OREGON DEPARTMENT OF TRANSPORTATION

A Guide to School Area Safety

September 2025

Oregon Department of Transportation

Contents

Introduction to School Area Safety

Improving walking, biking, and rolling around schools presents an opportunity to address safety concerns in areas with potentially high concentrations of especially vulnerable children and families who walk, bike, and roll to and from school. Improving conditions for these users can lead to safer conditions for all travelers in the area and can help agencies meet goals related to improving public health, increasing rates of walking and biking, providing affordable mobility, and reducing air pollution.

Audience

The guidebook is a comprehensive resource on safety in school areas to support people involved in the effort to keep students safe when getting to and from school. The guide provides community members, road authorities, school staff, planning and engineering professionals, and public agency staff with information and resources to understand and improve safety in and around schools.

It does not establish policy or standards for the Oregon Department of Transportation (ODOT) or other road authorities in the state.

What's New

The 2025 version of the guide replaces the previous 2017 version and contains updated information related to laws and rules as well as guidance and best practices for planning, engineering, programming, and design. This guide incorporates the changes to the *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD), 11th ed. (2023), as well as the 2009 MUTCD Oregon Supplement, and the 2025 *Highway Design Manual*.

Safe Routes to School in Oregon

ODOT Safe Routes to School (SRTS) programming, which advances students options to walk, bike, and roll to school, is an important aspect of school area safety. A comprehensive SRTS program should include construction as well as education and encouragement components. Due to the evolving nature of SRTS education and encouragement programming, this guide points to external resources that will have the most current information for those components of a SRTS program.

Do you have questions about Site Circulation or SRTS in Oregon? Contact ODOT's SRTS Team for resources, technical assistance, and more.

The Need for School Area Safety

Providing opportunities for families to walk and bike to school provides benefits for students and the school community beyond traffic safety including healthier students, improved air quality, and lower transportation costs for families. The decision to walk or bike is highly influenced by how comfortable and safe people feel, designing an environment where all ages and abilities can travel safely requires designing for comfort and safety. Factors like motor vehicle speed and volume are two of the biggest causes of stress for people walking and biking, especially in areas that experience surges in traffic and congestion at specific times, such as during arrival and dismissal. ODOT's *Highway Design Manual* notes that school-age children and those traveling with school-age children are much less likely to walk or bike in a stressful environment that does not prioritize safety, comfort, and convenience. Additionally, students and families that are interested or curious about walking and biking to school can be deterred by roadway conditions that do not provide a comfortable and safe environment.

Designing for increased comfort for families choosing to walk and bike to school also focuses on the safety of vulnerable road users. ODOT uses the term vulnerable road users to describe anyone who is not protected by a motor vehicle while they are traveling. This includes people walking, biking, using a personal mobility device, or other types of active transportation. School area safety focuses on improving safety for these vulnerable road users and creates a safer travel environment for everyone, including those driving to school. Through roadway design that prioritizes safety, most fatal crashes can be prevented. One death on our roads, especially in school areas, is too many.

ODOT Vulnerable Road User Safety Programs

ODOT has programs specifically focused on safety for vulnerable road users:

- The Vulnerable Road User Crash Response Program responds to fatal vulnerable road users crashes as they occur and works to identify and address corridors for priority safety and equity improvements for vulnerable road users.
- The Pedestrian and Bicycle Program works to reduce crashes involving people walking and biking, eliminate crashes that result in injuries and deaths, and promote walking and biking to improve health and safety.

Safe System Approach

School area safety design can adopt elements of the US Department of Transportation's Safe System Approach, a framework that prioritizes creating roadways that eliminate deaths and serious injuries. Safe System principles are grounded around the fact that humans sometimes make mistakes, and people outside of motor vehicles are more vulnerable in a crash. Therefore, transportation systems should be designed in a way so that mistakes do not result in human death or severe injury. This approach focuses on roadway designs that anticipate human mistakes and reduce the risks of a crash, and incorporate redundancies for safety in the road design, while also minimizing the risk of a serious injury or fatality when crashes do take place.

Elements of the Safe System Approach that are highly relevant for school area safety are:

Safe Road Users. People living, working, or traveling in school areas should be safe walking, biking, rolling, taking transit, or driving.

Safe Speeds. Slower travel speeds help save lives and reduce the risk of a life-altering injury or death.

Safe Roads. Design roads so that human error does not result in the loss of human life.

Post-Crash Care. When crashes do occur, reduce harm by providing rapid access to emergency medical care and analyzing data to support system improvements.

How Speed Kills

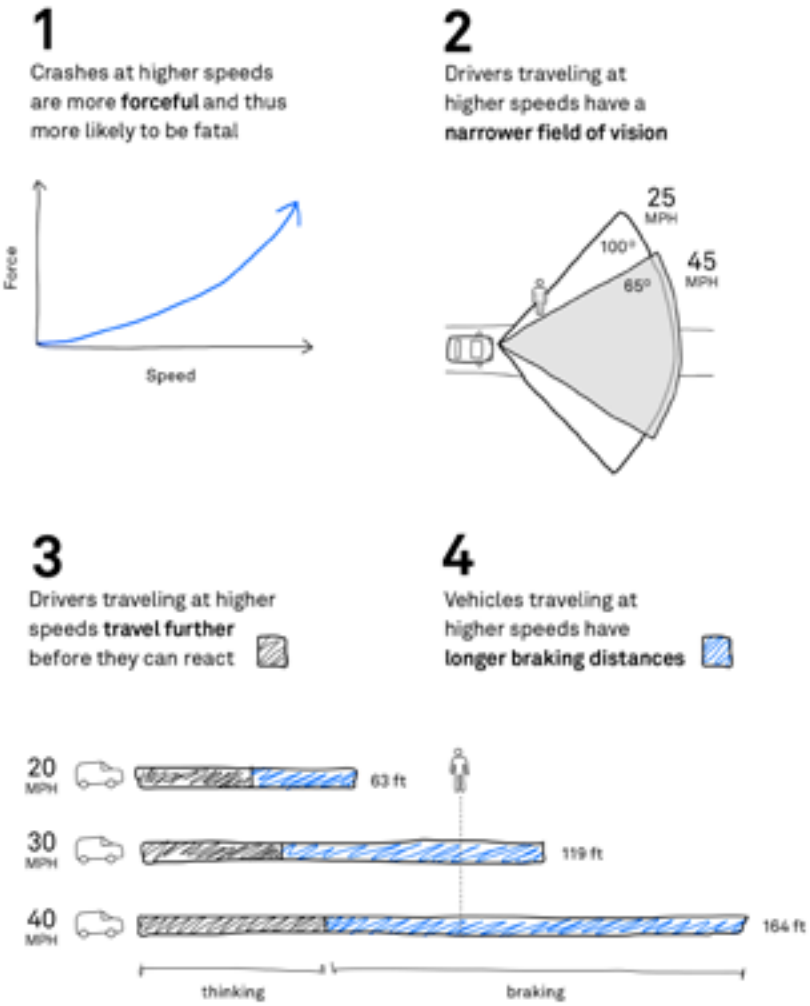
Slower speeds provide drivers more time to react, and collisions at lower speeds cause less injury:

40 mph: A pedestrian struck by a vehicle at 40 mph is almost certain to have severe or life-threatening injuries.

30 mph: If the vehicle is going 30 mph, a pedestrian still has nearly a 50 percent chance of dying or facing life-altering injuries.

20 mph: Crash survivability is significantly better when vehicle speeds are less than 20 mph.

Because the severe injury rate for people walking and biking is much higher when vehicles are traveling at higher speeds, even a reduction of 5 mph can make a big difference for people walking and biking.



From NACTO City Limits Guide from 2020 (pg. 14)

Section I: School Zones

School Zone

School area refers to the general vicinity of a school where school activity takes places, while a **school zone** is a defined section of road with unique legal standing such as lower speed limits, higher fines, crossing guards, etc. A school zone should exist inside or equal to the school area, but both the area and zone can have school specific signage such as school crosswalk signs. A school area does not require designation under state and local statues like a school zone. School areas may contain both school property and the public right of way around the school property.

School zones are identified by signs indicating the presence of the school zone. A school can be a public or private educational institution for one or more levels from kindergarten through grade 12 or a publicly funded early childhood education program under certain conditions.

See ORS 801.462 for definition of school and school zone.

School Speed Zone

School speed zones are a special case of reduced speed limits allowed by statute but require signs to be posted to be enforceable as a speed limit. Different signs are used for the two categories of school speed zones:

- Zones **adjacent to school grounds** use "When Flashing" or "School Days 7AM to 5PM" signs where reduced speed limits apply.
- Zones at **school crosswalks away from school grounds** use "When Flashing" or "When Children Are Present" signs where reduced speed limits apply.

A **school zone** is a section of roadway adjacent to school grounds that may also include a **school speed zone** to reduce speed limits within the zone. An engineering study is required to establish a school speed zone.

Not all school zones are posted with a "School Speed Limit 20" sign. There may be areas adjacent to school grounds where the need for reduced school speeds may be deemed unnecessary—for instance, residential streets on the side or back of a school or a street that has minimal vehicle traffic and slower traffic speeds.

See ORS 811.124 for definition of school speed zone.

Adjacent to school grounds

Crosswalk away from school grounds

Establishing a School Speed Zone

A school speed zone provides the greatest margin of safety on high-speed or high-volume roads when implemented along with other pedestrian improvements such as sidewalks, crosswalk bulb-outs, and crossing guards. If there are children walking to school on a high-speed or high traffic volume road, the road authority should first consider providing improved pedestrian facilities for greater safety for the students. A reduced school speed may also be considered as part of those improvements.

WHO DETERMINES THAT A SCHOOL ZONE OR SCHOOL SPEED ZONE IS APPROPRIATE?

Each road authority, Tribal government, state, county, or city determines where school zones and school speed zones are located along roadways under their jurisdiction. Some schools may have to work with multiple jurisdictions for roadways adjacent to the school property. As a starting point to identify neighboring road authorities, schools can use the ODOT GIS map to identify road owners. Schools should then contact staff at the agency to confirm ownership and establish a working relationship for collaboration on school area safety. An engineering study should establish the locations and limits of a school speed zone.

School zones and school speed zones should be established as per the applicable sections of the *Manual on Uniform Traffic Control Devices* (MUTCD), *MUTCD-OR Supplement*, *Speed Zone Manual,* and other adopted policies. The engineer for the road authority is encouraged to use these guidelines to help determine the need for a school speed zone. A local jurisdiction that does not have sufficient engineering expertise is encouraged to contact their local region ODOT traffic engineering office for assistance or hire a consulting engineer with experience in school zoning. School districts and local traffic safety committees should request a school speed zone study through the local road authority. More information regarding the process for the establishment of a school speed zone may be found in ODOT's *Speed Zone Manual*.

Studies in areas where few students and families are observed walking should also investigate if students and families would like to walk to and from the school area but are prevented by barriers to walkability.

Engineering Study

An engineering study is a written engineering and traffic investigation that includes analysis and evaluation of relevant information to determine a designated speed that is reasonable and safe in the local conditions. The study must be conducted by or under the supervision of a licensed engineer. Once complete, the engineering study will be used to determine the ideal speed for safe travel in the school area. Section III: Designing for Safety outlines engineering studies and safety audits in greater detail.

TIP: Oregon Safe Routes to School provides resources on gathering data on families' experiences traveling to school. Find free evaluation resources on the Oregon SRTS website.

Table 1: ODOT's Speed Zone Manual Determination Considerations for School Speed Zones

	SCHOOL SPEED ZONE TYPICALLY APPROPRIATE	SCHOOL SPEED ZONE REQUIRES JUSTIFICATION	SCHOOL SPEED ZONE IS DISCOURAGED
Education Facilities	Public or private elementary, middle, or high school.	Public early childhood education program.	Public or private early childhood education program, elementary, middle, or high school when conditions outlined below apply.
Roadway Location	Road is adjacent to any part of the school grounds.	--	--
Crossing Conditions	Marked crosswalk(s) do not have a signal or stop sign protection.	Marked crosswalks are protected by a signal or stop sign. Marked crosswalks are on a section of road not adjacent to the school.	--
Speed Conditions	Posted speed limit is 40 mph or below.	--	Posted speed limit is 45 mph or above.
Existing Student and Family Travel Behavior	--	Few students are observed walking nearby. Students walking along Safe Routes to School Plan routes do not cross the roadway in the proposed zone area.	Students and families have other options for traveling to and from school such as busing or driving.
How is it determined?	An engineering study can establish whether a school zone is needed to improve safety or whether other features or safeguards should be considered such as improved pedestrian facilities like sidewalks, crosswalk bulb-outs, and crossing guards.		

See ODOT's Speed Zone Manual Section 703 for specifics of school speed zones and engineering studies.

Designing for School Zones

Infrastructure improvements in school zones should account for the unique factors associated with young students who may be walking or biking to and from school. As children grow, they will expand their independent mobility, and planning for travel in school areas should account for students traveling independently, as well as with adults or older children. Some of the factors associated with school-aged children are:

Visibility: Students may not be visible to drivers, they may have difficulty seeing and being seen by others due to their size, and they may also assume anyone who they can see also sees them.

Environmental cues: Generally, students have a narrower field of vision than adults and may have more trouble accurately assessing the speed and distance of motor vehicles. Younger students may also struggle to easily identify the direction sounds are coming from.

Understanding of hazards: Younger students may not understand motor vehicles as a hazard or complex traffic situations well. For example, they may assume that if one lane of traffic stops, other lanes will also stop.

Learning from others: Children tend to imitate the behaviors they observe in adults and older children.

Funding and Planning Expertise

ODOT offers Safe Routes to School Planning Technical Assistance Grants for a consultant to work with communities to develop formal Safe Routes to School Plans, including recommendations for infrastructure improvements that support access to school. The Planning Technical Assistance process involves analyzing existing infrastructure, a crash analysis, review of previous planning efforts, and community engagement in order to identify and then prioritize infrastructure improvement projects near schools. These SRTS Plans also help connect projects with potential implementation funding opportunities.

More information about the Planning Technical Assistance Grant program and funding resources can be found on the Oregon Safe Routes to School website.

Guidance for Rural Area Schools

While schools are key destinations in all types of communities, they are particularly important in rural areas where they may also serve as centers of activity. Safe access to schools in rural areas not only benefits the children and families attending the school, but all community members attending events and accessing resources on the school grounds, potentially including emergency services or shelter. Creating safe access to schools for the entire community requires a different approach compared to schools located within neighborhoods in more urban and suburban areas. Common challenges for transportation to and from schools in rural areas include:

- Rural schools have a **more dispersed student population with longer trip distances to and from school** and may not be located with neighborhoods or residences. Many rural school districts have most of their students traveling to school by bus.
- Residents in rural areas experience **higher fatal crash rates,** elevating the safety risks when traveling to and from school.
- Rural schools are often **adjacent to higher speed roadways** that also serve as community main streets and freight corridors. Some roads may experience low volumes of traffic most of the time, but have increased traffic during school arrival and dismissal. Roads are also shared by agricultural equipment, which tend to be wide and slow moving.
- Transportation **options are typically focused on motor vehicles,** and facilities such as bike lanes, sidewalks, and public transportation may be limited.
- Lower pedestrian activity may pose a **barrier to justifying pedestrian crossings.** Keep in mind that students may leave the school grounds during the school day for lunch or electives, even in rural areas.
- Specialized **winter maintenance** for active transportation facilities may not be feasible for small communities.

Since school speed zones primarily address safety concerns for people walking and biking, they may not be appropriate in rural areas. Instead, focusing on improving areas with safety concerns related to motor vehicle activity may be more effective. Some safety improvements may require costly stormwater drainage infrastructure; however, there are low-cost safety measures available that will not impact stormwater drainage, such as:

- At the school driveway entrance/exit, consider illumination, warning signs, or turn restrictions to improve visibility and awareness.
- Create floating curb extensions or use paint and/or flex-posts to help reduce crossing distance and slow vehicle speeds.

More extensive measures such as an urban roadway design, roundabout, or a transition treatment may help drivers better anticipate school-related activity and conflicts. See Section III: Designing for Safety for examples of these treatments and others that may be appropriate for schools in rural areas.

For more guidance on transition treatments, see NCHRP 737: *Design Guidance for High-Speed to Low-Speed Transition Zones for Rural Highways*, NACTO *Designing Streets for Kids*, and FHWA *Small Town and Rural Multimodal Networks.*

Section II: Laws, Rules, and Standards About School Areas

Oregon Revised Statutes and Oregon Administrative Rules

The definitions and authorities for school zones in Oregon are established by Oregon Revised Statutes (ORSs) and Oregon Administrative Rules (OARs). These rules and statutes define the authority, limits, penalties, and establishment process for school specific statutes such as school zones and traffic patrols as well as other relevant statutes for how vehicles circulate. Many of the most relevant statutes and administrative rules for school area safety considerations are outlined in this section.

See the Oregon Revised Statutes and the Oregon Administrative Rules online for the full, most up-to-date versions of statutes discussed in this section.

DEFINITION OF LAWS, RULES, STANDARDS, AND GUIDELINES

A **statute**, also known as an Oregon Revised Statute (ORS), is a law passed by the Oregon State Legislature.

Oregon Administrative Rules (OARs) are the regulations created by state agencies to implement, interpret, or prescribe law or policy. They provide guidance on how Oregon laws (Oregon Revised Statutes or ORSs) are to be carried out and enforced. Unlike ORSs, which are enacted by the legislature, OARs are adopted through a rulemaking process.

A road authority **standard or guideline** refers to a written statement developed by the road authority that establishes required, recommended, or optional practices related to transportation matters. These policies can cover a wide range of areas, including traffic control, commercial vehicle operations, and access to state highways. For example, ODOT maintains the Sign Policy and Guidelines which provide additional guidance and options for signing needs that are not covered in the MUTCD for ODOT projects.

Speed Zone Rules and Statutes

ORS 801.462 defines schools, school zones, and school speed zones.

ORS 811.111 describes school zone speed limits. This statute is primarily focused on speed limit violations, but also provides definitions for school zones with 20 mph speed limits. ORS 811.111 outlines the different methods roadway authorities can use to indicate a school zone adjacent to school grounds and at crosswalks outside of school grounds as outlined in Section I: School Zones.

ORS 811.124 defines "when children are present" as when children are occupying a crosswalk, waiting on the curb or roadside, or when a traffic control member is present at a crosswalk. Note that this designation applies at any time of day.

ORS 810.243 allows for the operation of flashing lights as traffic control devices to indicate children are traveling to or from school in a school zone. The statute allows for operation of flashing lights between 7:00 a.m. and 5:00 p.m. on a day when school is in session, but local regulations for allowable hours of operation for flashing lights in school zones may differ.

ORS 811.235 establishes the fines for traffic offenses in school zones. The fines vary based on the level of offense (e.g., misdemeanor versus felony) and the type of traffic offense.

ORS 810.438 establishes when a city may operate a photo radar and includes specific requirements for signage and location of the radar in school zones.

ORS 810.245 establishes the ability of road authorities to install signs giving notice of increasing fines in school zones. These signs must be posted as per ORS 811.235 to reinforce higher fines in school zones.

Rules and Statutes Relevant for School Circulation

OAR 734-020-0005 adopts the MUTCD as the uniform system of marking and signing highways in Oregon, as required under ORS 810.200, including school area signing and marking.

ORS 801.220 defines crosswalk as any part of a roadway with an intersection or crosswalk marking following the standards established under ORS 810.200.

ORS 811.020 prohibits drivers from overtaking another vehicle that is stopped at a marked or unmarked crosswalk to permit a pedestrian to cross the roadway.

ORS 811.025 requires drivers to yield to pedestrians on a sidewalk.

ORS 811.028 requires drivers to stop and remain stopped for a pedestrian in a crosswalk.

ORS 811.550 identifies places where stopping, standing, and parking are prohibited, such as a bike lane, on a crosswalk, or within 20 feet of a crosswalk at an intersection.

ORS 814.400 establishes the right to the road for bicycles.

Jurisdiction and Authority Granting Rules and Statutes

ORS 195.115 requires city and county governing bodies to work with school district personnel to identify barriers and hazards to children walking or bicycling to and from school. The cities, counties, and districts may collaborate on a plan (often a Safe Routes to School Plan) for funding safety improvements.

ORS 332.176 requires school districts to evaluate potential safety improvements within 1 mile of an elementary school (and 1.5 miles of a secondary school) in conjunction with large (over $1 million) publicly bonded construction projects.

ORS 810.180 gives ODOT the authority to designate speeds (i.e., speeds different from statutory speeds) on all public roadways in Oregon and allows ODOT to delegate its authority to certain local jurisdictions.

OAR 734-020-0015 is related to designating speeds by establishing speed zones other than statutory speeds (but does not apply to school zones). The OAR describes the process for establishment of speed zones on public roads and is outlined in the Speed Zone Manual.

OAR 737-025 establishes the Safe Routes to School Fund to assist communities in identifying and reducing barriers and hazards to children walking or biking to school. The OAR also establishes criteria used for awarding grants from the fund.

Traffic Patrol Laws

ORS 339.650 defines "traffic patrol" as one or more individuals appointed by a public or private school to protect students in their crossing of streets or highways on their way to or from the school by directing the students or by cautioning vehicle operators.

OAR 581-021-0100 establishes the operation and authorities for School Traffic Patrols. The *Oregon Traffic Patrol Manual* published by the Oregon Department of Education is adopted as the operational guide for school traffic patrols. The Department is also responsible for distributing equipment and establishing, assisting, and training patrols. The school districts are responsible for requesting patrol training and assistance. School districts may also opt to operate school traffic patrols by district guidelines that are approved by the State Superintendent of Public Instruction as meeting or exceeding the standards in the *Oregon Traffic Patrol Manual*.

ORS 339.655 allows school districts to operate traffic patrols and authorizes schools to provide medical care to traffic patrol members injured or disabled while acting as a member of a traffic control. District traffic patrols must be consistent with the rules outlined in ORS 339.660.

ORS 339.660 establishes rules for eligibility for traffic patrols and requires that members are at least 18 years of age or have written parental consent for traffic patrol membership, must display a badge marked "traffic patrol" while serving, and may display a directional sign where students are using a crosswalk.

ORS 339.665 requires the Department of Education, ODOT, and state and local law enforcement agencies to cooperate with schools in organizing their traffic patrols.

ORS 811.015 and ORS 811.017 require drivers to obey and yield to traffic patrol members who make cautionary signs or signals indicating they are directing students to the crosswalk or are entering a crosswalk to direct students.

Standards and Guidelines

Traffic Control Devices

ODOT adopts uniform standards for traffic control devices, including signs and pavement markings for all streets open to the public in Oregon as required by statute (ORS 810.200). These standards must be largely in agreement with national standards. The federal *Manual on Uniform Traffic Control Devices* (MUTCD) sets minimum standards and guidance to create national uniformity in traffic control devices to create safety through consistency. States and local municipalities may supplement the MUTCD to provide further, more specific guidance for road authorities operating in their boundaries. ODOT has adopted the MUTCD. The school area guidance can be found in Part 7, Traffic Controls for School Areas. This guide was written at the same time as the Oregon Supplement to the 11th edition of the MUTCD and referenced the draft form.

The Oregon Supplement to the MUTCD aligns the MUTCD with the state statutes and rules; all deviations from the MUTCD included in the Oregon Supplement must be justified and are adopted through the OAR process by permission of the Federal Highway Administration (FHWA).

This updated guide is based on the 11th edition of the MUTCD. Readers are encouraged to review the latest MUTCD.

The MUTCD and Oregon Supplement create uniformity in design and placement standards for traffic control devices such as signs, signals, and pavement marketing. This is an important element of creating safety for all road users through consistency in signage for drivers. Oregon reserves specific signs and sign backings for school areas to help road users quickly identify and adapt to school areas. More information about traffic control devices can be found in Section IV: Traffic Control Elements. Specific design details for traffic control devices are outlined in additional ODOT policy and guidelines:

- *ODOT Sign Policy and Guidelines* identify the signs authorized for school areas along with guidelines on their location.
- *ODOT Pavement Marking Manual* sets the parameters and uniform methods for pavement markings for the Oregon State Highway System.

Find the most recent versions of ODOT's guides on their publications page.

ODOT Highway Design Manual

ODOT Highway Design Manual (HDM) provides uniform guidance, policies, and procedures for designing, constructing, and renovating highways, roads, and streets within the Oregon State Highway System. The HDM also includes information on creating an accessible transportation system for all users. The 2023 version of the ODOT HDM incorporated the Blueprint for Urban Design, which provides enhanced guidance focusing on urban and suburban contexts across Oregon.

Accessibility

Transportation should be accessible and inclusive. Federal regulations prohibit discrimination on the basis of disability in state and local government services, which includes transportation facilities, per the Americans with Disabilities Act (ADA) (28 CFR Part 35). State and local governments, including school districts working on transportation projects in school areas, are required to make transportation services accessible even when explicit design standards are emerging or evolving. ODOT has incorporated national guidance and best practices under the ADA to incorporate accessible design into the state's transportation system, including in Oregon's HDM.

FURTHER ACCESSIBILITY GUIDANCE

- Public Right-of-Way Accessibility Guidelines outline guidance for accessible sidewalks, streets, crosswalks, and other transportation facilities in the public right of way in relation to ADA and the Architectural Barriers Act.
- ODOT ADA Transition Plan is ODOT's plan to make Oregon's transportation system accessible.

Other Guidelines

ODOT's *Speed Zone Manual* discusses the speed zone investigation process for Oregon and contains guidance for determining when school speed zones apply.

ODOT Standard Drawings are intended for use on the specific design of physical improvements on public works projects (without modification). These drawings are stamped by an ODOT Engineer of Record and are backed by engineering analysis, calculations, and justification.

Find the most recent versions of ODOT's guides on their publications page.

Truncated domes provide both a tactile and visual cue for pedestrians with visual impairments that they are leaving a sidewalk area.

Section III: Designing for Safety

Safety Measures and School Zone Safety

Designing for safety in school zones is especially important as school zones have a high concentration of especially vulnerable users, including students walking and biking. To improve school area safety, roadway authorities, school districts, and communities should first work to identify the barriers to safety for students and families traveling to school. The current approach to safety in the US is the US Department of Transportation's Safe System Approach, which focuses on human mistakes and human vulnerability and then designs a system with built-in redundancies to protect everyone. The Safe System Approach aims to be both reactive to existing hazards such as crash hotspots and proactive in identifying potential future crashes based on risk factors.

Source: US Department of Transportation

ORS 195.111 requires city and county governments to work with school districts to identify barriers and hazards to children walking and biking to and from school and allows them to create a plan to reduce the barriers identified. Conducting safety assessments and choosing improvements designed to address barriers to safety can help local governments meet this requirement.

Identifying safety hazards is the first step in recognizing opportunities for improving safety in the school area. Selecting the ideal design treatment should include examining what the estimated impact on safety will be as well as what is feasible in the site location based on budget and infrastructure. Using measurable solutions can help agencies easily understand which design elements can be affordable and effective countermeasures to identified safety barriers. FHWA's Crash Modification Factors (CMFs) and Proven Safety Countermeasures are two means of identifying measurable solutions for transportation safety hazards.

Identifying Measurable Solutions

Crash Modification Factors indicate the proportion of crashes that would be expected after implementing a countermeasure, such as a Rectangular Rapid Flashing Beacon. CMF values below 1 indicate an expected decrease in crashes. CMFs can be used to identify which countermeasure will have the highest impact on decreasing crashes. More information and specific countermeasures are available on the CMF Clearinghouse website.

FHWA Proven Safety Countermeasures are a collection of countermeasures and strategies that are effective in reducing fatalities and serious injuries on roadways. The countermeasures are clustered to address specific safety focus areas: speed management, intersections, roadway departures, pedestrians and bicyclists, as well as a set of countermeasures that address multiple focus areas (these are referred to as crosscutting). Each countermeasure also has an estimated percent reduction in total crashes based on FHWA studies. While all FHWA countermeasures can be applicable to school areas, this guide highlights those focused on safety for people walking and biking, and crosscutting measures. Find the countermeasures and most recent data on the FHWA website.

POTENTIAL FHWA PROVEN SAFETY COUNTERMEASURES FOR SCHOOL AREAS

COUNTERMEASURE	ESTIMATED CRASH REDUCTION
Pedestrians and Bicyclists	
 **Crosswalk Visibility Enhancements** Crosswalk enhancements make people walking and rolling more visible to drivers with improvements such as high-visibility crosswalk markings, improved lighting, and advance signing and pavement marking.	• High-visibility crosswalks: 40% reduction in crashes with pedestrian injury • Intersection lighting: 42% reduction in pedestrian crashes • Advance yield or stop markings: 25% reduction in pedestrian crash
 **Leading Pedestrian Intervals (LPIs)** LPIs give people crossing the street an opportunity to enter the crosswalk 3 to 7 seconds before the green light indication for vehicles. Can be especially beneficial at intersections with high vehicle turning volumes. Costs for implementing LPI timing are low when only an alteration to signal timing is needed.	• 13% reduction in pedestrian-vehicle crashes at intersections

POTENTIAL FHWA PROVEN SAFETY COUNTERMEASURES FOR SCHOOL AREAS

COUNTERMEASURE	ESTIMATED CRASH REDUCTION
 **Medians and Pedestrian Refuge Islands** Medians and pedestrian refuge islands are physical spaces between lanes of traffic, allowing pedestrians to cross one direction of traffic at a time.	• Median with marked crosswalk: 46% reduction in pedestrian crashes • Pedestrian refuge island: 56% reduction in pedestrian crashes
 **Pedestrian Hybrid Beacons (PHBs)** PHBs are a traffic control device used to help people walking, rolling, and biking safely cross high-speed roadways at midblock and uncontrolled crossings by providing a button to activate a beacon that will slow, then stop traffic at the crossing.	• 55% reduction in pedestrian crashes • 29% reduction in total crashes
 **Rectangular Rapid Flashing Beacons (RRFBs)** RRFBs accompany pedestrian warning signs to enhance visibility and driver awareness at an uncontrolled, marked crosswalk.	• 47% reduction in pedestrian crashes • 98% increase in motorist yielding rates
 **Road Diet** A safety-focused roadway reconfiguration to calm traffic and provide better mobility and access for all users by reducing the number of lanes of traffic.	• 4-lane to 3-lane road diet conversions: 19% - 47% reduction in total crashes
 **Walkways** Walkways are any defined space for use by a person traveling by foot or using a wheelchair such as a pedestrian walkway, shared use path, sidewalk, or roadway shoulder. Pedestrians should have a connected network or walkways to desired destinations without gaps.	• Sidewalks: 65% - 89% reduction in crashes with people walking along roadways • Paved shoulders: 71% reduction in crashes with people walking along roadways
 **Bicycle Lanes** Bicycle lanes are dedicated spaces for riding a bicycle intended to increase comfort and safety for people riding bikes. Bicycle lanes can be separated from traffic or directly adjacent to traffic.	• Converting traditional bicycle lane to a separated lane with flexible posts: 53% reduction in bicycle/ vehicle crashes • Bicycle lane addition: 30% - 49% reduction in total crashes

POTENTIAL FHWA PROVEN SAFETY COUNTERMEASURES FOR SCHOOL AREAS

COUNTERMEASURE	ESTIMATED CRASH REDUCTION
Crosscutting	
 **Lighting** Adequate lighting can provide enhanced visibility as well as personal security for multimodal users.	• 42% reduction in nighttime injury pedestrian crashes at intersections • 33% - 38% reduction in nighttime crashes at rural and urban intersections • 28% reduction in nighttime injury crashes on rural and urban highways
 **Road Safety Audit** An eight step process to identify barriers to safety along roadways and identify opportunities for improvement that uses a Safe System Approach.	• 10% - 60% reduction in total crashes
Speed Management	
 **Appropriate Speed Limits for All Road Users** Speed control is one of the most important methods for reducing fatalities and serious injuries. Speed is an especially important factor on roadways where vehicles and vulnerable road users mix (such as school areas.)	• Crash reduction is variable, but case studies are available on the FHWA website.
 **Speed Safety Cameras** Speed safety cameras can be an used to detect speeding and capture video or photo evidence of vehicles violating the posted speed limit. These cameras can be an effective and reliable method to enforce safe speeds and alter driver behavior.	• 47% reduction for injury crashes in urban arterials using a single, stationary camera. • 37% reduction in fatal and injury crashes when multiple cameras capture average speed over time. • 20% reduction in fatal and injury crashes using portable cameras along urban arterials.

Source: FHWA Proven Safety Countermeasures, 2025

Accessibility in School Areas

Designing for all ages and abilities creates transportation facilities that are safe, comfortable, and accessible for everyone. Students and families traveling to school areas should not face barriers due to limited accessibility of facilities such as sidewalks, signals, and crossings. Further, local governments are required to incorporate accessibility into infrastructure by the ADA. When considering school area travel, schools should ensure that at a minimum the following are accessible: arrival points, exterior routes, parking, and loading and unloading zones.

Incorporating accessibility into school infrastructure improvements can benefit everyone. For example, appropriate curb ramps are also beneficial for families pushing strollers on their walk to school, and signal crossing timing that is long enough for a person with limited mobility may also be beneficial for young children who may take longer to cross the street.

Agencies can refer to federal and state accessibility guidance:

- Public Right-of-Way Accessibility Guidelines (PROWAG) outlines guidance for accessible sidewalks, streets, crosswalks, and other transportation facilities as part of the ADA and the Architectural Barriers Act.
- *ODOT Highway Design Manual*
- ADA Accessibility Standards
- *ODOT ADA Transition Plan*

Inclusive Walk Audit Facilitator's Guide

People with disabilities are more likely to rely on walking and public transportation for daily trips. This guide provides best practices and information on how to better include people with disabilities in walk audits and foster a more inclusive planning process.

Safety Assessment

Creating a safe environment for students and families to travel to school will require treatments that respond to the specific barriers to safety at each individual school site. Roadway authorities, school districts, and communities can undertake different types of safety assessments with varying levels of requirements to identify safety concerns traveling to and from school, as well as for families circulating in school grounds during school arrival and dismissal.

A typical safety assessment will include qualitative and quantitative data about the travel conditions in the school area. Three different methods of safety assessment and approaches are outlined in this section, but in general safety assessments will:

- Select **current or future proposed projects** to assess (e.g., intersection, roadway) and identify project partners.
- Gather and assess **quantitative data** about the travel conditions in the area such as crash data and counts of people walking, biking, rolling, and driving.
- Gather **qualitative data** about experiences traveling in the area by different modes through engagement with the community.
- Assess and **analyze the data** for barriers to safely traveling to school and opportunities for improvement.
- Select **appropriate treatments** that address the specific barriers to safety uncovered by the safety assessment process.
- Evaluate and **adjust improvements as needed** to determine if changes have been successful or if further adjustments are needed.

NACTO's *Designing Streets for Kids* guide includes recommendations for effective engagement strategies for children and caregivers, including:

- Engage students and families in all steps of the process
- Ask broad and non-leading questions about experiences rather than technical design
- Foster and maintain partnerships from the outset
- Be inclusive and transparent about the process and provide ways to engage that meet the needs of the community such as translation or paper surveys
- Celebrate and acknowledge the input from community members

Assessing for safety should include input from community members on their experiences and goals traveling to school. For example, simply counting the current number of students using crossings or following a designated school route might not capture the experiences of students and families who avoid walking or biking to school due to current barriers.

Traffic Engineering Study

Reducing motor vehicle speed is an effective way to increase safety in a school area. As mentioned in Section I: School Zones, establishing a 20 mph school speed zone requires an engineering study justifying the school speed zone. The engineering study, conducted by a licensed engineer, will analyze and evaluate the local conditions to determine a reasonable and safe speed for those conditions. Engineering studies are adapted to the specifics of the school area and roadways to consider all relevant factors to how people are traveling in the area, such as traffic volumes, turning movements, or other safety issues. These studies may include the following:

- The maximum speed and any specific locations where speeds change in the area.
- Crash history, including crash type and modes, frequency, and severity.
- Input from school staff, traffic safety committees, the school district, local law enforcement, and any other community representatives.
- Examination of traffic patterns during different times of day, days of the week, or even seasons.
- Types of factors that cause adverse road conditions such as weather, visibility, and other environmental factors as well as how frequently they occur.
- Locations of signs in the area.
- Speed study analyzing speeds used while traveling in the area.
- The number of students walking to and from school.
- Number of people using the school crossing.
- Examinations of the school arrival and dismissal locations and traffic flow.
- Examinations of any existing Safe Routes to School plans.

See ODOT's Speed Zone Manual Section 703 for specifics of engineering and speed zone studies.

ODOT Planning Technical Assistance site visit in Amity.

ODOT's Engineering Assistance program provides consultant support to communities for priority infrastructure projects for bike and pedestrian transportation. Learn more about engineering assistance and grants on the ODOT SRTS website.

Road Safety Audit

Road Safety Audits (RSAs) are one of the FHWA's proven safety countermeasures, **with an estimated 10% to 60% reduction in total crashes.** An RSA aims to understand which elements of the road present a safety concern and what opportunities exist to eliminate or mitigate those concerns. It also examines the context of safety concerns such as which road users are impacted and under what circumstances. The RSA can be applied to existing or future roads or intersections and gathers an independent, multidisciplinary team to identify barriers to safety and potential improvements for all road users.

The RSA process aligns with the Safe System Approach because unlike traditional safety assessments, it incorporates human factors and multimodal safety concerns into the process—which is especially important for designing for students walking and biking to school. The process also prioritizes choosing designs with data-backed safety records.

ROAD SAFETY AUDIT PROCESS

Design Team / Project Owner

- Identify Study Area
- Select RSA Team

RSA Team

- Conduct Start-Up Meeting
- Perform Field Reviews
- Analyze and Report on Findings
- Present Findings to Owner

Design Team / Project Owner

- Prepare Formal Response
- Incorporate Findings

Safe Routes Assessments

A School Route Plan for each school serving elementary through high school students should be prepared to serve as the basis for identifying the desired walking and biking routes. However, schools will need to assess the safety of potential routes before making recommendations. When assessing the safety of the immediate area surrounding the school building, it is important to consider elements of the school site and street design such as the provision of sidewalks, street widths, visibility at key locations, and design of arrival and dismissal areas. Conducting a walk or bike audit can be an effective way to understand the experience of traveling around a school site area and identify safety concerns.

- Are there sight obstructions that should be corrected by restricting or removing parking or by trimming trees and shrubs?
- What accommodations have been made for children riding to school on bikes?
- Are the designated loading and unloading zones free from conflicts with other traffic?
- Are sidewalks wide enough at dismissal time?

Walk or bike audits conducted with community members and partner agencies such as school districts, roadway authorities, and other local governments can help identify needed improvements to school areas and be an important step in creating recommended walking and bike routes for schools. Once problem areas are identified, then changes to the layout of the street, traffic control devices, and education and law enforcement activities can be identified and enacted.

The Oregon Safe Routes to School website has resources and toolkits for assessing different modes of traveling to school in your community. Find information about planning assistance and resources for assessing different modes of traveling to school in your community:

- Walkability Checklist
- Bikeability Checklist

Street Design Toolbox

Pedestrian Enhancements

Physical elements of the pedestrian network should be assessed for safety and comfort. This includes an assessment of features such as sidewalks, curb ramps, and crosswalks. Conflicts with motor vehicles at crosswalks and driveways should be assessed. Enhancements such as sidewalks, driveway relocations or consolidation, traffic calming, and improved sight distance may be identified. A marked crossing alone may not sufficiently address safety barriers identified in a school area; enhancing crosswalk visibility can address issues like poor lighting conditions, parked cars, and visibility issues from roadway curvature. FHWA Proven Safety Countermeasures identify three elements to improve crosswalk visibility for safety outcomes:

- **High-visibility crosswalks** (40% estimated crash reduction)
- **Improved lighting** (42% estimated crash reduction)
- **Enhanced signing and pavement markings** (24% estimated crash reduction)

This section provides an overview of some common pedestrian enhancements, but agencies may need to refer to other strategies mentioned in the provided resources on the right to address concerns specific to their school site. Section IV: Traffic Control Elements covers important traffic control devices for creating safe and comfortable travel for people walking and rolling, including marked crossings, pavement markings, signage, signals, and beacons such as Pedestrian Hybrid Beacons and Rectangular Rapid Flashing Beacons in more detail.

GUIDANCE AND RESOURCES

- ODOT *Highway Design Manual*: On state highways, the design of pedestrian facilities should follow the standards established in the ODOT *Highway Design Manual.*
- ODOT *Traffic Manual*: Section 310.3 focuses on crossing enhancements.
- ODOT *Bicycle and Pedestrian Design Guide*
- American Association of State Highway and Transportation Officials *Guide for the Planning, Design and Operation of Pedestrian Facilities*
- FHWA *Small Towns and Rural Multimodal Networks*
- National Association of City Transportation Officials (NACTO) *Urban Street Design Guide*
- NACTO *Designing Streets for Kids*
- Global Designing Cities Initiative
- ADA Accessibility Standards
- Public Right-of-Way Accessibility Guidelines

Pedestrian Enhancements

CURB EXTENSIONS

Curb extensions (bulb-outs) can reduce crossing distances and can increase pedestrian visibility by and reduce the crossing distance and exposure at crossings. . They can be used to provide space for ADA-compliant pedestrian ramps, enhance bikeway crossings, and contribute to streetscape design. Curb extensions can be created through extension of the physical walkway, or through on-street paint and flex posts where expanding the sidewalk itself is not possible due to costs or project timing. Where on-street parking is present, curb extensions should be considered. Curb extensions should be planned thoughtfully along corridors with separated bike lanes.

Curb extension at school crossing in Heppner.

MEDIANS AND PEDESTRIAN REFUGE ISLANDS

Medians and pedestrian islands allow for crossing a single direction of traffic at a time and allow students to use existing gaps in traffic to split the crossing of the roadway into manageable parts. This is especially important where there are multiple travel lanes in each direction. Without enhancements such as islands, these roadways may not offer good opportunities for crossing and may result in students dashing across the roadway during less than adequate gaps. Median islands are one of the most effective ways to increase safety and make crossing easier; additionally, roadway narrowing from installing the median has traffic calming benefits. While median islands generally provide significant safety benefits, their possible impact to vehicle turning movements should be assessed.

ODOT Safe Routes to School Construction Grant funded pedestrian refuge island in Albany.

Pedestrian Enhancements

Raised crosswalk at Rogue Primary School in Central Point.

RAISED CROSSWALKS

Pedestrian crosswalks may be combined with a speed table to increase pedestrian visibility and lower traffic speeds. A raised crosswalk typically involves raising the roadway to an elevation near that of the sidewalk. Even though curb ramps are usually eliminated with raised crosswalks, tactile warning stripes must be provided to warn visually impaired pedestrians of the interface with vehicular traffic. Raised crosswalks can be located midblock or at intersections, and they may be used in parking lots and across driveways. However, they may not be appropriate on arterials. If the street is frequently used by emergency response vehicles, it may not be appropriate to install raised crosswalks or it may be necessary to modify the design of the raised crosswalk.

A note on textured crosswalks

Textured crosswalks are generally discouraged due to their challenges with long-term durability and visibility. Textured or colored crosswalks can actually be less visible than conventional marked crosswalks (red brick tends to fade to black, especially at times of low visibility). Textured crosswalks can be rough, impeding the movement of people using wheelchairs, walkers, or those with sight impairments. Textured and colored crosswalks are typically higher maintenance, and some materials can become slick, creating a slipping hazard.

ODOT's practice is to not install textured or colored crosswalks. It is sometimes, however, the desire of a local road authority to install them. If textured crosswalks are used, they should be made of durable materials, such as stamped concrete, with minimal beveling. Colored crosswalks should avoid the use of standard traffic control colors. All textured and/or colored crosswalks are required to have the standard transverse white lines or continental (longitudinal) white lines to ensure their visibility to and recognition by motorists.

Traffic Calming

Traffic calming measures are intended to encourage drivers to drive at appropriate speeds. The selection of traffic calming strategies must consider the operational goals for the roadway, adjacent land use, and emergency vehicle operations. Selecting the right treatments for traffic calming will also depend on the posted speed limit and size of the current roadway. Strategies for local neighborhood streets will differ from those used on arterials, state highways, and rural roads.

LOCAL NEIGHBORHOOD TRAFFIC CALMING

- Speed humps, speed tables, or raised crosswalks
- Traffic circles or diverters
- Narrower street and intersection widths, which can be combined with curb extensions
- Other geometric features or traffic control that may be aimed at reducing the speed and/or volume of traffic

GUIDANCE AND RESOURCES

- ODOT *Main Street Handbook*
- NACTO *Urban Street Design Guide*
- NACTO *Designing Streets for Kids*
- NACTO *Designing for All Ages and Abilities*
- New Jersey Safe Routes to School *Improving Safety in School Zones on State Highways*
- FHWA *Rural Multimodal Networks*
- NACTO *Urban Bikeway Design Guide*

Traffic Calming

Pedestrian improvements on a high speed road in John Day, Oregon funded by a ODOT Safe Routes to School Construction Grant.

IMPROVING SAFETY ON HIGH-SPEED ROADWAYS

Schools can be located along high-speed roadways, such as state highways with speed limits of 55 mph or greater. These roadways have fewer signalized intersections and safe crossing opportunities, and may have higher volumes of traffic or multiple lanes of traffic. These conditions pose serious challenges for children and families when traveling on or across these roads. As the guidance for establishing school speed zones does not recommend school speed zones in areas where the posted speed limit is 45 mph or greater, schools and communities can pursue other infrastructure options to create safer conditions for students and families traveling to school. Improvements should focus on reducing vehicle speed, increasing visibility, and reducing pedestrian exposure.

Possible strategies include street design elements, many of which are outlined in other areas of this section:

- Creating or widening walkways; where sidewalks or separated walkways are not feasible, creating paved road shoulders
- Crosswalk visibility enhancements such as lighting and signage
- Pedestrian refuge islands
- Pedestrian hybrid beacons
- Leading pedestrian interval
- Curb extensions
- Roadway lane reconfiguring (such as a 4-lane to 3-lane “road diet” conversion)
- Road safety audit

Bicycle Enhancements

Surrounding streets should be equipped with appropriate accommodations for students on bicycles, and bicycle access should be available from all directions. Sidewalks, bikeways, and trails should connect to the school property. Consider improving linkages between surrounding neighborhoods to provide access such as between cul-de-sacs and school property. People riding bikes should have secure and separate parking facilities close to school entrances.

Bicycle facilities need to be developed in a comprehensive manner to provide an uninterrupted network of comfortable routes to school. Separated bikeways are increasingly being recognized for their ability to enhance safety and attract new riders on streets where standard bike lanes may have been used in the past. Note that the 11th edition of the MUTCD now recommends that bike routes be considered in school zones when biking is not allowed on the sidewalks on the pedestrian route.

GUIDANCE AND RESOURCES

- ODOT *Highway Design Manual*: On state highways, the design of bicycle facilities should follow the standards established in the ODOT *Highway Design Manual*.
- ODOT *Traffic Manual*
- ODOT *Bicycle and Pedestrian Design Guide*
- AASHTO *Guide for Development of Bicycle Facilities*
- FHWA *Small Towns and Rural Multimodal Networks*
- NACTO *Urban Street Design Guide*
- NACTO *Designing Streets for Kids*
- NACTO *Designing for All Ages and Abilities*
- NACTO *Urban Bikeway Design Guide*

SEPARATED AND OFF-STREET BIKEWAYS

Separated bikeways, also known as protected bike lanes, cycle tracks, raised bike lanes, and shared use paths, offer an element of physical separation between motorized vehicles and bicycles. These facilities provide safer, more comfortable conditions for all multimodal users, especially when roadway speeds and volumes are high.

Traveling to school along a separated path in Ashland.

Bicycle Enhancements

ON-ROAD BIKEWAYS

On-road bikeways such as shoulders, bike lanes, and buffered bike lanes are located on the same curb-to-curb portion of the roadway as motor vehicles, but have no physical separation between people biking and driving. Often, on-road bikeways may also place people bicycling between parked and moving vehicles. For on road bikeways, NACTO's *Designing for All Ages and Abilities* recommends choosing roads with speeds at or below 25 mph and proactively designing to reduce curbside and intersection conflicts.

Top: Biking to school in Bend, Oregon.

Bottom: Bike lane with parked cars and posts acting as a buffer from the roadway in Medford built with an ODOT Safe Routes to School Construction Grant.

Above: Bike to school day in Hood River on a community greenway, photo courtesy of Hood River County.

Below: Greenway signage in Portland, photo courtesy of Metro.

NEIGHBORHOOD GREENWAYS OR BICYCLE BOULEVARDS

Neighborhood greenways or bicycle boulevards are streets shared by people driving and biking. They are characterized by slow speeds (25 mph or less) and low traffic volumes where people on bikes ride in the travel lane with motor vehicles and special attention is given to the needs of the people biking. Using diverters, prohibiting through traffic, or removing marking can help further reduce motor vehicle volume on these streets.

Bicycle Enhancements

ON-SITE BICYCLE PARKING

Students, faculty, and staff riding their bike to school will need appropriate parking for their bicycles. Ideally, families and school staff will have access to bike parking that is convenient to access, secure, easy to use, and protected from the elements. Providing high-quality bike parking is an effective way to communicate that active transportation is a safe and reliable way to commute to school.

Schools may have no bike parking at all or older bike parking facilities with hard-to-use bike racks that may be in an out-of-the-way area of the school. Placing racks in the front of the school both helps raise awareness of the option to travel to school by bike and provides more watchful eyes on the bike parking. A high-quality bike rack should meet the following criteria:

- Provide two points of contact with the bike frame, and allow locking of the frame and at least one wheel with a U-lock
- Be anchored to the ground securely
- Resist cutting, corrosion, or deformation from natural or human causes
- Work well for a variety of bicycle frame types (cargo bikes, children's bicycles, step-through frames, diamond frames etc.)
- Accommodate bicycle fenders, baskets, and racks
- Do not require lifting the bicycle to access or use the rack

Staple racks fulfill all the criteria above, while wheel/wave racks do not. In addition to high-quality parking, consider adding fix-it stations with tools and a pump as well as racks for skateboards.

Eugene-Springfield Bicycle Parking Assessment Tool

The Eugene-Springfield Safe Routes to School program created an assessment tool to help districts evaluate the quality of bike parking at their school and understand how it can be improved. The tool was created in 2014 in collaboration with the Safe Routes Partnership and guides schools and districts through a six-step process to score bicycle parking facilities by evaluating bicycle rack types, location, quantity, security, and accessibility.

View the report and assessment tool on the Safe Routes Partnership's website.

High-quality bike parking examples at schools in Sweet Home (top) and Ashland (bottom).

Quick Build Projects

Safety improvements can often take a long time to implement. They can run into delays due to challenges for funding, public support, and approvals. Quick build projects, also known as demonstration projects, provide communities with a fast, more affordable method to address barriers to safety. These projects use lower-cost, temporary, easily removed materials to make changes to the roadway, and they can be used to test the impact of the changes on behavior and gather community input on the changes before investing in more expensive, permanent changes. Often, quick build projects are a middle phase between initial planning and permanent reconstruction. However, in some cases quick build projects may be a long term installation.

Quick build projects can be used to implement many of the street design elements covered in this section.

PAINTED CURB EXTENSIONS

Using paint and flexible posts, or other easily removable physical objects, is a low-cost and efficient way to implement curb extensions without extending the existing sidewalk area.

PEDESTRIAN REFUGE ISLANDS

Temporary materials such as flexible posts, paint, bollards, or movable planters and paint can be used to create a temporary pedestrian refuge island in a multi-lane road.

TURN CALMING

Creating barriers to corner cutting and fast turning can help reduce vehicle turning speeds and increase visibility of people crossing the street. Using paint, hardened centerlines, rubber curbs, or flexible posts can change the radii of corners and encourage safer turning speeds.

GUIDANCE & RESOURCES

- Metro *Community Quick-Build and Demonstration Projects Guide*
- NACTO *Quick Builds for Better Streets*
- California Bicycle Coalition *Quick-Build Guide*
- MUTCD Section 3J.07: Sidewalk Extensions Designated by Pavement Markings

ODOT Safe Routes to School Quick Build projects to improve crossings in Mt. Angel (top) and Sweet Home (bottom).

Quick Build Projects

Quick build project in Portland using temporary barriers and pavement marking to create a multiuse path in the roadway, which was later turned into a permanent multiuse path. Photo from Metro.

Planters and pavement markings create a larger buffer for the bike lane on Lloyd Blvd. in Portland. Photo from Metro.

SEPARATED BIKE LANES

Flexible posts, planters, or hay bales can be used to quickly create designated and more protected space for bikes on the roadway. These can be used to add physical separation to an existing bike lane, test a new bike lane, or reallocate space on a street for a separated bikeway.

REFLECTIVE STRIPS ON SIGNPOSTS

Adding a reflective strip to the length of a school area signpost is a low-cost option for enhancing driver awareness of important school area signage.

Program and Policy Toolbox

Improvements within School Premises

Site layout and parking areas should be focused on reducing pedestrian, bicycle, and motor vehicle conflicts.

Schools receive the highest volume of traffic during student arrival and dismissal time, when the student body and their families are all traveling to and from school in the same time period. Schools may experience congestion; long lines of idling cars; drivers parking cars in areas that block access to bike lanes, crosswalks, and travel lanes; and conflicts between students walking, rolling, or busing to school and those arriving by personal vehicles. Schools can use the data gathered in site assessments for other elements of infrastructure to inform improvements and select treatments to improve school area circulation.

When possible, consideration should be given to separating bus and parent arrival/dismissal points. Redesign of parking areas to improve flow and reduce pedestrian/vehicle conflicts should be considered. School officials should work closely with public works (traffic engineering) representatives to evaluate traffic safety issues with site layout and parking.

Like all aspects of school area safety, circulation issues can be addressed by a combination of education and infrastructure improvements. Providing resources like route maps, awareness campaigns on the public health impacts of idling vehicles, and education to build confidence in walking and rolling to school safely can all help address school circulation issues.

GUIDANCE AND RESOURCES

- ODOT's *Site Circulation Toolkit* provides an overview of methods to identify problems and solutions for circulation at your school, including ways to reduce motor vehicle speeds.
- ODOT's *SRTS Park and Walk Toolkit* provides a how-to for remote drop-off programs.
- Feet First's *Improve Your School Arrival and Departure Procedures* toolkit provides step-by-step instructions for creating a circulation map.
- *Eugene-Springfield Bicycle Parking Assessment Tool*

Improvements within School Premises

TEMPORARY ROAD ACCESS CHANGES

Schools can work with local jurisdictions to get approval to create temporary restrictions on vehicle movement near a school. This could be creating temporary one-way streets using removable barriers and signage or creating a limited access street in the school area that restricts vehicle access entirely and opens up the street for students walking and rolling.

REMOTE DROP-OFF LOCATIONS

Remote drop-off locations are located within a half-mile of the school site and disperse vehicle traffic to a wider area. Students walking from a remote drop-off point get the same benefits from physical activity as students walking from their home; this can be an especially helpful option for schools with a widely dispersed student body. Schools interested in remote drop-off should designate recommended walking routes between the school area and drop-off location and share them with the school community.

Temporary road closure signage and barrier for drop off and pick up in Hood River. Photo courtesy of Hood River County.

School Routes

The safety assessments and audits of the school area can also inform school route maps and circulation maps for families traveling to school by walking, biking, and driving. This can help all families understand the safest way to arrive at school by whichever travel mode they choose.

CIRCULATION MAP

Schools can create a circulation map to encourage families to navigate to and from the school area in a way that prioritizes safety for all families traveling to and from school. Portland Bureau of Transportation and Beaverton School District have worked with individual schools to create school circulation maps for schools to address site circulation issues.

ODOT GREAT STREETS PROGRAM

The ODOT Great Streets Program offers funding to address multiple needs in a single project to create more complete streets focusing on state highways that function as main streets. Schools located along state highways serving as main streets should consider applying to the Great Streets Program for infrastructure improvements to address school area safety needs that will provide benefits for the whole community.

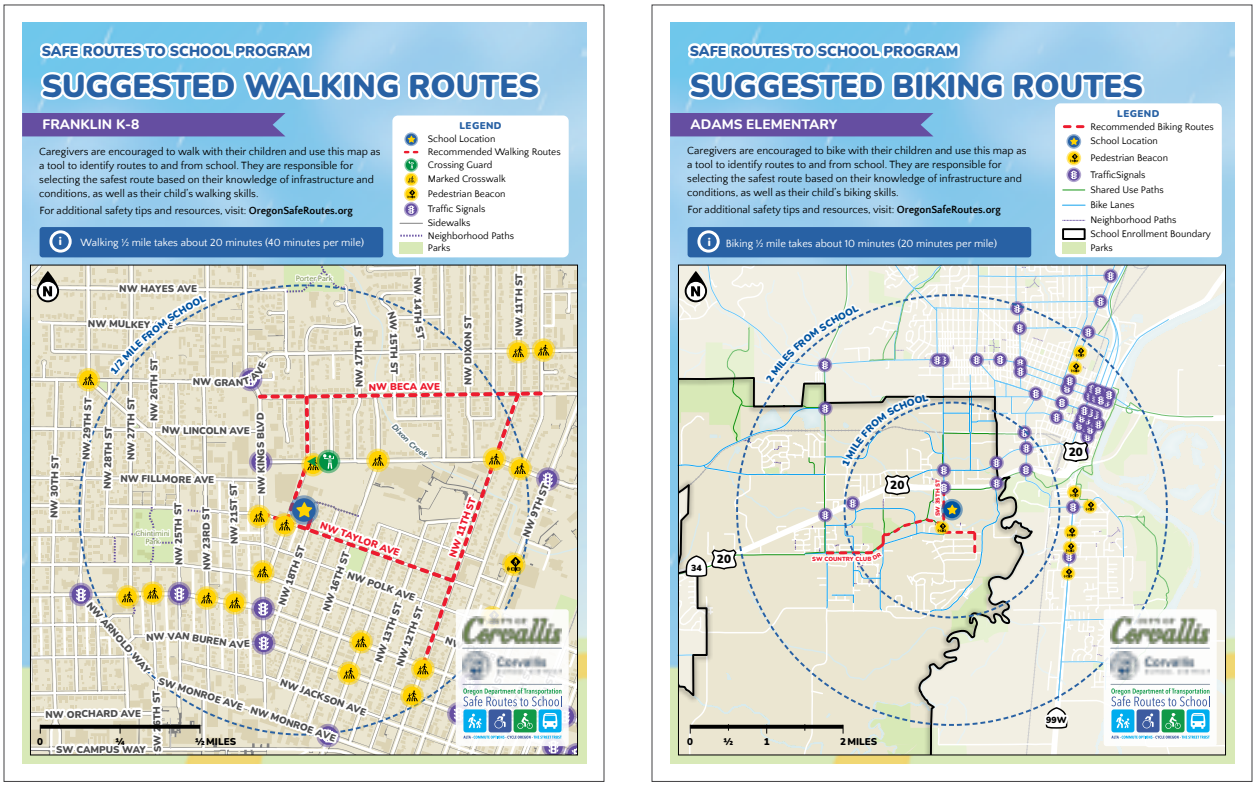
Sacramento Elementary School circulation map, provided by the Portland Bureau of Transportation.

Barnes Elementary School Site Circulation Map, provided by Beaverton School District.

School Routes

WALKING AND BIKING ROUTE MAPS

Using road safety audits can help guide the route assessment team by creating a recommended route for traveling to school. The routes do not need to cover the entire route all students may take, but will typically focus on areas of the school within a few miles for bike maps and a half mile for walk maps. Maps should include recommended routes, school location, and helpful information about infrastructure like types of walkways, safety elements like marked crosswalks, and crossing guards.



Example of a SRTS walking (left) and biking (right) maps from Corvallis School District.

School Routes

WALKING SCHOOL BUS AND BIKE BUS WAYFINDING

Walking School Buses and Bike Buses can be a helpful and fun way to help more families walk and roll to school. The Walking School Bus or Bike Bus is led by one or more adults and follows a specific route to school, allowing students to join in along the route—as they might with a traditional school bus. Providing yard signs or creating pavement markings along the route can help raise awareness of the Walking School Bus or Bike Bus to families who might want to participate and can keep other road users aware of children using the road to travel to school.

Walking School Bus in Springfield.

BIKE BUS SIGNAGE IN PORTLAND

The Portland Bureau of Transportation (PBOT) is working to bolster bike buses throughout the City of Portland with infrastructure improvements along the route as well as signage to raise awareness of bike buses in the city. Funded by a Metro Regional Travel Options Grant, PBOT is installing signs aimed at both drivers and potential bike bus users. The project uses lawn signs, pavement markings, and plaques for existing street signs to be used along the route as well as signs for the "caboose" of the bus to use to discourage motor vehicle drivers from trying to pass the group. PBOT will evaluate the impact of the signs on driver behavior in fall 2025.

Source: Portland Bureau of Transportation

Beyond Design: Educational Programming

Safe Routes to School (SRTS) emphasizes the importance of education and encouragement for walking and biking to school alongside infrastructure improvements for school area safety. Along with incorporating safety focused school area transportation design, school districts and communities can also encourage families walking and rolling to school through education activities such as hosting walk and roll to school events, sharing resources with families on safety, organizing carpool programs, and including walking and biking safety in PE curriculum, and more. The Oregon SRTS website includes information on SRTS education grants and free resources for creating SRTS education programs in your community. Additionally, communities can order free education materials for people walking, biking, and rolling from the ODOT Storeroom.

Visit the Oregon SRTS website to find out if your community has a local SRTS Coordinator and connect to your Regional Hub. Find out more details about SRTS resources in Section V: School Zone Safety Resources.

Students in Salem participating in a Jump Start bicycle safety class. Learn more about the Jump Start program on the Oregon SRTS website.

Students at James John Elementary in Portland with a Walking School Bus sign.

Student traffic patrol team member assisting students crossing during a walk to school event at Jefferson Elementary School in Medford.

Section IV: Traffic Control Elements

The *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD) promotes uniformity in design of signs and pavement markings to include shape, color, dimension, symbols, as well as uniform application of signs. Consistency and uniformity in signage helps promote safety and mobility for all road users, including people walking, rolling, and biking, by prompting drivers to adjust to conditions such as school zones.

This section outlines signage relevant to school area safety, but before implementing any signage, road authorities and school area transportation advocates should check the most recent standards and guidance found in the MUTCD, Oregon Supplement to the MUTCD, *ODOT Sign Policy and Guidelines*, *ODOT Pavement Marking Design Guidelines*, and any other relevant local policies before proceeding. Some road jurisdictions may have more stringent standards about the application or size of the signs. Refer to the applicable road jurisdiction's standards for further information. The information in this section references the 11th edition of the MUTCD, the Oregon Supplement to the MUTCD, and the 2025 edition of the *ODOT Sign Policy and Guidelines*. Some updates from the 11th edition of the MUTCD for school areas include:

- New crosswalk, asphalt art, and sidewalk extensions
- Allows for speed feedback signs with school signage
- Allows for school signage assembly with a Rectangular Rapid Flashing Beacon

A version of the 2009 MUTCD with redline 11th edition updates can be found here.

Chapter 7 of the ODOT Sign Policy and Guidelines specifically covers school area signs and contains example layouts for school zone signage.

Maintenance

Signs and pavement markings for school speed zones should be inspected routinely by the road authority. Preferably, inspections should occur before the beginning of each school year or towards the end of the school year to schedule maintenance during the summer. Damaged signs should be replaced. If the use of the school building or traffic patterns change, the school district should notify the road authority. Zones which no longer meet the criteria for school areas should be removed (such as when the school permanently closes or the building use changes).

Recently maintained intersection in Harrisburg.

General Regulatory and Advisory Signage

The MUTCD 11th edition specifies that school warning signs should use a florescent yellow-green (FYG) background with a black legend and border and that the signs should be retroreflective or illuminated. Note that some specific signs may have differences outlined in the manual, which supersedes general guidance. ODOT reserves the FYG sign background for school-related warning signs. This visual uniformity can help drivers and other road users quickly identify when they are following school area signage and adapt their behavior for safety.

ODOT recommends against mixing standard yellow and FYG sign backgrounds for pedestrian/bicycle signs in a school area. If both sign types are needed within a school area, the road authority can use FYG backgrounds on the pedestrian/bicycle warning signs.

The process for acquiring and installing school zone signs is determined by the roadway authority; school district staff should consult with the roadway authority for specifics.

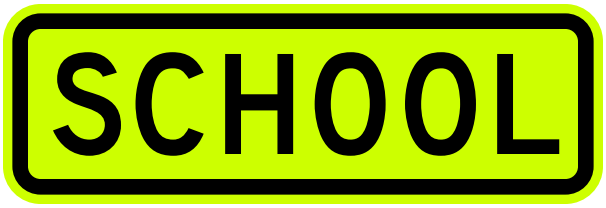
School Zones

The beginning of a school zone is established by posting a school sign (S1-1). The sign may be supplemented with a "School" plaque (S4-3P) and/or, if appropriate, an "All Year" plaque (S4-7P). This is referred to as the School Zone Sign Assembly.

School Speed Zones

School Speed Limit Assembly is used in established school speed zones and requires signs indicating the beginning and end points of the school speed zones. The specific beginning and end signs are selected based on the conditions for when the school speed zone is in effect (when flashing, school hours, or when children are present), the posted speed limit in the area in advance of the school zone, and if higher fines in the school speed zone are in effect.

S1-1



S4-3P

S4-7P

BEGINNING OF SCHOOL SPEED ZONE SIGNS

The beginning of a school speed zone is marked by a combination of the "School" plaque (S4-3P) with the speed sign (R2-1) and a bottom plaque indicating when the school zone is in effect (S4-1P, S4-2P, S4-4P, S4-5P, or OS4-8). Alternatively, OS5-5 and S5-1 combined plaques and may be used instead; this may be especially helpful if using additional signs for higher fines. See Section I: School Zones for guidance on where school speed zones are encouraged, where they require additional justification, and where they are discouraged.

SCHOOL SPEED ZONE ASSEMBLY

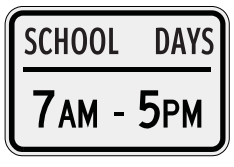
Condition A: Zones **adjacent to school grounds**

S4-3P

R2-1

S4-4P

or



OS4-8

Condition B: Zones at **school crosswalks away from school grounds**

S4-3P

R2-1

S4-4P

or

S4-2P

Guidance for School Zone Plaques

- **When Flashing:** All "When Flashing" (S4-4P) plaques and signs must also be accompanied by a flashing unit that meets the requirements of ORS 810.243.
- **Timeframe:** Timeframe plaques (S4-1P or OS4-8) must adhere to the 7:00 a.m. to 5:00 p.m. stated in the ORS.
- **When Children Are Present:** The "When Children Are Present" (S4-2P) plaque is only used away from school grounds. The specific conditions for using "When Children Are Present" are defined in ORS 811.124.

The choice should be based on the conditions outlined in Section 1: School Zones and a consideration of the site conditions, local practice, and school needs. Flashing units are generally more effective at getting drivers' attention and warning drivers of possible school children in the area. However, the additional cost may not be justified in some situations when the added visibility is not needed. Flashing units should especially be considered for higher speed approaches (35 mph or greater).

SCHOOL SPEED ZONE AHEAD

In areas where the posted speed limit is 35 mph or greater, a "Reduced School Speed Zone Ahead" (S4-5) sign may also be used. This sign should be placed 150 to 250 feet before the school zone (S1-1) sign per MUTCD 7B.16.

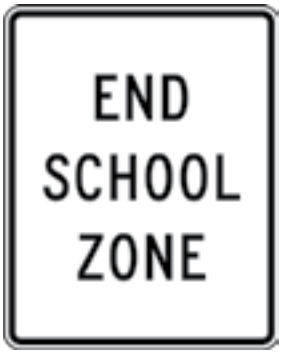
S4-5

END OF SCHOOL ZONE SIGNS

The end of a school speed zone must be marked with either the "End School Zone" (S5-2) or "End School Zone Speed Limit" (S5-3) sign.

- If the school speed zone includes higher fines signing (R2-10 or R2-6P), the "End School Zone" (S5-2) sign should be used.
- For zones without higher fines, the "End School Zone Speed Limit" (S5-3) sign should be used.

A standard speed limit sign alone is not an acceptable substitute to an "End School Zone" sign, but may be used in conjunction with either sign above to indicate the underlying speed of the roadway.



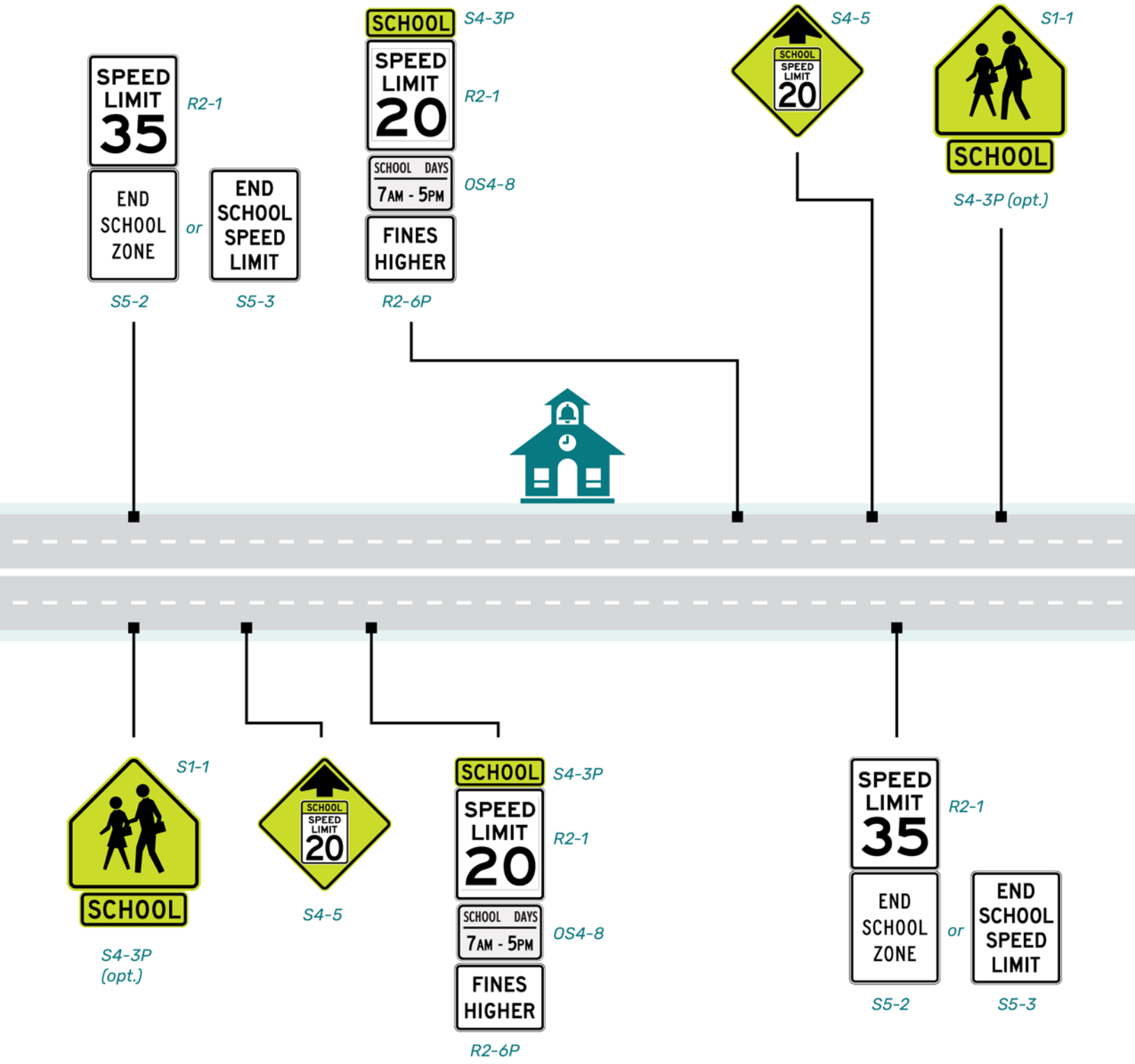
S5-2

S5-3

R2-10

R2-6P

EXAMPLE OF SIGNING FOR A SCHOOL SPEED ZONE WITH A SCHOOL SPEED LIMIT AND HIGHER FINES ONLY FOR SPEEDING



Speed Feedback Signs

A speed feedback sign is a type of changeable message sign that may be used to display the speed of approaching drivers. The sign may be portable or permanently installed in conjunction with the School Speed Limit Assembly.

These signs have been shown to be quite effective in slowing the fastest violators in school speed zones. Considerations for installing a permanent speed feedback sign include the following:

- Crash experience within the past three years
- Prevailing travel speeds when children are arriving or leaving the school
- Installation and maintenance costs
- Public support
- Number of children who walk or bike to school and use the entrances covered by the signs
- Speed feedback signs should only be used when school zone speed limit is in effect (MUTCD 7B.05P12)

The speed feedback sign should be used with the school zone assembly, ODOT also has a standard detail for this assembly, DET4455.

S3-1

School Bus Signage

"School Bus Stop Ahead" (S3-1) signs are used in advance of locations where school buses stopping to pick up or discharge passengers are not visible for a minimum distance of 500 feet and there is no opportunity to relocate the bus stop to a location with better visibility. The sign shall have a minimum 30-inch by 30-inch size. These signs are not intended to be used everywhere a school bus stops to pick up or discharge passengers but only where terrain and roadway features limit the approach sight distance and where there is no opportunity to relocate the stop to another location with adequate visibility. Stops posted with these signs should be reviewed periodically to determine if they are still used.

Bus stop locations may be reviewed through the guidance offered in the National Highway Transportation Safety Administration's publication *Selecting School Bus Stop Locations: A Guide for School Transportation Professionals*.

Parking Restrictions

Parking restrictions and other signs governing the stopping and standing of vehicles can be used to cover a wide variety of applications and can be a very effective tool for increasing school area safety. Visibility and control of traffic are some reasons for considering parking restrictions. Contact the road authority or local jurisdiction for regulations and any special requirements governing parking restrictions. Restrictions can include a variety of options including but not limited to the following: prohibiting parking at any time, limited-time parking, and restrictions based on vehicle type, day, or time of day. Road authorities may authorize curb markings (usually yellow) to supplement standard signs or to replace signs if permitted by local ordinance.

ORS 811.550 (17) prohibits parking within 20 feet of any crosswalk at an intersection regardless of whether or not a sign is posted.

Parking restriction sign near school crossing in Chenowith.

Increased Fines

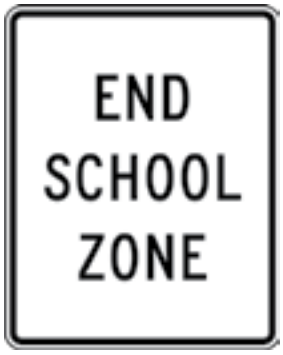
The higher fine provision applies in school zones only if posted (as fines higher) and the "When Flashing" or "When Children Are Present" supplemental plaques are used. See School Speed Zone Assembly section above for specific requirements for those plaques. Road jurisdictions are allowed under ORS 810.245 to post signs warning of increased traffic fines within school speed zones.

A school district may request the road authority to install a "Begin Higher Fines Zone" (R2-10) sign or a "Fines Higher" plaque (R2-6P) as described in Sections 7B.10 of the 11th edition MUTCD. The "Fines Higher" plaque (R2-6P), if used, should be placed on the School Zone Sign (S1-1) Assembly. If either the "Begin Higher Fines Zone" (R2-10) sign or a "Fines Higher" (R2-6P) plaque are posted, an "End School Zone" (S5-2) sign must be used (MUTCD 7B.06).

R2-10

R2-6P

S1-1



S5-2

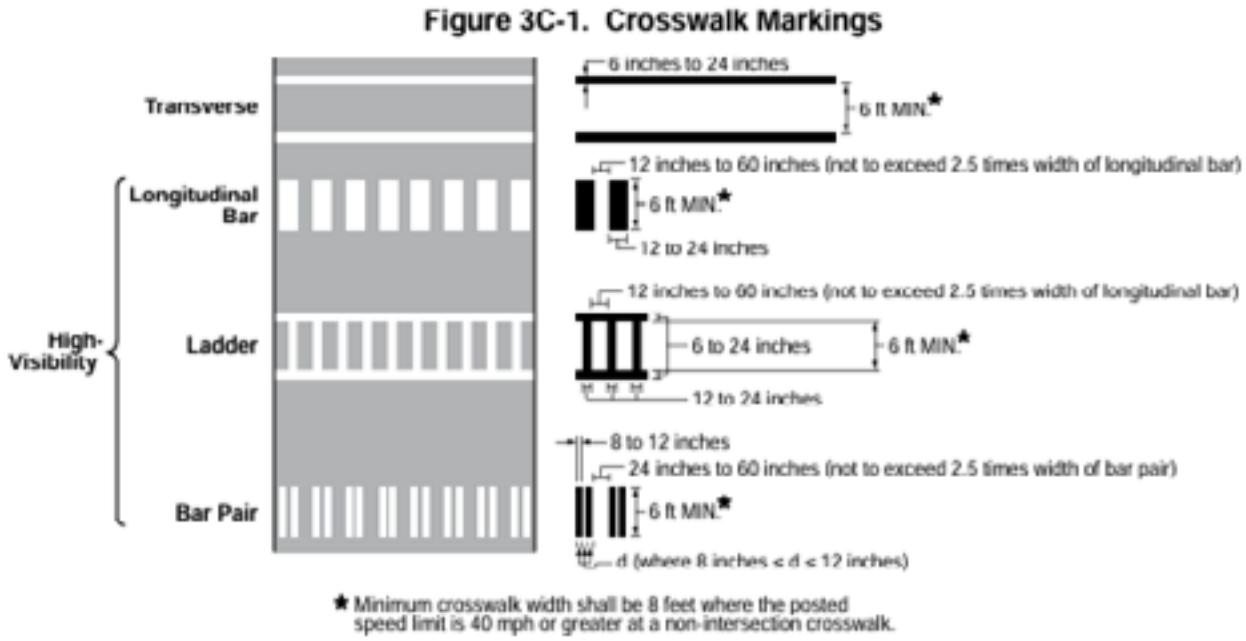
Student using unmarked crossing on high speed road to get to school.

Marked Crosswalks

In Oregon, every crosswalk is a legal pedestrian crossing, whether marked or not, unless otherwise signed. Marked crosswalks are most commonly located where pedestrian crossings are frequent, including intersections and some midblock locations. Drivers are required to stop for pedestrians in marked and unmarked crosswalks. On roadways without traffic controls where it is not feasible to require children to walk out of direction, crosswalks may also be marked in other uncontrolled locations. Locations for uncontrolled marked crosswalks should consider a School Route Plan, if available, as well as the need and ability to provide adult crossing guards and safety features such as illumination, median refuge islands, and curb extensions. In an effort to ensure that marked crosswalks are only placed where they are needed, an engineering study is required and communication with the school and/or school district is advised before establishing marked crosswalks at locations other than signalized or stop/yield controlled approaches to intersections. The number and age of the students using the crossing should be taken into consideration.

Marked Crosswalks **Mid-block Crosswalk** **Unmarked Crosswalk**

Source: ODOT What You Need to Know about Oregon Crosswalk Laws



Crosswalk markings from the 11th edition of the MUTCD

Longitudinal (also called "continental") crosswalk markings have been shown to be visible from significantly greater distances and can require less maintenance than transverse crosswalk markings, so their use is encouraged at uncontrolled marked crosswalks for state highways. ODOT has established the following practices, regardless of whether the marked crosswalk is in a school zone or not:

- Marking uncontrolled crosswalks with longitudinal markings
- Marking signalized and stop-controlled crosswalks with transverse crosswalk markings

The convention of using longitudinal markings at uncontrolled crosswalks and transverse markings at controlled crosswalks is intended to distinguish uncontrolled crosswalks (where drivers have an obligation to scan and stop for pedestrians intending to cross the street) from controlled crosswalks (where the driving task is regulated by a stop-control, e.g., stop sign or traffic signal.) Some communities have adopted an alternative practice of using longitudinal crosswalk markings at all school crosswalks (signalized, stop controlled, or uncontrolled) as a means of distinguishing school crosswalks in the community.

See FHWA Publication HRT-04-100 and ODOT's Criteria for Establishing Marked Crosswalks in the ODOT Traffic Manual or FHWA's Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations for further guidance on the decision to mark or not mark a crosswalk. Additional treatments beyond pavement markings are often needed; see the ODOT Traffic Manual for guidance on the selection of additional treatments. See A Guide to Oregon Crosswalk Law for more detailed information on crosswalks.

School Zone Crossings

SCHOOL ADVANCE CROSSING ASSEMBLY

The School Advance Crossing Assembly consists of a school sign (S1-1) and an "Ahead" plaque (W16-9P). This sign may be omitted when preceded by a School Zone Sign Assembly.

Top to bottom: S1-1, W16-9P

Top to bottom: S1-1, W16-7P

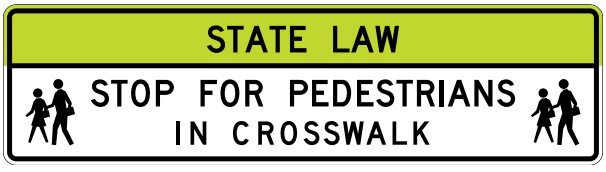
SCHOOL CROSSING ASSEMBLY

The School Crosswalk Warning Assembly consists of a school (S1-1) sign supplemented with a diagonal downward pointing arrow (W16-7P). The School Crossing Assembly may be used at uncontrolled school crossings that are adjacent to schools and along established school pedestrian routes. This sign assembly shall not be used at crossings controlled by Stop or Yield signs. The Overhead School Crossing and In-Street Pedestrian Crossing may be used as a supplement to the School Crossing Assembly with the diagonal arrow (W16-7P) at the crosswalk location. (MUTCD 7B.03)

OVERHEAD SCHOOL CROSSING

The Overhead School Crossing (R1-9c) reminds road users that it is state law to stop for pedestrians. The Overhead School Crossing assembly should not be used at a signalized intersection or crossings with a Pedestrian Hybrid Beacon or emergency vehicle beacon. If used indiscriminately, drivers may lose respect for the sign and ignore it when it is used at uncontrolled intersections. A better option may be to enhance the visibility of the entry points into the school zone.

Flashing beacons may be used with the Overhead Pedestrian Crossing Sign (R1-9a), but the beacons should not replace the beacons that are associated with a "When Flashing" school speed zone sign assembly. If used in a "When Flashing" school speed zone, care should be taken to locate the crosswalk beacon at a sufficient distance from the "When Flashing" beacon to avoid driver confusion.



R1-9c

R1-6a

R1-6a

R1-6c

In-Street Pedestrian Signs

In-Street Pedestrian Crossing signs are intended to be used to remind drivers of the laws regarding right-of-way of people walking and rolling at unsignalized pedestrian crossings. Version R1-6c is specific to school crossings, while R1-6a is a general pedestrian sign that may have the "school" plaque (S4-3P) appended to the top of it. Guidance on using these signs is given in section 7B.03 of the 11th edition of the MUTCD. The "Stop For" legend must be used in Oregon. Before installing signs, each location should be reviewed separately in terms of site conditions and pedestrian safety. Signs may be installed on a lane line, on the centerline, on an edge line, or on a median island and as close as practical to the marked crossing without placing it in the crosswalk, typically 1 to 5 feet in advance of the crosswalk.

These signs have proven to be very effective as traffic calming devices and at increasing motorist stopping compliance at crosswalks. They have been shown to achieve a level of stopping compliance similar to Rectangular Rapid Flashing Beacons in lower speed locations. They can be especially effective if placed and removed daily or only when crossing guards are present to indicate when children are arriving or departing from school. They can be an effective complement to school crossing guards.

The In-Street Pedestrian Crossing signs shall not be placed at signal controlled intersections, but may be used at intersections or midblock crossings with flashing beacons. Where there is a high volume of turning movements (especially large vehicles), an in-street sign may need to be placed on a raised island to prevent the need for frequent replacement. Narrow streets may pose a problem as the signs may not allow enough room for larger vehicles or unskilled drivers to pass without hitting the sign.

Wayfinding

Bicycle Destination Signs

Bicycle destination (D1-1b, D1-1c, D1-2b, D1-2c, D1-3b, and D1-3c) and distance (D2-1a, D2-2a, and D2-3a) signs provide guidance to people on bikes traveling on bikeway networks about distance and directions to different destinations along the network. If there are multiple destinations to be indicated from one location, they may be included on a single sign with arrows for each destination (destinations in the same direction may be grouped together with one arrow), but appropriate spacing should be included between destinations in different directions. Bicycle destination signs may use a bicycle symbol placed next to each destination or group of destinations or an oversized bicycle symbol as the top line of the sign (D2-1a, D2-2a, D2-3, D2-3a) as described in section 9D.01 of the 11th edition of the MUTCD. The Oregon Supplement to the MUTCD allows for travel times as on option on Bicycle Destination Signs as shown in the Oregon versions of Bicycle Destination Signs (OBD1-1c, OBD1-2c, OBD1-3c).

The signs are intentionally smaller to focus specifically on people traveling by bike, rather than motor vehicles, as the route options are different. For example, the signs may direct people on bikes to a separated path, bicycle route, or sidewalk providing connectivity to another bicycle facility. The signs should not be used as a replacement for destination signs intended for drivers of motor vehicles.

OBD1-1c

D1-1b

D1-2c

OBD1-2c

D2-2a

OBD1-3c

D2-3a

Bicycle Route Signs

For unnamed designated bicycle routes (e.g., the bicycle route is not a trail or scenic route like the Oregon Coast Bike Route or Springwater Corridor), signs (D11-1 and D11-1c) may be used to indicate to road users that they are on a bicycle route. If used, bicycle route signs can be repeated at regular intervals so that people on bikes entering along the route from side streets will be able to confirm they are on a bicycle route. Bicycle routes may be marked by "begin" signs (M4-14P) and "end" signs (M4-6P).

The bike route plaque (D-11-1bP) may be installed to supplement the Alternative Bike Route Sign (11-1c), the Bicycle Directional Sign (D11-11), or a street name sign (D3-1).

D11-1

D11-1c

M4-14P

M4-6P

D11-1bP

D3-1

D11-11

Bicycle Parking, Sharing, and Locker Signs

Bicycle parking and storage can be indicated by a bicycle parking sign (D4-3) or a bicycle locker sign (D4-4a). If there is a regulated bicycle sharing system, the bicycle sharing station sign (D4-4) may be used to indicate the location of a sharing station.

D4-3

D4-4

D4-4a

School Zone Pavement Markings

Pavement markings can be used to supplement the regulations or warnings of other devices such as traffic signs or they may obtain results that cannot be obtained by the use of any other device. However, pavement markings have definite limitations. They may be covered by snow, may not be clearly visible when wet, and may not be durable when subject to heavy traffic. Pavement markings also require a higher degree of maintenance than other traffic control devices, resulting in recurring costs to the road jurisdiction.

Note that information about marked crosswalks and parking restrictions were covered earlier in this chapter in the Marked Crosswalks and Parking Restrictions sections in conjunction with the relevant signage information for these pavement marking types.

Stop Lines

Stop lines are solid white lines normally 12 to 24 inches wide extending across all approach lanes and indicate the point at which vehicles are required to stop in compliance with the stop sign, traffic signal, or other legal requirement. Both marked crosswalks and stop lines indicate the point behind which a vehicle is required to stop; stop lines may be used in addition to a marked crosswalk if an engineering study determines an additional need. When used, stop lines shall be placed as near as practical to the intersecting roadway but should not be closer than 4 feet to the traveled way or crosswalk line.

Advance Stop Lines

Advance stop lines are stop lines set in advance of intersections or marked crosswalks on multi-lane roadways in order to provide additional time and visibility for people walking and rolling to avoid vehicles not stopping in adjacent lanes (i.e., multiple threat crashes). Typically, advance stop lines are used at uncontrolled marked crosswalks but may also be used at a controlled intersection where vehicles need to track over the center line. Advance stop lines are strongly recommended to reduce multiple threat crashes whenever a crosswalk is marked across a street with more than one through lane in each direction.

Advance stop lines (24-inch width) are typically set back 20 to 50 feet in advance of uncontrolled marked crosswalks (20 feet is the minimum). A common practice is to place them a distance in feet relative to the stopping distance at the posted speed. The "Stop Here for Pedestrians" (or pedestrian symbol) sign R1-5b or R1-5c must be used if an advance stop line is used for a pedestrian crosswalk. See "Advance Stop Lines" in the *ODOT Traffic Manual* for further guidance.

Word and Symbol Markings

Word and symbol markings on the pavement may be used as a supplement, but are not a required marking. An engineering study can recommend when pavement markings and symbols should be used. Compared to signs, markings in the travel lane require a high degree of maintenance, and they should be used only as necessary. Words, symbols, numerals, and arrows should be white and should be proportionally scaled to fit the roadway on which they are placed. If the message consists of more than one word, it should read up (i.e., the first word should be nearest to the driver). Pavement messages should preferably be no more than one lane in width except school messages, which may extend to the width of two lanes. When a two-lane width is used, the characters should be 10 feet or more in height. SCHOOL is one of the more commonly used markings. See Sections 3B.20 and 7C.02 of the 11th edition of the MUTCD for further guidance.

Traffic Signals and Beacons in School Areas

School Area Traffic Signals

School signals are standard traffic control signals erected at established school crossings on the basis of the need to create adequate gaps in the vehicular traffic stream for pedestrian crossings. When properly designed, located, and operated under conditions that fully warrant their use, school signals may offer the following **ADVANTAGES** over other treatments:

- Traffic signals generally have a higher rate of driver compliance as compared to treatments that do not have a red indication such as flashing beacons or signs.
- Considering initial and operating costs, traffic signals may offer cost-savings as compared with police supervision or crossing guards over a period of several years.
- Under conditions of favorable spacing, signals can be coordinated with adjacent signals to provide for continuous or nearly continuous movement of vehicular traffic.

Students and families walking to school using a traffic signal with a crossing guard.

The following **DISADVANTAGES** for signals should be considered when choosing a specific means of crossing control:

- School signal control has a much higher initial cost than police supervision or crossing guards. It should only be considered for locations where several years of use is expected.
- In some circumstances, an intersection operating with a traffic signal may still need supplemental control by an adult, guard, or school safety patrol (i.e., right turns on red).
- Signals can increase the frequency of some types of motor vehicle crashes (i.e., rear-end crashes).

A traffic signal may be warranted at an established school crossing when a traffic engineering study indicates that the number of adequate gaps in the traffic stream during the periods the children are using the crossing is less than the number of minutes in the same time period. Signals have the potential to increase some types of crashes; they should be used only after other less restrictive means to have students utilize existing gaps have been considered (e.g., pedestrian refuge islands, in-street signs). See Section 4C.06 of the MUTCD for more information on traffic signals in school zones.

All signals and beacons should incorporate accessible pedestrian signals, which use auditory and vibrating elements to indicate the signal is on.

Pedestrian Hybrid Beacons (PHBs)

The PHB is a traffic control device that may be used at intersections and midblock pedestrian crossings on arterial streets. The signal indications are dark until a person walking or rolling pushes a button that activates the device. Once activated, the PHB cycles through periods of flashing yellow, solid yellow, solid red, and then flashing red for traffic on the arterial street. The standard Walk, flashing Don't Walk, and Don't Walk messages are shown to pedestrians at the appropriate times.

PHBs tend to be used where vehicle speeds are too high to permit people walking and rolling to safely cross the road or where gaps in traffic are not adequate to permit them to cross. They offer an efficiency advantage for motor vehicles over conventional traffic signals because traffic can proceed (after stopping) during the flashing red phase, and they generally cost significantly less than a conventional traffic signal, especially if the PHB heads can be located along the side/median of the street instead of overhead. Red indications, as used in conventional traffic signals and PHBs, have been found to generally result in the highest rates of stopping compliance at marked crosswalks.

Rectangular Rapid Flashing Beacons (RRFBs)

RRFBs consist of two rapidly and alternately flashed rectangular yellow LED arrays located between the crosswalk warning sign and the supplemental downward arrow plaque. These devices have very high efficacy in driver compliance for yielding at crossings. There is evidence that they increase the distance at which motorists begin to slow for a pedestrian in a crosswalk. Compared to full signals and PHBs, RRFBs are a less expensive option. Like other treatments, RRFBs should be considered when indicated as the most effective treatment option by an engineering study. Crossing guards can be an additional tool to provide gaps in traffic at school crossing when warranted by an engineering study

RRFBs may only be used in conjunction with a Pedestrian or School Crossing Assembly and they may not be used with traffic signals, stop signs, or yield signs. If used in a "When Flashing" school speed zone, care should be taken to locate the RRFB at a sufficient distance from the "When Flashing" beacon to avoid driver confusion. If placed too closely to a "When Flashing" beacon, some drivers may mistakenly believe the school speed zone is in effect when the RRFB is flashing; conflicts arise if other drivers continue at normal speeds. See the *ODOT Traffic Manual* section 310.3, and see Chapter 4L Flashing Beacons of the MUTCD for more guidance.

Flashing Beacons for IndicatingCchildren Arriving or Leaving School

The School Speed Limit Assembly, "School Speed Limit 20 When Flashing" (S4-2P, R2-1, and S4-4P or S5-1), must be accompanied by circular flashing beacon lights to indicate when children are scheduled to arrive at or leave school. Statute ORS 810.243 requires that the beacons flash only when children are scheduled to arrive or leave school unless a few very specific conditions are met. Typical flashing periods are at the beginning and end of the school day. The general practice is to set the beacons to flash approximately 30 minutes prior to and 15 minutes after a scheduled arrival, and for 15 minutes prior to and 30 minutes after a scheduled departure. Flashing may also occur for half-day releases such as noon for half-day kindergarten release. The road authority may need to conduct field observations to determine the daily flashing schedule. The road authority typically maintains and programs the flashers according to the school-provided schedule for the school year.

See ORS 810.243 for additional information on guidance for when a school flashing beacon may be used, including hours of operation. See MUTCD 4S.04 for guidance on design and operation of a Speed Limit Sign Beacon.

School Crossing Guards and Safety Patrols

School districts are authorized to have traffic safety patrols per Oregon rules and statutes. See Section II: Laws, Rules, and Standards About School Areas for more information on the administrative rules and statutes governing traffic patrol. These traffic patrols are an important part of keeping families safe while walking and biking to school by helping children cross streets safely at key locations. The *Oregon Traffic Patrol Manual For Schools* (Oregon Department of Education) recommends practices for the organization, operation, and administration of a crossing guard program in Oregon. The information below is a summary of some of the key points of that document.

Traffic patrol programs can use two types of school crossing supervision:

- Control of vehicles and pedestrians by adult safety patrol members or police officers
- Control of pedestrians by student members of the traffic safety patrol

The statutes and rules for school traffic patrols are covered in ORS 339.659 to 339.665 and under OAR 581-021-0100.

State guidance uses the terms "crossing guard," "traffic patrol," and "safety patrol" interchangeably. All terms refer to members of a school district traffic patrol team.

When to Use Adult Crossing Guards

Adult crossing guards are important members of a district traffic patrol program. An engineering study should be used to determine at which location adult crossing guards are placed. The Department of Education suggests that an adult crossing guard is generally needed when any one of the following conditions exist:

- The traffic situation at the school crossing is too hazardous to be navigated by children.
- The crosswalk is so far from the school that school officials cannot monitor it.
- It is difficult for children to observe traffic at all corners.
- The crossing is close to school and a great number of children make it difficult to control the crossing.
- When there is a high volume of turning traffic to and from an arterial.
- When there is a high volume of pedestrian traffic across an arterial.
- When there is not at least one safe gap in traffic per minute during the crossing time or when an engineering study has shown that adequate gaps need to be created.
- Where authorized by law.

Each of these conditions may require adult supervision to create gaps in traffic, slow traffic near crosswalks, and safely assist groups of children across the street. Customarily, crossing guards are used in elementary schools. In particularly unsafe crossing situations, middle schools may wish to utilize crossing guards as well.

What Can Crossing Guards Do?

ADULT CROSSING GUARDS

Crossing guards should not be directing traffic. Instead, they should be selecting opportune times to create a safe gap for students to cross the street. Crossing guards may be used to provide gaps in traffic at school crossings where an engineering study has shown that adequate gaps must be created.

Crossing guards should be easily identified as a member of a traffic patrol team, and are required to wear a fluorescent yellow-green vest labeled as ANSI 107-2004 for class 2 risk exposure. They may also wear a fluorescent yellow-green hat and carry a school crossing flag or flagger paddle as recommended by the Oregon Department of Education.

STUDENT SAFETY PATROL TEAM MEMBERS

Student safety patrols should be authorized by the local school board. Like adult crossing guards, they do not direct traffic, but they do supervise children using a crossing. School authorities should be responsible for organizing, instructing and supervising student safety patrols with the assistance of the local police. They should be students from the fifth grade or higher, and parental approval should be obtained in writing before a student is used as a member of the safety patrol.

Student safety patrol members must wear a bright colored yellow, orange, or strong yellow-green retroreflective ANSI Class 1 high-visibility safety vest. Student safety patrols carry a retroreflective 24-inch minimum square flag. The flag color may be yellow or strong yellow-green.

Training Resources

The Oregon Department of Education, Pupil Transportation Program provides technical assistance for establishing student safety patrol programs. Training videos for adult and student members are available upon request at 503-974-5737 or email at buslicense@ode.state.or.us.

The Oregon Safe Routes to Schools Technical Assistance Provider team may have additional training resources and materials available. Find out how to connect with your Regional Hub and, if available, local Safe Routes to School Coordinator, on the Oregon SRTS website to get support with your traffic patrol program.

Section V: School Zone Safety Resources

National Resources

The National Center for Safe Routes to School is a centralized resource of information on successful Safe Routes to School programs and strategies. Users of this site will find information on how to start and sustain a Safe Routes to School Program, case studies of successful programs as well as many other resources for training and technical assistance. A comprehensive Online Guide is available. This federally-funded program also provides educational resources related to SRTS, a listserv, and toll-free phone number.

The Safety Division of Federal Highway Administration Safe Streets and Roads for All (SS4A) projects for Tribal, regional, and local initiatives to prevent roadway deaths and serious injuries. These projects use the Safe System Approach described in Section III: Designing for Safety. Safe Routes to School projects can be included in SS4A grant projects.

The Institute of Transportation Engineers offers a variety of Briefing Sheets on matters related to school area safety, walking and bicycling audits, school site design, and traffic calming.

The National Center for Safe Routes to School has a website for Walk and Bike to School Day which offers resources for attracting wide support and momentum for your Safe Routes to School events along with some fun.

The Pedestrian and Bicycle Information Center (PBIC) is a clearinghouse for information about health and safety, engineering, advocacy, education, enforcement, and access and mobility. The PBIC serves anyone interested in pedestrian and bicycle issues, including planners, engineers, private citizens, advocates, educators, police enforcement and the health community. PBIC supports a repository for digital image files.

The Institute for Transportation Research and Education at North Carolina State University provides information on best practices for managing school campus traffic.

Oregon Resources

Oregon's Safe Routes to School Program maintains a website with resources, information, and funding opportunities about education and infrastructure for Safe Routes to School.

- Learn about **education offerings** such as free incentives and outreach materials for five Walk+Roll to school days each year; Jump Start, the bicycle and pedestrian safety train-the-trainer program; free educational materials; opportunities for high school students; and more.
- Get **infrastructure support** with example plans, assessment guides, information about traffic gardens, evaluation resources, and technical assistance for Planning and Engineering projects.
- Use **School Pool** to support carpooling to and from in your community.
- Get **free resources** from assessment guides to curriculum to informational brochures for families.
- Learn about **funding opportunities** through ODOT for Safe Routes to Schools.
- Connect with your **Regional Hub** to meet other SRTS practitioners at monthly calls, attend educational webinars, and receive regular newsletters and updates on Oregon Safe Routes to School opportunities including joining a bi-annual SRTS conference hosted by Oregon SRTS.

The Oregon Department of Education, Pupil Transportation Program provides technical assistance for establishing student safety patrol programs. The *Oregon Traffic Patrol Manual For Schools* recommends practices for the organization, operation, and administration of a crossing guard program in Oregon. Training videos for safety patrols are available by contacting ODE at buslicense@ode.state.or.us.

Oregon's Transportation and Growth Management Program provides information related to school siting and the role this decision has on walking and biking rates.

The Legacy Trauma Nurses Talk Tough Program at Legacy Emanuel Medical Center offers presentations to elementary and junior high school students in the Portland metro area related to bicycle and auto safety. The center also offers below-retail cost helmets.

Oregon Walks promotes walking and advocates for safe, convenient, and attractive walking conditions in Oregon communities and can provide resources for creating connected communities for pedestrians.

Local Programs Around Oregon

Connect with your Safe Routes to School Regional Hub to find out about programs, opportunities, and resources for Safe Routes to School in your community. Find your Regional Hub and more at the ODOT Safe Routes to School website.

Funding Opportunities

The Oregon Safe Routes to School Program provides information about funding opportunities from ODOT as well as local and national organizations. Find more information on the funding page.

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Oregon