark County, and other enforcement agencies operating within its boundary, with guidelines for the uniform and consistent application of traffic control devices in school zones. The guidelines cover the use of school areas, reduced school speed zones, and how the signing and pavement markings should be designed for consistent and uniform applications. (Appendix C provides further detail on school zone traffic control requirements and recommendations and presents information on active school zone flashers.)

This policy also describes the Safe Routes to School (SRTS) program, a national organization that encourages children to walk and bike to school. The SRTS program studies and recommends various engineering improvements, including pavement markings and signing, in school zones.

Guidelines are intended to improve safety for other pedestrian crossing enhancements near schools, such as rectangular rapid flashing beacons, pedestrian hybrid beacons, variable message signs, pedestrian refuges, curb extensions, illumination, and traffic calming measures.

Additionally, the policy describes the funding and cost-sharing aspects of providing treatments for school zones. Schools interested in establishing engineering elements for a school zone must meet the criteria and obtain the approval of Clark County. Typically, the school pays for the initial cost of the traffic control device and its installation and Clark County covers maintenance costs.

Other supplemental material is provided in the appendices attached to this policy, such as layouts showing the recommended signing and pavement markings for school zones.

¹ MUTCD 2009, Chapter 1 A

CHAPTER 2: LAWS AND RULES ABOUT SCHOOL ZONES

Laws and rules about school zones are set at both national and statewide levels. Several national and state manuals provide guidance on the implementation of school zone traffic control devices that are compliant with the laws. Because there are many sources for school zone laws and rules, it is important to understand their precedence over one another. Specific guidance established by the state of Washington supersedes national practice and must be followed, where applicable. In other cases, national guidance should be used for consistency. National guidance is used unless there is a Washington modification in place. Figure 1 shows the laws and manuals that were used to develop this policy regarding school zone signing and pavement marking and how they relate to each other.

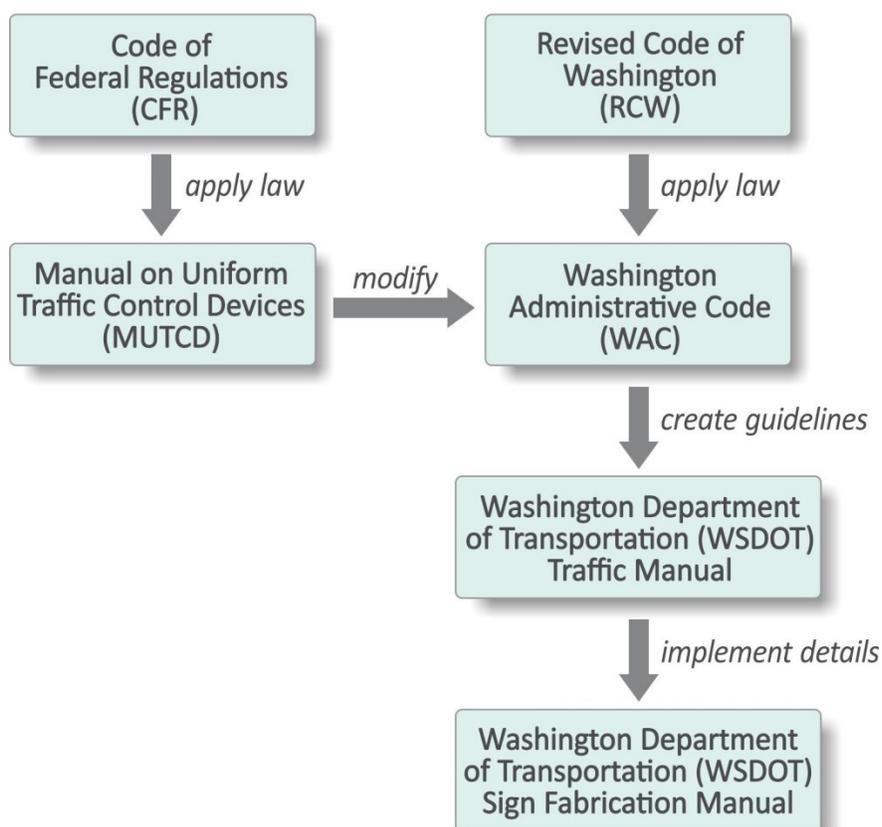


Figure 1. Sources for School Zone Laws and Rules

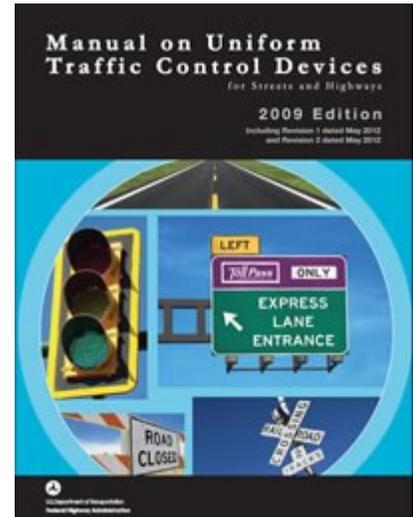
Consistency is crucial for school zone safety; therefore the recommendations provided in Chapter 5 should be used for designing signing and pavement markings for a school zone.

Manual on Uniform Traffic Control Devices (MUTCD)

The Manual on Uniform Traffic Control Devices (MUTCD) sets national standards and guidelines for traffic control devices along facilities open to public travel. The MUTCD is published by the Federal Highway Administration (FHWA) under Title 23 - Code of Federal Regulations (CFR), Part 655, Subpart F, and applies the national laws.

Traffic control devices for roadways that are located within school zones are covered in Part 7 (Traffic Control for School Areas) of the manual. Uniform application of school traffic control devices is one step to improving safety within school zones. Uniformity avoids confusion among road users and promotes consistent behavior and expectation.

The MUTCD emphasizes the importance of uniformity by providing standards and guidance on many aspects of school zone signing and pavement markings, ranging from sign sizes, color, location, mounting height, and retro-reflectivity to when marked school crossings and pedestrian hybrid beacons are recommended. The manual also presents examples of school zone and school crossing layouts, with the recommended signing and pavement markings (MUTCD Figures 7B-2 through 7B-5).



Revised Code of Washington (RCW)

The Revised Code of Washington (RCW) is a compilation of the current laws in the state of Washington. Title 46 relates to motor vehicle laws and Title 61 is specific to rules of the road. Several RCWs apply to school zones (see Appendix D). For example, under state law the penalty is doubled for speeding infractions committed within a school zone, and the penalty may not be waived, reduced, or suspended. Fifty percent of the money collected for these infractions must be deposited into the school zone safety account, which is created in the custody of the State Treasurer. Expenditures from the school zone safety account may be used only by the Washington Traffic Safety Commission for school zone safety projects in local communities.

Washington Administrative Code (WAC)

The Washington Administrative Code (WAC) amends the MUTCD to comply with laws and policies specific to the Revised Code of Washington (the RCWs). These amendments for school zones are listed in Appendix E.

WSDOT Traffic Manual and Sign Fabrication Manual

The Washington State Department of Transportation (WSDOT) Traffic Manual provides guidance on school zone signing and pavement markings (see Appendix F for sample layout). The WSDOT Sign Fabrication Manual implements these guidelines by providing fabrication details that maintain uniformity in appearance of the signs used by WSDOT. Standard S-series signs, which are specific to school zones, are illustrated in the WSDOT Sign Fabrication Manual, as shown in Appendix F. The WSDOT Traffic Manual also describes crosswalk specifications and standard details for crosswalks, stop lines, and traffic letter applications (see Appendix G).

Washington Modifications

The changes, additions, or deletions from national practice that are applicable in Washington related to school pavement marking and signing practices are:

- Drivers must stop for pedestrians at crosswalks,² NOT yield.
- The distance is 300 feet (revised from the national 200 feet) for the beginning point of a reduced school speed limit from the school grounds or school crosswalk.
- Fines are double in school zones, regardless of signage, therefore signs warning of higher fines are optional, not required.
- The END SCHOOL ZONE sign is accompanied by the posted speed limit sign.
- The law regarding when children are present is active when:
 - School children are occupying or walking within the marked crosswalk.
 - School children are waiting at the curb or on the shoulder of the roadway and are about to cross the roadway by way of the marked crosswalk.
 - School children are present or walking along the roadway, either on the adjacent sidewalk or, in the absence of sidewalks, on the shoulder within the posted school speed limit zone extending 300 feet in either direction from the marked crosswalk.
- The WHEN FLAGGED enforcement legend option for when a reduced speed is in effect was added, which is not a national standard.
- Different crosswalk marking patterns from the national standard.
- School route plans are required for all elementary schools.³
- Crossing guards at school crossings shall be used at uncontrolled locations, in addition to school crossing warning signs, a marked crosswalk, and a school speed limit assembly.

Other Guidelines (Local Agencies)

Three other agencies in and near Clark County have their own practices related to school zone signing and pavement markings. These are the cities of Vancouver, Camas, and Battle Ground. Their practices are summarized below (see Appendix H for standard details).

City of Vancouver

Vancouver has a standard detail for school zone signing, including a school speed limit sign assembly, a school ahead sign, and speed enforcement signs for WHEN CHILDREN ARE PRESENT or WHEN FLASHING (Standard Details T29-22 and T29-23 with and without a raised crosswalk). Additionally, Vancouver has a standard detail for a sign and flasher assembly (Standard Detail T20-14).

For pavement markings, Vancouver has a standard detail for traditional and ladder style crosswalks, as well as the SCHOOL legend (Standard Details T29-41 and T29-58).

² Crosswalks can be either unmarked or marked, but the criteria is that a pedestrian or bicyclist is within one lane of the half of the roadway in which the vehicle is traveling in or onto which it is turning (RCW 46.61.235).

³ School route plans show the suggested walking or bicycling route to school on a map.



City of Camas

Camas has two standards for crosswalks—intersection and midblock (Standard Details ST30 and ST31).

City of Battle Ground

Battle Ground has one standard related to school zones—ladder stripe crosswalks (Standard Detail TR-8.01).

CHAPTER 3: SAFE ROUTES TO SCHOOL PROGRAM

Background

The Safe Routes to School (SRTS) program, which encourages children to walk and bike to school, started in the United States in 1997 in the Bronx, New York. After various pilot programs, the SRTS program spread throughout the country. Eight years later, Congress passed legislation that established a national program to assist states and communities. The program examines conditions around the school and provides guidelines for establishing a safe route to school.⁴

Washington became involved in SRTS as part of the pilot project in 2004. Since then, 230 schools in the state have participated in the SRTS program and the number of children walking and bicycling has increased by over 20 percent.⁵

As part of SRTS projects, various engineering improvements can be installed if warranted, such as sidewalk improvements, traffic calming and speed reduction improvements, pedestrian and bicycle crossing improvements, on-street bicycle facilities, off-street bicycle and pedestrian facilities, and secure bicycle parking facilities.

In addition to engineering improvements, successful implementation of the SRTS program involves education and encouragement. The walking school bus is an example of an educational program that teaches children safety skills and promotes walking to school. The walking school bus is used in Washington, as well as nationally, and is paired with the SRTS program's Walk and Bike to School Day.

Enrollment

WSDOT administers the SRTS Funding Program and provides federal and state funded grants for projects throughout the state. These projects must be located within two miles of primary and middle schools. Applicants must describe how their project would increase the number of students walking and biking to school safely by making improvements in areas of health and safety education, enforcement, and engineering. WSDOT reviews and prioritizes the funding requests. Projects completed through this grant must follow federal and local requirements to receive funding.

Many proposed and constructed projects within Clark County were funded through the Washington SRTS program, from 2004 through 2015. Table 1 lists each project with year, agency, location, and project elements.

⁴ National Center for Safe Routes to School, Accessed November 2014: <http://www.saferoutesinfo.org/>

⁵ Washington State Department of Transportation. "Safe Routes to School." Accessed January 2015: <http://www.wsdot.wa.gov/localprograms/saferoutes/>

Table 1. Safe Route to Schools Projects

Year	Safe Routes to School Projects within Clark County		
	Agency	Location	Project Elements
2004 (Pilot)	Evergreen School District	SE 136 th Improvements	Overhead flashing beacons at school crosswalk, refuge island, curb ramps, sidewalk
2007	Washougal	Hathaway Crosswalk Lighting	Flashing beacons, illumination, crosswalk, pavement markings, signs, emphasis patrol
	Vancouver	Fircrest Elementary	Sidewalk, safety education, emphasis patrol
		Riverview Elementary	
		Eleanor Roosevelt Elementary	Sidewalk, speed cushions, emphasis patrol
		Ogden Area Safe Routes to School	
Hockinson School District	NE 104 th Street Phase II	Sidewalk, safety education, emphasis patrol	
2009-2011	Vancouver	MacArthur Blvd/Mill Plain Blvd to Lieser Rd School Safety Improvements	Sidewalk, crosswalk, pedestrian and bicycle safety education, school zone photo enforcement
		Image Elementary Pedestrian Safety Improvements	Sidewalk, crosswalk and pavement markings, pedestrian and bicycle safety education, emphasis patrol
	Camas	Grass Valley Trail Extension	Pedestrian path, pedestrian and bicycle education, "School Share"
2011-2013	Camas	NW 18 th Ave Safety Improvements	Sidewalk, health and environmental education classes, additional police patrol
		NE 43 rd Ave Safety Improvements	
	Vancouver	Walnut Grove Elementary	Sidewalk, pedestrian and bicycle safety education, additional police patrol
2013-2015	Evergreen Public Schools	Pacific Middle School Walkway	Sidewalk, crosswalk, illumination, curb ramps, bicycle and pedestrian safety materials, additional police patrol
	Clark County	Sacajawea Elementary Pedestrian Safety	Sidewalk, curb and gutter, crosswalk, crossing guard safety equipment, walking school bus program, education, speed feedback signs, emphasis patrol
	Vancouver	Endeavour Elementary Pathway and Safety Improvement Program	Shared use path, education, speed feedback sign, emphasis patrol
	Woodland	South Woodland Safe Walking Route	Sidewalk, curb and gutter, crossing guards and improvements, walking school bus program
	Battle Ground	School Zone Safety Improvements, City Wide	Crosswalk, flashing beacons, guided walk groups, crossing guards, education, emphasis patrol

What is a SRTS n

The MUTCD recommends that a school route plan be prepared for each school that serves elementary to high school students to develop uniformity in the use of school-area traffic control devices and to form the basis for the school's traffic control plan. In Washington, state law requires the school district to develop a school route plan for all elementary schools where children walk to and from school. Although school route plans are only required for elementary schools, they are recommended for middle/junior high schools. For high schools, the state recommends preparation of a walking plan, rather than a SRTS plan.

The SRTS plan consists of a map showing streets, the school, existing traffic control devices, established school walk routes, and established school crossings. Additionally, the SRTS plan shall cover an area of at least one mile from the school and illustrate the suggested routes to school. The SRTS plan shall be distributed to all students with instructions that it be taken home and discussed with the parents.

How to Develop a SRTS Plan

In developing the school routes and crossings, certain guidelines should be followed:

- Limit the number of school zone crossings to encourage students to cross streets in groups, creating a larger concentration of students crossing in one desirable location.
- Avoid mid-block crossings, unless they are signalized or supervised by an adult crossing guard.
- Provide the greatest physical separation between walking children and traffic.
- Expose children to the lowest speeds and fewest vehicles.
- Limit the number of road or rail crossings.
- Allow only one entrance-exit from each block to and from school.
- Select routes with sidewalks or paths.
- Avoid areas with personal safety concerns, such as locations with abandoned buildings, unleashed dogs, lack of street lighting, overgrown vegetation, and known or suspected crime.
- Locate a crossing near the drop-off area or bus stop to create a path to the school.
- Serve every residence in the walking attendance boundary.
- Provide the most direct route possible, given the above considerations.

In establishing school crossing placement and the use of pedestrian hybrid beacons, the school must consider factors such as sidewalk presence, number of students, age level of students, and total extra walking distance. The school must also consider traffic issues such as vehicle traffic volume and the frequency of gaps in the traffic stream when determining appropriate crossing locations. If gaps are insufficient then the school must consider measures that create sufficient gaps.

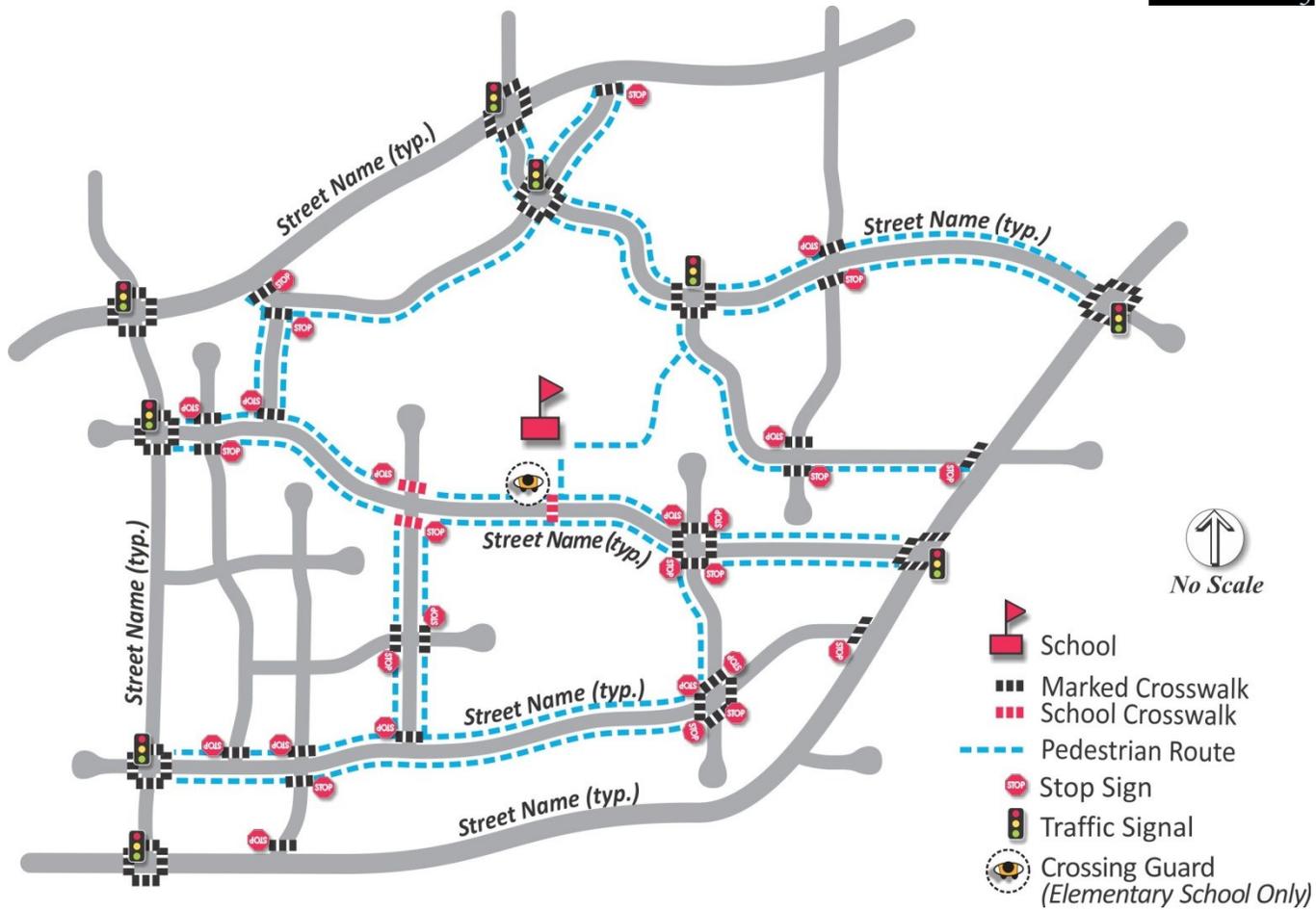


Figure 2. Example Safe Routes to School Plan

CHAPTER 4: SCHOOL ZONES

Reduced School Speed Zone and School Area Defined

A reduced school speed zone (RSSZ) is a designated section of roadway adjacent to a school or on a school route plan with a school crosswalk featuring signing to advise drivers of the reduced speed limit in the school zone of 20 miles per hour (mph). The RSSZ begins 300 feet in both directions of the marked school crosswalk or school boundary. According to Washington law, fines are doubled in school zones.

A school area, on the other hand, is a more general designation and the signage serves a warning purpose only. Regulations are no different than a typical roadway. School areas are adjacent to schools, but do not necessarily have a school crosswalk. The distance set for school areas is a function of the speed set for the roadway⁶, instead of the 300 feet in both directions like the RSSZ.

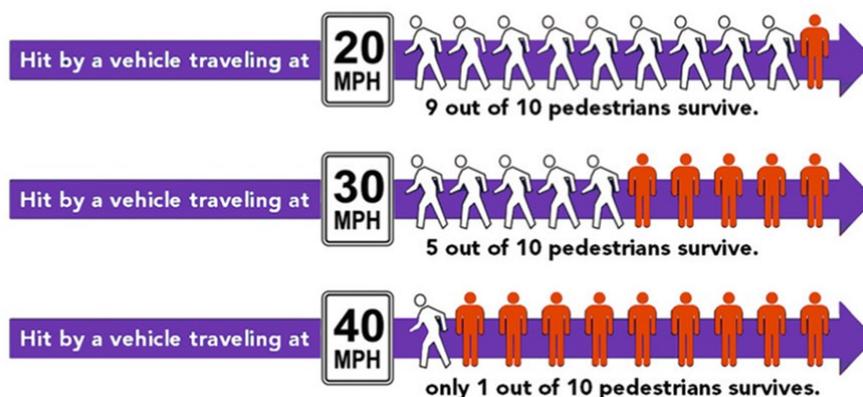
Graphical definitions for both reduced school speed zones and school areas are shown on Figure 3.

Importance of Reduced School Speed Zone

RSSZs have a reduced speed limit that is enforced during specific times of day, depending on the enforcement legend used with the school speed limit sign assembly. In the state of Washington, the school speed zone is always 20 mph (note that this is state-specific).

The 20 mph speed is a critical threshold that the state selected based on pedestrian survival rates reported by PEDS, an organization

based in Atlanta devoted to walking and pedestrian safety.⁷ Studies have indicated that nine out of ten pedestrians will survive being hit by a vehicle traveling at 20 miles per hour or less. However, as vehicle speed increases, the pedestrian survival rate decreases, to the point where only one out of ten pedestrians will survive being hit by a vehicle traveling at 40 miles per hour. The RSSZ in Washington is enforced and set in place for pedestrian safety. The ability of the driver to reduce the vehicle's speed in school zones is crucial in keeping pedestrians safe.



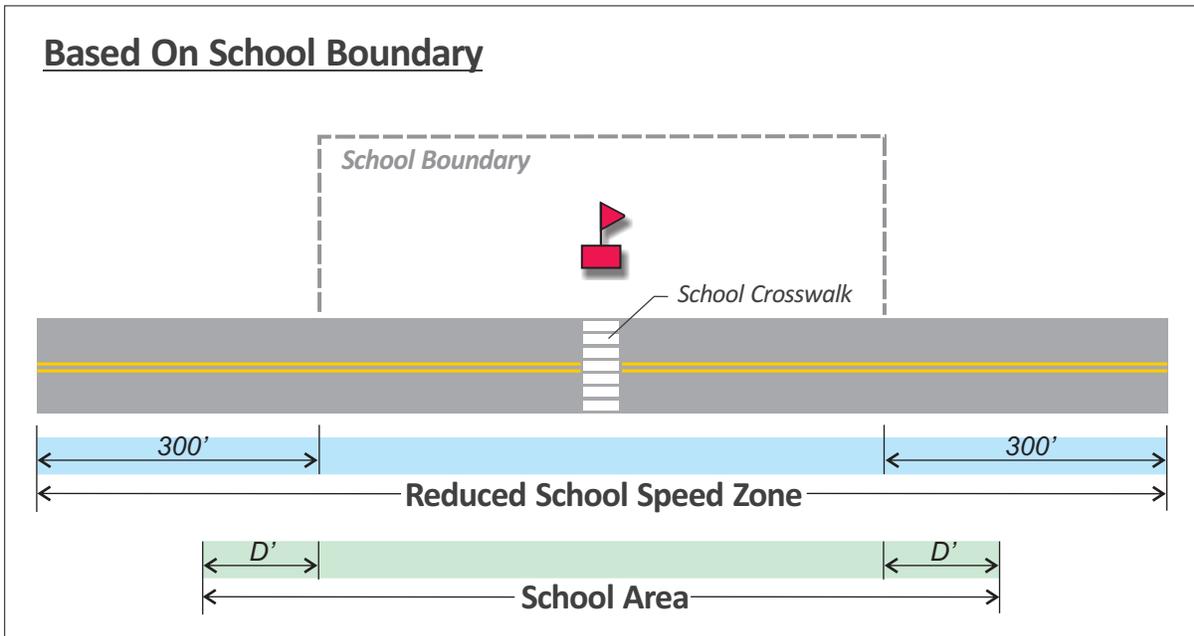
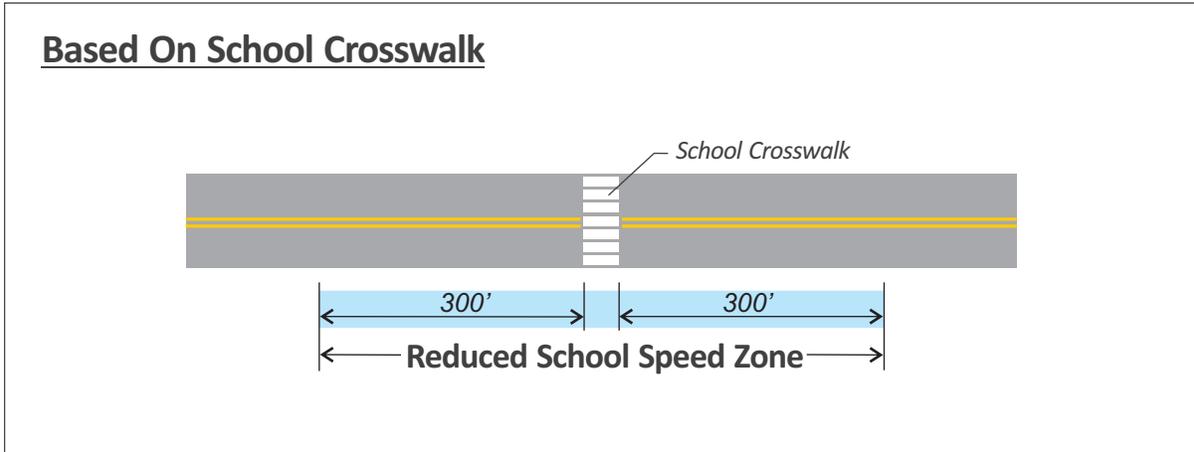
Pedestrian Survival Rates and Vehicle Speeds

⁶ MUTCD 2009, Table 2C-4

⁷ PEDS. Accessed January 2015: <http://peds.org/drive-like-your-kids-live-here/>



Figure 3
 Reduced School Speed Zones and School Areas Defined



Reduced School Speed Zone - Regulatory, reduced 20 mph speed limit
 School Area - Warning, normal speed limit

Note: Use Figure 4 to determine if a Reduced School Speed Zone is recommended, or Figure 5 to determine if a School Area is recommended.

School Area Distance

85th Percentile Speed (mph)	"D" School Area Distance (ft.)
20-35	100-150
40	125-150
45	175

Distance defined by MUTCD Table 2C-4 and Clark County preference

When Should Reduced School Speed Zones Be Used

This policy establishes the guidelines for when reduced school speed zones should be used, when they should not be used, and when they would require further justification. The criteria for these guidelines are based on a literature review of current practices for school zone signing and pavement markings in other states,⁸ though it should be noted many states have their own policies and there is no overall consensus. Based on this literature review,⁹ the following is true regarding school zone signing and pavement markings:

- For elementary and junior high schools (K-8), school zones are encouraged when there is at least one marked school crosswalk within the proposed school zone that is not protected by a signal or STOP sign. Some states also require that the posted speed should be 40 mph or below.
- For elementary and junior high schools (K-8), school zones include a marked crosswalk, advance and school crossing signs, reduced speed limit enforced either when flashing, during school days for specific hours, or when children are present. For example, Arizona uses the STOP WHEN CHILDREN ARE IN CROSSWALK sign and the NO PASSING sign, which is different from the other states.
- For high schools, there is a range in school zone recommendations by state—from not typically being used unless an engineering study determines that there is a need for enhanced safety to being treated in the same manner as elementary and junior high schools.

Figure 4 illustrates the process for the recommendation of a RSSZ. Several criteria must be met to justify its installation and to assist in receiving approval from Clark County. In general, the following are considerations used in determining if a RSSZ is recommended:

- hen there is at least one school crosswalk that is not protected by a signal or STOP sign; and
- When the school is PK-8; and
- When the posted speed of the roadway is 40 mph or below.

When RSSZs are established, pavement markings and signing must be used to properly delineate these school zones. Additionally, flashers can be used as a supplemental device to provide additional warning, and traffic control devices can be used to regulate traffic when needed (see Figure 9). When a RSSZ is recommended, the school must still get approval from Clark County.

⁸ The literature review was of five states (Oregon, Alaska, Arizona, Florida, and New York).

⁹ Ibid

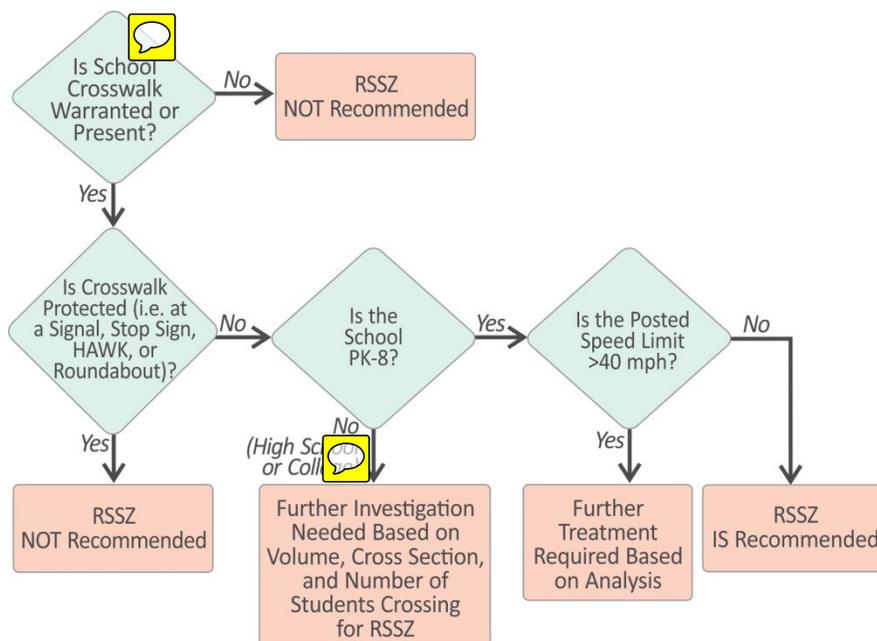


Figure 4. Process for Recommendation of a Reduced School Speed Zone (RSSZ)

When Should School Areas Be Used

The process for the recommendation of a school area is shown in Figure 5. The considerations used in determining if a school area is recommended are when the following is true:

- When the roadway is adjacent to the school; and
- When a public road intersects, there is a controlled crossing, or there is a direct school driveway; and
- When the posted speed of the roadway is greater than 30 mph

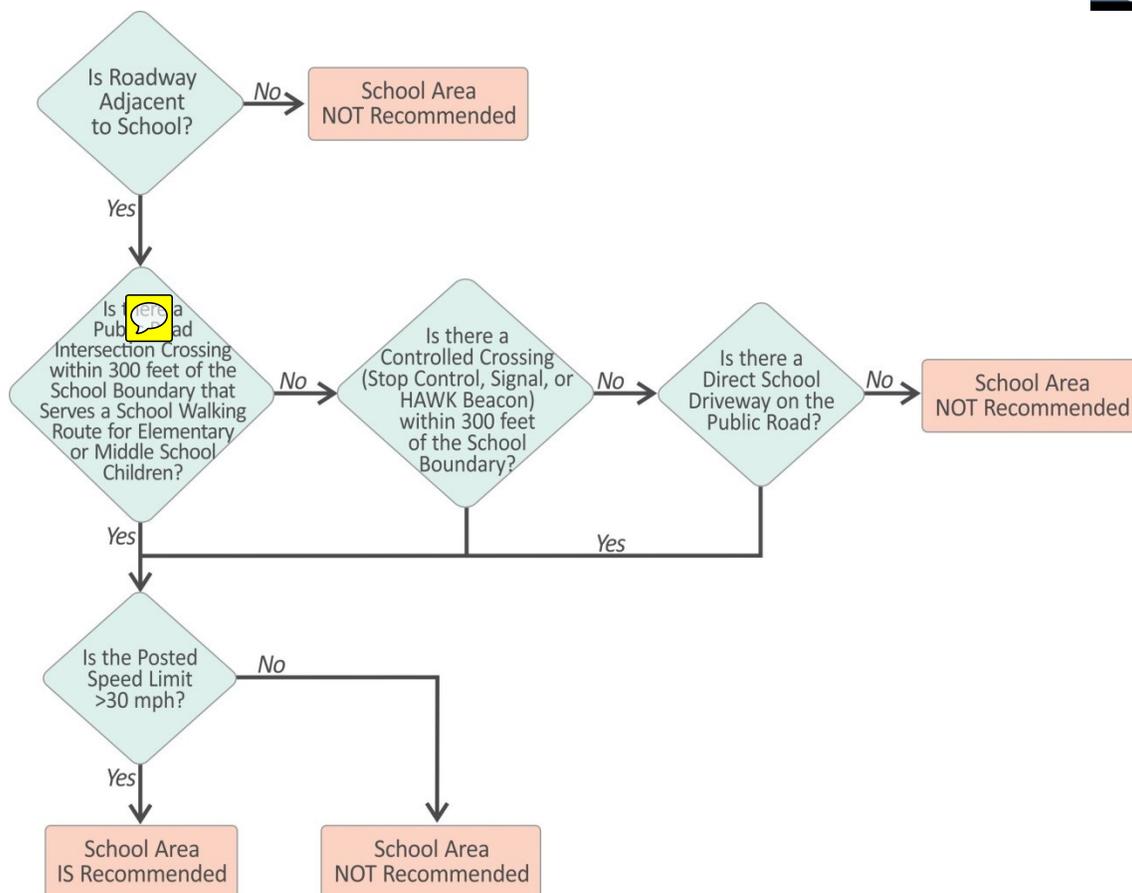


Figure 5. Process for Recommendation of a School Area

School Crosswalk Defined

Marked school crosswalks provide guidance for pedestrians who are crossing roadways and alert road users.¹⁰ However, the crosswalk markings by themselves do not improve pedestrian safety.

When Should School Crosswalks Be Used

Specific criteria should be followed when placing marked crosswalks in school zones, as shown in Figure 6. The flowchart illustrates the locations where marked crosswalks should be used, should not be used, or would require further evaluation. In general, school crosswalks are encouraged when:

- The roadway is adjacent to the school grounds and/or is on the school route plan; and
- There are at least 20 children per any peak hour of the day who will use the crosswalk; and
- When the school is PK-8; and
- There is no adjacent school crosswalk within 300 feet; and
- The crossing location is not at a signal, stop sign, or a roundabout; and

¹⁰ Manual on Uniform Traffic Control Devices (MUTCD) 2009, Section 3B.18.

- The annual daily traffic does not exceed 9,000 vehicles per day, and the number of travel lanes does not exceed two lanes.¹¹

When school crossings are established, pavement markings and signing must be used to delineate those school areas. If a school crossing is desired, the school must get approval from Clark County or the respective jurisdiction. Additionally, when school crosswalks are used, the school district must commit to guarding the school crosswalk as well as providing proper illumination at the school crosswalk. The jurisdiction shall conduct the necessary engineering investigation and follow the guidelines established in this document prior to granting approval.

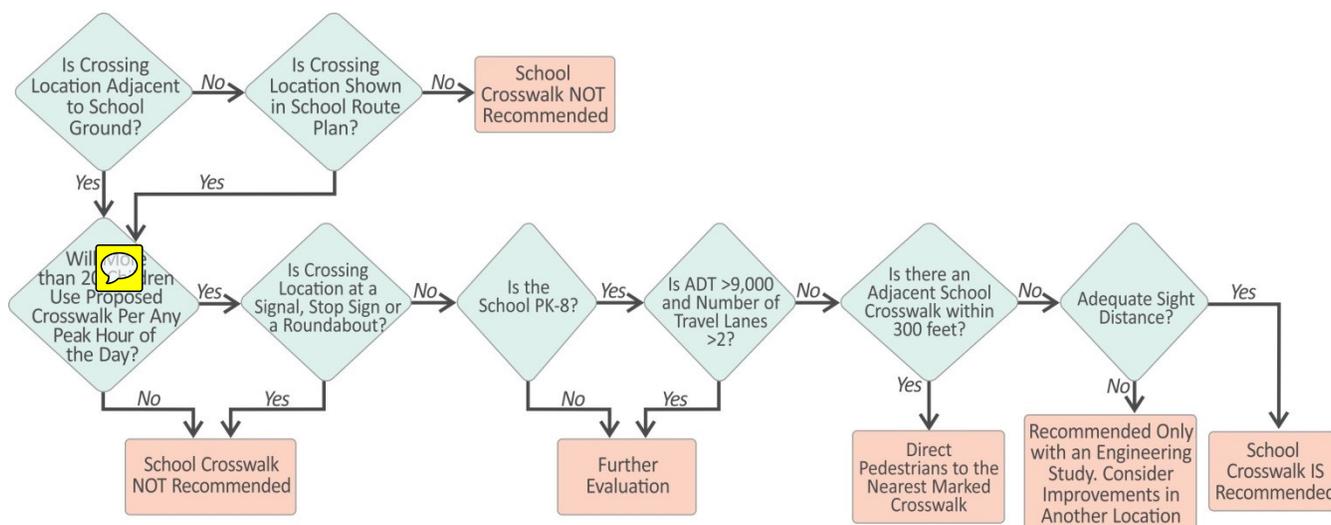


Figure 6. Process for Recommendation of a School Crosswalk

School Crossing Guards and Safety Patrols

Crossing guards not only guide children, they are role models in teaching students to cross streets safely. They provide supplemental traffic control and are an extra indicator (beyond pavement marking and striping) to drivers that children are present.

Adult crossing guards may be used to provide gaps in traffic at school crossings where an engineering study has determined that adequate gaps need to be created in the traffic stream. There must be adequate stopping sight distance to ensure the safety of the guard.

Clark County requires school crossing guards at all of its elementary and middle school crossings during key times of the day. Crossing guards are present for twenty to thirty minutes right before school starts and after the school is released.¹² To determine if a crossing guard should be used at school crossings in Clark County that are not elementary school level, gaps in traffic should be assessed. A recommended method for determining the frequency and adequacy of gaps in the traffic stream is given in the ITE Traffic Control Devices Handbook.¹³

¹¹ Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations, FHWA Publication Number: HRT-04-100, 2005.

¹² Meeting with Clark County Sheriff's Office, August 29, 2014.

¹³ Institute of Transportation Engineers, Traffic Control Devices Handbook, 2nd Edition, 2013

The Washington Administrative Code states that school crossing guards shall only control school crossings that include the following items: school crossing warning sign (S1-1), marked crosswalk, and school speed limit sign¹⁴. When crossings are controlled by stop signs, the school crossing warning sign may be omitted. Additionally, when crossings are controlled by a traffic signal or a stop sign the school speed limit sign is only used depending on an engineering study.

For adult crossing guard qualifications, uniform requirements, and operating procedures, see the MUTCD.

Enforcement

Although enforcement within reduced school speed zones is performed continually, Clark County typically stations more officers in these areas at the start of the school year to emphasize safety. The primary purpose of issuing tickets is to increase driver compliance, which results in ensuring the safety of children.

Both Clark County officers and school resource officers can enforce RSSZs throughout the school year. Clark County has a low ratio of enforcement personnel per resident (1/12,500 people),¹⁵ which means a lower level of school zone enforcement compared to other agencies such as the City of Vancouver. Within Clark County, the number of tickets issued in school zones was steady for 2011 and 2012, at 111 tickets for each year, as shown in Figure 7. In 2013, about half as many school zone tickets were issued—57.12 tickets, an average of six school zone tickets per school month.

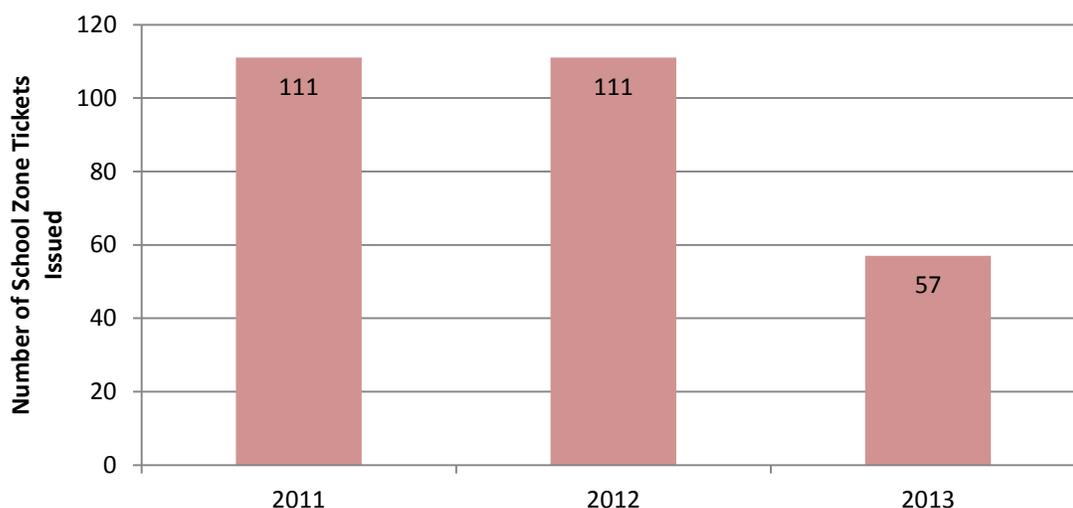


Figure 7. Clark County School Zone Ticket Trend

The RCW requires a speed limit of 20 mph for reduced school speed zones. The speed zone extends 300 feet in either direction of the crosswalk or border of the active school zone boundary.¹⁶ The limits of an RSSZ are defined by appropriate signage.

¹⁴ WAC 392-151-030 Controlled crossings

¹⁵ Meeting with Clark County Sheriff's Office, August 29, 2014.

¹⁶ RCW 46.61.440

School zone speeding tickets are typically issued when the officer visually assesses a speeding condition confirms it with a speed measurement via radar or LiDAR. The school boundary should be defined by the distance stated in Washington law. When writing a ticket, the officer must make note that either children are present or the flasher is active, indicating an active school zone. Officers keep a copy of the Clark County flasher schedule with them to assist with enforcement.¹⁷

The fines are doubled in school zones, with ticket cost ranging between \$187 and \$400. The standard base fine is doubled regardless of any additional signage (signs stating fines are higher) warning drivers. Although speeding is the primary violation, other violations that occur in school zones are also fined at double the rate—these include failure to yield to a pedestrian in a crosswalk, failure to remain stopped to allow the pedestrian or bicyclist to cross the roadway, and failure to exercise care.

The ticket cannot be mitigated or reduced.^{18,19} The only way a driver may not be required to pay the fine is to successfully contest the violation.

Clark County law enforcement staff stated that the most common reasons for contesting school zone speeding tickets were:¹⁷

- School speed zone sign was not visible.
- Vehicle was not in the school zone when speed was recorded.
- School zone boundary was not well defined.
- Vehicle was entering an active school zone from a side street that was not signed or the flashers were not visible.
- Validity of speed measurement (either radar or LiDAR) was in question.
- Children were not present.
- There was confusion with other speed limit signs located within the school zone.

Clark County law enforcement provided guidance on school zone signing for easier enforcement with the following recommendations:

-  Duration of school flashers should be less than an hour at a time for higher compliance.
- School zones with active flashers are easier to enforce.
- Additional flashers should be installed on the back side to assist with vehicles entering an active school zone from the side street.
- The enforcement legends for the school speed limit that include specific times of day and when flashing are more clear than when children are present. When children are present can be more difficult to enforce due to uncertainty on which days and hours to enforce as well as who is defined as a child.



¹⁷ Meeting with Clark County Sheriff's Office , August 29, 2014

¹⁸ RCW 46.61.440

¹⁹ Meeting with Clark County Traffic Court Commissioner, August 26, 2014

CHAPTER 5: SCHOOL AREA TRAFFIC CONTROL DEVICES

School Area Pavement Markings

Pavement markings assist in the delineation of a school area and can be used to supplement a sign, a signal, or can be used on their own. Pavement markings can have a regulatory or a warning purpose. The largest advantage to pavement markings is that the markings are on the road where drivers generally look. However, there are limitations to their functionality because they can be covered by snow, obscured by heavy traffic, or have reduced visibility when wet and are difficult to maintain.

Pavement markings must be visible at night and shall be retro-reflective unless directly illuminated. Markings are typically applied using durable or thermoplastic material. Pavement word markings shall be white and should read in the direction of travel.

Pavement markings within school areas shall comply with Part 3 (Markings) of the MUTCD, Washington State, or local guidelines, where available. The Washington guidelines include crosswalk specifications and standard details for crosswalks, stop lines, and traffic letter applications (as presented in Appendix G).

The recommended school pavement markings are listed in Table 2, including the pavement marking name, an image of the marking, a description, and the typical use. School pavement markings are:

- Marked crosswalks
- Stop lines
- Word and symbol markings (SCHOOL or SCHOOL XING)

The SCHOOL pavement marking is optional and its use has both advantages and disadvantages. The greatest advantage is that the marking provides supplemental guidance and warning. A disadvantage is that it requires more frequent maintenance with periodic refreshing or replacement after road resurfacing. SCHOOL XING or PEDESTRIAN XING pavement markings can be used prior to the crosswalk location.

The SCHOOL marking and XING markings are most beneficial on high-volume or high-speed roads or locations requiring supplemental warning (such as vertical or horizontal curves). Therefore, the cross-section and presence of obstructions should be considered when deciding if the SCHOOL pavement markings should be used at a particular location.



Table 2: School Pavement Markings

Pavement Marking Name	Image	Description	Typical Use
School Crosswalk	<p style="text-align: center;"><i>Longitudinal</i></p> 	<p>24-inch wide solid pattern separated by gaps of 4 feet, length of each marking is 8 feet</p>	<p>Where school crosswalks are recommended (see Figure 6). Note: Locate to avoid wheel paths, orient parallel with wheel paths</p>
Stop Line		<p>Solid white lines extending across approach lanes 12 inches wide at least. Clark County standard is 24 inches wide.</p>	<p>Indicates point at which vehicles need to stop for a STOP sign or other traffic control devices. Note: Should be placed at least 4 feet in advance of crosswalk at controlled intersection and 20-50 feet at uncontrolled locations</p>
Word and Symbol Markings (SCHOOL)		<p>White word marking, may extend to the width of two approach lanes; should be 10 feet or more in height If two or more words are used then they should read in the direction of travel and be separated by at least 4 times the character height</p>	<p>Can be used on approach lanes to guide or warn traffic</p>

School Area Static Signing

School area signing must follow the general provisions in MUTCD sections 2A, 2B.06, and Part 7. Traffic control devices and other signs or messages within the roadway right-of-way shall be placed only as authorized by a public authority or the official having jurisdiction.

School warning signs and any supplemental plaques shall have a fluorescent yellow-green background with black legend and border. School (S-series) signs shall have ASTM Specification D 4956 type VIII or IX background sheeting. The signs used for school area traffic control shall be retro-reflectorized or internally illuminated. The sizes of signs and plaques used in school areas shall comply with MUTCD Table 7B-1 unless engineering judgment determines that a minimum or oversized sign size would be more appropriate.

School Signs

School signs are listed in Table 3, including the sign name, an image of the sign, the sign code, the typical use, and desired location. The school signs are:

- School Zone Assembly
- School Advance Crossing Assembly
- School Speed Limit Assembly
- HIGHER FINES/FINES DOUBLE
- School Crossing Assembly
- END SCHOOL ZONE
- END SCHOOL SPEED LIMIT
- Posted Speed Limit Sign
- Reduced School Speed Limit Ahead Sign
- In-Street School Children Crossing
- School Bus Stop Ahead
- School Bus Turn Ahead
- Parking and Stopping Restrictions
- Overhead Crosswalk
- Overhead Stop for Pedestrians

The school (S1-1) sign has the following applications:

- School Area – The S1-1 sign can be used to warn road users they are approaching a school area that might include school buildings or grounds, a school crossing, or school-related activity adjacent to the roadway.
- School Zone – The S1-1 sign can be used to identify the location of the beginning of a designated school zone. Although, in the state of Washington it would not serve this purpose since all school zones are reduced school speed zone, which would instead have a school speed limit assembly.
- School Advance Crossing – If combined with an AHEAD (W16-9P) plaque or an XX FEET (W16-2P or W16-2aP) plaque to comprise the School Advance Crossing Assembly, the S1-1 sign can be used to warn road users that they are approaching a place where school children cross the roadway.

- School Crossing – If combined with a diagonal downward pointing arrow plaque (W16-7P) to comprise the School Crossing Assembly, the S1-1 sign can be used to warn approaching road users of the location of the school crosswalk.
- School Advance Area/Zone – If combined with an arrow plaque (W16-6 or M6-4), the S1-1 sign can be used to warn road users on cross streets that once they make a turn, they will enter a school area or a reduced school speed zone.

The penalty is doubled for infractions committed within a designated school zone, regardless of whether the HIGHER FINES/FINES DOUBLE sign is installed. Because of the increased penalty within a reduced school speed zone, the end of school zone sign is installed to alert the driver of the school zone boundary and permission to return to normal speed. For locations where the posted speed is more than 10 mph greater than the reduced school speed limit of 20 mph (i.e., when the posted speed is 35 mph or greater), a reduced school speed limit ahead sign should be considered.

The School Speed Limit Assembly has various enforcement legends that can be used, and these should be selected by Clark County on a case by case basis. The following are the enforcement legend options:

- WHEN FLASHING (S5-1)
- WHEN CHILDREN ARE PRESENT (S5-101) – as defined in WAC 468-95-335
- WHEN FLAGGED (S5-102)
- 8:30 AM to 5:00 PM (S4-1)
- SCHOOL DAYS X:XX AM to X:XX PM (S4-5)
- SCHOOL DAYS X:XX AM to X:XX AM (S4-5A)
- SCHOOL DAYS X:XX PM to X:XX PM (S4-5A)

The guidelines for use of in-street signs were provided by the Safe Routes to School Guide and follow MUTCD standards.^{20,21} When considering the installation of overhead crosswalk signs, approach speed of traffic, width of crossing, and number of lanes should be assessed.

²⁰ Safe Routes to School (SRTS) Guide. Available online: http://guide.saferoutesinfo.org/engineering/in-street_signing.cfm

²¹ MUTCD 2009, Section 2B.12



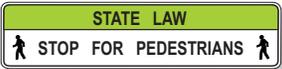
Table 3A: School Signing

Sign Name	Image & Sign Code	Typical Use	Desired Location
School Zone Assembly	S1-1 S4-3P (optional)	Warn road users they are approaching a school area OR identify the beginning of a designated school zone	Dependent on speed of roadway (see MUTCD Table 2C-4), 700 feet maximum from school boundary and at least 100 feet from School Speed Limit Assembly
School Advance Crossing Assembly	-OR- S1-1 W16-9P -OR- S1-1 W16-6 -OR- S1-1 M6-4	Warn road users they are approaching a school crossing	Dependent on speed of roadway (see MUTCD Table 2C-4), minimum 100 feet from School Crossing Assembly
School Speed Limit Assembly	-OR- S4-1 -OR- WSDOT S4-5 -OR- WSDOT S4-5A	Notify road user there is a reduced speed limit in effect according to the enforcement legend	300 feet from school boundary or crosswalk
HIGHER FINES/ FINES DOUBLE	-OR- R2-6aP	Notify road user where increased fines are imposed	Located below School Speed Limit Assembly
School Crossing Assembly	S1-1 W16-7P	Warn road users they are at the school crossing location	At school crosswalk
END SCHOOL ZONE	S5-2	Notify road users the school zone has ended	300 feet from school boundary or crosswalk opposite School Speed Assembly
END SCHOOL SPEED LIMIT	S5-3	Notify road users the reduced speed limit is no longer in effect	300 feet from school boundary or crosswalk opposite School Speed Assembly
Posted Speed Limit	R2-1	Notify road users of the speed limit outside of the school zone Note: Should not be installed within limits of school speed zones	Located above END SCHOOL ZONE sign
Reduced School Speed Limit Ahead	S4-5 S4-5a	Warn road users they are approaching a reduced school speed limit that is more than 10 mph less than the normal speed limit	Dependent on speed of roadway (see Layouts in Appendix B)

Note: Sign code is from MUTCD unless otherwise noted.



Table 3B: School Signing

Sign Name	Image & Sign Code	Typical Use	Desired Location
In-Street School Children Crossing	 <p>R1-6c</p>	<p>At unsignalized crossings, mounted on a portable base, used only during school commute times, and on unsignalized two-lane low-speed streets rather than multi-lane high-speed streets</p> <p>Note: State law may be omitted from sign</p>	In advance of the crosswalk, preferably in the median to avoid being hit
School Bus Stop Ahead	 <p>S3-1</p>	Only used when the school bus stop is not visible to road users within 500 feet of sight distance	In advance of locations where the school bus stops to pick up or drop off children
School Bus Turn Ahead	 <p>S3-2</p>	Only used when there is limited sight distance to the school bus turnaround	Located at the school bus turnaround
Parking and Stopping Restrictions	 <p>R7 and R8 series</p>	<p>To restrict parking by a school, can be used near a crossing, for drop off/pick up activities, or near driveways</p> <p>Typical enforcement legends include the following: No Parking X:XX AM to X:XX PM School Days Only No Stopping X:XX AM to X:XX PM School Days Only XX Min Loading X:XX AM to X:XX PM School Days Only No Standing X:XX AM to X:XX PM School Days Only</p> <p>Note: Parking will not be allowed within 100 feet upstream and 50 feet downstream of the school crosswalk</p>	Located by curb markings to reinforce the restriction area
Overhead Crosswalk	 <p>WSDOT W11A-301</p>	<p>At marked school crosswalks where a traffic engineering analysis has determined that conventional traffic control measures are not adequate</p> <p>Note: Must include pedestrian or school activated flashing lights</p>	At marked school crosswalk
Overhead Stop for Pedestrians	 <p>R1-9a</p>	<p>Can be used instead of overhead crosswalk sign</p> <p>Note: Must include pedestrian or school activated flashing lights</p>	At marked school crosswalk

Note: Sign code is from MUTCD unless otherwise noted.

Layouts for Static Signing

The layouts in Appendix A show the recommended pavement markings and static signing for school areas. The layouts in Appendix B show the recommended pavement markings and signing for reduced school speed zones (RSSZ's) under various scenarios to provide consistency. The layouts provide recommended distances for the sign locations. The distances were developed based on MUTCD standards and modified per Clark County preference.

The layouts for the reduced school speed zone (RSSZ) include options for the enforcement legend of the school speed zone, including when children are present, when flagged, when flashing, for specific times of the day, or when flashing. The when flashing enforcement legend option, which is supplemented with flashing beacons, will be further discussed in the active signing section of the policy.

The enforcement legend to be used at each school zone should be examined carefully. As noted by Clark County law enforcement, the enforcement legend that describes specific times of day when the school zone is active may be a clearer definition for drivers and law enforcement than simply “when children are present.”

A supplemental school speed limit assembly is recommended when the static sign spacing in any direction exceeds 600 feet within a school zone or when the active sign spacing exceeds 1,250 feet. The repeated assembly is meant as a reminder to drivers regarding the presence of a school zone and also to advise any side street drivers. The spacing distance is to be measured between school speed limit assemblies assuming there are no school crossings encountered. If a school crossing is present, the distance needs to restart again. The supplemental school speed limit assemblies are required based on the spacing criteria, unless otherwise determined by an engineering study.

The County has established thresholds for how to handle scenarios where school boundaries and/or school crossings are located adjacent to one another. When a school crossing is located outside of the school boundary, the threshold of 800 feet is used to determine if the entire area should be treated as one reduced school speed zone, or if the two areas should be treated separately. The distance of 800 feet was established using a distance of 300 feet on each side (the state mandated distance) and a 200 foot long distance in the middle.

For adjacent schools, two threshold distances have been established, 800 and 1,500 feet. For schools separated by less than 800 feet, the entire area will be treated as one reduced school speed zone. For schools separated by more than 800 feet, but less than 1,500 feet, the two schools will be treated mainly separate, where the school speed limit is ended, but the school zone is not ended in between the schools. For schools separated by more than 1,500 feet, the two schools will be treated completely separately where the school zone is ended in between the schools. The details for exactly how each scenario should be handled are shown in the layouts in Appendix B.

School Zone Active Signing

Flashing Beacons Defined

Flashing beacons can be used for reduced school speed limit zones and at marked school crossings to provide additional warning for drivers. Flashing beacons improve awareness and provide warning of reduced speeds for

school safety. Beacons must be in compliance with MUTCD requirements outlined in section 4L.²² The MUTCD states that beacons shall have a flash rate of not less than 50 or more than 60 times per minute. The illuminated period of each flash shall be a minimum of half and a maximum of two-thirds of the total cycle.^{23,22} There are no Washington modifications to the MUTCD related to flashing beacons.

There are two types of beacons applicable for school zones—warning beacons and speed limit beacons. A warning beacon may be used for other applications to provide warning, such as a midblock school crossing. A speed limit sign beacon shall be used only to supplement a school speed limit sign.

Warning Beacons

Warning beacons may be used to warn users of obstructions, emphasize the presence of midblock crosswalks, and supplement warning and regulatory signs that include the phrase WHEN FLASHING. Warning beacons shall not be used to supplement STOP, DO NOT ENTER, WRONG WAY, and SPEED LIMIT signs. A warning beacon shall:

- Consist of one or more signal sections of a standard traffic signal face with a flashing circular yellow signal indication in each signal section.
- Be used only to supplement an appropriate warning or regulatory sign or marker.
- Have a minimum clearance of 15 feet and a maximum of 19 feet above the pavement, if the beacon is suspended over the roadway.



Warning Beacon

Warning beacons should be operated only when the condition or regulation exists. Furthermore, if more than one signal section is used, they may be flashed either alternately or simultaneously.

Speed Limit Beacons (or School Speed Limit Flashing Beacon)

A speed limit beacon, also referred to as a school speed limit flashing beacon, shall be used only to supplement a speed limit sign. A speed limit beacon shall:

- Be used only to supplement a fixed or variable speed limit sign.
- Have circular yellow signal indications that have a nominal diameter of not less than 8 inches.
- Be horizontally aligned²⁴.
- Be alternately flashed if two signal indications are used.
- Be accompanied by appropriate signing indicating that the displayed speed is in effect.



School Speed Limit Flashing Beacon

²² MUTCD 2009, Chapter 4L, Flashing Beacons.

²³ Ibid

²⁴ County preference per discussion with MUTCD and FHWA in October 2014

When a school speed limit flashing beacon is used, it must follow the detail shown in Figure 8. The detail includes a school speed limit sign for use with flashing beacons (S5-1) from the Washington Sign Fabrication Manual, a two twelve-inch yellow vehicle signals with backboard, and a visor located at the side-by-side at the top of the speed limit sign, all mounted on a spun aluminum pole. The fines double sign (R2-6a) will be located below the school speed limit sign, leaving a vertical clearance of seven feet to the ground. The flasher cabinet will be located below the fines double sign to house the components. Additionally, another single twelve-inch yellow vehicle signal with a backboard and a visor or a strobe light will be located on the back of the sign. This informs side street traffic regarding an active school speed zone and helps with enforcement.

When Should Warning Beacons Be Used

Warning beacons should be used to emphasize the time that a warning sign is active. For example, warning signs that could be active under certain conditions include pedestrian-activated midblock crossing, be prepared to stop, ramp meter ahead, etc. When warning beacons are used, the warning sign and beacon must be accompanied by the WHEN FLASHING sign.

When Should Speed Limit Flashing Beacons Be Used

According to the WSDOT Traffic Manual, the school speed zone sign assembly may be supplemented with flashing beacons to draw attention and increase compliance with the reduced school speed zone. Flashing beacons are not needed in all school zones and are more effective than static signs under certain conditions.

When used in the appropriate situations, flashing beacons can reduce 85th percentile speeds and increase driver compliance compared to static signs, according to a Washington Traffic Safety Commission Study and the results from a speed study conducted in Clark County (see Appendix C).²⁵ The Washington study noted, in areas where the approach speed to a school speed zone is 35 mph or above, schools with WHEN FLASHING signs had significantly fewer vehicles travelling in excess of 35 mph (only 3 percent) compared to WHEN CHILDREN ARE PRESENT signs (30 percent) and WHEN FLAGGED signs (23 percent).

The process for consideration of a school speed limit flasher is shown in Figure 9. In general, flashers are encouraged in conjunction with the reduced school speed limit sign when:

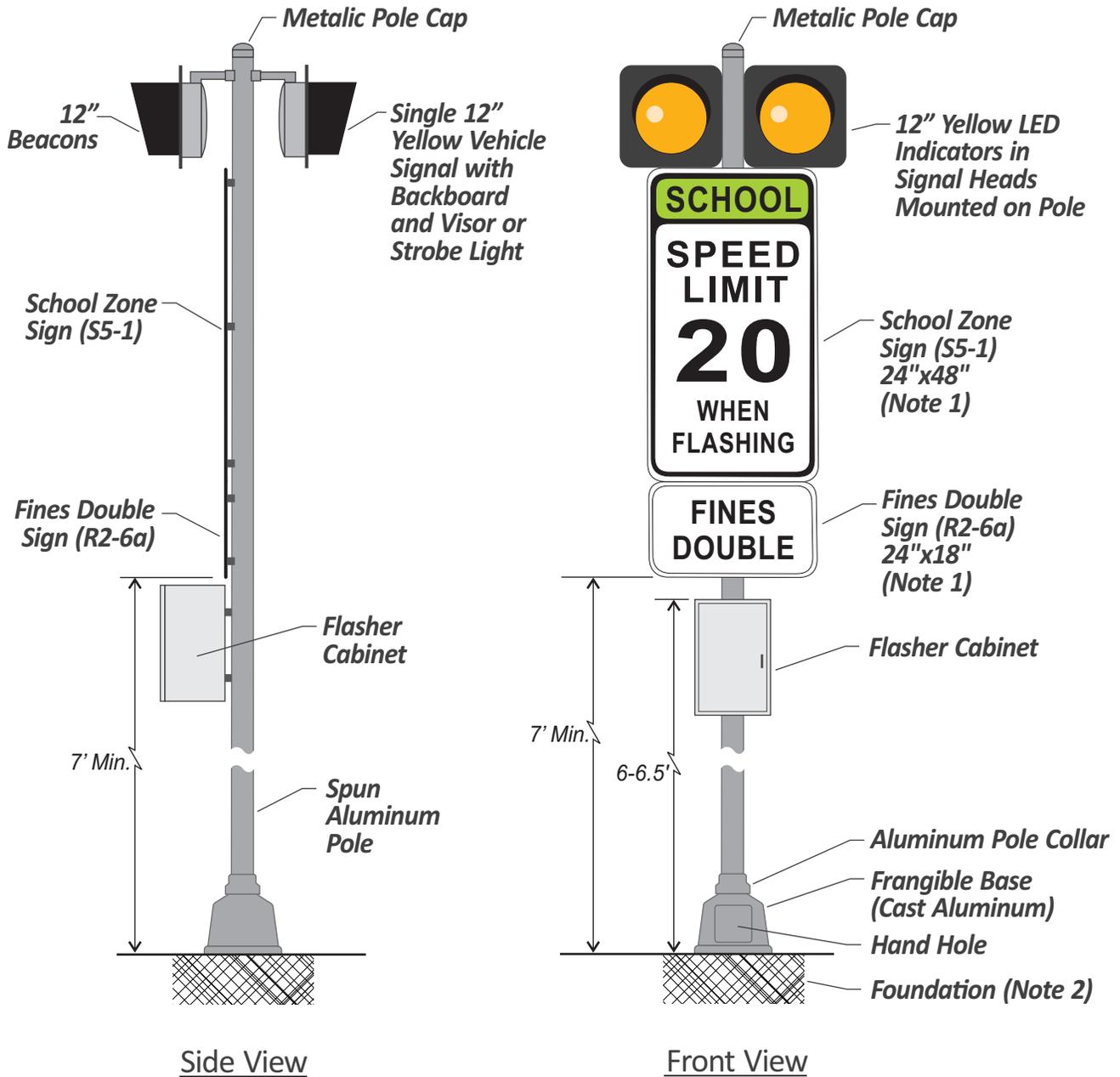
- There is a RSSZ that has been established (an outcome from the Figure 4 process).
- The posted speed is greater than or equal to 30 mph.

However, schools need to get approval from Clark County and conduct an engineering study, in addition to meeting the criteria outlined in Figure 9.

²⁵ Washington Traffic Safety Commission. *Vehicle Speeds in School Zones*. Available online: http://wtsc.wa.gov/wp-content/uploads/dlm_uploads/2014/10/VEHICLE-SPEEDS-IN-SCHOOL-ZONES-full-rept.doc



Figure 8
 School Speed Limit Flasher Detail



Notes:

- 1.) When the roadway has four lanes or more with a posted speed limit of 40 mph or higher use oversized sign sizes of:
 36"x72" for S5-1
 36"x24" for R2-6a
- 2.) For foundation details see Clark County School Flasher Standard Drawing.
- 3.) Use of solar power must be approved by County Traffic Engineer and only used when conditions occur that make hard wire power infeasible.

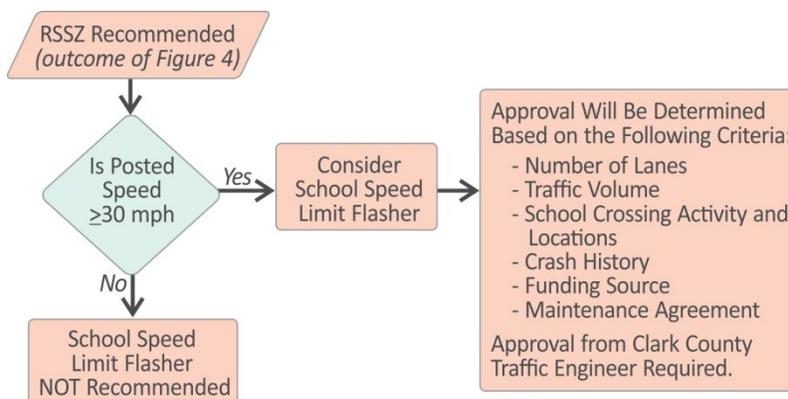


Figure 9. Process for Consideration of a School Speed Limit Flasher

Layouts for Active Signing

The layouts in Appendix B show the recommended pavement markings and signing for reduced school speed zones (RSSZ's) under various scenarios to provide consistency. The layouts provide recommended distances for the sign locations. The distances were developed based on MUTCD standards and modified per Clark County preference.

The layouts in Appendix B show flashers as one of the enforcement legend options in a reduced school speed zone.

CHAPTER 6: OTHER PEDESTRIAN CROSSING ENHANCEMENTS

Additional pedestrian enhancements are available to increase the safety of crossings near and along school routes. The crossing improvements discussed below can be used as a supplement to the standard signs and pavement markings discussed in previous chapters. The County will develop a Pedestrian Policy that will provide further detail on the use of other pedestrian crossing enhancements in the future.

Pedestrian Hybrid Beacon or High Intensity Activated Crosswalk

Application of the Pedestrian Hybrid Beacon (PHB), also referred to as the HAWK (High Intensity Activated Crosswalk), is discussed in Chapter 4F of the MUTCD. The PHB is used to control traffic at unsignalized locations and should only be used in conjunction with marked crosswalks.

Further guidance can be found in Figures 4F-1 and 4F-2 from the MUTCD (see Appendix I), which provide guidelines on when to install a PHB based on the roadway speed, number of pedestrian crossings, and the vehicular volume along the roadway.



Pedestrian Hybrid Beacon (PHB) or High Intensity Activated Crosswalk (HAWK)

MUTCD Signal Warrant 5 (School Crossing) is intended for situations where schoolchildren crossing a major roadway is the primary reason to consider installing a traffic control signal. School children are defined as elementary through high school students.

The need for a traffic control signal shall be considered when an engineering study of the frequency and adequacy of gaps in the vehicular traffic stream meets the warrant requirements. The traffic signal warrant for school crossings is met when the number of adequate gaps in the traffic stream is less than the number of minutes during the period when school children are using the crossing (MUTCD Section 7A.03) and when there are a minimum of 20 school children during the highest crossing hour.

In addition to identifying pedestrian and vehicle thresholds, the MUTCD provides the following guidance:

- The school crossing signal warrant shall not be applied at locations where the distance to the nearest traffic control signal along the major street is less than 300 feet, unless the proposed traffic control signal will not restrict the progressive movement of traffic.
- Before a decision is made to install a traffic control signal, consideration shall be given to the implementation of other remedial measures, such as warning signs and flashers, school speed zones, school crossing guards, or a grade-separated crossing.

- If installed at a non-intersection location, the traffic control signal should be installed at least 100 feet from side streets or driveways that are controlled by STOP or YIELD signs, and it should be pedestrian-actuated.

Rectangular Rapid Flashing Beacon (RRFB)

Rectangular Rapid Flashing Beacons (RRFBs) are a type of active warning beacon that can enhance safety at unsignalized pedestrian crossings. Use of RRFBs is not covered in the 2009 MUTCD; however, FHWA has published an interim approval documenting the appropriate installation of these warning devices.²⁶ Additionally, the WSDOT has issued a similar approval for their use in Washington.

In school zones, a RRFB may be used at marked crosswalks to supplement school crossing warning signs. RRFBs should not be installed on approaches controlled by YIELD signs, STOP signs, or traffic signals. The FHWA suggests limiting the installation of RRFBs to locations with the most critical safety concerns because their effectiveness may diminish with over use.

RRFBs serve a similar purpose as PHBs and are typically a more affordable alternative. Several research efforts have focused on the effectiveness of each warning device and have developed guidelines to determine when each warning device should be applied.

The Oregon Department of Transportation funded a research effort to evaluate the effectiveness of RRFBs and PHBs in Oregon. This research concluded that PHBs are not well understood by drivers and that public education should accompany installations in new areas. This research provides a crosswalk treatment decision matrix that can be used to identify the appropriate treatment based on several key considerations. Potential treatments included in the matrix are PHBs, RRFBs, median installed RRFBs, and standard crosswalks. A copy of the decision matrix is included in Appendix I.

Changeable Message Signs

Changeable message signs may be used to inform drivers of the reduced school speed limit in situations where added emphasis is needed. When used, the variable sign should have the same basic shape, message, legend layout, and colors as the associated fixed-message signs. Section 7B.15 of the MUTCD provides additional guidance on the installation and requirements for these devices.



Rectangular Rapid Flashing Beacon (RRFB)



Changeable Message Sign

²⁶ Federal Highway Administration, "Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons (IA-11)", Accessed November 2014, http://mutcd.fhwa.dot.gov/resources/interim_approval/ia11/fhwamemo.htm

Pedestrian Refuges and Curb Extensions

Pedestrian refuges or islands split a roadway crossing into multiple stages while providing a safe place for pedestrians to wait between stages. These refuges are most beneficial when there are multiple travel lanes in each direction that contribute to a longer crossing distance. A center turn lane is a great opportunity for pedestrian islands to be installed without impacting travel lanes.



Pedestrian Refuge

Pedestrian crossing distances can also be reduced through the use of curb extensions (also known as bulb-outs). Curb extensions narrow the roadway and can serve as a traffic calming device—these have been shown to reduce vehicle speeds. Additionally, curb extensions provide increased visibility for pedestrians waiting to cross and are particularly beneficial when on-street parking is present.

Stop Here for Pedestrians

The STOP HERE FOR PEDESTRIANS (R1-5b or R1-5c) sign provides advance notice for crosswalks on uncontrolled multi-lane approaches. The stop bar supplements the sign and should be placed twenty to fifty feet in advance of the nearest crosswalk line. The advance stop bar indicates the point at which vehicles need to stop behind the STOP HERE FOR PEDESTRIANS sign. The advance stop bar is a 24-inch-wide solid white line extending across all approach lanes. This treatment is particularly helpful when used on multilane roadways.

Grade Separated Crossings

Grade separated crossings can be used at locations with high pedestrian crossing demand and heavy vehicular flow. These may include overpasses or underpasses; note that overpasses are typically easier to maintain and easier to protect from vandalism. Grade-separated crossings are expensive and should be considered only in locations where pedestrians are likely to use the facility (rather than cross at nearby locations without appropriate signing and pavement markings). Grade separated crossing should: be accessible, have minimal grade changes, and have a clear passage width of at least 12 feet.

Illumination

Lighting is important to include at all pedestrian crossing locations where pedestrian activity is expected during dark conditions. Lighting provides visibility for drivers to see pedestrians in the crosswalk.

FHWA HT-08-053, The Information Report on Lighting Design for Mid-block Crosswalks, found that a vertical illumination of 20 lux in front of the crosswalk, measured at a height of 5 feet from the road surface, provided adequate detection distances in most circumstances. The optimal location of street lights is positioned 10 feet in advance of the crosswalk to achieve the desired lighting.²⁷



Illumination at Pedestrian Crossings

The County follows WSDOT standards for light levels and uniformity ratios for a midblock pedestrian crossing²⁸.

Traffic Calming Measures

Traffic calming devices are used to reduce vehicle speeds along a roadway. They can sometimes impede emergency response vehicles, however, and new applications should be coordinated with emergency services. There are a number of traffic calming measures that can be used depending on the design of the roadway and surrounding land use. For neighborhoods streets, these devices typically include:

- Speed humps
- Traffic circles or diverters
- Curb extensions
- Raised crosswalks

See  WSDOT's Pedestrian Facility Guidebook or AASHTO's Guide for the Planning, Design and Operation of Pedestrian Facilities²⁹ for more information.

²⁷ Los Angeles County. *Model Design Manual for Living Streets*. 2011.

²⁸ WSDOT Design Manual, Exhibit 1040-25 Light Levels and Uniformity Ratios, July 2014.

²⁹ American Association of State Highway and Transportation Officials (AASHTO) Guide for the Planning, Design, and Operation of Pedestrian Facilities, 1st Edition, 2004

CHAPTER 7: TRAFFIC CONTROL DEVICES INSTALLATION, MAINTENANCE, AND FUNDING

Once school zone and their associated traffic control devices have been identified, the devices will need to be funded, installed and maintained. In order to establish the funding mechanism for the installation and maintenance of the traffic control devices, the roles and responsibilities of each entity will need to be recognized. This could be attained via inter-local agreements between the agencies and the school districts that define the roles and responsibility of each partnering entity.

The agreements will generally follow these guidelines:

- School districts will be financially responsible for the installed cost of approved active traffic control devices. These active traffic control devices include school flashers and changeable speed limit signs and any appurtenances and setup cost associated with the active traffic control devices.
- School districts will be financially responsible for the installed cost of street illumination related to a school crossing.
- School districts will be financially responsible for upgrading of existing active school traffic control devices and street illumination to current standards.
- School districts will be financially responsible for upkeep of active traffic control devices. The upkeep will include but is not limited to the replacement of solar panels, beacons, and internal electronics etc. The upkeep and replacement may be due to normal wear, theft, or third party damage. In cases where the third party can be identified, the agency will attempt to collect costs from the third party's insurer.
- Agencies will be responsible for day-to-day operation and maintenance of the active traffic control devices and street illumination. The agencies will bear the cost of routine operation and maintenance and pay for recurring associated fee, such as internet fee, energy cost for flashing beacon and illumination, etc.
- Agencies will be responsible for the installation, maintenance and upgrade of other school zone traffic control, within the County right-of-way. These include static signs, striping and pavement markings.
- Agencies will be responsible for the cost associated with evaluating and engineering of school zone traffic control and related traffic control if any.
- Agencies will be responsible for the system programming for flashing beacons; however the school district will be responsible for providing school schedules (times and dates) on a yearly basis or any interim change. Additionally, a reimbursable will need to be setup for agency staff time with the school districts.

- Agencies reserve the right to replace flashing beacons with a sign indicating when the school zone is enforced if the continuation of the flashing beacons becomes impractical or revoke the approval of traffic control device.
- Agencies will respond to requests from the school districts. Citizens will be directed to the school districts for all school related traffic control issues.

The terms of the agreement can vary by school district and agency but need to be documented and agreed upon by all parties.

In Washington, the responsibilities for school traffic control devices along roadways that are part of the state highway system are assigned based on the population of the city³⁰, as follows:

- Population \geq 25,000 = City
- Population $<$ 25,000 = State

³⁰ RCW 47.24.020